

# Route 16 Priority Corridor Study Chelsea and Everett, Massachusetts

Second St  
NEXT INTERSECTION

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Spring St  
2ND INTERSECTION



# Route 16 Priority Corridor Study

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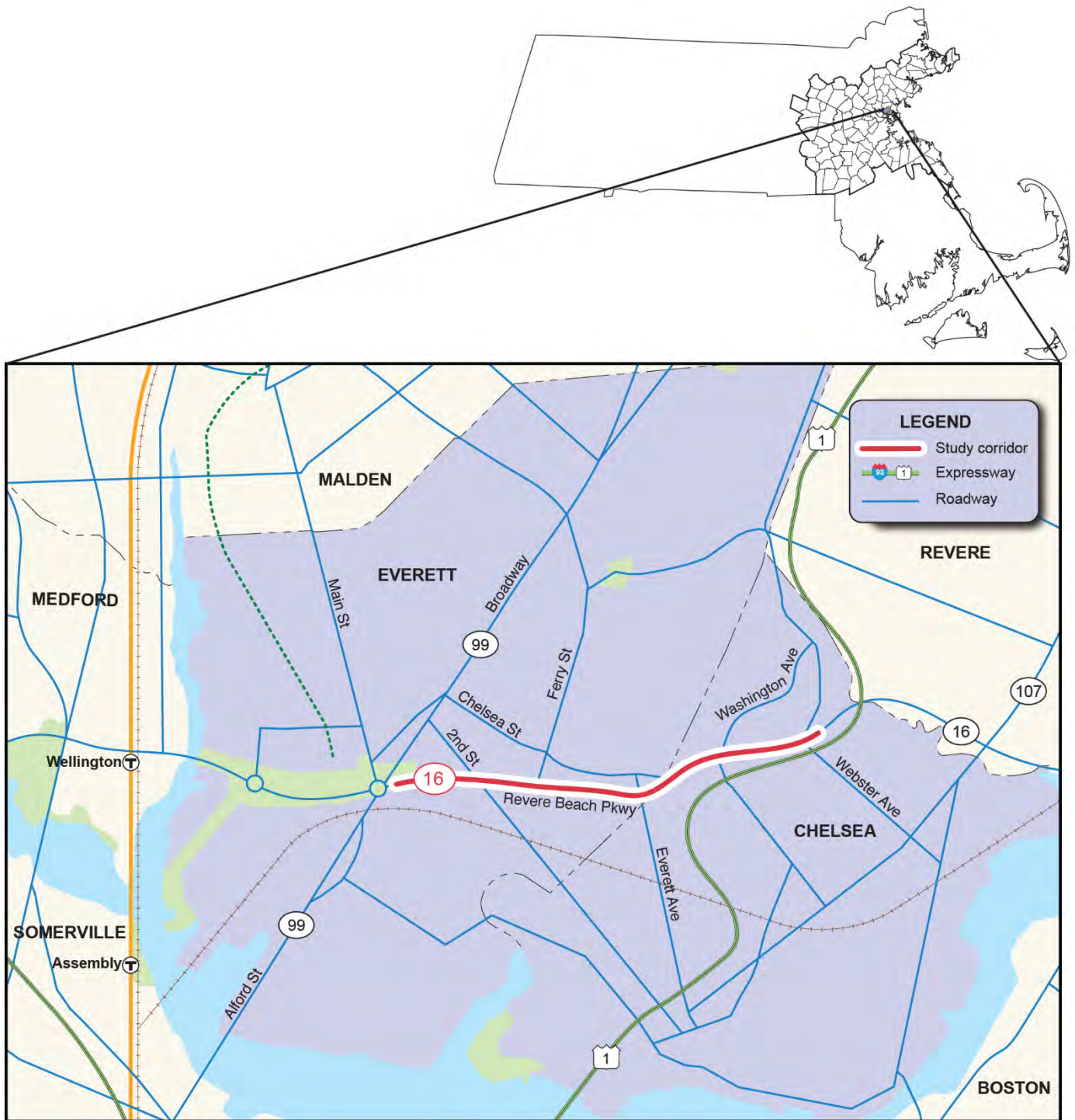
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# Abstract

The *Route 16 Priority Corridor Study* focuses on one of the locations identified in the Needs Assessment for *Charting Progress to 2040*, the Metropolitan Planning Organization's (MPO) Long-Range Transportation Plan (LRTP) endorsed in 2015. The LRTP is used to guide investment decisions regarding transportation infrastructure improvements in the Boston region. The MPO prioritized this location for study after considering a number of factors: the need to address poor safety conditions and traffic congestion; the desire to enhance multimodal transportation; and the potential for recommendations from the study to be implemented. This report details the existing conditions, assesses safety and operational problems, discusses options for improvements, and makes recommendations for implementing improvements. The recommendations, if implemented, would transform the roadway into a more pedestrian- and bicyclist-friendly roadway, improve safety at high-crash locations, make traffic flow and operations efficient, support the vision of connecting the neighborhoods to places such as schools and local businesses, and promote multimodal transportation.

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# Executive Summary

## ES.1 BACKGROUND

The Boston Region Metropolitan Planning Organization (MPO) selected Route 16 between Routes 1 and 99 in the cities of Chelsea and Everett as the subject of a corridor study in federal fiscal year 2019. The study focuses on one of the locations identified in the Needs Assessment for *Charting Progress to 2040*, the MPO's Long-Range Transportation Plan endorsed in 2015. The Needs Assessment is used to guide investment decisions regarding transportation infrastructure improvements in the Boston region. The MPO prioritized this location for study after considering a number of factors, including the need to address poor safety conditions and traffic congestion; desire to enhance multimodal transportation; need to maintain regional travel capacity; and the potential to implement the study recommendations. The report analyzes the existing conditions, assesses safety and operational problems in the corridor, and discusses concepts for roadway improvements.

## ES.2 EXISTING CONDITIONS

Route 16 in Chelsea and Everett is a two-way, six-lane principal arterial under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). The jurisdiction of roadway was transferred to MassDOT from the Department of Conservation and Recreation in 2017. The cities of Chelsea and Everett have jurisdiction of the crossing arterials and streets. A series of maps are appended to this report. The maps in Figures 1 and 2 show the study area and roadway configuration.

The MassDOT Highway Division, cities of Chelsea and Everett, and Boston Region MPO collected and assembled the data used to assess the existing conditions and identify problems in the corridor. The data included socio-economic and demographic data; vehicular, pedestrian, and bicycle volumes; traffic speeds and crashes; and community input data (community survey). Figures 3 through 15 summarize the collected data.

Key vehicular, pedestrian, and bicycle issues and concerns were identified within the corridor. Many locations in the study area experienced a greater-than-expected number of crashes: five intersections are on the list of the Top 200 high-crash location in Massachusetts and seven intersections (including the five



top 200 high-crash locations) are on the list of Highway Safety Improvement Program crash clusters.<sup>1</sup>

Current pedestrian and bicycle conditions include a lack of adequate sidewalk conditions, narrow pedestrian refuge areas, insufficient pedestrian crossing intervals, and obstructions in sidewalks. In addition, absence of crosswalks at some locations on Route 16, wheelchair ramps that are not compliant with the Americans with Disabilities Act, lack of pedestrian countdown timers and detection for bicycles, and parking on sidewalks by businesses along the corridor worsens the problems.

Figures 16 through 20 describe the existing intersection levels of service (LOS). Current traffic operations include high levels of congestion, queues blocking intersections, high vehicular speeds, and drivers running red lights during peak periods. The traffic safety and operational problems include, but are not limited to outdated signal equipment such as missing signal visors and backplates, rusty signal poles, poor visibility of post-mounted signals, poor left-turn signal displays, insufficient left-turn storage, and outdated signal timing plans. Figures 21 through 24 summarize the problems identified in the corridor.

**ES.3 PROPOSED IMPROVEMENTS**

MPO staff, working with an advisory task force (representatives from MassDOT and the cities of Chelsea and Everett), developed short-, medium-, and long-term improvement concepts for the corridor. MassDOT is currently implementing improvements at several locations in the corridor as part of the Encore Boston Harbor mitigation project including the Route 16 intersections at Everett Avenue, Union Street, Washington Avenue, and Webster/Garfield Avenues. In addition, road safety audits have been conducted for the Sweetser Circle and Webster/Garfield intersection because of the high number of crashes in the corridor, along with a conditional assessment of Route 16 (Revere Beach Parkway), which evaluated the existing conditions and recommended improvements. Finally, Everett is currently conducting a study evaluating Sweetser Circle improvements to accommodate pedestrians and bicycles as well as make traffic operations safer and more efficient. MPO staff reviewed the recommendations from these projects and studies and incorporated them into this study.

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<sup>1</sup> An HSIP crash cluster is a location in which the number and severity of crashes—as measured on the Equivalent Property Damage Only (EPDO) index—ranks the location among the top five percent of crash clusters in the region. The EPDO method assigns weighted values to each crash based on whether the crash resulted in property damage (unweighted), injury (weighted by 5), or a fatality (weighted by 10).

### ES3.1 Short-Term and Medium-Term Improvements

The proposed short-term improvements address safety and operational concerns that, when implemented, will bring the roadway to MassDOT standards. They are usually low cost, relatively uncomplicated and inexpensive to implement, and require minimal design efforts. The medium-term improvements are usually low to medium cost, more complicated than their short-term counterparts did, and require more funding resources and design and engineering efforts.

The recommended short- and medium-term improvements are diagrammed in Figures 25 through 28 and described in Table ES-1. The intersection LOS that would result from short-term signal retiming and coordination is shown in Figures 29 through 32, and the analysis indicated that retiming the signals in the corridor would reduce delay between 10 and 30 percent during weekday AM and PM peak periods.

**Table ES-1  
Short- and Medium-Term Improvements**

Issue	Improvement	Time Frame	Cost	Jurisdiction
Environmental	Provide routine street cleaning and trash/litter pickup	Short	Medium	MassDOT
Congestion	Optimize traffic signal timings and coordinate signals to reduce congestion and delay	Short	Medium	MassDOT
Congestion	Repair or replace malfunctioning vehicle detectors at signalized intersections, especially on Route 16 westbound left-turn lane at Garfield Avenue and Webster Avenue intersection.	Short	Low	MassDOT
Congestion	Lengthen short left-turn lanes to reduce their impacts (traffic queues and drivers turning from wrong lanes) from interrupting traffic flow in the straight-through lanes. Or increase signal phase intervals of short left-turn lanes	Medium	Medium	MassDOT
Congestion	Consider working with owner of the Car Wash located between Second Street and Spring Street to relocate the entry and exit to reduce its impacts on traffic flow on Route 16, Second Street, and Spring Street.	Medium	Medium	MassDOT
Pedestrian safety	Make wheelchair ramps ADA-compliant by adding detectable plates	Medium	Medium	MassDOT
Pedestrian safety	Align pedestrian signal in the southwest corner with crosswalk on Lewis Street	Short	Low	MassDOT

<b>Issue</b>	<b>Improvement</b>	<b>Time Frame</b>	<b>Cost</b>	<b>Jurisdiction</b>
Pedestrian safety	Reposition detectable warning plates on Garfield Avenue to align better with crosswalks	Short	Low	MassDOT
Pedestrian safety	Bring poor sidewalks to meet MassDOT standards and ADA-compliance	Medium	Medium	MassDOT
Pedestrian safety	Widen the median opening to provide enough pedestrian refuge areas and welcoming space	Medium	Medium	MassDOT
Pedestrian safety	Add countdown timers to help expedite pedestrian crossing at signalized intersections	Medium	Medium	MassDOT
Pedestrian safety	Work with business owners to remove parking on sidewalks throughout the corridor	Medium	Medium	MassDOT
Pedestrian	Add crosswalks on Route 16 at the following locations: <ul style="list-style-type: none"> <li>• East leg of Route 16 at Second Street</li> <li>• East leg of Route 16 at South Ferry Street</li> <li>• West leg of Route 16 at Everett Avenue</li> <li>• West leg of Route 16 at Union Street</li> </ul>	Medium	MassDOT	MassDOT
Bicycle safety	Provide bicycle detection at the signalized intersections	Medium	Medium	MassDOT
Safety	Modify clearance intervals to MassDOT standards to address high number of angle and rear-end crashes	Short	Medium	MassDOT
Safety	Replace or repair signal heads with missing or damaged visors and backplates	Short	Low	MassDOT
Safety	Replace incandescent signal sections with LED sections	Short	Low	MassDOT
Safety	Replace broken and straighten slanted light poles and improve street lighting	Medium	Medium	MassDOT
Safety	Upgrade all 8-inch signal lenses to 12-inch signal heads	Short	Low	MassDOT
Safety	Install stop signs and add crosswalks on Garvey Street and Terminal Street	Short	Low	MassDOT
Safety	Install advance street name and guide signs to improve wayfinding	Medium	Medium	MassDOT
Safety	Increase police patrol and presence to reduce speeding, red light runners, and blocking intersection	Short	Medium	State/City Police
Safety	Reduce width of rightmost eastbound lane from Lewis Street to Second Street to prevent drivers forming two lanes (pavement restriping)	Short	Low	MassDOT

Issue	Improvement	Time Frame	Cost	Jurisdiction
Safety	Narrow the width of channelized right-turn lane on Garfield Avenue to prevent drivers forming two lanes, need to consider truck movements (pavement striping)	Short	Low	MassDOT
Safety	Realign the guide signage on Webster Avenue so it becomes visible to northbound traveling vehicles	Short	Low	MassDOT
Safety	Trim vegetation to provide drivers with more clear view of signs and signals at the following intersection (Spring Street, Union Street, and Webster Avenue)	Short	Low	MassDOT
Safety and operations	Consider providing split phasing for the side streets to eliminate potential conflicts between opposing vehicles (Everett, Washington, and Garfield/Webster Avenues)	Medium	Medium	MassDOT
Safety and operations	Provide advance intersection lane control signs on Route 16 to indicate lane configuration ahead	Medium	Medium	MassDOT
Safety and operations	Improve drainage systems in the corridor to reduce flooding from storms	Medium	Medium	MassDOT
Pavement	Resurface roadway	Medium	Medium	MassDOT
Pavement	Provide pavement markings to clearly show the lanes at intersections	Short	Low	MassDOT
Pavement	Provide pavement markings to clearly show the northbound and southbound left and through lanes on Everett Avenue, Garfield Avenue, and Webster Avenue	Short	Low	MassDOT, Everett, and Chelsea

ADA = Americans with Disabilities Act. MassDOT = Massachusetts Department of Transportation.  
 Source: Central Transportation Planning Staff.

### ES3.2 Long-Term Improvements

The long-term improvements, usually high cost, typically require more design and engineering efforts, environmental permitting, and more funding resources. They focus on modernizing the roadway to incorporate advanced technologies and make it multimodal and pedestrian and bicycle friendly (safety, mobility, connectivity, and security). For the purposes of this study, MPO staff divided the corridor into three segments—western, middle, and eastern—and developed improvement concepts for each segment. The recommended improvements are diagrammed in Figures 33 through 36 and described in Table ES-2. The LOS that would result from the improvements are shown in Figures 37 through 40. The analysis indicate that the long-term improvements would reduce signal delay during weekday AM and PM peak period by 10 percent to 30 percent.



**Table ES-2  
Long-Term Improvements**

<b>Issue</b>	<b>Improvement</b>	<b>Cost</b>	<b>Jurisdiction</b>
Pedestrian and bicycle safety	Construct a multiuse path on either side of Route 16 between Lewis Street and Everett Avenue to accommodate pedestrians and bicyclists safely. Add bicycle racks at convenient locations.	High	MassDOT
Pedestrian safety	Upgrade all sidewalks, pedestrian refuge areas, and wheelchair ramps to MassDOT standards	High	MassDOT
Safety	Reconstruct the cobblestone median between Everett Avenue and Union Street to MassDOT standards	High	MassDOT
Congestion and safety	Upgrade outdated traffic signal equipment to mast-arm mounted signal heads to increase visibility	High	MassDOT
Congestion and safety	Study Sweetser Circle to identify options to improve safety, reduce congestion, and accommodate pedestrian and bicyclists	High	MassDOT
Congestion and safety	Implement an ATSC to optimizing traffic signal timings and coordination	High	MassDOT
Congestion and safety	Install an exclusive northbound left-turn lane on Second Street to reduce congestion and increase safety	High	MassDOT and Everett
Congestion and safety	Install exclusive left-turn lanes on the following streets to reduce congestion, left-turn conflicts, and make traffic flow efficient. <ul style="list-style-type: none"> <li>• Everett Avenue</li> <li>• Garfield Avenue</li> <li>• Webster Avenue</li> </ul>	High	MassDOT, Everett, and Chelsea
Pedestrian safety	Install a traffic signal at Boston Street to improve safety for pedestrian crossing Route 16	High	MassDOT
Environmental	Improve landscape and streetscape and more greenery along the corridor to provide a welcoming environment for all uses	High	MassDOT
Safety	Upgrade light poles and fixtures to MassDOT standards	High	MassDOT
Access management	Implement access management by consolidating and sharing driveways in future development along the corridor	High	MassDOT
Pedestrian safety	Improve pedestrian crossings experience at Union Street intersection	High	MassDOT
Safety	Redesign the approach of County Road to align with the one-way street and right-turn only out of County Road.	High	MassDOT and Chelsea
Safety	Improve signage and wayfinding throughout the corridor	High	MassDOT
Congestion	Lengthen the Route 16 westbound left-turn lane to provide more storage for vehicles turning onto Webster Avenue	High	MassDOT
Congestion	Install a traffic signal to provide access from Route 1 southbound to Route 16 eastbound	High	MassDOT
Congestion	Add a new ramp connecting Route 16 westbound to Route 1 northbound	High	MassDOT

Issue	Improvement	Cost	Jurisdiction
Safety	Construct geometric improvements at Webster/Garfield Avenue intersection: <ul style="list-style-type: none"> <li>• Move the west leg of Route 16 approximately 15 feet to the west to create more space within the intersection for left turning movements to eliminate conflicts</li> <li>• Consider geometric improvements to improve alignment on Webster and Garfield Avenues</li> </ul>	High	MassDOT

ATSC = Adaptive Traffic Signal Control Technology. MassDOT = Massachusetts Department of Transportation.

Source: Central Transportation Planning Staff.

### ES.4 CONCLUSION

The concepts developed in this study provide MassDOT, the cities of Chelsea and Everett, and other stakeholders an opportunity to review conceptual options for addressing the deficiencies in the corridor before committing design and engineering funds to a roadway improvement project. If implemented, the proposed improvements offered in this report would increase traffic safety, make traffic operations more efficient, and modernize the roadway to accommodate all users. MassDOT and the cities of Chelsea and Everett are not obligated to make these improvements, but if they were to seek improvements on this roadway, this document provides a guide to possible improvements.

This study aligns with the Boston Region MPO’s goals of modernizing roadways to improve capacity and mobility by expanding the quantity and quality of walking and bicycling infrastructure; making transit service more efficient; reducing congestion; increasing safety on the region’s highway system; and preserving the transportation system.



# Chapter 1—Introduction

## 1.1 ORIGIN OF STUDY

The Boston Region Metropolitan Planning Organization (MPO) has been conducting studies of roadway corridors identified through the Needs Assessment of the Long-Range Transportation Plan (LRTP) as needing infrastructure improvements to address safety, mobility, and traffic operations problems.<sup>2</sup> Municipalities in the region and the Massachusetts Department of Transportation (MassDOT) have been receptive to these studies, which provide them with the opportunity to review conceptual options to improve a specific arterial segment before committing design and engineering funds to a project. After reviewing the options, if a proponent initiates a project that qualifies for state and federal funds, the study's documentation may be useful to both MassDOT and the project proponent. The information provided in the study's report is useful for completing MassDOT Highway Division's project initiation forms, identifying problems along the corridor, justifying the need for improvements, and providing improvement concepts to advance into the preliminary design and engineering stages.

MPO staff identified a number of arterial roadway segments that should be prioritized because they require maintenance, modernization, and safety and mobility improvements; these roadway segments are listed in the LRTP. To address the problems that exist in some of these arterial segments, a study was included in the federal fiscal year (FFY) 2019 Unified Planning Work Program (UPWP).<sup>3</sup> Through this study, MPO staff recommended conceptual improvements for one or more corridors, or several small sections within a corridor. MPO staff selects locations for study—considering agency, municipal, subregional, and other public feedback—and collect data, conduct technical analysis, and recommend improvements. Recommendations from the study are sent to implementing agencies, which may choose to fund improvements through various federal, state, and local sources, separately or in combination.

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<sup>2</sup> Boston Region Metropolitan Planning Organization, *Charting Progress to 2040: The New Long-Range Transportation Plan of the Boston Region Metropolitan Planning Organization*, endorsed by the Boston Region MPO on July 30, 2015.

<sup>3</sup> Boston Region Metropolitan Planning Organization, *Unified Planning Work Program, Federal Fiscal Year 2017*, endorsed by the Boston Region Metropolitan Planning Organization on July 28, 2016.





# Chapter 2—Study Location

## 2.1 SELECTION PROCESS

On October 18, 2018, the Boston Region MPO approved the Route 16 in Chelsea and Everett study, following a selection process that involved a review of safety conditions, congestion, multimodal and regional significance of the roadway, regional equity, and the potential for implementing study recommendations.<sup>4,5,6,7,8,9</sup> Figure 1 shows the arterial roadway segments in the study area. (All figures are included at the end of the report.)

The study location was selected from a list of 44 arterial segments in 37 municipalities in the MPO region.<sup>10</sup> A copy of the technical memorandum describing the selection process is included in Appendix A. MassDOT Highway Division District 4, the MassDOT Office of Transportation Planning, and the cities of Chelsea and Everett supported the study of Route 16. They participated by collecting data needed for the analyses, reviewing documentation of existing conditions, identifying problems, and developing improvements to mitigate the problems.

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<sup>4</sup> Safety Conditions: The location has a higher-than-average crash rate for its functional class; contains a crash cluster that makes it eligible for HSIP funding; contains a crash location on MassDOT Highway Division's Top High Crash Locations Report; or has a significant number of pedestrian and bicycle crashes (two or more per mile).

<sup>5</sup> Congested Conditions: The travel time index is at least 1.3. The travel time index is the ratio of the peak-period travel time to the free-flow travel time.

<sup>6</sup> Multimodal Significance: The roadway carries one or more bus routes or is adjacent to a transit stop or station; the roadway supports bicycle or pedestrian activities or there is a project planned that will support these activities; there is a need to accommodate pedestrians and bicyclists and improve transit on the roadway; or there is a significant amount of truck traffic on the roadway serving regional commerce.

<sup>7</sup> Regional Significance: The roadway is on the National Highway System; carries a significant portion of regional traffic (Average Daily Traffic of 20,000 vehicles or more); lies within 0.5 miles of environmental-justice transportation analysis areas or zones; or is essential for the region's economic, cultural, or recreational development.

<sup>8</sup> Regional Equity: To ensure that, over time, all subregions in the MPO's planning area receive support from the MPO in the form of Unified Planning Work Program planning studies, during each funding cycle, MPO staff select no more than one location per subregion to study and choose a location in a different subregion from the location studied in the preceding cycle.

<sup>9</sup> Implementation Potential: The study location is proposed by the jurisdictional agency or agencies for the roadway; proposed or prioritized by a Subregional group; or identified as a priority for improvement by other stakeholders.

<sup>10</sup> Boston Region Metropolitan Planning Organization, *Selection of FFY 2019 LRTP Priority Corridor Study Location*, Technical Memorandum, October 18, 2018.

## 2.2 STUDY GOALS AND OBJECTIVES

MassDOT and the cities of Chelsea and Everett have shown a commitment to improving conditions as follows:

- Increase safety for motorists, pedestrians, and bicyclists
- Increase the quality and quantity of walking and bicycling options
- Modernize the roadway and make travel more efficient and reliable
- Support economic vitality and livability of the communities

Toward that end, the objectives of this study were to

- collect data on roadway conditions, pedestrians, bicyclists, motorists, and transit users;
- analyze data and identify existing problems;
- determine the needs of pedestrians, bicyclists, motorists, and transit riders; and
- develop improvement concepts to address problems and needs.

# Chapter 3—Roadway Characteristics

## 3.1 ROADWAY AND STUDY AREA

Route 16 is a state highway in Massachusetts. In the study area, it is called Revere Beach Parkway. Figure 2 shows the roadway's number of lanes. In Everett, the roadway's right-of-way (ROW) width varies between 110 and 120 feet and in Chelsea between 85 and 110 feet. This roadway serves regional and local traffic and includes several MPO transportation equity zones (Figure 3). It is a six-lane, two-way roadway classified as an urban principal arterial and part of the National Highway System program. There is no shoulder on either side for the majority of the corridor.<sup>11</sup> The posted speed limit is 35 mph throughout the corridor.

## 3.2 SIGNALIZED INTERSECTIONS

Several cross streets and driveways intersect Route 16, which create safety and operations issues for motorists, pedestrians, and bicyclists. Figure 2 also shows the signalized intersections identified for study. There are 10 signalized intersections in the corridor, equipped with fully or semi-actuated traffic-control systems; however, they require updating, lack emergency preemption, and the signal heads are missing visors and backplates. The equipment, along with the existing signal timings and phasing plans are outdated and many of the signal posts are rusty. The following describes the geometry, traffic and control, and land uses surrounding the signalized intersections.

### 3.2.1 Route 16 and Lewis Street Intersection

Lewis Street is the first intersection to the west of the study area. A city-owned street that intersects Route 16 to form a four-leg signalized intersection (Figure 2). At the intersection, Route 16 has three through lanes on each approach and Lewis Street has one lane on each approach. Left turns are prohibited from Route 16 onto Lewis Street in either direction. The intersection is equipped with an Eagle Epac 300 M41 signal controller and has a semi-actuated and coordinated traffic-signal system with functioning pedestrian signals. The signal heads are mounted on posts and many of them lack black backplates with retroreflective yellow borders; thus, they do not fully conform to MassDOT's current standards. Crosswalks are provided on all legs of the intersection, but the markings are faded and the median openings are narrow. All of the wheelchair ramps have detectable warning plates. It is one of the critical intersections in the corridor—congested during peak periods with high traffic volumes on Route 16 and intensive merging on the eastbound approach of Route 16—created by on-

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<sup>11</sup> Right-of-way is defined as the land or interest therein, acquired for or devoted to a highway.

ramp traffic entering from Route 99. The land use near the intersection is residential and commercial, and the Sumner Whittier Elementary School is in the northwestern corner of the intersection. A school crossing guard helps students cross at the intersection during school openings and closings.

### **3.2.2 Route 16 and Second Street/Garvey Street Intersection**

Second Street and Garvey Street are city-owned streets that intersect Route 16 at an oblique angle to form a five-leg signalized intersection (Figure 2). Each of the approaches on Route 16 have three travel lanes and one lane on each of the approaches from Second Street and Garvey Street. Left turns are prohibited from Route 16 onto Second Street and Garvey Street in both directions and traffic on Garvey Street is controlled by a stop sign. The Second Street intersection is equipped with an Eagle Epac 300 M51 signal controller and has an actuated and coordinated traffic-signal system with functioning pedestrian signals. The signal heads are mounted on posts and they have no backplates. Crosswalks are provided at the intersection, except on the east leg of Route 16. The crosswalk markings are faded, median openings are narrow, and some of the wheelchair ramps do not have detectable warning plates. This is a critical intersection because it handles high traffic volumes with a high percentage of trucks, and it is congested during peak periods. Many of the trucks at the intersection are entering and exiting from the industrial area located along Second Street south of the intersection. The intersection curb radii are adequate for trucks because the oblique angle on Second Street facilitate both left and right turns. The land uses adjacent to the intersection are primarily commercial and industrial.

### **3.2.3 Route 16 and Spring Street Intersection**

Spring Street is a city-owned street that intersects Route 16 to form a four-leg signalized intersection (Figure 2). At the intersection, Route 16 has four lanes on each approach, an exclusive left-turn lane and three through lanes. Spring Street has one lane on each approach serving all traffic movements. The intersection is equipped with an Eagle Epac 300 M41 signal controller and has an actuated and coordinated traffic-signal system with functioning pedestrian signals. The signal heads are mounted on a mixture of mast-arms and post mounts; they also lack backplates. Crosswalks are provided on all legs of the intersection, but the markings are faded and the median openings are narrow or absent. The wheelchair ramps have detectable warning plates except for the one in the northeastern corner of the intersection. The intersection handles high volumes of traffic on Route 16 and it is congested during peak periods. The intersection curb radii are not adequate for truck turning movements. The land uses adjacent to the intersection are primarily commercial and their business parking spaces and needs have taken most of the sidewalk on the south side of Route 16.

### **3.2.4 Route 16 and South Ferry Street/Terminal Street**

South Ferry Street and Terminal Street are city-owned local roadways. South Ferry Street intersects Route 16 at an oblique angle to form a signalized intersection (Figure 2). At the same intersection, Terminal Street is under stop control and functions more as a driveway for several businesses. Each approach of Route 16 has three through lanes and an exclusive eastbound left-turn lane. Left turns are prohibited from the Route 16 westbound approach. South Ferry Street is a one-lane, one-way street for traffic heading northbound away from the intersection. The intersection is equipped with an Eagle Epac 300 M51 signal controller and has an actuated and coordinated traffic-signal system. In addition, all of the signal heads are mounted on posts and they do not have backplates. The signal lenses are a mixture of light-emitting diode (LED) and incandescent sections. The signal lenses for left-turn movements are 8-inch sections, while the other sections are 12-inch sections. The land uses in the area are mostly commercial.

### **3.2.5 Route 16 and Vine Street Intersection**

Vine Street is a city-owned street that intersects Route 16 to form a four-leg signalized intersection (Figure 2). At the intersection, Route 16 has three through lanes on each approach and an exclusive westbound left-turn lane. Left turns are prohibited from eastbound approach of Route 16. Vine Street has one lane on each approach serving all traffic movements. The intersection is equipped with an Eagle Epac 300 M41 signal controller and has an actuated and coordinated traffic-signal system. The signal heads are a mixture of mast-arm and post mounts and they lack backplates. The signal lenses are a mixture of LED and incandescent sections. Crosswalks are provided on all legs of the intersection, but the one on the west leg of Route 16 lacks pedestrian signals with pushbuttons. In addition, the crosswalk markings are faded and the wheelchair ramps on the north side of Route 16 have no detectable warning plates. The intersection handles high traffic and truck volumes, and it is congested during peak periods. The intersection curb radii are not adequate for trucks turning right onto and out of Vine Street. The land uses in the area are mostly commercial with industrial uses located on the south side of Route 16.

### **3.2.6 Route 16 and Vale Street Intersection**

Vale Street is a city-owned local roadway that intersects Route 16 at an oblique angle to form a three-leg signalized intersection (Figure 2). At the intersection, Route 16 has three through lanes on each approach and an exclusive westbound left-turn lane. Left turns are prohibited from the eastbound approach of Route 16. Vale Street has one lane on its approach serving all traffic movements. The intersection is equipped with an Eagle Epac 300 M51 signal controller and has

an actuated and coordinated traffic-signal system. In addition, the signal heads are a mixture of mast-arms and post mounts and have backplates, but the signal lenses are a mixture of LED and incandescent sections. Crosswalks are provided at the intersection on the west leg of Route 16 and on Vale Street and the markings are faded. There are functioning pedestrian signals with pushbuttons, but the wheelchair ramps lack detectable warning plates. The land uses in the area are mostly commercial.

### **3.2.7 Route 16 and Everett Avenue Intersection**

Everett Avenue is a city-owned street, which intersects Route 16 to form a four-leg signalized intersection (Figure 2). At the intersection, Route 16 has four lanes on each approach, an exclusive left-turn lane and three through lanes. Everett Avenue has one wide lane (approximately 21 feet) on each approach, but drivers form two lanes (exclusive left-turn and through/right-turn lanes) on each approach. The intersection is equipped with an Econolite ASC/3-1000 signal controller and has an actuated and coordinated traffic-signal system. The signal heads are mounted on posts and they have no backplates. There are functioning pedestrian signals at all four corners of the intersection and crosswalks are provided on all legs of the intersection except on the west leg of Route 16. The crosswalk markings are faded, the median openings are narrow or absent, and the wheelchair ramps have no detectable warning plates. The intersection handles high volumes of traffic on Route 16 and Everett Avenue and it is congested during peak periods. The intersection curb radii are adequate for trucks. The land uses adjacent to the intersection are primarily commercial and educational with the Chelsea High School located in the southeastern corner of the intersection.

### **3.2.8 Route 16 and Union Street Intersection**

Union Street is a city-owned street that intersects Route 16 at an oblique angle to form a three-leg signalized intersection (Figure 2). Route 16 has three through lanes on each approach at the intersection while Union Street has one lane on approach serving all movements. Left turns are prohibited on the eastbound approach of Route 16 and drivers have to proceed through the intersection and use a U-turn bay to turn left. The intersection is equipped with an Eagle Epac 300 M41 signal controller and has a semi-actuated and coordinated traffic signal. The signal heads are mounted on posts and they lack backplates. There are no crosswalks on Route 16 and guardrails are blocking pedestrian access to the intersection. The crosswalk on Union Street has wheelchair ramps and detectable warning plates but is not under signal control. The land use near the intersection is primarily residential; however, the Shore Educational Collaborative is located north of the intersection.

### **3.2.9 Route 16 and Washington Avenue Intersection**

Washington Avenue is a city-owned street that intersects Route 16 to form a four-leg signalized intersection (Figure 2). At the intersection, Route 16 has four lanes on each approach, an exclusive left-turn lane and three through lanes. Washington Avenue has two lanes on its southbound approach, an exclusive left-turn and through/right-turn lanes. While the northbound approach has a single wide lane (about 20 feet wide) serving all traffic movements, during peak periods, drivers form two lanes (a left-turn lane and a through/right-turn lane) on that approach. The intersection has recently received geometric and traffic signal improvements. It is equipped with a new TS2, Type 1 signal controller, has an actuated and coordinated traffic-signal system, signal heads are mounted on overhead mast-arms and have retroreflective backplates. There are functioning pedestrian signals at all four corners of the intersection and crosswalks are provided on all legs of the intersection with new markings and wider median openings. In addition, the wheelchair ramps have detectable warning plates. The intersection handles high volumes of traffic on Route 16 and Everett Avenue and is congested during peak periods. The intersection curb radii are adequate for trucks. The land uses adjacent to the intersection are primarily commercial and residential.

### **3.2.10 Route 16 and Webster and Garfield Avenues Intersection**

Webster and Garfield Avenues are city-owned streets that intersect Route 16 on a horizontal curve to form a four-leg signalized intersection (Figure 2). At the intersection, Route 16 has three through lanes on each approach and an exclusive left-turn lane on the westbound approach. Garfield and Webster Avenues have a single wide lane (20 feet wide) on each approach and drivers form two lanes in each of them (exclusive left-turn lane and through/right-turn lane). The intersection is equipped with a TCT LMD 9200 signal controller that operates as an actuated uncoordinated traffic-signal system. The signal heads are mounted on a mixture of a mast-arm and posts. Many of the signal heads do not have backplates and the signal lenses are a mixture of LED and incandescent sections. There are functioning pedestrian signals with pushbuttons at all four corners of the intersection, crosswalks on all legs of the intersection, and wheelchair ramps with detectable warning plates. The crosswalk markings are faded and the median openings are narrow. The intersection handles high volumes of traffic on Route 16 and Everett Avenue and it is congested during peak periods. The intersection curb radii are adequate for trucks. The land uses adjacent to the intersection are primarily commercial and residential.



### 3.3 SIDEWALKS, CROSSWALKS, AND WHEELCHAIR RAMPS

Providing facilities to keep pedestrians and bicyclists safe and separated from vehicular traffic in this corridor is a high priority because of the high volume of traffic, high vehicle speeds, high volume of truck traffic, long crossing distances, and mixed land uses (residential, educational, commercial, and industrial).

#### 3.3.1 Sidewalks

Figure 4 shows the sidewalk network on Route 16. Approximately 70 percent of the sidewalks either have surface or structural defects or are covered with vegetation and debris accumulation; thus, a significant portion of the roadway's existing sidewalks need repair or reconstruction.<sup>12</sup>

#### 3.3.2 Crosswalks

Many of the signalized intersections have crosswalks on all approaches but there are locations where pedestrians cross Route 16 without crosswalks. These locations include the following:

- East leg of Route 16 at Second Street
- East leg of Route 16 at South Ferry Street
- East leg of Route 16 at Vale Street
- West leg of Route 16 at Boston Street
- West leg of Route 16 at Union Street

In addition, although traffic on South Ferry Street and Union Street are under signal control, their crosswalks are not under signal control. Furthermore, most of the crosswalk markings are worn and not visible. In addition, crosswalk openings in the median of Route 16 are narrow; at some locations, the median extends into the crosswalk blocking the path for pedestrians; and at other locations, there are no openings in the median such as in the following locations:

- Second Street intersection
- Spring Street intersection
- Everett Avenue intersection
- Union Street intersection

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<sup>12</sup> The minimum width for a sidewalk is five feet excluding the width of the curb. The measurement of a sidewalk sometimes includes the width of the curb. If this method of measurement is used, the minimum width of a sidewalk is 5.5 feet. In addition, sidewalks must have the necessary access features to comply with the federal Americans with Disabilities Act.

### 3.3.3 Wheelchair Ramps

Many of the wheelchair ramps lack detectable warning plates or horizontal and cross slopes are not constructed to MassDOT standards.

## 3.4 STREET LIGHTS

The light poles along the roadway are conventional lighting used in highway applications, which support luminaire-mounting heights ranging from approximately 30 feet to 50 feet. The light poles are aluminum with mast-arm. MassDOT uses only steel poles. Figure 5 shows the conditions of the existing streetlights. The majority of the light poles and fixtures are functioning well; however, a few of the light poles are missing or damaged (slanted, missing light fixture).

## 3.5 LAND USE

The area surrounding the roadway in Everett is primarily commercial, with hotels, retail stores, automobile repair and detailing shops, and restaurants. In Chelsea, it is primarily residential, although the Chelsea High School, Shore Educational Collaborative, Metro Credit, and many restaurants are located in the corridor.

North of Route 16 in Chelsea and Everett, the neighborhoods are vibrant and densely settled with single and multi-family dwellings that are mixed with commercial retail services on Chelsea Street and Washington Avenue. Side streets such as Lewis Street, Second Street, Spring Street, South Ferry Street, Vine Street, Everett Avenue, Union Street, Washington Avenue, Garfield Avenue, and Webster Avenue connect Route 16 to the neighborhoods. The Summer Whittier Elementary School, Veteran Memorial Park, Jacob Scharf Playground, Washington Park, and Voke Park are located in this area.

South of Route 16 in Chelsea and Everett is the industrial district. This district is served by a limited number of short and disconnected streets because the Massachusetts Bay Transportation Authority (MBTA) Newburyport/Rockport commuter rail line runs through the area. Second Street and Everett Avenue are the only streets that cross the commuter rail line and have direct access to Route 16. Businesses in the industrial district include produce storage and distribution, packaging, scrap metal businesses, supermarkets, hotels, and automobile/truck repair services.

Recently, the industrial district has been undergoing transformation to nonindustrial uses such as new housing, hotels, office, retail, and recreational uses. With the new Silver Line extension to Chelsea, the Encore Boston Harbor casino, and the Chelsea Greenway, it is expected that the current transformation

will continue into the future. For instance, several long-term transit projects are proposed for the area to support development.

## Chapter 4—Planned Projects and Studies

Transportation projects planned for the Route 16 corridor and previous studies that addressed the study area or its surroundings are described below. The conceptual improvements developed in this study considered and incorporated recommendations from the previous studies.

### 4.1 RECONSTRUCTION OF FERRY STREET, SOUTH FERRY STREET, AND A PORTION OF ELM STREET

MassDOT's project number 607652 will reconstruct Ferry Street from the Malden city line to Route 16 and Elm Street between Ferry Street and Woodlawn Street.<sup>13</sup> The work will include resurfacing, new sidewalks, wheelchair ramps, and curb extensions. The traffic signals at five locations and the fire station will be upgraded and the signals at Chelsea Street will be replaced by a roundabout. This project is funded through the MPO's 2020 Transportation Improvement Program (TIP).

### 4.2 EVERETT: DECK REPLACEMENTS FOR SWEETSER CIRCLE BRIDGES

The scope of work for this MassDOT's project number 608706 includes deck replacement and traffic safety upgrades. Substructure repairs will also be included. This project is in the preliminary stage.

### 4.3 SWEETSER CIRCLE IMPROVEMENTS

The City of Everett is leading a study to develop improvements for Sweetser Circle. The project goals are to develop the following improvements and strategies:

- Facilitate bus rapid transit (BRT) on Route 99
- Accommodate future Silver Line expansion
- Connect on-street bicycle facilities to the Northern Strand Community Trail
- Expand open and green spaces
- Connect Lower and Upper Broadway neighborhoods
- Improve pedestrian safety

The project would seek to convert proposed Sweetser Circle Bridge repair into a transformative project that would provide better connections for the Broadway BRT, Silver Line, Northern Strand Community Trail, and Wellington Trail. This project is ongoing and in the preliminary stage.

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<sup>13</sup> MassDOT Project Information, information on MassDOT highway projects can be found at <https://hwy.massdot.state.ma.us/projectinfo/projectinfo.asp>

#### **4.4 EVERETT TRANSIT STUDY**

The Everett Transit Action Plan was developed to identify short- and long-term solutions to improve transit for the Everett residents.<sup>14</sup> The study was conducted because several recent planning initiatives in the region have resulted in the need for a comprehensive analysis of future transportation needs. The study developed feasible recommendations to address existing and future transit issues.

#### **4.5 BRIDGE REPLACEMENTS: REVERE BEACH PARKWAY (ROUTE 16) OVER THE MALDEN RIVER (WOODS MEMORIAL BRIDGE) AND OVER MBTA AND RIVERS EDGE DRIVE**

MassDOT's project number 604660 will replace the existing nonoperating drawbridge with a new fixed bridge. This project is in construction, which ends in spring 2020.

#### **4.6 RECONSTRUCTION OF BEACHAM STREET IN EVERETT**

MassDOT's project number 609257 will reconstruct Beacham Street to provide safety and operational improvements and will include roadway pavement reconstruction. The project will include improved traffic operations and safety, new signs and pavement markings, improved drainage, streetscape enhancements, and accommodations for pedestrians and bicycles. This project is at the preliminary design stage and construction will begin in summer 2024.

#### **4.7 SILVER LINE/BRT CONSTRUCTION**

MassDOT's project number 604428 constructed a new BRT from Everett Avenue to Eastern Avenue along MassDOT ROW, formally Grand Junction Railroad ROW. The project created a two-lane busway with four new bus station platforms and reconstructed the Washington Avenue Bridge. The project was completed in spring 2019 and the Silver Line is in operation.

The extension offers new dedicated BRT service connecting Chelsea to East Boston with the South Boston Waterfront (South Station and Seaport District). The four new BRT Stations are located at Eastern Avenue, Box District, Bellingham Square, and Chelsea near the local Market Basket. The line provides effective connection to key employment destinations in Boston taking about 7,000 passengers from Chelsea and Revere from congested roadways and overcrowded bus routes.

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<sup>14</sup> Everett Transit Action Plan, Final Report, November 2016

#### **4.8 CHELSEA GREENWAY**

MassDOT's project number 604428 constructed the Chelsea Greenway. As part of the Silver Line project, the Chelsea Greenway, a shared-use path, was built parallel to the Silver Line. The 0.65-mile multiuse path connects Downtown Chelsea and Eastern Avenue stations. Chelsea and Everett, along with advocates for active transportation, support plans to extend the Greenway to provide safe connections to support smart growth and development around the new transit services and connect to regional greenway network, including the Northern Strand Community Trail and the East Boston Greenway. The project has been completed and is operational.

#### **4.9 BRIDGE BETTERMENT, ROUTE 1 OVER ARLINGTON STREET AND 5TH STREET/MBTA RAILROAD/SPRUCE STREET**

MassDOT's project number 605287 will rehabilitate the Route 1 Viaduct in Chelsea. This project is funded through the MPO's 2019 TIP and construction ends in summer 2021.

#### **4.10 RECONSTRUCTION ON WASHINGTON AVENUE FROM REVERE BEACH PARKWAY TO HEARD STREET**

This MassDOT project number 605974 will reconstruct Washington Avenue from the Revere Beach Parkway to the MBTA Bridge at Heard Street. The project will also build a new storm water management system separating the existing combined storm water and sewer system, replace the aging water main, and construct sidewalks and wheelchair ramps, and direct bicycles to appropriate accommodations. Two major intersections will be reconstructed: Washington Avenue at Forsyth Street/Gardner Street/Cary Avenue (Cary Square) and the intersection of Washington Avenue at Carter Street/County Road. This project is in the preliminary design stage.

#### **4.11 RECONSTRUCTION ON ROUTE 16 (REVERE BEACH PARKWAY) AND WASHINGTON AVENUE**

This project improves safety and traffic operation at the intersection as part of the mitigation improvements for Encore Boston Harbor casino. The project upgraded the traffic signal equipment, retimed the traffic signal, made geometric improvements including an exclusive southbound left turn lane, and improved accommodations for pedestrians to comply with ADA-standards. The project was completed in 2019.

#### **4.12 RECONSTRUCTION ON BROADWAY (ROUTE 107) FROM CITY HALL AVENUE TO THE REVERE CITY LINE**

The scope of work for MassDOT project number 608078 involves the reconstruction of a one-mile segment of Broadway. Improvements to the roadway will include surface and subsurface work and include replacement of utilities; construction of a dedicated bike lane; and upgrades to the existing sidewalk network that will include ADA-compliant ramps at all intersections. This project is funded through the 2022 TIP for the Boston Region MPO.

#### **4.13 ROAD SAFETY AUDIT, ROUTE 16 AT GARFIELD AND WEBSTER AVENUES**

In July 2018, the City of Chelsea, in collaboration with MassDOT and the Department of Conservation and Recreation (DCR), conducted a road safety audit (RSA) for the subject intersection.<sup>15</sup> The RSA was conducted because the intersection was identified as a high-crash location based on the 2013–15 Highway Safety Improvement Program (HSIP) crash cluster data.<sup>16</sup> The MassDOT Highway Division's *Traffic and Safety Engineering 25% Design Submission Guidelines* require an RSA for all project-related high-crash locations to identify safety enhancements that may be implemented in conjunction with an off-site mitigation project, and other measures that could be programmed for implementation by other agencies or municipalities. The RSA recommended several short-, medium-, and long-term improvements to address safety and operations problems at the intersections. They included provisions for formalizing left-turn lanes on Garfield and Webster Avenue, modifying the signal phasing and timing plans, upgrading signal equipment, geometric enhancements, pavement markings, and new signage.

#### **4.14 LOWER MYSTIC REGIONAL WORKING GROUP STUDY**

In the recently completed Lower Mystic Regional Working Group (LMRWG) study, planning for improved transportation and mobility in the Sullivan Square area, several transit improvements and pedestrian and bicycle accommodations were proposed to reduce travel times, decrease congestion, increase access to jobs, and enhance quality of life.<sup>17</sup>

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<sup>15</sup> Road Safety Audit, (Revere Beach Parkway [Route 16] at Garfield Avenue/Webster Avenue, City of Chelsea), prepared for Massachusetts Department of Transportation, July 2018.

<sup>16</sup> An HSIP crash cluster is a location in which the number and severity of crashes—as measured on the Equivalent Property Damage Only (EPDO) index—ranks the location among the top 5 percent of crash clusters in the region. The EPDO method assigns weighted values to each crash based on whether the crash resulted in property damage (unweighted), injury (weighted by 5), or a fatality (weighted by 10).

<sup>17</sup> Lower Mystic Regional Working Group, Planning for Improved Transportation and Mobility in the Sullivan Square Area, Fall 2018

# Chapter 5—Data Collection

## 5.1 DATA COLLECTION

MassDOT Highway Division's Traffic Data Collection section conducted automatic traffic recorder (ATR) counts during a seven-day period from Tuesday, December 4, 2018, to Monday, December 10, 2018, and a recount for those locations where the count machines malfunctioned from Tuesday, April 23, 2019, to Monday, April 29, 2019.<sup>18</sup> The ATR machines count vehicles continuously during the collection period and are used to determine the volume and hourly distribution of traffic on a roadway.

MassDOT Highway Division's Traffic Data Collection section also collected turning-movement counts (TMC) in the study area on Thursday, December 6, 2018. MassDOT performed TMCs at 11 intersections on the Route 16 corridor, conducting the counts during the weekday AM peak travel period (6:00 AM to 9:00 AM) and weekday PM peak travel period (3:00 PM to 6:00 PM). MassDOT performed a second count on Saturday, December 8 and Sunday, December 9 at these locations in order to capture weekend volumes. The weekend counts were conducted during the midday peak period (11:00 AM to 2:00 PM). In all cases, MassDOT recorded heavy vehicles, pedestrians, and bicycles separately.

## 5.2 DAILY TRAFFIC VOLUMES

Figure 6 shows a summary of the average weekday traffic data recorded using the MassDOT counts. The amount of daily traffic ranges between 38,000 to 70,000 vehicles per day. The counts show that traffic gradually increases toward the west end of the corridor as drivers turn onto Route 16 to access various Boston destinations and beyond. This occurs mainly on side streets at Garfield and Webster Avenues, Washington Avenue, Everett Avenue, Vine Street, and Second Street. Notably, the counts indicate that there is little difference between weekday and weekend volumes, based in part on the regional traffic present on Route 16. Appendix B contains full records of the ATR counts.

## 5.3 DAILY TRUCK VOLUMES

Figure 7 shows a summary of the average weekday truck data recorded using the MassDOT counts and data from the 2016 Freight Planning Support

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<sup>18</sup> All of the traffic data used in this study were collected before the Encore Boston Harbor opened.



memorandum.<sup>19</sup> The amount of daily truck traffic on Route 16 ranges between 3 percent and 5 percent. Second Street serves most of the trucks to and from the industrial area. More than 1,600 trucks use Second Street daily, which comprise about 12 percent of its daily traffic. Appendix B contains full records of the truck counts.

#### 5.4 TURNING MOVEMENT VOLUMES

Figure 8 shows the turning movement volumes at the 11 intersections during the weekday AM and PM peak hours. Peak hours in the corridor were recorded as 6:30 AM to 7:30 AM in the morning and 4:00 PM to 5:00 PM in the afternoon peak. The afternoon volumes were remarkably consistent and stayed within 4 percent of the highest peak volumes throughout the entire afternoon collection period. This kind of “peak spreading” is a common characteristic of urban roadways where demand exceeds available capacity.

Figure 9 shows the weekend midday turning-movement volumes at the 11 intersections. The highest volumes were observed between 12:30 PM and 1:30 PM, during which time the total intersection volumes were 4 percent lower than during the weekday PM peak hour. Appendix B contains the turning movement data.

#### 5.5 PEDESTRIAN AND BICYCLE VOLUMES

The TMC data were also used to provide staff with information about pedestrian and bicyclist activity during the three-hour collection periods. Figure 10 cites the observed pedestrian volumes and Figure 11 cites the observed bicyclist volumes (bicycle on the road only). Table 1 distinguishes the number of pedestrians that crossed Route 16 from those that crossed an adjacent side street on the north or south side of Route 16.

The counts show that pedestrian activity is highest at Washington Avenue intersection, which is also an HSIP pedestrian crash cluster. The counts show that pedestrian activity is moderate at the following Route 16 intersections: Garfield and Webster Avenues, Everett Avenue, Vine Street, and Lewis Street. The Sumner Whitter Elementary School and Chelsea High School generate some of the pedestrian traffic at Lewis Street and Everett Avenue.

Counts of bicycles on the road were very low on weekdays and weekends. MPO staff attributes the low cyclist volumes primarily to the absence of appropriate

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<sup>19</sup> Boston Region Metropolitan Planning Organization, *Freight Planning Support, FFY 2014: Improving Truck Travel in the Everett-Chelsea Industrial Area*, Technical Memorandum, dated January 21, 2016.

facilities in the corridor, cold December weather, high volumes of traffic, and high speeds of vehicles, which create high stress and safety concerns.

**Table 1  
Peak Period Pedestrian Crossing Types**

	Route 16	Side Street on the North	Side Street on the South	Route 16	Side Street on the North	Side Street on the South	Route 16	Side Street on the North	Side Street on the South	Route 16	Side Street on the North	Side Street on the South
Route 16 Intersection	Thurs AM	Thurs AM	Thurs AM	Thurs PM	Thurs PM	Thurs PM	Sat PM	Sat PM	Sat PM	Sun PM	Sun PM	Sun PM
Lewis Street	73	26	7	54	13	17	18	5	16	12	6	13
Second Street	12	10	10	30	11	15	21	7	11	16	5	7
Spring Street	5	9	8	19	20	12	6	14	24	20	9	33
South Ferry Street	4	20	0	16	18	0	4	19	0	6	18	0
Vine Street	44	8	15	72	10	16	40	14	14	26	7	5
Vale Street	14	0	36	25	0	29	7	0	10	13	0	12
Boston Street	3	0	15	10	0	7	3	0	9	3	0	3
Everett Avenue	41	4	16	88	15	32	44	5	9	34	4	11
Union Street	3	6	0	3	14	0	2	3	0	2	10	0
Washington Street	148	14	2	139	24	4	56	6	4	61	19	0
Garfield/ Webster Avenues	41	2	1	86	4	3	42	6	0	55	9	0

Weekday AM = 6:00 AM to 9:00 AM. Weekday PM = 3:00 PM to 6:00 PM. Weekend PM 11:00 AM to 2:00 PM.  
 Shading denotes that a crosswalk is absent on Route 16 at this location.  
 Source: Central Transportation Planning Staff.

**5.6 SPOT SPEED DATA**

Staff collected vehicle spot speeds at three of the ATR sites on Route 16. The spot speeds measure speeds at a specific point and do not include delays at the intersections when traveling through the corridor. Figure 12 summarizes the spot speed data and compares it with the posted speed regulations, which is 35 mph throughout the study area. The 85th percentile speeds are higher than the posted speed limits because of the high speeds of vehicles during the off-peak periods. Actual travel speeds in the corridor are much lower than the spot speeds because they include delays at the intersections. Figure 12 also shows the travels speeds during the PM peak travel, which are about one-half of the posted speed limit (14–18 mph), reflecting congestion and delay at the signalized intersections. It is expressed as speed index, which is equal to the average travel speed divided by the posted speed limit. Speed index indicates congestion more accurately than travel speeds alone because low travel speeds may be the

results of low speed limits on certain facilities. Appendix B contains more information about speed data.

## 5.7 SIGNAL TIMING AND COORDINATION DATA

MassDOT Highway District 4 provided MPO staff with existing signal timings, as-built traffic signal plans, and signal-phase sequences of the signalized intersections (included in Appendix C). The signal information included that collected from field assessment of the signal systems as part of the DCR conditional assessment.<sup>20</sup> MPO staff used Google Maps and field visits to identify recent modifications to the intersection layouts and signal plans in order to analyze the condition of existing traffic operations.

## 5.8 CRASH DATA

To evaluate safety for motorists, pedestrians, and bicyclists in the study area, MPO staff used crash data from MassDOT's Registry of Motor Vehicles database from January 2012 through December 2016. During the five-year analysis period, 657 crashes were recorded in the MassDOT database. Figure 13 shows the HSIP intersection crash clusters and spatial distribution of these crashes within the study area. Many locations in the study area experienced a greater-than-expected number of crashes. Five intersections are on the list of the Top 200 high-crash location in Massachusetts, seven intersections (including the five top 200 high-crash locations) are on the list of HSIP crash clusters. Table 2 is a summary of the crashes. Appendix D contains figures and tables that break down the crash data. Some features of the crashes include the following:

- No fatal crashes, but the injury rate was very high: 35 percent of crashes resulted in injury to at least one of the involved parties.
- Thirty-five percent of all crashes were rear-ends and 32 percent were angle crashes. Many of the rear-end and angle crashes may be caused by congestion and drivers running red lights, which is common at the signalized intersections in the corridor.
- Forty percent of crashes took place during peak period (defined as 6:00 AM to 9:00 AM and 3:00 PM to 6:00 PM).
- Twenty-six crashes involved a pedestrian and six crashes involved a bicyclist.
- Eighty-five percent of crashes took place at an intersection. Fifteen percent of crashes took place along an open roadway segment.

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<sup>20</sup> Conditional Assessment Report, Medford Veterans Memorial Highway/Revere Beach Parkway/Route 16, The Fellsway Segment 1, and the Lynnway, Medford, Everett, Chelsea, Revere, Lynn, and Somerville Massachusetts, prepared for Massachusetts Department of Transportation, by VHB, Inc., August 2018

**Table 2**  
**Route 16 Crash Statistics (Five-Year Crash Summary)**

<b>Crash Variable</b>	<b>All Crashes</b>
<b>Crash Severity</b>	—
Nonfatal injury	229
Property damage only (none injured)	404
Not Reported	24
<b>Manner of Collision</b>	—
Rear-end	229
Angle	212
Sideswipe, same direction	105
Single vehicle crash	89
Head-on	19
Sideswipe, opposite direction	3
<b>Road Surface Conditions</b>	—
Dry	539
Wet	103
Snow/Ice	14
Unknown	1
<b>Ambient Light Conditions</b>	—
Daylight	380
Dark—lighted roadway	250
Dusk	11
Dawn	7
Dark—roadway not lighted	7
Not reported	2
<b>Weather Conditions</b>	—
Clear	421
Cloudy	79
Rain	68
Snow	10
Unknown	79
<b>Travel Period</b>	—
Off-peak	396
Peak	261
<b>Pedestrian and Bicycle Crashes</b>	—
Vehicle crashes	626
Pedestrian-related crashes	26
Bicycle-related crashes	6
<b>Crash Location</b>	—
Intersection	557
Segment	100
<b>Total crashes</b>	<b>657</b>

Peak Periods are 6:00 AM to 9:00 AM and 3:00 PM to 7:00 PM Monday through Friday.

Source: Central Transportation Planning Staff.

## 5.9 TRANSIT SERVICES DATA

The study area is located in the middle of several transit services; however, there is no bus service on Route 16 within the study limits. Three bus services (Routes 110, 111, and 112) cross the roadway at Everett Avenue and Washington Avenue but they do not serve the commercial, industrial, and residential uses along the corridor. The Newburyport/Rockport Commuter Rail Station has a station in Chelsea, about half a mile away. In addition, Wellington Station on the Orange Line and the Wellington Station Busway, which serves several buses (Routes 90, 97, 99, 100, 106, 108, 110, 112, 134, and 710), are located less than one mile away from the western limits of the corridor. Appendix E contains the bus schedules and map showing the stops.

The MBTA bus Route 110, which serves Wonderland or Broadway and Park Avenue-Wellington Station, operates through the area in Everett on Broadway, Chelsea Street, and Ferry Street. It provides bus service to Bell Circle, Revere Centre, Woodlawn, Everett Square, Sweetser Circle, Orange Line, Blue Line, and Haverhill Commuter Rail. Buses run Monday through Friday every 15 to 20 minutes from 4:55 AM to 12:35 AM; every 35 minutes on Saturdays from 5:00 AM to 12:37 AM; and every hour on Sundays from 5:00 AM to 12:32 AM.

MBTA bus Route 111, which serves Woodlawn or Broadway and Park Avenue-Haymarket Station, operates through the area in Chelsea on Washington, Sagamore, and Garfield Avenues. It provides bus service to Chelsea Square, Bellingham Square, Cary Square, Green Line, and Orange Line. Buses run Monday through Friday every 10 minutes from 4:44 AM to 12:34 AM, and 10 to 15 minutes on Saturdays and Sundays from 6:15 AM to 10:35 AM.

MBTA bus Route 112, which serves Wellington Station/Wood Island Station, operates through the area on Everett Avenue and Chelsea Street. It provides bus service to Everett Square, Admiral's Hill, Market Basket, Bellingham Square, Quigley Hospital, Blue Line Station, Orange Line Station, and the Newburyport/Rockport Commuter Rail Station in Chelsea. Buses run Monday through Saturday every 45 minutes from 6:20 AM to 7:00 PM, and hourly on Sundays from 8:30 AM to 7:00 PM.

# Chapter 6—Existing Conditions Analyses

## 6.1 SAFETY ANALYSIS

### 6.1.1 HSM Methodology: Predicted and Expected Crashes

MPO staff used methods outlined in the 2010 edition of the *Highway Safety Manual* (HSM) to analyze safety. The techniques in the HSM combine roadway geometry, traffic volumes, crash history, and regional factors into a unified metric referred to as expected crashes, that estimates the intrinsic safety conditions at a site by compensating for the random fluctuations typically associated with samples of crash data. Expected crashes may be categorized several ways, such as by manner of collision or degree of injury; and may be converted into dollar values based on agreed-upon societal cost figures for different types of crashes. They may be used to identify high-risk sites with potential for improvement, and to compare the relative merits of different intervention strategies.<sup>21</sup>

The HSM methodology had previously been the subject of research by MassDOT in cooperation with faculty from University of Massachusetts Lowell. The result of this study was to refine the formulas and coefficients of the HSM methodology for intersections to match Massachusetts traffic data better. MPO staff used these regionalized versions of the HSM methods for its analysis of intersections.<sup>22</sup> The HSM procedure requires that a corridor be broken down into intersections and segments as each type of facility is analyzed with a distinct method. For each intersection and each segment, the number of expected crashes during a five-year period is shown along with number of crashes that MassDOT recorded between 2012 and 2016. This comparison provides insight into the responsiveness of a particular location to potential safety interventions. If the predicted number of crashes (crashes per year under idealized circumstances) is significantly less than the expected number of crashes, it suggests that correctable factors are elevating the crash rate. The difference between these two terms is referred to as the Potential for Safety Improvement (PSI). Figure 14 summarizes results of the existing-conditions safety analysis. Table 3 shows the numerical values of the PSI for the different intersections and segments (shaded green) within the corridor. It shows the 11 intersections and four segments into

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<sup>21</sup> American Association of State Highway and Transportation Officials, *Highway Safety Manual 2010*, Washington, DC, December 2010.

<sup>22</sup> Yuanchang Xie and Chen (Julian) Chen, *Calibration of Safety Performance Functions for Massachusetts Urban and Suburban Intersections*. Report prepared for Massachusetts Department of Transportation Office of Transportation Planning, March 2016.

which MPO staff divided the corridor, and site locations in green with PSI less than 0; yellow for PSI between 0 and 1; and red for PSI greater than 1. It also shows the high-risk site designation, which is a statistical comparison with other Massachusetts intersections developed as part of the MassDOT and University of Massachusetts research. The last row in Table 3 shows that nine of 15 sites showed potential for improvements and seven of 11 intersections qualify as high risk.

**Table 3**  
**Potential for Safety Improvement**

Location	Total Observed Crashes	Total Predicted Crashes	Total Expected Crashes	PSI	High-Risk Site	Observed Crashes > Expected Crashes
Between Sweetser Circle and Everett Avenue	32	28	27	-0.31	-	Y
Route 16 at Lewis Street	42	19	35	3.15	Y	Y
Route 16 at Second Street	61	80	71	-1.84	N	N
Route 16 at Spring Street	41	38	40	0.29	Y	Y
Route 16 at South Ferry Street	31	31	31	0.07	Y	N
Route 16 at Vine Street	59	57	67	1.96	Y	N
Route 16 at Vale Street	22	32	25	-1.35	N	N
Route 16 at Boston Street	10	26	12	-2.81	N	N
Route 16 at Everett Avenue	82	50	78	5.63	Y	Y
Between Everett Avenue and Washington Avenue	29	12	20	1.71	-	Y
Route 16 at Union Street	21	38	22	-3.22	N	N
Route 16 at Washington Avenue	76	45	74	5.85	Y	Y
Between Washington Avenue and Garfield Avenue	16	12	14	0.38	-	Y

Location	Total Observed Crashes	Total Predicted Crashes	Total Expected Crashes	PSI	High-Risk Site	Observed Crashes > Expected Crashes
Route 16 at Garfield Avenue and Webster Avenue	104	66	110	8.96	Y	N
Between Garfield Avenue and Route 1 SB Off-Ramp	10	7	4	-0.44	-	Y
Entire Route 16 Corridor	636	541	631	9 of 15	7 of 11	8 of 15

PSI = Potential for Safety Improvement. SB = southbound.  
 Green shading denotes segments within the corridor.  
 Source: Central Transportation Planning Staff.

**6.1.2 HSM Methodology: Monetary Value of Crashes**

Staff also used the HSM analysis results to assign a monetary value to the societal burden of traffic crashes. The Federal Highway Administration provides comprehensive cost values that consider both economic costs (lost wages, property damage) and costs from monetizing changes in quality-adjusted life years. These equivalencies are categorized by type and severity of accident. For the purposes of this study, MPO staff used two values: \$15,600 per property damage only crash and \$260,800 per crash involving a non-capacitating injury. Both values are adjusted to reflect the 2016 Massachusetts cost of living.<sup>23</sup> Table 4 shows the total estimated comprehensive societal cost per year that resulted from crashes within the corridor. Estimated costs based on expected crashes and observed crashes are well above \$12 million per year, which demonstrates that investing in safety improvements inside the corridor could yield large returns when considering the comprehensive societal cost. Appendix D presents further detail about the input data, computational steps, and HSM formula outputs.

**Table 4  
 Comprehensive Costs of Crashes**

Crash Severity	Crashes Per Year (Observed)	Estimated Cost (Observed)	Crashes Per Year (Expected)	Estimated Cost (Expected)
Property Damage Only	80.2	\$1,250,700	84.0	\$1,310,400
Fatal and Injury	46.0	\$12,000,000	43.2	\$11,266,600
<b>Total</b>	<b>126.2</b>	<b>\$13,250,700</b>	<b>127.2</b>	<b>\$12,577,000</b>

Source: Central Transportation Planning Staff.

<sup>23</sup> Jeffrey Gooch, VHB, *MassDOT Average Comprehensive Crash Costs*, Technical Memorandum, dated January 1, 2018, to the Massachusetts Department of Transportation.



### 6.1.3 Analysis of Crash Diagrams

MPO staff prepared crash diagrams (included in Appendix D) for the entire length of the corridor to examine patterns within the crash data. The associated tables may be used to look up additional detail for specific crash events. Considering all of the available data, MPO staff drew the following conclusions about conditions at different intersections within the study area:

**High Priority Intersections: Lewis Street, Second Street, Spring Street, Vine Street, Everett Avenue, Washington Avenue, and Garfield/Webster Avenues**

Each of these intersections has both large numbers of observed crashes and great potential for safety improvement, making them clear targets for intervention. At these locations there are high numbers of angle crashes within the intersections, rear-end crashes on the approaches of Route 16, and high rates of injury. In addition, many of the pedestrian and bicycle crashes occurred at these intersections. Important contributing factors in these crashes are peak-period congestion, high speed of vehicles (off-peak period), running red lights, blocking intersections, and yellow and all-red clearance intervals.

**Low-to-Medium Priority Intersections: South Ferry Street, Vale Street, Boston Street, and Union Street**

Although the HSM analyses show that these intersections are not high-risk sites, the unconventional geometry, lack of pedestrian amenities, and outdated signal equipment present moderate potential for safety improvements. Six pedestrians and bicyclists were struck by vehicles at these locations.

## 6.2 INTERSECTION AND ARTERIAL LEVELS OF SERVICE ANALYSIS

### 6.2.1 Intersection Level-of-Service (LOS) Analysis

Staff conducted traffic operations analyses consistent with the Highway Capacity Manual (HCM) methodologies.<sup>24</sup> HCM methodology is used to assess traffic conditions at signalized and unsignalized intersections and to rate the LOS from A to F. LOS A represents the best operating conditions (little to no delay), while LOS F represents the worst operating conditions (long delay). LOS E represents operating conditions at capacity (the limit of acceptable delay). Table 5 presents the control delays (standards for comparison) associated with each LOS for signalized and unsignalized intersections.

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<sup>24</sup> Transportation Research Board of the National Academies, *Highway Capacity Manual 2010*, Washington, DC, December 2010.

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

<b>Level of Service</b>	<b>Signalized Intersection Control Delay (seconds per vehicle)</b>	<b>Unsignalized Intersection Control Delay (seconds per vehicle)</b>
A	<10	<10
B	10–20	10–15
C	20–35	15–25
D	35–55	25–35
E	55–80	35–50
F	> 80	> 50

Source: Highway Capacity Manual 2010.

Using the traffic and signal data collected, MPO staff built traffic analysis networks for the weekday AM, weekday PM, and weekend PM peak hours. Synchro traffic analysis was used to assess the capacity and quality of traffic flow.<sup>25</sup> Figures 15 through 18 show the analysis results for the weekday AM, weekday PM, and weekend Saturday and Sunday midday PM peak periods, respectively. The results of the Synchro model may seem overly optimistic, as congestion is a known issue in the corridor, where the queues continue building for hours across the lengthy morning and afternoon peak periods. The traffic volumes are also based on counts at the intersections, which show the entry volume for each intersection and may be much smaller than the demand volume during peak hours. Appendix F presents the existing conditions LOS analysis worksheets. Aside from the intersections at Vale Street and Union Street, which operate at LOS B and LOS A, all of the remaining signalized intersections operate at capacity or fail during the weekday AM and PM peak hours. The side streets in the study area generally experience higher levels of delay than Route 16. Generally, traffic operations in the corridor on weekends are acceptable, and the signalized intersections function well at LOS D or better (prior to Encore Boston Harbor opening), except for the ones at Lewis Street, Second Street, and Garfield/Webster Avenues, which operate at LOS E or F.

**6.2.2 Arterial LOS Analysis**

When considering signal timing among a series of signalized intersections, as for coordinated signal operation, performance measures that account for the relative interaction of adjacent intersections become important. In addition to the estimation of intersection-level performance measures at each intersection along the arterial, a number of performance measures are used to assess how well the intersections operate together as a system. The most popular measures used to assess how well arterial traffic progresses include number of stops, travel speed, and travel time. The HCM provides a methodology to determine arterial LOS

<sup>25</sup> Trafficware Inc., Synchro Studio 9, Synchro plus SimTraffic, Build 914, Sugar Land, Texas.

based on travel speed. Table 6 presents the average travel speeds (standards for comparison) associated with each LOS for principal arterials and minor arterials. The arterial LOS analysis results indicated that Route 16 operates at LOS F during peak travel hours on weekdays and LOS E during peak hours on weekends.

**Table 6  
HCM Existing Arterial Level of Service**

Urban Street Class	I	II	III	IV
Range of FFS	55 to 45 mph	45 to 35 mph	35 to 30 mph	35 to 25 mph
Typical FFS	50 mph	40 mph	35 mph	30 mph
LOS	Average Travel Speed	Average Travel Speed	Average Travel Speed	Average Travel Speed
A	> 42	> 35	> 30	> 25
B	> 34-42	> 28-35	> 24-30	> 19-25
C	> 27-34	> 22-28	> 18-24	> 13-19
D	> 21-27	> 17-22	> 14-18	> 9-13
E	> 16-21	> 13-17	> 10-14	> 7-9
F	≤ 16	≤ 13	≤ 10	≤ 7

FFS = free-flow speeds. HCM = Highway Capacity Manual. LOS = level of service.  
Based on HCM arterial class definition, Route 16 is a class III arterial  
Source: Transportation Research Board. Highway Capacity Manual 2000. National Academy of Sciences, Transportation Research Board, Washington, D.C., 2000.

**6.3 ACTIVE (NONMOTORIZED) TRANSPORTATION MODES**

**6.3.1 Pedestrian Level of Service (PLOS)**

The quality of pedestrian travel is largely affected by the roadway infrastructure, such as whether there are sidewalks or traffic signals that allow pedestrians time to cross an intersection before vehicles get a green light. To reflect the complex relationship between pedestrians and their travel environments, MPO staff developed a PLOS tool, which grades a given roadway on its quality of pedestrian travel, and whether it reflects the goals emphasized in the MPO’s LRTP: safety, system preservation, capacity management and mobility, and economic vitality.<sup>26</sup> The ratings in this pedestrian assessment tool is displayed in Appendix F. Based on the tool, Route 16 in Chelsea and Everett was rated *poor* in terms of safety, *poor* in terms of system preservation, and *poor* in terms of economic vitality and capacity management and mobility. Overall, the assessment indicates that the roadway needs improvements to accommodate pedestrians.

<sup>26</sup> Ryan Hicks and Casey-Marie Claude, *Pedestrian Level-of-Service Memorandum*, Technical Memorandum to the Boston Region Metropolitan Planning Organization, January 19, 2017.

### 6.3.2 Bicycle Level of Service (BLOS)

The quality of bicycle travel is largely affected by the character of the roadway and safety and security such as speed of vehicles, travel time, comfort and convenience, and freedom to maneuver. The BLOS tool is intended to help users and planners assess the infrastructure needs that facilitates the bicycle travel. The approach is similar to the PLOS tool in that it grades locations with features that are suitable or unsuitable for bicyclists—areas well suited for bicycle travel are awarded high scores and areas unsuitable for bicycle travel are awarded low scores. In addition, the BLOS ratings (displayed in Appendix F) correlate with the goals emphasized in the MPO's LRTP. Based on the BLOS tool, Route 16 in Chelsea and Everett was rated *poor* in terms of safety, *poor* in terms of system preservation, and *poor* in terms of economic vitality and capacity management and mobility. Overall, the assessment indicates that the roadway needs improvements to accommodate bicyclists.



# Chapter 7—Community and Stakeholder Engagement

Stakeholder participation is a crucial part of any project. Hence, MPO staff used a number of methods to engage the communities of Chelsea and Everett in planning for improvements to Route 16.

## 7.1 COMMUNITY SURVEY

MPO staff developed a survey to help determine the public's opinion about concerns and problems on Route 16 in Chelsea and Everett and to learn their ideas for resolving them. The online survey, posted on the cities of Chelsea and Everett websites, received 580 responses between February 1, 2019, and March 8, 2019. Figure 19 shows the questions contained in the survey, along with the answers received. More than one-third of respondents left significant free-response feedback for one or more questions; those comments are included in **Error! Reference source not found.**

Some notable conclusions drawn from the survey are below:

- The vast majority of respondents (77 percent) drive on the corridor. However, 14 percent of respondents also said that they walk, jog, or bicycle in the corridor despite low observed pedestrian and bicyclist volumes.
- Poorly timed traffic signals, high volumes of traffic, difficulty crossing Route 16, high speed of vehicles, and poor accommodation for pedestrians and bicyclists were the most commonly cited problems, both in the survey answers and in free responses.
- Many respondents expressed surprise that anyone would consider bicycling in the corridor because of the dangerous conditions.
- Many participants commented traffic operations: intersections being blocked and drivers frequently running red lights during peak hours, both for their effects on traffic (preventing turning movements) as well as concern for pedestrian safety (obstructing crosswalks).
- Despite being a population of mostly drivers, the respondents seemed extremely receptive to the idea of improving facilities for active transportation modes.
- Eighty percent of residents indicated they would like to see improved traffic flow and circulation, more greenery and welcoming streetscape, and enhanced safety for all users in the corridor.

- The written comments were overwhelmingly focused on ideas for improved traffic signal timing and coordination, routine maintenance such as litter pick up, continuous and connected sidewalks, and the wide eastbound far-right travel lane (18 feet wide) between Lewis Street and Second Street. Drivers use it as two lanes during peak periods and as a single lane during off-peak period, which creates confusion.
- Suggestions mentioned in the free response included longer left-turn storage lanes, better left-turn signal indications to reduce conflicts between left-turns and opposing left-turns and through traffic, and better signage and wayfinding information.
- Respondents also mentioned frequent police patrol and enforcement as measures to reduce running red lights, speeding, and blocking intersections.
- Although improving public transit did not seem to be a priority, some respondents were surprised that there was no bus service on Route 16, and indicated that they would like to see improved bus service.

Feedback from the survey was helpful to gauge community sentiment and to solicit ideas for solutions to the existing problems.

## **7.2 ADVISORY TASK FORCE**

An advisory task force composed of representatives from the cities of Chelsea and Everett and MassDOT was established to guide this study. MPO staff met with the task force twice. In the first meeting, they discussed the work scope and existing problems. In the second meeting, MPO staff presented the existing condition analyses, proposed improvements, and received advice from the task force members. This report reflects the task force's feedback. Appendix A includes a list of task force members and comments.

# Chapter 8—Deficiencies

Figures 20 through 23 summarize the deficiencies in the corridor based on field visits, analyzing the collected data, determining the public’s opinion about the problems, and obtaining feedback from the advisory task force.

## 8.1 PEDESTRIAN AND BICYCLE CONCERNS

Pedestrians and bicyclists face challenges in the corridor. The following are the pedestrian and bicycle concerns based on the analysis, visits, and feedback.

- Many wheelchair ramps lack detectable warning plates and are not ADA-compliant.
- Majority of crosswalk markings have faded and are not clearly visible to motorists. In addition, many of the crosswalks have obstructions in them, particularly, roadway median protruding into them.
- Trash on sidewalks and along the corridor present unwelcoming environment for pedestrians and bicyclists.
- Many of the pedestrian refuge areas in the middle of the crosswalks are too narrow and do not provide adequate protections for pedestrians.
- All of the pedestrian signals and pedestrian pushbuttons are not accessible to people with disabilities.
- There are no countdown timers to assist pedestrians, especially for crossing the wider Route 16 roadway, where the crossing distances are 90 feet or longer
- The absence of crosswalks on the Route 16 at South Ferry Street, Boston Street, and Union Street increase pedestrians risk of crashes
- There were 26 pedestrian and 6 bicyclist crashes in the 5-year period from 2012 to 2016, and the intersection of Route 16 and Washington Avenue is an HSIP pedestrian crash cluster
- Drivers blocking intersections including crosswalks and frequently running red lights create safety concerns for pedestrians.
- Poor sidewalk conditions—many sections of the sidewalk network have vegetation outgrowth and debris accumulations that have reduced width of the sidewalks to substandard levels. Many sections also have surface defects and structural problems that present risks to pedestrians.



## 8.2 SAFETY CONCERNS

Traffic safety is a major concern, pedestrians, bicyclists, and motorists are all affected. The crash analysis and feedback from the communities and advisory task force indicated the following safety concerns:

- Five intersections in the corridor are on the list of 2013–15 Top 200 high-crash intersections in Massachusetts.
- Seven intersections in the corridor are HSIP-eligible intersection crash clusters
- High numbers of angle and rear-end crashes occur at each of the signalized intersections.
- High number of crashes involving permitted left turns occur at many of the signalized intersections.
- One HSIP-eligible pedestrian crash cluster at the Washington Avenue intersection.

## 8.3 TRAFFIC OPERATION CONCERNS

Poor traffic operating conditions contribute to the poor safety conditions in the corridor. Through field visits and road safety audits, MPO staff identified the following concerns:

- Drivers running red lights and causing crashes.
- High level of congestion and traffic queues blocking intersections during peak periods.
- Lack of police presence to reduce speeding, red light runners, and blocking intersections
- Intensive merge on Route 16 eastbound resulting from traffic exiting Sweetser Circle to Route 16 eastbound near Lewis Street intersection.
- The wide eastbound far-right travel lane (18 feet) between Lewis Street and Second Street confuses drivers because it is used as two lanes during peak periods and as a single lane during off-peak period.
- Conflicts in the turning path of vehicles within the intersection, especially for the dual left turns and for left turns and opposing through movements, which cause crashes.
- Short left-turn lanes on Route 16 at South Ferry Street, Washington Avenue, and Garfield/Webster Avenues cause backups that interrupt traffic flow in the through lanes.

- Poor signal displays for protected and permitted left-turns confuse drivers and contribute to crashes.
- General lack of wayfinding signs in the corridor.
- Pavement markings are worn out.

#### **8.4 TRAFFIC SIGNAL EQUIPMENT CONCERNS**

The traffic signal systems need upgrading to make traffic operations more efficient as well as to improve safety. Traffic signal equipment issues identified through the MassDOT conditional assessment, field visits, and analysis include the following:

- Existing traffic signal timings are outdated resulting in poorly timed signals and traffic progression and congestion throughout the corridor
- Many components of the signal equipment are outdated, such as rusty signal poles, missing visors and backplates, eight-inch signal lenses, and lack of emergency vehicle or queue preemption
- Post-mounted signals do not provide adequate visibility for drivers



# Chapter 9—Future Conditions

## 9.1 FUTURE TRAFFIC PROJECTIONS

Planners typically use a planning model to forecast traffic volumes based on changes in the transportation network or land use. For this study, MPO staff used the Boston Region MPO's statewide model, which was recently adopted for the development of the LRTP. This model's socioeconomic components are derived from forecasts produced by the Metropolitan Area Planning Council. The model is calibrated at a regional level for 164 cities and towns, which include the 97 cities and towns in the MPO's planning region. Using this model, staff projected that between now and 2040, peak-period traffic volumes on Route 16 would increase by 3 to 9 percent. The peak-period traffic on the side streets such as Second Street, Everett Avenue, Washington Avenue, and Garfield/Webster Avenues would have much higher total growth during the same period, between 5 percent and 12 percent over the 24-year period. To test the impact that the proposed improvements would have on future traffic conditions, MPO staff used the estimated growth factors and the existing peak-hour turning movement volumes to develop the 2040 traffic projections.

## 9.2 PROPOSED SHORT- AND MEDIUM-TERM IMPROVEMENTS

The corridor would immensely benefit from short- and medium-term improvements. They include installing signs, marking pavement, painting high-visibility crosswalks, adding detectable warning plates to existing wheelchair ramps, and upgrading signal-head sections. Medium-term improvements include adding countdown timers for pedestrians, retiming and coordinating signals, improving drainage, repairing substandard sidewalks, and making minor geometric modifications. Figures 24 through 27 show the short- and medium-term safety and operational improvements, which are similar across intersections in the corridor. Table 7 describes the short- and medium-term improvements along with the time frame, cost, and jurisdiction.

**Table 7**  
**Short- and Medium-Term Improvements**

<b>Issue</b>	<b>Improvement</b>	<b>Time Frame</b>	<b>Cost</b>	<b>Jurisdiction</b>
Environmental	Provide routine street cleaning and trash/litter pickup	Short	Medium	MassDOT
Congestion	Optimize traffic signal timings and coordinate signals to reduce congestion and delay	Short	Medium	MassDOT
Congestion	Repair or replace malfunctioning vehicle detectors at signalized intersections, especially on Route 16 westbound left-turn lane at Garfield Avenue and Webster Avenue intersection.	Short	Low	MassDOT
Congestion	Lengthen short left-turn lanes to reduce their impacts (traffic queues and drivers turning from wrong lanes) from interrupting traffic flow in the straight-through lanes. Or increase signal phase intervals of short left-turn lanes	Medium	Medium	MassDOT
Congestion	Consider working with owner of the Car Wash located between Second Street and Spring Street to relocate the entry and exit to reduce its impacts on traffic flow on Route 16, Second Street, and Spring Street.	Medium	Medium	MassDOT
Pedestrian safety	Make wheelchair ramps ADA-compliant by adding detectable plates	Medium	Medium	MassDOT
Pedestrian safety	Align pedestrian signal in the southwest corner with crosswalk on Lewis Street	Short	Low	MassDOT
Pedestrian safety	Reposition detectable warning plates on Garfield Avenue to align better with crosswalks	Short	Low	MassDOT
Pedestrian safety	Bring poor sidewalks to meet MassDOT standards and ADA-compliance	Medium	Medium	MassDOT
Pedestrian safety	Widen the median opening to provide enough pedestrian refuge areas and welcoming space	Medium	Medium	MassDOT
Pedestrian safety	Add countdown timers to help expedite pedestrian crossing at signalized intersections	Medium	Medium	MassDOT
Pedestrian safety	Work with business owners to remove parking on sidewalks throughout the corridor	Medium	Medium	MassDOT

Issue	Improvement	Time Frame	Cost	Jurisdiction
Pedestrian	Add crosswalks on Route 16 at the following locations: <ul style="list-style-type: none"> <li>• East leg of Route 16 at Second Street</li> <li>• East leg of Route 16 at South Ferry Street</li> <li>• West leg of Route 16 at Everett Avenue</li> <li>• West leg of Route 16 at Union Street</li> </ul>	Medium	MassDOT	MassDOT
Bicycle safety	Provide bicycle detection at the signalized intersections	Medium	Medium	MassDOT
Safety	Modify clearance intervals to MassDOT standards to address high number of angle and rear-end crashes	Short	Medium	MassDOT
Safety	Replace or repair signal heads with missing or damaged visors and backplates	Short	Low	MassDOT
Safety	Replace incandescent signal sections with LED sections	Short	Low	MassDOT
Safety	Replace broken and straighten slanted light poles and improve street lighting	Medium	Medium	MassDOT
Safety	Upgrade all 8-inch signal lenses to 12-inch signal heads	Short	Low	MassDOT
Safety	Install stop signs and add crosswalks on Garvey Street and Terminal Street	Short	Low	MassDOT
Safety	Install advance street name and guide signs to improve wayfinding	Medium	Medium	MassDOT
Safety	Increase police patrol and presence to reduce speeding, red light runners, and blocking intersection	Short	Medium	State/City Police
Safety	Reduce width of rightmost eastbound lane from Lewis Street to Second Street to prevent drivers forming two lanes (pavement restriping)	Short	Low	MassDOT
Safety	Narrow the width of channelized right-turn lane on Garfield Avenue to prevent drivers forming two lanes, need to consider truck movements (pavement striping)	Short	Low	MassDOT
Safety	Realign the guide signage on Webster Avenue so it becomes visible to northbound traveling vehicles	Short	Low	MassDOT
Safety	Trim vegetation to provide drivers with more clear view of signs and signals at the following intersection (Spring Street, Union Street, and Webster Avenue)	Short	Low	MassDOT
Safety and operations	Consider providing split phasing for the side streets to eliminate potential conflicts between opposing vehicles (Everett, Washington, and Garfield/Webster Avenues)	Medium	Medium	MassDOT

Issue	Improvement	Time Frame	Cost	Jurisdiction
Safety and operations	Provide advance intersection lane control signs on Route 16 to indicate lane configuration ahead	Medium	Medium	MassDOT
Safety and operations	Improve drainage systems in the corridor to reduce flooding from storms	Medium	Medium	MassDOT
Pavement	Resurface roadway	Medium	Medium	MassDOT
Pavement	Provide pavement markings to clearly show the lanes at intersections	Short	Low	MassDOT
Pavement	Provide pavement markings to clearly show the northbound and southbound left and through lanes on Everett Avenue, Garfield Avenue, and Webster Avenue	Short	Low	MassDOT, Everett, and Chelsea

ADA = Americans with Disabilities Act. MassDOT = Massachusetts Department of Transportation.  
 Source: Central Transportation Planning Staff.

In addition to the safety and operations improvements, MPO staff evaluated what the LOS of Route 16 in Chelsea and Everett would be if the traffic signals were retimed and coordinated. The analysis focused on modifying the yellow and all-red intervals, phase splits, cycle lengths, and offsets to determine the effects of signal coordination on the existing traffic volumes. The results of the LOS analyses are shown in Figures 28 through 31. Appendix F presents the short-term signal timing and coordination LOS analysis worksheets.

**9.3 PROPOSED LONG-TERM IMPROVEMENTS**

The corridor needs long-term improvements to address multimodal transportation, including active transportation needs and congestion reduction measures. Long-term improvements typically require more design and engineering efforts, environmental permitting, and larger funding resources. They include reconstruction to modernize the signal equipment, accommodate pedestrians and bicyclists, improve transit services, increase safety for all users, and support livable communities and economic vitality.

Because of the varying cross-sectional width along the corridor, MPO staff divided the roadway into three segments for the long-term improvements:

- Western Segment: From Route 99 (Broadway) to Everett Avenue
- Middle Segment: Everett Avenue to Washington Avenue
- Eastern Segment: From Washington Avenue to Route 1

Figures 32 through 35 show the proposed long-term improvements, which are summarized in Table 8 along with the time frame, cost, and jurisdiction. The LOS resulting from the long-term improvements are shown in Figures 36 through 39.

**Table 8  
Long-Term Improvements**

<b>Issue</b>	<b>Improvement</b>	<b>Cost</b>	<b>Jurisdiction</b>
Pedestrian and bicycle safety	Construct a multiuse path on either side of Route 16 between Lewis Street and Everett Avenue to accommodate pedestrians and bicyclists safely. Add bicycle racks at convenient locations.	High	MassDOT
Pedestrian safety	Upgrade all sidewalks, pedestrian refuge areas, and wheelchair ramps to MassDOT standards	High	MassDOT
Safety	Reconstruct the cobblestone median between Everett Avenue and Union Street to MassDOT standards	High	MassDOT
Congestion and safety	Upgrade outdated traffic signal equipment to mast-arm mounted signal heads to increase visibility	High	MassDOT
Congestion and safety	Study Sweetser Circle to identify options to improve safety, reduce congestion, and accommodate pedestrian and bicyclists	High	MassDOT
Congestion and safety	Implement an ATSC to optimizing traffic signal timings and coordination	High	MassDOT
Congestion and safety	Install an exclusive northbound left-turn lane on Second Street to reduce congestion and increase safety	High	MassDOT and Everett
Congestion and safety	Install exclusive left-turn lanes on the following streets to reduce congestion, left-turn conflicts, and make traffic flow efficient. <ul style="list-style-type: none"> <li>• Everett Avenue</li> <li>• Garfield Avenue</li> <li>• Webster Avenue</li> </ul>	High	MassDOT, Everett, and Chelsea
Pedestrian safety	Install a traffic signal at Boston Street to improve safety for pedestrian crossing Route 16	High	MassDOT
Environmental	Improve landscape and streetscape and more greenery along the corridor to provide a welcoming environment for all uses	High	MassDOT
Safety	Upgrade light poles and fixtures to MassDOT standards	High	MassDOT
Access management	Implement access management by consolidating and sharing driveways in future development along the corridor	High	MassDOT
Pedestrian safety	Improve pedestrian crossings experience at Union Street intersection	High	MassDOT
Safety	Redesign the approach of County Road to align with the one-way street and right-turn only out of County Road.	High	MassDOT and Chelsea
Safety	Improve signage and wayfinding throughout the corridor	High	MassDOT
Congestion	Lengthen the Route 16 westbound left-turn lane to provide more storage for vehicles turning onto Webster Avenue	High	MassDOT
Congestion	Install a traffic signal to provide access from Route 1 southbound to Route 16 eastbound	High	MassDOT
Congestion	Add a new ramp connecting Route 16 westbound to Route 1 northbound	High	MassDOT



Issue	Improvement	Cost	Jurisdiction
Safety	Construct geometric improvements at Webster/Garfield Avenue intersection: <ul style="list-style-type: none"> <li>• Move the west leg of Route 16 approximately 15 feet to the west to create more space within the intersection for left turning movements to eliminate conflicts</li> <li>• Consider geometric improvements to improve alignment on Webster and Garfield Avenues</li> </ul>	High	MassDOT

ATSCCT = Adaptive Traffic Signal Control Technology. MassDOT = Massachusetts Department of Transportation.

Source: Central Transportation Planning Staff.

### 9.4 PERFORMANCE OF THE IMPROVEMENTS

#### 9.4.1 Arterial and Network Performance with Improvements

Arterial performance is usually based on the average travel speed for the segment under consideration. In this study, MPO staff focused on signal delays and total network delays because most of the traffic congestion in the segment happens at the intersections.

Table 9 presents the signal delays traveling along Route 16 for the existing conditions, and short- and long-term improvements. Analyses indicate that retiming and coordinating the signals (short-term) would result in 5 percent to 20 percent reduction in traffic signal delays along Route 16 during weekday AM and PM peak travel periods. In addition, analyses indicate that the long-term improvements would reduce congestion by 10 percent to 30 percent during peak travel periods.

MPO staff also analyzed total network delay, which includes signal and queue delays for traffic on Route 16 and the side streets. The total network delays are presented in Table 10 and the analyses indicated that the short-term improvements would reduce overall delay by 15 percent to 25 percent and the long-term improvements by 10 percent to 35 percent.

**Table 9**  
**Measure of Effectiveness: Route 16 Signal Delay**

Scenario	AM	AM	PM	PM	Sat PM	Sat PM
	Arterial Signal Delay (sec/veh)	Percent Change	Arterial Signal Delay (sec/veh)	Percent Change	Arterial Signal Delay (sec/veh)	Percent Change
<i>Eastbound</i>	--	--	--	--	--	--
Existing	375	--	628	--	328	--
Short-Term	334	11%	572	9%	300	9%
Long-Term	314	16%	510	19%	285	13%
<i>Westbound</i>	--	--	--	--	--	--
Existing	397	--	360	--	219	--
Short-Term	383	4%	320	11%	234	-7%
Long-Term	277	30%	358	1%	227	-4%

Sec/veh = seconds per vehicle.  
 AM = 6:30 AM to 7:30 AM. PM = 4:00 PM to 5:00 PM.  
 Source: Central Transportation Planning Staff.

**Table 10**  
**Measure of Effectiveness: Total Network Delay**

Scenario	AM	AM	PM	PM	Sat PM	Sat PM
	Arterial Signal Delay (sec/veh)	Percent Change	Arterial Signal Delay (sec/veh)	Percent Change	Arterial Signal Delay (sec/veh)	Percent Change
Existing	507	--	737	--	426	--
Short-Term	390	23%	693	6%	405	5%
Long-Term	324	36%	688	7%	411	4%

AM = 6:30 AM to 7:30 AM. PM = 4:00 PM to 5:00 PM.  
 Source: Central Transportation Planning Staff.

**9.4.2 PLOS Performance with Improvements**

MPO staff evaluated what the future PLOS of Route 16 would be in Chelsea and Everett, if the recommendations from this study were implemented. Appendix F contains results of the PLOS scorecard analyses. Based on the assessment, Route 16 was rated *good* in terms of meeting the MPO’s goals for capacity management and mobility and economic vitality because of the prioritization of safe accommodations for pedestrians and bicyclists and improving connectivity of the pedestrian network.

**9.4.3 BLOS Performance with Improvements**

MPO staff evaluated what the future BLOS of Route 16 would be in Chelsea and Everett, if the recommendations from this study were implemented. Appendix F contains results of the BLOS scorecard analyses. Based on the assessment, Route 16 was rated *excellent* in terms of meeting the MPO’s goals for capacity management and mobility and economic vitality because of prioritizing safe accommodations for bicyclists and improving connectivity of the bicycle network.

#### 9.4.4 Safety Impacts of Proposed Improvements

Each of the proposed improvements was chosen to target specific safety deficiencies present in the study area.

- **Corridor and Intersection Lighting Upgrades.** MPO staff recommends upgrading or replacing these facilities as part of any future project. Providing intersection and highway lighting could reduce nighttime crashes by approximately 18 percent to 38 percent<sup>27</sup>.
- **Pedestrian Crossing Safety.** Improving the ability of pedestrians to cross Route 16 safely was a major priority in this study. The recommendations include fitting all signalized intersections with high-visibility crosswalks and installing midblock pedestrian-activated crossing signals at selected locations. Upgrading crossings has been shown to reduce vehicle-pedestrian collisions by about 40 percent.<sup>28</sup> Providing pedestrian-activated crossing signals such as pedestrian hybrid beacons could reduce vehicle-pedestrian crashes by as much as 55 percent.<sup>26</sup>
- **Bicycle Safety.** The survey responses showed that Route 16 is generally considered for bicyclists. The proposals in this study seek to remedy this problem by providing bicyclists with multiuse paths separated from the travel lanes. A 2014 analysis of bicycle crashes in Florida showed a 25 percent reduction in vehicle/bicycle collision totals after installing shared-use path.<sup>29</sup> However, other studies show an increase in the total number of bicycle accidents as more riders choose to use the new facilities.
- **Resurfacing and Pavement Marking Installations.** A corridor project like this will necessarily include some degree of pavement resurfacing or replacement. This change could improve safety by increasing pavement friction and replacing faded pavement markings. However, currently available studies cannot reliably correlate the magnitude of the effect, as it depends heavily on the characteristics of the site.

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<sup>27</sup> US Department of Transportation Federal Highway Administration, Crash Modification Factors Clearinghouse, August 14, 2018, <http://www.cmfclearinghouse.org/>

<sup>28</sup> L. Chen, C. Chen, and R. Ewing. "The Relative Effectiveness of Pedestrian Safety Countermeasures at Urban Intersections - Lessons from a New York City Experience." Presented at the 91st Annual Meeting of the Transportation Research Board, January 22–26, Washington, DC, 2012, [http://www.cmfclearinghouse.org/study\\_detail.cfm?stid=280](http://www.cmfclearinghouse.org/study_detail.cfm?stid=280)

<sup>29</sup> P. Alluri, A. Raihan, D. Saha, et al. "Statewide Analysis of Bicycle Crashes." Florida Department of Transportation (May 2017).

## 9.5 REGIONAL LONG-TERM STRATEGIES

Although Route 16 is a six-lane roadway, it is still very congested. The land uses along the corridor are undergoing changes due to redevelopment of existing properties into housing, hotels, office space, and commercial uses. Several transportation projects have come to the area to support these transformations, reduce congestion, and improve quality of life. They include the following projects:

- Silver Line extension to Chelsea, which was completed recently. Its Chelsea Station is less than one-half mile from the Route 16 corridor.
- The Chelsea Greenway recently completed runs along the Silver Line.
- Bike lanes on Lower Broadway.

In addition, the following regional long-term proposals may benefit travel in the Route 16 corridor and need further evaluation to determine their feasibility. The evaluation of these proposals are beyond the scope of this study.

### 9.5.1 Connecting Bicycle Infrastructure (Northern Strand and Greenway)

As part of the Silver Line project, the Chelsea Greenway, a shared-use path, was built parallel to the Silver Line. The 0.65-mile multiuse path connects Downtown Chelsea and Eastern Avenue stations. Chelsea and Everett, along with advocates for active transportation, support plans to extend the Greenway to provide safe connections to support smart growth and development around the new transit services and to connect to the regional greenway network, including the Northern Strand Community Trail and the East Boston Greenway. One of the options for connecting the Chelsea Greenway to the Northern Strand Community Trail is along the Newburyport/Rockport Commuter Rail Line ROW, the same ROW for future extension of the Silver Line to Sullivan Station. Figure 40 shows the Chelsea Greenway and possible connections to the regional greenway network. In addition, the City of Chelsea has plans to extend connections from the Greenway to Everett Avenue and the local Market Basket through a safe on-road greenway connector, which would include bike lanes, signage, and other streetscape improvements. Such a connection would link nicely with the multiuse path proposed on Route 16 in Everett between Everett Avenue and Lewis Street to connect to the Northern Strand Trail.

### 9.5.2 Extension of Silver Line to the Orange Line Station

The recent Silver Line extension offers a new, dedicated BRT service connecting Chelsea to East Boston with the South Boston Waterfront, South Station, and

Seaport District. In the recently completed Lower Mystic Regional Working Group (LMRWG) study, planning for improved transportation and mobility in the Sullivan Square area, one of the proposed transit improvements, which would benefit the Chelsea and Everett residents, is to further extend the Silver Line from the Chelsea Station. This extension would connect to Kendall Square using a combination of dedicated lanes and commuter rail ROW (Newburyport/Rockport Commuter Rail Line). Figure 41 shows the proposed regional transit projects in the study area. A station at Gateway Center in Everett would also enhance connections to the commercial and industrial businesses in the area as well as the Encore Boston casino.

### **9.5.3 Sullivan Square Commuter Rail Stop**

Also part of the LMRWG study recommendations, a commuter rail stop at Sullivan Square on the Newburyport/Rockport Commuter Rail Line, would benefit North Shore commuters. The proposal would facilitate transfers between the commuter rail line and the Orange Line and bus routes to North Station, Kendall Square, and employment areas at Assembly Square and the Inner Belt in Somerville.

### **9.5.4 Bus Service on Route 16**

Presently there are no bus services on Route 16 in the corridor. An idea that came out of the community survey was adding bus service along the corridor to the Wellington Station and Sullivan Square. A feasibility study of such service was beyond this study, but should include express service and dedicated bus lanes on Route 16.

# Chapter 10—Conclusion and Next Steps

If implemented, the improvements proposed in this report would yield the following benefits:

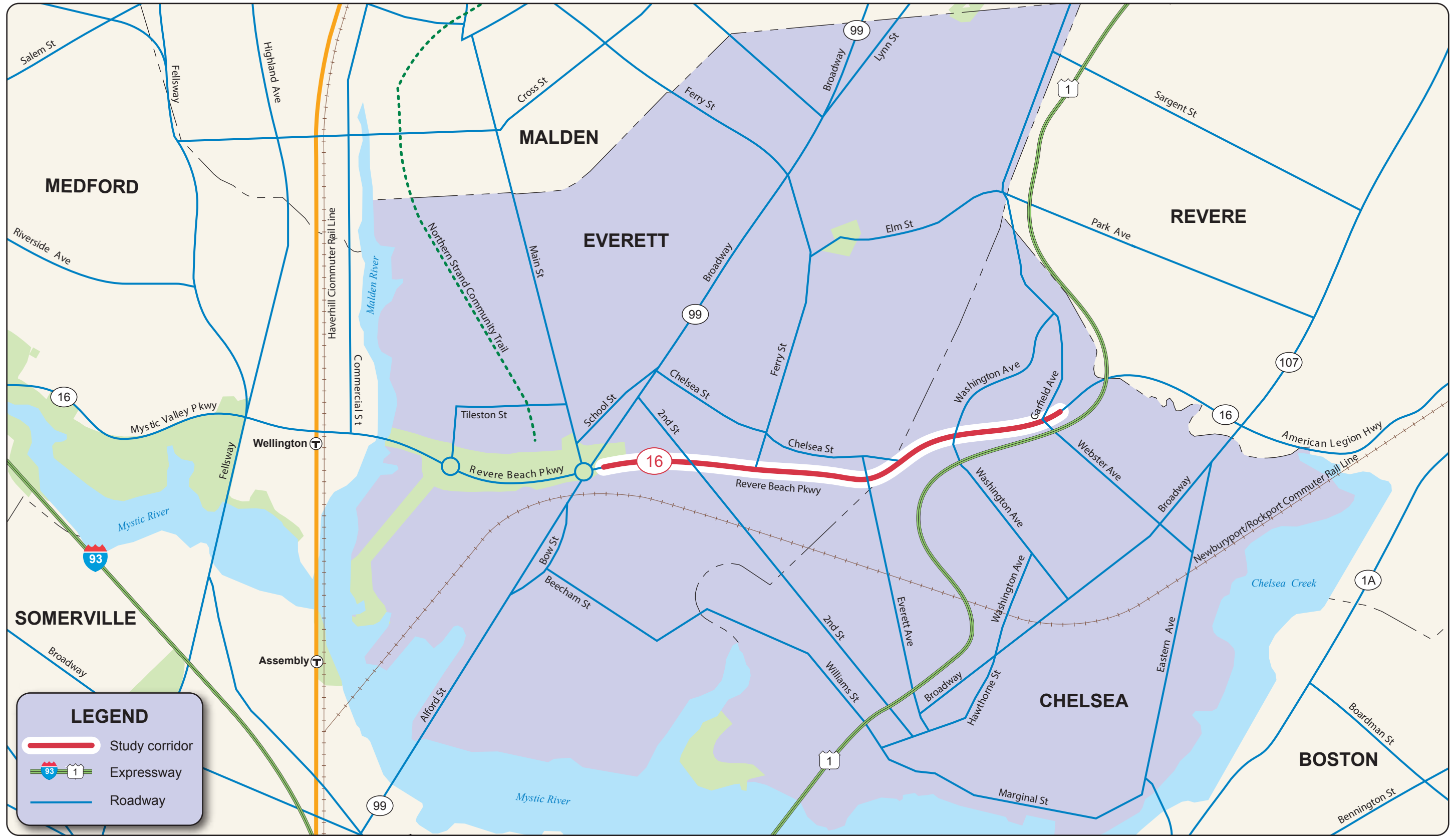
- Modernize the corridor into a more pedestrian- and bicyclist-friendly roadway such as continuous and connected sidewalks, multiuse paths, safe crosswalks, adequate pedestrian refuge areas, and accessible pedestrian signals.
- Improve safety at HSIP intersection crash cluster locations and other high-crash locations in the corridor
- Improve traffic flow and operations in the corridor, especially at very congested intersections
- Transform Route 16 to support the vision of connecting the neighborhoods to places such as schools and local businesses and promoting multimodal transportation

## 10.1 PROJECT IMPLEMENTATION

Successful implementation of the improvements would require cooperation between MassDOT Highway Division and the cities of Chelsea and Everett to ensure that sidewalks and multiuse paths are continuous and connected, and to ensure that MassDOT's standards guide the design of roadway elements. In addition, it is important for stakeholders to evaluate the improvement concepts with all road users in mind. MassDOT has jurisdiction of Route 16 and would be responsible for implementing renovations to the roadway and intersections. The cities of Chelsea and Everett have jurisdiction of the side streets and would be responsible for implementing renovations on those streets.

## 10.2 PROJECT DEVELOPMENT

Project development is the process that takes transportation improvements from concept to construction. This process will depend upon cooperation between MassDOT, the cities of Chelsea and Everett, and the Boston Region MPO. This planning study provides the necessary information for the project proponents to initiate the project notification and review process. After completing these initial steps, the proponents can start preliminary design and engineering and begin working with the MPO to program funding for the project in the TIP. Appendix H contains an overview of the project development process.



BOSTON  
REGION  
MPO



**Figure 1**  
**Regional Map of Study Area and Nearby Roadways**

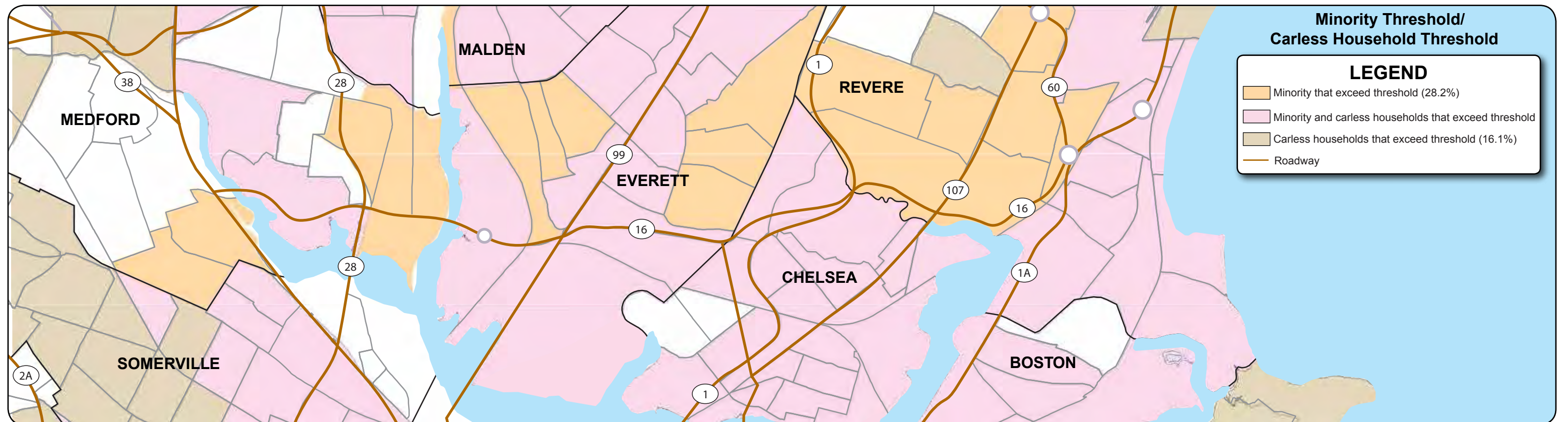
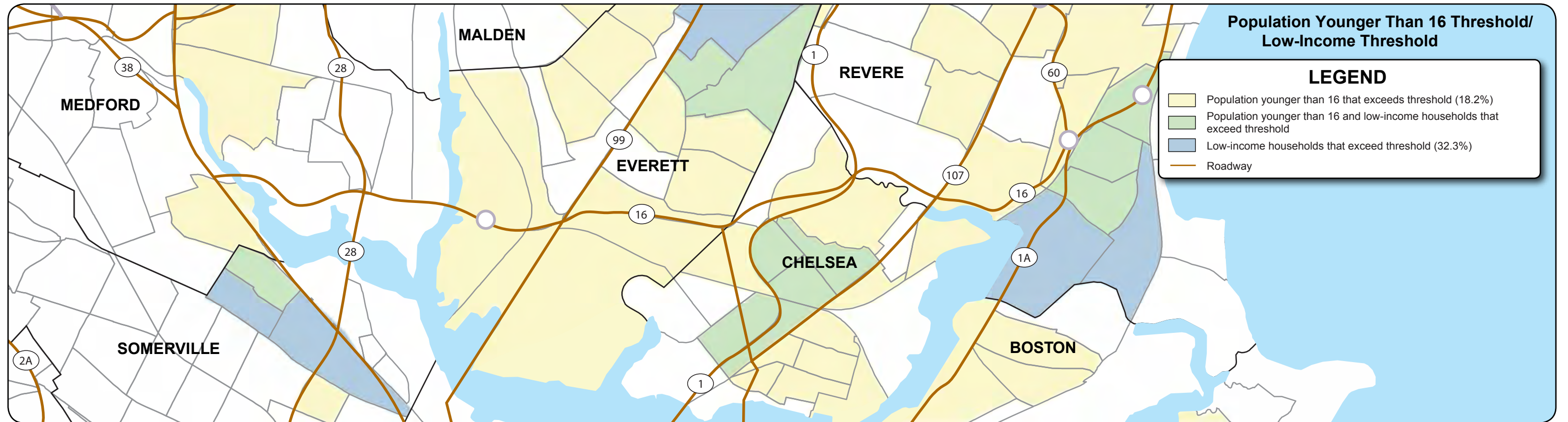
*Addressing Priority Corridors from  
the LRTP Needs Assessment:  
Route 16 in Chelsea and Everett*





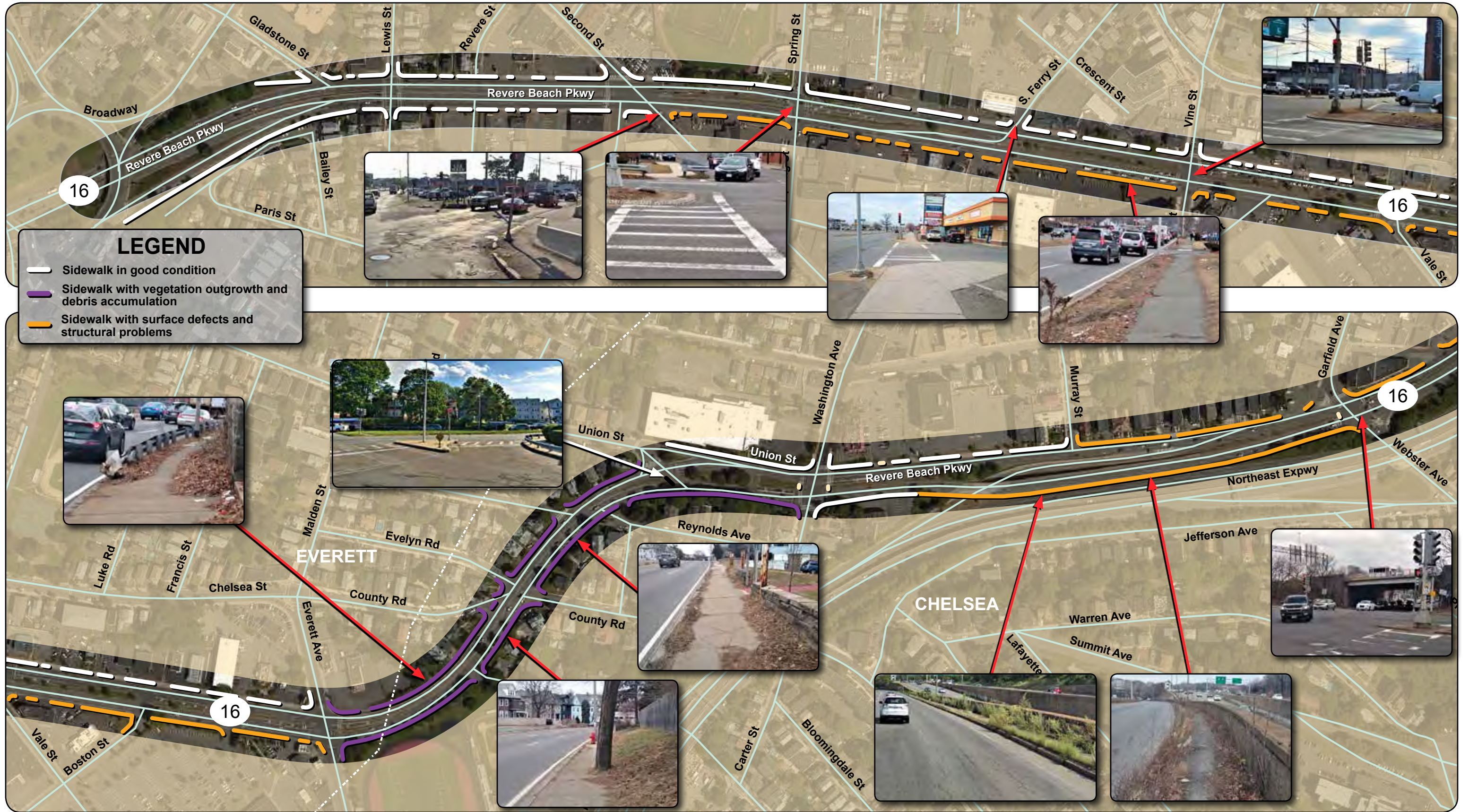
**Figure 2**  
**Existing Roadway Configuration**





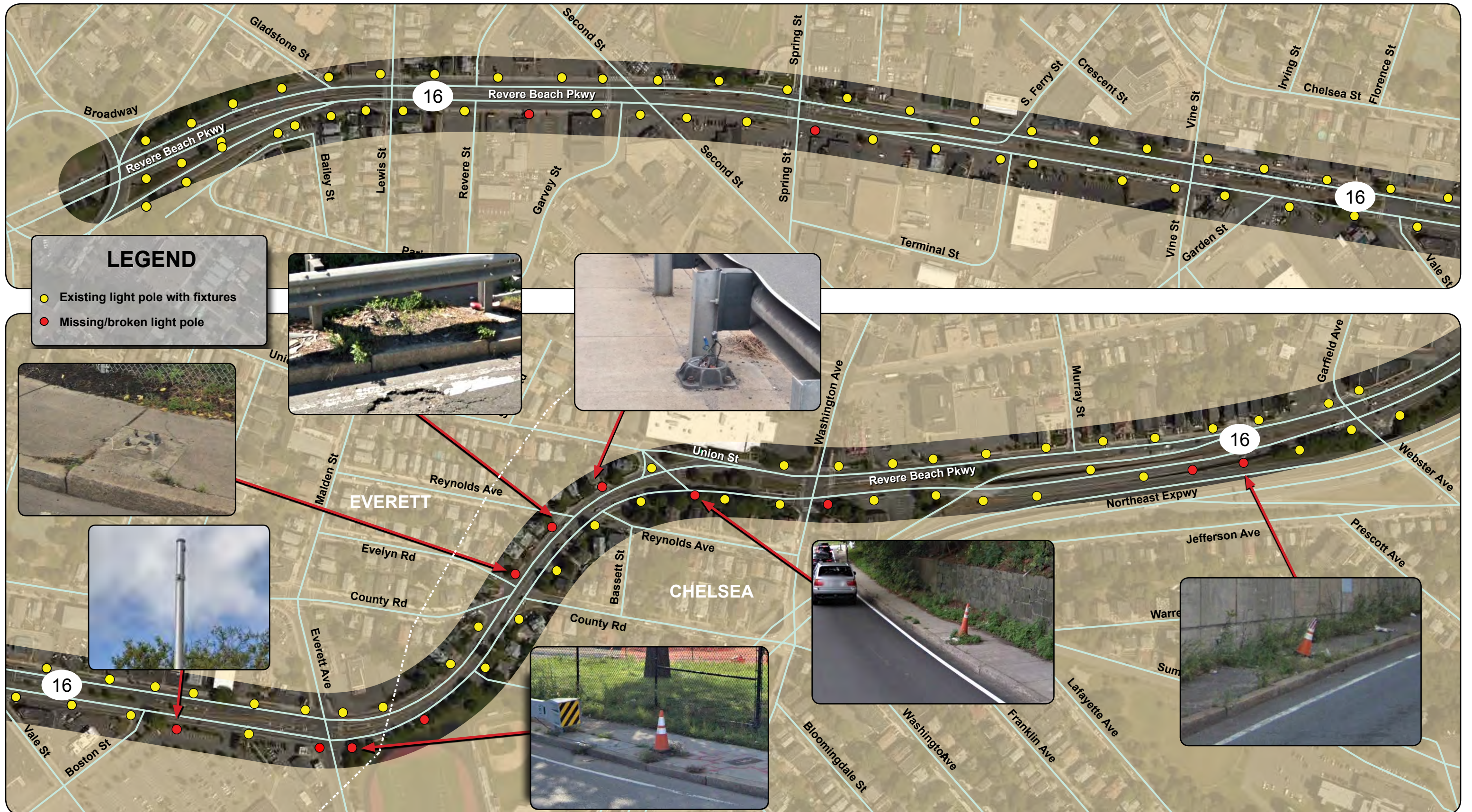
**Figure 3**  
**Transportation Equity Map**





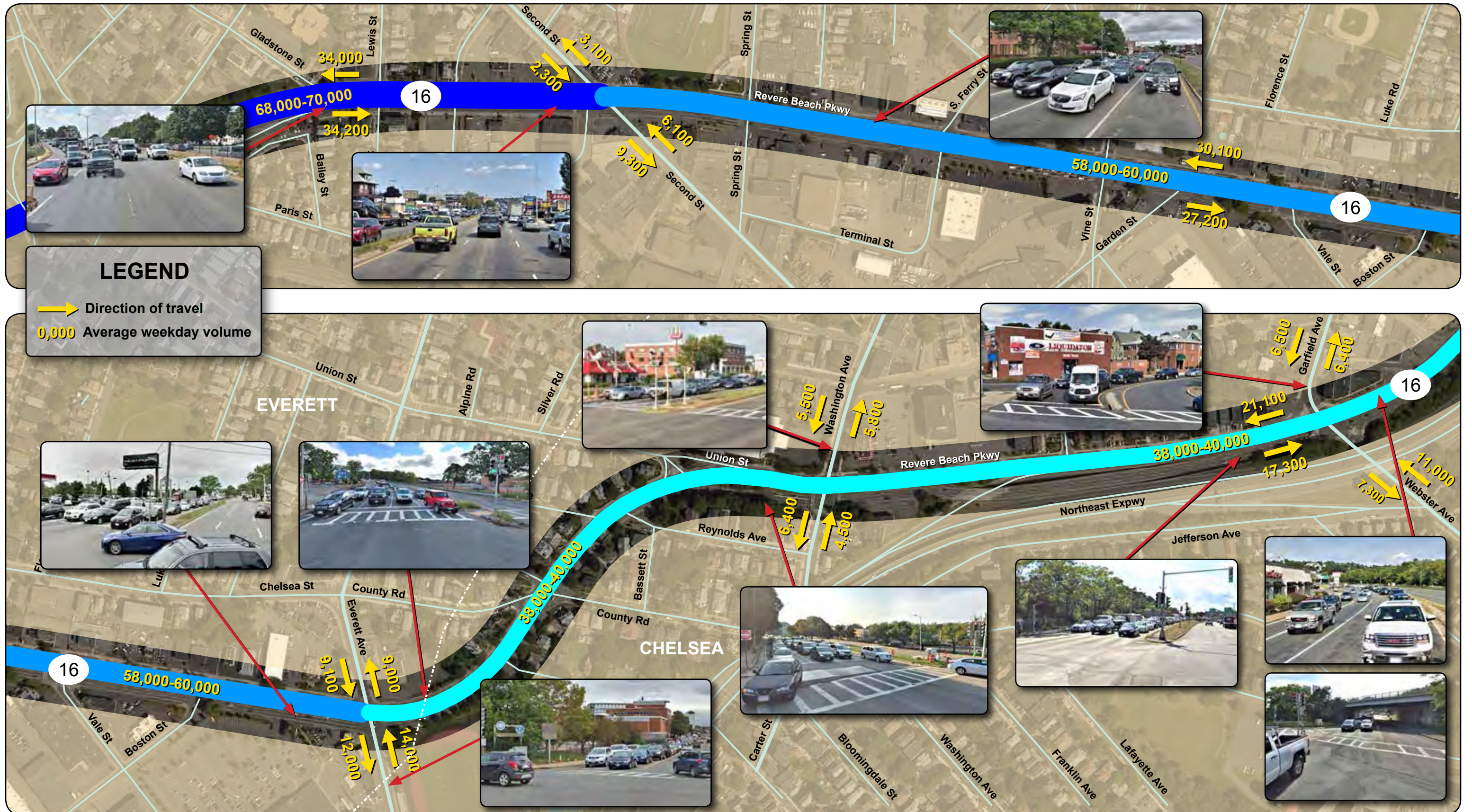
**Figure 4**  
**Existing Sidewalk Conditions**





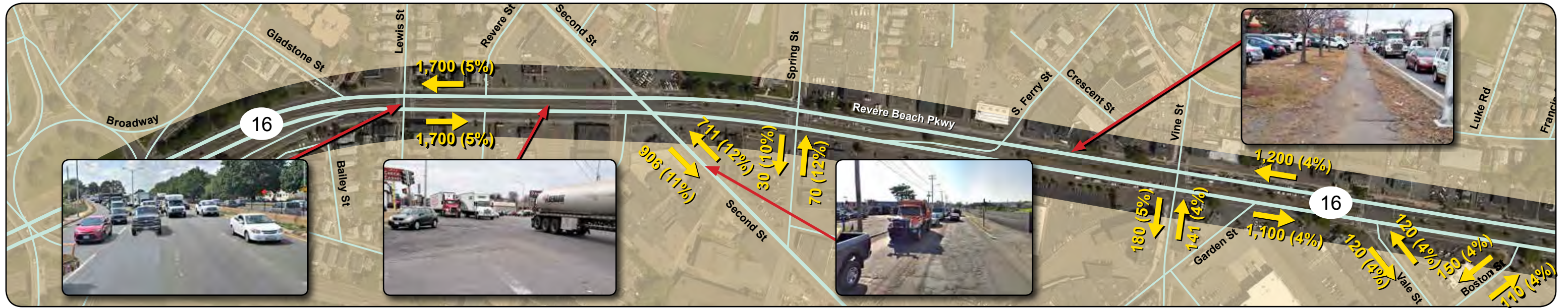
**Figure 5**  
**Existing Street Lighting Conditions**





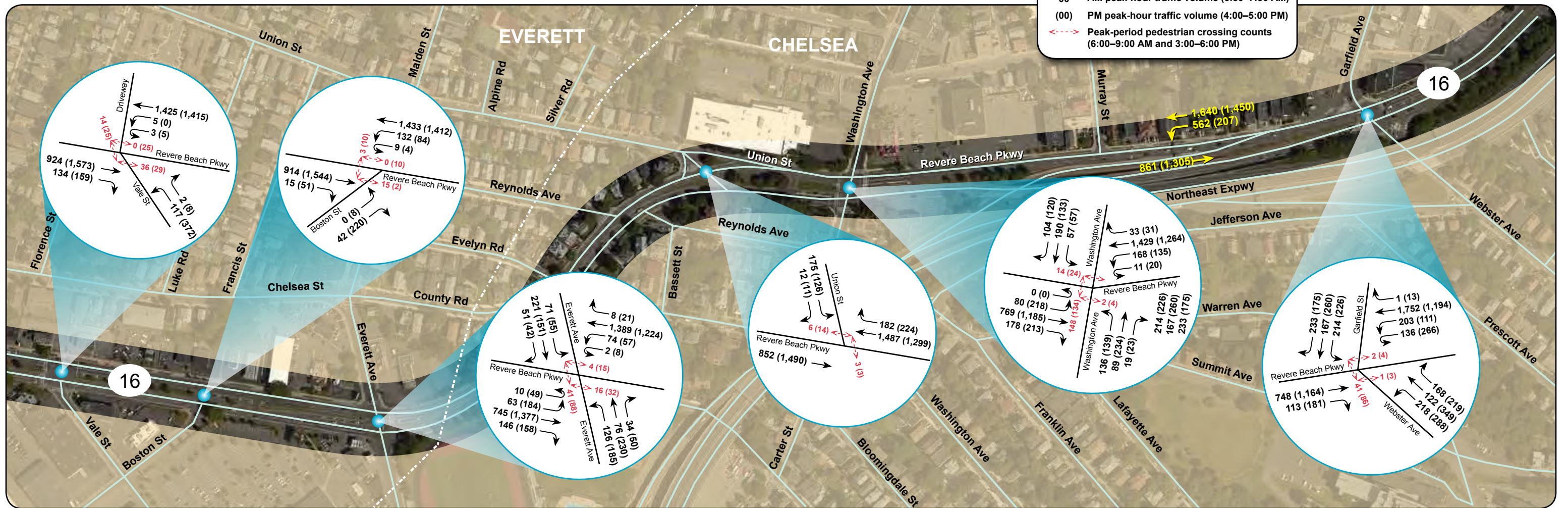
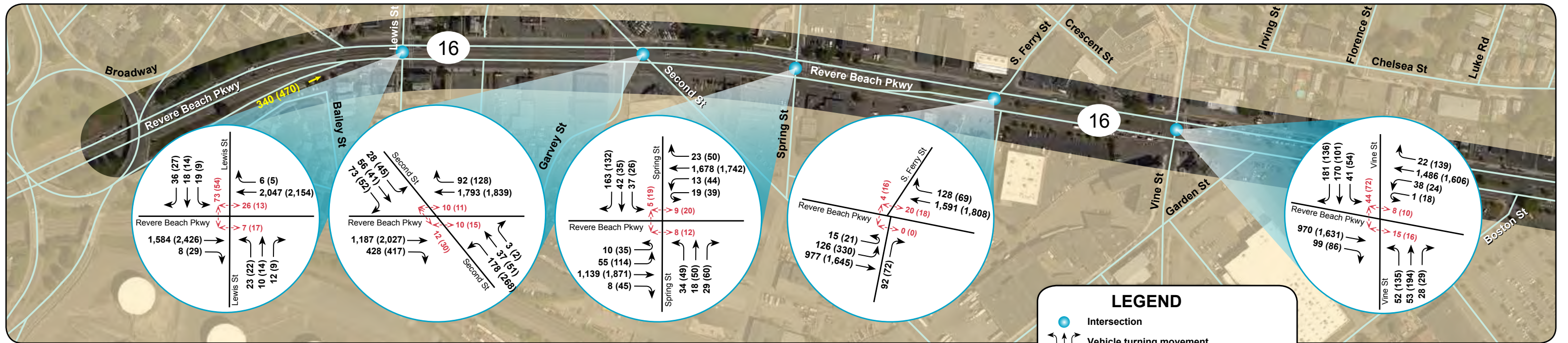
**Figure 6**  
Average Weekday Traffic Volumes





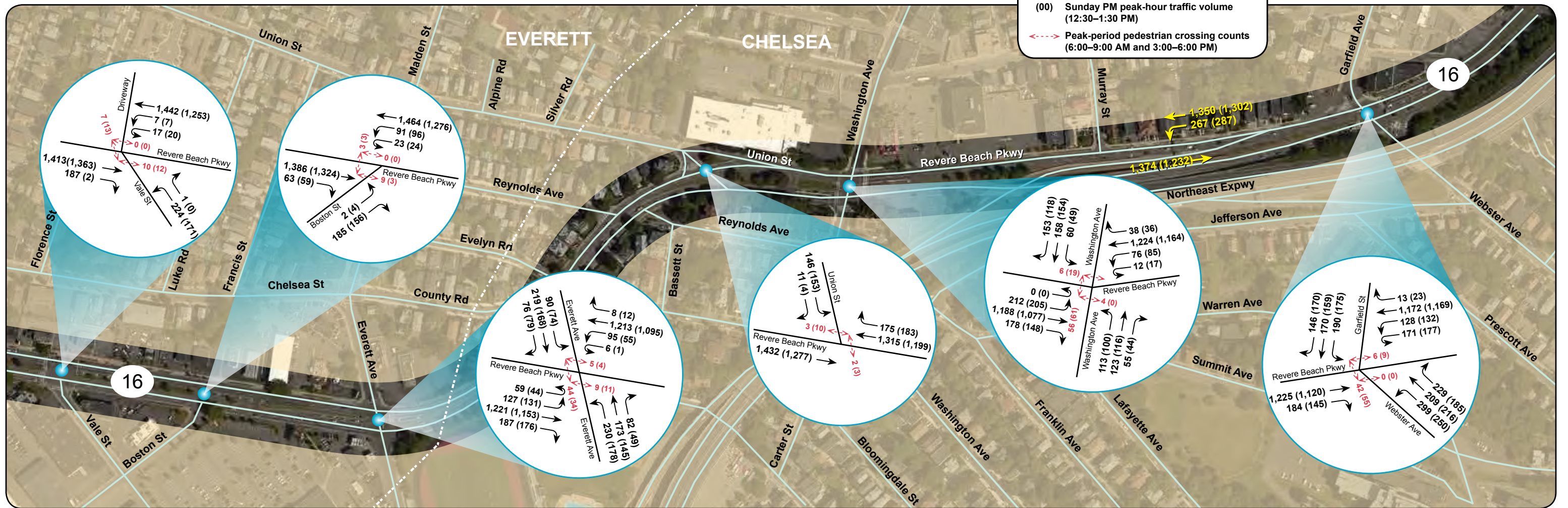
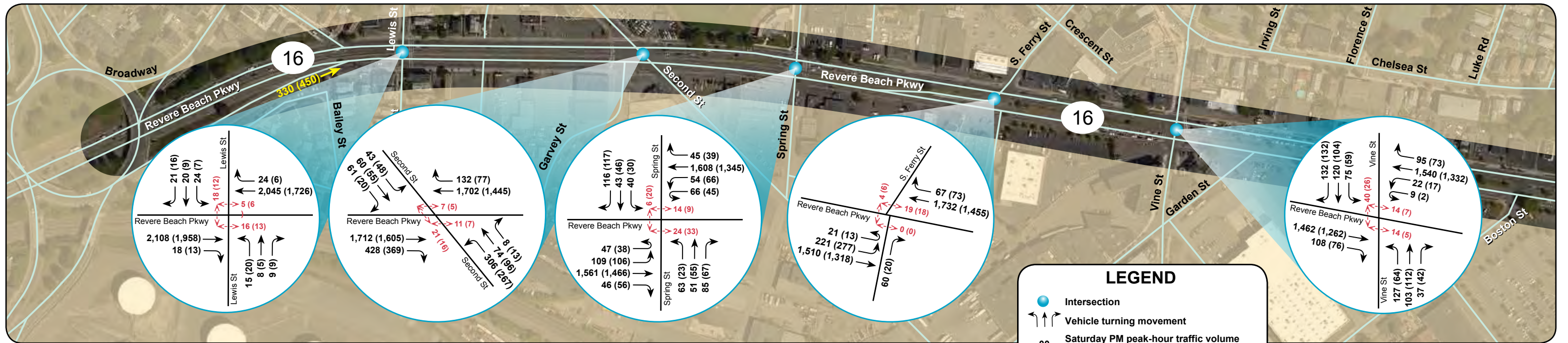
**Figure 7**  
Average Weekday Truck Volumes





**Figure 8**  
Weekday Peak-Hours Turning Movement Volumes





**Figure 9**  
Weekend Midday Peak-Hour Turning Movement Volumes





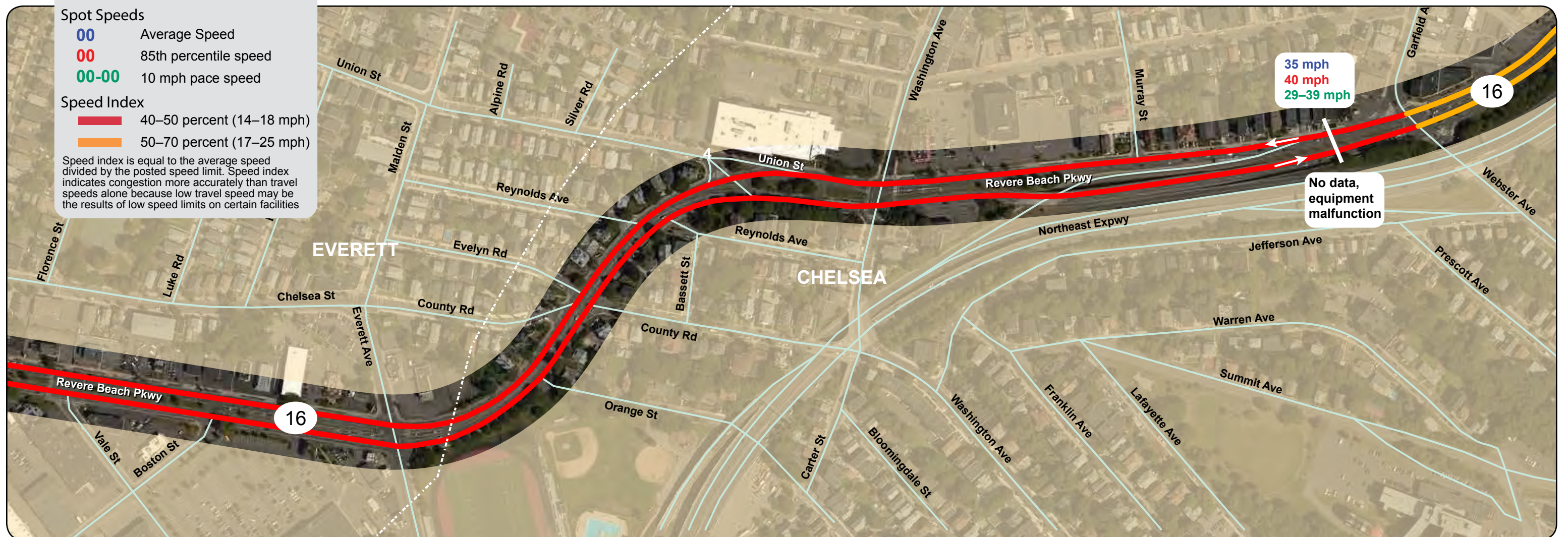
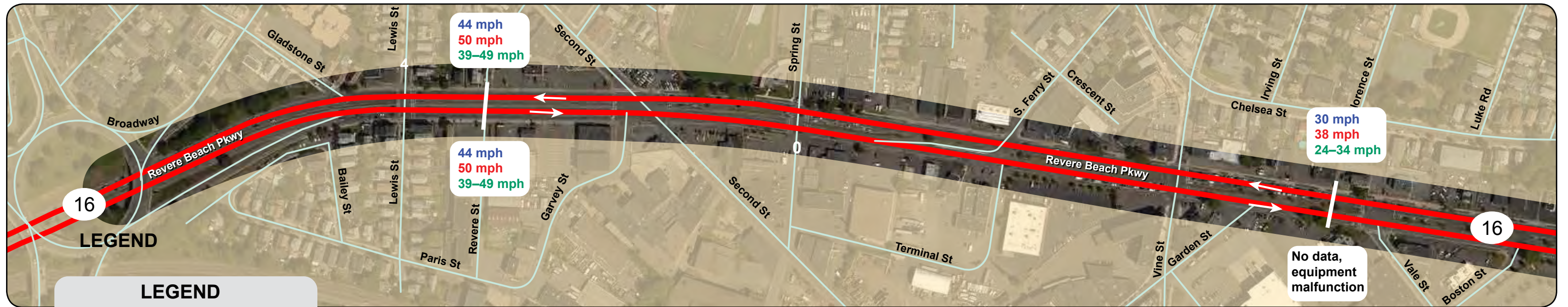
**Figure 10**  
Weekday and Weekend Pedestrian Volumes





**Figure 11**  
Weekday and Weekend Bicycle-on-Road Volumes  
(Excludes Bicycles on Sidewalk)





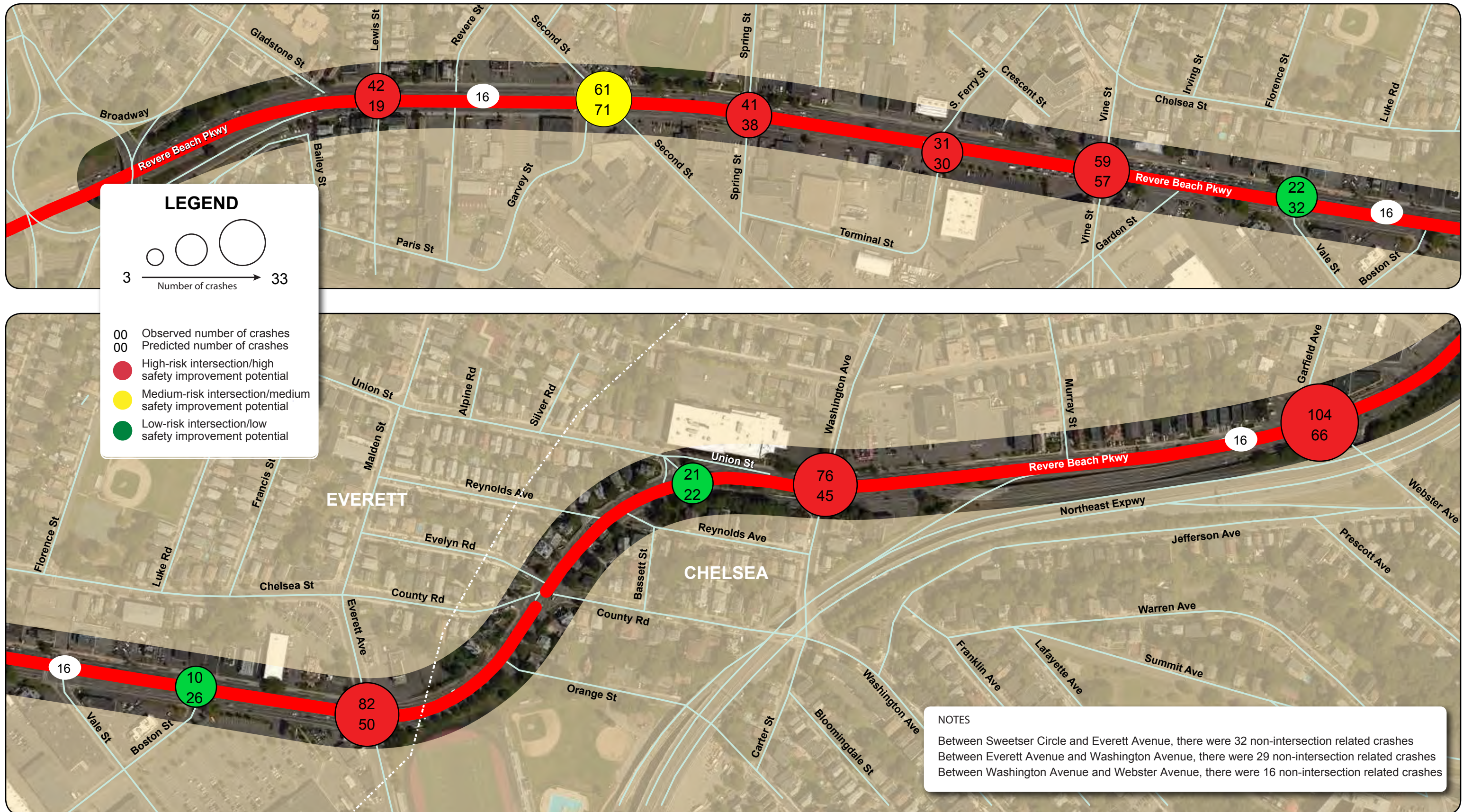
**Figure 12**  
Spot Speeds and Speed index Measurements





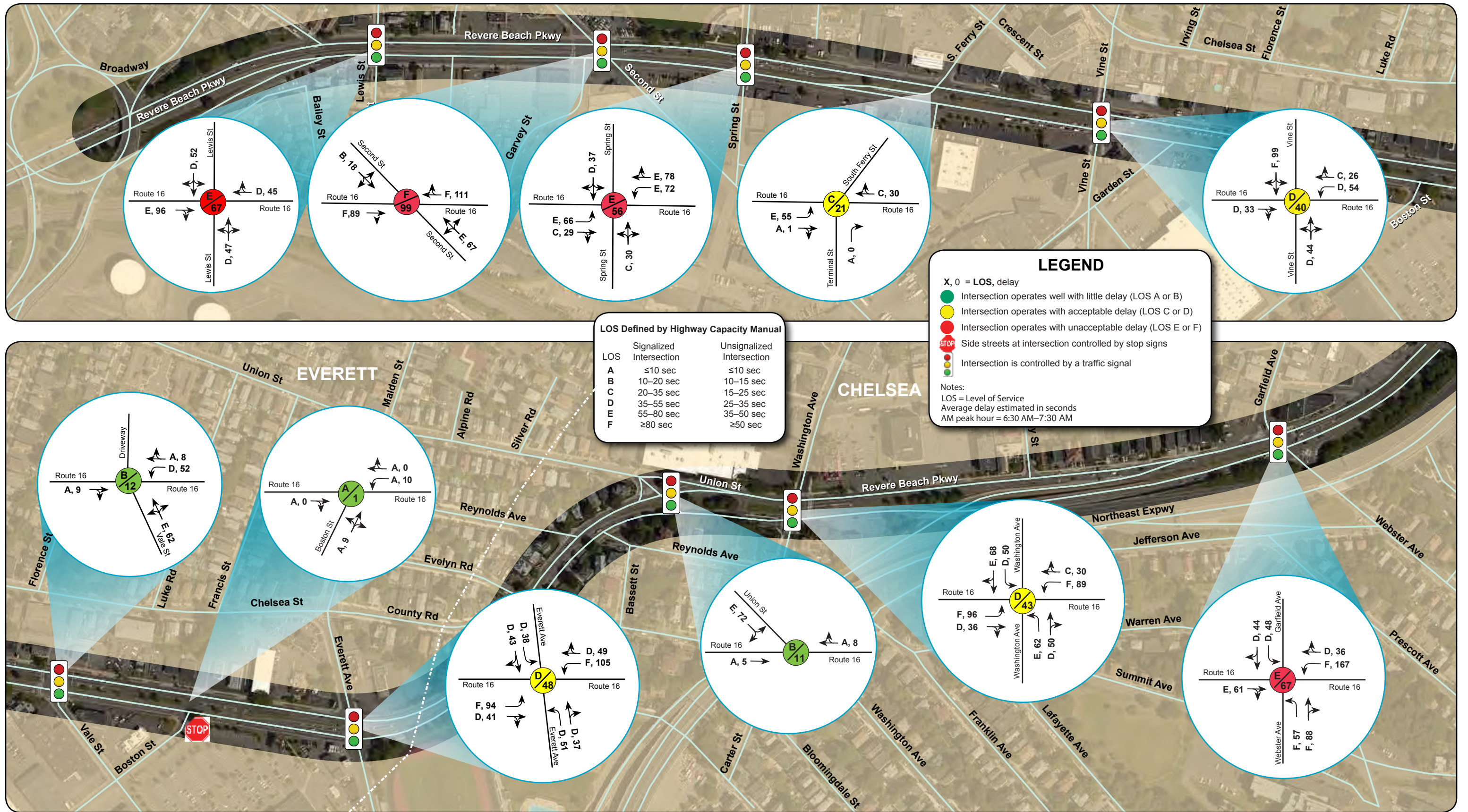
**Figure 13**  
Highway Safety Improvement Program Intersection Crash Clusters





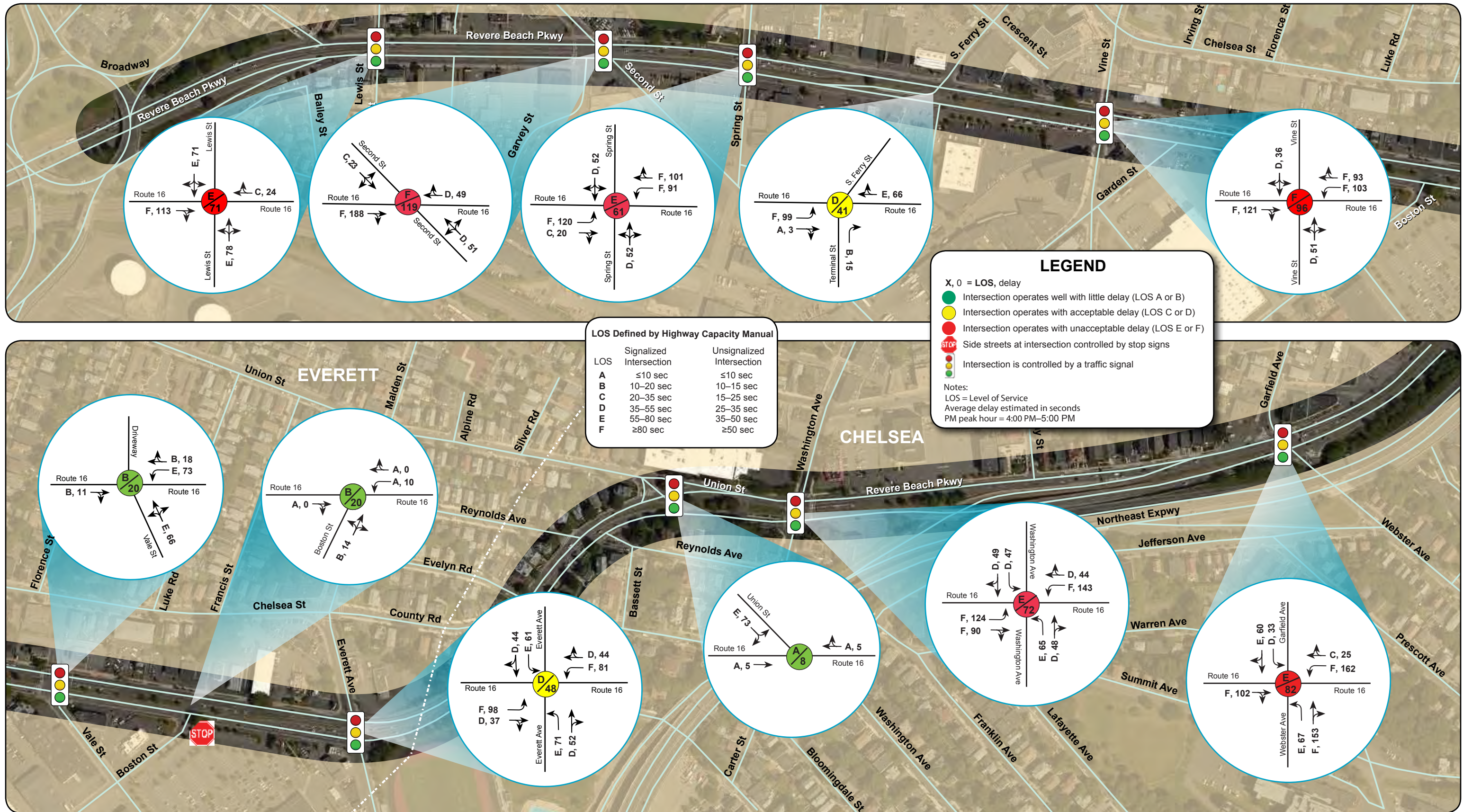
**Figure 14**  
Observed and Predicted Crashes (2012–16) and Safety Improvement Potentials





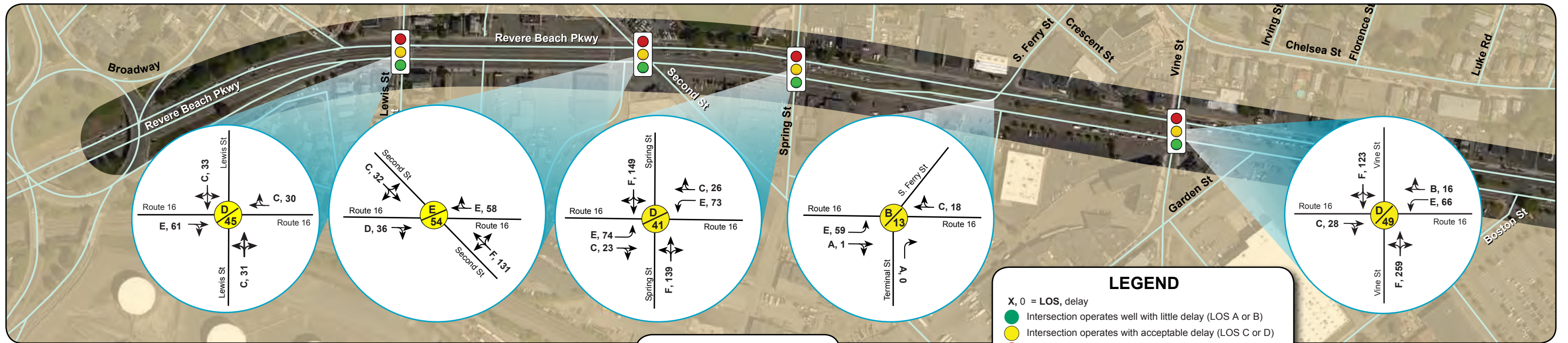
**Figure 15**  
 Weekday AM Peak-Hour Level of Service and Delay





**Figure 16**  
 Weekday PM Peak-Hour Level of Service and Delay





**LOS Defined by Highway Capacity Manual**

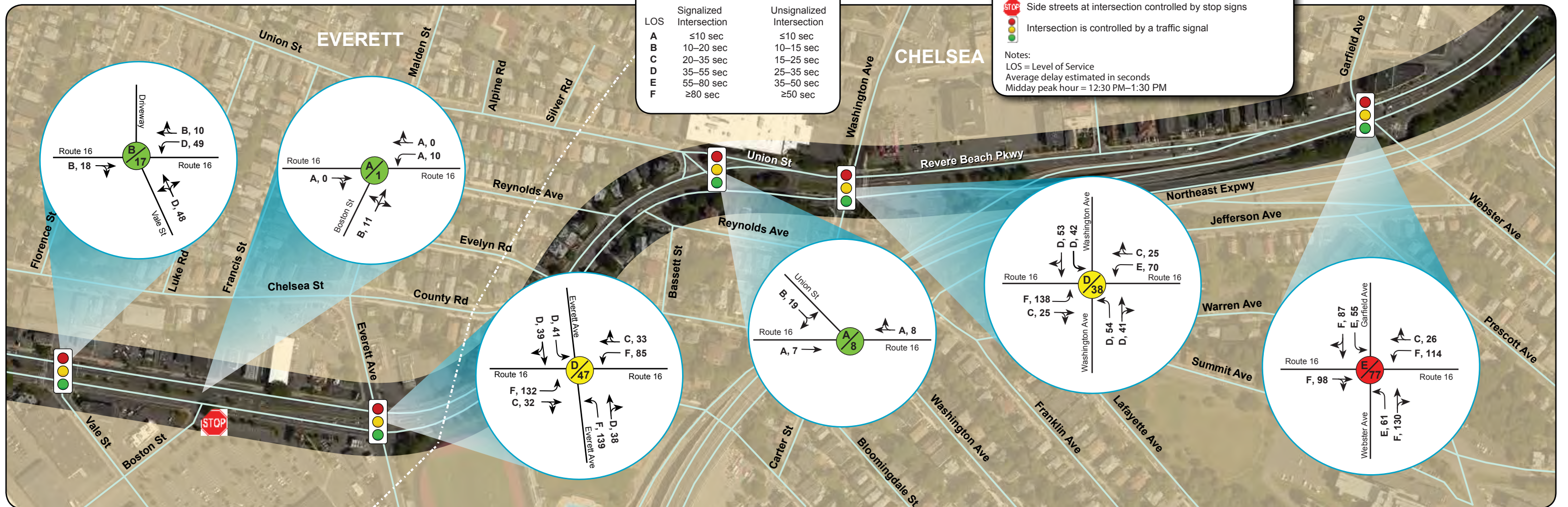
LOS	Signalized Intersection	Unsignalized Intersection
A	≤10 sec	≤10 sec
B	10–20 sec	10–15 sec
C	20–35 sec	15–25 sec
D	35–55 sec	25–35 sec
E	55–80 sec	35–50 sec
F	≥80 sec	≥50 sec

**LEGEND**

X, 0 = LOS, delay

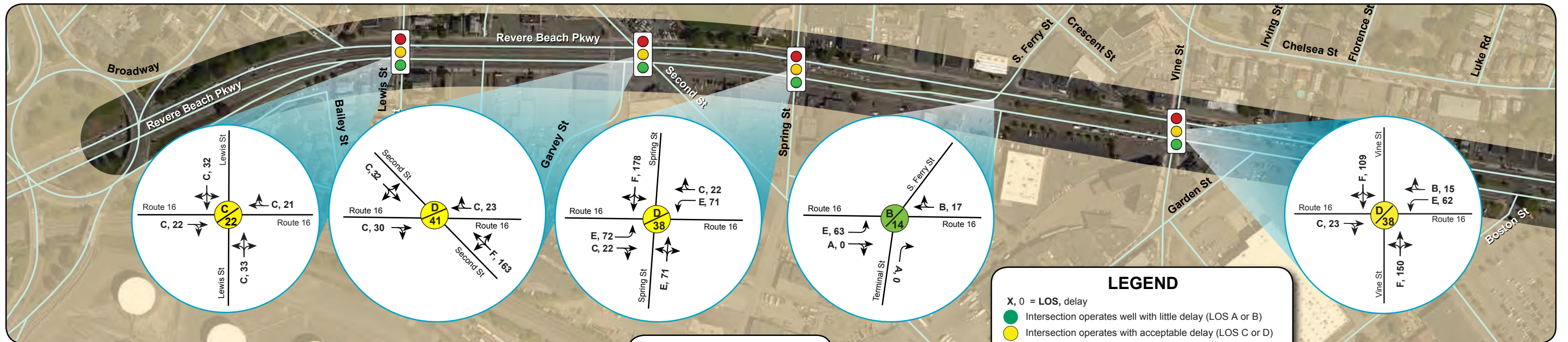
- Green circle: Intersection operates well with little delay (LOS A or B)
- Yellow circle: Intersection operates with acceptable delay (LOS C or D)
- Red circle: Intersection operates with unacceptable delay (LOS E or F)
- Red octagon: Side streets at intersection controlled by stop signs
- Traffic light icon: Intersection is controlled by a traffic signal

Notes:  
 LOS = Level of Service  
 Average delay estimated in seconds  
 Midday peak hour = 12:30 PM–1:30 PM



**Figure 17**  
**Weekend Saturday Midday Peak-Hour Level of Service and Delay**





### LEGEND

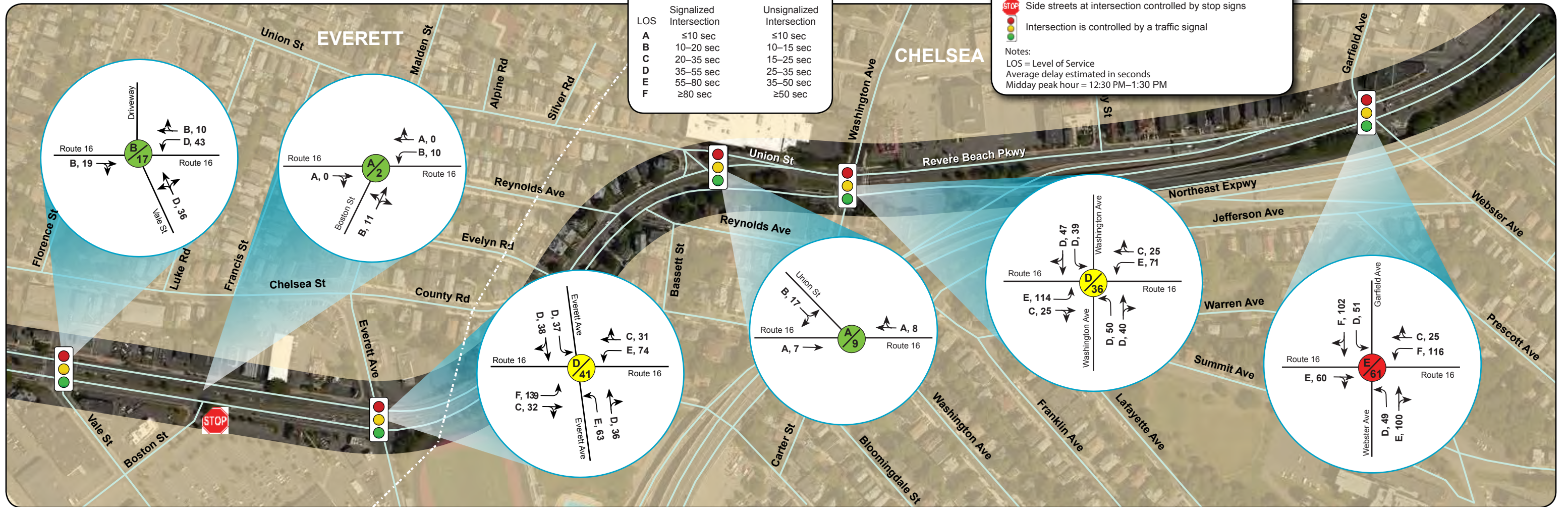
X, 0 = LOS, delay

- Intersection operates well with little delay (LOS A or B)
- Intersection operates with acceptable delay (LOS C or D)
- Intersection operates with unacceptable delay (LOS E or F)
- Side streets at intersection controlled by stop signs
- Intersection is controlled by a traffic signal

Notes:  
 LOS = Level of Service  
 Average delay estimated in seconds  
 Midday peak hour = 12:30 PM–1:30 PM

#### LOS Defined by Highway Capacity Manual

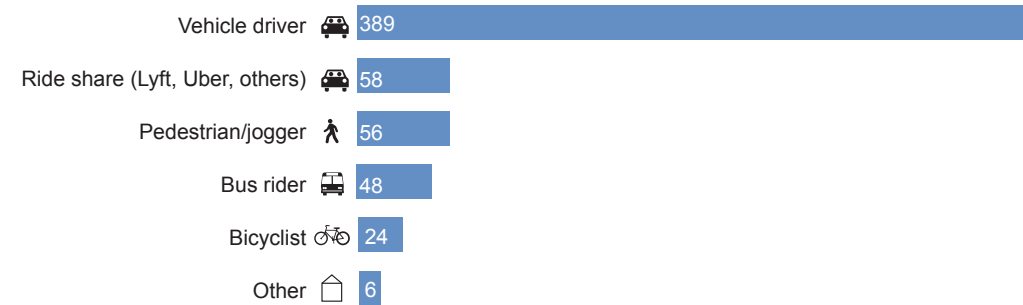
LOS	Signalized Intersection	Unsignalized Intersection
A	≤10 sec	≤10 sec
B	10–20 sec	10–15 sec
C	20–35 sec	15–25 sec
D	35–55 sec	25–35 sec
E	55–80 sec	35–50 sec
F	≥80 sec	≥50 sec



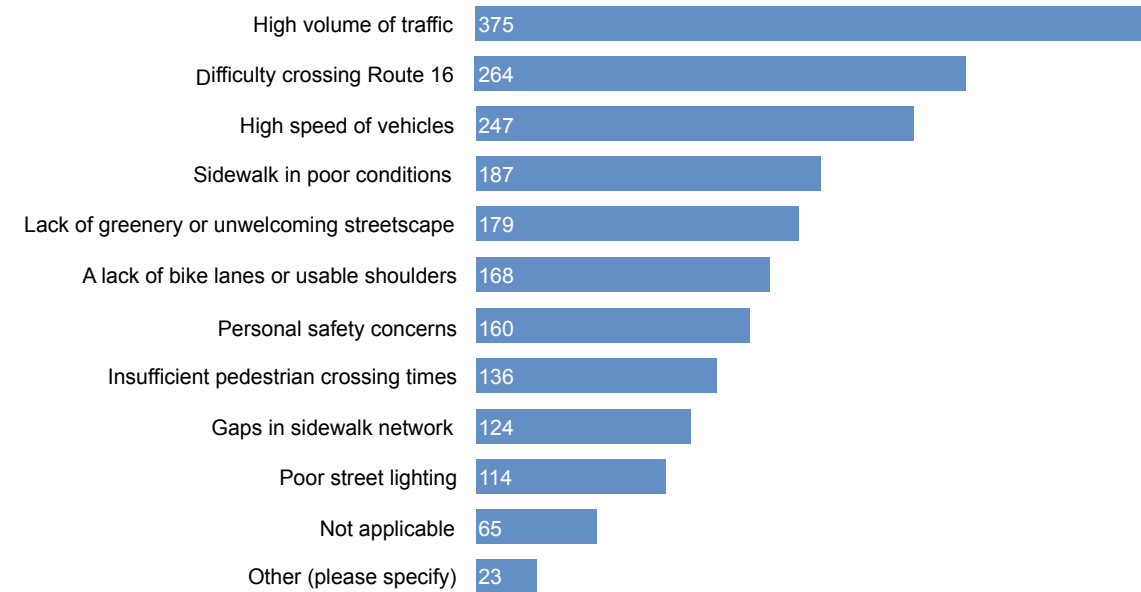
**Figure 18**  
**Weekend Sunday Midday Peak-Hour Level of Service and Delay**



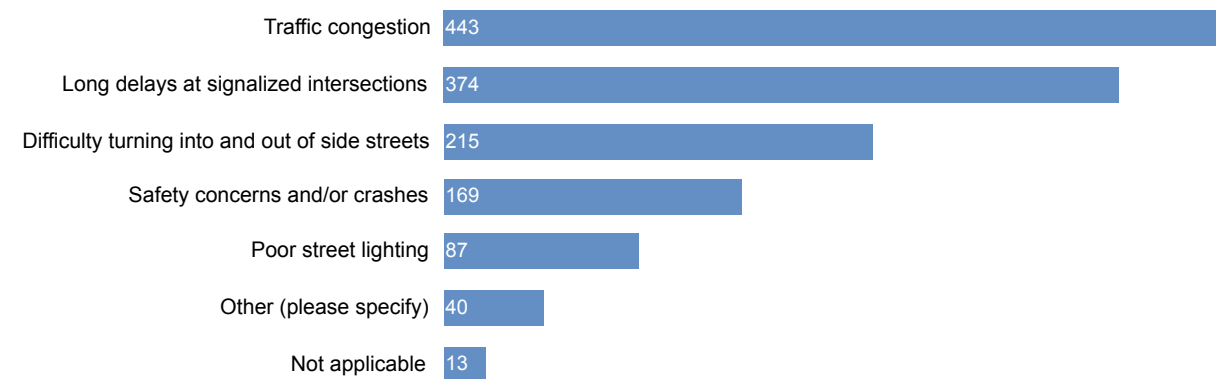
**1. How do you typically use Route 16? Are you a:**



**2. Please indicate any problems that you encounter or that keep you from bicycling or walking along Route 16?**



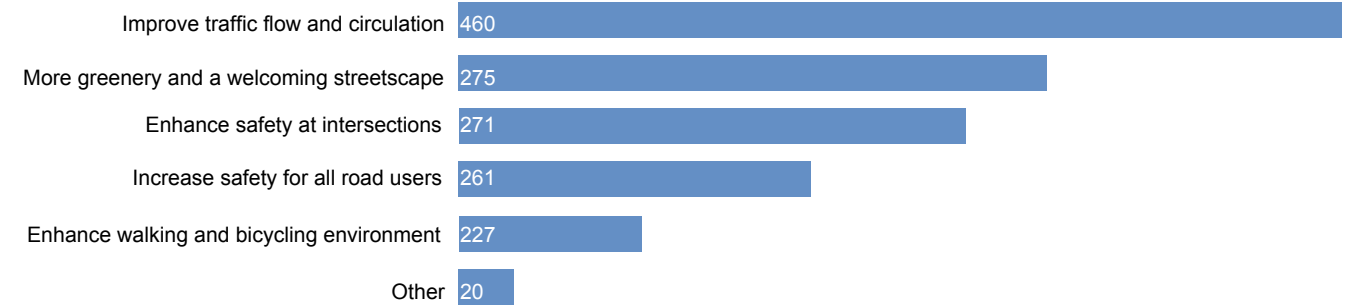
**3. While driving on Route 16, what problems do you encounter?**



**4. Described the safety and operations problems that you would like to see addressed.**

- Lack of maintenance
- Poor pavement conditions and worn-out markings
- Lots of trash along the roadway and unwelcoming environment
- Outdated signal equipment (not MUTCD compliant)
- Poor drainage and flooding conditions
- Blocked intersections and running red lights create safety problems for pedestrians
- Unsafe conditions for students crossing Route 16 at Lewis Street and Everett Avenue
- Conflicts between left-turns and opposing left-turns/through traffic
- Few posted speed limits and lack of police patrol

**5. Indicate any traffic operational improvements you would like to see implemented in the Route 16 corridor.**



**6. Described the improvements that you would like to see implemented in the Route 16 corridor.**

- Routine maintenance and trash/litter pick up
- Good drainage systems to reduce flooding in corridor
- Good pavement conditions and high-visibility markings
- Continuous and connected sidewalk
- Upgraded signal equipment (MUTCD compliant)
- Bus service along Route 16 in Chelsea and Everett
- More state police patrol and enforcement to reduce running red light, speeding, and blocking intersection
- Better signage and wayfinding information
- Longer left-turn storage lanes
- Better left-turn signal indications to reduce conflicts between left-turns and opposing left-turn and through traffic
- More posted speed limit signs to guide drivers



# LEGEND

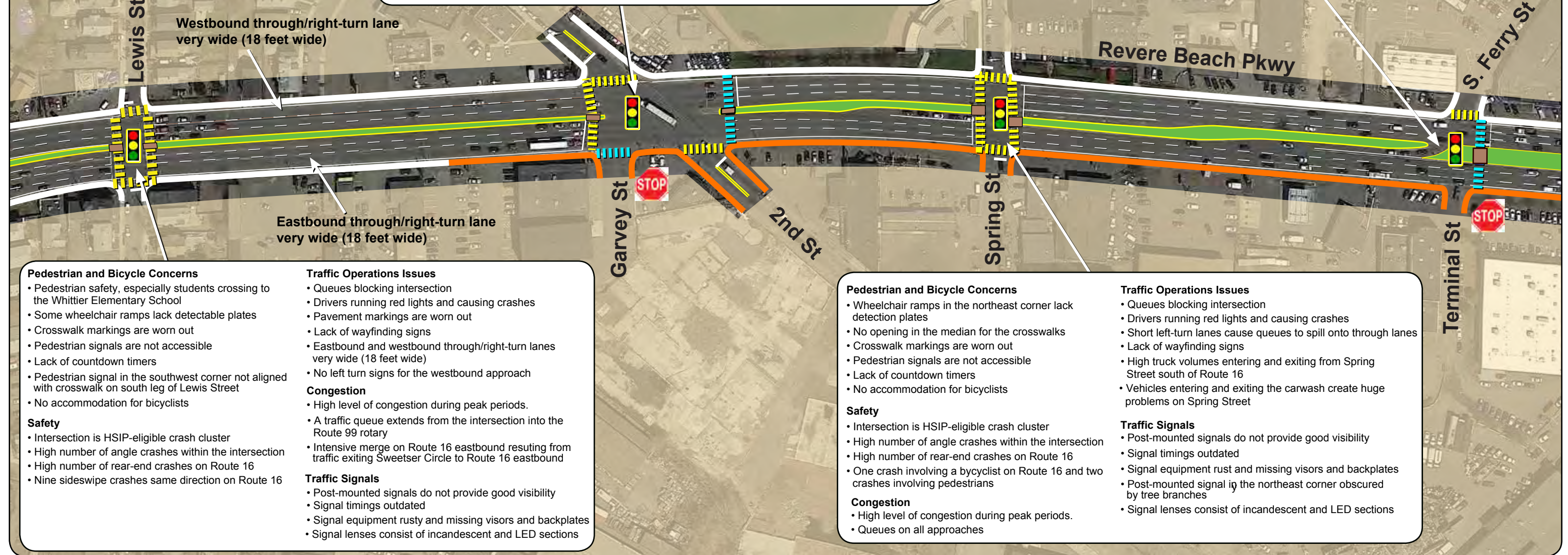
- Narrow crosswalk median opening
  - No crosswalk
  - Sidewalk with surface defects and structural problems
  - Sidewalk in good condition
  - Roadway median
- LED = light-emitting diode  
HSIP = Highway Safety Improvement Program

- Pedestrian and Bicycle Concerns**
- Some wheelchair ramps lack detectable plates
  - Crosswalk markings are worn out
  - Pedestrian signal are not accessible
  - Lack of countdown timers
  - No crosswalk on the east leg of Route 16
  - No accommodation for bicyclists
- Safety**
- Intersection is on the list of 2013–15 Top 200 high-crash intersections in Massachusetts
  - Intersection is HSIP-eligible crash cluster
  - High number of angle crashes within the intersection
  - High number of rear-end crashes
  - Six crashes involving permitted left-turns on Second Street
  - One crash involving a bicyclist in crosswalk
- Congestion**
- High level of congestion during peak periods.
  - Queues on all approaches and blocking intersection

- Traffic Operations Issues**
- Northbound left turns need an exclusive left-turn lane
  - Drivers running red lights and causing crashes
  - Pavement markings are worn out
  - Lack of wayfinding signs
  - Garvey Street is unsignalized within the intersection
  - Northbound right turns needs No Turn on Red sign
  - High truck volumes entering and exiting from Second Street south of the intersection
  - Vehicles entering and exiting car wash create safety and operations problems
  - Eastbound and westbound through/right-turn lanes very wide (18 feet wide).
- Traffic Signals**
- Post-mounted signals do not provide good visibility
  - Signal timings outdated
  - Signal equipment rusty and missing visors and backplates
  - Signal lenses consist of incandescent and LED sections

- Pedestrian and Bicycle Concerns**
- Wheelchair ramps on South Ferry and Terminal Street lacks detectable plates
  - Crosswalk on South Ferry Street not signalized
  - No crosswalk on Route 16
  - Crosswalk markings are worn out
  - No accommodation for bicyclists
- Safety**
- High number of angle crashes within the intersection
  - High number of rear-end crashes on Route 16
  - One crash each involving a pedestrian and a bicyclist
  - Three crashes hitting an object in the gore of the left turn lane

- Traffic Operations Issues**
- Terminal Street is unsignalized within the intersection
  - Drivers running red lights and causing crashes
  - Drivers turning left from the leftmost through lane
  - Westbound traffic often blocks the intersection preventing left-turns from entering the intersection on green light
  - Pavement markings are worn out
  - Lack of wayfinding signs
- Traffic Signals**
- Post-mounted signals do not provide good visibility
  - Signal timings outdated
  - Signal equipment rusty and missing visors and backplates
  - Signal lenses consist of incandescent and LED sections



- Pedestrian and Bicycle Concerns**
- Pedestrian safety, especially students crossing to the Whittier Elementary School
  - Some wheelchair ramps lack detectable plates
  - Crosswalk markings are worn out
  - Pedestrian signals are not accessible
  - Lack of countdown timers
  - Pedestrian signal in the southwest corner not aligned with crosswalk on south leg of Lewis Street
  - No accommodation for bicyclists
- Safety**
- Intersection is HSIP-eligible crash cluster
  - High number of angle crashes within the intersection
  - High number of rear-end crashes on Route 16
  - Nine sideswipe crashes same direction on Route 16

- Traffic Operations Issues**
- Queues blocking intersection
  - Drivers running red lights and causing crashes
  - Pavement markings are worn out
  - Lack of wayfinding signs
  - Eastbound and westbound through/right-turn lanes very wide (18 feet wide)
  - No left turn signs for the westbound approach
- Congestion**
- High level of congestion during peak periods.
  - A traffic queue extends from the intersection into the Route 99 rotary
  - Intensive merge on Route 16 eastbound resulting from traffic exiting Sweetser Circle to Route 16 eastbound
- Traffic Signals**
- Post-mounted signals do not provide good visibility
  - Signal timings outdated
  - Signal equipment rusty and missing visors and backplates
  - Signal lenses consist of incandescent and LED sections

- Pedestrian and Bicycle Concerns**
- Wheelchair ramps in the northeast corner lack detection plates
  - No opening in the median for the crosswalks
  - Crosswalk markings are worn out
  - Pedestrian signals are not accessible
  - Lack of countdown timers
  - No accommodation for bicyclists
- Safety**
- Intersection is HSIP-eligible crash cluster
  - High number of angle crashes within the intersection
  - High number of rear-end crashes on Route 16
  - One crash involving a bicyclist on Route 16 and two crashes involving pedestrians
- Congestion**
- High level of congestion during peak periods.
  - Queues on all approaches

- Traffic Operations Issues**
- Queues blocking intersection
  - Drivers running red lights and causing crashes
  - Short left-turn lanes cause queues to spill onto through lanes
  - Lack of wayfinding signs
  - High truck volumes entering and exiting from Spring Street south of Route 16
  - Vehicles entering and exiting the carwash create huge problems on Spring Street
- Traffic Signals**
- Post-mounted signals do not provide good visibility
  - Signal timings outdated
  - Signal equipment rust and missing visors and backplates
  - Post-mounted signal in the northeast corner obscured by tree branches
  - Signal lenses consist of incandescent and LED sections

**Figure 20**  
**Summary of Problems and Concerns: Lewis Street to South Ferry Street**



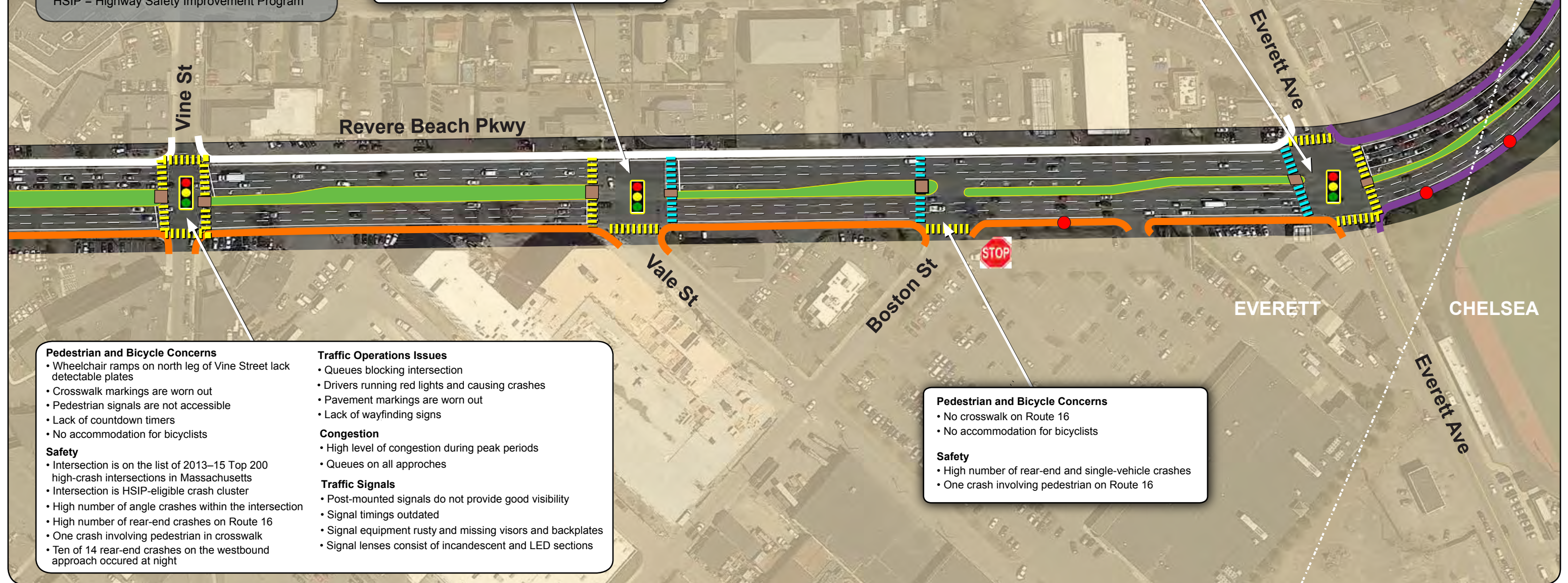
# LEGEND

- Narrow crosswalk median opening
  - No crosswalk
  - Broken or missing light pole
  - Sidewalk with surface defects and structural problems
  - Sidewalk with vegetation outgrowth and debris accumulation
  - Sidewalk in good condition
  - Roadway median
- LED = light-emitting diode  
HSIP = Highway Safety Improvement Program

- Pedestrian and Bicycle Concerns**
- Wheelchair ramps lack detectable plates
  - No crosswalk on the east leg of Route 16
  - No accommodation for bicyclists
- Safety**
- High number of rear-end crashes on Route 16
  - One pedestrian crash in crosswalk on Vale Street
- Congestion**
- Occasional traffic queue on eastbound approach
- Traffic Operations Issues**
- Drivers running red lights and causing crashes
  - Pavement markings are worn out
  - Lack of wayfinding signs
- Traffic Signals**
- Signal timings outdated
  - Signal lenses consist of incandescent and LED sections

- Pedestrian and Bicycle Concerns**
- Some wheelchair ramps lack detectable plates
  - Crosswalk markings are worn out
  - No crosswalk on the west leg of Route 16
  - Pedestrian signals are not accessible
  - Lack of countdown timers
  - No accommodation for bicyclists
- Safety**
- Intersection is on the list of 2013–15 Top 200 high-crash intersections in Massachusetts
  - Intersection is HSIP-eligible crash cluster
  - High number of angle crashes within the intersection
  - High number of rear-end crashes on Route 16
  - Three pedestrian crashes and one bicycle crash on the west leg of Route 16 where there is no crosswalk

- Traffic Operations Issues**
- Queues blocking intersection
  - Drivers running red lights and causing crashes
  - Pavement markings are worn out
  - Lack of wayfinding signs
  - Right turns need No Turn on Red signs
- Congestion**
- High level of congestion during peak periods.
  - Queues on all approaches
- Traffic Signals**
- Post-mounted signals do not provide good visibility
  - Signal timings outdated
  - Signal equipment rusty and missing visors and backplates
  - Signal lenses consist of incandescent and LED sections
  - Conflicts between left turns and opposing traffic



- Pedestrian and Bicycle Concerns**
- Wheelchair ramps on north leg of Vine Street lack detectable plates
  - Crosswalk markings are worn out
  - Pedestrian signals are not accessible
  - Lack of countdown timers
  - No accommodation for bicyclists
- Safety**
- Intersection is on the list of 2013–15 Top 200 high-crash intersections in Massachusetts
  - Intersection is HSIP-eligible crash cluster
  - High number of angle crashes within the intersection
  - High number of rear-end crashes on Route 16
  - One crash involving pedestrian in crosswalk
  - Ten of 14 rear-end crashes on the westbound approach occurred at night

- Traffic Operations Issues**
- Queues blocking intersection
  - Drivers running red lights and causing crashes
  - Pavement markings are worn out
  - Lack of wayfinding signs
- Congestion**
- High level of congestion during peak periods
  - Queues on all approaches
- Traffic Signals**
- Post-mounted signals do not provide good visibility
  - Signal timings outdated
  - Signal equipment rusty and missing visors and backplates
  - Signal lenses consist of incandescent and LED sections

- Pedestrian and Bicycle Concerns**
- No crosswalk on Route 16
  - No accommodation for bicyclists
- Safety**
- High number of rear-end and single-vehicle crashes
  - One crash involving pedestrian on Route 16

**Figure 21**  
**Summary of Problems and Concerns: Vine Street to Everett Avenue**









**Figure 22**  
**Summary of Problems and Concerns: Everett Avenue to Washington Avenue**



# LEGEND

-  Narrow crosswalk median opening
  -  Broken or missing light pole
  -  Sidewalk with surface defects and structural problems
  -  Roadway median
- LED = light-emitting diode.  
 HSIP = Highway Safety Improvement Program

## Pedestrian and Bicycle Concerns

- Median openings lack detectable plates
- Pedestrian signals are not accessible
- Crosswalk markings are worn out
- Lack of countdown timers
- No accommodation for bicyclists

## Safety

- Intersection is on the list of Top 200 high-crash intersections in Massachusetts
- Intersection is HSIP-eligible crash cluster
- High number of angle crashes within the intersection
- High number of rear-end crashes on Route 16
- Two pedestrian crashes and one bicycle crash
- Sixteen crashes involving northbound and southbound permitted left turns
- Seven sideswipes involving vehicles changing lanes to get into the westbound left turn lane

## Congestion

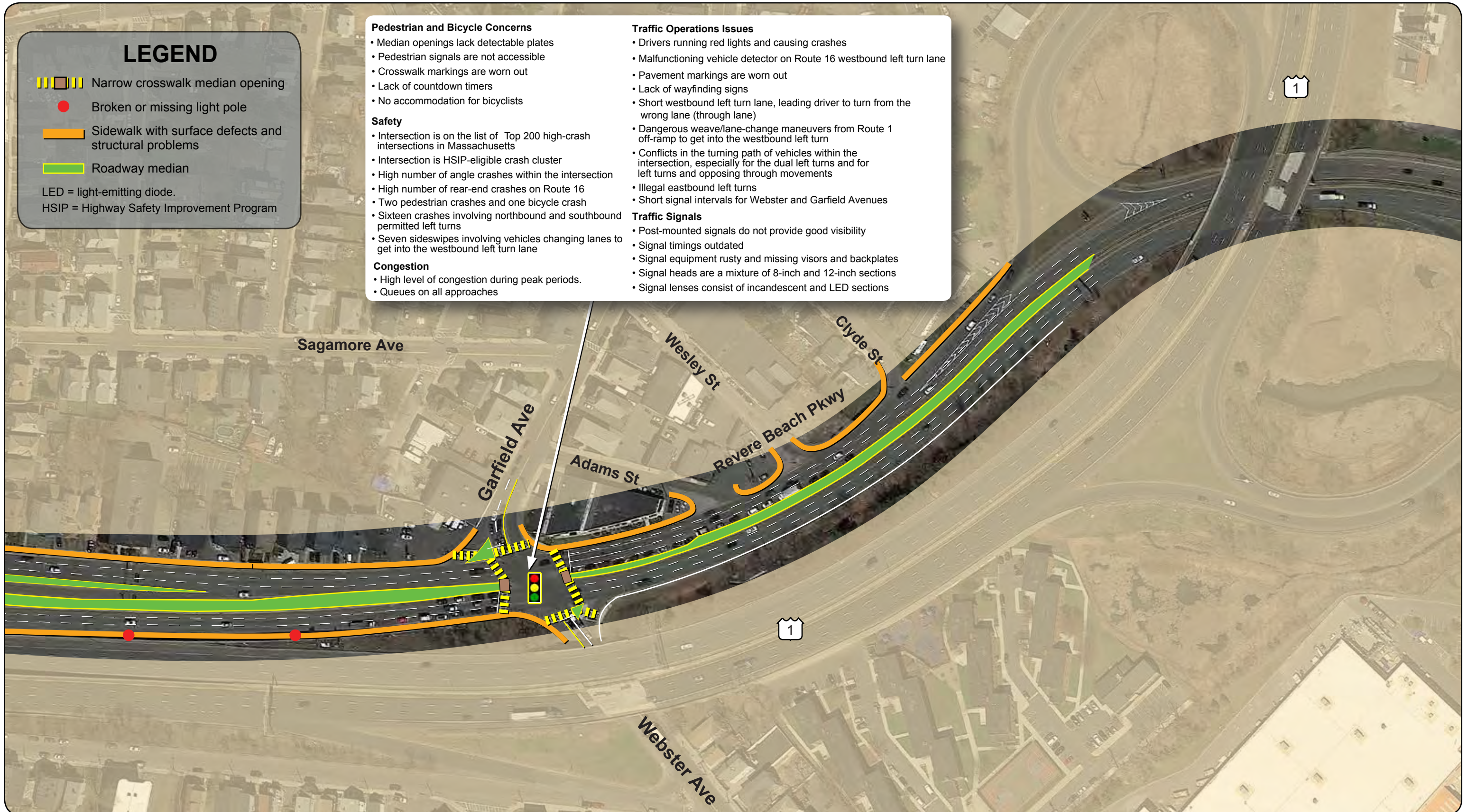
- High level of congestion during peak periods.
- Queues on all approaches

## Traffic Operations Issues

- Drivers running red lights and causing crashes
- Malfunctioning vehicle detector on Route 16 westbound left turn lane
- Pavement markings are worn out
- Lack of wayfinding signs
- Short westbound left turn lane, leading driver to turn from the wrong lane (through lane)
- Dangerous weave/lane-change maneuvers from Route 1 off-ramp to get into the westbound left turn
- Conflicts in the turning path of vehicles within the intersection, especially for the dual left turns and for left turns and opposing movements
- Illegal eastbound left turns
- Short signal intervals for Webster and Garfield Avenues

## Traffic Signals









- Post-mounted signals do not provide good visibility
- Signal timings outdated
- Signal equipment rusty and missing visors and backplates
- Signal heads are a mixture of 8-inch and 12-inch sections
- Signal lenses consist of incandescent and LED sections



**Figure 23**  
**Summary of Problems and Concerns: Washington Avenue to Route 1**

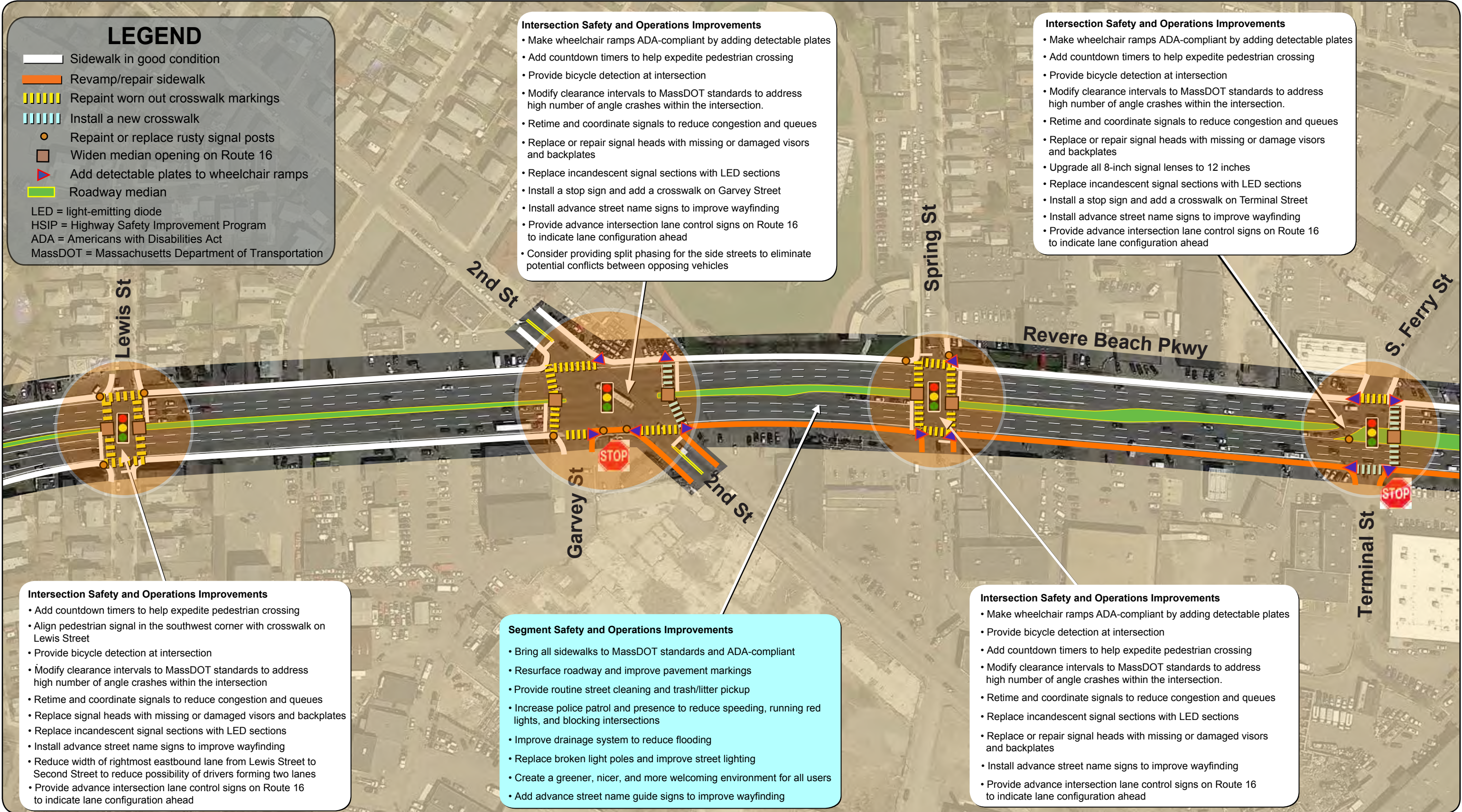


# LEGEND

-  Sidewalk in good condition
  -  Revamp/repair sidewalk
  -  Repaint worn out crosswalk markings
  -  Install a new crosswalk
  -  Repaint or replace rusty signal posts
  -  Widen median opening on Route 16
  -  Add detectable plates to wheelchair ramps
  -  Roadway median
- LED = light-emitting diode  
 HSIP = Highway Safety Improvement Program  
 ADA = Americans with Disabilities Act  
 MassDOT = Massachusetts Department of Transportation

- Intersection Safety and Operations Improvements**
- Make wheelchair ramps ADA-compliant by adding detectable plates
  - Add countdown timers to help expedite pedestrian crossing
  - Provide bicycle detection at intersection
  - Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection.
  - Retime and coordinate signals to reduce congestion and queues
  - Replace or repair signal heads with missing or damaged visors and backplates
  - Replace incandescent signal sections with LED sections
  - Install a stop sign and add a crosswalk on Garvey Street
  - Install advance street name signs to improve wayfinding
  - Provide advance intersection lane control signs on Route 16 to indicate lane configuration ahead
  - Consider providing split phasing for the side streets to eliminate potential conflicts between opposing vehicles

- Intersection Safety and Operations Improvements**
- Make wheelchair ramps ADA-compliant by adding detectable plates
  - Add countdown timers to help expedite pedestrian crossing
  - Provide bicycle detection at intersection
  - Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection.
  - Retime and coordinate signals to reduce congestion and queues
  - Replace or repair signal heads with missing or damage visors and backplates
  - Upgrade all 8-inch signal lenses to 12 inches
  - Replace incandescent signal sections with LED sections
  - Install a stop sign and add a crosswalk on Terminal Street
  - Install advance street name signs to improve wayfinding
  - Provide advance intersection lane control signs on Route 16 to indicate lane configuration ahead



- Intersection Safety and Operations Improvements**
- Add countdown timers to help expedite pedestrian crossing
  - Align pedestrian signal in the southwest corner with crosswalk on Lewis Street
  - Provide bicycle detection at intersection
  - Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection
  - Retime and coordinate signals to reduce congestion and queues
  - Replace signal heads with missing or damaged visors and backplates
  - Replace incandescent signal sections with LED sections
  - Install advance street name signs to improve wayfinding
  - Reduce width of rightmost eastbound lane from Lewis Street to Second Street to reduce possibility of drivers forming two lanes
  - Provide advance intersection lane control signs on Route 16 to indicate lane configuration ahead

- Segment Safety and Operations Improvements**
- Bring all sidewalks to MassDOT standards and ADA-compliant
  - Resurface roadway and improve pavement markings
  - Provide routine street cleaning and trash/litter pickup
  - Increase police patrol and presence to reduce speeding, running red lights, and blocking intersections
  - Improve drainage system to reduce flooding
  - Replace broken light poles and improve street lighting
  - Create a greener, nicer, and more welcoming environment for all users
  - Add advance street name guide signs to improve wayfinding










- Intersection Safety and Operations Improvements**
- Make wheelchair ramps ADA-compliant by adding detectable plates
  - Provide bicycle detection at intersection
  - Add countdown timers to help expedite pedestrian crossing
  - Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection.
  - Retime and coordinate signals to reduce congestion and queues
  - Replace incandescent signal sections with LED sections
  - Replace or repair signal heads with missing or damaged visors and backplates
  - Install advance street name signs to improve wayfinding
  - Provide advance intersection lane control signs on Route 16 to indicate lane configuration ahead



**Figure 24**  
**Short- and Medium-Term Improvements: Lewis Street to South Ferry/Terminal Streets**



# LEGEND

-  Sidewalk in good condition
  -  Revamp/repair sidewalk
  -  Repaint worn out crosswalk markings
  -  Install a crosswalk
  -  Repaint or replace rusty signal posts
  -  Widen median opening on Route 16
  -  Add detectable plates to wheelchair ramps
  -  Replace broken street light
  -  Roadway median
- LED = light-emitting diode  
 HSIP = Highway Safety Improvement Program  
 ADA = Americans with Disabilities Act  
 MassDOT = Massachusetts Department of Transportation

- ### Intersection Safety and Operations Improvements
- Make wheelchair ramps ADA-compliant by adding detectable plates
  - Add countdown timers to help expedite pedestrian crossing
  - Provide bicycle detection at intersection
  - Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection
  - Retime and coordinate signals to reduce congestion and queue
  - Replace incandescent signal sections with LED sections
  - Replace signal heads with missing or damaged visors and backplates
  - Install advance street name signs to improve wayfinding
  - Provide advance intersection lane control signs to indicate lane configuration ahead

- ### Intersection Safety and Operations Improvements
- Make wheelchair ramps ADA-compliant by adding detectable plates
  - Add countdown timers to help expedite pedestrian crossing
  - Provide bicycle detection at intersection
  - Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection
  - Retime and coordinate signals to reduce congestion and queues
  - Consider providing split phasing for the side streets to eliminate potential conflicts between opposing vehicles
  - Replace signal heads with missing or damaged visors and backplates
  - Upgrade all 8-inch signal lenses to 12 inches
  - Replace incandescent signal sections with LED sections
  - Install advance street name signs to improve wayfinding
  - Provide advance intersection lane control signs on all approaches to indicate lane configuration ahead

- ### Intersection Safety and Operations Improvements
- Make wheelchair ramps ADA-compliant by adding detectable plates
  - Add countdown timers to help expedite pedestrian crossing
  - Install pedestrian signals for the crosswalks on the west leg of Route 16 and for the crosswalks on Vine Street
  - Provide bicycle detection at intersection
  - Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection
  - Retime and coordinate signals to reduce congestion and queues
  - Replace signal heads with missing or damaged visors and backplates
  - Upgrade all 8-inch signal and pedestrian lenses to 12 inches
  - Replace incandescent signal sections with LED sections
  - Install street name signs to improve wayfinding
  - Install advance street name signs to improve wayfinding
  - Consider providing split phasing for the side streets to eliminate conflicts

- ### Segment Safety and Operations Improvements
- Bring all sidewalks to MassDOT standards and ADA-compliant
  - Resurface roadway and improve pavement markings
  - Provide routine street cleaning and trash/litter pickup
  - Increase police patrol and presence to reduce speeding, running red lights, and blocking intersections
  - Improve drainage system to reduce flooding
  - Replace broken light poles and improve street lighting
  - Create a greener, nicer, and more welcoming environment for all users
  - Add advance street name guide signs to improve wayfinding










Provide pavement markings to formalize the northbound and southbound exclusive left-turn and through/right-turn lanes



**Figure 25**  
**Short- and Medium-Term Improvements: Vine Street to Everett Avenue**



# LEGEND

-  Sidewalk in good condition
  -  Revamp/repair sidewalk
  -  Repaint worn out crosswalk markings
  -  Install a crosswalk
  -  Repaint or replace rusty signal posts
  -  Widen median opening on Route 16
  -  Add detectable plates to wheelchair ramps
  -  Replace broken street light
  -  Roadway median
- LED = light-emitting diode  
 ADA = Americans with Disabilities Act  
 MassDOT = Massachusetts Department of Transportation

- Segment Safety and Operations Improvements**
- Bring all sidewalks to MassDOT standards and ADA-compliant
  - Resurface roadway and improve pavement markings
  - Provide routine street cleaning and trash/litter pickup
  - Increase police patrol and presence to reduce speeding, running red lights, and blocking intersections
  - Improve drainage system to reduce flooding
  - Replace broken light poles and improve street lighting
  - Create a greener, nicer, and more welcoming environment for all users
  - Add advance street name guide signs to improve wayfinding

- Intersection Safety and Operations Improvements**
- Make wheelchair ramps ADA-compliant by adding detectable plates
  - Put crosswalk on Union Street under signal control
  - Install a crosswalk on the west leg of Route 16
  - Open guardrail in the northwest corner to provide access to proposed crosswalks on Route 16
  - Provide bicycle detection at intersection
  - Add countdown timers to help expedite pedestrian crossing
  - Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection
  - Retime and coordinate signals to reduce congestion and queues
  - Replace signal heads with missing or damaged visors and backplates
  - Replace incandescent signal sections with LED sections
  - Install advance street name signs to improve wayfinding
  - Provide advance intersection lane control signs on all approaches to indicate lane configuration ahead







- Intersection Safety and Operations Improvements**
- Retime and coordinate signals to reduce congestion and queues
  - Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection.
  - Consider providing split phasing for the side streets to eliminate potential conflicts between opposing vehicles
  - Provide bicycle detection along Route 16 and Washington Avenue
  - Install advance street name signs to improve wayfinding
  - Provide advance intersection lane-control signs on all approaches to indicate lane configuration ahead



**Figure 26**  
**Short- and Medium-Term Improvements: Everett Avenue to Washington Avenue**



# LEGEND

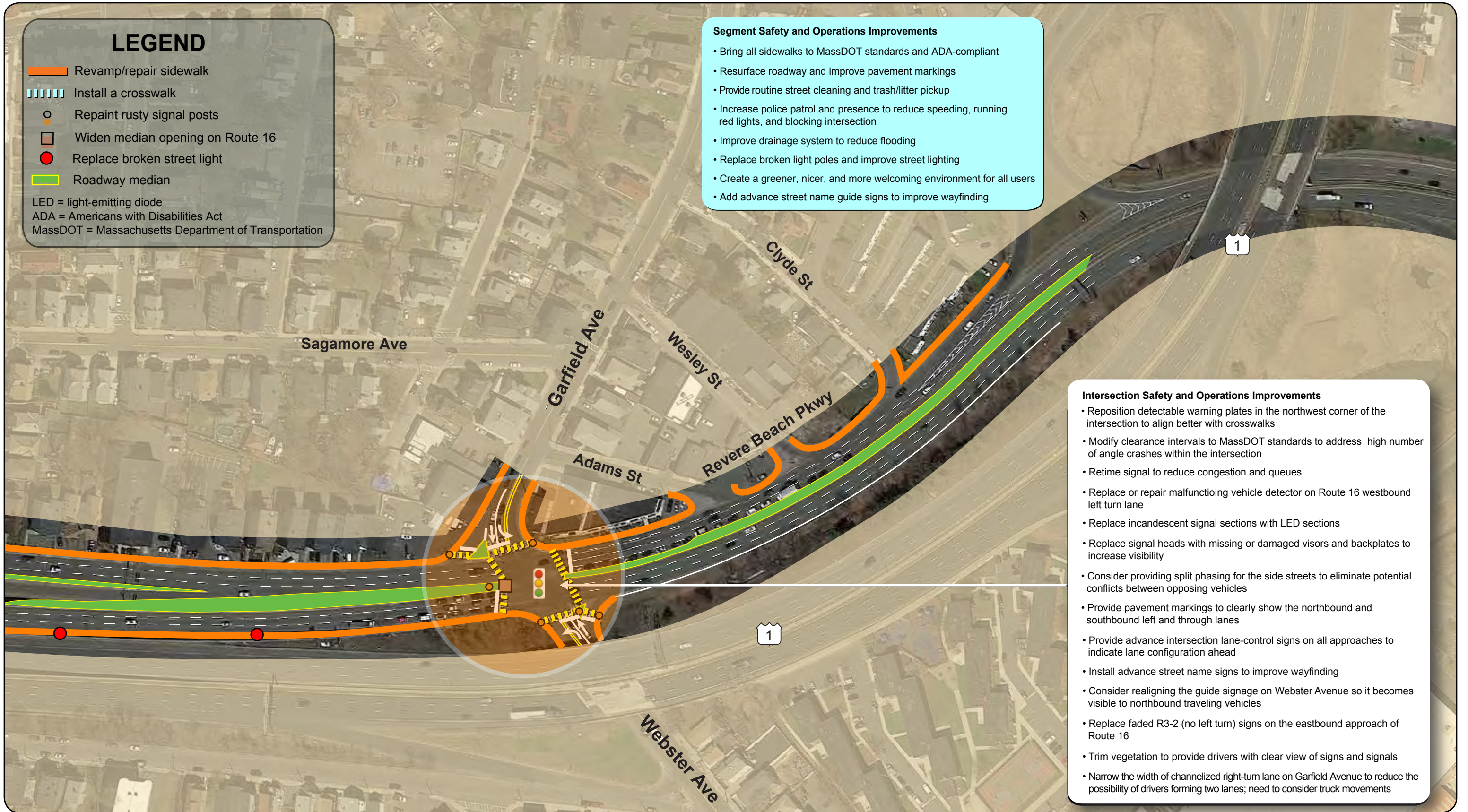
-  Revamp/repair sidewalk
  -  Install a crosswalk
  -  Repaint rusty signal posts
  -  Widen median opening on Route 16
  -  Replace broken street light
  -  Roadway median
- LED = light-emitting diode  
 ADA = Americans with Disabilities Act  
 MassDOT = Massachusetts Department of Transportation

## Segment Safety and Operations Improvements

- Bring all sidewalks to MassDOT standards and ADA-compliant
- Resurface roadway and improve pavement markings
- Provide routine street cleaning and trash/litter pickup
- Increase police patrol and presence to reduce speeding, running red lights, and blocking intersection
- Improve drainage system to reduce flooding
- Replace broken light poles and improve street lighting
- Create a greener, nicer, and more welcoming environment for all users
- Add advance street name guide signs to improve wayfinding

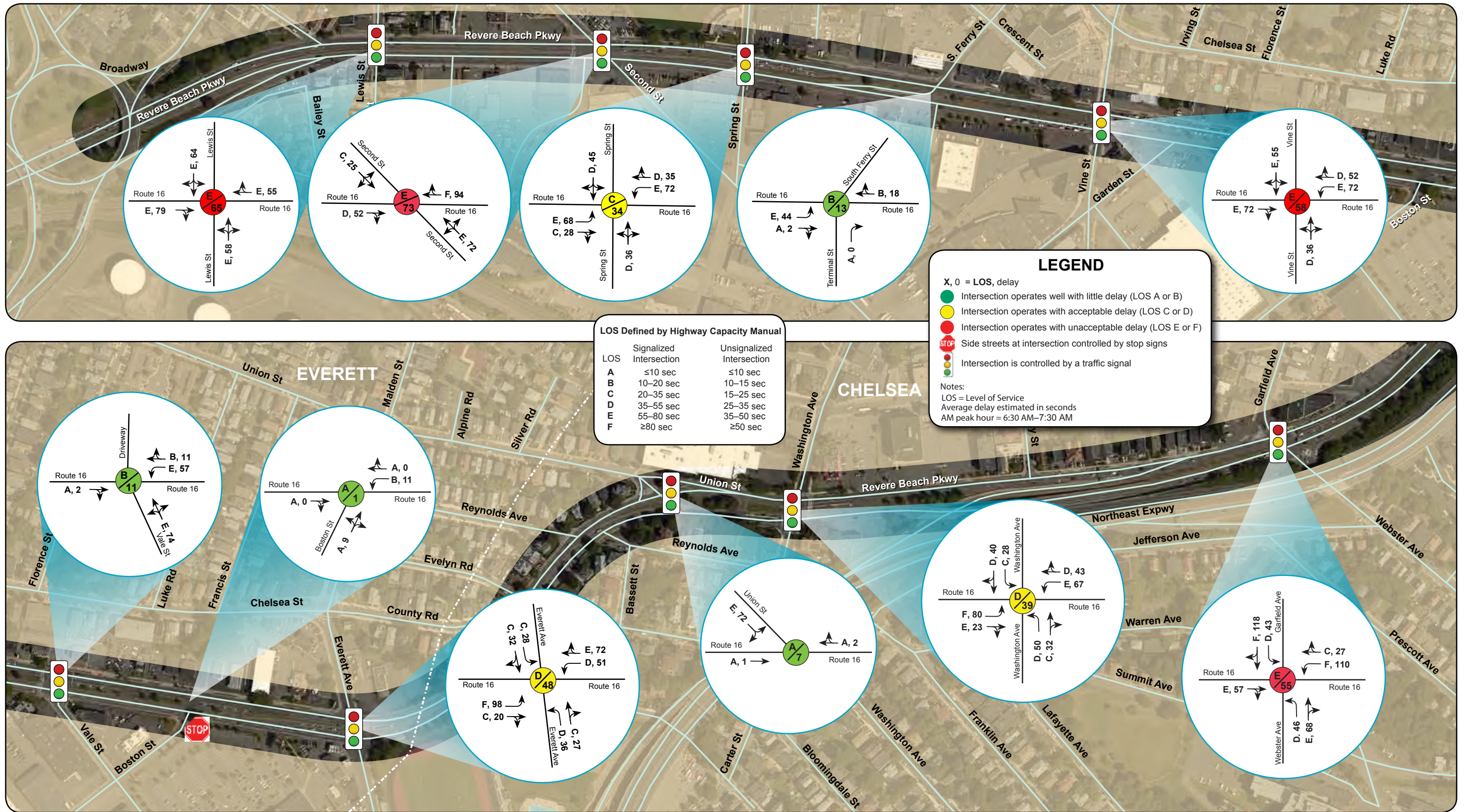
## Intersection Safety and Operations Improvements

- Reposition detectable warning plates in the northwest corner of the intersection to align better with crosswalks
- Modify clearance intervals to MassDOT standards to address high number of angle crashes within the intersection
- Retime signal to reduce congestion and queues
- Replace or repair malfunctioning vehicle detector on Route 16 westbound left turn lane
- Replace incandescent signal sections with LED sections
- Replace signal heads with missing or damaged visors and backplates to increase visibility
- Consider providing split phasing for the side streets to eliminate potential conflicts between opposing vehicles
- Provide pavement markings to clearly show the northbound and southbound left and through lanes
- Provide advance intersection lane-control signs on all approaches to indicate lane configuration ahead
- Install advance street name signs to improve wayfinding
- Consider realigning the guide signage on Webster Avenue so it becomes visible to northbound traveling vehicles
- Replace faded R3-2 (no left turn) signs on the eastbound approach of Route 16
- Trim vegetation to provide drivers with clear view of signs and signals
- Narrow the width of channelized right-turn lane on Garfield Avenue to reduce the possibility of drivers forming two lanes; need to consider truck movements



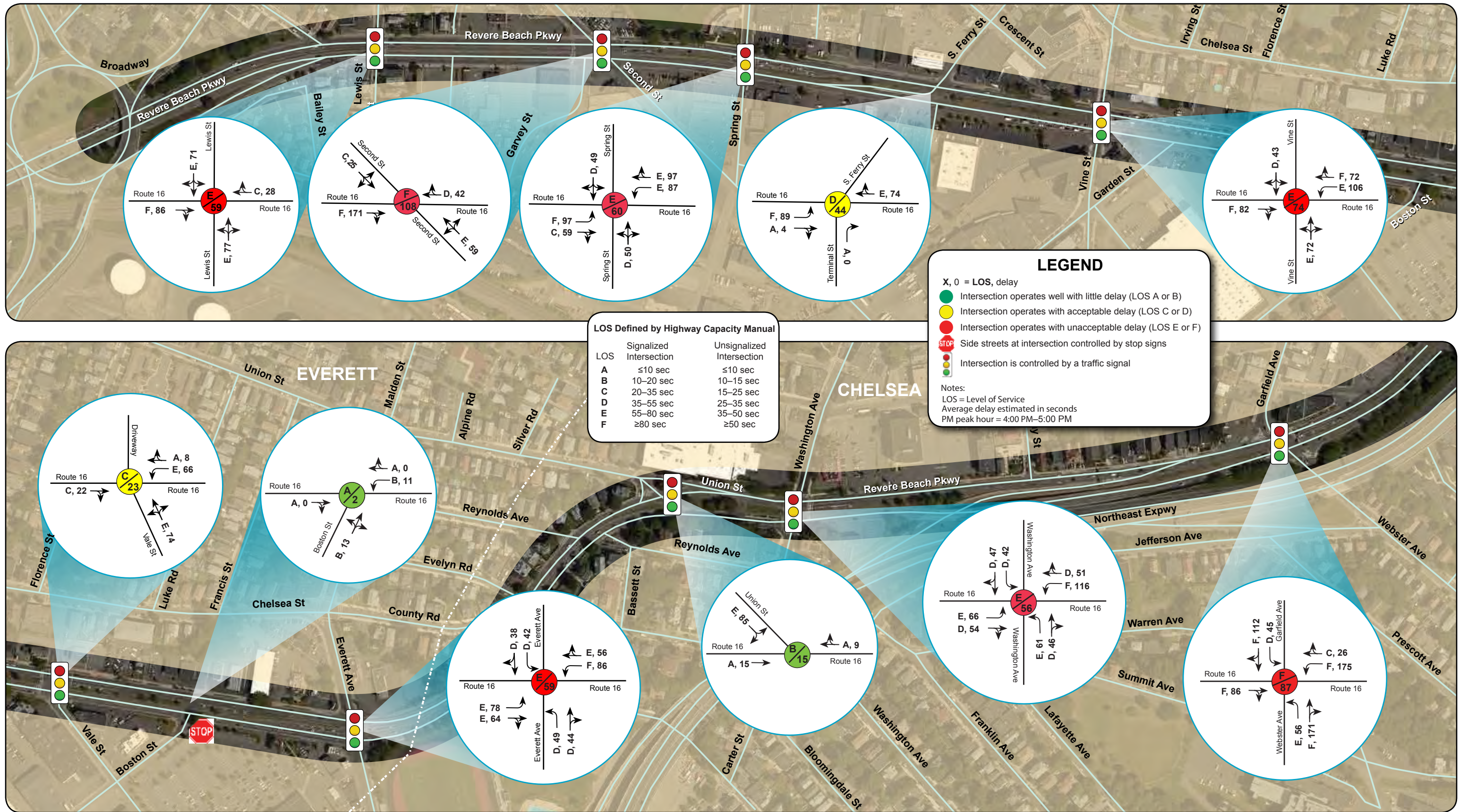
**Figure 27**  
**Short- and Medium-Term Improvements: Washington Avenue to Route 1**





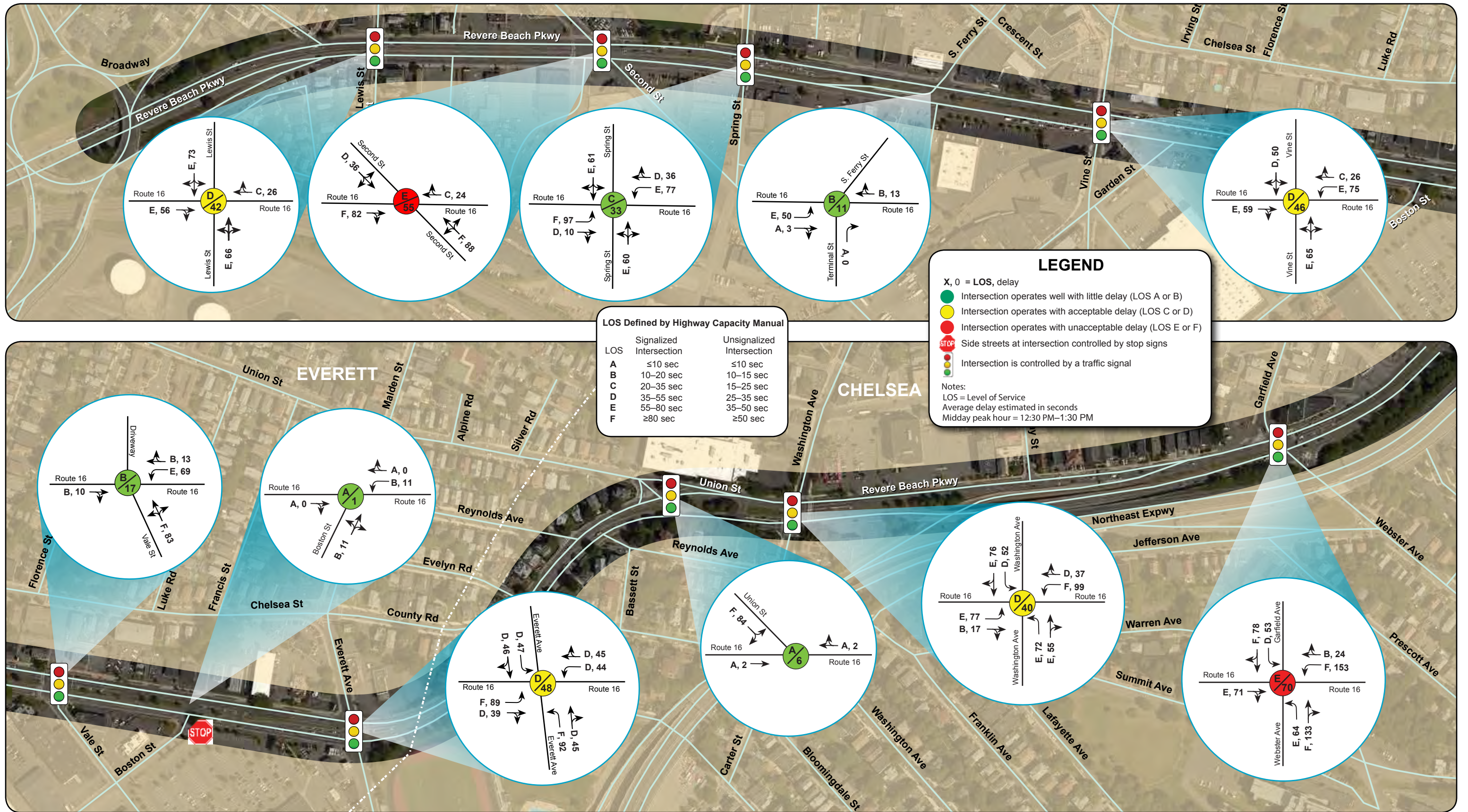
**Figure 28**  
 Weekday AM Peak-Hour Level of Service and Delay  
 Short-Term Traffic Signal Retiming and Coordination Improvements





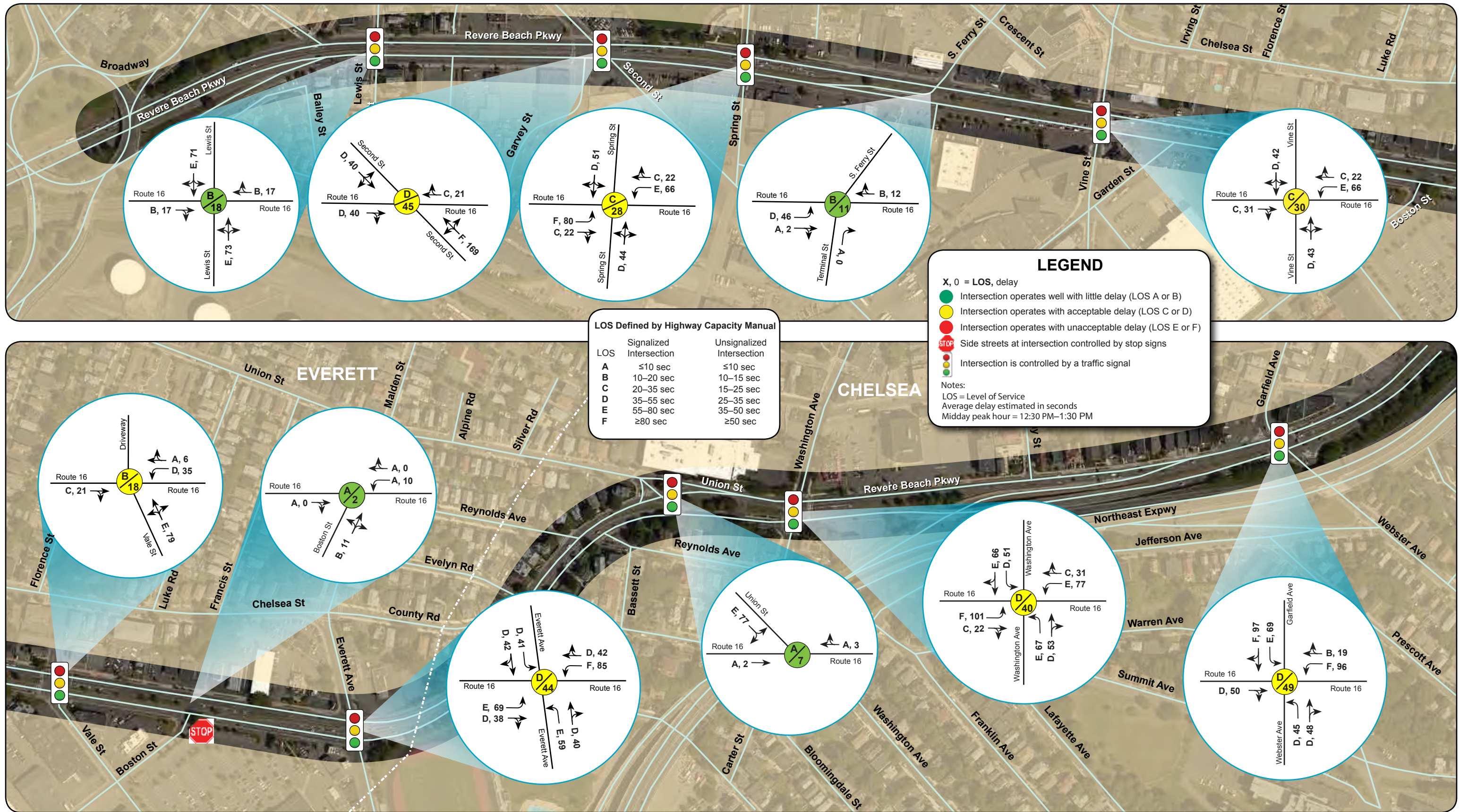
**Figure 29**  
 Weekday PM Peak-Hour Level of Service and Delay  
 Short-Term Traffic Signal Retiming and Coordination Improvements





**Figure 30**  
**Weekend Saturday Midday Peak Hour Level of Service and Delay**  
**Short-Term Traffic Signal Retiming and Coordination Improvements**








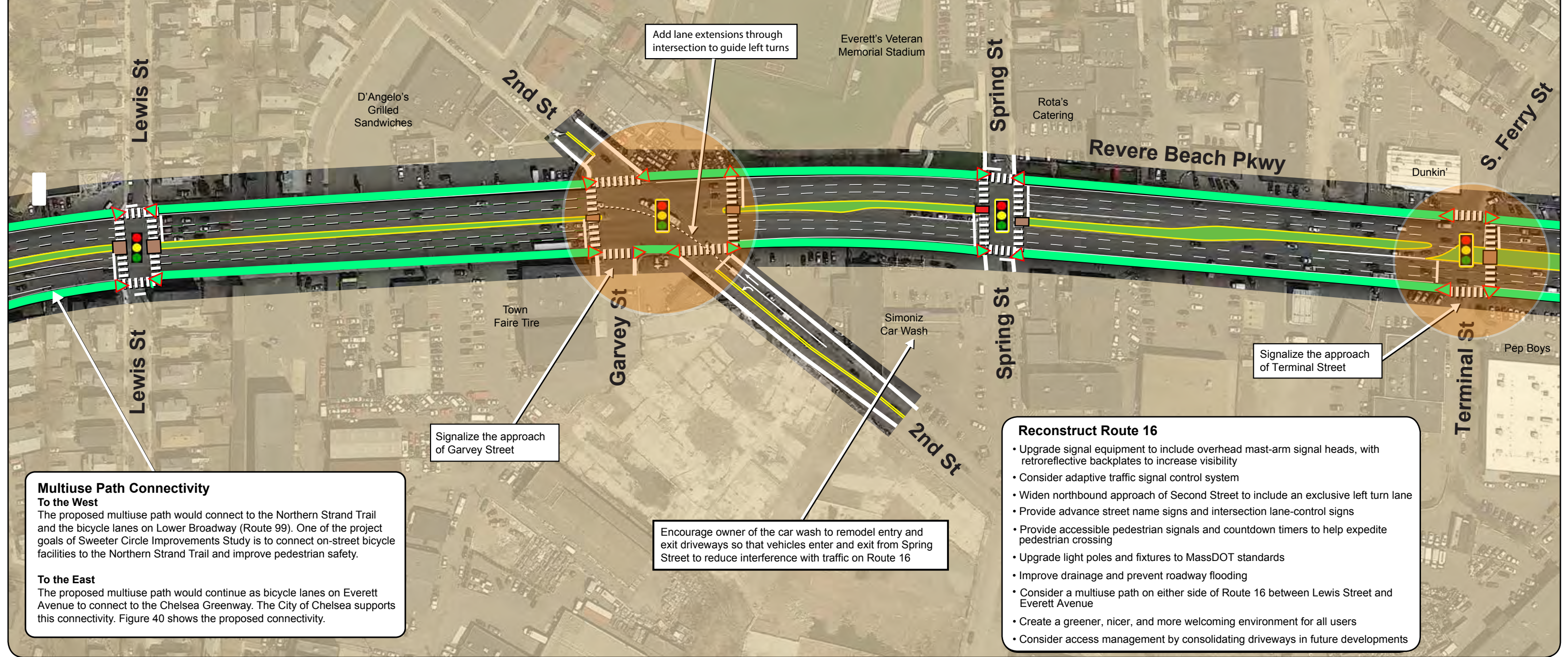
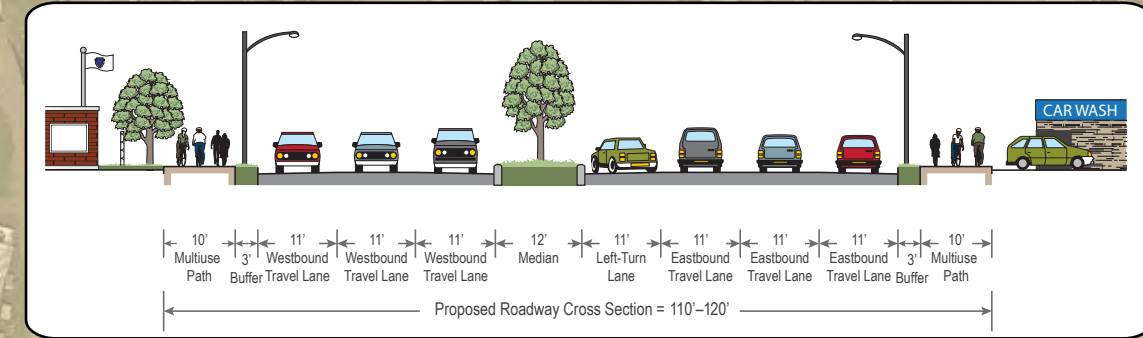
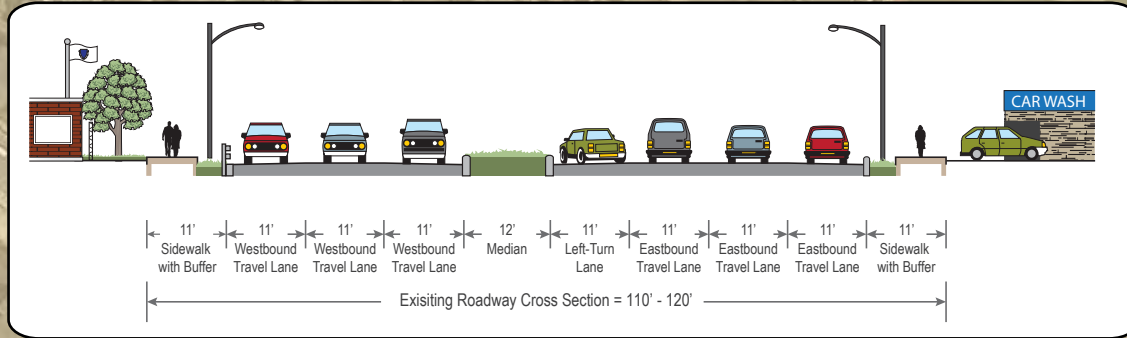


**Figure 31**  
**Weekend Sunday Midday Peak Hour Level of Service and Delay**  
**Short-Term Traffic Signal Retiming and Coordination Improvements**



# LEGEND

-  Multiuse path
  -  Crosswalk
  -  Median opening
  -  ADA-compliant wheelchair ramp
  -  Roadway median
- ADA = Americans with Disabilities Act  
MassDOT = Massachusetts Department of Transportation



**Multiuse Path Connectivity**

**To the West**  
The proposed multiuse path would connect to the Northern Strand Trail and the bicycle lanes on Lower Broadway (Route 99). One of the project goals of Sweeter Circle Improvements Study is to connect on-street bicycle facilities to the Northern Strand Trail and improve pedestrian safety.

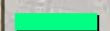
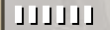


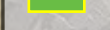
**To the East**  
The proposed multiuse path would continue as bicycle lanes on Everett Avenue to connect to the Chelsea Greenway. The City of Chelsea supports this connectivity. Figure 40 shows the proposed connectivity.

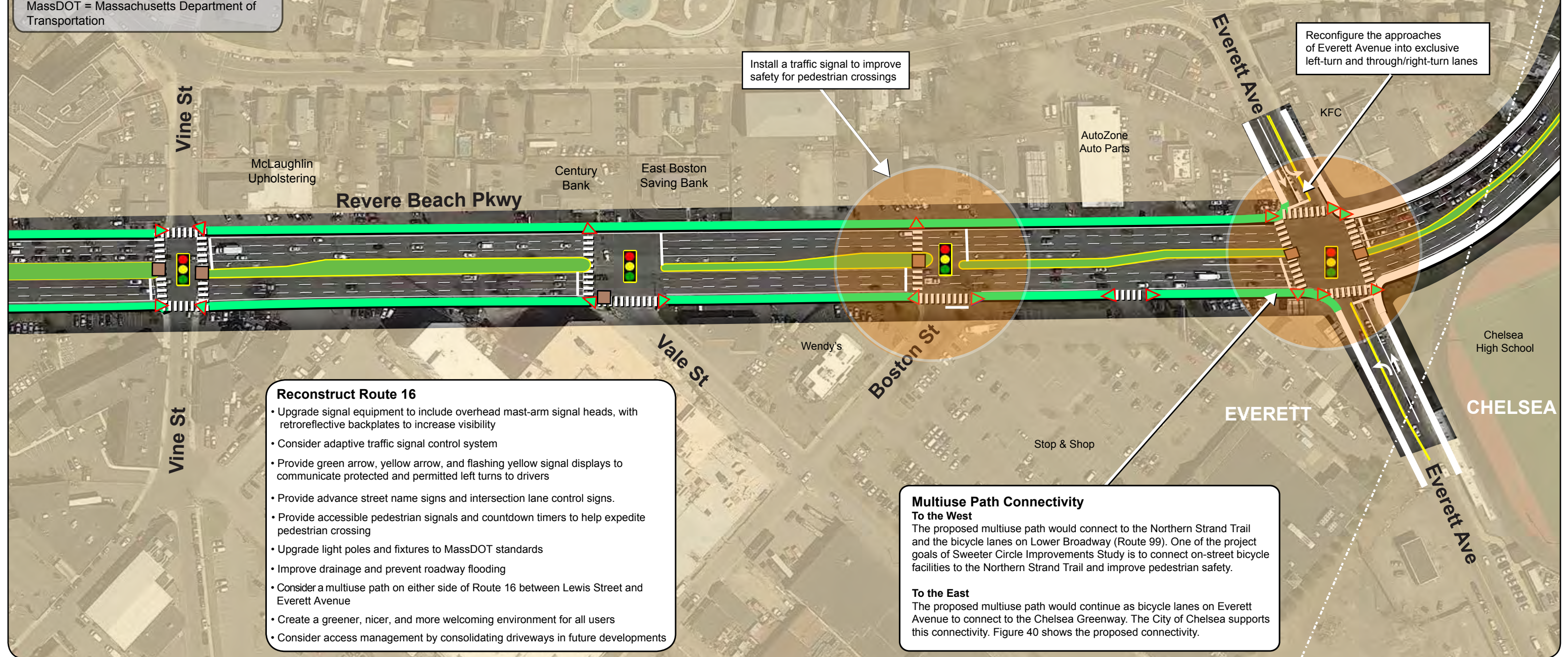
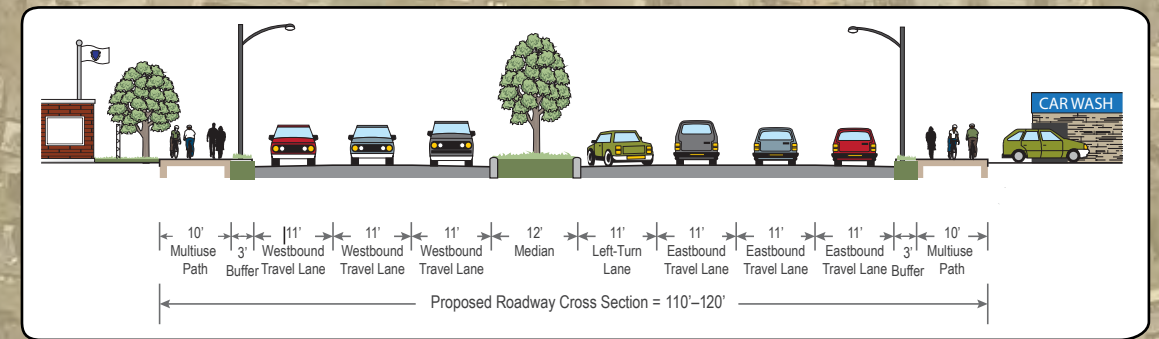
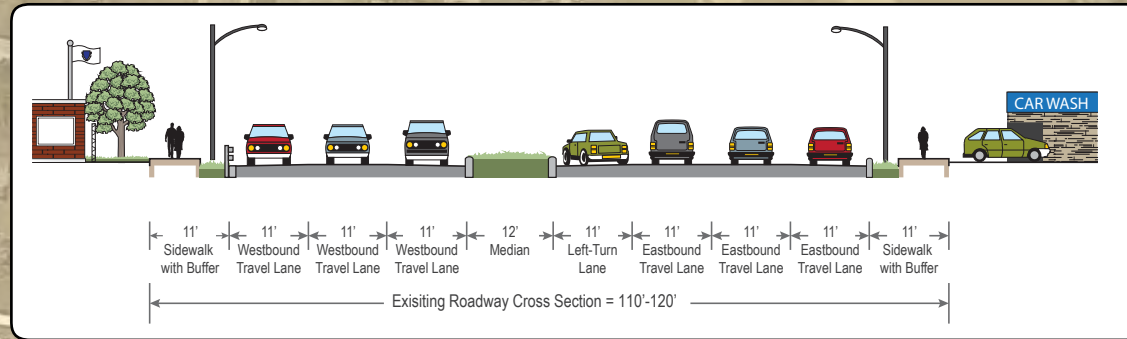
- Reconstruct Route 16**
- Upgrade signal equipment to include overhead mast-arm signal heads, with retroreflective backplates to increase visibility
  - Consider adaptive traffic signal control system
  - Widen northbound approach of Second Street to include an exclusive left turn lane
  - Provide advance street name signs and intersection lane-control signs
  - Provide accessible pedestrian signals and countdown timers to help expedite pedestrian crossing
  - Upgrade light poles and fixtures to MassDOT standards
  - Improve drainage and prevent roadway flooding
  - Consider a multiuse path on either side of Route 16 between Lewis Street and Everett Avenue
  - Create a greener, nicer, and more welcoming environment for all users
  - Consider access management by consolidating driveways in future developments

**Figure 32**  
**Long-Term Improvements: Lewis Street to South Ferry Street**



# LEGEND

-  Multiuse path
  -  Crosswalk
  -  Median opening
  -  ADA-compliant wheelchair ramp
  -  Roadway median
- ADA = Americans with Disabilities Act  
MassDOT = Massachusetts Department of Transportation








- Reconstruct Route 16**
- Upgrade signal equipment to include overhead mast-arm signal heads, with retroreflective backplates to increase visibility
  - Consider adaptive traffic signal control system
  - Provide green arrow, yellow arrow, and flashing yellow signal displays to communicate protected and permitted left turns to drivers
  - Provide advance street name signs and intersection lane control signs.
  - Provide accessible pedestrian signals and countdown timers to help expedite pedestrian crossing
  - Upgrade light poles and fixtures to MassDOT standards
  - Improve drainage and prevent roadway flooding
  - Consider a multiuse path on either side of Route 16 between Lewis Street and Everett Avenue
  - Create a greener, nicer, and more welcoming environment for all users
  - Consider access management by consolidating driveways in future developments

**Figure 33**  
**Long-Term Improvements: Vine Street to Everett Avenue**



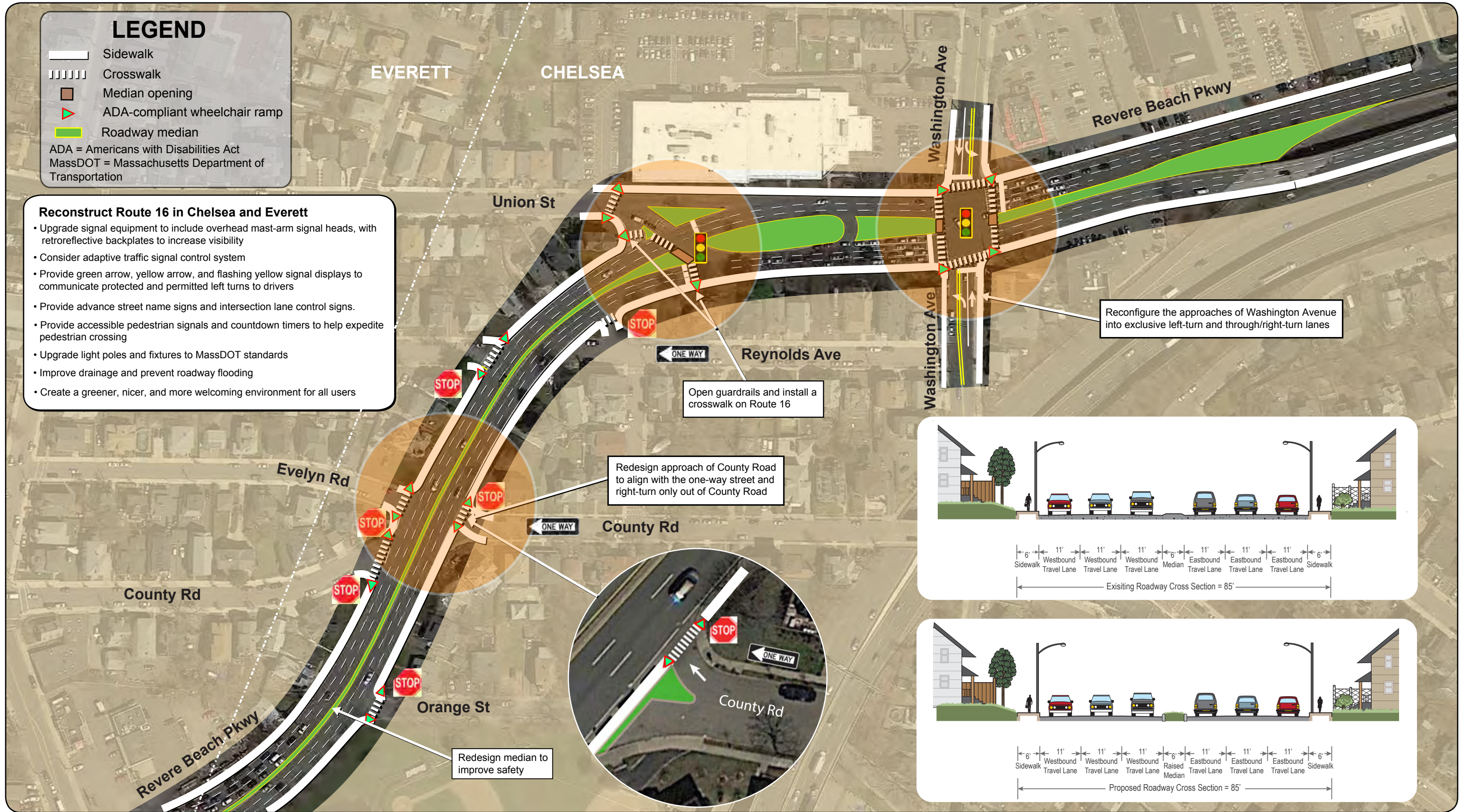
# LEGEND

-  Sidewalk
-  Crosswalk
-  Median opening
-  ADA-compliant wheelchair ramp
-  Roadway median

ADA = Americans with Disabilities Act  
 MassDOT = Massachusetts Department of Transportation

## Reconstruct Route 16 in Chelsea and Everett

- Upgrade signal equipment to include overhead mast-arm signal heads, with retroreflective backplates to increase visibility
- Consider adaptive traffic signal control system
- Provide green arrow, yellow arrow, and flashing yellow signal displays to communicate protected and permitted left turns to drivers
- Provide advance street name signs and intersection lane control signs.
- Provide accessible pedestrian signals and countdown timers to help expedite pedestrian crossing
- Upgrade light poles and fixtures to MassDOT standards
- Improve drainage and prevent roadway flooding
- Create a greener, nicer, and more welcoming environment for all users



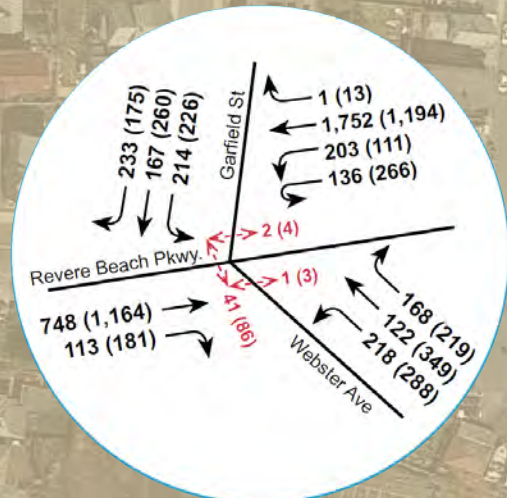
**Figure 34**  
 Long-Term Improvements: Everett Avenue to Washington Avenue



# LEGEND

- Sidewalk
  - Crosswalk
  - Median opening
  - ADA-compliant wheelchair ramp
  - Roadway median
- ADA = Americans with Disabilities Act  
MassDOT = Massachusetts Department of Transportation

- ### Reconstruct Route 16 in Chelsea and Everett
- Upgrade signal equipment to include overhead mast-arm signal heads, with retroreflective backplates to increase visibility
  - Consider adaptive traffic signal control system
  - Provide green arrow, yellow arrow, and flashing yellow signal displays to communicate protected and permitted left turns to drivers
  - Provide advance street name signs and intersection lane control signs.
  - Provide accessible pedestrian signals and countdown timers to help expedite pedestrian crossing
  - Upgrade light poles and fixtures to MassDOT standards
  - Improve drainage and prevent roadway flooding
  - Create a greener, nicer, and more welcoming environment for all users



AM and PM peak-period traffic volumes and pedestrian crossings

Add lane extensions through intersection to guide left turn drivers

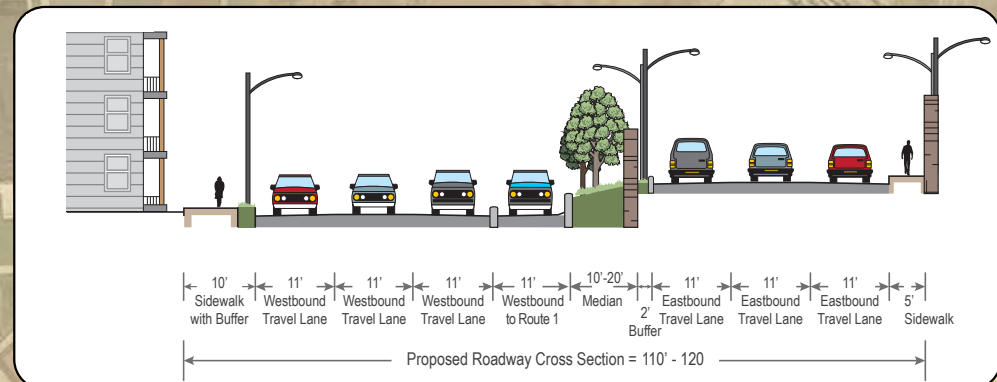
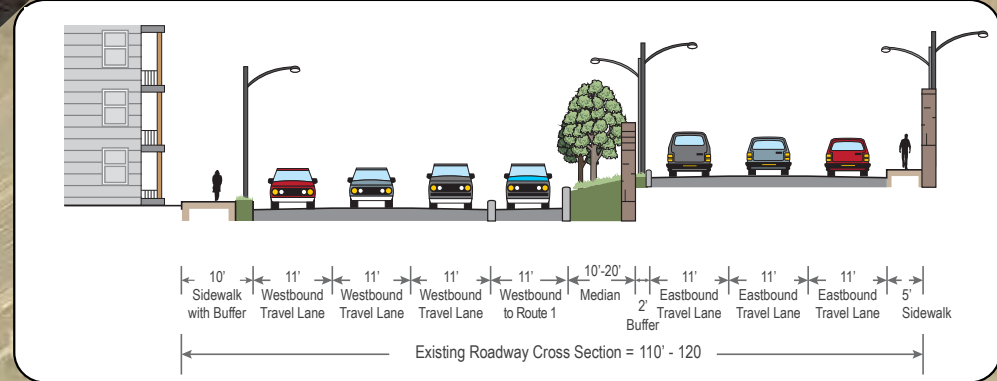
Move the approach of the west leg of Route 16 about 15 feet to the west to create more space in the intersection to prevent left-turn conflicts

Reconfigure the approaches of Webster and Garfield Avenues into exclusive left-turn and through/right-turn lanes

Alternative 1: Consider lengthening the Route 16 westbound left-turn lane to provide more storage

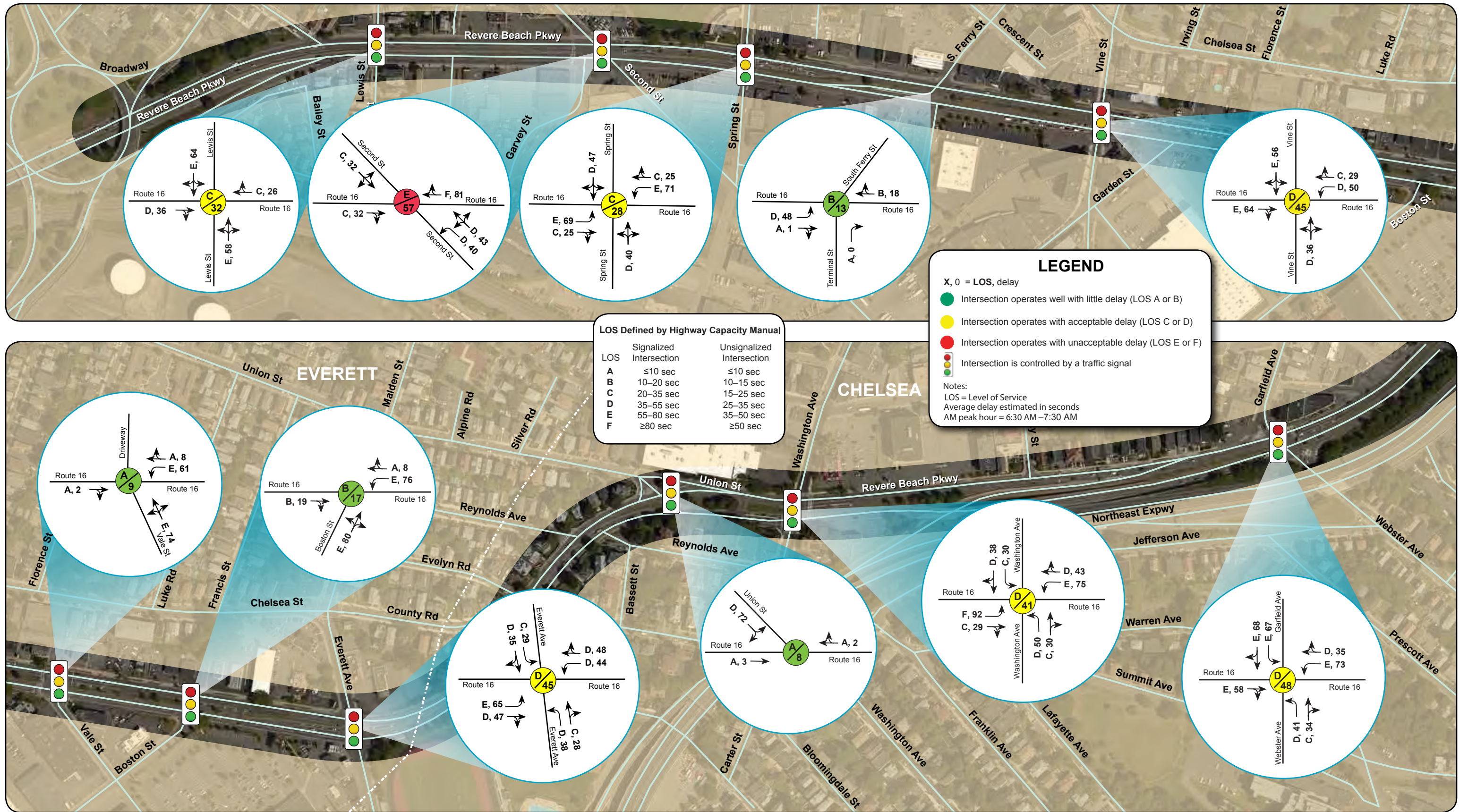
Alternative 2: Consider installing a traffic signal to provide access from Route 1 southbound to Route 16 eastbound

Alternative 3: Consider adding a new ramp connecting Route 16 westbound to Route 1 northbound



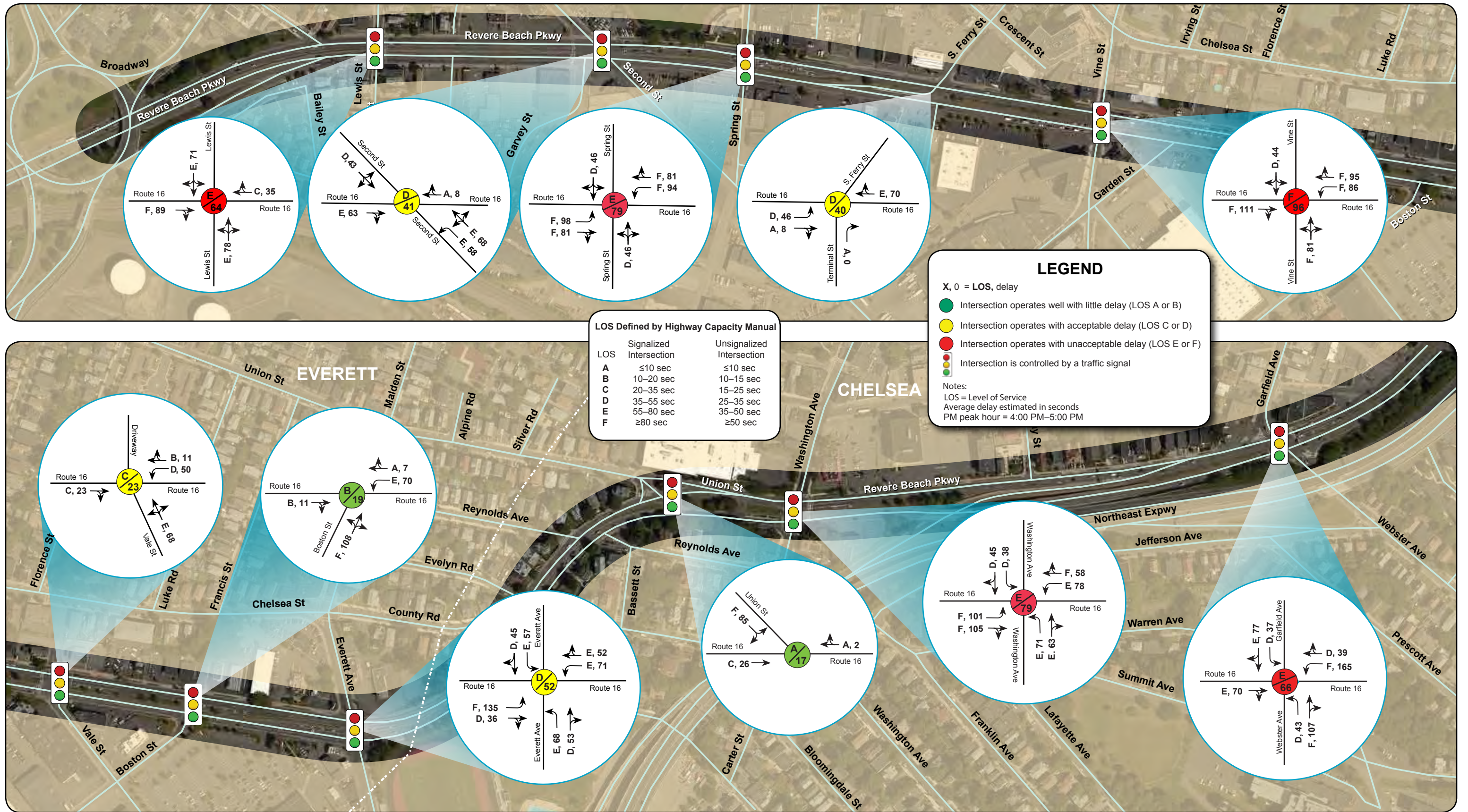
**Figure 35**  
**Long-Term Improvements: Washington Avenue to Route 1**





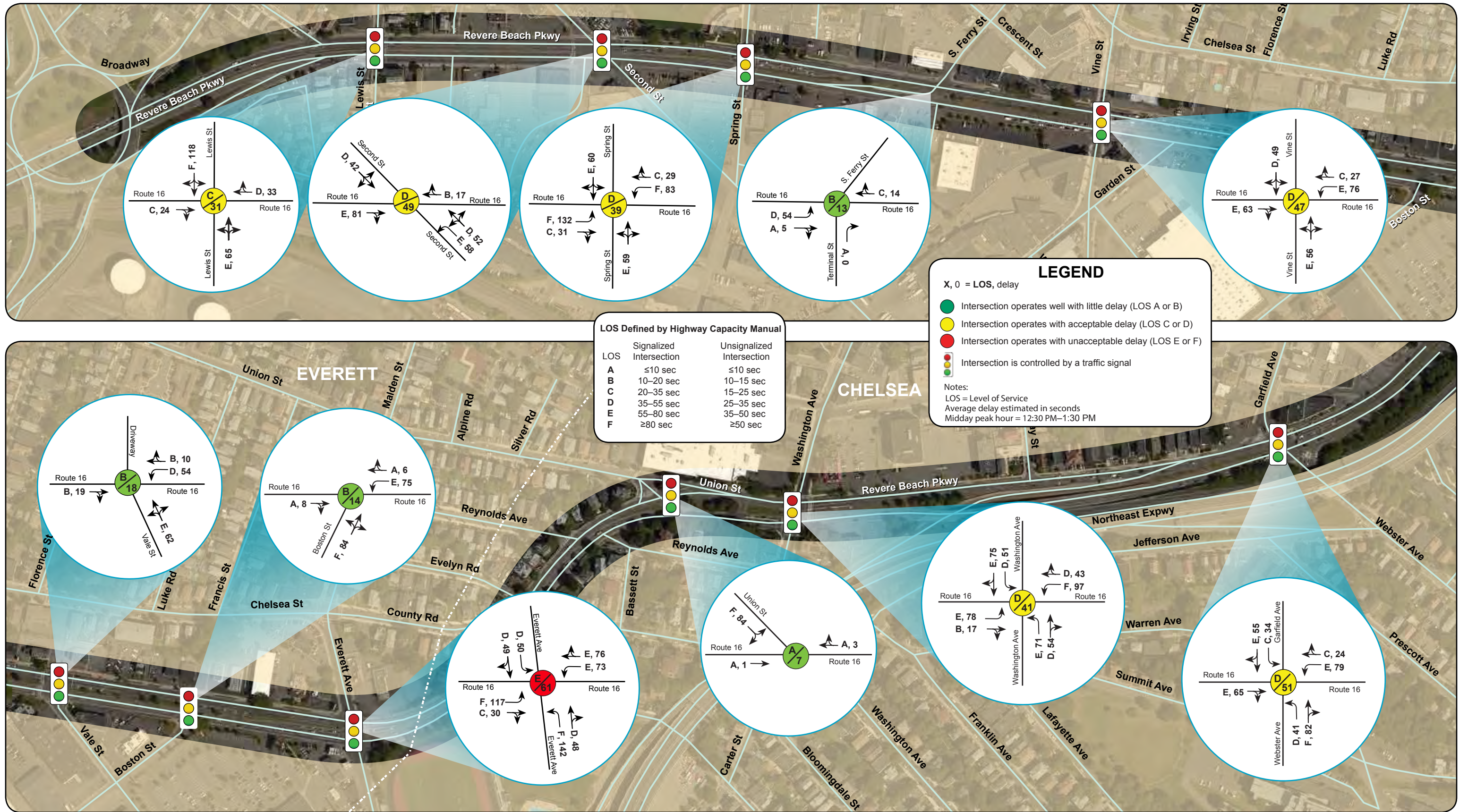
**Figure 36**  
 Weekday AM Peak-Hour Level of Service and Delay  
 Long-Term Improvements





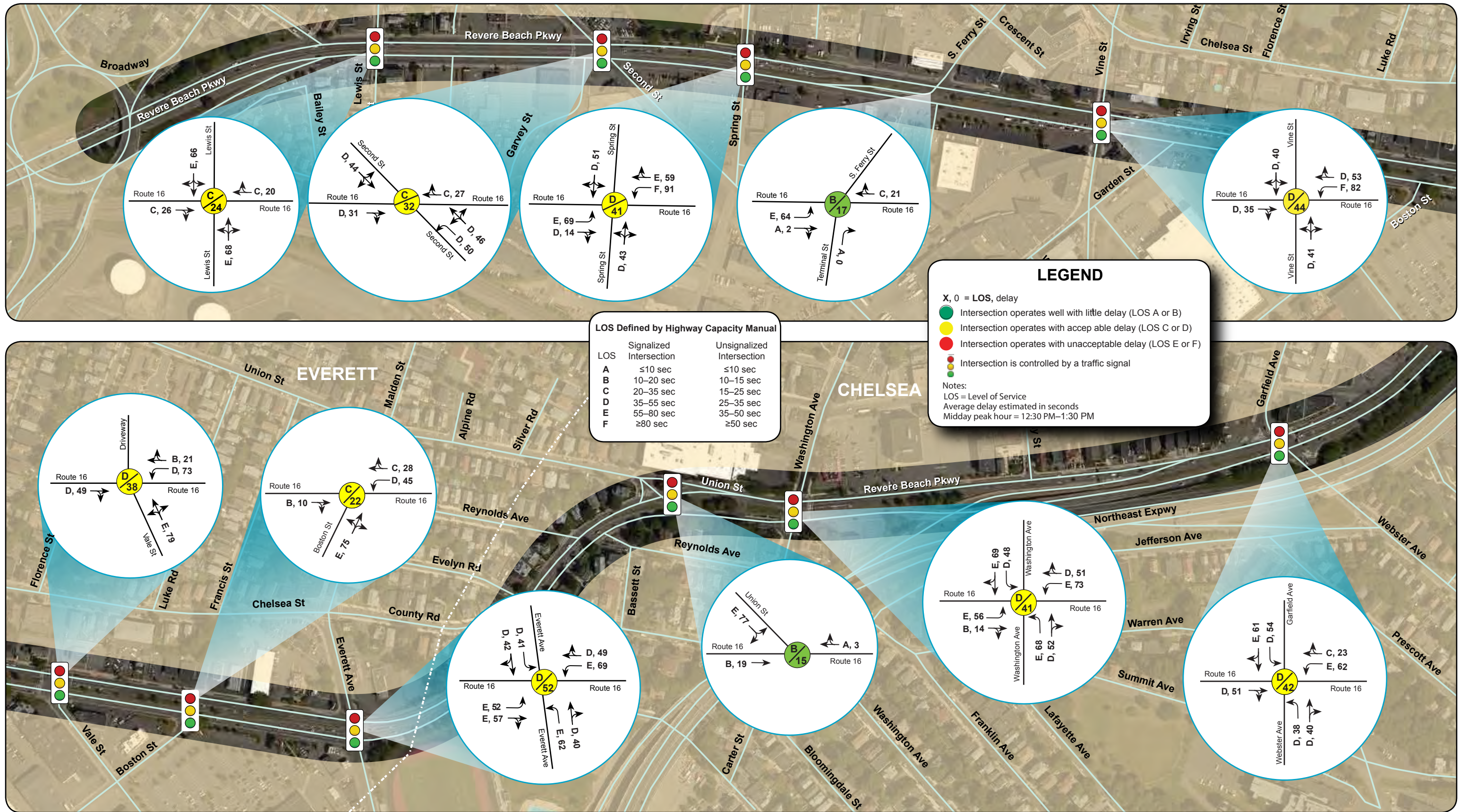
**Figure 37**  
 Weekday PM Peak-Hour Level of Service and Delay  
 Long-Term Improvements





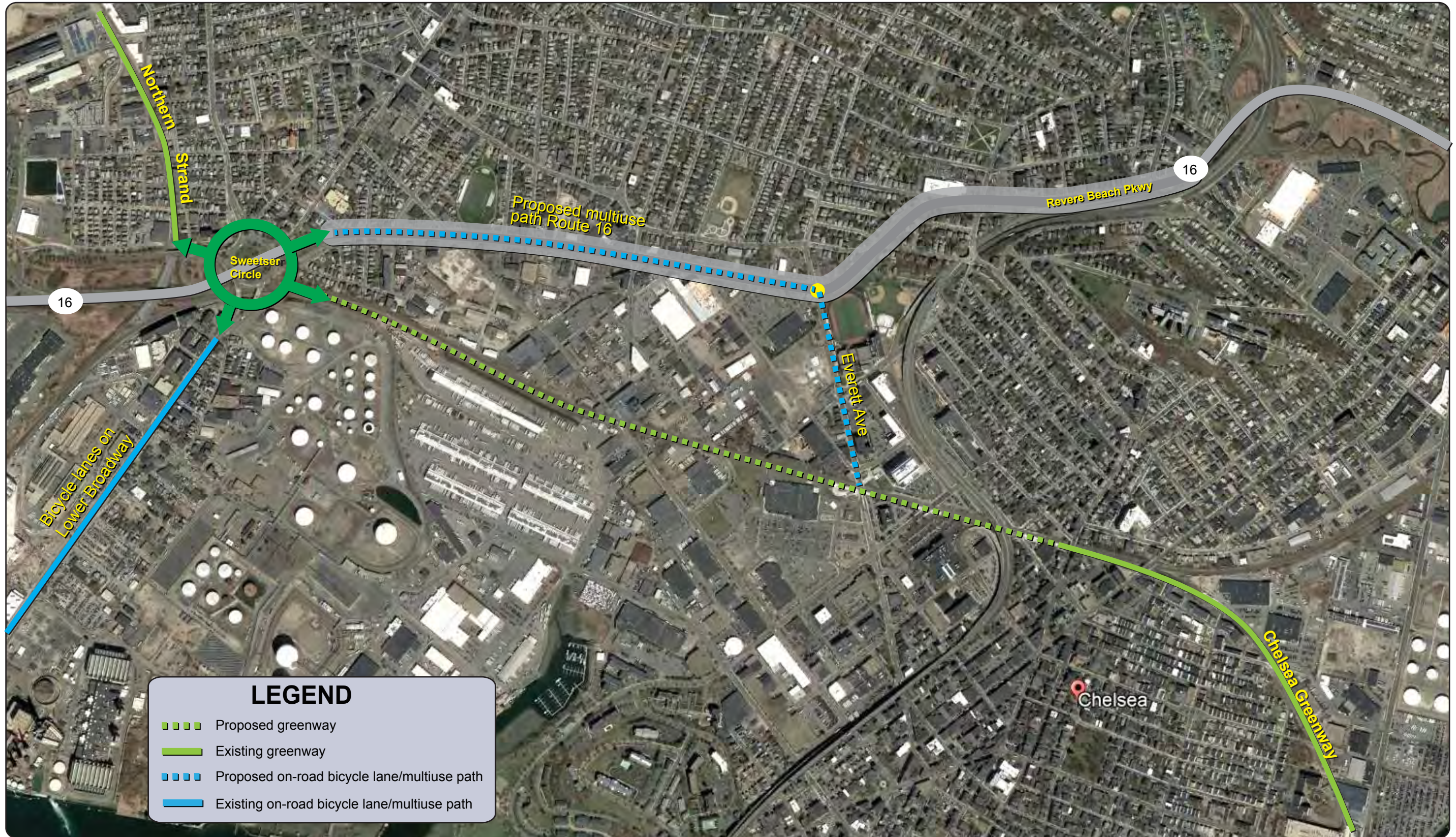
**Figure 38**  
**Weekend Saturday Midday Peak Hour Level of Service and Delay**  
**Long-Term Improvements**





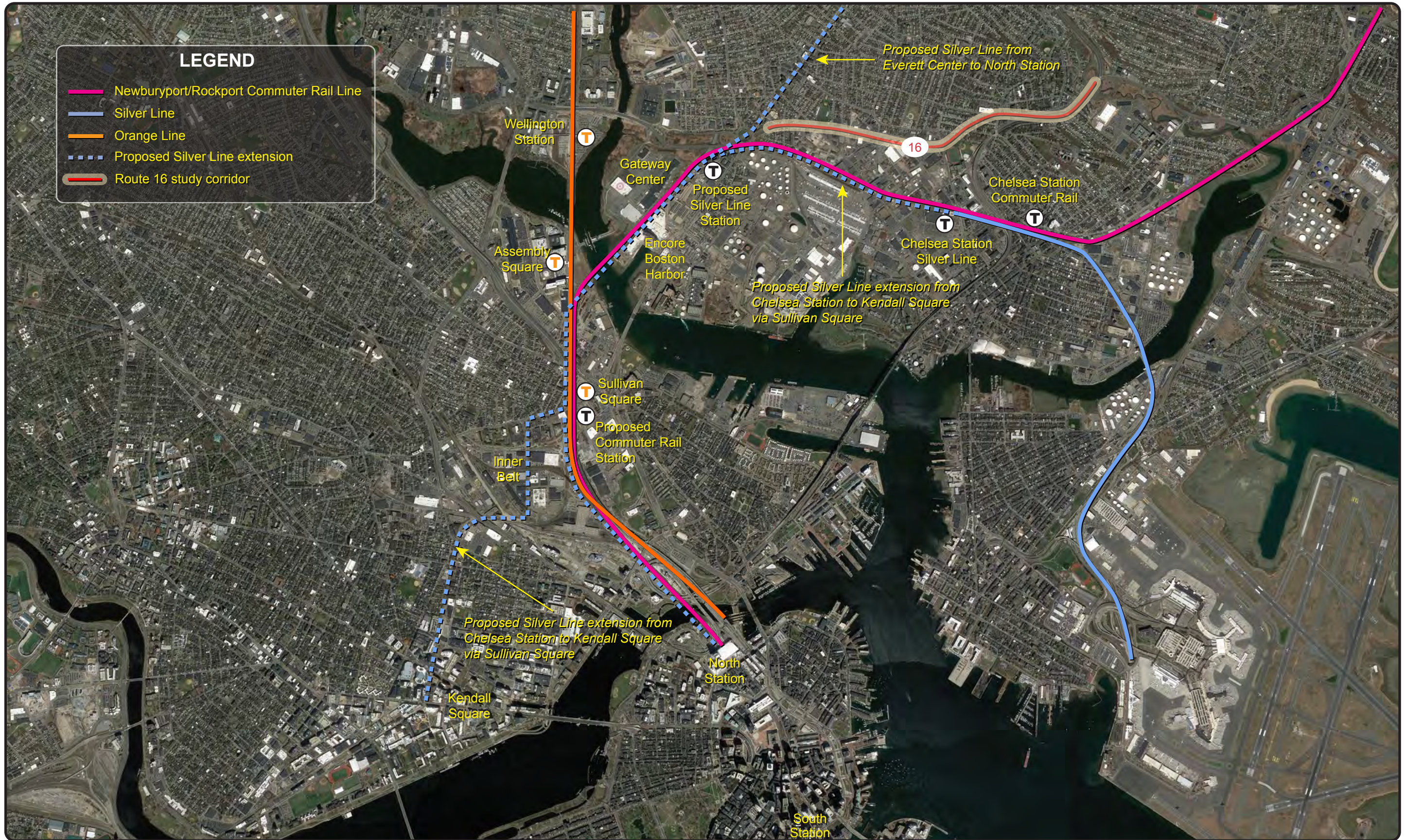
**Figure 39**  
 Weekend Sunday Midday Peak Hour Level of Service and Delay  
 Long-Term Improvements





**Figure 40**  
**Proposed Long-Term Pedestrian and Bicycle Improvements**





**Figure 41**  
**Long-Term Regional Transit Strategies**



# **Appendix A: Comments and Selection Process**

1. Selection of Study Locations
2. Public Participation and Comments



## **Part % Selection of Study Locations**



## BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Stephanie Pollack, MassDOT Secretary and CEO and MPO Chair  
Karl H. Quackenbush, Executive Director, MPO Staff

### **TECHNICAL MEMORANDUM**

**DATE:** October 18, 2018  
**TO:** Boston Region Metropolitan Planning Organization  
**FROM:** Seth Asante, MPO Staff  
**RE:** Selection of FFY 2019 LRTP Priority Corridor Study Location

#### **1 BACKGROUND**

During the development of the Boston Region Metropolitan Planning Organization's (MPO) Long-Range Transportation Plan (LRTP), *Charting Progress to 2040*, the MPO staff identified the existing needs for all transportation modes in the region.<sup>1</sup> The results were compiled in the LRTP Needs Assessment, which is used to guide the MPO's decision-making process for selecting transportation projects to fund in future Transportation Improvement Programs (TIP). The MPO goals that guided the development of the LRTP Needs Assessment include the following:

- Safety—make all modes safe
- Preservation—maintain and modernize the system
- Capacity Management and Mobility—use existing facility capacity more efficiently and increase healthy transportation capacity
- Clean Air/Clean Communities—create an environmentally friendly transportation system
- Transportation Equity—provide comparable transportation access and service quality among communities, regardless of income level or minority population
- Economic Vitality—ensure our transportation network serves as a strong foundation for economic vitality

Based on previous and ongoing transportation-planning work—including the MPO's Congestion Management Process (CMP) and planning studies—MPO staff identified several priority arterial roadway segments that require

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<sup>1</sup> Boston Region Metropolitan Planning Organization, *Charting Progress to 2040: The New Long-Range Transportation Plan of the Boston Region Metropolitan Planning Organization*, endorsed by the Boston Region MPO on July 30, 2015.



maintenance, modernization, and safety and mobility improvements. These locations are documented in the LRTP Needs Assessment.

To address problems on some of these arterial segments, the *Addressing Priority Corridors from the Long-Range Transportation Plan Needs Assessment* study was included in the federal fiscal year (FFY) 2019 Unified Planning Work Program (UPWP).<sup>2</sup> This memorandum presents the results of the selection process and recommendation of the location to study to the MPO board for discussion.<sup>3</sup>

By focusing on arterial segments rather than intersections, planners can evaluate multimodal transportation needs comprehensively (with the goal of creating Complete Streets). A holistic approach to analyzing problems and forming recommendations ensures that the needs of all transportation users are considered. Ultimately, this approach will result in roadways where it is safe to cross the street and walk or cycle to shops, schools, train stations, and recreational facilities, and where buses can run on time. Typically, the recommended improvements are within a roadway's right-of-way. They take into account the needs of abutters and users, and the interests and support of stakeholders.

## 2 SELECTION PROCEDURE

The process for selecting study locations consisted of three steps.

1. MPO staff gathered and assembled data about the arterial segments from the LRTP Needs Assessment and used the data to identify and prioritize them.
2. MPO staff examined the arterial segments more closely by applying specific criteria.
3. Staff scored each arterial segment and assigned a priority of *low*, *medium*, or *high* to each segment.

Details about each step in the process are provided below.

### 2.1 Gathering Data and Identifying Potential Arterial Segments

MPO staff identified 44 arterial segments in 37 municipalities in the Boston region based on the following data sources:

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<sup>2</sup> Unified Planning Work Program, Federal Fiscal Year 2019, endorsed by the Boston Region Metropolitan Planning Organization on June 21, 2018.

<sup>3</sup> Boston Region MPO Work Program for Addressing Priority Corridors from the Long-Range Transportation Plan Needs Assessment: Federal Fiscal Year 2019, September 20, 2018.

- The Massachusetts Department of Transportation (MassDOT) 2017 Road Inventory File and 2011–15 crash database were used to assemble the following information for each arterial segment: roadway jurisdiction, National Highway System status, average daily traffic (ADT), high-crash locations, and crash rates.
- The MPO’s CMP data on arterial congestion were used to determine average travel speeds, travel-time index (travel time in the peak period divided by travel time at free-flow conditions), and speed index (average travel speed divided by the speed limit) on each arterial segment.
- The MPO’s data on gaps in the bike network and data on the location of MassDOT bike facilities were used to identify needs for the bicycle mode, including locations where connectivity between bicycle facilities could be improved and where bicyclists’ accommodations could be improved.
- Data on Massachusetts Bay Transportation Authority (MBTA) bus service performance and passenger loads were used to determine the percentage of bus trips that do not adhere to the schedule (in other words, that provide late service) or do not adhere to passenger load standards (resulting in crowding).
- Data on MBTA bus routes, subway lines, and commuter rail lines were used to identify which arterial segments serve MBTA buses or stations.
- Data on the MPO’s Environmental Justice (EJ) transportation analysis zones were used to identify areas of concern as relates to environmental justice.
- Data selected from MassDOT’s project-information database, the MPO’s FFY 2019–23 TIP projects, MPO planning studies and other studies, and municipal websites were used to obtain data on projects, studies, and TIP projects that are planned or programmed for each arterial segment.

Table 1 (attached) presents the data and information gathered on each of the following arterial segments:

- Municipality
- Metropolitan Area Planning Council (MAPC) subregion
- Jurisdiction
- MassDOT district office
- Number of top-200 high-crash locations
- Number of crash clusters that are eligible for Highway Safety Improvement Program (HSIP) funding
- Travel-time index



- Transit service performance
- Proximity to an EJ transportation analysis zone (within one-half mile distance)
- Relevant studies or projects within or near the segment

Table 1 also includes the score and priority rating that were determined by applying the selection criteria. The processes for scoring and assigning priority ratings to segments are described below.

## 2.2 Selection Criteria

MPO staff examined the arterial segments more closely by applying the following six criteria and assigning points based on the number of criteria that apply to each location.

1. *Safety Conditions, 0–4 points (each of the four criteria is worth one point)*
  - Location has a higher-than-average crash rate for its functional class
  - Location contains an HSIP-eligible crash cluster
  - Location is identified in the Massachusetts *Top High Crash Locations Report*
  - Location has a significant number of pedestrian and bicycle crashes per year (two or more per mile) or contains one or more HSIP-eligible bike-pedestrian crash cluster
2. *Congested Conditions, 0–2 points (each of the two criteria is worth one point)*
  - Travel-time index is at least 1.3
  - Travel-time index is at least 2.0
3. *Multimodal Significance, 0–3 points (each of the three criteria is worth one point)*
  - Location currently supports transit, bicycle, or pedestrian activities
  - Location needs to have improved transit, bicycle, or pedestrian facilities
  - Location has a high volume of truck traffic serving regional commerce
4. *Regional Significance, 0–4 points (each of the four criteria is worth one point)*
  - Location is in the National Highway System
  - Location carries a significant portion of regional traffic (ADT is greater than 20,000)

- Location lies within 0.5 miles of an EJ transportation analysis zone
  - Location is essential for the region's economic, cultural, or recreational development
5. *Regional Equity, 0–2 points (each of the two criteria is worth one point)*
- Location is in an MAPC subregion for which there has not been a Priority Corridors study
  - Location is in an MAPC subregion for which there has not been a Priority Corridors study in the previous three years.
6. *Implementation Potential, 0–3 points (each of the three criteria is worth one point)*
- Location is proposed or endorsed for study by the agency that administers the roadway
  - Location is proposed or endorsed by its MAPC subregional group and is a priority for that subregional group
  - Other stakeholders strongly support improvements for the location

### 2.3 Rating Potential Roadways

MPO staff rated arterial segments with a total score of 10 or fewer points as *low* priority; those with a score of 11 to 12 points as *medium* priority; and those with a total score of 13 or more points as *high* priority. MPO staff gave 13 arterial segments a high-priority rating based on safety and operational needs, multimodal and regional significance, regional equity, and support for improvements from agencies and municipalities. Staff then examined high-priority segments more closely, and excluded arterials that had projects meeting any of the following criteria from further consideration for this cycle of the Priority Corridors study: recently completed, in construction, in design, under study, or programmed in the TIP with the 25 percent design completed.

Staff also evaluated the pedestrian accommodation and safety improvement needs for the two segments with the highest scores by applying the MPO's recently developed Pedestrian Report Card Assessment.<sup>4</sup> The locations highly qualify based on pedestrian accommodation or safety improvement requirements. Appendix A contains detailed results of the assessments. The two arterial segments with the highest scores were:

- Route 16 in Chelsea and Everett
- Route 20 in Weston

Based on this evaluation, MPO staff recommends studying the segment on Route 16 from Route 99 in Everett to Webster Avenue/Garfield Avenue in

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<sup>4</sup> Ryan Hicks and Casey-Marie Claude, Boston Region Metropolitan Planning Organization, *Pedestrian Level-of-Service Memorandum*, January 19, 2017.



Chelsea. Figure 1 shows the study area with seven HSIP intersection crash clusters. Figure 2 shows the general locations of previous Priority Corridor studies, and the location identified for this year's study.

### **3 ARTERIAL SEGMENT SELECTED FOR STUDY: ROUTE 16 IN EVERETT AND CHELSEA**

The arterial segment that was selected for study was Route 16 in Chelsea and Everett, based on a total score of 15, using the five selection criteria (safety, congestion, multimodal and regional significance, regional equity, and implementation potential). Route 16 runs east-west through Everett and Chelsea, from Revere to the east to Medford to the west. MassDOT recently acquired Route 16 from I-93 in Medford to Route 145 in Revere from the Department of Conservation and Recreation and the entire section would be maintained by Highway District 4. In Chelsea and Everett, the roadway primarily passes through commercial, industrial, and residential areas. Current evaluation indicates that there are safety, capacity management, and mobility problems in the segment. Seven locations along the segment contain HSIP-eligible crash clusters, five of which are in the top 200 intersection crash clusters in Massachusetts. In addition, the segment has a higher-than-average crash rate for its functional class. Additionally, several intersections in the segment are congested, which create long traffic queues during peak travel periods. Finally, accommodations for pedestrians and bicyclists are poor and need improvement—there are gaps in the sidewalk network and there is need for better bicycle connections from Route 16 to Route 99.

The Cities of Chelsea and Everett and MassDOT Highway Division are considering Complete Streets solutions for the corridor and have expressed support for and willingness to participate in a study of this arterial segment (See Appendix B). MPO staff would identify the problems and develop Complete Street solutions that could be implemented by MassDOT. The recommended arterial segment meets the selection criteria of this study, especially by supporting the transportation improvement priorities of the MPO's LRTP. The recommended arterial segment is approximately 1.5 miles long and would require considerable resources for evaluating alternative improvement plans.

### **4 NEXT STEPS**

After the MPO board discusses this recommendation, staff will meet with officials from the Cities of Chelsea and Everett, MassDOT, MAPC, and other stakeholders to discuss the study specifics, conduct field visits, collect data, identify needs, and develop solutions.

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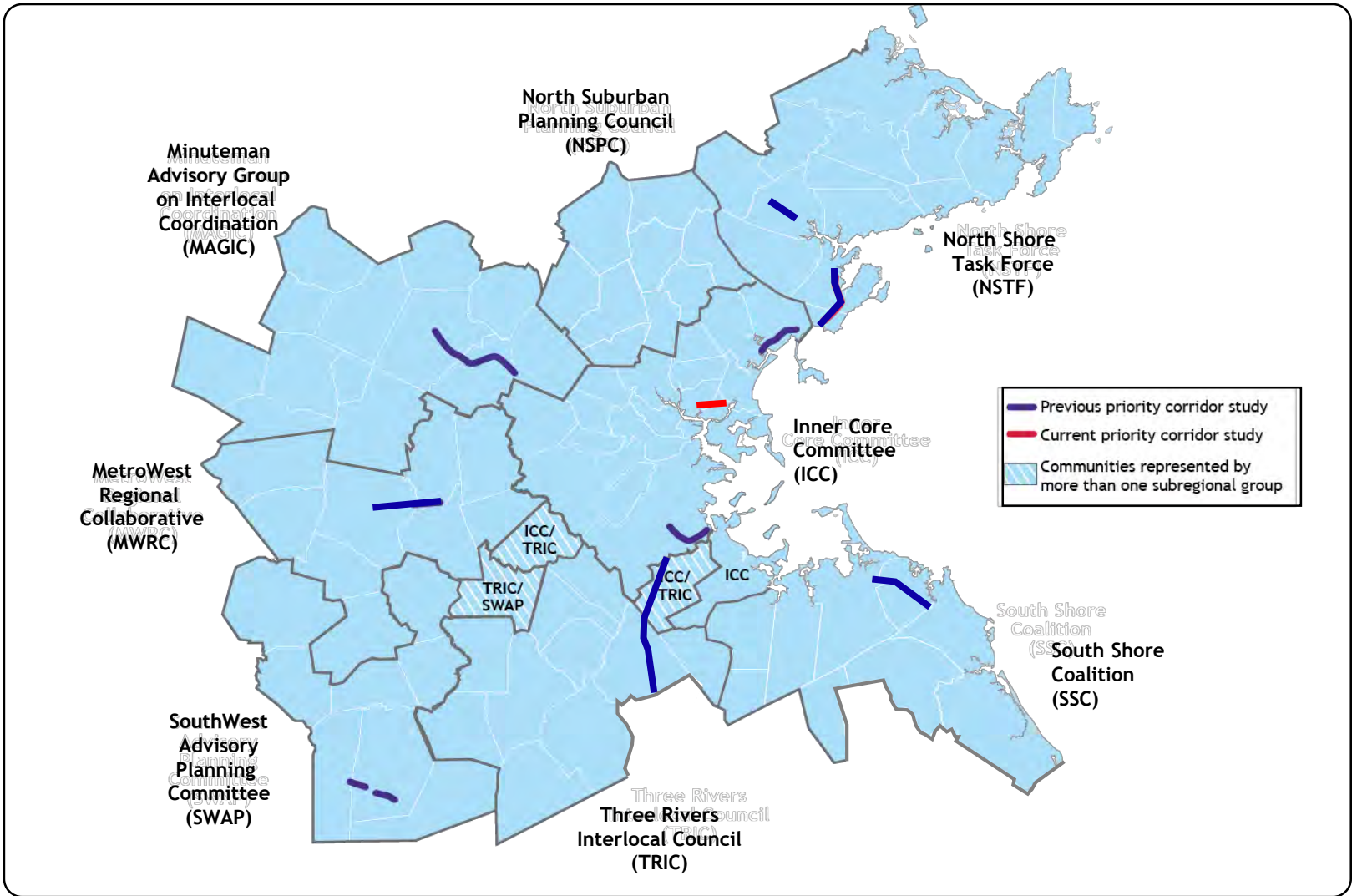


**BOSTON  
REGION  
MPO**

**FIGURE 1**  
**Highway Safety Improvement Program Intersection Crash Clusters**

*Addressing Priority  
Corridors from the LRTP  
Needs Assessment*






**BOSTON REGION MPO**  **FIGURE 2** Previous and Current LRTP Priority Corridor Studies by MAPC Subregion Addressing Priority Corridors from the LRTP Needs Assessment



TABLE 1  
Arterial Segments Considered for Study: Priority Corridors for Long-Range Transportation Plan Needs Assessment Study

Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Number of Top-200 High-Crash Locations 2013-15	Number of HSIP-Eligible Crash Clusters 2013-15**	Travel Time Index	Transit Service	Crowded or Late Bus	In or Near Environment 1 Justice Zone	Study, Project, or TIP Project	Safety Conditions***	Congested Conditions***	Multimodal Significance***	Regional Significance***	Regional Equity***	Implementation Potential***	Score	Priority Rating	Summary of Comments
Selected for Study: Route 16 (Revere Beach Parkway)	Chelsea and Everett	ICC	4	MassDOT	Yes	2	3	7	2.97	MBTA bus Routes 97, 99, 106, 110, 112, 104, 105, and 109 MBTA Orange Line Rapid Transit at Wellington and MBTA Commuter Rail at Chelsea	Yes	Yes The entire segment lies within EJ zones.	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updated traffic information, assessment of parkway conditions, and assessment and understanding of deficiencies along the heavily cycled parkways.	3	2	3	4	0	3	15	High	This arterial segment was selected because it has seven HSIP clusters in the segment, five of which are in the top-200 high-crash locations in Massachusetts. In addition, MassDOT recently acquired Route 16 from I-93 in Medford to Route 145 in Revere from the Department of Conservation and Recreation and the Highway District 4 has suggested studying Route 16 (Revere Beach Parkway) from Second Street in Everett to Webster Avenue/Garfield Avenue in Chelsea. The Cities of Everett and Chelsea have expressed their support, interest, and participation in the study.
Route 20	Weston	MWRC	6	MassDOT	Yes	3	1	3	4.06	MBTA bus Route 70 MBTA Commuter Rail at Waltham and Kendall Green	Yes	Yes An EJ Zone is located 0.1 mile from the end of the segment.	Intersection improvements Boston Post Road (Route 20) at Wellesley Street, preliminary design stage	3	2	2	4	1	2	14	High	A congestion study was suggested through UPWP and LRTP outreach in 2012, 2013, and 2014 by MAGIC; a formal letter was submitted and verbal comments were made at an MWRC subregion meeting. The location was resubmitted in a comment on Draft FFY 2014 UPWP and was suggested in the 2017 MPO outreach program.
Routes 4 and 225	Bedford and Lexington	MAGIC	4	MassDOT, Bedford, and Lexington	Yes (part)	3, 5	1	8	2.82	Three MBTA bus stops MBTA bus Route 62	Yes	None	Great Road Project: Master Plan and Conceptual Design, prepared by VHB for the Town of Bedford in 2011, in preliminary design The MassDOT-administered section, from I-95 to Hartwell Avenue, was the subject of a Lexington study (Hartwell Avenue Traffic Mitigation Plan Bedford Street Concept Plan)—and a road safety audit was performed for this segment in November 2011 MassDOT Project #607409: Lexington—Reconstruction On Massachusetts Avenue, From Marrett Road To Pleasant Street—The proposed project will address safety and capacity deficiencies at three intersections along Massachusetts Avenue, Marrett Road (Route 2A), Maple Street (Route 2A), and Pleasant Street (Routes 4/225). (Construction 2016-2018)	4	2	2	3	1	1	13	High	This arterial segment was not selected because it did not have the support of MassDOT District 4 and also sections of it had already been studied. The Town of Bedford requested in FFY 2017 that the MPO study this arterial segment from I-95 in Lexington to Loomis Street in Bedford. The MAGIC subregion requested that the FFY 2012 UPWP and FFY 2013 UPWP include a study of Routes 4 and 225. The MassDOT section from I-95 to Hartwell Avenue was the subject of a Lexington study.
Route 9	Framingham	MWRC	3	MassDOT	Yes	2	1	7	4.47	MWRTA bus Routes 1, 2, 3, 7, and 9	None	Yes More than one-half the route lies within or adjacent to an EJ zone.	MassDOT Project #603865 is located in Framingham at the intersection of Route 9 and Temple Street; in preliminary design MassDOT Project #608006 Pedestrian Hybrid Beacon Installation at Route 9 and Maynard Road; 25% design stage MassDOT Project #604991, Resurfacing and Related Work on Route 9, includes wheelchair ramp upgrades, additional sidewalks/repairs, and signal improvements; completed in autumn 2011 MassDOT Project #608006: Framingham- Pedestrian Hybrid Beacon Installation At Route 9 And Maynard Road—The proposed project will construct an at-grade pedestrian crossing across Route 9 in the vicinity of Maynard Road and the Framingham Fire Station. (Design public hearing 2017)	3	2	2	4	1	1	13	High	This arterial segment was not selected because, according to MassDOT District 3, most of the intersections on this corridor have already been studied.
Route 107	Lynn	ICC	4	MassDOT and Lynn	Yes	3	2	12	2.86	MBTA bus Routes 424, 426, 436, 441, 442, 450, 455, 456, 459, 429, and 435 MBTA Commuter Rail at River Works, Lynn/Central Square, and Swampscott Ferry service	Yes	Yes The entire segment lies within EJ zones.	MassDOT Project #608927, Reconstruction of Route 107 in Lynn and Salem MassDOT Project #604952, Bridge Replacement, Route 107 over the Saugus River; Design exception submitted (as of 01/26/2017); The construction will begin in autumn 2018. MassDOT Project #26710, Bridge Replacement, Route 107 over the Saugus River (Fox Hill Bridge); completed spring 2013 MassDOT Project #603938, Western Avenue Bridge over Saugus River (Fox Hill Bridge)	4	2	2	4	0	1	13	High	This arterial segment was not selected for study because a Route 107 Corridor Study in Lynn and Salem has been completed by MassDOT recently and the proposed improvements would be addressed under project #608927, in design.
Route 28	Milton	ICC and TRIC	6	MassDOT and Milton	Yes	3	1	4	3.48	51 MBTA bus stops MBTA bus Routes 240, 245, 24, 28, 26, 30, 31, and 33 MBTA Red Line Rapid Transit at Mattapan/Ashmont Station BAT Route 12	Yes	Yes EJ zones are located at the northern end.	MassDOT Project #607342, Intersection and Signal Improvements at Route 28 (Randolph Avenue) and Chickatawbut Road; in preliminary design MassDOT Project #106901, Roadway Reconstruction on Route 28 (Randolph Avenue) from Reedsdale Road to Milton/Quincy town line; completed 2008 Conceptual TIP #1008, Reconstruct the Intersection of Blue Hills Parkway and Brook Road	4	2	2	3	0	2	13	High	This arterial segment was not selected because there have been several improvements in this segment in recent years. In addition, in FFY 2018, MPO staff selected Route 138 in Milton as the subject of an LRTP Priority Corridor study



TABLE 1  
Arterial Segments Considered for Study: Priority Corridors for Long-Range Transportation Plan Needs Assessment Study

Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Number of Top-200 High-Crash Locations 2013-15	Number of HSIP-Eligible Crash Clusters 2013-15**	Travel Time Index	Transit Service	Crowded or Late Bus	In or Near Environmental Justice Zone	Study, Project, or TIP Project	Safety Conditions***	Congested Conditions***	Multimodal Significance***	Regional Significance***	Regional Equity***	Implementation Potential***	Score	Priority Rating	Summary of Comments
Route 114	Peabody	NSTF	4	MassDOT and Peabody	Yes	2	1	3	4.60	Three MBTA bus stops MBTA bus Routes 435, 465	Yes	Yes One-half of the segment abuts an EJ zone.	MassDOT Project # 608567, Improvements at Route 114 at Sylvan Street, Cross Street, Northshore Mall, Loris Road, Route 128 Interchange, and Esquire Drive. Project locations were selected based on the HSIP Top 200 Crash Cluster mapping and in coordination with the District and Regional Planning Agency, in design	4	2	2	3	1	1	13	High	Route 114 in Peabody was listed as a potential corridor in need of signal progression and improvements to accommodate pedestrians and bicyclists. However, the arterial segment was not selected because, according to MassDOT Highway District 4, a road safety audit was completed for the segment in August 2016 and a consultant has started design work as part of project #608567. The location was suggested in the 2017 MPO outreach program.
Route 28	Randolph	TRIC	6	MassDOT and Randolph	Yes	3	1	5	3.00	50 MBTA bus stops MBTA bus Routes 240 and 238 MBTA Commuter Rail at Holbrook/Randolph BAT Route 12	Yes	Yes The entire segment lies within EJ Zones.	FFY 2008 Safety and Operations Analyses at Intersections study Arterial Coordination Study, CTPS study (2010) MassDOT Project #601735 Resurfacing and related work on and related work on a section of Route 28; completed 2008 MassDOT Project #601735 Resurfacing and related work on Route 28 from Union Square to Avon town line; completed 2006	4	2	2	4	0	1	13	High	The location has received several MassDOT projects and CTPS studies and it is not recommended for study.
Route 114	Salem	NSTF	4	MassDOT and Salem	Yes	2, 3	0	3	3.06	18 MBTA bus stops MBTA bus Routes 450, 451, 455, 456, 459, and 465 MBTA Commuter Rail at Salem and Beverly Ferry service	Yes	Yes One-half the segment abuts EJ zones.	Transportation Improvement Study for Routes 1A, 114, and 107 and Other Roadways in Downtown Salem, 2005 CTPS study MassDOT Project #605332, Bridge Replacement (Route 114) North Street over North River; in preliminary design	3	2	2	4	1	1	13	High	NA
Route 1A	Salem	NSTF	4	MassDOT and Salem	Yes	2	0	2	2.81	16 MBTA bus stops MBTA bus Routes 455 and 459 MBTA Commuter Rail at Salem Ferry service	Yes	Yes The entire segment lies within EJ zones.	CTPS Lower North Shore Transportation Improvement Study proposed improvements for Route 1A in Revere in October 2000; an update may be necessary.	3	2	2	4	1	1	13	High	This arterial segment was not selected because the southern end of this arterial segment is included in the study of Route 1A at Winnin Square in Marblehead and in Swampscott; this location was selected as the subject of the FFY 2016 Priority Corridors Study.
Route 16	Wellesley	MWRC	6	MassDOT and Wellesley	Yes	3	0	5	3.57	MBTA Commuter Rail at Wellesley Square, Wellesley Hills, and Wellesley Farms MWRTA Route 8	N/A	Yes The southern end of the segment lies in an EJ zone.	MassDOT Project #94762, Bridge Rehabilitation, Route 16 (Washington Street) over Route 9, including relocation of retaining wall; completed summer 2010. MassDOT Project #600712, Reconstruction of Route 16 from Grantland Road to the Newton City Line. The work consisted of paving, drainage improvements, sidewalk reconstruction, traffic signals, and ornamental lighting on Route 16. A signal was installed at the Washington Street/Walnut Street intersection, and the pedestrian crossing 150 feet south of Hillside Road was upgraded, completed in 2004.	3	2	2	4	1	1	13	High	The location was suggested in 2014 LRTP outreach through verbal comments at a 495/MetroWest Partnership meeting.
Route 18	Weymouth	SSC	6	MassDOT	Yes	3	3	10	3.55	Nine MBTA bus stops MBTA bus Route 225 MBTA Commuter Rail at South Weymouth	Yes	Yes EJ zones lie adjacent to the segment.	MassDOT Project #601630—The project consists of reconstructing and widening Route 18 from Highland Place in Weymouth to Route 139 in Abington including the replacement of Bridge W-32-13 over the MBTA. The roadway widening will provide an additional travel lane in each direction. The proposed roadway cross section consists of four 11.5 foot travel lanes, two 5 foot shoulders and two 5.5 foot sidewalks. Shared accommodations for all users have been provided in accordance with applicable guidelines.	4	2	2	4	1	0	13	High	This arterial segment was not selected because a MassDOT project, currently in construction, would address problems in the entire segment and no study is needed at this time.
Route 129	Wilmington	NSPC	4	MassDOT and Wilmington	Yes	3	0	5	4.31	MBTA Commuter Rail at Wilmington, North Wilmington, Anderson/Woburn, and Reading	N/A	None	MassDOT Project #601732, Rehabilitation, Route 129 (Lowell Street) from Route 38 (Main Street) to Woburn Street. The project includes full-depth reconstruction and widening, accessible (ADA-compliant) sidewalks, new tree plantings, and bicycle accommodation within the newly paved shoulders. The intersection of Route 129 and 38 was realigned with new traffic signals and the bridge over Maple Meadow Brook was replaced; completed in 2009. MassDOT Project #608051 will reconstruct Route 38 from Route 62 to the Woburn city line and will add bike lanes, sidewalks, turn lanes, and signal upgrades; in preliminary design.	3	2	2	3	2	1	13	High	N/A
Route 2	Acton	MAGIC	3	MassDOT	Yes	2	0	1	2.80	MBTA Commuter Rail at South Acton and West Concord	N/A	Yes	MassDOT Project #604472, Resurfacing and Related Work on Route 2 (includes all of Acton); completed in spring 2014 MassDOT Project #607748, Intersection and Signal Improvements on Route 2 and Route 111 at Piper Road and Taylor Road; in preliminary design MassDOT Project #604609, Traffic Sign Replacement and Safety Improvements on Route 2; completed in summer 2009 TIP Project #606223, Bruce Freeman Rail Trail Construction (Phase II-B) in Acton and Concord to connect the trail across Route 2, programmed in FFY 2018 TIP	2	2	2	4	1	1	12	Medium	Location has MassDOT projects. A MassDOT road safety audit is scheduled for the Piper Road/Taylor Road intersection; the project is in the preliminary design phase. The MAGIC subregion expressed interest in a Route 2 study.

TABLE 1  
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Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Number of Top-200 High-Crash Locations 2013-15	Number of HSIP-Eligible Crash Clusters 2013-15**	Travel Time Index	Transit Service	Crowded or Late Bus	In or Near Environmental Justice Zone	Study, Project, or TIP Project	Safety Conditions***	Congested Conditions***	Multimodal Significance***	Regional Significance***	Regional Equity***	Implementation Potential***	Score	Priority Rating	Summary of Comments
Route 60	Arlington	ICC	4	Arlington	Yes	3	0	2	3.92	Eight MBTA bus stops MBTA bus Routes 67, 62, 76, 77, 78, 79, 80, 84, and 350	Yes	Yes	CTPS and MAPC Community Transportation Technical Assistance Program evaluated the high-crash location at the intersection at Massachusetts Avenue, March 2010.  MassDOT Project #606885, The contractor is planning to finish the rest of the bike route symbols and electric work, weather permitting (as of 01/06/2017); in construction.	3	2	3	3	0	1	12	Medium	N/A
Routes 2 and 16 (Alewife Brook Parkway)	Cambridge	ICC	6	DCR	Yes	2	0	2	5.77	MBTA bus Routes 79, 350, 62, 67, 74, 76, 78, 84, and 351 MBTA Rapid Transit on the Red Line MBTA Commuter Rail at Porter Square	Yes	Yes	Alewife Studies, Phase II, CTPS study (2009).  DCR announced a comprehensive study of the parkway system for bike lanes.  MassDOT Project #605637, Improvements at Route 2 and Route 16. The purpose of this project is to perform minor widening, eliminate a merge condition, and improve throughput capacity and vehicle queue storage at the intersection of Route 2 and Route 16 (Alewife Brook Parkway); under construction.	3	2	2	4	0	1	12	Medium	The Fresh Pond Residents Alliance identified Fresh Pond Parkway and Alewife Brook Parkway as locations in need of transportation improvements. Concerns include pedestrian safety of young students who walk to Shady Hill School because of high traffic volumes, environmental issues, and lack of livability.
Route 2 (Fresh Pond Parkway)	Cambridge	ICC	6	DCR	Yes	2	1	2	2.31	MBTA bus Routes 75, 71, 72, 73, 74, and 78 MBTA Red Line Rapid Transit MBTA Commuter Rail at Porter Square	Yes	Yes	DCR announced that the agency will conduct a traffic study of several intersections along Mount Auburn Street and Fresh Pond Parkway, in partnership with the City of Cambridge and the MBTA. The study will focus on safety measures, bus prioritization, and accessibility.  Conceptual TIP project #987 would acquire Minuteman Path right-of-way in Watertown to connect Minuteman Bikeway from Arlington, Cambridge, and Watertown to Dr. Paul Dudley White Bike Path in Boston.	3	2	2	4	0	1	12	Medium	The Fresh Pond Residents Alliance identified Fresh Pond Parkway and Alewife Brook Parkway as locations in need of transportation improvements. Concerns include pedestrian safety of young students who walk to Shady Hill School because of high traffic volumes, environmental issues, and lack of livability.
Route 16 (Revere Beach Parkway and Mystic Valley Parkway)	Medford	ICC	4	MassDOT	Yes	2, 3	2	4	4.18	MBTA bus Routes 90, 97, 99, 100, 106, 108, 110, 112, and 134 MBTA Rapid Transit on the Orange Line at Wellington and on the Red Line at Porter Square MBTA Commuter Rail at West Medford and Porter Square	Yes	Yes	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updating traffic information, assessing parkway conditions, and assessing and understanding deficiencies along the heavily cycled parkways.  #604660: Everett-Medford-Bridge Replacements, Revere Beach Parkway (Route 16), E-12-004=M-12-018 Over The Malden River (Woods Memorial Bridge) and M-12-017 Over MBTA and Rivers Edge Drive—The purpose of this project is to replace the existing non-operating draw bridge with a new fixed bridge. (Construction ends in 2020)	3	2	2	4	0	1	12	Medium	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.
Route 9	Natick	MWRC	3	MassDOT	Yes	2	0	8	4.30	MWRTA bus Routes 1, 4, 9, and 10	None	Yes	MassDOT Project #605091, Work consists of bridge repairs on four bridges over Route 9 and Speen Street, in preliminary design  MassDOT Project #605313 will reconstruct the Route 9/Route 27 interchange; 25% project design stage.  #607732: Framingham-Natick-Cochituate Rail Trail Construction Including Pedestrian Bridge, N-03-014, Over Route 9 and F-07-033=N-03-029 Over Route 30 (begins 2018/2019)  #608281: Framingham-Natick-Adaptive Signal Control On Route 9 (Worcester Road)—Installation of adaptive traffic control signal equipment, vehicle detection, communication equipment, and managing software at five traffic signals (three in Framingham plus two in Natick) on Route 9. (completed summer 2017)	3	2	1	4	1	1	12	Medium	This segment was not selected because, according to MassDOT District 3, the installation of an adaptive traffic control system for five signals and the reconstruction of the Route 9 and Oak Street intersection are currently under construction. The Route 9 and Route 27 interchange is currently in design.
Route 16	Newton	ICC	6	MassDOT and Newton	Yes	3	0	6	2.86	MBTA Routes 59, 170, 505, 553, 554, and 556 MBTA Green Line Rapid Transit MBTA Commuter Rail at West Newton	Yes	Yes	MassDOT Project #606780, Bridge Rehabilitation, Route 16 (Washington Street) over I-90, MBTA/CSX Corporation and Access Road; 25% package comments to DE (as of 02/19/2016).  Conceptual TIP #1067, Washington Street (Phase 2), from Commonwealth Avenue to Perkins Street	2	2	2	4	0	2	12	Medium	In FFY 2014, a subregional study was conducted on Washington Street in Newton.  The location was suggested in 2014 LRTP outreach through verbal comments at a 495/MetroWest Partnership meeting.



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Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Number of Top-200 High-Crash Locations 2013-15	Number of HSIP-Eligible Crash Clusters 2013-15**	Travel Time Index	Transit Service	Crowded or Late Bus	In or Near Environment Justice Zone	Study, Project, or TIP Project	Safety Conditions***	Congested Conditions***	Multimodal Significance***	Regional Significance***	Regional Equity***	Implementation Potential***	Score	Priority Rating	Summary of Comments
Route 3A	Quincy	ICC	6	MassDOT, DCR, and Quincy	Yes	3	1	6	3.76	MBTA bus Routes 201, 202, 210, 211, 212, 217, 275, 276, and 217 MBTA Red Line Rapid Transit at Quincy Center, Wollaston, and North Quincy MBTA Commuter Rail at Quincy Center	Yes	Yes The entire segment lies within or near EJ zones.	MassDOT Project #608569, Intersection improvements at Route 3A (Southern Artery) and Broad Street. The project is planned to be funded through the FFY 2021 TIP, in the preliminary design phase. MassDOT Project #605729, Intersection and signal improvements at Hancock Street and East/West Squantum streets. The project consists of widening and improvements to the intersection of Hancock Street with East and West Squantum Streets and improvements along Hancock Street to the MBTA access drive; completed in fall 2015. MassDOT Project #606518, As part of the Quincy Redevelopment project, the city plans to construct a new bridge over the existing MBTA tracks that will connect the downtown area at Market Square and Hancock Street and improve pedestrian conditions along Hancock Street; 25% package received (as of 12/16/2016) An FFY 2012 CTPS safety and operations study addressed	3	2	2	4	0	1	12	Medium	Route 3A (Hancock Street and Southern Artery) has received several improvement projects and a CTPS study. The location was suggested in the 2017 MPO outreach program.
Route 16 (Revere Beach Parkway)	Revere	ICC	4	MassDOT	Yes	2	0	3	2.86	MBTA bus Routes 110, 116, 117, 119, 424, 426, 428, 448, 449, 450, 455, and 459 MBTA Rapid Transit on Blue Line MBTA Commuter Rail at Chelsea	Yes	Yes The entire segment lies within EJ Zones.	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updating traffic information, assessing parkway conditions, and assessing and understanding deficiencies along the heavily cycled parkways. The Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.	2	2	3	4	0	1	12	Medium	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.
Route 1	Walpole	TRIC	5	MassDOT	Yes	3	0	2	2.53	MBTA Commuter Rail at Sharon and Walpole	N/A	Yes One EJ zone lies adjacent to the southern end of the segment.	MassDOT's I-95 South Corridor Study presented a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 and included a recommended plan of short-term and long-term improvements (June 2010) MassDOT Project #608480, Resurfacing and related work on Route 1, in preliminary design MassDOT Project #608599, Stormwater Improvements to treat discharges from Route 1, I-95, and Route 1A to the Neponset River and an Unnamed Tributary; in preliminary design	2	2	3	4	0	1	12	Medium	The location has MassDOT projects and studies and was not recommended for study by MassDOT Highway District 5.
Route 135	Wellesley	MWRC	6	MassDOT and Wellesley	Yes	3	0	3	2.97	MBTA Commuter Rail at Natick, Wellesley Square, and Wellesley Hills MWRTA bus Route 8	None	Yes Most of the segment lies adjacent to EJ zones.	No projects	3	2	2	3	1	1	12	Medium	None
Route 3A	Weymouth	SSC	6	MassDOT	Yes	3	0	1	2.74	30 MBTA bus stops MBTA bus Routes 220, 221, and 222 MBTA Commuter Rail at Quincy Center, Weymouth Landing/ East Braintree, and West Hingham Ferry service	Yes	Yes An EJ zone in Quincy is 0.2 miles from the segment.	MassDOT Project #608231, The intent of this project is to reconstruct Route 3A and address poor traffic operations along the corridor. The project will also upgrade accommodations for bicyclists and pedestrians; in design MassDOT Project #604382, Route 3A (Washington Street) Bridge; construction completed winter 2016/2017 MassDOT Project #608483, Work consists of resurfacing on Route 3A; in preliminary design	2	2	2	4	1	1	12	Medium	A road safety audit was completed for Route 3A in Weymouth in September 2016. The audit identified the problems and needs on the roadway, and suggested short-, medium-, and long-term improvements. MassDOT District 6 indicated that a study would probably be redundant as the audit provided the information needed to advance Project #608321 in design.
Route 62	Bedford	MAGIC	4	MassDOT and Bedford	No	5	0	1	3.65	Three MBTA bus stops MBTA bus Route 62	Yes	None	Great Road Project: Master Plan and Conceptual Design, prepared by VHB for the Town of Bedford in 2011. The plan was to improve pedestrian and bicycle access, recommend streetscape improvements that would highlight the "Center" of Bedford while taking into consideration traffic flow through the area, crosswalk locations, intersection and traffic control improvements, property access, and parking.	3	2	2	2	1	1	11	Medium	Forms part of Routes 4 and 225 arterial segment.
Route 99	Everett	ICC	4	Everett	Yes	3	0	3	3.23	40 MBTA bus stops MBTA bus Routes 97, 104, 105, 109, 110, 112, 99, and 106	Yes	Yes The entire segment lies within EJ zones.	MassDOT Project #602383 reconstructed Route 99 with a traffic signal upgrade, from Second Street to the Malden city line in 2008; completed autumn 2007. All work is complete except punch list work; completed 2008. MassDOT Project #602382 reconstructed Route 99 from Sweetser Circle to the Alford Street Bridge in 2013; completed spring 2013.	2	2	2	4	0	1	11	Medium	Not recommended for study because the MassDOT projects listed completely reconstructed Route 99 with signal improvements from Alford Street Bridge to the Malden city line.
Route 16	Holliston	MWRC	3	MassDOT and Holliston	Yes	3	0	2	2.09	MWRTA bus Route 6	None	None	MassDOT Project #605745, Reconstruction of Route 16 from Quail Run to the Sherborn town line; in preliminary design 2011 CTPS study, Route 126 Corridor: Transportation Improvement Study 2008 CTPS study, Washington Street (Route 16/126) at Hollis Street	3	2	1	2	1	2	11	Medium	Location has MassDOT projects and CTPS studies, which have not been implemented. The 495/MetroWest Partnership expressed interest in a Route 16 study. The section that experiences the most crashes is the town center portion (under Holliston jurisdiction). A road safety audit was performed for the town center portion in December 2012.

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Route 16	Natick	MWRC	3	Natick	Yes	3	0	0	2.21	None	N/A	Yes	No projects	1	2	2	3	1	2	11	Medium	The 495/MetroWest Partnership expressed interest in a Route 16 study. Specific issues in this segments include improvements to accommodate pedestrians and bicyclists.
Route 9	Newton	ICC	6	MassDOT	Yes	2	0	7	5.99	Six MBTA bus stops MBTA bus Routes 60, 52, and 59 MBTA Green Line	Yes	An EJ zone in Brookline is 0.3 miles from the segment.	MassDOT Project #604327, Resurfacing and Related Work on Route 9 (Boylston Street) from the Wellesley/Newton city line to Newton/Brookline city line; completed in summer 2012 MassDOT Project #601704, Reconstruction and Signal Improvements on Walnut Street, from Homer Street to Route 9; in design; 25% package received (as of 12/23/2013) MassDOT Project #606835, Reconstruction of Highland Avenue, Needham Street, and Charles River Bridge, from Webster Street to Route 9; 75% package received (as of 09/23/2016). MassDOT Project #604327, resurfaced this segment, including updates to guardrails and improvements to the existing drainage structures; construction was completed in 2012.	2	2	2	4	0	1	11	Medium	According to MassDOT District 6, improvements were recently made to accommodate new developments. An analysis of the new existing conditions would be helpful to compare with the future projected conditions.
Route 1	Norwood	TRIC	5	MassDOT	Yes	3	0	4	4.85	MBTA Commuter Rail at Islington, Dedham Corp Center, Endicott, Norwood Depot, Windsor Gardens, and Plimptonville	N/A	Yes One EJ zone lies adjacent to the southern end of the segment.	MassDOT's I-95 South Corridor Study, provided a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 that included a recommended plan of short-term and long-term improvements (June 2010) MassDOT Project #608052, Route 1 at Morse Street (approved by PRC Nov. 2014); in preliminary design MassDOT Project #605857, Route 1 at University Avenue and Everett Street; Town design is at pre-25% MassDOT Project #605321, Bridge Preservation, Route 1 over the Neponset River; in design stage	2	2	2	4	0	1	11	Medium	The location has MassDOT projects and studies and it is not recommended for study.
Route 1A	Revere	ICC	4	MassDOT	Yes	2	0	1	3.93	15 MBTA bus stops MBTA bus Routes 110, 116, 117, 411, 424, 426, 439, 441, 442, 448, 449, 450, and 455 MBTA Rapid Transit on Blue Line MBTA Commuter Rail at Chelsea and River Works	Yes	The entire segment lies within EJ zones.	Conceptual TIP Project #982, Mahoney Circle (Bell Circle) Grade Separation	2	2	2	4	0	1	11	Medium	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.
Route 9	Wellesley	MWRC	6	MassDOT	Yes	2	0	9	2.76	MBTA Commuter Rail at Wellesley Hills and Wellesley Farms MWRTA bus Route 1	None	None	MassDOT Project #601586, Intersection Improvements at Route 9 (Worcester Street) and Oak Street, from 1500 feet West of Oak Street to 300 feet East of Overbrook Drive, construction ended in spring 2015 MassDOT Project #607340, Resurfacing on Route 9, from Dearborn Street to the Natick town line, in preliminary design MassDOT Project #606530, Drainage Improvements along Route 9 Boulder Creek Culvert (Design Only); 25% design stage (as of 06/10/2015) MAPC Land Use/Corridor Study (fall 2013)	2	2	2	3	1	1	11	Medium	MassDOT has a preliminary assessment of this corridor that will develop into 25% design plans for roadway improvements.
Memorial Drive (Routes 2 and 3)	Cambridge	ICC	6	DCR	Yes	2	2	5	4.99	MBTA bus Routes 747, 1, 47, 64, 66, 70, 70A, 71, 73, 86, and 701 MBTA Rapid Transit available on the Red and Green Lines MBTA Commuter Rail at North Station, Back Bay, Yawkey, Porter Square, and Belmont	Yes	Most of the segment lies within or adjacent to EJ Zones.	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updating traffic information, assessing parkway conditions, and assessing and understanding deficiencies along the heavily cycled parkways.	3	2	1	4	0	0	10	Low	None
Route 2	Lincoln	MAGIC	4	MassDOT	Yes	2	0	2	2.93	MBTA Commuter Rail at Concord and Lincoln	N/A	None	MassDOT Project #602894, Crosby's Corner (2 at 2A) Improvements; under construction MassDOT Project #604629, Resurfacing and Related Work on Route 2; completed in 2010 FFY 2013 Priority Corridors for LRTP Needs Assessment Study (Concord and Lincoln)	2	2	2	2	1	1	10	Low	Route 2 was suggested during MPO outreach as a route experiencing congestion that affects MAGIC communities and Cambridge. There are many projects and studies conducted for this corridor, including the Route 2 (Crosby's Corner) improvements.
Route 3A	Marshfield	SSC	5	MassDOT	Yes	3	0	1	2.41	GATRA bus MBTA Commuter Rail at Greenbush	None	None	The corridor is within the limits of MassDOT Project #605664, Resurfacing and Related Work on Route 3A (Duxbury town line northerly to Scituate town line), work includes patching and microsurfacing, shoulder reconstruction, and drainage structures; 100% design stage; no construction funding identified	2	2	2	2	1	1	10	Low	None



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Route 135	Natick	MWRC	3	Natick	Yes	3	0	3	2.97	MWRTA bus Routes 10 and 11 MBTA Commuter Rail at Natick and West Natick	None	None	MassDOT Project #600573 reconstructed Route 135 in Natick in 2008. More extensive improvements were proposed in the downtown area, on East Central Street between North Main Street and Union Street, including signal upgrades, new sidewalks, pavement rehabilitation, and shoulders; Contract #32302 was completed; all construction operations have been suspended (as of 06/30/2007)  2010 CTPS study, West Central Street (Route 135) at Speen Street.	3	2	2	1	1	1	10	Low	Congestion in the downtown area; likely focus area would be on the intersection of Route 135 at Route 27 and the intersection of Route 135 at Speen Street because of the crash history of those locations.
Route 129	Reading	NSPC	4	MassDOT and Reading	Yes	3	0	0	3.06	11 MBTA bus stops MBTA bus Route 136 MBTA Commuter Rail at Wakefield, Reading, and Woburn	Yes	None	No projects	2	2	2	1	2	1	10	Low	None
Route 1	Sharon	TRIC	5	MassDOT	Yes	3	0	1	2.36	MBTA Commuter Rail at Sharon and Walpole	N/A	None	MassDOT's I-95 South Corridor Study, provided a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 that included a recommended plan of short-term and long-term improvements (June 2010)  MassDOT Project #603622, Bridge Rehabilitations, Route 1/Route I-95; completed in 2010	2	2	3	2	0	1	10	Low	Segment has MassDOT projects and studies.
Route 16	Sherborn	SWAP	3	Sherborn	Yes	3	0	0	2.96	None	N/A	None	2002 CTPS study, Traffic Congestion in SWAP Subregion: Sherborn Town Center Traffic-Flow Improvement Study  Conceptual TIP #915, Washington Street (Route 16)	1	2	1	3	1	2	10	Low	Location was suggested in 2014 LRTP outreach at a 495/MetroWest Partnership meeting.  The section that experiences the most crashes and congestion is the town center portion, where Route 16 and Route 27 combine and split.
Route 9	Southborough	MWRC	3	MassDOT	Yes	2	0	2	3.11	MWRTA bus Route 7	None	None	MAPC Land Use/Route 9 Corridor Study (fall 2013).  The CTPS Safety and Operations at Intersections study evaluated congestion and safety issues at the Route 9/Oak Hill Road/Central Street intersection in FFY 2012.  MassDOT's I-495/Route 9 study, November 2013. The western section of Route 9 in Southborough between the I-95 interchange and Crystal Pond Road was evaluated for short-term and long-term improvements as part of this study.  MassDOT Project #607172, Resurfacing and Related Work on Route 9, from Westborough to just west of White Bagley Road; construction ends in summer 2016	2	2	2	2	1	0	9	Low	Most of the intersections on this corridor have already been studied, as MassDOT District 3 has noted.
Route 1	Westwood	TRIC	6	MassDOT	Yes	3	0	0	3.49	None	N/A	None	MassDOT's I-95 South Corridor Study provided a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 and included a recommended plan of short-term and long-term improvements (June 2010)  MassDOT Project #603162, Route 128 Add-a-Lane Bridges (Bridge III), Route 1 and 1A over I-95/128; completed in 2012	1	2	2	3	0	1	9	Low	Segment has MassDOT projects and studies.
Route 3A	Scituate	SSC	5	MassDOT	Yes	3	0	0	2.21	MBTA Commuter Rail at Greenbush, North Scituate, and Cohasset	N/A	None	FFY 2013 Subregional Priority Corridor Study  The corridor is within the limits of MassDOT Project #605664, Resurfacing and Related Work on Route 3A (Duxbury town line northerly to Scituate town line); no construction funding identified. Work includes patching and microsurfacing, shoulder reconstruction, and drainage structures; 100% design stage.	1	2	2	1	1	1	8	Low	The FFY 2013 Subregional Priority Corridors Study was conducted within the segment. MassDOT District 5 comments refer to MassDOT Project #605664 (in the 100% design stage).
Route 62	Concord	MAGIC	4	Concord	Yes	3	0	0	3.66	MBTA Commuter Rail at Concord and West Concord	N/A	None	MassDOT Project #604646 Reconstruction of Main Street (Route 62) from Water Street to the Acton town line. The purpose of this project is to reconstruct a 1.2 mile section of Main Street. The project includes the reclamation and repaving of the existing roadway, installation of granite curbing, ADA, drainage upgrades, and the addition of a sidewalk from Brook Trail Road to the Acton Town Line.	1	2	1	1	1	1	7	Low	None

**Notes:**

**\*Functional Class**

2 = principal arterial; 3 = principal arterial other (rural minor arterial or urban principal arterial); 5 = minor arterial (urban minor arterial or rural major collector)

**\*\*Number of HSIP-eligible crash clusters**

HSIP-eligible crash clusters are defined by MassDOT as crash clusters that rank within the top five percent of crash clusters for each regional planning agency, based on the Equivalent Property Damage Only (EDPO) index. In the EDPO index, property damage only crashes are awarded one point each, crashes involving injuries are given five points each, and fatal crashes are given 10 points each. In the Boston region, the 896 intersections in the top five percent have crash clusters with a minimum EDPO value of 42.

**\*\*\*Selection Criteria**

Safety Conditions: Segment has a high crash rate for its functional class, contains an HSIP-eligible crash location, a top-200 high-crash location, and/or a significant number or HSIP-eligible clusters of pedestrian or bicycle crashes.

Congested Conditions: Segment has a Travel Time Index of at least 1.3 and/or of at least 2.0, that is, which signify that it experiences delays during peak periods.

Multimodal Significance: Segment supports transit or bicycle or pedestrian activities, has a need to improve these activities, and/or has a high volume of truck traffic serving regional commerce.

Regional Significance: Segment is in the National Highway System, carries a significant proportion of regional traffic, lies within 0.5 miles of Environmental Justice transportation analysis zones, and/or is essential for regional economic, cultural, or recreational development in the area.

Regional Equity: Location is in a subregion that has not had a priority corridor study before, or location is in a subregion that has not had a priority corridor study in the in last three years.

Implementation Potential: Improvements to the segment are proposed or endorsed by the roadway administrative agency (agencies), proposed or endorsed by the subregion and are a priority for the subregion, and/or have strong support from other stakeholders.

**Acronyms**

ADA = Americans with Disabilities Act. BAT = Brockton Area Transit Authority. CTPS = Central Transportation Planning Staff. DCR = Department of Conservation and Recreation. DEIR = Draft Environmental Impact Report. EJ = Environmental justice. FFY = Federal fiscal year. GATRA = Greater Attleboro Taunton Regional Transit Authority. HSIP = Highway Safety Improvement Program. ICC = Inner Core Committee. LRTP = Long-Range Transportation Plan. MAGIC = Minuteman Advisory Group on Interlocal Coordination. MAPC = Metropolitan Area Planning Council. MassDOT = Massachusetts Department of Transportation. MBTA = Massachusetts Bay Transportation Authority. MPO = Boston Region Metropolitan Planning Organization. MWRC = MetroWest Regional Collaborative. MWRTA = MetroWest Regional Transit Authority. NSPC = North Suburban Planning Council. NSTF = North Shore Task Force. PRC = MassDOT Project Review Committee. SSC = South Shore Coalition. SWAP = South West Advisory Planning Committee. TIP = Transportation Improvement Program. TRIC = Three Rivers Interlocal Council. UPWP = Unified Planning Work Program. VHB = Vanasse, Hangen, Brustlin Inc.

Source: Central Transportation Planning Staff.

## **Part &: Public Participation and Comments**



## Seth Asante

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**From:** Jay Monty  
**Sent:** Tuesday, September 4, 2018 10:14 AM  
**To:** Seth Asante  
**Cc:** Catherine Rollins Denisi; Mayor Carlo DeMaria  
**Subject:** RE: Route 16 Priority Corridor Study in Everett and Chelsea

Hi Seth,

Absolutely. We're thrilled to hear that MassDOT is moving forward with this project. Improving Rte 16 in Everett is a high priority of the City, particularly as it pertains to the pedestrian, bicycle and transit facilities on the corridor which are in most cases hazardous and in many cases non-existent. We have several large development projects along the corridor in various stages of permitting and construction which make this project all the more critical for the safety and mobility of our residents.

We will plan to participate in the study and (hopefully) re-design of the corridor in any way that is appropriate. I would suggest that the western limit of the project should extend slightly beyond Second Street and include the on-ramp from Rte 99 and pedestrian and bicycle connections from Rte 16 to Rte 99.

We look forward to participating and please let me know how we can be of assistance.

Thanks,

Jay

Jay Monty  
Transportation Planner  
Department of Planning and Development  
City of Everett  
484 Broadway, Rm 25  
Everett, MA 02149  
617-544-6033

---

**From:** Seth Asante [mailto:sasante@ctps.org]  
**Sent:** Tuesday, September 04, 2018 10:06 AM  
**To:** Jay Monty  
**Subject:** Route 16 Priority Corridor Study in Everett and Chelsea

Hi Jay,

MassDOT Highway Division's District 4 has suggested studying Route 16 (Revere Beach Parkway) from Second Street in Everett to Webster Avenue/Garfield Avenue in Chelsea, about 1.4 miles long. After reviewing the arterial segment, it is very likely that the MPO staff would recommend it for LRTP priority corridor study. MassDOT recently acquired Route 16 from I-93 in Medford to Route 145 in Revere from the Department of Conservation and Recreation and the entire section will be maintained by District 4.

A quick assessment indicates the arterial segment has six Highway Safety Improvement Program (HSIP) crash clusters, five of which are in the top-200 intersection crash clusters in Massachusetts. The intersection of Route 16 and Washington Avenue in Chelsea is also part of an HSIP pedestrian crash cluster. In addition, the segment experiences traffic congestion and has pedestrian and bicycle accommodation issues. The study would focus on Complete Streets solutions: accommodating bicyclists and pedestrians safely, closing gaps in sidewalk network, and addressing ADA issues. It will also address congestion by retiming and coordinating traffic signals to improve traffic flow, upgrading signal equipment, access management, as well as improving signage and wayfinding, and modernizing the roadway to MassDOT standards.

We would like to have broader support and participation in the study by engaging the communities in Everett and Chelsea. I am therefore contacting you to see if Everett has interest and willing to participate in a study. Please feel free to call or email me if you have any question.

Thank you,  
Seth

**Seth A. Asante, P.E.** | Chief Transportation Planner  
CENTRAL TRANSPORTATION PLANNING STAFF  
857.702.3644 | [sasante@ctps.org](mailto:sasante@ctps.org)  
[www.ctps.org/bostonmpo](http://www.ctps.org/bostonmpo)

Two Park Plaza, Suite 2100 | Boston, MA 02114-0200  
Tel: 617.504.9900 | Fax: 617.579.9499 | TTY: 617.579.9499





## Seth Asante

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**From:** DePriest, John  
**Sent:** Wednesday, September 5, 2018 7:56 AM  
**To:** 'Seth Asante'; Jay Monty  
**Cc:** Mark Abbott; Connie Raphael (DOT); Train, Alexander  
**Subject:** RE: Route 16 Priority Corridor Study in Everett and Chelsea

Yes, Chelsea will participate. I am cc'ing Alex Train, our infrastructure planner, on this email.

What will the City's role be in this study?

John DePriest, AICP  
Director of Planning & Development

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**From:** Seth Asante [mailto:[sasante@ctps.org](mailto:sasante@ctps.org)]  
**Sent:** Wednesday, August 29, 2018 4:35 PM  
**To:** Jay Monty; DePriest, John  
**Cc:** Mark Abbott; Connie Raphael (DOT)  
**Subject:** Route 16 Priority Corridor Study in Everett and Chelsea

Good Afternoon,

MassDOT Highway Division's District 4 has suggested studying Route 16 (Revere Beach Parkway) from Second Street in Everett to Webster Avenue/Garfield Avenue in Chelsea, about 1.4 miles long. After reviewing the arterial segment, it is very likely that the MPO staff would recommend it for LRTP priority corridor study. MassDOT recently acquired Route 16 from I-93 in Medford to Route 145 in Revere from the Department of Conservation and Recreation and the entire section will be maintained by District 4.

A quick assessment indicates the arterial segment has six Highway Safety Improvement Program (HSIP) crash clusters, five of which are in the top-200 intersection crash clusters in Massachusetts. The intersection of Route 16 and Washington Avenue in Chelsea is also part of an HSIP pedestrian crash cluster. In addition, the segment experiences traffic congestion and has pedestrian and bicycle accommodation issues. The study would focus on Complete Streets solutions: accommodating bicyclists and pedestrians safely, closing gaps in sidewalk network, and addressing ADA issues. It will also address congestion by retiming and coordinating traffic signals to improve traffic flow, upgrading signal equipment, access management, as well as improving signage and wayfinding, and modernizing the roadway to MassDOT standards.

We would like to have broader support and participation in the study by engaging the communities in Everett and Chelsea. I am therefore contacting you to see if Everett and Chelsea have interest and willing to participate in a study. Please feel free to call or email me if you have any question.

Thank you,  
Seth

**Seth A. Asante, P.E.** | Chief Transportation Planner  
CENTRAL TRANSPORTATION PLANNING STAFF  
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[www.ctps.org/bostonmpo](http://www.ctps.org/bostonmpo)

## Seth Asante

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**From:** Chen-Yuan Wang  
**Sent:** Wednesday, August 1, 2018 9:41 AM  
**To:** Seth Asante  
**Cc:** Mark Abbott  
**Subject:** FW: CTPS 2019 studies

Seth, FYI.

---

**From:** Raphael, Connie J. (DOT) <[connie.raaphael@state.ma.us](mailto:connie.raaphael@state.ma.us)>  
**Sent:** Tuesday, July 31, 2018 4:50 PM  
**To:** Chen-Yuan Wang ([cwang@ctps.org](mailto:cwang@ctps.org)) <[cwang@ctps.org](mailto:cwang@ctps.org)>; Mark Abbott ([mabbott@ctps.org](mailto:mabbott@ctps.org)) <[mabbott@ctps.org](mailto:mabbott@ctps.org)>  
**Subject:** FW: CTPS 2019 studies

Hi Chen-Yuan and Mark,

We have a suggestion for a corridor study in the future. MassDOT recent acquired Route 16 from I-93 in Medford to Route 145 in Revere. This entire section will be maintained by District 4. The section we would suggest studying would be from 2<sup>nd</sup> Street in Everett to Webster Ave/Garfield Ave in Chelsea.

Connie

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**From:** Suszynski, Frank G. (DOT)  
**Sent:** Monday, July 30, 2018 3:27 PM  
**To:** Raphael, Connie J. (DOT) <[Connie.Raphael@dot.state.ma.us](mailto:Connie.Raphael@dot.state.ma.us)>; Fallon, Brian M. (DOT) <[Brian.Fallon@dot.state.ma.us](mailto:Brian.Fallon@dot.state.ma.us)>; Gregg, John E. (DOT) <[John.Gregg@dot.state.ma.us](mailto:John.Gregg@dot.state.ma.us)>; Timoner, Sara (DOT) <[Sara.Timoner@dot.state.ma.us](mailto:Sara.Timoner@dot.state.ma.us)>  
**Subject:** RE: CTPS 2019 studies

Hi Connie,  
How about Revere Beach Parkway, formally DCR sections?

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**From:** Raphael, Connie J. (DOT)  
**Sent:** Monday, July 30, 2018 2:38 PM  
**To:** Suszynski, Frank G. (DOT); Fallon, Brian M. (DOT); Gregg, John E. (DOT); Timoner, Sara (DOT)  
**Subject:** CTPS 2019 studies

Hi all,

CTPS will be looking for priority corridors and expressway bottleneck locations to study next federal fiscal year. The corridors can also be areas, like the Medford Square study. The bottlenecks would be similar to the Route 3 at Route 128 recommendations. I haven't heard when they will need ideas for studies yet but will keep you informed.

Thanks

Connie



**Route 16 Priority Corridor Study in Chelsea and Milton**

**When: Monday, May 13, 2019 1:00 PM**

**Where: City Council Chambers, Chelsea City Hall, Third Floor, (500 Broadway)**

<b>Name</b>	<b>Affiliation</b>	<b>Email</b>
Tony Sousa	City of Everett	tony.sousa@ci.everett.ma.us
Jay Monty	City of Everett	jay.monty@ci.everett.ma.us
John DePriest	City of Chelsea	JDePriest@chelseama.gov
Alexander Train	City of Chelsea	<a href="mailto:ATrain@chelseama.gov">ATrain@chelseama.gov</a>
Brian Kyes	City of Chelsea	<a href="mailto:BKyes@chelseama.gov">BKyes@chelseama.gov</a>
Leonard Albanese	City of Chelsea	<a href="mailto:LAlbanese@chelseama.gov">LAlbanese@chelseama.gov</a>
Bert Taverna	City of Chelsea	<a href="mailto:BTaverna@chelseama.gov">BTaverna@chelseama.gov</a>
Fidel Maltez	City of Chelsea	<a href="mailto:FMaltez@chelseama.gov">FMaltez@chelseama.gov</a>
Lou Mammolette	City of Chelsea	<a href="mailto:LMammolette@chelseama.gov">LMammolette@chelseama.gov</a>
John Noftle	City of Chelsea	<a href="mailto:JNoftle@chelseama.gov">JNoftle@chelseama.gov</a>
Tom Ambrosino	City of Chelsea	<a href="mailto:TAmbrosino@chelseama.gov">TAmbrosino@chelseama.gov</a>
Ned Keefe	City of Chelsea	<a href="mailto:NKeefe@chelseama.gov">NKeefe@chelseama.gov</a>
Ben Cares	City of Chelsea	<a href="mailto:BCares@chelseama.gov">BCares@chelseama.gov</a>
Cassandra Gascon	MassDOT—Planning	Cassandra.Gascon@state.ma.us
Bryan Pounds	MassDOT—Planning	<a href="mailto:bryan.pounds@state.ma.us">bryan.pounds@state.ma.us</a>
Ethan Britland	MassDOT Planning	<a href="mailto:ethan.britland@state.ma.us">ethan.britland@state.ma.us</a>
Mikaela Niles	MassDOT Planning	<a href="mailto:makaela.Niles@dot.state.ma.us">makaela.Niles@dot.state.ma.us</a>
Connie Raphael	MassDOT—District 4	Connie.Raphael@state.ma.us
Sara Timoner	MassDOT—District 4	sara.timoner@state.ma.us
John Gregg	MassDOT—District 4	john.gregg@state.ma.us
Jeffrey Gomes	MassDOT—District 4	<a href="mailto:jeffrey.r.gomes@state.ma.us">jeffrey.r.gomes@state.ma.us</a>
Brian Levine	MassDOT—District 4	brian.levine@state.ma.us
Timothy Paris	MassDOT District 4	<a href="mailto:timothy.paris@dot.state.ma.us">timothy.paris@dot.state.ma.us</a>
Mark Abbott	Boston Region MPO	mabbott@ctps.org
Seth Asante	Boston Region MPO	<a href="mailto:sasante@ctps.org">sasante@ctps.org</a>

**Route 16 Priority Corridor Study in Chelsea and Everett  
Kickoff Meeting  
Mayor's Conference Room, 3<sup>rd</sup> Floor  
Everett City Hall,  
November 14, 2018, 2:00 PM — 3:00 PM**

**ATTENDANCE**

- Brian Levine, MassDOT—District 4
- Jeffrey Gomes, MassDOT—District 4
- Cassandra Gascon, MassDOT—Office of Transportation Planning
- Jay Monty, City of Everett
- John DePriest, City of Chelsea
- Alexander Train, City of Chelsea
- Mark Abbott, Boston Region MPO/CTPS
- Benjamin Erban, Boston Region MPO/CTPS
- Seth Asante, Boston Region MPO/CTPS

**MEETING SUMMARY**

**Summary of Study Tasks**

- Collect Stakeholder Input—throughout length of project.
- Collect Data for Analysis—intersection geometry, signal timings, turning movement counts (TMCs), automatic traffic recorder (ATR) counts, spot speed studies, crash data, community survey data—by January 2019
- Analyze Existing Conditions/Identify Problems—by March 2019
- Develop Conceptual Improvements—by May 2019
- Prepare Study Document for Review—by July 2019
- Final Report—by September 2019

**Issues and Concerns Raised**

- Traffic Congestion
  - High levels of congestion and high number of crashes throughout the study area were one of the main reasons it was selected as a priority corridor. Representatives from Chelsea mentioned that congestion seems to have worsened significantly over the past 5-10 years.
  - Observations of increased truck traffic were brought up as a contributing factor. CTPS will receive heavy vehicle volumes with the turning movement count data and detailed classification information with the three ATR/speed sites along Route 16. These data can help to show the role heavy vehicles play in increased congestion.
  - Significant queues on several of the minor approaches, particularly those at Second Street northbound and Everett Avenue northbound. There are several large industrial and commercial properties in the neighborhood to



the south, as well as some new developments, and these intersections may not be adequate to handle the growing trips to these areas. There also may have been recent traffic signal retiming that increased delay on some of the minor approaches.

- Jeff Gomes mentioned Sunday turning movement counts should also be collected in order to model Sunday signal coordination, which might be different from the weekday or Saturday configuration.
- **Traffic Safety**
  - Data from the MassDOT crash database show five top-200 crash clusters, seven HSIP-eligible crash clusters, one pedestrian crash cluster, and a high corridor crash rate, all of which is consistent with driver experience using the corridor.
- **Bicycle and Pedestrian Concerns**
  - At present, Route 16 is completely unsafe for cyclists. Alex Train mentioned he is an experienced biker and would never bike on any part of Route 16 east of Wellington.
  - There is some bicycle and pedestrian traffic generated by people working in nearby industrial properties in Everett or Malden. In particular, the New England Produce Center off Second Street attracts a significant amount of foot and bike traffic ahead of the start of the overnight shift. This is noticeable around 10 PM. Generally the shifts wrap up around 10 AM. These late trips could be missed by the turning movement counts (which also count bicycles and pedestrians) because they are so far from the peak periods. CTPS will monitor the 24-hour ATR counts for an associated increase in heavy vehicle traffic during these hours.
- **Other Comments**
  - Both cities expressed interest in posting a public survey similar to what CTPS has done in previous corridor studies in Canton and Milton. Any such survey should be available in Spanish, Portuguese, and Haitian Creole to reach all residents. CTPS should have the translation resources available for this.
  - Jeff Gomes mentioned that there are a few other ongoing studies and projects which overlap the corridor, including a VHB conditional assessment study extending from Winthrop Street to the Medford border (*Jeff provided a copy of the study to CTPS*), a project related to the impacts of the Casino, and a study related to the redevelopment of Suffolk Downs.
  - John DePriest said that the McDonalds at Washington Avenue will be demolished and rebuilt on the same parcel with more green space. The

driveway will also be moved 50 feet away from the intersection at Washington Avenue.

### **Follow-Up Tasks**

- **MassDOT**
  - Traffic signal timing plans and layouts from MassDOT Highway District 4 for the signalized intersections inside the corridor. *Jeff Gomes has already provided the signal timing information for all 10 traffic signals in the study corridor as well as speed limits and other layouts.*
  - ATRs and turning movement counts  
CTPS will update some of the requested locations to include Sunday counts and to clarify the location of ATR #11. *Request for turning movement counts has been updated to incorporate Sunday counts from 11:00 AM to 2:00 PM.*
  
- **Cities of Chelsea and Everett**
  - Any available data on recent or anticipated changes in land use within the corridor
  - Input on any questions they would like to see included on the online survey
  
- Any further feedback is welcome throughout the course of the study



**Route 16 Priority Corridor Study in Chelsea and Everett  
City Council Chambers, 3<sup>rd</sup> Floor  
Chelsea City Hall, 500 Broadway  
May 13, 2019, 1:00 PM**

**ATTENDANCE**

- Brian Levine, MassDOT—District 4
- Tim Paris, MassDOT—District 4
- Makaela Niles, MassDOT—Office of Transportation Planning
- Jay Monty, City of Everett
- John DePriest, City of Chelsea
- Bert Taverna, City of Chelsea
- Ben Cares, City of Chelsea
- Mark Abbott, Boston Region MPO/CTPS
- Seth Asante, Boston Region MPO/CTPS

**AGENDA**

1. Introductions
2. Existing conditions and problems
3. Short- and long-term improvement concepts
4. Feedback and other matters

**MEETING SUMMARY**

**Data Collection**

MPO staff presented data collected for the study, including traffic volumes, pedestrian and bicycle volumes, spot speed data, and crash data (2012-16).

**Existing Conditions**

MPO staff described the existing conditions, including the following:

- Conditions of the sidewalks, street lighting, pedestrian crossings, signal equipment, roadway pavement, pavement markings, and signage.
- Performance of the study intersections and the arterial segment in terms of delays, queues, levels of service, and travel time.
- Safety conditions including crash data summaries (2012-16), HSIP intersection clusters, and intersection and segment crash diagrams.
- Results of the community survey including observed problems and suggested improvements from residents.

## **Identified Problems**

- Poor accommodation for pedestrians and bicycles—poor sidewalk conditions, narrow pedestrian refuge areas, insufficient pedestrian crossing intervals, non-ADA-compliant wheelchair ramps, no countdown timers, no detection for bicycles, and parking on sidewalks.
- Outdated signal equipment—missing visors and backplates, rusty signal poles, poor visibility of post-mounted signals, poor left-turn signal displays, and outdated signal timing plans.
- Poor traffic operations—high levels of congestion, queues blocking intersections, and drivers running red light during peak periods.
- Poor traffic safety—high number of crashes, seven HSIP locations, and five top-200 high-crash locations.

## **Short-Term Improvements**

These are low-to-medium cost improvements. They include, but not limited to:

- Safety improvements for pedestrians and bicyclists by making wheelchair ramps ADA-compliant, upgrading poor sidewalks to MassDOT standards, widening median openings for pedestrian refuge areas, installing countdown timers, and bicycle detection at intersections.
- Traffic operations and control improvements such as retiming and coordinating signals, modifying clearance times to improve safety, upgrading existing traffic signal equipment to MassDOT/MUTCD standards, and better signal displays for left turn traffic.
- Formalizing left-turn lanes on the approaches of Everett Avenue and Webster/Garfield Avenues with pavement markings showing clearly the exclusive turn left lane and through/right turn lane.
- Better signage to improve wayfinding and lane configuration ahead
- Roadway resurfacing and new pavement markings.
- Routine street cleaning and trash/litter pickup.
- Increased police patrol/presence to reduce speeding, red light runners, parking on sidewalks, and blocking intersections.

## **Long-Term Improvements**

The long-term improvements include, but not limited to:

- A multi-use path on either side of Route 16 from Lewis Street to Everett Avenue for pedestrians and bicyclists.
- Sidewalks built to MassDOT standards between Everett Avenue and Webster Avenue.
- Accessible pedestrian signals and countdown timers to help expedite pedestrian crossings.



- Adaptive traffic signal control system to move traffic more efficiently through the corridor. It enables real time coordination and most beneficial where traffic patterns vary frequently because of diversions and incidents, and time-of-day signal coordination patterns are not sufficient to address the frequent and rapid fluctuations in traffic.
- Overhead mast-arm signal heads, with retroreflective backplates to increase visibility.
- An exclusive left-turn lane on the northbound approach of Second Street.
- Intersection geometric improvements at Second Street and Webster/Garfield Avenues to reduce conflicts between left turns and opposing through traffic.
- Concepts to address problems associated with the Route 16 westbound left-turn lane at Webster/Garfield Avenues.
- Access management to improve safety and traffic operations by consolidating business driveways through future developments

### **Issues and Concerns Raised at the Meeting**

- There is some coastal flooding during storms that has 2-3 inches of rain or at extreme high tides.
- Lots of puddling near Lewis Street.
- Encroachment of parking on sidewalks from business parking spaces.
- City of Everett rezoning, possible new development in future would consolidate driveway access to improve access management in the corridor.
- Chelsea – Route 16 and Route 107 coordination problems, developer paying for an RSA.
- New bike path from new Silver Line station, connecting to Market Basket. City of Chelsea would like to continue it to the Northern Strand bike path through a multi-use path proposed on Route 16 between Lewis Street and Everett Avenue.
- Proposed new ramp connecting Route 16 westbound to Route 1 northbound—possible mitigation from Suffolk Downs redevelopment.
- Guardrails are blocking access a crosswalk on Union Street
- No crosswalk on Route 16 at Union Street
- Provide pavement markings to formalize an exclusive left-turn lane and through/right lane on each approach of Everett Street—possible mitigation from City of Everett.

### **Follow-up Task**

- MPO staff would prepare a preliminary draft report by the end of June and submit it to the study advisory task force for review and comments.
- Any further feedback is welcome throughout the course of the study.

## Seth Asante

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**From:** Timoner, Sara (DOT)  
**Sent:** Friday, October 18, 2019 4:44 PM  
**To:** Seth Asante  
**Cc:** Son, Gloria H (DOT); Raphael, Connie J. (DOT)  
**Subject:** RE: Route 16 Priority Corridor Study, Chelsea and Everett

Hi Seth,

We've reviewed the Route 16 Corridor Study and have a few minor comments (mainly editorial):

- Were signal improvements constructed by the casino included as baseline in the study?
- The MUTCD does not recommend the use of HAWK signals at existing STOP or YIELD controlled intersections.
- The Route 16/Webster Ave/Garfield Ave WB left turn queue is actually due to non-working vehicle detector. Please include upgrading the signal detection as part of that intersection.
- The proposed multi-use path along Rt.16 ends at Everett Avenue in the study. Where will bicyclists wishing to go/coming from the east go?
- General: Table and Figure Numbers - Please check all references made throughout the report against the actual table and figure numbers.
- Page 38: Peak Hour Vs. Peak Period - On page 38, please change "peak hours" to "peak periods" since this refers to the three consecutive hours during which the data was collected.
- Page 57: AM peak hours - In both Table 7 and Table 9, AM peak hour is listed as 7:00AM - 8:00AM. In Figure 8 & Figure 28, The AM peak hour is listed as 6:30 AM-7:30AM. In Figure 15 & Figure 36, the AM peak hour is listed as 7:30 AM -8:30AM. On Page 36, the text states that the AM peak hour was 6:30 AM - 7:30 AM. Please clarify and update as appropriate.

Thanks and have a nice weekend!

Sara

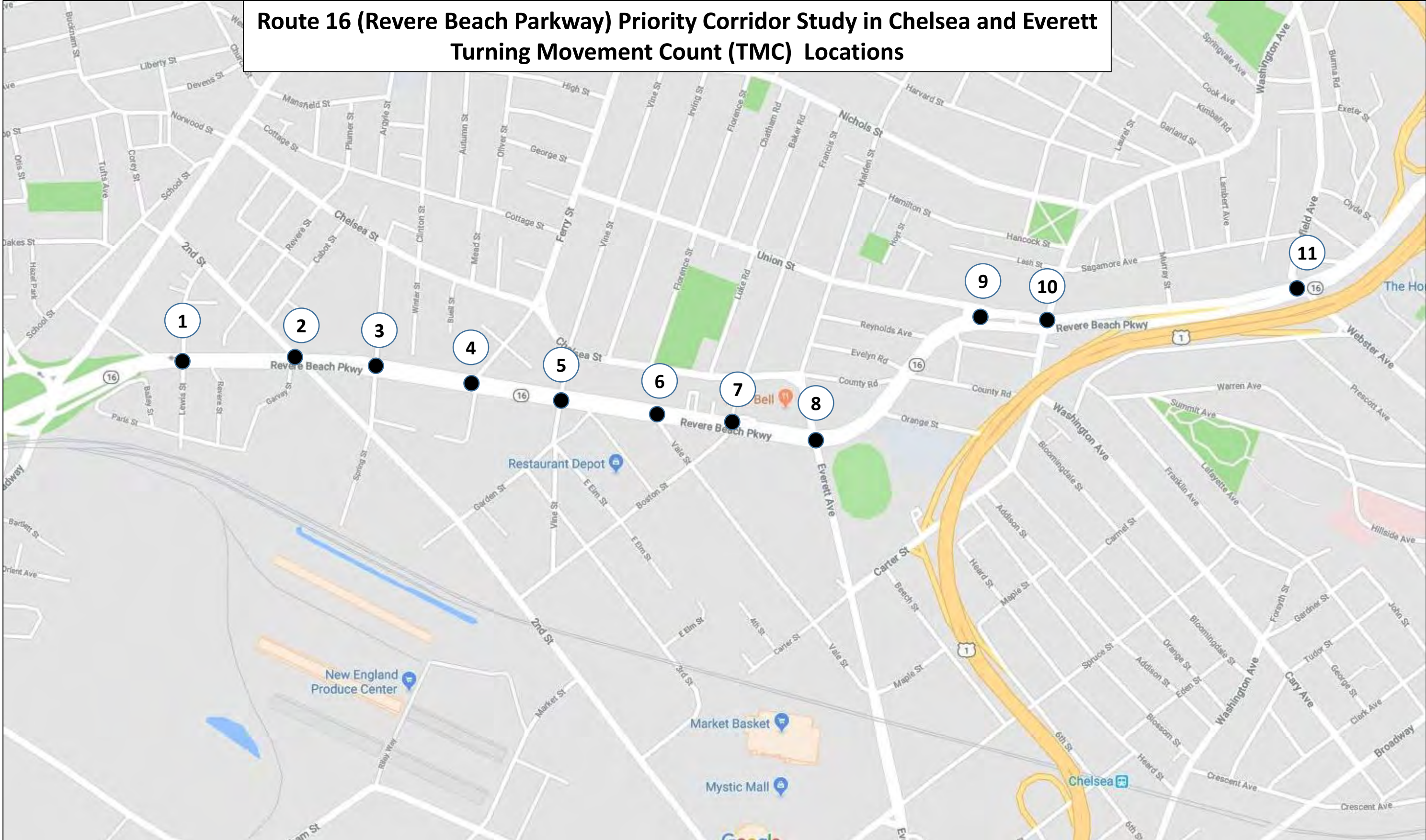
**Sara L. Timoner | Traffic Engineer | MassDOT | Highway Division | District 4**  
519 Appleton Street | Arlington, MA 02476 | p.(781)641-8435 | f.(781)646-5115 | [www.mass.gov/massdot](http://www.mass.gov/massdot)



# **Appendix B: Traffic Data Collection**

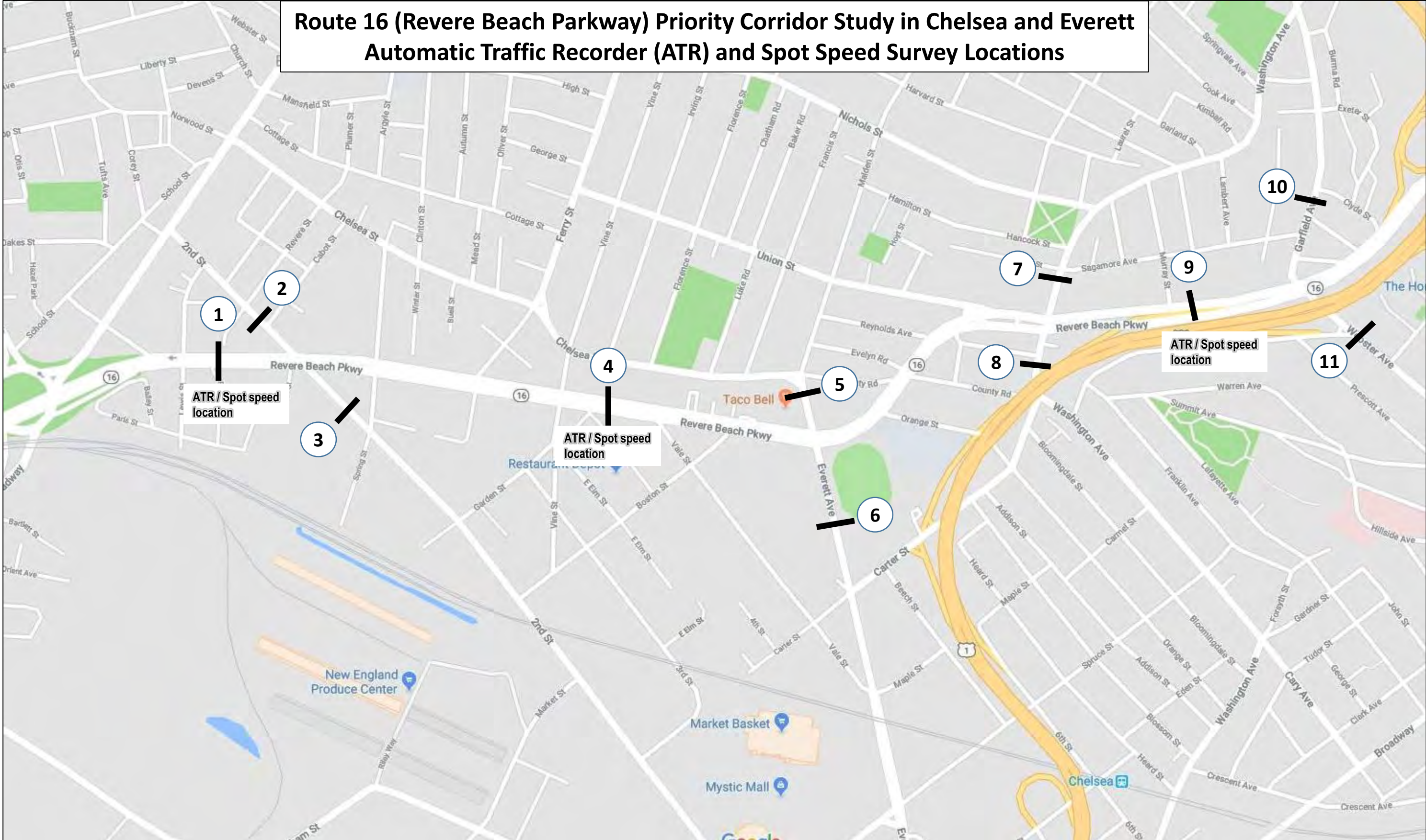
1. Turning Movement Count (TMC) Data
2. Automatic Traffic Recorder (ATR) Data

# Route 16 (Revere Beach Parkway) Priority Corridor Study in Chelsea and Everett Turning Movement Count (TMC) Locations





# Route 16 (Revere Beach Parkway) Priority Corridor Study in Chelsea and Everett Automatic Traffic Recorder (ATR) and Spot Speed Survey Locations



## **Part 2: Automatic Traffic Recorder (ATR) Data**



MassDOT Highway Division  
WEEKLY SUMMARY FOR LANE 1  
Starting: 4/23/2019

STA. 1 EB

Site Reference: 180480000155  
Site ID: 000000000103  
Location: Route 16 EB, west of Gladstone St.  
Direction: EAST

File: StalEB.prn  
City: Everett  
County:

TIME	MON 29	TUE 23	WED 24	THU 25	FRI 26	WKDAY AVG	SAT 27	SUN 28	WEEK AVG	TOTAL
01:00	591		577	540	647	588	737	834	654	3926
02:00	448		377	393	442	415	497	656	468	2813
03:00	396		363	344	486	397	408	572	428	2569
04:00	328		371	361	399	364	372	420	375	2251
05:00	462		473	448	494	469	327	244	408	2448
06:00	897		829	891	878	873	496	282	712	4273
07:00	1428		1372	1480	1449	1432	881	433	1173	7043
08:00	1836		1713	1858	1815	1805	1107	631	1493	8960
09:00	1642		1508	1537	1615	1575	1427	789	1419	8518
10:00	1711		1653	1770	1633	1691	1627	1038	1572	9432
11:00	1930		1722	1923	1823	1849	1831	1355	1764	10584
12:00	1985		1864	1946	1844	1909	1963	1681	1880	11283
13:00	2039		1856	2063	2079	2009	2136	1968	2023	12141
14:00	2109		2081	2140	2117	2111	2168	2163	2129	12778
15:00	2137	2015	2090	2214	2060	2103	2302	2155	2139	14973
16:00	2241	2305	2345	2273	2181	2269	2280	2168	2256	15793
17:00	2274	2421	2379	2470	2288	2366	2341	2073	2320	16246
18:00	2439	2451	2406	2426	2437	2431	2191	2014	2337	16364
19:00	2342	2288	2407	2376	2312	2345	2269	1776	2252	15770
20:00	1931	2015	2181	2151	1893	2034	1845	1475	1927	13491
21:00	1605	1598	1815	1709	1629	1671	1653	1380	1627	11389
22:00	1432	1239	1522	1498	1483	1434	1562	1138	1410	9874
23:00	1103	923	1231	1248	1380	1177	1397	992	1182	8274
24:00	834	718	993	1027	1036	921	1094	868	938	6570
TOTALS	36140	17973	36128	37086	36420	36238	34911	29105	34886	227763
% AVG WKDY	99.7	49.5	99.6	102.3	100.5		96.3	80.3		
% AVG WEEK	103.5	51.5	103.5	106.3	104.3		100	83.4		
AM Times	12:00		12:00	12:00	12:00	12:00	12:00	12:00	12:00	
AM Peaks	1985		1864	1946	1844	1909	1963	1681	1880	
PM Times	18:00	18:00	19:00	17:00	18:00	18:00	17:00	16:00	18:00	
PM Peaks	2439	2451	2407	2470	2437	2431	2341	2168	2337	

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 1 WB

Site Reference: 180480000580  
 Site ID: 000000000104  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: WEST

File: V-1-04.prn  
 City: EVERETT  
 County: VOL WB

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	205	262	261	215	313	251	411	351	288	2018
02:00	163	170	202	177	229	188	334	261	219	1536
03:00	127	177	149	170	174	159	261	228	183	1286
04:00	189	239	185	206	210	205	219	169	202	1417
05:00	477	558	539	532	484	518	304	169	437	3063
06:00	1054	1549	1436	1338	1412	1357	596	297	1097	7682
07:00	1588	2308	2015	1950	1848	1941	779	415	1557	10903
08:00	1390	1917	1419	1407	1495	1525	918	477	1289	9023
09:00	1380	1504	1462	1252	1434	1406	1026	642	1242	8700
10:00	1382	1709	1379	1360	1779	1521	1260	1024	1413	9893
11:00	1581	1724	1590	1744	1738	1675	1461	1170	1572	11008
12:00	1631	1697	1639	1752	1708	1685	1502	1290	1602	11219
13:00	1684	1768	1679	1742	1738	1722	1636	1336	1654	11583
14:00	1473	1786	1883	1860	1806	1761	1659	1412	1697	11879
15:00	1786	1836	1832	1824	1833	1822	1539	1487	1733	12137
16:00	1964	2012	1918	2133	2071	2019	1432	1245	1825	12775
17:00	1576	2001	1743	2082	2077	1895	1328	1293	1728	12100
18:00	1384	1949	1480	2096	1840	1749	1220	1076	1577	11045
19:00	1096	1518	1211	1751	1526	1420	1060	964	1303	9126
20:00	826	1218	944	1336	1272	1119	917	784	1042	7297
21:00	696	963	703	1030	1120	902	786	650	849	5948
22:00	561	713	579	777	902	706	706	568	686	4806
23:00	467	618	513	685	880	632	686	508	622	4357
24:00	307	444	354	478	585	433	493	335	428	2996
TOTALS	24987	30640	27115	29897	30474	28611	22533	18151	26245	183797
% AVG WKDY	87.3	107	94.7	104.4	106.5		78.7	63.4		
% AVG WEEK	95.2	116.7	103.3	113.9	116.1		85.8	69.1		
AM Times	12:00	07:00	07:00	07:00	07:00	07:00	12:00	12:00	12:00	
AM Peaks	1631	2308	2015	1950	1848	1941	1502	1290	1602	
PM Times	16:00	16:00	16:00	16:00	17:00	16:00	14:00	15:00	16:00	
PM Peaks	1964	2012	1918	2133	2077	2019	1659	1487	1825	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 2 NB

Site Reference: 180480000465  
 Site ID: 000000020102  
 Location: SENCOND ST., NORTH OF RTE.16  
 Direction: NORTH

File: V-2-0102.prn  
 City: EVERETT  
 County: VOL N&S

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	19	40	26	36	27	29	56	66	38	270
02:00	22	24	23	24	21	22	36	43	27	193
03:00	22	17	15	17	25	19	33	30	22	159
04:00	12	17	14	12	19	14	26	27	18	127
05:00	23	19	21	18	20	20	20	15	19	136
06:00	50	51	51	53	54	51	37	25	45	321
07:00	122	122	129	115	116	120	62	30	99	696
08:00	162	170	158	159	167	163	108	67	141	991
09:00	157	203	170	174	171	175	132	98	157	1105
10:00	173	194	175	157	170	173	170	122	165	1161
11:00	150	189	165	178	170	170	196	169	173	1217
12:00	178	175	172	168	184	175	246	172	185	1295
13:00	203	180	163	175	184	181	236	214	193	1355
14:00	259	188	187	200	195	205	216	174	202	1419
15:00	207	219	246	175	194	208	222	184	206	1447
16:00	193	180	198	195	208	194	236	199	201	1409
17:00	184	183	217	199	190	194	207	180	194	1360
18:00	196	231	216	222	211	215	204	208	212	1488
19:00	201	209	188	204	206	201	220	201	204	1429
20:00	180	161	171	164	190	173	185	136	169	1187
21:00	120	140	127	125	165	135	154	126	136	957
22:00	85	93	97	98	113	97	121	82	98	689
23:00	69	97	76	68	84	78	91	53	76	538
24:00	36	54	51	59	70	54	71	50	55	391
-----										
TOTALS	3023	3156	3056	2995	3154	3066	3285	2671	3035	21340
% AVG WKDY	98.5	102.9	99.6	97.6	102.8		107.1	87.1		
% AVG WEEK	99.6	103.9	100.6	98.6	103.9		108.2	88		
AM Times	12:00	09:00	10:00	11:00	12:00	09:00	12:00	12:00	12:00	
AM Peaks	178	203	175	178	184	175	246	172	185	
PM Times	14:00	18:00	15:00	18:00	18:00	18:00	13:00	13:00	18:00	
PM Peaks	259	231	246	222	211	215	236	214	212	

U4  
 NB 3066  
 SB 2346  
 -----  
 COMB AWD 5412  
 FAC .96(.93)  
 COMB ADT 4,800

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 2  
 Starting: 12/3/2018

STA. 2 SB

Site Reference: 180480000465  
 Site ID: 000000020102  
 Location: SENCOND ST., NORTH OF RTE.16  
 Direction: SOUTH

File: V-2-0102.prn  
 City: EVERETT  
 County: VOL N&S

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	10	13	37	11	12	16	22	55	22	160
02:00	4	10	20	8	5	9	15	31	13	93
03:00	7	11	12	14	12	11	13	16	12	85
04:00	15	17	15	14	17	15	16	17	15	111
05:00	22	23	25	27	30	25	20	20	23	167
06:00	69	71	67	55	73	67	38	17	55	390
07:00	150	173	174	179	153	165	68	36	133	933
08:00	180	244	219	198	209	210	81	51	168	1182
09:00	169	216	193	197	167	188	116	77	162	1135
10:00	126	152	126	139	143	137	131	102	131	919
11:00	124	156	113	123	118	126	154	100	126	888
12:00	144	145	116	135	128	133	166	126	137	960
13:00	127	141	134	131	129	132	194	123	139	979
14:00	144	163	125	129	124	137	150	119	136	954
15:00	166	196	172	174	153	172	143	122	160	1126
16:00	133	137	147	177	116	142	134	120	137	964
17:00	128	162	159	161	131	148	111	95	135	947
18:00	115	145	137	185	129	142	97	91	128	899
19:00	103	127	120	117	101	113	95	77	105	740
20:00	92	80	72	89	90	84	78	60	80	561
21:00	58	76	65	67	64	66	75	75	68	480
22:00	42	40	39	43	56	44	74	75	52	369
23:00	41	41	34	44	44	40	95	61	51	360
24:00	19	39	14	24	27	24	57	21	28	201
TOTALS	2188	2578	2335	2441	2231	2346	2143	1687	2216	15603
% AVG WKDY	93.2	109.8	99.5	104	95		91.3	71.9		
% AVG WEEK	98.7	116.3	105.3	110.1	100.6		96.7	76.1		
AM Times	08:00	08:00	08:00	08:00	08:00	08:00	12:00	12:00	08:00	
AM Peaks	180	244	219	198	209	210	166	126	168	
PM Times	15:00	15:00	15:00	18:00	15:00	15:00	13:00	13:00	15:00	
PM Peaks	166	196	172	185	153	172	194	123	160	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 3 NB

Site Reference: 180480000798  
 Site ID: 000000030102  
 Location: SENCOND ST., SOUTH OF RTE.16  
 Direction: NORTH

File: V-3-0102.prn  
 City: EVERETT  
 County: VOL N&S

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	49	52	46	59	58	52	84	74	60	422
02:00	43	54	68	47	53	53	57	49	53	371
03:00	37	48	40	65	38	45	50	36	44	314
04:00	46	43	40	40	45	42	43	27	40	284
05:00	112	82	112	93	106	101	68	37	87	610
06:00	247	281	281	315	285	281	175	77	237	1661
07:00	313	351	305	335	295	319	230	82	273	1911
08:00	294	279	267	260	248	269	279	155	254	1782
09:00	276	321	264	269	259	277	295	164	264	1848
10:00	367	383	322	314	386	354	389	280	348	2441
11:00	389	430	352	425	410	401	407	333	392	2746
12:00	366	396	402	410	407	396	407	327	387	2715
13:00	437	408	370	415	429	411	416	384	408	2859
14:00	468	435	411	444	425	436	409	386	425	2978
15:00	368	353	387	350	301	351	412	338	358	2509
16:00	348	382	403	329	344	361	385	373	366	2564
17:00	325	324	363	337	363	342	389	365	352	2466
18:00	373	390	376	358	350	369	347	357	364	2551
19:00	354	373	368	392	356	368	315	317	353	2475
20:00	276	296	295	278	300	289	274	226	277	1945
21:00	200	295	226	262	260	248	236	172	235	1651
22:00	125	159	142	178	184	157	153	110	150	1051
23:00	113	128	121	117	130	121	157	91	122	857
24:00	50	102	85	120	115	94	104	92	95	668
TOTALS	5976	6365	6046	6212	6147	6137	6081	4852	5944	41679
% AVG WKDY	97.3	103.7	98.5	101.2	100.1		99	79		
% AVG WEEK	100.5	107	101.7	104.5	103.4		102.3	81.6		
AM Times	11:00	11:00	12:00	11:00	11:00	11:00	11:00	11:00	11:00	
AM Peaks	389	430	402	425	410	401	407	333	392	
PM Times	14:00	14:00	14:00	14:00	13:00	14:00	13:00	14:00	14:00	
PM Peaks	468	435	411	444	429	436	416	386	425	

U3

NB 6137

SB 9324

comb AWD 15461

FAL .97(.96)

comb APT 14,400

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 2  
 Starting: 12/3/2018

STA. 3 SB

Site Reference: 180480000798  
 Site ID: 000000030102  
 Location: SENCOND ST., SOUTH OF RTE.16  
 Direction: SOUTH

File: V-3-0102.prn  
 City: EVERETT  
 County: VOL N&S

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	80	80	78	58	146	88	107	75	89	624
02:00	61	55	57	61	77	62	63	69	63	443
03:00	69	101	97	111	94	94	61	51	83	584
04:00	120	120	106	141	140	125	89	53	109	769
05:00	198	196	203	234	226	211	121	77	179	1255
06:00	366	359	327	393	387	366	181	88	300	2101
07:00	533	442	444	505	478	480	242	110	393	2754
08:00	545	569	550	581	650	579	299	182	482	3376
09:00	569	468	548	619	616	564	388	219	489	3427
10:00	598	598	561	592	680	605	422	310	537	3761
11:00	588	561	614	573	638	594	460	379	544	3813
12:00	595	531	554	564	737	596	558	413	564	3952
13:00	593	554	532	599	717	599	546	441	568	3982
14:00	524	547	597	544	690	580	561	509	567	3972
15:00	558	606	616	613	629	604	630	464	588	4116
16:00	538	536	557	649	553	566	590	465	555	3888
17:00	491	489	529	583	537	525	452	466	506	3547
18:00	512	449	477	596	376	482	442	380	461	3232
19:00	390	430	432	427	371	410	342	342	390	2734
20:00	297	319	315	421	369	344	333	273	332	2327
21:00	242	255	244	417	282	288	227	197	266	1864
22:00	208	212	238	288	236	236	163	157	214	1502
23:00	157	124	193	227	182	176	140	147	167	1170
24:00	114	124	141	203	169	150	108	104	137	963
TOTALS	8946	8725	9010	9999	9980	9324	7525	5971	8583	60156
% AVG WKDY	95.9	93.5	96.6	107.2	107		80.7	64		
% AVG WEEK	104.2	101.6	104.9	116.4	116.2		87.6	69.5		
AM Times	10:00	10:00	11:00	09:00	12:00	10:00	12:00	12:00	12:00	
AM Peaks	598	598	614	619	737	605	558	413	564	
PM Times	13:00	15:00	15:00	16:00	13:00	15:00	15:00	14:00	15:00	
PM Peaks	593	606	616	649	717	604	630	509	588	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 4/23/2019

STA. 4 EB

Site Reference: 180480000122  
 Site ID: 000000000403  
 Location: Route 16 EB, west of Vale St.  
 Direction: EAST

File: Sta.4EB.prn  
 City: Everett  
 County:

TIME	MON 29	TUE 23	WED 24	THU 25	FRI 26	WKDAY AVG	SAT 27	SUN 28	WEEK AVG	TOTAL
01:00	416		448	421	455	435	586	656	497	2982
02:00	294		284	291	322	297	396	540	354	2127
03:00	233		212	227	321	248	308	422	287	1723
04:00	170		215	222	260	216	265	326	243	1458
05:00	203		260	232	277	243	174	175	220	1321
06:00	512		498	550	521	520	300	177	426	2558
07:00	978		966	968	1028	985	513	275	788	4728
08:00	1228		1192	1251	1245	1229	676	432	1004	6024
09:00	1031		1017	971	1102	1030	888	586	932	5595
10:00	1042		1094	1132	1102	1092	1110	751	1038	6231
11:00	1249		1190	1286	1258	1245	1326	1028	1222	7337
12:00	1540		1373	1377	1340	1407	1409	1252	1381	8291
13:00	1407		1390	1545	1517	1464	1553	1441	1475	8853
14:00	1468	1357	1584	1571	1488	1493	1618	1645	1533	10731
15:00	1575	1576	1524	1603	1691	1593	1689	1563	1603	11221
16:00	1723	1709	1712	1618	1635	1679	1654	1539	1655	11590
17:00	1807	1873	1797	1920	1716	1822	1600	1540	1750	12253
18:00	1895	1867	1893	1801	1948	1880	1540	1468	1773	12412
19:00	1780	1807	1826	1822	1892	1825	1601	1370	1728	12098
20:00	1616	1719	1729	1790	1453	1661	1322	1213	1548	10842
21:00	1386	1386	1533	1465	1184	1390	1255	1055	1323	9264
22:00	1256	1134	1337	1342	1216	1257	1245	875	1200	8405
23:00	913	953	1068	1159	1039	1026	1118	728	996	6978
24:00	717	674	767	859	861	775	892	654	774	5424
TOTALS	26439	16055	26909	27423	26871	26812	25038	21711	25750	170446
% AVG WKDY	98.6	59.8	100.3	102.2	100.2		93.3	80.9		
% AVG WEEK	102.6	62.3	104.5	106.4	104.3		97.2	84.3		
AM Times	12:00		12:00	12:00	12:00	12:00	12:00	12:00	12:00	
AM Peaks	1540		1373	1377	1340	1407	1409	1252	1381	
PM Times	18:00	17:00	18:00	17:00	18:00	18:00	15:00	14:00	18:00	
PM Peaks	1895	1873	1893	1920	1948	1880	1689	1645	1773	

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 4/23/2019

STA. 4 WB

Site Reference: 180480000111  
 Site ID: 000000000404  
 Location: Route 16 WB, west of Vale St.  
 Direction: WEST

File: Sta.4WB.prn  
 City: Everett  
 County:

TIME	MON 29	TUE 23	WED 24	THU 25	FRI 26	WKDAY AVG	SAT 27	SUN 28	WEEK AVG	TOTAL
01:00	309		267	295	378	312	432	484	360	2165
02:00	218		154	194	283	212	308	439	266	1596
03:00	168		127	180	186	165	266	349	212	1276
04:00	229		187	251	227	223	222	272	231	1388
05:00	631		460	592	614	574	356	229	480	2882
06:00	1528		1295	1565	1492	1470	688	389	1159	6957
07:00	2161		1925	2090	1999	2043	994	593	1627	9762
08:00	1934		1506	1752	1786	1744	1250	749	1496	8977
09:00	1897		1495	1801	1843	1759	1334	1007	1562	9377
10:00	1661		1687	1915	1790	1763	1610	1323	1664	9986
11:00	1602		1457	1847	1604	1627	1812	1458	1630	9780
12:00	1567		1334	1635	1640	1544	1850	1698	1620	9724
13:00	1556		1390	1571	1710	1556	1913	1768	1651	9908
14:00	1548	1392	1524	1639	1764	1573	1853	1767	1641	11487
15:00	1925	1392	1727	1712	1960	1743	1932	1790	1776	12438
16:00	1849	1555	1915	1881	1961	1832	1846	1607	1802	12614
17:00	1995	1587	1804	1953	1825	1832	1727	1593	1783	12484
18:00	1889	1475	1752	1818	1766	1740	1628	1532	1694	11860
19:00	1520	1219	1516	1721	1574	1510	1579	1436	1509	10565
20:00	1436	1135	1490	1489	1427	1395	1451	1232	1380	9660
21:00	1219	960	1207	1386	1156	1185	1338	1082	1192	8348
22:00	1058	759	1045	1055	1031	989	1189	895	1004	7032
23:00	844	683	846	896	898	833	961	749	839	5877
24:00	568	418	487	604	627	540	716	506	560	3926
TOTALS	31312	12575	28597	31842	31541	30164	29255	24947	29138	190069
% AVG WKDY	103.8	41.6	94.8	105.5	104.5		96.9	82.7		
% AVG WEEK	107.4	43.1	98.1	109.2	108.2		100.4	85.6		
AM Times	07:00		07:00	07:00	07:00	07:00	12:00	12:00	10:00	
AM Peaks	2161		1925	2090	1999	2043	1850	1698	1664	
PM Times	17:00	17:00	16:00	17:00	16:00	16:00	15:00	15:00	16:00	
PM Peaks	1995	1587	1915	1953	1961	1832	1932	1790	1802	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 4/23/2019

STA. 5 NB

Site Reference: 000000000133  
 Site ID: 000000000501  
 Location: Everett Avenue NB, north of Rte.16  
 Direction: NORTH

File: Sta.5NB.prn  
 City: Everett  
 County:

TIME	MON 29	TUE 23	WED 24	THU 25	FRI 26	WKDAY AVG	SAT 27	SUN 28	WEEK AVG	TOTAL
01:00	119		143	114	136	128	170	132	135	814
02:00	58		88	84	64	73	98	142	89	534
03:00	48		31	42	50	42	94	95	60	360
04:00	36		32	35	39	35	53	61	42	256
05:00	30		30	54	34	37	39	48	39	235
06:00	94		103	107	76	95	67	40	81	487
07:00	245		204	184	161	198	114	71	163	979
08:00	323		365	329	280	324	196	122	269	1615
09:00	265		314	234	258	267	248	139	243	1458
10:00	314		440	291	318	340	297	209	311	1869
11:00	293		349	316	339	324	317	262	312	1876
12:00	394		428	403	454	419	414	339	405	2432
13:00	422	461	434	432	483	446	438	401	438	3071
14:00	368	470	392	411	467	421	512	426	435	3046
15:00	437	443	454	436	497	453	489	455	458	3211
16:00	573	487	620	526	663	573	481	406	536	3756
17:00	681	580	623	615	660	631	483	434	582	4076
18:00	661	668	664	624	629	649	533	418	599	4197
19:00	645	583	648	605	549	606	508	453	570	3991
20:00	554	544	543	504	543	537	480	386	507	3554
21:00	450	454	415	461	428	441	435	309	421	2952
22:00	372	405	419	395	418	401	379	328	388	2716
23:00	199	273	301	283	361	283	344	229	284	1990
24:00	107	200	182	178	271	187	215	158	187	1311
TOTALS	7688	5568	8222	7663	8178	7910	7404	6063	7554	50786
% AVG WKDY	97.1	70.3	103.9	96.8	103.3		93.6	76.6		
% AVG WEEK	101.7	73.7	108.8	101.4	108.2		98	80.2		
AM Times	12:00		10:00	12:00	12:00	12:00	12:00	12:00	12:00	
AM Peaks	394		440	403	454	419	414	339	405	
PM Times	17:00	18:00	18:00	18:00	16:00	18:00	18:00	15:00	18:00	
PM Peaks	681	668	664	624	663	649	533	455	599	

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 5 NB

Site Reference: 180480000857  
 Site ID: 000000050102  
 Location: EVERETT AVE., NORTH OF RTE.16  
 Direction: NORTH

File: V-5-0102nbedited.prn  
 City: EVERETT  
 County: VOL N&S

TIME	MON 3	TUE 4	WED	THU	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		136				136			136	136
02:00		84				84			84	84
03:00		50				50			50	50
04:00		41				41			41	41
05:00		50				50			50	50
06:00		94				94			94	94
07:00		264				264			264	264
08:00		317				317			317	317
09:00		344				344			344	344
10:00		332				332			332	332
11:00		366				366			366	366
12:00		440				440			440	440
13:00	484	495				489			489	979
14:00	529	472				500			500	1001
15:00	602	501				551			551	1103
16:00	654	615				634			634	1269
17:00	783	627				705			705	1410
18:00	776	612				694			694	1388
19:00	687	528				607			607	1215
20:00	591	509				550			550	1100
21:00	453	350				401			401	803
22:00	357	307				332			332	664
23:00	308	252				280			280	560
24:00	222	190				206			206	412
-----										
TOTALS	6446	7976	0	0	0	8467	0	0	8467	14422
-----										
% AVG WKDY	76.1	94.2								
% AVG WEEK	76.1	94.2								
-----										
AM Times		12:00				12:00			12:00	
AM Peaks		440				440			440	
-----										
PM Times	17:00	17:00				17:00			17:00	
PM Peaks	783	627				705			705	

U4

NB 8467  
 SB 12121  
 -----  
 COMB AWD 20588  
 FAC .96(.93)  
 COMB ADT 18,400



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 2  
 Starting: 12/3/2018

STA. 55B

Site Reference: 180480000857  
 Site ID: 000000050102  
 Location: EVERETT AVE., NORTH OF RTE.16  
 Direction: SOUTH

File: V-5-0102.prn  
 City: EVERETT  
 County: VOL N&S

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	117	52	75	143	160	109	227	217	141	991
02:00	80	44	45	92	139	80	191	165	108	756
03:00	41	34	33	58	102	53	141	108	73	517
04:00	82	46	50	50	77	61	76	81	66	462
05:00	105	92	104	133	137	114	105	58	104	734
06:00	254	255	262	304	328	280	156	79	234	1638
07:00	559	567	595	637	665	604	294	146	494	3463
08:00	645	673	640	806	769	706	390	219	591	4142
09:00	612	590	529	764	766	652	484	282	575	4027
10:00	480	497	446	607	741	554	707	407	555	3885
11:00	603	455	458	721	751	597	761	543	613	4292
12:00	735	474	521	768	840	667	893	568	685	4799
13:00	825	512	878	793	744	750	955	668	767	5375
14:00	795	521	855	870	909	790	840	755	792	5545
15:00	916	548	943	920	818	829	864	734	820	5743
16:00	745	582	890	865	919	800	904	576	783	5481
17:00	724	489	860	888	807	753	859	588	745	5215
18:00	736	499	933	1007	729	780	704	621	747	5229
19:00	545	507	859	793	821	705	715	744	712	4984
20:00	561	469	750	732	752	652	521	541	618	4326
21:00	386	370	582	636	593	513	421	426	487	3414
22:00	350	325	470	518	469	426	463	328	417	2923
23:00	322	227	362	446	415	354	396	338	358	2506
24:00	223	194	306	365	376	292	354	225	291	2043
TOTALS	11441	9022	12446	13916	13827	12121	12421	9417	11776	82490
% AVG WKDY	94.3	74.4	102.6	114.8	114		102.4	77.6		
% AVG WEEK	97.1	76.6	105.6	118.1	117.4		105.4	79.9		
AM Times	12:00	08:00	08:00	08:00	12:00	08:00	12:00	12:00	12:00	
AM Peaks	735	673	640	806	840	706	893	568	685	
PM Times	15:00	16:00	15:00	18:00	16:00	15:00	13:00	14:00	15:00	
PM Peaks	916	582	943	1007	919	829	955	755	820	

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 4/23/2019

Page: 1

STA. 5SB

Site Reference: 00000000112  
 Site ID: 00000000502  
 Location: Everett Avenue SB, north of Rte.16  
 Direction: SOUTH

File: Sta.5SB.prn  
 City: Everett  
 County:

TIME	MON 29	TUE 23	WED 24	THU 25	FRI 26	WKDAY AVG	SAT 27	SUN 28	WEEK AVG	TOTAL
01:00	122		61	108	115	101	134	193	122	733
02:00	71		52	60	76	64	108	172	89	539
03:00	49		50	49	39	46	80	97	60	364
04:00	48		38	47	57	47	72	89	58	351
05:00	85		87	78	92	85	96	57	82	495
06:00	226		250	274	237	246	129	86	200	1202
07:00	462		546	564	461	508	272	167	412	2472
08:00	703		714	685	701	700	361	243	567	3407
09:00	572		648	531	556	576	414	304	504	3025
10:00	503		434	454	440	457	514	410	459	2755
11:00	445		433	413	489	445	543	461	464	2784
12:00	410		472	472	506	465	538	401	466	2799
13:00	441	506	471	404	507	465	613	496	491	3438
14:00	437	476	452	387	490	448	584	531	479	3357
15:00	548	572	514	455	544	526	614	514	537	3761
16:00	558	541	501	549	501	530	532	458	520	3640
17:00	454	537	553	411	500	491	519	375	478	3349
18:00	411	518	574	467	456	485	495	424	477	3345
19:00	436	484	509	463	446	467	527	355	460	3220
20:00	421	498	476	474	458	465	483	373	454	3183
21:00	335	370	398	409	385	379	388	334	374	2619
22:00	270	331	343	354	288	317	357	288	318	2231
23:00	236	291	251	280	307	273	329	222	273	1916
24:00	154	204	162	176	206	180	274	168	192	1344
TOTALS	8397	5328	8989	8564	8857	8766	8976	7218	8536	56329
% AVG WKDY	95.7	60.7	102.5	97.6	101		102.3	82.3		
% AVG WEEK	98.3	62.4	105.3	100.3	103.7		105.1	84.5		
AM Times	08:00		08:00	08:00	08:00	08:00	11:00	11:00	08:00	
AM Peaks	703		714	685	701	700	543	461	567	
PM Times	16:00	15:00	18:00	16:00	15:00	16:00	15:00	14:00	15:00	
PM Peaks	558	572	574	549	544	530	614	531	537	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 4/23/2019

STA.6NB

Site Reference: 00000000146  
 Site ID: 000000060102  
 Location: Everett Avenue NB, south of Rte.16  
 Direction: NORTH

File: Sta.6NB.prn  
 City: Everett  
 County:

TIME	MON 29	TUE 23	WED 24	THU 25	FRI 26	WKDAY AVG	SAT 27	SUN 28	WEEK AVG	TOTAL
01:00	138		104	89	208	134	229	255	170	1023
02:00	123		66	60	146	98	192	233	136	820
03:00	94		28	48	99	67	142	136	91	547
04:00	95		52	46	94	71	122	122	88	531
05:00	154		79	101	180	128	128	98	123	740
06:00	402		245	253	431	332	219	105	275	1655
07:00	640		302	306	636	471	361	206	408	2451
08:00	764		250	300	756	517	504	277	475	2851
09:00	769		307	418	790	571	605	398	547	3287
10:00	775		397	344	764	570	676	518	579	3474
11:00	792		349	372	809	580	904	616	640	3842
12:00	859		411	411	977	664	913	717	714	4288
13:00	861	521	403	400	1099	656	999	794	725	5077
14:00	925	507	399	383	1009	644	966	838	718	5027
15:00	936	451	446	396	1053	656	922	757	708	4961
16:00	835	541	516	263	1007	632	932	804	699	4898
17:00	878	463	501	862	853	711	926	711	742	5194
18:00	872	488	444	847	860	702	838	717	723	5066
19:00	775	381	493	787	852	657	803	680	681	4771
20:00	860	396	422	849	753	656	771	577	661	4628
21:00	632	344	359	802	617	550	647	518	559	3919
22:00	335	296	296	629	590	429	576	422	449	3144
23:00	115	207	189	469	487	293	502	332	328	2301
24:00	9	144	143	357	385	207	355	267	237	1660
TOTALS	13638	4739	7201	9792	15455	10996	14232	11098	11476	76155
% AVG WKDY	124	43	65.4	89	140.5		129.4	100.9		
% AVG WEEK	118.8	41.2	62.7	85.3	134.6		124	96.7		
AM Times	12:00		12:00	09:00	12:00	12:00	12:00	12:00	12:00	
AM Peaks	859		411	418	977	664	913	717	714	
PM Times	15:00	16:00	16:00	17:00	13:00	17:00	13:00	14:00	17:00	
PM Peaks	936	541	516	862	1099	711	999	838	742	

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 4/23/2019

STA. 6 SB

Site Reference: 000000000146  
 Site ID: 000000060102  
 Location: Everett Avenue SB, south of Rte.16  
 Direction: SOUTH

File: Sta.6SB.prn  
 City: Everett  
 County:

TIME	MON	TUE 23	WED 24	THU 25	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00			104	89		96			96	193
02:00			66	60		63			63	126
03:00			28	48		38			38	76
04:00			52	46		49			49	98
05:00			79	101		90			90	180
06:00			245	253		249			249	498
07:00			302	306		304			304	608
08:00			250	300		275			275	550
09:00			307	418		362			362	725
10:00			397			397			397	397
11:00			349			349			349	349
12:00			411			411			411	411
13:00		521	403			462			462	924
14:00		507	399			453			453	906
15:00		451	446			448			448	897
16:00		541	516			528			528	1057
17:00		463	501			482			482	964
18:00		488	444			466			466	932
19:00		381	493			437			437	874
20:00		396	422			409			409	818
21:00		344	359			351			351	703
22:00		296	296			296			296	592
23:00		207	189			198			198	396
24:00		144	143			143			143	287
TOTALS	0	4739	7201	1621	0	7356	0	0	7356	13561
% AVG WKDY		64.4	97.8	22						
% AVG WEEK		64.4	97.8	22						
AM Times			12:00	09:00		12:00			12:00	
AM Peaks			411	418		411			411	
PM Times		16:00	16:00			16:00			16:00	
PM Peaks		541	516			528			528	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 7 NB

Site Reference: 180480000710  
 Site ID: 000000070102  
 Location: WASHINGTON ST., NORTH OF RTE.16  
 Direction: NORTH

File: V-7-0102.prn  
 City: CHELSEA  
 County: VOL N&S

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	73	73	89	82	90	81	141	156	100	704
02:00	38	49	60	45	63	51	93	116	66	464
03:00	44	33	37	36	51	40	81	80	51	362
04:00	24	24	17	30	32	25	51	43	31	221
05:00	26	26	36	30	37	31	31	37	31	223
06:00	67	76	84	91	74	78	58	32	68	482
07:00	160	163	163	161	156	160	104	60	138	967
08:00	199	225	206	195	221	209	125	106	182	1277
09:00	233	211	217	221	253	227	184	130	207	1449
10:00	213	209	202	239	214	215	265	175	216	1517
11:00	233	215	201	221	237	221	267	250	232	1624
12:00	277	242	265	249	269	260	349	300	278	1951
13:00	317	263	277	301	337	299	386	274	307	2155
14:00	303	313	311	275	313	303	332	350	313	2197
15:00	319	412	345	351	386	362	337	310	351	2460
16:00	427	415	431	462	455	438	397	366	421	2953
17:00	433	378	483	484	512	458	365	344	428	2999
18:00	496	474	442	405	496	462	346	302	423	2961
19:00	387	435	396	429	405	410	351	308	387	2711
20:00	302	353	297	352	360	332	301	244	315	2209
21:00	237	278	286	314	343	291	238	222	274	1918
22:00	225	243	263	244	277	250	283	203	248	1738
23:00	187	215	215	204	231	210	234	131	202	1417
24:00	146	150	148	161	215	164	202	120	163	1142
TOTALS	5366	5475	5471	5582	6027	5577	5521	4659	5432	38101
% AVG WKDY	96.2	98.1	98	100	108		98.9	83.5		
% AVG WEEK	98.7	100.7	100.7	102.7	110.9		101.6	85.7		
AM Times	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	
AM Peaks	277	242	265	249	269	260	349	300	278	
PM Times	18:00	18:00	17:00	17:00	17:00	18:00	16:00	16:00	17:00	
PM Peaks	496	474	483	484	512	462	397	366	428	

u4  
 NB 5577  
 SB 5306  
 -----  
 COMB AWD 10883  
 FAC .96(.93)  
 COMB ADT 9,700

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 2  
 Starting: 12/3/2018

STA. 7 SB

Site Reference: 180480000710  
 Site ID: 000000070102  
 Location: WASHINGTON ST., NORTH OF RTE.16  
 Direction: SOUTH

File: V-7-0102.prn  
 City: CHELSEA  
 County: VOL N&S

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	50	42	36	43	46	43	78	115	58	410
02:00	33	24	32	23	37	29	48	66	37	263
03:00	26	25	30	23	41	29	56	61	37	262
04:00	43	41	51	43	52	46	46	40	45	316
05:00	68	63	67	83	75	71	54	36	63	446
06:00	221	251	240	238	225	235	109	46	190	1330
07:00	358	383	395	357	373	373	165	108	305	2139
08:00	344	324	348	363	346	345	239	138	300	2102
09:00	390	380	370	337	369	369	281	183	330	2310
10:00	286	293	292	282	314	293	323	281	295	2071
11:00	283	279	280	281	303	285	359	315	300	2100
12:00	275	250	250	262	270	261	357	350	287	2014
13:00	262	253	300	274	281	274	378	358	300	2106
14:00	293	257	294	260	340	288	350	322	302	2116
15:00	292	299	302	307	302	300	311	304	302	2117
16:00	312	316	296	316	308	309	338	265	307	2151
17:00	309	285	308	285	338	305	335	318	311	2178
18:00	300	301	326	310	332	313	340	276	312	2185
19:00	311	273	298	281	320	296	316	197	285	1996
20:00	217	240	232	232	317	247	276	235	249	1749
21:00	174	177	210	188	225	194	202	165	191	1341
22:00	141	152	169	168	188	163	184	153	165	1155
23:00	134	122	126	134	175	138	192	119	143	1002
24:00	93	87	86	109	128	100	127	89	102	719
TOTALS	5215	5117	5338	5199	5705	5306	5464	4540	5216	36578
% AVG WKDY	98.2	96.4	100.6	97.9	107.5		102.9	85.5		
% AVG WEEK	99.9	98.1	102.3	99.6	109.3		104.7	87		
AM Times	09:00	07:00	07:00	08:00	07:00	07:00	11:00	12:00	09:00	
AM Peaks	390	383	395	363	373	373	359	350	330	
PM Times	16:00	16:00	18:00	16:00	14:00	18:00	13:00	13:00	18:00	
PM Peaks	312	316	326	316	340	313	378	358	312	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 8 NB

Site Reference: 180480000423  
 Site ID: 000000080102  
 Location: WASHINGTON ST., SOUTH OF RTE.16  
 Direction: NORTH

File: V-8-0102.prn  
 City: CHELSEA  
 County: VOL N&S

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	38	46	38	43	54	43	54	93	52	366
02:00	38	29	27	31	36	32	54	56	38	271
03:00	28	34	27	34	40	32	47	45	36	255
04:00	18	12	12	21	20	16	26	32	20	141
05:00	42	30	52	37	51	42	25	31	38	268
06:00	110	127	110	128	114	117	55	46	98	690
07:00	207	213	221	223	210	214	111	66	178	1251
08:00	250	248	246	250	274	253	135	107	215	1510
09:00	199	195	201	186	211	198	168	120	182	1280
10:00	194	175	196	204	191	192	219	184	194	1363
11:00	197	154	164	170	200	177	249	256	198	1390
12:00	182	190	193	186	196	189	258	262	209	1467
13:00	204	178	194	210	249	207	297	217	221	1549
14:00	228	202	242	207	256	227	278	251	237	1664
15:00	311	293	283	295	319	300	234	275	287	2010
16:00	322	326	358	358	376	348	296	249	326	2285
17:00	354	335	400	372	364	365	267	253	335	2345
18:00	349	339	347	355	369	351	262	191	316	2212
19:00	277	298	325	315	311	305	260	219	286	2005
20:00	195	247	235	217	230	224	214	170	215	1508
21:00	147	154	158	190	216	173	154	154	167	1173
22:00	129	146	122	150	174	144	181	119	145	1021
23:00	105	120	115	108	140	117	145	98	118	831
24:00	85	102	96	101	111	99	139	78	101	712
TOTALS	4209	4193	4362	4391	4712	4365	4128	3572	4212	29567
% AVG WKDY	96.4	96	99.9	100.5	107.9		94.5	81.8		
% AVG WEEK	99.9	99.5	103.5	104.2	111.8		98	84.8		
AM Times	08:00	08:00	08:00	08:00	08:00	08:00	12:00	12:00	08:00	
AM Peaks	250	248	246	250	274	253	258	262	215	
PM Times	17:00	18:00	17:00	17:00	16:00	17:00	13:00	15:00	17:00	
PM Peaks	354	339	400	372	376	365	297	275	335	

U4  
 NB 4365  
 SB 6743  
 COMB AWD 11108  
 FAC .96 (.93)  
 COMB ADT 9,900

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 2  
 Starting: 12/3/2018

STA. 85B

Site Reference: 180480000423  
 Site ID: 000000080102  
 Location: WASHINGTON ST., SOUTH OF RTE.16  
 Direction: SOUTH

File: V-8-0102.prn  
 City: CHELSEA  
 County: VOL N&S

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	26	64	51	54	92	57	109	76	67	472
02:00	6	46	42	43	62	39	81	23	43	303
03:00	3	40	33	41	47	32	75	16	36	255
04:00	1	25	40	36	34	27	43	9	26	188
05:00	22	52	52	54	57	47	44	4	40	285
06:00	122	172	182	177	167	164	77	9	129	906
07:00	376	416	420	428	360	400	131	21	307	2152
08:00	520	569	572	585	521	553	165	96	432	3028
09:00	636	645	463	547	454	549	189	55	427	2989
10:00	321	369	313	337	341	336	292	37	287	2010
11:00	348	321	294	321	317	320	343	73	288	2017
12:00	346	268	252	305	312	296	350	282	302	2115
13:00	293	283	282	338	379	315	402	343	331	2320
14:00	347	275	298	324	400	328	411	385	348	2440
15:00	488	402	447	469	445	450	408	371	432	3030
16:00	467	391	399	468	428	430	370	266	398	2789
17:00	434	399	380	467	417	419	403	200	385	2700
18:00	446	445	453	468	406	443	425	335	425	2978
19:00	395	396	406	423	390	402	288	279	368	2577
20:00	294	279	291	284	355	300	155	277	276	1935
21:00	247	240	259	274	289	261	179	250	248	1738
22:00	218	229	243	218	253	232	134	183	211	1478
23:00	177	198	178	201	238	198	110	108	172	1210
24:00	126	132	128	159	181	145	90	55	124	871
-----										
TOTALS	6659	6656	6478	7021	6945	6743	5274	3753	6102	42786
-----										
% AVG WKDY	98.7	98.7	96	104.1	102.9		78.2	55.6		
% AVG WEEK	109.1	109	106.1	115	113.8		86.4	61.5		
-----										
AM Times	09:00	09:00	08:00	08:00	08:00	08:00	12:00	12:00	08:00	
AM Peaks	636	645	572	585	521	553	350	282	432	
-----										
PM Times	15:00	18:00	18:00	15:00	15:00	15:00	18:00	14:00	15:00	
PM Peaks	488	445	453	469	445	450	425	385	432	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 9EB

Site Reference: 180480000100  
 Site ID: 000000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST

File: V-9-03.prn  
 City: CHELSEA  
 County: VOL EB

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	248	257	251	278	375	281	454	463	332	2326
02:00	152	160	185	195	208	180	290	281	210	1471
03:00	124	145	148	158	205	156	247	268	185	1295
04:00	136	126	117	147	155	136	188	177	149	1046
05:00	160	156	159	177	160	162	123	123	151	1058
06:00	312	339	321	300	324	319	164	131	270	1891
07:00	626	664	618	625	608	628	367	179	526	3687
08:00	727	874	740	821	886	809	471	310	689	4829
09:00	671	780	712	730	812	741	629	369	671	4703
10:00	786	826	782	783	768	789	775	545	752	5265
11:00	903	935	809	908	904	891	976	729	880	6164
12:00	939	940	875	920	888	912	1158	888	944	6608
13:00	1067	1028	1061	1040	1031	1045	1278	1069	1082	7574
14:00	1045	1058	1001	1021	1056	1036	1238	1167	1083	7586
15:00	1203	1218	1096	1103	1142	1152	1231	1120	1159	8113
16:00	1276	1383	1235	1149	1246	1257	1131	1083	1214	8503
17:00	1182	1249	1215	1207	1108	1192	1059	1042	1151	8062
18:00	1222	1258	1157	1170	985	1158	1057	999	1121	7848
19:00	939	989	1144	1036	878	997	999	875	980	6860
20:00	855	904	955	881	900	899	865	735	870	6095
21:00	763	749	699	901	846	791	761	656	767	5375
22:00	606	574	712	716	732	668	716	577	661	4633
23:00	515	502	648	616	693	594	628	407	572	4009
24:00	469	451	396	515	560	478	590	420	485	3401
-----										
TOTALS	16926	17565	17036	17397	17470	17271	17395	14613	16904	118402
% AVG WKDY	98	101.7	98.6	100.7	101.1		100.7	84.6		
% AVG WEEK	100.1	103.9	100.7	102.9	103.3		102.9	86.4		
AM Times	12:00	12:00	12:00	12:00	11:00	12:00	12:00	12:00	12:00	
AM Peaks	939	940	875	920	904	912	1158	888	944	
PM Times	16:00	16:00	16:00	17:00	16:00	16:00	13:00	14:00	16:00	
PM Peaks	1276	1383	1235	1207	1246	1257	1278	1167	1214	

U<sup>3</sup>  
 EB 17271  
 WB 21097  
 Comb AWD 38368  
 FAC .97 (.96)  
 Comb APT 35,700

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 9 WB

Site Reference: 180470000792  
 Site ID: 000000000904  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: WEST

File: V-9-04.prn  
 City: CHELSEA  
 County: VOL WB

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	151	186	204	190	246	195	299	330	229	1606
02:00	134	129	137	142	183	145	259	248	176	1232
03:00	126	135	119	135	165	136	205	220	157	1105
04:00	150	182	148	168	186	166	145	141	160	1120
05:00	322	396	351	346	407	364	188	120	304	2130
06:00	833	928	815	868	907	870	344	199	699	4894
07:00	1188	1444	1450	1317	1318	1343	490	308	1073	7515
08:00	1511	1667	1493	1386	1452	1501	681	327	1216	8517
09:00	1436	1569	1326	1266	1264	1372	809	553	1174	8223
10:00	1231	1329	1190	1187	1225	1232	942	734	1119	7838
11:00	1165	1219	1006	1153	1159	1140	1065	950	1102	7717
12:00	1118	1070	843	1175	1183	1077	1196	1059	1092	7644
13:00	1154	1160	853	1102	1149	1083	1139	1003	1080	7560
14:00	1177	1223	1112	1135	1214	1172	1261	1231	1193	8353
15:00	1303	1200	1172	1312	1280	1253	1188	1163	1231	8618
16:00	1338	1228	1255	1394	1322	1307	1068	1089	1242	8694
17:00	1323	1322	1291	1390	1399	1345	1105	1076	1272	8906
18:00	1260	1346	1177	1410	1278	1294	1124	976	1224	8571
19:00	1034	1075	1025	1152	1078	1072	1039	862	1037	7265
20:00	795	898	787	943	928	870	874	791	859	6016
21:00	620	681	650	683	785	683	734	658	687	4811
22:00	591	592	549	597	694	604	650	560	604	4233
23:00	445	498	483	521	674	524	596	433	521	3650
24:00	276	339	302	374	457	349	457	302	358	2507
TOTALS	20681	21816	19738	21346	21953	21097	17858	15333	19809	138725
% AVG WKDY	98	103.4	93.5	101.1	104		84.6	72.6		
% AVG WEEK	104.4	110.1	99.6	107.7	110.8		90.1	77.4		
AM Times	08:00	08:00	08:00	08:00	08:00	08:00	12:00	12:00	08:00	
AM Peaks	1511	1667	1493	1386	1452	1501	1196	1059	1216	
PM Times	16:00	18:00	17:00	18:00	17:00	17:00	14:00	14:00	17:00	
PM Peaks	1338	1346	1291	1410	1399	1345	1261	1231	1272	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 10 EB

Site Reference: 180480000005  
 Site ID: 000000100304  
 Location: GARFIELD AVE., NORTH/EAST OF RTE.16  
 Direction: EAST

File: V-10-0304.prn  
 City: CHELSEA  
 County: VOL N/E&SW

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	38	54	47	56	97	58	124	112	75	528
02:00	42	30	24	33	64	38	87	70	50	350
03:00	29	22	34	35	54	34	62	72	44	308
04:00	18	17	16	14	43	21	51	33	27	192
05:00	23	16	12	14	26	18	28	22	20	141
06:00	112	71	56	45	222	101	52	24	83	582
07:00	188	110	94	89	401	176	80	41	143	1003
08:00	280	194	165	193	520	270	139	59	221	1550
09:00	316	177	191	202	472	271	153	95	229	1606
10:00	319	167	176	171	384	243	277	268	251	1762
11:00	404	183	201	182	456	285	325	463	316	2214
12:00	406	194	190	197	353	268	446	476	323	2262
13:00	453	235	226	213	433	312	529	394	354	2483
14:00	391	246	245	259	408	309	507	456	358	2512
15:00	522	339	311	307	569	409	575	640	466	3263
16:00	609	391	439	358	674	494	517	550	505	3538
17:00	730	407	497	462	724	564	478	585	554	3883
18:00	694	527	448	467	718	570	455	559	552	3868
19:00	602	394	433	441	683	510	397	477	489	3427
20:00	479	334	252	477	514	411	350	333	391	2739
21:00	355	263	235	473	426	350	253	331	333	2336
22:00	261	195	200	366	356	275	251	218	263	1847
23:00	171	148	139	267	255	196	228	137	192	1345
24:00	72	91	124	178	164	125	139	89	122	857
TOTALS	7514	4805	4755	5499	9016	6308	6503	6504	6361	44596
% AVG WKDY	119.1	76.1	75.3	87.1	142.9		103	103.1		
% AVG WEEK	118.1	75.5	74.7	86.4	141.7		102.2	102.2		
AM Times	12:00	08:00	11:00	09:00	08:00	11:00	12:00	12:00	12:00	
AM Peaks	406	194	201	202	520	285	446	476	323	
PM Times	17:00	18:00	17:00	20:00	17:00	18:00	15:00	15:00	17:00	
PM Peaks	730	527	497	477	724	570	575	640	554	

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MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 4/23/2019

STA. 10 NB

Site Reference: 180480000163  
 Site ID: 000000001004  
 Location: Garfield Avenue NB, north of Rte.16  
 Direction: NORTH

File: Sta.10NB.prn  
 City: Chelsea  
 County:

TIME	MON 29	TUE 23	WED 24	THU 25	FRI 26	WKDAY AVG	SAT 27	SUN 28	WEEK AVG	TOTAL
01:00	76		54	68	71	67	114	134	86	517
02:00	41		32	55	54	45	69	160	68	411
03:00	32		25	21	31	27	72	125	51	306
04:00	21		12	25	32	22	29	83	33	202
05:00	34		22	20	29	26	18	31	25	154
06:00	68		43	61	63	58	42	41	53	318
07:00	193		131	131	140	148	100	50	124	745
08:00	269		266	231	283	262	139	81	211	1269
09:00	262		196	237	245	235	182	137	209	1259
10:00	227		191	184	177	194	230	203	202	1212
11:00	256		186	260	242	236	269	290	250	1503
12:00	255		212	268	301	259	396	356	298	1788
13:00	319		247	328	326	305	448	356	337	2024
14:00	336	235	297	325	327	304	411	430	337	2361
15:00	417	278	309	368	462	366	475	388	385	2697
16:00	477	407	500	555	510	489	443	422	473	3314
17:00	526	399	470	592	434	484	420	441	468	3282
18:00	537	409	518	487	539	498	431	384	472	3305
19:00	522	428	480	419	529	475	392	348	445	3118
20:00	487	316	384	445	356	397	375	329	384	2692
21:00	313	248	315	378	301	311	315	273	306	2143
22:00	307	242	292	316	255	282	263	159	262	1834
23:00	215	183	175	191	219	196	259	163	200	1405
24:00	152	110	150	160	140	142	171	131	144	1014
TOTALS	6342	3255	5507	6125	6066	5828	6063	5515	5823	38873
% AVG WKDY	108.8	55.8	94.4	105	104		104	94.6		
% AVG WEEK	108.9	55.8	94.5	105.1	104.1		104.1	94.7		
AM Times	08:00		08:00	12:00	12:00	08:00	12:00	12:00	12:00	
AM Peaks	269		266	268	301	262	396	356	298	
PM Times	18:00	19:00	18:00	17:00	18:00	18:00	15:00	17:00	16:00	
PM Peaks	537	428	518	592	539	498	475	441	473	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 4/23/2019

STA. 10 SB

Site Reference: 180480000101  
 Site ID: 000000001003  
 Location: Garfield Ave SB, north of Rte.16  
 Direction: SOUTH

File: Sta.10SB.prn  
 City: Chelsea  
 County:

TIME	MON 29	TUE 23	WED 24	THU 25	FRI 26	WKDAY AVG	SAT 27	SUN 28	WEEK AVG	TOTAL
01:00	48		52	76	82	64	88	144	81	490
02:00	38		36	55	50	44	87	106	62	372
03:00	35		44	41	48	42	48	80	49	296
04:00	47		60	71	54	58	51	70	58	353
05:00	75		88	85	91	84	60	59	76	458
06:00	271		286	278	267	275	111	76	214	1289
07:00	515		593	624	508	560	208	127	429	2575
08:00	567		748	738	619	668	285	169	521	3126
09:00	526		607	704	576	603	323	241	496	2977
10:00	341		429	554	409	433	372	300	400	2405
11:00	321		384	529	375	402	427	356	398	2392
12:00	287		313	462	368	357	454	428	385	2312
13:00	283		340	476	421	380	457	440	402	2417
14:00	252	407	373	506	382	384	442	470	404	2832
15:00	323	481	439	589	474	461	407	419	447	3132
16:00	361	516	480	643	430	486	455	385	467	3270
17:00	408	508	571	578	462	505	473	376	482	3376
18:00	422	479	527	574	417	483	437	370	460	3226
19:00	422	385	497	575	406	457	423	355	437	3063
20:00	358	347	464	469	352	398	402	323	387	2715
21:00	280	277	320	352	245	294	279	247	285	2000
22:00	197	226	257	290	216	237	254	195	233	1635
23:00	132	154	194	232	205	183	212	137	180	1266
24:00	105	115	111	138	146	123	143	96	122	854
TOTALS	6614	3895	8213	9639	7603	7981	6898	5969	7475	48831
% AVG WKDY	82.8	48.8	102.9	120.7	95.2		86.4	74.7		
% AVG WEEK	88.4	52.1	109.8	128.9	101.7		92.2	79.8		
AM Times	08:00		08:00	08:00	08:00	08:00	12:00	12:00	08:00	
AM Peaks	567		748	738	619	668	454	428	521	
PM Times	18:00	16:00	17:00	16:00	15:00	17:00	17:00	14:00	17:00	
PM Peaks	422	516	571	643	474	505	473	470	482	

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 12/3/2018

STA. 11 EB

Site Reference: 180480000455  
 Site ID: 000000110304  
 Location: WEBSTER AVE., SOUTH/WEST OF RTE. 16  
 Direction: EAST

File: V-11-0304.prn  
 City: CHELSEA  
 County: VOL N/E&S/W

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	96	102	90	137	160	117	224	187	142	996
02:00	78	88	72	68	137	88	149	150	106	742
03:00	65	46	61	72	104	69	128	136	87	612
04:00	45	44	42	52	60	48	68	69	54	380
05:00	78	92	68	80	90	81	69	46	74	523
06:00	218	239	226	216	222	224	97	62	182	1280
07:00	423	421	406	418	475	428	220	117	354	2480
08:00	530	546	534	535	572	543	320	200	462	3237
09:00	490	450	470	456	462	465	384	261	424	2973
10:00	511	429	472	474	554	488	537	367	477	3344
11:00	559	517	461	549	569	531	600	521	539	3776
12:00	584	497	539	589	604	562	644	537	570	3994
13:00	599	616	605	636	636	618	710	568	624	4370
14:00	640	660	615	751	725	678	714	625	675	4730
15:00	768	688	753	838	782	765	695	609	733	5133
16:00	885	744	870	876	828	840	726	582	787	5511
17:00	880	807	853	838	803	836	674	602	779	5457
18:00	895	825	772	779	815	817	640	631	765	5357
19:00	754	711	741	718	741	733	620	750	719	5035
20:00	632	609	547	619	616	604	506	687	602	4216
21:00	506	476	483	520	523	501	464	478	492	3450
22:00	383	373	343	393	421	382	402	298	373	2613
23:00	256	279	299	336	376	309	345	244	305	2135
24:00	192	223	236	262	245	231	278	193	232	1629
TOTALS	11067	10482	10558	11212	11520	10958	10214	8920	10557	73973
% AVG WKDY	100.9	95.6	96.3	102.3	105.1		93.2	81.4		
% AVG WEEK	104.8	99.2	100	106.2	109.1		96.7	84.4		
AM Times	12:00	08:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	
AM Peaks	584	546	539	589	604	562	644	537	570	
PM Times	18:00	18:00	16:00	16:00	16:00	16:00	16:00	19:00	16:00	
PM Peaks	895	825	870	876	828	840	726	750	787	

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EB 10958

WB 7311

COMB AWD 18269

FAC .96 (.93)

COMB ADT 16,300



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 1  
 Starting: 4/23/2019

STA. 11SB

Site Reference: 000000000137  
 Site ID: 000000110304  
 Location: Webster Avenue SB, south of Rte.16  
 Direction: SOUTH

File: Sta.11SB.prn  
 City: Chelsea  
 County:

TIME	MON	TUE 23	WED 24	THU 25	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00			54	83		68			68	137
02:00			48	56		52			52	104
03:00			64	80		72			72	144
04:00			129	132		130			130	261
05:00			148	136		142			142	284
06:00			298	256		277			277	554
07:00			526	470		498			498	996
08:00			541	413		477			477	954
09:00			162			162			162	162
10:00			25			25			25	25
11:00			31			31			31	31
12:00			17			17			17	17
13:00			21			21			21	21
14:00		339	20			179			179	359
15:00		432	40			236			236	472
16:00		421	50			235			235	471
17:00		417	44			230			230	461
18:00		456	299			377			377	755
19:00		424	449			436			436	873
20:00		369	436			402			402	805
21:00		277	319			298			298	596
22:00		242	257			249			249	499
23:00		157	170			163			163	327
24:00		94	103			98			98	197
-----										
TOTALS	0	3628	4251	1626	0	4875	0	0	4875	9505
-----										
% AVG WKDY		74.4	87.2	33.3						
% AVG WEEK		74.4	87.2	33.3						
-----										
AM Times			08:00	07:00		07:00			07:00	
AM Peaks			541	470		498			498	
-----										
PM Times		18:00	19:00			19:00			19:00	
PM Peaks		456	449			436			436	

ROAD CLOSURE

MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 2  
 Starting: 4/23/2019

STA. 11 NB

Site Reference: 000000000137  
 Site ID: 000000110304  
 Location: Webster Avenue NB, south of Rte.16  
 Direction: NORTH

File: Sta.11NB.prn  
 City: Chelsea  
 County:

TIME	MON 29	TUE 23	WED 24	THU 25	FRI 26	WKDAY AVG	SAT 27	SUN 28	WEEK AVG	TOTAL
01:00	225		154	162	215	189	318	393	244	1467
02:00	139		106	128	152	131	234	334	182	1093
03:00	142		85	100	132	114	269	318	174	1046
04:00	159		56	59	165	109	206	231	146	876
05:00	232		99	103	199	158	172	144	158	949
06:00	527		264	262	442	373	280	185	326	1960
07:00	1066		565	551	935	779	497	248	643	3862
08:00	1037		653	713	1165	892	651	344	760	4563
09:00	934		650	637	1082	825	782	555	773	4640
10:00	698		710	620	938	741	957	805	788	4728
11:00	776		744	888	1067	868	1129	960	927	5564
12:00	818		839	911	1029	899	1161	1169	987	5927
13:00	978		909	1020	1128	1008	1241	1188	1077	6464
14:00	900	734	1034	981	1195	968	1243	1277	1052	7364
15:00	1012	791	1108	1101	1447	1091	1337	1251	1149	8047
16:00	1305	944	1255	1321	1398	1244	1181	1229	1233	8633
17:00	1270	870	1152	1400	1197	1177	1280	1185	1193	8354
18:00	1310	871	1110	1423	1289	1200	1243	1131	1196	8377
19:00	1323	893	990	1331	1261	1159	1092	1064	1136	7954
20:00	1260	767	890	1264	1135	1063	1080	917	1044	7313
21:00	914	628	763	995	1025	865	941	791	865	6057
22:00	855	621	630	949	811	773	856	594	759	5316
23:00	594	438	432	566	710	548	649	436	546	3825
24:00	439	274	365	447	562	417	522	420	432	3029
TOTALS	18913	7831	15563	17932	20679	17591	19321	17169	17790	117408
% AVG WKDY	107.5	44.5	88.4	101.9	117.5		109.8	97.6		
% AVG WEEK	106.3	44	87.4	100.7	116.2		108.6	96.5		
AM Times	07:00		12:00	12:00	08:00	12:00	12:00	12:00	12:00	
AM Peaks	1066		839	911	1165	899	1161	1169	987	
PM Times	19:00	16:00	16:00	18:00	15:00	16:00	15:00	14:00	16:00	
PM Peaks	1323	944	1255	1423	1447	1244	1337	1277	1233	



MassDOT Highway Division  
 WEEKLY SUMMARY FOR LANE 2  
 Starting: 12/3/2018

STA. 11 WB

Site Reference: 180480000455  
 Site ID: 000000110304  
 Location: WEBSTER AVE., SOUTH/WEST OF RTE. 16  
 Direction: WEST

File: V-11-0304.prn  
 City: CHELSEA  
 County: VOL N/E&S/W

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	55	45	48	54	72	54	110	100	69	484
02:00	45	45	41	50	44	45	63	111	57	399
03:00	71	73	71	74	77	73	77	93	76	536
04:00	115	125	116	127	118	120	113	98	116	812
05:00	124	140	132	138	137	134	108	85	123	864
06:00	307	285	277	271	273	282	127	77	231	1617
07:00	413	451	458	473	390	437	164	93	348	2442
08:00	408	440	494	396	429	433	228	159	364	2554
09:00	162	488	445	250	256	320	260	193	293	2054
10:00	21	468	391	31	37	189	351	267	223	1566
11:00	34	409	369	43	33	177	399	342	232	1629
12:00	33	370	367	46	38	170	468	337	237	1659
13:00	59	384	384	47	61	187	537	457	275	1929
14:00	59	382	392	75	344	250	463	451	309	2166
15:00	33	456	410	100	392	278	483	438	330	2312
16:00	85	416	445	107	492	309	451	407	343	2403
17:00	174	494	441	160	416	337	388	357	347	2430
18:00	139	442	461	382	433	371	435	417	387	2709
19:00	182	419	385	403	422	362	399	88	328	2298
20:00	186	357	330	330	371	314	387	10	281	1971
21:00	180	275	272	307	293	265	293	98	245	1718
22:00	132	223	216	235	248	210	248	180	211	1482
23:00	115	141	160	173	209	159	179	116	156	1093
24:00	66	84	105	107	125	97	147	76	101	710
-----										
TOTALS	3198	7412	7210	4379	5710	5573	6878	5050	5682	39837
-----										
% AVG WKDY	57.3	132.9	129.3	78.5	102.4		123.4	90.6		
% AVG WEEK	56.2	130.4	126.8	77	100.4		121	88.8		
-----										
AM Times	07:00	09:00	08:00	07:00	08:00	07:00	12:00	11:00	08:00	
AM Peaks	413	488	494	473	429	437	468	342	364	
-----										
PM Times	20:00	17:00	18:00	19:00	16:00	18:00	13:00	13:00	18:00	
PM Peaks	186	494	461	403	492	371	537	457	387	

\* PARKING ON HOSE?

$$7412 + 7210 = 14622 / 2 = 7311$$

MassDOT Highway Division  
WEEKLY SUMMARY FOR LANE 1  
Starting: 12/3/2018

STA. 12

Site Reference: 180480000510  
Site ID: 000000001200  
Location: ON-RAMP FROM RTE. 99 TO RTE.16 EB  
Direction:

File: R-1200.prn  
City: EVERETT  
County: RAMP VOL

TIME	MON 10	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT 8	SUN 9	WEEK AVG	TOTAL
01:00	151	163	168	187	288	191	306	242	215	1505
02:00	116	114	118	113	133	118	173	204	138	971
03:00	87	94	107	122	130	108	187	185	130	912
04:00	82	96	76	104	112	94	135	120	103	725
05:00	104	92	114	124	113	109	114	61	103	722
06:00	145	181	155	137	166	156	121	83	141	988
07:00	197	206	198	213	212	205	211	118	193	1355
08:00	207	211	232	189	313	230	281	160	227	1593
09:00	211	191	196	200	367	233	341	203	244	1709
10:00	318	265	272	324	448	325	397	290	330	2314
11:00	361	375	331	361	505	386	462	324	388	2719
12:00	387	413	350	414	588	430	496	416	437	3064
13:00	412	404	430	390	607	448	517	457	459	3217
14:00	402	436	422	366	574	440	476	440	445	3116
15:00	378	420	477	386	510	434	453	448	438	3072
16:00	400	486	452	502	513	470	549	468	481	3370
17:00	396	473	468	439	532	461	476	454	462	3238
18:00	400	453	417	431	526	445	490	420	448	3137
19:00	460	492	481	479	515	485	429	369	460	3225
20:00	352	412	410	480	457	422	389	356	408	2856
21:00	317	383	394	559	464	423	375	329	403	2821
22:00	325	380	405	470	395	395	321	267	366	2563
23:00	364	320	400	448	414	389	364	250	365	2560
24:00	315	275	278	383	367	323	316	251	312	2185
TOTALS	6887	7335	7351	7821	9249	7720	8379	6915	7696	53937
% AVG WKDY	89.2	95	95.2	101.3	119.8		108.5	89.5		
% AVG WEEK	89.4	95.3	95.5	101.6	120.1		108.8	89.8		
AM Times	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	
AM Peaks	387	413	350	414	588	430	496	416	437	
PM Times	19:00	19:00	19:00	21:00	13:00	19:00	16:00	16:00	16:00	
PM Peaks	460	492	481	559	607	485	549	468	481	



## **Part 1: Turning Movement Count (TMC) Data**

**Everett - Route 16 and Lewis Street TM1 TMC - TMC**

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582540, Location: 42.403166, -71.056668

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction Time	Lewis Street Southbound						Route 16 Westbound						Lewis Street Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 6:00AM	37	14	10	0	61	6	7	2293	0	0	2300	1	12	10	28	0	50	2	3	1379	0	0	1382	11	3793
7:00AM	36	16	24	0	76	14	11	1766	0	0	1777	0	11	9	18	0	38	4	14	1537	0	0	1551	50	3442
8:00AM	24	12	15	0	51	6	14	1665	0	0	1679	1	13	6	11	1	31	1	14	1384	1	1	1400	10	3161
3:00PM	26	14	9	0	49	2	9	2225	0	0	2234	3	7	14	24	0	45	1	29	2238	0	1	2268	9	4596
4:00PM	27	14	9	0	50	6	5	2154	0	0	2159	9	9	14	22	0	45	10	29	2426	0	0	2455	11	4709
5:00PM	21	20	6	0	47	5	18	2219	0	0	2237	3	6	16	20	0	42	6	28	2385	0	0	2413	19	4739
2018-12-08 11:00AM	21	11	11	0	43	2	11	1863	0	0	1874	4	7	10	13	0	30	4	18	1766	1	1	1786	3	3733
12:00PM	24	18	20	0	62	3	23	1983	0	0	2006	5	9	11	18	0	38	11	32	1985	0	0	2017	0	4123
1:00PM	27	21	17	0	65	0	18	1874	0	0	1892	5	8	12	12	0	32	1	5	1850	1	0	1856	1	3845
2018-12-09 11:00AM	20	9	7	0	36	4	8	1699	0	1	1708	1	5	10	14	0	29	3	16	1386	0	1	1403	3	3176
12:00PM	22	13	8	0	43	0	7	1783	0	0	1790	0	10	6	17	0	33	4	11	1752	0	1	1764	3	3630
1:00PM	16	9	7	0	32	2	6	1684	0	0	1690	4	9	5	20	0	34	6	13	1958	0	0	1971	1	3727
<b>Total</b>	301	171	143	0	615	50	137	23208	0	1	23346	36	106	123	217	1	447	53	212	22046	3	5	22266	121	46674
% Approach	48.9%	27.8%	23.3%	0%	-	-	0.6%	99.4%	0%	0%	-	-	23.7%	27.5%	48.5%	0.2%	-	-	1.0%	99.0%	0%	0%	-	-	-
% Total	0.6%	0.4%	0.3%	0%	1.3%	-	0.3%	49.7%	0%	0%	50.0%	-	0.2%	0.3%	0.5%	0%	1.0%	-	0.5%	47.2%	0%	0%	47.7%	-	-
Motorcycles	1	0	0	0	1	-	0	9	0	0	9	-	0	0	0	0	0	-	0	5	0	0	5	-	15
% Motorcycles	0.3%	0%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Lights	300	167	138	0	605	-	136	22569	0	1	22706	-	105	121	214	0	440	-	210	21282	3	5	21500	-	45251
% Lights	99.7%	97.7%	96.5%	0%	98.4%	-	99.3%	97.2%	0%	100%	97.3%	-	99.1%	98.4%	98.6%	0%	98.4%	-	99.1%	96.5%	100%	100%	96.6%	-	97.0%
Single-Unit Trucks	0	3	4	0	7	-	1	408	0	0	409	-	1	1	2	1	5	-	0	420	0	0	420	-	841
% Single-Unit Trucks	0%	1.8%	2.8%	0%	1.1%	-	0.7%	1.8%	0%	0%	1.8%	-	0.9%	0.8%	0.9%	100%	1.1%	-	0%	1.9%	0%	0%	1.9%	-	1.8%
Articulated Trucks	0	0	0	0	0	-	0	153	0	0	153	-	0	0	0	0	0	-	1	271	0	0	272	-	425
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.7%	0%	0%	0.7%	-	0%	0%	0%	0%	0%	-	0.5%	1.2%	0%	0%	1.2%	-	0.9%
Buses	0	1	1	0	2	-	0	66	0	0	66	-	0	1	1	0	2	-	1	67	0	0	68	-	138
% Buses	0%	0.6%	0.7%	0%	0.3%	-	0%	0.3%	0%	0%	0.3%	-	0%	0.8%	0.5%	0%	0.4%	-	0.5%	0.3%	0%	0%	0.3%	-	0.3%
Bicycles on Road	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	0	1	0	0	1	-	4
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	50	-	-	-	-	-	36	-	-	-	-	-	53	-	-	-	-	-	121	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and Lewis Street TM1 TMC - TMC**

Thu Dec 6, 2018

AM Peak (Dec 06 2018 6:15AM - 7:15AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582540, Location: 42.403166, -71.056668

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Lewis Street Southbound						Route 16 Westbound						Lewis Street Northbound						Route 16 Eastbound						Int						
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*							
2018-12-06																															
6:15AM	12	1	2	0	15	0	2	646	0	0	648	0	1	1	7	0	9	0	0	330	0	0	330	4	1002						
6:30AM	12	3	2	0	17	2	1	557	0	0	558	0	1	3	7	0	11	1	0	359	0	0	359	3	945						
6:45AM	6	5	5	0	16	1	2	535	0	0	537	0	6	4	5	0	15	1	3	402	0	0	405	2	973						
7:00AM	9	6	3	0	18	1	2	508	0	0	510	0	2	0	6	0	8	1	3	396	0	0	399	4	935						
<b>Total</b>	<b>39</b>	<b>15</b>	<b>12</b>	<b>0</b>	<b>66</b>	<b>4</b>	<b>7</b>	<b>2246</b>	<b>0</b>	<b>0</b>	<b>2253</b>	<b>0</b>	<b>10</b>	<b>8</b>	<b>25</b>	<b>0</b>	<b>43</b>	<b>3</b>	<b>6</b>	<b>1487</b>	<b>0</b>	<b>0</b>	<b>1493</b>	<b>13</b>	<b>3855</b>						
% Approach	59.1%	22.7%	18.2%	0%	-	-	0.3%	99.7%	0%	0%	-	-	23.3%	18.6%	58.1%	0%	-	-	0.4%	99.6%	0%	0%	-	-	-						
% Total	1.0%	0.4%	0.3%	0%	1.7%	-	0.2%	58.3%	0%	0%	58.4%	-	0.3%	0.2%	0.6%	0%	1.1%	-	0.2%	38.6%	0%	0%	38.7%	-	-						
PHF	0.813	0.625	0.600	-	0.917	-	0.875	0.869	-	-	0.869	-	0.417	0.500	0.893	-	0.717	-	0.500	0.925	-	-	0.922	-	0.962						
Motorcycles	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	1						
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%						
Lights	39	15	11	0	65	-	7	2148	0	0	2155	-	9	8	25	0	42	-	6	1353	0	0	1359	-	3621						
% Lights	100%	100%	91.7%	0%	98.5%	-	100%	95.6%	0%	0%	95.7%	-	90.0%	100%	100%	0%	97.7%	-	100%	91.0%	0%	0%	91.0%	-	93.9%						
Single-Unit Trucks	0	0	0	0	0	-	0	65	0	0	65	-	1	0	0	0	1	-	0	60	0	0	60	-	126						
% Single-Unit Trucks	0%	0%	0%	0%	0%	-	0%	2.9%	0%	0%	2.9%	-	10.0%	0%	0%	0%	2.3%	-	0%	4.0%	0%	0%	4.0%	-	3.3%						
Articulated Trucks	0	0	0	0	0	-	0	28	0	0	28	-	0	0	0	0	0	-	0	48	0	0	48	-	76						
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	1.2%	0%	0%	1.2%	-	0%	0%	0%	0%	0%	-	0%	3.2%	0%	0%	3.2%	-	2.0%						
Buses	0	0	1	0	1	-	0	4	0	0	4	-	0	0	0	0	0	-	0	26	0	0	26	-	31						
% Buses	0%	0%	8.3%	0%	1.5%	-	0%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	1.7%	0%	0%	1.7%	-	0.8%						
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0						
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%						
Pedestrians	-	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	13							
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-							

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Lewis Street TM1 TMC - TMC**

Thu Dec 6, 2018

PM Peak (Dec 06 2018 3:45PM - 4:45PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582540, Location: 42.403166, -71.056668

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Lewis Street Southbound						Route 16 Westbound						Lewis Street Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 3:45PM	9	5	2	0	16	1	3	607	0	0	610	1	2	4	6	0	12	0	10	556	0	0	566	2	1204
4:00PM	8	3	4	0	15	0	2	530	0	0	532	3	1	5	3	0	9	5	6	607	0	0	613	3	1169
4:15PM	4	4	1	0	9	2	1	555	0	0	556	3	3	2	8	0	13	3	9	584	0	0	593	6	1171
4:30PM	7	4	3	0	14	1	2	567	0	0	569	0	4	4	8	0	16	0	8	647	0	0	655	0	1254
<b>Total</b>	28	16	10	0	54	4	8	2259	0	0	2267	7	10	15	25	0	50	8	33	2394	0	0	2427	11	4798
% Approach	51.9%	29.6%	18.5%	0%	-	-	0.4%	99.6%	0%	0%	-	-	20.0%	30.0%	50.0%	0%	-	-	1.4%	98.6%	0%	0%	-	-	-
% Total	0.6%	0.3%	0.2%	0%	1.1%	-	0.2%	47.1%	0%	0%	47.2%	-	0.2%	0.3%	0.5%	0%	1.0%	-	0.7%	49.9%	0%	0%	50.6%	-	-
PHF	0.778	0.800	0.625	-	0.844	-	0.667	0.930	-	-	0.929	-	0.625	0.750	0.781	-	0.781	-	0.825	0.925	-	-	0.926	-	0.956
Motorcycles	1	0	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	2
% Motorcycles	3.6%	0%	0%	0%	1.9%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Lights	27	15	10	0	52	-	8	2216	0	0	2224	-	10	15	24	0	49	-	33	2327	0	0	2360	-	4685
% Lights	96.4%	93.8%	100%	0%	96.3%	-	100%	98.1%	0%	0%	98.1%	-	100%	100%	96.0%	0%	98.0%	-	100%	97.2%	0%	0%	97.2%	-	97.6%
Single-Unit Trucks	0	0	0	0	0	-	0	27	0	0	27	-	0	0	1	0	1	-	0	44	0	0	44	-	72
% Single-Unit Trucks	0%	0%	0%	0%	0%	-	0%	1.2%	0%	0%	1.2%	-	0%	0%	4.0%	0%	2.0%	-	0%	1.8%	0%	0%	1.8%	-	1.5%
Articulated Trucks	0	0	0	0	0	-	0	13	0	0	13	-	0	0	0	0	0	-	0	20	0	0	20	-	33
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.6%	0%	0%	0.6%	-	0%	0%	0%	0%	0%	-	0%	0.8%	0%	0%	0.8%	-	0.7%
Buses	0	1	0	0	1	-	0	3	0	0	3	-	0	0	0	0	0	-	0	1	0	0	1	-	5
% Buses	0%	6.3%	0%	0%	1.9%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	1
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	4	-	-	-	-	-	7	-	-	-	-	-	8	-	-	-	-	-	11	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and Lewis Street TM1TMC - TMC**

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 12:30PM - 1:30PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582540, Location: 42.403166, -71.056668

Provided by: Precision Data Industries, LLC

(PDI)

46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Lewis Street Southbound							Route 16 Westbound							Lewis Street Northbound							Route 16 Eastbound							Int
	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		
2018-12-08 12:30PM	7	6	4	0	17	2		8	480	0	0	488	2		3	2	4	0	9	3		7	497	0	0	504	0		1018
12:45PM	3	4	9	0	16	0		4	490	0	0	494	0		2	1	4	0	7	6		6	495	0	0	501	0		1018
1:00PM	6	6	6	0	18	0		6	573	0	0	579	1		2	2	0	0	4	0		2	483	0	0	485	0		1086
1:15PM	5	4	5	0	14	0		6	502	0	0	508	1		2	3	7	0	12	1		3	515	0	0	518	0		1052
<b>Total</b>	21	20	24	0	65	2		24	2045	0	0	2069	4		9	8	15	0	32	10		18	1990	0	0	2008	0		4174
% Approach	32.3%	30.8%	36.9%	0%	-	-		1.2%	98.8%	0%	0%	-	-	28.1%	25.0%	46.9%	0%	-	-	0.9%	99.1%	0%	0%	-	-				
% Total	0.5%	0.5%	0.6%	0%	1.6%	-		0.6%	49.0%	0%	0%	49.6%	-	0.2%	0.2%	0.4%	0%	0.8%	-	0.4%	47.7%	0%	0%	48.1%	-				
PHF	0.750	0.833	0.667	-	0.903	-		0.750	0.892	-	-	0.893	-	0.750	0.667	0.536	-	0.667	-	0.643	0.966	-	-	0.969	-		0.961		
Motorcycles	0	0	0	0	0	-		0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-		0		
% Motorcycles	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-		0%		
Lights	21	20	23	0	64	-		24	2004	0	0	2028	-	9	8	15	0	32	-	18	1950	0	0	1968	-		4092		
% Lights	100%	100%	95.8%	0%	98.5%	-		100%	98.0%	0%	0%	98.0%	-	100%	100%	100%	0%	100%	-	100%	98.0%	0%	0%	98.0%	-		98.0%		
Single-Unit Trucks	0	0	1	0	1	-		0	31	0	0	31	-	0	0	0	0	0	-	0	27	0	0	27	-		59		
% Single-Unit Trucks	0%	0%	4.2%	0%	1.5%	-		0%	1.5%	0%	0%	1.5%	-	0%	0%	0%	0%	0%	-	0%	1.4%	0%	0%	1.3%	-		1.4%		
Articulated Trucks	0	0	0	0	0	-		0	8	0	0	8	-	0	0	0	0	0	-	0	12	0	0	12	-		20		
% Articulated Trucks	0%	0%	0%	0%	0%	-		0%	0.4%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0%	0.6%	0%	0%	0.6%	-		0.5%		
Buses	0	0	0	0	0	-		0	2	0	0	2	-	0	0	0	0	0	-	0	1	0	0	1	-		3		
% Buses	0%	0%	0%	0%	0%	-		0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0%	-		0.1%		
Bicycles on Road	0	0	0	0	0	-		0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-		0		
% Bicycles on Road	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-		0%		
Pedestrians	-	-	-	-	-	2		-	-	-	-	4		-	-	-	-	-	10		-	-	-	-	-	0			
% Pedestrians	-	-	-	-	-	100%		-	-	-	-	100%		-	-	-	-	-	100%		-	-	-	-	-	-			

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Second Street TM2 TMC - TMC**

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582541, Location: 42.403148, -71.053879

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction Time	Second Street Southbound						Route 16 Westbound						Second Street Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 6:00AM	89	45	29	0	163	1	84	2016	0	0	2100	1	2	30	224	0	256	0	416	1020	0	0	1436	1	3955
7:00AM	66	68	52	0	186	5	107	1546	0	0	1653	1	4	41	178	0	223	5	457	1188	2	0	1647	4	3709
8:00AM	34	78	62	0	174	4	110	1463	0	0	1573	2	3	51	176	0	230	5	443	981	0	0	1424	3	3401
3:00PM	61	41	35	0	137	3	105	1772	0	0	1877	2	9	63	243	1	316	4	503	1629	0	0	2132	9	4462
4:00PM	52	41	45	0	138	5	128	1844	1	0	1973	2	2	51	268	0	321	10	417	2095	0	0	2512	9	4944
5:00PM	62	60	32	0	154	3	133	1912	0	0	2045	5	4	48	260	0	312	1	465	1951	0	2	2418	3	4929
2018-12-08 11:00AM	57	57	40	0	154	4	136	1582	0	0	1718	2	11	89	281	0	381	5	446	1517	0	0	1963	4	4216
12:00PM	62	61	58	0	181	2	119	1620	0	0	1739	3	6	99	295	0	400	4	415	1665	0	1	2081	7	4401
1:00PM	56	58	42	0	156	1	123	1651	0	0	1774	0	13	80	294	0	387	2	418	1667	1	4	2090	5	4407
2018-12-09 11:00AM	38	46	38	0	122	3	97	1444	0	0	1541	0	7	58	238	0	303	5	308	1239	0	1	1548	9	3514
12:00PM	38	46	37	0	121	0	104	1463	0	0	1567	2	15	105	262	0	382	1	326	1594	0	3	1923	1	3993
1:00PM	20	55	48	0	123	2	77	1445	1	0	1523	1	13	96	267	2	378	1	369	1669	0	7	2045	3	4069
<b>Total</b>	635	656	518	0	1809	33	1323	19758	2	0	21083	21	89	811	2986	3	3889	43	4983	18215	3	18	23219	58	50000
<b>% Approach</b>	35.1%	36.3%	28.6%	0%	-	-	6.3%	93.7%	0%	0%	-	-	2.3%	20.9%	76.8%	0.1%	-	-	21.5%	78.4%	0%	0.1%	-	-	-
<b>% Total</b>	1.3%	1.3%	1.0%	0%	3.6%	-	2.6%	39.5%	0%	0%	42.2%	-	0.2%	1.6%	6.0%	0%	7.8%	-	10.0%	36.4%	0%	0%	46.4%	-	-
<b>Motorcycles</b>	0	1	2	0	3	-	2	12	0	0	14	-	0	3	2	0	5	-	1	12	0	0	13	-	35
<b>% Motorcycles</b>	0%	0.2%	0.4%	0%	0.2%	-	0.2%	0.1%	0%	0%	0.1%	-	0%	0.4%	0.1%	0%	0.1%	-	0%	0.1%	0%	0%	0.1%	-	0.1%
<b>Lights</b>	626	642	508	0	1776	-	1304	19350	2	0	20656	-	89	789	2772	3	3653	-	4634	17746	3	18	22401	-	48486
<b>% Lights</b>	98.6%	97.9%	98.1%	0%	98.2%	-	98.6%	97.9%	100%	0%	98.0%	-	100%	97.3%	92.8%	100%	93.9%	-	93.0%	97.4%	100%	100%	96.5%	-	97.0%
<b>Single-Unit Trucks</b>	7	11	5	0	23	-	12	275	0	0	287	-	0	14	117	0	131	-	178	274	0	0	452	-	893
<b>% Single-Unit Trucks</b>	1.1%	1.7%	1.0%	0%	1.3%	-	0.9%	1.4%	0%	0%	1.4%	-	0%	1.7%	3.9%	0%	3.4%	-	3.6%	1.5%	0%	0%	1.9%	-	1.8%
<b>Articulated Trucks</b>	0	1	0	0	1	-	0	68	0	0	68	-	0	0	77	0	77	-	151	122	0	0	273	-	419
<b>% Articulated Trucks</b>	0%	0.2%	0%	0%	0.1%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	2.6%	0%	2.0%	-	3.0%	0.7%	0%	0%	1.2%	-	0.8%
<b>Buses</b>	2	1	3	0	6	-	5	50	0	0	55	-	0	4	18	0	22	-	19	57	0	0	76	-	159
<b>% Buses</b>	0.3%	0.2%	0.6%	0%	0.3%	-	0.4%	0.3%	0%	0%	0.3%	-	0%	0.5%	0.6%	0%	0.6%	-	0.4%	0.3%	0%	0%	0.3%	-	0.3%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	3	0	0	3	-	0	1	0	0	1	-	0	4	0	0	4	-	8
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	33	-	-	-	-	-	21	-	-	-	-	-	43	-	-	-	-	-	58	
<b>% Pedestrians</b>	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and Second Street TM2 TMC - TMC**

Thu Dec 6, 2018

AM Peak (Dec 06 2018 6:15AM - 7:15AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582541, Location: 42.403148, -71.053879

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Second Street Southbound							Route 16 Westbound							Second Street Northbound							Route 16 Eastbound							Int
	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		
2018-12-06 6:15AM	29	10	10	0	49	0		17	571	0	0	588	0		1	5	68	0	74	0		103	232	0	0	335	0		1046
6:30AM	24	9	7	0	40	1		29	508	0	0	537	1		0	10	39	0	49	0		95	282	0	0	377	0		1003
6:45AM	17	19	7	0	43	0		18	453	0	0	471	0		0	6	56	0	62	0		115	303	0	0	418	0		994
7:00AM	17	10	7	0	34	2		22	454	0	0	476	0		2	10	42	0	54	0		113	313	0	0	426	1		990
<b>Total</b>	87	48	31	0	166	3		86	1986	0	0	2072	1		3	31	205	0	239	0		426	1130	0	0	1556	1		4033
% Approach	52.4%	28.9%	18.7%	0%	-	-		4.2%	95.8%	0%	0%	-	-	1.3%	13.0%	85.8%	0%	-	-	27.4%	72.6%	0%	0%	-	-		-		
% Total	2.2%	1.2%	0.8%	0%	4.1%	-		2.1%	49.2%	0%	0%	51.4%	-	0.1%	0.8%	5.1%	0%	5.9%	-	10.6%	28.0%	0%	0%	38.6%	-		-		
PHF	0.750	0.632	0.775	-	0.847	-		0.741	0.870	-	-	0.881	-	0.375	0.775	0.754	-	0.807	-	0.926	0.905	-	-	0.915	-		0.964		
Motorcycles	0	0	0	0	0	-		0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-		1		
% Motorcycles	0%	0%	0%	0%	0%	-		0%	0.1%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-		0%		
Lights	86	46	31	0	163	-		84	1939	0	0	2023	-	3	28	161	0	192	-	368	1048	0	0	1416	-		3794		
% Lights	98.9%	95.8%	100%	0%	98.2%	-		97.7%	97.6%	0%	0%	97.6%	-	100%	90.3%	78.5%	0%	80.3%	-	86.4%	92.7%	0%	0%	91.0%	-		94.1%		
Single-Unit Trucks	1	1	0	0	2	-		2	34	0	0	36	-	0	2	28	0	30	-	25	44	0	0	69	-		137		
% Single-Unit Trucks	1.1%	2.1%	0%	0%	1.2%	-		2.3%	1.7%	0%	0%	1.7%	-	0%	6.5%	13.7%	0%	12.6%	-	5.9%	3.9%	0%	0%	4.4%	-		3.4%		
Articulated Trucks	0	0	0	0	0	-		0	9	0	0	9	-	0	0	15	0	15	-	25	20	0	0	45	-		69		
% Articulated Trucks	0%	0%	0%	0%	0%	-		0%	0.5%	0%	0%	0.4%	-	0%	0%	7.3%	0%	6.3%	-	5.9%	1.8%	0%	0%	2.9%	-		1.7%		
Buses	0	1	0	0	1	-		0	3	0	0	3	-	0	1	1	0	2	-	8	17	0	0	25	-		31		
% Buses	0%	2.1%	0%	0%	0.6%	-		0%	0.2%	0%	0%	0.1%	-	0%	3.2%	0.5%	0%	0.8%	-	1.9%	1.5%	0%	0%	1.6%	-		0.8%		
Bicycles on Road	0	0	0	0	0	-		0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-		1		
% Bicycles on Road	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-		0%		
Pedestrians	-	-	-	-	-	3		-	-	-	-	-	1		-	-	-	-	-	0		-	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	-100%		-	-	-	-	-100%		-	-	-	-	-		-	-	-	-	-	-	-100%			

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Second Street TM2 TMC - TMC**

Thu Dec 6, 2018

PM Peak (Dec 06 2018 4PM - 5PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582541, Location: 42.403148, -71.053879

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Second Street Southbound						Route 16 Westbound						Second Street Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 4:00PM	12	10	15	0	37	2	34	464	0	0	498	0	0	15	70	0	85	3	108	553	0	0	661	4	1281
4:15PM	15	9	11	0	35	0	30	466	0	0	496	0	1	9	74	0	84	4	91	508	0	0	599	0	1214
4:30PM	10	13	14	0	37	1	34	466	1	0	501	1	0	10	70	0	80	0	120	547	0	0	667	0	1285
4:45PM	15	9	5	0	29	2	30	448	0	0	478	1	1	17	54	0	72	3	98	487	0	0	585	5	1164
<b>Total</b>	52	41	45	0	138	5	128	1844	1	0	1973	2	2	51	268	0	321	10	417	2095	0	0	2512	9	4944
<b>% Approach</b>	37.7%	29.7%	32.6%	0%	-	-	6.5%	93.5%	0.1%	0%	-	-	0.6%	15.9%	83.5%	0%	-	-	16.6%	83.4%	0%	0%	-	-	-
<b>% Total</b>	1.1%	0.8%	0.9%	0%	2.8%	-	2.6%	37.3%	0%	0%	39.9%	-	0%	1.0%	5.4%	0%	6.5%	-	8.4%	42.4%	0%	0%	50.8%	-	-
<b>PHF</b>	0.867	0.788	0.750	-	0.932	-	0.941	0.989	0.250	-	0.985	-	0.500	0.735	0.905	-	0.941	-	0.869	0.947	-	-	0.942	-	0.962
<b>Motorcycles</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	2	0	0	2	-	0	2	0	0	2	-	4
<b>% Motorcycles</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	3.9%	0%	0%	0.6%	-	0%	0.1%	0%	0%	0.1%	-	0.1%
<b>Lights</b>	52	41	45	0	138	-	127	1812	1	0	1940	-	2	46	256	0	304	-	388	2056	0	0	2444	-	4826
<b>% Lights</b>	100%	100%	100%	0%	100%	-	99.2%	98.3%	100%	0%	98.3%	-	100%	90.2%	95.5%	0%	94.7%	-	93.0%	98.1%	0%	0%	97.3%	-	97.6%
<b>Single-Unit Trucks</b>	0	0	0	0	0	-	0	20	0	0	20	-	0	1	8	0	9	-	19	26	0	0	45	-	74
<b>% Single-Unit Trucks</b>	0%	0%	0%	0%	0%	-	0%	1.1%	0%	0%	1.0%	-	0%	2.0%	3.0%	0%	2.8%	-	4.6%	1.2%	0%	0%	1.8%	-	1.5%
<b>Articulated Trucks</b>	0	0	0	0	0	-	0	8	0	0	8	-	0	0	2	0	2	-	10	10	0	0	20	-	30
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	-	0%	0.4%	0%	0%	0.4%	-	0%	0%	0.7%	0%	0.6%	-	2.4%	0.5%	0%	0%	0.8%	-	0.6%
<b>Buses</b>	0	0	0	0	0	-	1	4	0	0	5	-	0	1	2	0	3	-	0	1	0	0	1	-	9
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0.8%	0.2%	0%	0%	0.3%	-	0%	2.0%	0.7%	0%	0.9%	-	0%	0%	0%	0%	0%	-	0.2%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	1
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	2.0%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	5	-	-	-	-	-	2	-	-	-	-	-	10	-	-	-	-	-	9	-
<b>% Pedestrians</b>	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and Second Street TM2 TMC - TMC**

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 12:30PM - 1:30PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582541, Location: 42.403148, -71.053879

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Second Street Southbound						Route 16 Westbound						Second Street Northbound						Route 16 Eastbound						Int
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-08 12:30PM	10	19	13	0	42	0	36	412	0	0	448	1	3	22	74	0	99	2	115	417	0	0	532	2	1121
12:45PM	21	10	11	0	42	0	31	410	0	0	441	0	0	21	74	0	95	0	109	429	0	0	538	0	1116
1:00PM	14	22	12	0	48	0	32	513	0	0	545	0	2	14	69	0	85	0	107	450	0	0	557	1	1235
1:15PM	16	9	7	0	32	0	33	383	0	0	416	0	3	17	89	0	109	1	97	416	1	3	517	1	1074
<b>Total</b>	61	60	43	0	164	0	132	1718	0	0	1850	1	8	74	306	0	388	3	428	1712	1	3	2144	4	4546
<b>% Approach</b>	37.2%	36.6%	26.2%	0%	-	-	7.1%	92.9%	0%	0%	-	-	2.1%	19.1%	78.9%	0%	-	-	20.0%	79.9%	0%	0.1%	-	-	-
<b>% Total</b>	1.3%	1.3%	0.9%	0%	3.6%	-	2.9%	37.8%	0%	0%	40.7%	-	0.2%	1.6%	6.7%	0%	8.5%	-	9.4%	37.7%	0%	0.1%	47.2%	-	-
<b>PHF</b>	0.726	0.682	0.827	-	0.854	-	0.917	0.837	-	-	0.849	-	0.667	0.841	0.860	-	0.890	-	0.930	0.951	0.250	0.250	0.962	-	0.920
<b>Motorcycles</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
<b>% Motorcycles</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Lights</b>	61	60	43	0	164	-	132	1693	0	0	1825	-	8	73	297	0	378	-	408	1685	1	3	2097	-	4464
<b>% Lights</b>	100%	100%	100%	0%	100%	-	100%	98.5%	0%	0%	98.6%	-	100%	98.6%	97.1%	0%	97.4%	-	95.3%	98.4%	100%	100%	97.8%	-	98.2%
<b>Single-Unit Trucks</b>	0	0	0	0	0	-	0	21	0	0	21	-	0	1	5	0	6	-	12	17	0	0	29	-	56
<b>% Single-Unit Trucks</b>	0%	0%	0%	0%	0%	-	0%	1.2%	0%	0%	1.1%	-	0%	1.4%	1.6%	0%	1.5%	-	2.8%	1.0%	0%	0%	1.4%	-	1.2%
<b>Articulated Trucks</b>	0	0	0	0	0	-	0	2	0	0	2	-	0	0	3	0	3	-	8	8	0	0	16	-	21
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	1.0%	0%	0.8%	-	1.9%	0.5%	0%	0%	0.7%	-	0.5%
<b>Buses</b>	0	0	0	0	0	-	0	2	0	0	2	-	0	0	1	0	1	-	0	2	0	0	2	-	5
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0.3%	0%	0.3%	-	0%	0.1%	0%	0%	0.1%	-	0.1%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	4	
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Spring Street TM3 TMC - TMC**

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582699, Location: 42.403003, -71.052055

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Spring Street Southbound							Route 16 Westbound							Spring Street Northbound							Route 16 Eastbound							Int
	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		
2018-12-06																													
6:00AM	171	34	40	0	245	3	19	1861	13	15	1908	0	42	21	65	0	128	2	8	949	39	8	1004	0	3285				
7:00AM	142	42	29	0	213	1	18	1522	19	26	1585	3	31	12	16	0	59	5	14	1112	70	8	1204	1	3061				
8:00AM	116	28	39	1	184	5	30	1395	25	32	1482	1	36	21	33	0	90	1	11	958	53	14	1036	0	2792				
3:00PM	114	39	24	0	177	4	39	1718	43	30	1830	5	60	54	57	0	171	1	45	1763	111	31	1950	0	4128				
4:00PM	132	35	26	0	193	12	50	1721	44	39	1854	8	60	50	49	0	159	4	45	1898	114	35	2092	3	4298				
5:00PM	123	42	19	0	184	4	46	1829	32	28	1935	2	52	59	70	0	181	7	20	1734	110	22	1886	1	4186				
2018-12-08																													
11:00AM	154	49	40	1	244	3	41	1468	50	55	1614	3	108	58	40	0	206	11	39	1356	88	48	1531	0	3595				
12:00PM	118	43	46	1	208	8	44	1518	57	59	1678	0	95	58	62	0	215	5	41	1537	105	49	1732	1	3833				
1:00PM	119	37	41	0	197	3	44	1558	54	50	1706	2	82	53	45	0	180	8	43	1538	102	39	1722	0	3805				
2018-12-09																													
11:00AM	132	49	24	0	205	2	33	1326	57	32	1448	4	82	48	29	3	162	15	38	1109	83	35	1265	0	3080				
12:00PM	122	37	25	0	184	3	46	1357	44	44	1491	8	82	57	40	0	179	5	30	1394	80	54	1558	0	3412				
1:00PM	117	46	30	0	193	4	39	1360	66	45	1510	7	67	55	23	0	145	13	56	1578	106	38	1778	1	3626				
<b>Total</b>	1560	481	383	3	2427	52	449	18633	504	455	20041	43	797	546	529	3	1875	77	390	16926	1061	381	18758	7	43101				
<b>% Approach</b>	64.3%	19.8%	15.8%	0.1%	-	-	2.2%	93.0%	2.5%	2.3%	-	-	42.5%	29.1%	28.2%	0.2%	-	-	2.1%	90.2%	5.7%	2.0%	-	-	-				
<b>% Total</b>	3.6%	1.1%	0.9%	0%	5.6%	-	1.0%	43.2%	1.2%	1.1%	46.5%	-	1.8%	1.3%	1.2%	0%	4.4%	-	0.9%	39.3%	2.5%	0.9%	43.5%	-	-				
<b>Motorcycles</b>	0	1	0	0	1	-	0	11	0	1	12	-	0	1	0	0	1	-	0	13	0	0	13	-	27				
<b>% Motorcycles</b>	0%	0.2%	0%	0%	0%	-	0%	0.1%	0%	0.2%	0.1%	-	0%	0.2%	0%	0%	0.1%	-	0%	0.1%	0%	0%	0.1%	-	0.1%				
<b>Lights</b>	1547	474	379	3	2403	-	442	18241	493	452	19628	-	765	530	511	3	1809	-	387	16449	1050	377	18263	-	42103				
<b>% Lights</b>	99.2%	98.5%	99.0%	100%	99.0%	-	98.4%	97.9%	97.8%	99.3%	97.9%	-	96.0%	97.1%	96.6%	100%	96.5%	-	99.2%	97.2%	99.0%	99.0%	97.4%	-	97.7%				
<b>Single-Unit Trucks</b>	11	6	4	0	21	-	5	261	10	2	278	-	25	15	11	0	51	-	3	274	10	3	290	-	640				
<b>% Single-Unit Trucks</b>	0.7%	1.2%	1.0%	0%	0.9%	-	1.1%	1.4%	2.0%	0.4%	1.4%	-	3.1%	2.7%	2.1%	0%	2.7%	-	0.8%	1.6%	0.9%	0.8%	1.5%	-	1.5%				
<b>Articulated Trucks</b>	0	0	0	0	0	-	2	64	1	0	67	-	6	0	3	0	9	-	0	125	0	1	126	-	202				
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	-	0.4%	0.3%	0.2%	0%	0.3%	-	0.8%	0%	0.6%	0%	0.5%	-	0%	0.7%	0%	0.3%	0.7%	-	0.5%				
<b>Buses</b>	2	0	0	0	2	-	0	55	0	0	55	-	1	0	3	0	4	-	0	65	1	0	66	-	127				
<b>% Buses</b>	0.1%	0%	0%	0%	0.1%	-	0%	0.3%	0%	0%	0.3%	-	0.1%	0%	0.6%	0%	0.2%	-	0%	0.4%	0.1%	0%	0.4%	-	0.3%				
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	1	0	0	1	-	0	0	1	0	1	-	0	0	0	0	0	-	2				
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0.2%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%				
<b>Pedestrians</b>	-	-	-	-	-	52	-	-	-	-	-	43	-	-	-	-	-	77	-	-	-	-	-	7	-				
<b>% Pedestrians</b>	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-				

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and Spring Street TM3 TMC - TMC**

Thu Dec 6, 2018

AM Peak (Dec 06 2018 6:15AM - 7:15AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582699, Location: 42.403003, -71.052055

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Spring Street Southbound						Route 16 Westbound						Spring Street Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 6:15AM	55	8	7	0	70	0	4	491	2	6	503	0	11	5	19	0	35	0	1	205	12	1	219	0	827
6:30AM	40	4	15	0	59	2	6	484	5	2	497	0	7	8	8	0	23	1	4	280	8	3	295	0	874
6:45AM	41	16	9	0	66	1	6	413	2	3	424	0	9	5	16	0	30	0	1	272	12	2	287	0	807
7:00AM	41	12	5	0	58	0	8	427	3	7	445	0	5	2	6	0	13	1	1	323	10	2	336	0	852
<b>Total</b>	177	40	36	0	253	3	24	1815	12	18	1869	0	32	20	49	0	101	2	7	1080	42	8	1137	0	3360
<b>% Approach</b>	70.0%	15.8%	14.2%	0%	-	-	1.3%	97.1%	0.6%	1.0%	-	-	31.7%	19.8%	48.5%	0%	-	-	0.6%	95.0%	3.7%	0.7%	-	-	-
<b>% Total</b>	5.3%	1.2%	1.1%	0%	7.5%	-	0.7%	54.0%	0.4%	0.5%	55.6%	-	1.0%	0.6%	1.5%	0%	3.0%	-	0.2%	32.1%	1.3%	0.2%	33.8%	-	-
<b>PHF</b>	0.805	0.625	0.600	-	0.904	-	0.750	0.924	0.600	0.643	0.929	-	0.727	0.625	0.645	-	0.721	-	0.438	0.836	0.875	0.667	0.846	-	0.961
<b>Motorcycles</b>	0	0	0	0	0	0	0	1	0	0	1	-	0	0	0	0	0	0	0	1	0	0	1	-	2
<b>% Motorcycles</b>	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0.1%
<b>Lights</b>	175	38	36	0	249	-	23	1759	10	18	1810	-	27	17	47	0	91	-	7	1008	41	8	1064	-	3214
<b>% Lights</b>	98.9%	95.0%	100%	0%	98.4%	-	95.8%	96.9%	83.3%	100%	96.8%	-	84.4%	85.0%	95.9%	0%	90.1%	-	100%	93.3%	97.6%	100%	93.6%	-	95.7%
<b>Single-Unit Trucks</b>	2	2	0	0	4	-	0	43	2	0	45	-	4	3	1	0	8	-	0	33	1	0	34	-	91
<b>% Single-Unit Trucks</b>	1.1%	5.0%	0%	0%	1.6%	-	0%	2.4%	16.7%	0%	2.4%	-	12.5%	15.0%	2.0%	0%	7.9%	-	0%	3.1%	2.4%	0%	3.0%	-	2.7%
<b>Articulated Trucks</b>	0	0	0	0	0	-	1	6	0	0	7	-	0	0	1	0	1	-	0	21	0	0	21	-	29
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	-	4.2%	0.3%	0%	0%	0.4%	-	0%	0%	2.0%	0%	1.0%	-	0%	1.9%	0%	0%	1.8%	-	0.9%
<b>Buses</b>	0	0	0	0	0	-	0	6	0	0	6	-	1	0	0	0	1	-	0	17	0	0	17	-	24
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	3.1%	0%	0%	0%	1.0%	-	0%	1.6%	0%	0%	1.5%	-	0.7%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Spring Street TM3 TMC - TMC**

Thu Dec 6, 2018

PM Peak (Dec 06 2018 3:45PM - 4:45PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582699, Location: 42.403003, -71.052055

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Spring Street Southbound						Route 16 Westbound						Spring Street Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 3:45PM	32	14	6	0	52	2	8	475	8	4	495	1	16	12	13	0	41	1	10	424	30	10	474	0	1062
4:00PM	30	10	4	0	44	4	12	432	12	7	463	3	10	5	11	0	26	1	9	507	34	9	559	0	1092
4:15PM	31	12	9	0	52	5	9	437	13	13	472	3	13	17	11	0	41	3	13	446	30	8	497	1	1062
4:30PM	40	6	4	0	50	2	12	429	10	10	461	0	18	18	13	0	49	0	13	503	28	12	556	2	1116
<b>Total</b>	133	42	23	0	198	13	41	1773	43	34	1891	7	57	52	48	0	157	5	45	1880	122	39	2086	3	4332
% Approach	67.2%	21.2%	11.6%	0%	-	-	2.2%	93.8%	2.3%	1.8%	-	-	36.3%	33.1%	30.6%	0%	-	-	2.2%	90.1%	5.8%	1.9%	-	-	-
% Total	3.1%	1.0%	0.5%	0%	4.6%	-	0.9%	40.9%	1.0%	0.8%	43.7%	-	1.3%	1.2%	1.1%	0%	3.6%	-	1.0%	43.4%	2.8%	0.9%	48.2%	-	-
PHF	0.831	0.750	0.639	-	0.952	-	0.854	0.933	0.827	0.654	0.955	-	0.792	0.722	0.923	-	0.801	-	0.865	0.927	0.897	0.813	0.933	-	0.970
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	2	0	0	2	-	2
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%
Lights	133	41	23	0	197	-	41	1744	42	34	1861	-	56	52	46	0	154	-	44	1845	121	39	2049	-	4261
% Lights	100%	97.6%	100%	0%	99.5%	-	100%	98.4%	97.7%	100%	98.4%	-	98.2%	100%	95.8%	0%	98.1%	-	97.8%	98.1%	99.2%	100%	98.2%	-	98.4%
Single-Unit Trucks	0	1	0	0	1	-	0	18	1	0	19	-	1	0	1	0	2	-	1	23	1	0	25	-	47
% Single-Unit Trucks	0%	2.4%	0%	0%	0.5%	-	0%	1.0%	2.3%	0%	1.0%	-	1.8%	0%	2.1%	0%	1.3%	-	2.2%	1.2%	0.8%	0%	1.2%	-	1.1%
Articulated Trucks	0	0	0	0	0	-	0	6	0	0	6	-	0	0	1	0	1	-	0	10	0	0	10	-	17
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	2.1%	0%	0.6%	-	0%	0.5%	0%	0%	0.5%	-	0.4%
Buses	0	0	0	0	0	-	0	5	0	0	5	-	0	0	0	0	0	-	0	0	0	0	0	-	5
% Buses	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	13	-	-	-	-	-	7	-	-	-	-	-	5	-	-	-	-	-	3	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and Spring Street TM3 TMC - TMC**

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 12:15PM - 1:15PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582699, Location: 42.403003, -71.052055

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Spring Street Southbound						Route 16 Westbound						Spring Street Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-08 12:15PM	42	14	10	0	66	4	12	368	8	12	400	0	23	23	13	0	59	2	11	362	25	10	408	1	933
12:30PM	21	8	7	0	36	3	11	382	19	19	431	0	25	16	13	0	54	3	7	389	26	10	432	0	953
12:45PM	25	13	13	0	51	0	10	384	9	18	421	0	23	5	20	0	48	0	13	377	27	16	433	0	953
1:00PM	40	9	11	0	60	0	16	468	11	22	517	0	18	14	20	0	52	1	13	387	29	9	438	0	1067
<b>Total</b>	128	44	41	0	213	7	49	1602	47	71	1769	0	89	58	66	0	213	6	44	1515	107	45	1711	1	3906
% Approach	60.1%	20.7%	19.2%	0%	-	-	2.8%	90.6%	2.7%	4.0%	-	-	41.8%	27.2%	31.0%	0%	-	-	2.6%	88.5%	6.3%	2.6%	-	-	-
% Total	3.3%	1.1%	1.0%	0%	5.5%	-	1.3%	41.0%	1.2%	1.8%	45.3%	-	2.3%	1.5%	1.7%	0%	5.5%	-	1.1%	38.8%	2.7%	1.2%	43.8%	-	-
PHF	0.762	0.786	0.788	-	0.807	-	0.766	0.856	0.618	0.807	0.855	-	0.890	0.630	0.825	-	0.903	-	0.846	0.974	0.922	0.703	0.977	-	0.915
Motorcycles	0	0	0	0	0	-	0	1	0	1	2	-	0	0	0	0	0	-	0	0	0	0	0	-	2
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0.1%	0%	1.4%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%
Lights	128	43	40	0	211	-	48	1579	44	70	1741	-	88	58	65	0	211	-	44	1490	107	45	1686	-	3849
% Lights	100%	97.7%	97.6%	0%	99.1%	-	98.0%	98.6%	93.6%	98.6%	98.4%	-	98.9%	100%	98.5%	0%	99.1%	-	100%	98.3%	100%	100%	98.5%	-	98.5%
Single-Unit Trucks	0	1	1	0	2	-	1	17	2	0	20	-	1	0	0	0	1	-	0	15	0	0	15	-	38
% Single-Unit Trucks	0%	2.3%	2.4%	0%	0.9%	-	2.0%	1.1%	4.3%	0%	1.1%	-	1.1%	0%	0%	0%	0.5%	-	0%	1.0%	0%	0%	0.9%	-	1.0%
Articulated Trucks	0	0	0	0	0	-	0	4	1	0	5	-	0	0	0	0	0	-	0	7	0	0	7	-	12
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.2%	2.1%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0.5%	0%	0%	0.4%	-	0.3%
Buses	0	0	0	0	0	-	0	1	0	0	1	-	0	0	1	0	1	-	0	3	0	0	3	-	5
% Buses	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	1.5%	0%	0.5%	-	0%	0.2%	0%	0%	0.2%	-	0.1%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	7	-	-	-	-	-	0	-	-	-	-	-	6	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# Everett - Route 16 and South Ferry Street TM... - TMC

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582702, Location: 42.40279, -71.049673

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	South Ferry Street Southbound					Route 16 Westbound					Route 16 Eastbound					
Time	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	Int
2018-12-06 6:00AM	2	0	0	2	5	137	1688	0	1825	1	833	111	18	962	1	2789
7:00AM	1	0	0	1	3	129	1433	0	1562	0	978	149	11	1138	0	2701
8:00AM	1	0	0	1	12	132	1332	0	1464	1	884	97	10	991	1	2456
3:00PM	0	0	0	0	6	99	1653	0	1752	3	1545	317	22	1884	0	3636
4:00PM	3	0	0	3	7	69	1779	0	1848	3	1645	330	21	1996	4	3847
5:00PM	3	0	0	3	5	82	1864	0	1946	4	1500	331	20	1851	2	3800
2018-12-08 11:00AM	0	0	0	0	7	100	1575	0	1675	1	1291	202	16	1509	0	3184
12:00PM	2	0	0	2	3	67	1555	0	1622	1	1455	225	17	1697	2	3321
1:00PM	0	0	0	0	9	83	1632	0	1715	0	1475	253	13	1741	0	3456
2018-12-09 11:00AM	1	0	0	1	4	80	1333	0	1413	3	998	194	14	1206	0	2620
12:00PM	1	0	0	1	5	81	1390	0	1471	0	1317	224	17	1558	0	3030
1:00PM	1	0	0	1	9	73	1392	0	1465	1	1338	277	13	1628	2	3094
<b>Total</b>	15	0	0	15	75	1132	18626	0	19758	18	15259	2710	192	18161	12	37934
<b>% Approach</b>	100%	0%	0%	-	-	5.7%	94.3%	0%	-	-	84.0%	14.9%	1.1%	-	-	-
<b>% Total</b>	0%	0%	0%	0%	-	3.0%	49.1%	0%	52.1%	-	40.2%	7.1%	0.5%	47.9%	-	-
<b>Motorcycles</b>	0	0	0	0	-	0	7	0	7	-	14	3	0	17	-	24
<b>% Motorcycles</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.1%	0.1%	0%	0.1%	-	0.1%
<b>Lights</b>	15	0	0	15	-	1116	18227	0	19343	-	14796	2677	184	17657	-	37015
<b>% Lights</b>	100%	0%	0%	100%	-	98.6%	97.9%	0%	97.9%	-	97.0%	98.8%	95.8%	97.2%	-	97.6%
<b>Single-Unit Trucks</b>	0	0	0	0	-	12	269	0	281	-	274	25	8	307	-	588
<b>% Single-Unit Trucks</b>	0%	0%	0%	0%	-	1.1%	1.4%	0%	1.4%	-	1.8%	0.9%	4.2%	1.7%	-	1.6%
<b>Articulated Trucks</b>	0	0	0	0	-	3	77	0	80	-	121	1	0	122	-	202
<b>% Articulated Trucks</b>	0%	0%	0%	0%	-	0.3%	0.4%	0%	0.4%	-	0.8%	0%	0%	0.7%	-	0.5%
<b>Buses</b>	0	0	0	0	-	1	44	0	45	-	53	4	0	57	-	102
<b>% Buses</b>	0%	0%	0%	0%	-	0.1%	0.2%	0%	0.2%	-	0.3%	0.1%	0%	0.3%	-	0.3%
<b>Bicycles on Road</b>	0	0	0	0	-	0	2	0	2	-	1	0	0	1	-	3
<b>% Bicycles on Road</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	75	-	-	-	-	18	-	-	-	-	12	-
<b>% Pedestrians</b>	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



# Everett - Route 16 and South Ferry Street TM... - TMC

Thu Dec 6, 2018

AM Peak (Dec 06 2018 6:15AM - 7:15AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582702, Location: 42.40279, -71.049673

Provided by: Precision Data Industries,  
LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	South Ferry Street Southbound					Route 16 Westbound					Route 16 Eastbound					
Time	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	Int
2018-12-06 6:15AM	0	0	0	0	0	31	475	0	506	0	195	26	3	224	0	730
6:30AM	0	0	0	0	2	33	413	0	446	0	233	29	6	268	0	714
6:45AM	1	0	0	1	3	35	416	0	451	1	238	29	5	272	1	724
7:00AM	1	0	0	1	2	22	378	0	400	0	280	31	1	312	0	713
<b>Total</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>7</b>	<b>121</b>	<b>1682</b>	<b>0</b>	<b>1803</b>	<b>1</b>	<b>946</b>	<b>115</b>	<b>15</b>	<b>1076</b>	<b>1</b>	<b>2881</b>
<b>% Approach</b>	100%	0%	0%	-	-	6.7%	93.3%	0%	-	-	87.9%	10.7%	1.4%	-	-	-
<b>% Total</b>	0.1%	0%	0%	0.1%	-	4.2%	58.4%	0%	62.6%	-	32.8%	4.0%	0.5%	37.3%	-	-
<b>PHF</b>	0.500	-	-	0.500	-	0.864	0.885	-	0.891	-	0.847	0.927	0.625	0.864	-	0.986
<b>Motorcycles</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
<b>% Motorcycles</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
<b>Lights</b>	2	0	0	2	-	119	1639	0	1758	-	874	111	13	998	-	2758
<b>% Lights</b>	100%	0%	0%	100%	-	98.3%	97.4%	0%	97.5%	-	92.4%	96.5%	86.7%	92.8%	-	95.7%
<b>Single-Unit Trucks</b>	0	0	0	0	-	1	33	0	34	-	35	3	2	40	-	74
<b>% Single-Unit Trucks</b>	0%	0%	0%	0%	-	0.8%	2.0%	0%	1.9%	-	3.7%	2.6%	13.3%	3.7%	-	2.6%
<b>Articulated Trucks</b>	0	0	0	0	-	1	7	0	8	-	21	0	0	21	-	29
<b>% Articulated Trucks</b>	0%	0%	0%	0%	-	0.8%	0.4%	0%	0.4%	-	2.2%	0%	0%	2.0%	-	1.0%
<b>Buses</b>	0	0	0	0	-	0	3	0	3	-	15	1	0	16	-	19
<b>% Buses</b>	0%	0%	0%	0%	-	0%	0.2%	0%	0.2%	-	1.6%	0.9%	0%	1.5%	-	0.7%
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	1	0	0	1	-	1
<b>% Bicycles on Road</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.1%	0%	0%	0.1%	-	0%
Pedestrians	-	-	-	-	7	-	-	-	-	1	-	-	-	-	-	1
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	100%

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# Everett - Route 16 and South Ferry Street TM... - TMC

Thu Dec 6, 2018

PM Peak (Dec 06 2018 4PM - 5PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582702, Location: 42.40279, -71.049673

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	South Ferry Street Southbound					Route 16 Westbound					Route 16 Eastbound					Int
	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	
2018-12-06 4:00PM	2	0	0	2	2	19	442	0	461	1	413	84	3	500	0	963
4:15PM	1	0	0	1	4	17	456	0	473	1	396	82	5	483	1	957
4:30PM	0	0	0	0	1	16	445	0	461	0	430	86	6	522	2	983
4:45PM	0	0	0	0	0	17	436	0	453	1	406	78	7	491	1	944
<b>Total</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>7</b>	<b>69</b>	<b>1779</b>	<b>0</b>	<b>1848</b>	<b>3</b>	<b>1645</b>	<b>330</b>	<b>21</b>	<b>1996</b>	<b>4</b>	<b>3847</b>
<b>% Approach</b>	100%	0%	0%	-	-	3.7%	96.3%	0%	-	-	82.4%	16.5%	1.1%	-	-	-
<b>% Total</b>	0.1%	0%	0%	0.1%	-	1.8%	46.2%	0%	48.0%	-	42.8%	8.6%	0.5%	51.9%	-	-
<b>PHF</b>	0.375	-	-	0.375	-	0.908	0.975	-	0.977	-	0.956	0.959	0.750	0.956	-	0.978
<b>Motorcycles</b>	0	0	0	0	-	0	0	0	0	-	2	0	0	2	-	2
<b>% Motorcycles</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.1%	0%	0%	0.1%	-	0.1%
<b>Lights</b>	3	0	0	3	-	66	1753	0	1819	-	1610	326	21	1957	-	3779
<b>% Lights</b>	100%	0%	0%	100%	-	95.7%	98.5%	0%	98.4%	-	97.9%	98.8%	100%	98.0%	-	98.2%
<b>Single-Unit Trucks</b>	0	0	0	0	-	2	13	0	15	-	25	3	0	28	-	43
<b>% Single-Unit Trucks</b>	0%	0%	0%	0%	-	2.9%	0.7%	0%	0.8%	-	1.5%	0.9%	0%	1.4%	-	1.1%
<b>Articulated Trucks</b>	0	0	0	0	-	0	8	0	8	-	8	0	0	8	-	16
<b>% Articulated Trucks</b>	0%	0%	0%	0%	-	0%	0.4%	0%	0.4%	-	0.5%	0%	0%	0.4%	-	0.4%
<b>Buses</b>	0	0	0	0	-	1	5	0	6	-	0	1	0	1	-	7
<b>% Buses</b>	0%	0%	0%	0%	-	1.4%	0.3%	0%	0.3%	-	0%	0.3%	0%	0.1%	-	0.2%
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	7	-	-	-	-	3	-	-	-	-	4	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and South Ferry Street TM... - TMC**

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 1PM - 2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582702, Location: 42.40279, -71.049673

Provided by: Precision Data Industries,  
LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	South Ferry Street Southbound					Route 16 Westbound					Route 16 Eastbound					
Time	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	Int
2018-12-08 1:00PM	0	0	0	0	4	15	474	0	489	0	391	52	6	449	0	938
1:15PM	0	0	0	0	0	19	407	0	426	0	348	60	4	412	0	838
1:30PM	0	0	0	0	3	27	386	0	413	0	360	68	2	430	0	843
1:45PM	0	0	0	0	2	22	365	0	387	0	376	73	1	450	0	837
<b>Total</b>	0	0	0	0	9	83	1632	0	1715	0	1475	253	13	1741	0	3456
<b>% Approach</b>	0%	0%	0%	-	-	4.8%	95.2%	0%	-	-	84.7%	14.5%	0.7%	-	-	-
<b>% Total</b>	0%	0%	0%	0%	-	2.4%	47.2%	0%	49.6%	-	42.7%	7.3%	0.4%	50.4%	-	-
<b>PHF</b>	-	-	-	-	-	0.769	0.861	-	0.877	-	0.943	0.866	0.542	0.967	-	0.921
<b>Motorcycles</b>	0	0	0	0	-	0	1	0	1	-	1	0	0	1	-	2
<b>% Motorcycles</b>	0%	0%	0%	-	-	0%	0.1%	0%	0.1%	-	0.1%	0%	0%	0.1%	-	0.1%
<b>Lights</b>	0	0	0	0	-	83	1616	0	1699	-	1437	253	12	1702	-	3401
<b>% Lights</b>	0%	0%	0%	-	-	100%	99.0%	0%	99.1%	-	97.4%	100%	92.3%	97.8%	-	98.4%
<b>Single-Unit Trucks</b>	0	0	0	0	-	0	13	0	13	-	29	0	1	30	-	43
<b>% Single-Unit Trucks</b>	0%	0%	0%	-	-	0%	0.8%	0%	0.8%	-	2.0%	0%	7.7%	1.7%	-	1.2%
<b>Articulated Trucks</b>	0	0	0	0	-	0	2	0	2	-	6	0	0	6	-	8
<b>% Articulated Trucks</b>	0%	0%	0%	-	-	0%	0.1%	0%	0.1%	-	0.4%	0%	0%	0.3%	-	0.2%
<b>Buses</b>	0	0	0	0	-	0	0	0	0	-	2	0	0	2	-	2
<b>% Buses</b>	0%	0%	0%	-	-	0%	0%	0%	0%	-	0.1%	0%	0%	0.1%	-	0.1%
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	-	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	9	-	-	-	-	0	-	-	-	-	-	0
<b>% Pedestrians</b>	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Vine Street TMC - TMC**

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582703, Location: 42.402488, -71.047645

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Vine Street Southbound							Route 16 Westbound							Vine Street Northbound							Route 16 Eastbound							Int
	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		
2018-12-06 6:00AM	200	126	40	0	366	3		16	1635	23	2	1676	9		23	48	54	0	125	8		105	843	0	0	948	10	3115	
7:00AM	169	204	49	0	422	2		24	1314	45	6	1389	8		23	62	56	0	141	3		97	904	0	0	1001	7	2953	
8:00AM	141	178	47	0	366	3		34	1291	37	6	1368	2		32	55	63	0	150	4		112	845	0	0	957	8	2841	
3:00PM	146	127	48	0	321	0		120	1573	20	15	1728	10		28	176	163	0	367	5		82	1495	0	0	1577	14	3993	
4:00PM	136	101	54	0	291	6		139	1579	24	18	1760	14		29	194	135	0	358	5		86	1631	0	0	1717	15	4126	
5:00PM	152	86	46	0	284	4		150	1613	20	10	1793	9		23	201	146	0	370	6		59	1285	0	0	1344	10	3791	
2018-12-08 11:00AM	162	116	64	0	342	3		90	1333	29	9	1461	9		60	110	101	0	271	10		113	1229	0	1	1343	3	3417	
12:00PM	133	119	82	3	337	8		105	1439	30	8	1582	6		42	108	104	0	254	3		111	1350	0	1	1462	9	3635	
1:00PM	128	121	77	0	326	3		77	1499	17	6	1599	5		49	142	113	0	304	1		96	1358	0	0	1454	8	3683	
2018-12-09 11:00AM	147	105	75	0	327	3		75	1267	17	1	1360	4		34	88	58	0	180	3		67	973	0	1	1041	6	2908	
12:00PM	112	99	79	0	290	2		98	1301	19	5	1423	3		34	94	58	0	186	0		82	1238	0	0	1320	3	3219	
1:00PM	132	104	59	0	295	2		73	1332	17	2	1424	6		42	112	64	0	218	2		78	1249	0	0	1327	4	3264	
<b>Total</b>	1758	1486	720	3	3967	39		1001	17176	298	88	18563	85		419	1390	1115	0	2924	50		1088	14400	0	3	15491	97	40945	
% Approach	44.3%	37.5%	18.1%	0.1%	-	-		5.4%	92.5%	1.6%	0.5%	-		14.3%	47.5%	38.1%	0%	-	-		7.0%	93.0%	0%	0%	-	-	-		
% Total	4.3%	3.6%	1.8%	0%	9.7%	-		2.4%	41.9%	0.7%	0.2%	45.3%	-		1.0%	3.4%	2.7%	0%	7.1%	-		2.7%	35.2%	0%	0%	37.8%	-	-	
Motorcycles	0	5	2	0	7	-		1	10	0	0	11	-		0	6	0	0	6	-		0	12	0	0	12	-	36	
% Motorcycles	0%	0.3%	0.3%	0%	0.2%	-		0.1%	0.1%	0%	0%	0.1%	-		0%	0.4%	0%	0%	0.2%	-		0%	0.1%	0%	0%	0.1%	-	0.1%	
Lights	1743	1453	698	3	3897	-		983	16797	284	88	18152	-		400	1358	1073	0	2831	-		1032	14001	0	3	15036	-	39916	
% Lights	99.1%	97.8%	96.9%	100%	98.2%	-		98.2%	97.8%	95.3%	100%	97.8%	-		95.5%	97.7%	96.2%	0%	96.8%	-		94.9%	97.2%	0%	100%	97.1%	-	97.5%	
Single-Unit Trucks	13	27	19	0	59	-		16	260	11	0	287	-		13	21	33	0	67	-		51	219	0	0	270	-	683	
% Single-Unit Trucks	0.7%	1.8%	2.6%	0%	1.5%	-		1.6%	1.5%	3.7%	0%	1.5%	-		3.1%	1.5%	3.0%	0%	2.3%	-		4.7%	1.5%	0%	0%	1.7%	-	1.7%	
Articulated Trucks	0	0	0	0	0	-		0	57	2	0	59	-		6	0	8	0	14	-		2	116	0	0	118	-	191	
% Articulated Trucks	0%	0%	0%	0%	0%	-		0%	0.3%	0.7%	0%	0.3%	-		1.4%	0%	0.7%	0%	0.5%	-		0.2%	0.8%	0%	0%	0.8%	-	0.5%	
Buses	2	0	1	0	3	-		1	49	1	0	51	-		0	2	1	0	3	-		3	51	0	0	54	-	111	
% Buses	0.1%	0%	0.1%	0%	0.1%	-		0.1%	0.3%	0.3%	0%	0.3%	-		0%	0.1%	0.1%	0%	0.1%	-		0.3%	0.4%	0%	0%	0.3%	-	0.3%	
Bicycles on Road	0	1	0	0	1	-		0	3	0	0	3	-		0	3	0	0	3	-		0	1	0	0	1	-	8	
% Bicycles on Road	0%	0.1%	0%	0%	0%	-		0%	0%	0%	0%	0%	-		0%	0.2%	0%	0%	0.1%	-		0%	0%	0%	0%	0%	-	0%	
Pedestrians	-	-	-	-	-	39		-	-	-	-	85		-	-	-	-	50		-	-	-	-	-	97				
% Pedestrians	-	-	-	-	-	100%		-	-	-	-	100%		-	-	-	-	100%		-	-	-	-	-	100%				

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and Vine Street TM5 TMC - TMC**

Thu Dec 6, 2018

AM Peak (Dec 06 2018 6:15AM - 7:15AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582703, Location: 42.402488, -71.047645

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Vine Street Southbound						Route 16 Westbound						Vine Street Northbound						Route 16 Eastbound						Int	
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*		
2018-12-06 6:15AM	48	31	11	0	90	0	2	452	2	0	456	1	2	8	12	0	22	0	16	192	0	0	208	2	776	
6:30AM	49	24	6	0	79	2	4	392	9	0	405	2	8	8	11	0	27	0	32	232	0	0	264	1	775	
6:45AM	51	48	12	0	111	1	5	391	11	1	408	3	10	18	19	0	47	5	30	254	0	0	284	5	850	
7:00AM	42	42	15	0	99	0	6	345	6	0	357	4	4	4	12	11	0	27	0	16	247	0	0	263	2	746
<b>Total</b>	190	145	44	0	379	3	17	1580	28	1	1626	10	24	46	53	0	123	5	94	925	0	0	1019	10	3147	
<b>% Approach</b>	50.1%	38.3%	11.6%	0%	-	-	1.0%	97.2%	1.7%	0.1%	-	-	19.5%	37.4%	43.1%	0%	-	-	9.2%	90.8%	0%	0%	-	-	-	
<b>% Total</b>	6.0%	4.6%	1.4%	0%	12.0%	-	0.5%	50.2%	0.9%	0%	51.7%	-	0.8%	1.5%	1.7%	0%	3.9%	-	3.0%	29.4%	0%	0%	32.4%	-	-	
<b>PHF</b>	0.931	0.755	0.733	-	0.854	-	0.708	0.874	0.636	0.250	0.891	-	0.600	0.639	0.697	-	0.654	-	0.734	0.910	-	-	0.897	-	0.926	
<b>Motorcycles</b>	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	1	0	0	1	-	2	
<b>% Motorcycles</b>	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0.1%	
<b>Lights</b>	189	140	42	0	371	-	16	1538	23	1	1578	-	21	42	49	0	112	-	84	852	0	0	936	-	2997	
<b>% Lights</b>	99.5%	96.6%	95.5%	0%	97.9%	-	94.1%	97.3%	82.1%	100%	97.0%	-	87.5%	91.3%	92.5%	0%	91.1%	-	89.4%	92.1%	0%	0%	91.9%	-	95.2%	
<b>Single-Unit Trucks</b>	1	5	2	0	8	-	1	35	3	0	39	-	2	4	4	0	10	-	9	36	0	0	45	-	102	
<b>% Single-Unit Trucks</b>	0.5%	3.4%	4.5%	0%	2.1%	-	5.9%	2.2%	10.7%	0%	2.4%	-	8.3%	8.7%	7.5%	0%	8.1%	-	9.6%	3.9%	0%	0%	4.4%	-	3.2%	
<b>Articulate d Trucks</b>	0	0	0	0	0	-	0	5	2	0	7	-	1	0	0	0	1	-	0	21	0	0	21	-	29	
<b>% Articulate d Trucks</b>	0%	0%	0%	0%	0%	-	0%	0.3%	7.1%	0%	0.4%	-	4.2%	0%	0%	0%	0.8%	-	0%	2.3%	0%	0%	2.1%	-	0.9%	
<b>Buses</b>	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	1	15	0	0	16	-	17	
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	1.1%	1.6%	0%	0%	1.6%	-	0.5%	
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	
<b>Pedestrians</b>	-	-	-	-	-	3	-	-	-	-	-	10	-	-	-	-	-	5	-	-	-	-	-	10	-	
<b>% Pedestrians</b>	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Vine Street TMS TMC - TMC**

Thu Dec 6, 2018

PM Peak (Dec 06 2018 3:45PM - 4:45PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582703, Location: 42.402488, -71.047645

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Vine Street Southbound						Route 16 Westbound						Vine Street Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 3:45PM	38	28	9	0	75	0	32	442	6	5	485	1	6	51	43	0	100	1	19	423	0	0	442	5	1102
4:00PM	34	38	13	0	85	2	24	394	7	2	427	6	1	53	38	0	92	1	21	410	0	0	431	1	1035
4:15PM	32	22	20	0	74	0	43	403	6	5	457	2	10	57	25	0	92	3	23	392	0	0	415	4	1038
4:30PM	40	19	11	0	70	2	29	377	4	5	415	5	12	43	38	0	93	1	25	408	0	0	433	9	1011
<b>Total</b>	144	107	53	0	304	4	128	1616	23	17	1784	14	29	204	144	0	377	6	88	1633	0	0	1721	19	4186
% Approach	47.4%	35.2%	17.4%	0%	-	-	7.2%	90.6%	1.3%	1.0%	-	-	7.7%	54.1%	38.2%	0%	-	-	5.1%	94.9%	0%	0%	-	-	-
% Total	3.4%	2.6%	1.3%	0%	7.3%	-	3.1%	38.6%	0.5%	0.4%	42.6%	-	0.7%	4.9%	3.4%	0%	9.0%	-	2.1%	39.0%	0%	0%	41.1%	-	-
PHF	0.900	0.704	0.663	-	0.894	-	0.744	0.914	0.821	0.850	0.920	-	0.604	0.890	0.837	-	0.949	-	0.880	0.965	-	-	0.973	-	0.950
Motorcycles	0	1	0	0	1	-	0	0	0	0	0	-	0	2	0	0	2	-	0	3	0	0	3	-	6
% Motorcycles	0%	0.9%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	1.0%	0%	0%	0.5%	-	0%	0.2%	0%	0%	0.2%	-	0.1%
Lights	142	105	51	0	298	-	126	1591	22	17	1756	-	28	199	140	0	367	-	85	1600	0	0	1685	-	4106
% Lights	98.6%	98.1%	96.2%	0%	98.0%	-	98.4%	98.5%	95.7%	100%	98.4%	-	96.6%	97.5%	97.2%	0%	97.3%	-	96.6%	98.0%	0%	0%	97.9%	-	98.1%
Single-Unit Trucks	2	1	1	0	4	-	2	15	1	0	18	-	0	1	2	0	3	-	3	21	0	0	24	-	49
% Single-Unit Trucks	1.4%	0.9%	1.9%	0%	1.3%	-	1.6%	0.9%	4.3%	0%	1.0%	-	0%	0.5%	1.4%	0%	0.8%	-	3.4%	1.3%	0%	0%	1.4%	-	1.2%
Articulate d Trucks	0	0	0	0	0	-	0	5	0	0	5	-	1	0	2	0	3	-	0	8	0	0	8	-	16
% Articulate d Trucks	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	3.4%	0%	1.4%	0%	0.8%	-	0%	0.5%	0%	0%	0.5%	-	0.4%
Buses	0	0	1	0	1	-	0	5	0	0	5	-	0	1	0	0	1	-	0	1	0	0	1	-	8
% Buses	0%	0%	1.9%	0%	0.3%	-	0%	0.3%	0%	0%	0.3%	-	0%	0.5%	0%	0%	0.3%	-	0%	0.1%	0%	0%	0.1%	-	0.2%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	1
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.5%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	4	-	-	-	-	-	14	-	-	-	-	-	6	-	-	-	-	-	19	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and Vine Street TM5 TMC - TMC**

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 12:30PM - 1:30PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582703, Location: 42.402488, -71.047645

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Vine Street Southbound							Route 16 Westbound							Vine Street Northbound							Route 16 Eastbound							Int
	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		
2018-12-08 12:30PM	31	29	17	0	77	3		24	385	9	1	419	1		9	17	28	0	54	1		21	348	0	0	369	3	919	
12:45PM	41	29	17	1	88	2		34	362	2	5	403	4		8	22	23	0	53	1		31	298	0	0	329	1	873	
1:00PM	31	29	22	0	82	0		21	403	6	2	432	2		8	26	53	0	87	1		37	356	0	0	393	0	994	
1:15PM	29	33	19	0	81	0		16	390	5	1	412	3		12	38	23	0	73	0		19	324	0	0	343	6	909	
<b>Total</b>	132	120	75	1	328	5		95	1540	22	9	1666	10		37	103	127	0	267	3		108	1326	0	0	1434	10	3695	
% Approach	40.2%	36.6%	22.9%	0.3%	-	-		5.7%	92.4%	1.3%	0.5%	-	-	13.9%	38.6%	47.6%	0%	-	-		7.5%	92.5%	0%	0%	-	-	-		
% Total	3.6%	3.2%	2.0%	0%	8.9%	-		2.6%	41.7%	0.6%	0.2%	45.1%	-	1.0%	2.8%	3.4%	0%	7.2%	-		2.9%	35.9%	0%	0%	38.8%	-	-		
PHF	0.805	0.909	0.852	0.250	0.932	-		0.699	0.955	0.611	0.450	0.964	-	0.771	0.678	0.599	-	0.767	-		0.730	0.931	-	-	0.912	-	0.929		
Motorcycles	0	0	1	0	1	-		0	0	0	0	0	-	0	0	0	0	0	-		0	1	0	0	1	-	2		
% Motorcycles	0%	0%	1.3%	0%	0.3%	-		0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-		0%	0.1%	0%	0%	0.1%	-	0.1%		
Lights	130	118	72	1	321	-		95	1512	22	9	1638	-	36	102	126	0	264	-		105	1300	0	0	1405	-	3628		
% Lights	98.5%	98.3%	96.0%	100%	97.9%	-		100%	98.2%	100%	100%	98.3%	-	97.3%	99.0%	99.2%	0%	98.9%	-		97.2%	98.0%	0%	0%	98.0%	-	98.2%		
Single-Unit Trucks	2	2	2	0	6	-		0	25	0	0	25	-	0	1	1	0	2	-		2	18	0	0	20	-	53		
% Single-Unit Trucks	1.5%	1.7%	2.7%	0%	1.8%	-		0%	1.6%	0%	0%	1.5%	-	0%	1.0%	0.8%	0%	0.7%	-		1.9%	1.4%	0%	0%	1.4%	-	1.4%		
Articulated Trucks	0	0	0	0	0	-		0	2	0	0	2	-	1	0	0	0	1	-		0	6	0	0	6	-	9		
% Articulated Trucks	0%	0%	0%	0%	0%	-		0%	0.1%	0%	0%	0.1%	-	2.7%	0%	0%	0%	0.4%	-		0%	0.5%	0%	0%	0.4%	-	0.2%		
Buses	0	0	0	0	0	-		0	1	0	0	1	-	0	0	0	0	0	-		1	1	0	0	2	-	3		
% Buses	0%	0%	0%	0%	0%	-		0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-		0.9%	0.1%	0%	0%	0.1%	-	0.1%		
Bicycles on Road	0	0	0	0	0	-		0	0	0	0	0	-	0	0	0	0	0	-		0	0	0	0	0	-	0		
% Bicycles on Road	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	-	0%		
Pedestrians	-	-	-	-	-	5		-	-	-	-	10		-	-	-	-	3		-	-	-	-	-	10				
% Pedestrians	-	-	-	-	-	-100%		-	-	-	-	-100%		-	-	-	-	-100%		-	-	-	-	-	-100%				

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# Everett - Route 16 and Vale Street TM6 TMC - TMC

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582710, Location: 42.402178, -71.045293

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Vale Street Northbound					Route 16 Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2018-12-06 6:00AM	1565	2	4	1571	1	1	141	0	142	3	118	773	0	891	3	2604
7:00AM	1304	3	3	1310	4	3	112	0	115	13	64	956	0	1020	3	2445
8:00AM	1282	1	1	1284	1	5	91	0	96	20	0	921	1	922	2	2302
3:00PM	1378	4	6	1388	0	10	356	0	366	11	142	1496	1	1639	6	3393
4:00PM	1406	0	5	1411	4	8	372	0	380	13	159	1605	2	1766	11	3557
5:00PM	1416	0	3	1419	0	11	370	0	381	5	148	1296	0	1444	4	3244
2018-12-08 11:00AM	1256	23	35	1314	0	5	190	0	195	10	131	1200	2	1333	1	2842
12:00PM	1365	12	21	1398	1	1	220	0	221	0	247	1032	3	1282	5	2901
1:00PM	1379	13	12	1404	0	1	213	0	214	0	32	871	2	905	0	2523
2018-12-09 11:00AM	1159	15	13	1187	1	3	150	0	153	5	93	870	1	964	0	2304
12:00PM	1226	8	11	1245	0	3	178	0	181	7	82	1061	2	1145	8	2571
1:00PM	1237	7	20	1264	0	0	171	0	171	0	2	955	1	958	4	2393
<b>Total</b>	15973	88	134	16195	12	51	2564	0	2615	87	1218	13036	15	14269	47	33079
<b>% Approach</b>	98.6%	0.5%	0.8%	-	-	2.0%	98.0%	0%	-	-	8.5%	91.4%	0.1%	-	-	-
<b>% Total</b>	48.3%	0.3%	0.4%	49.0%	-	0.2%	7.8%	0%	7.9%	-	3.7%	39.4%	0%	43.1%	-	-
<b>Motorcycles</b>	6	0	0	6	-	0	5	0	5	-	0	8	0	8	-	19
<b>% Motorcycles</b>	0%	0%	0%	0%	-	0%	0.2%	0%	0.2%	-	0%	0.1%	0%	0.1%	-	0.1%
<b>Lights</b>	15613	86	133	15832	-	49	2500	0	2549	-	1185	12624	15	13824	-	32205
<b>% Lights</b>	97.7%	97.7%	99.3%	97.8%	-	96.1%	97.5%	0%	97.5%	-	97.3%	96.8%	100%	96.9%	-	97.4%
<b>Single-Unit Trucks</b>	243	1	1	245	-	1	47	0	48	-	25	241	0	266	-	559
<b>% Single-Unit Trucks</b>	1.5%	1.1%	0.7%	1.5%	-	2.0%	1.8%	0%	1.8%	-	2.1%	1.8%	0%	1.9%	-	1.7%
<b>Articulated Trucks</b>	68	0	0	68	-	1	3	0	4	-	5	111	0	116	-	188
<b>% Articulated Trucks</b>	0.4%	0%	0%	0.4%	-	2.0%	0.1%	0%	0.2%	-	0.4%	0.9%	0%	0.8%	-	0.6%
<b>Buses</b>	41	1	0	42	-	0	9	0	9	-	3	52	0	55	-	106
<b>% Buses</b>	0.3%	1.1%	0%	0.3%	-	0%	0.4%	0%	0.3%	-	0.2%	0.4%	0%	0.4%	-	0.3%
<b>Bicycles on Road</b>	2	0	0	2	-	0	0	0	0	-	0	0	0	0	-	2
<b>% Bicycles on Road</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	12	-	-	-	-	87	-	-	-	-	47	-
<b>% Pedestrians</b>	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



# Everett - Route 16 and Vale Street TM6 TMC - TMC

Thu Dec 6, 2018

AM Peak (Dec 06 2018 6:15AM - 7:15AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582710, Location: 42.402178, -71.045293

Provided by: Precision Data Industries,  
LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Vale Street Northbound					Route 16 Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2018-12-06 6:15AM	435	0	1	<b>436</b>	0	0	43	0	<b>43</b>	1	27	177	0	<b>204</b>	1	<b>683</b>
6:30AM	391	1	1	<b>393</b>	1	0	37	0	<b>37</b>	0	34	223	0	<b>257</b>	0	<b>687</b>
6:45AM	367	1	0	<b>368</b>	0	0	23	0	<b>23</b>	1	36	221	0	<b>257</b>	1	<b>648</b>
7:00AM	348	1	2	<b>351</b>	1	1	27	0	<b>28</b>	0	47	254	0	<b>301</b>	0	<b>680</b>
<b>Total</b>	1541	3	4	<b>1548</b>	2	1	130	0	<b>131</b>	2	144	875	0	<b>1019</b>	2	<b>2698</b>
<b>% Approach</b>	99.5%	0.2%	0.3%	-	-	0.8%	99.2%	0%	-	-	14.1%	85.9%	0%	-	-	-
<b>% Total</b>	57.1%	0.1%	0.1%	<b>57.4%</b>	-	0%	4.8%	0%	<b>4.9%</b>	-	5.3%	32.4%	0%	<b>37.8%</b>	-	-
<b>PHF</b>	0.886	0.750	0.500	<b>0.888</b>	-	0.250	0.756	-	<b>0.762</b>	-	0.766	0.861	-	<b>0.846</b>	-	0.982
<b>Motorcycles</b>	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0	1	0	<b>1</b>	-	1
<b>% Motorcycles</b>	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0.1%	0%	<b>0.1%</b>	-	0%
<b>Lights</b>	1496	3	4	<b>1503</b>	-	1	127	0	<b>128</b>	-	136	805	0	<b>941</b>	-	2572
<b>% Lights</b>	97.1%	100%	100%	<b>97.1%</b>	-	100%	97.7%	0%	<b>97.7%</b>	-	94.4%	92.0%	0%	<b>92.3%</b>	-	95.3%
<b>Single-Unit Trucks</b>	31	0	0	<b>31</b>	-	0	2	0	<b>2</b>	-	3	35	0	<b>38</b>	-	71
<b>% Single-Unit Trucks</b>	2.0%	0%	0%	<b>2.0%</b>	-	0%	1.5%	0%	<b>1.5%</b>	-	2.1%	4.0%	0%	<b>3.7%</b>	-	2.6%
<b>Articulated Trucks</b>	12	0	0	<b>12</b>	-	0	0	0	<b>0</b>	-	3	20	0	<b>23</b>	-	35
<b>% Articulated Trucks</b>	0.8%	0%	0%	<b>0.8%</b>	-	0%	0%	0%	<b>0%</b>	-	2.1%	2.3%	0%	<b>2.3%</b>	-	1.3%
<b>Buses</b>	2	0	0	<b>2</b>	-	0	1	0	<b>1</b>	-	2	14	0	<b>16</b>	-	19
<b>% Buses</b>	0.1%	0%	0%	<b>0.1%</b>	-	0%	0.8%	0%	<b>0.8%</b>	-	1.4%	1.6%	0%	<b>1.6%</b>	-	0.7%
<b>Bicycles on Road</b>	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%
Pedestrians	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-	2
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	100%

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# Everett - Route 16 and Vale Street TM6 TMC - TMC

Thu Dec 6, 2018

PM Peak (Dec 06 2018 4PM - 5PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582710, Location: 42.402178, -71.045293

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Vale Street Northbound					Route 16 Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2018-12-06 4:00PM	354	0	1	355	0	3	87	0	90	3	29	397	0	426	4	871
4:15PM	349	0	2	351	1	3	103	0	106	5	46	395	0	441	4	898
4:30PM	340	0	2	342	3	0	81	0	81	3	40	419	1	460	0	883
4:45PM	363	0	0	363	0	2	101	0	103	2	44	394	1	439	3	905
<b>Total</b>	1406	0	5	1411	4	8	372	0	380	13	159	1605	2	1766	11	3557
<b>% Approach</b>	99.6%	0%	0.4%	-	-	2.1%	97.9%	0%	-	-	9.0%	90.9%	0.1%	-	-	-
<b>% Total</b>	39.5%	0%	0.1%	39.7%	-	0.2%	10.5%	0%	10.7%	-	4.5%	45.1%	0.1%	49.6%	-	-
<b>PHF</b>	0.968	-	0.625	0.972	-	0.667	0.903	-	0.896	-	0.864	0.958	0.500	0.960	-	0.983
<b>Motorcycles</b>	0	0	0	0	-	0	0	0	0	-	0	2	0	2	-	2
<b>% Motorcycles</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0.1%	0%	0.1%	-	0.1%
<b>Lights</b>	1371	0	5	1376	-	8	367	0	375	-	156	1566	2	1724	-	3475
<b>% Lights</b>	97.5%	0%	100%	97.5%	-	100%	98.7%	0%	98.7%	-	98.1%	97.6%	100%	97.6%	-	97.7%
<b>Single-Unit Trucks</b>	25	0	0	25	-	0	4	0	4	-	2	29	0	31	-	60
<b>% Single-Unit Trucks</b>	1.8%	0%	0%	1.8%	-	0%	1.1%	0%	1.1%	-	1.3%	1.8%	0%	1.8%	-	1.7%
<b>Articulated Trucks</b>	6	0	0	6	-	0	0	0	0	-	1	7	0	8	-	14
<b>% Articulated Trucks</b>	0.4%	0%	0%	0.4%	-	0%	0%	0%	0%	-	0.6%	0.4%	0%	0.5%	-	0.4%
<b>Buses</b>	4	0	0	4	-	0	1	0	1	-	0	1	0	1	-	6
<b>% Buses</b>	0.3%	0%	0%	0.3%	-	0%	0.3%	0%	0.3%	-	0%	0.1%	0%	0.1%	-	0.2%
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	4	-	-	-	-	13	-	-	-	-	11	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



# Everett - Route 16 and Vale Street TM6 TMC - TMC

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 11:45AM - 12:45PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582710, Location: 42.402178, -71.045293

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Vale Street Northbound					Route 16 Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2018-12-08 11:45AM	329	5	9	<b>343</b>	0	2	56	0	<b>58</b>	2	37	276	0	<b>313</b>	0	<b>714</b>
12:00PM	331	3	6	<b>340</b>	0	1	62	0	<b>63</b>	0	37	346	1	<b>384</b>	0	<b>787</b>
12:15PM	350	8	4	<b>362</b>	1	0	49	0	<b>49</b>	0	48	283	1	<b>332</b>	1	<b>743</b>
12:30PM	360	0	8	<b>368</b>	0	0	49	0	<b>49</b>	0	73	248	0	<b>321</b>	2	<b>738</b>
<b>Total</b>	<b>1370</b>	<b>16</b>	<b>27</b>	<b>1413</b>	<b>1</b>	<b>3</b>	<b>216</b>	<b>0</b>	<b>219</b>	<b>2</b>	<b>195</b>	<b>1153</b>	<b>2</b>	<b>1350</b>	<b>3</b>	<b>2982</b>
<b>% Approach</b>	97.0%	1.1%	1.9%	-	-	1.4%	98.6%	0%	-	-	14.4%	85.4%	0.1%	-	-	-
<b>% Total</b>	45.9%	0.5%	0.9%	<b>47.4%</b>	-	0.1%	7.2%	0%	<b>7.3%</b>	-	6.5%	38.7%	0.1%	<b>45.3%</b>	-	-
<b>PHF</b>	0.951	0.500	0.750	<b>0.960</b>	-	0.375	0.871	-	<b>0.869</b>	-	0.668	0.833	0.500	<b>0.879</b>	-	0.947
<b>Motorcycles</b>	1	0	0	<b>1</b>	-	0	1	0	<b>1</b>	-	0	0	0	<b>0</b>	-	2
<b>% Motorcycles</b>	0.1%	0%	0%	<b>0.1%</b>	-	0%	0.5%	0%	<b>0.5%</b>	-	0%	0%	0%	<b>0%</b>	-	0.1%
<b>Lights</b>	1341	14	27	<b>1382</b>	-	3	207	0	<b>210</b>	-	189	1130	2	<b>1321</b>	-	2913
<b>% Lights</b>	97.9%	87.5%	100%	<b>97.8%</b>	-	100%	95.8%	0%	<b>95.9%</b>	-	96.9%	98.0%	100%	<b>97.9%</b>	-	97.7%
<b>Single-Unit Trucks</b>	23	1	0	<b>24</b>	-	0	8	0	<b>8</b>	-	5	14	0	<b>19</b>	-	51
<b>% Single-Unit Trucks</b>	1.7%	6.3%	0%	<b>1.7%</b>	-	0%	3.7%	0%	<b>3.7%</b>	-	2.6%	1.2%	0%	<b>1.4%</b>	-	1.7%
<b>Articulate d Trucks</b>	3	0	0	<b>3</b>	-	0	0	0	<b>0</b>	-	0	7	0	<b>7</b>	-	10
<b>% Articulate d Trucks</b>	0.2%	0%	0%	<b>0.2%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0.6%	0%	<b>0.5%</b>	-	0.3%
<b>Buses</b>	2	1	0	<b>3</b>	-	0	0	0	<b>0</b>	-	1	2	0	<b>3</b>	-	6
<b>% Buses</b>	0.1%	6.3%	0%	<b>0.2%</b>	-	0%	0%	0%	<b>0%</b>	-	0.5%	0.2%	0%	<b>0.2%</b>	-	0.2%
<b>Bicycles on Road</b>	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%
Pedestrians	-	-	-	-	1	-	-	-	-	2	-	-	-	-	-	3
<b>% Pedestrians</b>	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	100%

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# Everett - Route 16 and Boston Street TM7 TMC - TMC

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582712, Location: 42.401975, -71.043603

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Boston Street Northbound					Route 16 Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2018-12-06 6:00AM	1471	99	8	1578	0	31	0	0	31	3	11	782	0	793	2	2402
7:00AM	1180	189	16	1385	0	56	0	0	56	6	49	947	0	996	0	2437
8:00AM	1126	163	7	1296	1	70	3	0	73	6	76	873	0	949	0	2318
3:00PM	1292	117	6	1415	2	189	14	0	203	2	62	1421	1	1484	0	3102
4:00PM	1281	84	4	1369	1	220	8	0	228	3	51	1569	4	1624	3	3221
5:00PM	1325	50	17	1392	2	191	6	0	197	2	44	1424	1	1469	2	3058
2018-12-08 11:00AM	1245	121	20	1386	0	181	9	0	190	7	44	1229	1	1274	0	2850
12:00PM	1360	96	16	1472	2	184	2	0	186	2	65	1369	2	1436	0	3094
1:00PM	1368	87	19	1474	1	170	4	0	174	0	65	1388	4	1457	0	3105
2018-12-09 11:00AM	1141	82	19	1242	0	124	4	0	128	1	38	937	1	976	1	2346
12:00PM	1232	78	28	1338	0	142	2	0	144	1	56	1171	0	1227	0	2709
1:00PM	1191	96	24	1311	1	156	4	0	160	1	59	1331	0	1390	1	2861
<b>Total</b>	15212	1262	184	16658	10	1714	56	0	1770	34	620	14441	14	15075	9	33503
<b>% Approach</b>	91.3%	7.6%	1.1%	-	-	96.8%	3.2%	0%	-	-	4.1%	95.8%	0.1%	-	-	-
<b>% Total</b>	45.4%	3.8%	0.5%	49.7%	-	5.1%	0.2%	0%	5.3%	-	1.9%	43.1%	0%	45.0%	-	-
<b>Motorcycles</b>	1	1	1	3	-	0	0	0	0	-	0	15	0	15	-	18
<b>% Motorcycles</b>	0%	0.1%	0.5%	0%	-	0%	0%	0%	0%	-	0%	0.1%	0%	0.1%	-	0.1%
<b>Lights</b>	14921	1180	183	16284	-	1641	52	0	1693	-	600	13991	13	14604	-	32581
<b>% Lights</b>	98.1%	93.5%	99.5%	97.8%	-	95.7%	92.9%	0%	95.6%	-	96.8%	96.9%	92.9%	96.9%	-	97.2%
<b>Single-Unit Trucks</b>	185	66	0	251	-	56	3	0	59	-	16	262	1	279	-	589
<b>% Single-Unit Trucks</b>	1.2%	5.2%	0%	1.5%	-	3.3%	5.4%	0%	3.3%	-	2.6%	1.8%	7.1%	1.9%	-	1.8%
<b>Articulated Trucks</b>	58	11	0	69	-	12	1	0	13	-	3	119	0	122	-	204
<b>% Articulated Trucks</b>	0.4%	0.9%	0%	0.4%	-	0.7%	1.8%	0%	0.7%	-	0.5%	0.8%	0%	0.8%	-	0.6%
<b>Buses</b>	45	3	0	48	-	3	0	0	3	-	0	52	0	52	-	103
<b>% Buses</b>	0.3%	0.2%	0%	0.3%	-	0.2%	0%	0%	0.2%	-	0%	0.4%	0%	0.3%	-	0.3%
<b>Bicycles on Road</b>	2	1	0	3	-	2	0	0	2	-	1	2	0	3	-	8
<b>% Bicycles on Road</b>	0%	0.1%	0%	0%	-	0.1%	0%	0%	0.1%	-	0.2%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	10	-	-	-	-	34	-	-	-	-	9	-
<b>% Pedestrians</b>	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# Everett - Route 16 and Boston Street TM7 TMC - TMC

Thu Dec 6, 2018

AM Peak (Dec 06 2018 6:15AM - 7:15AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582712, Location: 42.401975, -71.043603

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Boston Street Northbound					Route 16 Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2018-12-06 6:15AM	419	19	1	<b>439</b>	0	9	0	0	<b>9</b>	0	2	181	0	<b>183</b>	0	<b>631</b>
6:30AM	347	26	2	<b>375</b>	0	8	0	0	<b>8</b>	1	4	220	0	<b>224</b>	2	<b>607</b>
6:45AM	336	35	2	<b>373</b>	0	8	0	0	<b>8</b>	2	2	224	0	<b>226</b>	0	<b>607</b>
7:00AM	321	35	2	<b>358</b>	0	14	0	0	<b>14</b>	0	4	262	0	<b>266</b>	0	<b>638</b>
<b>Total</b>	1423	115	7	<b>1545</b>	0	39	0	0	<b>39</b>	3	12	887	0	<b>899</b>	2	<b>2483</b>
<b>% Approach</b>	92.1%	7.4%	0.5%	-	-	100%	0%	0%	-	-	1.3%	98.7%	0%	-	-	-
<b>% Total</b>	57.3%	4.6%	0.3%	<b>62.2%</b>	-	1.6%	0%	0%	<b>1.6%</b>	-	0.5%	35.7%	0%	<b>36.2%</b>	-	-
<b>PHF</b>	0.849	0.821	0.875	<b>0.880</b>	-	0.696	-	-	<b>0.696</b>	-	0.750	0.846	-	<b>0.845</b>	-	0.973
<b>Motorcycles</b>	0	1	0	<b>1</b>	-	0	0	0	<b>0</b>	-	0	1	0	<b>1</b>	-	2
<b>% Motorcycles</b>	0%	0.9%	0%	<b>0.1%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0.1%	0%	<b>0.1%</b>	-	0.1%
<b>Lights</b>	1378	98	7	<b>1483</b>	-	27	0	0	<b>27</b>	-	11	811	0	<b>822</b>	-	2332
<b>% Lights</b>	96.8%	85.2%	100%	<b>96.0%</b>	-	69.2%	0%	0%	<b>69.2%</b>	-	91.7%	91.4%	0%	<b>91.4%</b>	-	93.9%
<b>Single-Unit Trucks</b>	30	10	0	<b>40</b>	-	6	0	0	<b>6</b>	-	0	40	0	<b>40</b>	-	86
<b>% Single-Unit Trucks</b>	2.1%	8.7%	0%	<b>2.6%</b>	-	15.4%	0%	0%	<b>15.4%</b>	-	0%	4.5%	0%	<b>4.4%</b>	-	3.5%
<b>Articulated Trucks</b>	13	5	0	<b>18</b>	-	4	0	0	<b>4</b>	-	1	21	0	<b>22</b>	-	44
<b>% Articulated Trucks</b>	0.9%	4.3%	0%	<b>1.2%</b>	-	10.3%	0%	0%	<b>10.3%</b>	-	8.3%	2.4%	0%	<b>2.4%</b>	-	1.8%
<b>Buses</b>	2	1	0	<b>3</b>	-	2	0	0	<b>2</b>	-	0	14	0	<b>14</b>	-	19
<b>% Buses</b>	0.1%	0.9%	0%	<b>0.2%</b>	-	5.1%	0%	0%	<b>5.1%</b>	-	0%	1.6%	0%	<b>1.6%</b>	-	0.8%
<b>Bicycles on Road</b>	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	3	-	-	-	-	-	2
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



# Everett - Route 16 and Boston Street TM7 TMC - TMC

Thu Dec 6, 2018

PM Peak (Dec 06 2018 4:30PM - 5:30PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582712, Location: 42.401975, -71.043603

Provided by: Precision Data Industries,  
LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Boston Street Northbound					Route 16 Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2018-12-06 4:30PM	310	17	0	327	0	54	4	0	58	3	12	412	0	424	0	809
4:45PM	317	22	2	341	0	53	3	0	56	0	13	405	3	421	0	818
5:00PM	315	14	1	330	0	64	2	0	66	0	15	324	0	339	2	735
5:15PM	397	20	8	425	0	45	0	0	45	1	10	398	0	408	0	878
<b>Total</b>	1339	73	11	1423	0	216	9	0	225	4	50	1539	3	1592	2	3240
<b>% Approach</b>	94.1%	5.1%	0.8%	-	-	96.0%	4.0%	0%	-	-	3.1%	96.7%	0.2%	-	-	-
<b>% Total</b>	41.3%	2.3%	0.3%	43.9%	-	6.7%	0.3%	0%	6.9%	-	1.5%	47.5%	0.1%	49.1%	-	-
<b>PHF</b>	0.843	0.830	0.344	0.837	-	0.844	0.563	-	0.852	-	0.833	0.937	0.250	0.942	-	0.922
<b>Motorcycles</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
<b>% Motorcycles</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
<b>Lights</b>	1310	72	11	1393	-	212	8	0	220	-	50	1508	3	1561	-	3174
<b>% Lights</b>	97.8%	98.6%	100%	97.9%	-	98.1%	88.9%	0%	97.8%	-	100%	98.0%	100%	98.1%	-	98.0%
<b>Single-Unit Trucks</b>	17	1	0	18	-	2	1	0	3	-	0	15	0	15	-	36
<b>% Single-Unit Trucks</b>	1.3%	1.4%	0%	1.3%	-	0.9%	11.1%	0%	1.3%	-	0%	1.0%	0%	0.9%	-	1.1%
<b>Articulated Trucks</b>	4	0	0	4	-	2	0	0	2	-	0	12	0	12	-	18
<b>% Articulated Trucks</b>	0.3%	0%	0%	0.3%	-	0.9%	0%	0%	0.9%	-	0%	0.8%	0%	0.8%	-	0.6%
<b>Buses</b>	8	0	0	8	-	0	0	0	0	-	0	2	0	2	-	10
<b>% Buses</b>	0.6%	0%	0%	0.6%	-	0%	0%	0%	0%	-	0%	0.1%	0%	0.1%	-	0.3%
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	0	2	0	2	-	2
<b>% Bicycles on Road</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0.1%	0%	0.1%	-	0.1%
Pedestrians	-	-	-	-	0	-	-	-	-	4	-	-	-	-	-	2
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# Everett - Route 16 and Boston Street TM7 TMC - TMC

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 12:30PM - 1:30PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582712, Location: 42.401975, -71.043603

Provided by: Precision Data Industries,  
LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Boston Street Northbound					Route 16 Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2018-12-08 12:30PM	361	18	4	<b>383</b>	1	38	0	0	<b>38</b>	1	20	332	0	<b>352</b>	0	<b>773</b>
12:45PM	323	26	6	<b>355</b>	0	50	1	0	<b>51</b>	1	10	320	2	<b>332</b>	0	<b>738</b>
1:00PM	373	25	5	<b>403</b>	1	48	1	0	<b>49</b>	0	15	343	1	<b>359</b>	0	<b>811</b>
1:15PM	337	22	8	<b>367</b>	0	49	0	0	<b>49</b>	0	18	361	0	<b>379</b>	0	<b>795</b>
<b>Total</b>	1394	91	23	<b>1508</b>	2	185	2	0	<b>187</b>	2	63	1356	3	<b>1422</b>	0	<b>3117</b>
<b>% Approach</b>	92.4%	6.0%	1.5%	-	-	98.9%	1.1%	0%	-	-	4.4%	95.4%	0.2%	-	-	-
<b>% Total</b>	44.7%	2.9%	0.7%	<b>48.4%</b>	-	5.9%	0.1%	0%	<b>6.0%</b>	-	2.0%	43.5%	0.1%	<b>45.6%</b>	-	-
<b>PHF</b>	0.934	0.875	0.719	<b>0.935</b>	-	0.925	0.500	-	<b>0.917</b>	-	0.788	0.939	0.375	<b>0.938</b>	-	0.961
<b>Motorcycles</b>	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0
<b>% Motorcycles</b>	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%
<b>Lights</b>	1373	89	23	<b>1485</b>	-	184	2	0	<b>186</b>	-	61	1330	2	<b>1393</b>	-	3064
<b>% Lights</b>	98.5%	97.8%	100%	<b>98.5%</b>	-	99.5%	100%	0%	<b>99.5%</b>	-	96.8%	98.1%	66.7%	<b>98.0%</b>	-	98.3%
<b>Single-Unit Trucks</b>	18	2	0	<b>20</b>	-	1	0	0	<b>1</b>	-	2	16	1	<b>19</b>	-	40
<b>% Single-Unit Trucks</b>	1.3%	2.2%	0%	<b>1.3%</b>	-	0.5%	0%	0%	<b>0.5%</b>	-	3.2%	1.2%	33.3%	<b>1.3%</b>	-	1.3%
<b>Articulate d Trucks</b>	2	0	0	<b>2</b>	-	0	0	0	<b>0</b>	-	0	8	0	<b>8</b>	-	10
<b>% Articulate d Trucks</b>	0.1%	0%	0%	<b>0.1%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0.6%	0%	<b>0.6%</b>	-	0.3%
<b>Buses</b>	1	0	0	<b>1</b>	-	0	0	0	<b>0</b>	-	0	2	0	<b>2</b>	-	3
<b>% Buses</b>	0.1%	0%	0%	<b>0.1%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0.1%	0%	<b>0.1%</b>	-	0.1%
<b>Bicycles on Road</b>	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%
Pedestrians	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-	0
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Everett Avenue TM8 TMC - TMC**

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582713, Location: 42.401757, -71.041575

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Everett Avenue Southbound							Route 16 Westbound							Everett Avenue Northbound							Route 16 Eastbound							Int
	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		
2018-12-06																													
6:00AM	50	193	51	0	294	1		8	1450	38	1	1497	2		16	61	153	0	230	2		131	621	36	11	799	6	2820	
7:00AM	84	216	90	0	390	0		12	1278	102	1	1393	9		52	92	98	0	242	6		161	761	71	18	1011	6	3036	
8:00AM	66	186	71	0	323	3		11	1221	77	4	1313	7		50	89	125	0	264	8		172	682	58	21	933	11	2833	
3:00PM	57	163	81	0	301	7		24	1192	65	4	1285	17		51	197	175	0	423	8		155	1281	171	52	1659	24	3668	
4:00PM	42	151	55	0	248	6		21	1192	57	8	1278	16		50	230	185	0	465	14		158	1377	184	49	1768	15	3759	
5:00PM	46	189	67	0	302	2		29	1196	40	4	1269	12		67	259	190	0	516	10		148	1201	193	43	1585	4	3672	
2018-12-08																													
11:00AM	85	147	94	0	326	4		20	1120	77	3	1220	4		65	133	191	0	389	2		177	1072	122	62	1433	8	3368	
12:00PM	73	194	111	0	378	0		21	1153	94	3	1271	5		83	159	213	0	455	3		180	1193	116	60	1549	7	3653	
1:00PM	72	198	77	0	347	1		24	1172	69	4	1269	2		76	174	202	0	452	4		183	1201	120	66	1570	18	3638	
2018-12-09																													
11:00AM	60	174	60	0	294	4		15	1022	54	2	1093	6		44	117	180	1	342	5		142	812	91	37	1082	5	2811	
12:00PM	74	168	59	0	301	0		19	1087	52	0	1158	2		66	133	191	1	391	4		162	1074	111	40	1387	4	3237	
1:00PM	79	168	74	0	321	0		12	1072	55	1	1140	5		49	145	178	0	372	2		176	1124	131	44	1475	12	3308	
<b>Total</b>	788	2147	890	0	3825	28		216	14155	780	35	15186	87		669	1789	2081	2	4541	68		1945	12399	1404	503	16251	120	39803	
<b>% Approach</b>	20.6%	56.1%	23.3%	0%	-	-		1.4%	93.2%	5.1%	0.2%	-	-	14.7%	39.4%	45.8%	0%	-	-	12.0%	76.3%	8.6%	3.1%	-	-	-			
<b>% Total</b>	2.0%	5.4%	2.2%	0%	9.6%	-		0.5%	35.6%	2.0%	0.1%	38.2%	-	1.7%	4.5%	5.2%	0%	11.4%	-	4.9%	31.2%	3.5%	1.3%	40.8%	-	-			
<b>Motorcycles</b>	0	3	1	0	4	-		0	10	0	0	10	-	0	0	0	0	0	-	0	14	1	0	15	-	29			
<b>% Motorcycles</b>	0%	0.1%	0.1%	0%	0.1%	-		0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0.1%	0%	0.1%	-	0.1%			
<b>Lights</b>	776	2104	852	0	3732	-		198	13792	754	34	14778	-	637	1763	2043	2	4445	-	1899	11947	1389	496	15731	-	38686			
<b>% Lights</b>	98.5%	98.0%	95.7%	0%	97.6%	-		91.7%	97.4%	96.7%	97.1%	97.3%	-	95.2%	98.5%	98.2%	100%	97.9%	-	97.6%	96.4%	98.9%	98.6%	96.8%	-	97.2%			
<b>Single-Unit Trucks</b>	9	21	12	0	42	-		4	249	9	0	262	-	9	21	25	0	55	-	29	272	12	6	319	-	678			
<b>% Single-Unit Trucks</b>	1.1%	1.0%	1.3%	0%	1.1%	-		1.9%	1.8%	1.2%	0%	1.7%	-	1.3%	1.2%	1.2%	0%	1.2%	-	1.5%	2.2%	0.9%	1.2%	2.0%	-	1.7%			
<b>Articulated Trucks</b>	1	1	1	0	3	-		0	61	1	0	62	-	5	1	6	0	12	-	11	117	1	1	130	-	207			
<b>% Articulated Trucks</b>	0.1%	0%	0.1%	0%	0.1%	-		0%	0.4%	0.1%	0%	0.4%	-	0.7%	0.1%	0.3%	0%	0.3%	-	0.6%	0.9%	0.1%	0.2%	0.8%	-	0.5%			
<b>Buses</b>	0	13	24	0	37	-		14	43	16	1	74	-	18	4	3	0	25	-	6	48	1	0	55	-	191			
<b>% Buses</b>	0%	0.6%	2.7%	0%	1.0%	-		6.5%	0.3%	2.1%	2.9%	0.5%	-	2.7%	0.2%	0.1%	0%	0.6%	-	0.3%	0.4%	0.1%	0%	0.3%	-	0.5%			
<b>Bicycles on Road</b>	2	5	0	0	7	-		0	0	0	0	0	-	0	0	4	0	4	-	0	1	0	0	1	-	12			
<b>% Bicycles on Road</b>	0.3%	0.2%	0%	0%	0.2%	-		0%	0%	0%	0%	0%	-	0%	0%	0.2%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%			
<b>Pedestrians</b>	-	-	-	-	-	28		-	-	-	-	87		-	-	-	-	68		-	-	-	-	-	120				
<b>% Pedestrians</b>	-	-	-	-	-	100%		-	-	-	-	100%		-	-	-	-	100%		-	-	-	-	-	100%				

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Everett - Route 16 and Everett Avenue TM8 TMC - TMC**

Thu Dec 6, 2018

AM Peak (Dec 06 2018 7AM - 8AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582713, Location: 42.401757, -71.041575

Provided by: Precision Data Industries, LLC (PDI)

46 Morton Street, Framingham, MA, MA, 01702, US

Leg Direction	Everett Avenue Southbound						Route 16 Westbound						Everett Avenue Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 7:00AM	15	56	16	0	87	0	2	342	26	0	370	2	15	19	30	0	64	2	44	220	20	2	286	1	807
7:15AM	13	55	25	0	93	0	1	317	26	1	345	0	12	23	26	0	61	3	30	182	21	5	238	3	737
7:30AM	24	51	21	0	96	0	4	289	23	0	316	3	13	36	29	0	78	0	41	190	13	3	247	2	737
7:45AM	32	54	28	0	114	0	5	330	27	0	362	4	12	14	13	0	39	1	46	169	17	8	240	0	755
<b>Total</b>	84	216	90	0	390	0	12	1278	102	1	1393	9	52	92	98	0	242	6	161	761	71	18	1011	6	3036
<b>% Approach</b>	21.5%	55.4%	23.1%	0%	-	-	0.9%	91.7%	7.3%	0.1%	-	-	21.5%	38.0%	40.5%	0%	-	-	15.9%	75.3%	7.0%	1.8%	-	-	-
<b>% Total</b>	2.8%	7.1%	3.0%	0%	12.8%	-	0.4%	42.1%	3.4%	0%	45.9%	-	1.7%	3.0%	3.2%	0%	8.0%	-	5.3%	25.1%	2.3%	0.6%	33.3%	-	-
<b>PHF</b>	0.656	0.964	0.804	-	0.855	-	0.600	0.934	0.944	0.250	0.941	-	0.867	0.639	0.808	-	0.772	-	0.875	0.865	0.845	0.563	0.884	-	0.940
<b>Motorcycles</b>	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	1	0	0	1	-	2
<b>% Motorcycles</b>	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0.1%
<b>Lights</b>	83	212	82	0	377	-	11	1215	98	1	1325	-	45	86	95	0	226	-	151	694	70	16	931	-	2859
<b>% Lights</b>	98.8%	98.1%	91.1%	0%	96.7%	-	91.7%	95.1%	96.1%	100%	95.1%	-	86.5%	93.5%	96.9%	0%	93.4%	-	93.8%	91.2%	98.6%	88.9%	92.1%	-	94.2%
<b>Single-Unit Trucks</b>	1	4	3	0	8	-	0	47	3	0	50	-	1	5	0	0	6	-	7	41	1	1	50	-	114
<b>% Single-Unit Trucks</b>	1.2%	1.9%	3.3%	0%	2.1%	-	0%	3.7%	2.9%	0%	3.6%	-	1.9%	5.4%	0%	0%	2.5%	-	4.3%	5.4%	1.4%	5.6%	4.9%	-	3.8%
<b>Articulated Trucks</b>	0	0	1	0	1	-	0	5	0	0	5	-	3	1	2	0	6	-	3	17	0	1	21	-	33
<b>% Articulated Trucks</b>	0%	0%	1.1%	0%	0.3%	-	0%	0.4%	0%	0%	0.4%	-	5.8%	1.1%	2.0%	0%	2.5%	-	1.9%	2.2%	0%	5.6%	2.1%	-	1.1%
<b>Buses</b>	0	0	4	0	4	-	1	10	1	0	12	-	3	0	0	0	3	-	0	8	0	0	8	-	27
<b>% Buses</b>	0%	0%	4.4%	0%	1.0%	-	8.3%	0.8%	1.0%	0%	0.9%	-	5.8%	0%	0%	0%	1.2%	-	0%	1.1%	0%	0%	0.8%	-	0.9%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	1	-	0	0	0	0	0	-	1
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	1.0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	9	-	-	-	-	-	6	-	-	-	-	-	6	
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Everett Avenue TM8 TMC - TMC**

Thu Dec 6, 2018

PM Peak (Dec 06 2018 4:30PM - 5:30PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582713, Location: 42.401757, -71.041575

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Everett Avenue Southbound						Route 16 Westbound						Everett Avenue Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 4:30PM	14	41	19	0	74	1	7	283	12	0	302	2	17	71	50	0	138	2	38	358	47	10	453	5	967
4:45PM	14	34	12	0	60	2	2	300	16	4	322	2	11	55	43	0	109	6	41	367	52	14	474	3	965
5:00PM	14	47	17	0	78	0	6	267	7	1	281	5	20	72	62	0	154	5	34	291	48	11	384	1	897
5:15PM	13	52	10	0	75	0	3	387	10	1	401	1	20	71	40	0	131	1	44	316	45	10	415	2	1022
<b>Total</b>	55	174	58	0	287	3	18	1237	45	6	1306	10	68	269	195	0	532	14	157	1332	192	45	1726	11	3851
% Approach	19.2%	60.6%	20.2%	0%	-	-	1.4%	94.7%	3.4%	0.5%	-	-	12.8%	50.6%	36.7%	0%	-	-	9.1%	77.2%	11.1%	2.6%	-	-	-
% Total	1.4%	4.5%	1.5%	0%	7.5%	-	0.5%	32.1%	1.2%	0.2%	33.9%	-	1.8%	7.0%	5.1%	0%	13.8%	-	4.1%	34.6%	5.0%	1.2%	44.8%	-	-
PHF	0.982	0.832	0.763	-	0.917	-	0.643	0.799	0.703	0.375	0.814	-	0.850	0.934	0.786	-	0.864	-	0.892	0.907	0.923	0.804	0.910	-	0.942
Motorcycles	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	2
% Motorcycles	0%	0.6%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0.1%
Lights	55	170	55	0	280	-	17	1210	43	6	1276	-	65	266	194	0	525	-	156	1297	192	45	1690	-	3771
% Lights	100%	97.7%	94.8%	0%	97.6%	-	94.4%	97.8%	95.6%	100%	97.7%	-	95.6%	98.9%	99.5%	0%	98.7%	-	99.4%	97.4%	100%	100%	97.9%	-	97.9%
Single-Unit Trucks	0	2	2	0	4	-	1	17	1	0	19	-	2	3	1	0	6	-	0	20	0	0	20	-	49
% Single-Unit Trucks	0%	1.1%	3.4%	0%	1.4%	-	5.6%	1.4%	2.2%	0%	1.5%	-	2.9%	1.1%	0.5%	0%	1.1%	-	0%	1.5%	0%	0%	1.2%	-	1.3%
Articulated Trucks	0	0	0	0	0	-	0	2	0	0	2	-	0	0	0	0	0	-	1	13	0	0	14	-	16
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.6%	1.0%	0%	0%	0.8%	-	0.4%
Buses	0	0	1	0	1	-	0	8	1	0	9	-	1	0	0	0	1	-	0	1	0	0	1	-	12
% Buses	0%	0%	1.7%	0%	0.3%	-	0%	0.6%	2.2%	0%	0.7%	-	1.5%	0%	0%	0%	0.2%	-	0%	0.1%	0%	0%	0.1%	-	0.3%
Bicycles on Road	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1
% Bicycles on Road	0%	0.6%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	3	-	-	-	-	-	10	-	-	-	-	-	14	-	-	-	-	-	11	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Everett - Route 16 and Everett Avenue TM8 TMC - TMC**

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 12:30PM - 1:30PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582713, Location: 42.401757, -71.041575

Provided by: Precision Data Industries, LLC (PDI)

46 Morton Street, Framingham, MA, MA, 01702, US

Leg Direction	Everett Avenue Southbound						Route 16 Westbound						Everett Avenue Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-08 12:30PM	24	55	25	0	104	0	4	296	23	2	325	2	13	44	62	0	119	1	46	294	35	9	384	0	932
12:45PM	10	50	22	0	82	0	3	281	29	1	314	1	29	33	61	0	123	1	43	303	33	14	393	3	912
1:00PM	16	56	23	0	95	0	5	334	19	2	360	2	21	55	45	0	121	2	45	311	30	16	402	2	978
1:15PM	26	58	20	0	104	0	6	269	24	1	300	0	19	41	62	0	122	1	53	313	29	20	415	6	941
<b>Total</b>	76	219	90	0	385	0	18	1180	95	6	1299	5	82	173	230	0	485	5	187	1221	127	59	1594	11	3763
% Approach	19.7%	56.9%	23.4%	0%	-	-	1.4%	90.8%	7.3%	0.5%	-	-	16.9%	35.7%	47.4%	0%	-	-	11.7%	76.6%	8.0%	3.7%	-	-	-
% Total	2.0%	5.8%	2.4%	0%	10.2%	-	0.5%	31.4%	2.5%	0.2%	34.5%	-	2.2%	4.6%	6.1%	0%	12.9%	-	5.0%	32.4%	3.4%	1.6%	42.4%	-	-
PHF	0.731	0.944	0.900	-	0.925	-	0.750	0.883	0.819	0.750	0.902	-	0.707	0.786	0.927	-	0.986	-	0.882	0.975	0.907	0.738	0.960	-	0.962
Motorcycles	0	1	1	0	2	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	2
% Motorcycles	0%	0.5%	1.1%	0%	0.5%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0.1%
Lights	75	218	86	0	379	-	16	1156	92	6	1270	-	80	171	227	0	478	-	185	1196	127	58	1566	-	3693
% Lights	98.7%	99.5%	95.6%	0%	98.4%	-	88.9%	98.0%	96.8%	100%	97.8%	-	97.6%	98.8%	98.7%	0%	98.6%	-	98.9%	98.0%	100%	98.3%	98.2%	-	98.1%
Single-Unit Trucks	1	0	1	0	2	-	0	21	1	0	22	-	0	2	2	0	4	-	1	15	0	1	17	-	45
% Single-Unit Trucks	1.3%	0%	1.1%	0%	0.5%	-	0%	1.8%	1.1%	0%	1.7%	-	0%	1.2%	0.9%	0%	0.8%	-	0.5%	1.2%	0%	1.7%	1.1%	-	1.2%
Articulated Trucks	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	1	8	0	0	9	-	12
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.5%	0.7%	0%	0%	0.6%	-	0.3%
Buses	0	0	2	0	2	-	2	0	2	0	4	-	2	0	1	0	3	-	0	2	0	0	2	-	11
% Buses	0%	0%	2.2%	0%	0.5%	-	11.1%	0%	2.1%	0%	0.3%	-	2.4%	0%	0.4%	0%	0.6%	-	0%	0.2%	0%	0%	0.1%	-	0.3%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	5	-	-	-	-	-	-	11
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-100%	-	-	-	-	-	-100%	-	-	-	-	-	-	-	-100%

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



# Chelsea - Route 16 and Union Street TM9 TMC - TMC

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582715, Location: 42.403915, -71.037713

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Route 16 Northeastbound					Union Street Eastbound					
Time	T	BL	U	App	Ped*	BR	HL	U	App	Ped*	HR	T	U	App	Ped*	Int
2018-12-06 6:00AM	95	1478	0	1573	0	728	0	0	728	0	11	153	0	164	0	2465
7:00AM	225	1478	0	1703	0	992	0	0	992	1	15	210	0	225	4	2920
8:00AM	128	1322	0	1450	1	872	0	0	872	1	8	199	1	208	2	2530
3:00PM	235	1340	0	1575	0	1527	1	0	1528	0	27	152	0	179	8	3282
4:00PM	224	1306	0	1530	0	1568	0	1	1569	0	11	126	0	137	6	3236
5:00PM	243	1368	0	1611	2	1442	0	0	1442	1	8	121	0	129	0	3182
2018-12-08 11:00AM	166	1283	0	1449	0	1289	0	0	1289	0	8	153	0	161	2	2899
12:00PM	173	1305	0	1478	0	1487	0	0	1487	1	8	131	0	139	1	3104
1:00PM	175	1318	0	1493	0	1437	0	0	1437	1	9	149	0	158	0	3088
2018-12-09 11:00AM	119	1161	0	1280	0	978	1	0	979	2	6	103	0	109	2	2368
12:00PM	164	1174	0	1338	0	1252	0	0	1252	0	7	146	0	153	7	2743
1:00PM	183	1207	0	1390	0	1348	0	1	1349	0	4	153	0	157	1	2896
<b>Total</b>	2130	15740	0	17870	3	14920	2	2	14924	7	122	1796	1	1919	33	34713
<b>% Approach</b>	11.9%	88.1%	0%	-	-	100.0%	0%	0%	-	-	6.4%	93.6%	0.1%	-	-	-
<b>% Total</b>	6.1%	45.3%	0%	51.5%	-	43.0%	0%	0%	43.0%	-	0.4%	5.2%	0%	5.5%	-	-
<b>Motorcycles</b>	0	9	0	9	-	19	0	0	19	-	0	0	0	0	-	28
<b>% Motorcycles</b>	0%	0.1%	0%	0.1%	-	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	-	0.1%
<b>Lights</b>	2104	15330	0	17434	-	14380	2	2	14384	-	119	1777	1	1897	-	33715
<b>% Lights</b>	98.8%	97.4%	0%	97.6%	-	96.4%	100%	100%	96.4%	-	97.5%	98.9%	100%	98.9%	-	97.1%
<b>Single-Unit Trucks</b>	13	250	0	263	-	302	0	0	302	-	0	13	0	13	-	578
<b>% Single-Unit Trucks</b>	0.6%	1.6%	0%	1.5%	-	2.0%	0%	0%	2.0%	-	0%	0.7%	0%	0.7%	-	1.7%
<b>Articulated Trucks</b>	0	68	0	68	-	123	0	0	123	-	0	0	0	0	-	191
<b>% Articulated Trucks</b>	0%	0.4%	0%	0.4%	-	0.8%	0%	0%	0.8%	-	0%	0%	0%	0%	-	0.6%
<b>Buses</b>	12	83	0	95	-	94	0	0	94	-	2	5	0	7	-	196
<b>% Buses</b>	0.6%	0.5%	0%	0.5%	-	0.6%	0%	0%	0.6%	-	1.6%	0.3%	0%	0.4%	-	0.6%
<b>Bicycles on Road</b>	1	0	0	1	-	2	0	0	2	-	1	1	0	2	-	5
<b>% Bicycles on Road</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.8%	0.1%	0%	0.1%	-	0%
<b>Pedestrians</b>	-	-	-	-	3	-	-	-	-	7	-	-	-	-	33	-
<b>% Pedestrians</b>	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, T: Thru, U: U-Turn

# Chelsea - Route 16 and Union Street TM9 TMC - TMC

Thu Dec 6, 2018

AM Peak (Dec 06 2018 7AM - 8AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582715, Location: 42.403915, -71.037713

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Route 16 Northeastbound					Union Street Eastbound					Int
	T	BL	U	App	Ped*	BR	HL	U	App	Ped*	HR	T	U	App	Ped*	
2018-12-06 7:00AM	52	356	0	<b>408</b>	0	260	0	0	<b>260</b>	0	2	41	0	<b>43</b>	1	<b>711</b>
7:15AM	66	386	0	<b>452</b>	0	246	0	0	<b>246</b>	1	7	47	0	<b>54</b>	1	<b>752</b>
7:30AM	55	339	0	<b>394</b>	0	249	0	0	<b>249</b>	0	3	45	0	<b>48</b>	0	<b>691</b>
7:45AM	52	397	0	<b>449</b>	0	237	0	0	<b>237</b>	0	3	77	0	<b>80</b>	2	<b>766</b>
<b>Total</b>	<b>225</b>	<b>1478</b>	<b>0</b>	<b>1703</b>	<b>0</b>	<b>992</b>	<b>0</b>	<b>0</b>	<b>992</b>	<b>1</b>	<b>15</b>	<b>210</b>	<b>0</b>	<b>225</b>	<b>4</b>	<b>2920</b>
<b>% Approach</b>	13.2%	86.8%	0%	-	-	100%	0%	0%	-	-	6.7%	93.3%	0%	-	-	-
<b>% Total</b>	7.7%	50.6%	0%	<b>58.3%</b>	-	34.0%	0%	0%	<b>34.0%</b>	-	0.5%	7.2%	0%	<b>7.7%</b>	-	-
<b>PHF</b>	0.862	0.931	-	<b>0.943</b>	-	0.954	-	-	<b>0.954</b>	-	0.536	0.682	-	<b>0.703</b>	-	0.953
<b>Motorcycles</b>	0	2	0	<b>2</b>	-	1	0	0	<b>1</b>	-	0	0	0	<b>0</b>	-	3
<b>% Motorcycles</b>	0%	0.1%	0%	<b>0.1%</b>	-	0.1%	0%	0%	<b>0.1%</b>	-	0%	0%	0%	<b>0%</b>	-	0.1%
<b>Lights</b>	218	1405	0	<b>1623</b>	-	908	0	0	<b>908</b>	-	13	206	0	<b>219</b>	-	2750
<b>% Lights</b>	96.9%	95.1%	0%	<b>95.3%</b>	-	91.5%	0%	0%	<b>91.5%</b>	-	86.7%	98.1%	0%	<b>97.3%</b>	-	94.2%
<b>Single-Unit Trucks</b>	2	50	0	<b>52</b>	-	46	0	0	<b>46</b>	-	0	3	0	<b>3</b>	-	101
<b>% Single-Unit Trucks</b>	0.9%	3.4%	0%	<b>3.1%</b>	-	4.6%	0%	0%	<b>4.6%</b>	-	0%	1.4%	0%	<b>1.3%</b>	-	3.5%
<b>Articulated Trucks</b>	0	6	0	<b>6</b>	-	21	0	0	<b>21</b>	-	0	0	0	<b>0</b>	-	27
<b>% Articulated Trucks</b>	0%	0.4%	0%	<b>0.4%</b>	-	2.1%	0%	0%	<b>2.1%</b>	-	0%	0%	0%	<b>0%</b>	-	0.9%
<b>Buses</b>	4	15	0	<b>19</b>	-	16	0	0	<b>16</b>	-	2	1	0	<b>3</b>	-	38
<b>% Buses</b>	1.8%	1.0%	0%	<b>1.1%</b>	-	1.6%	0%	0%	<b>1.6%</b>	-	13.3%	0.5%	0%	<b>1.3%</b>	-	1.3%
<b>Bicycles on Road</b>	1	0	0	<b>1</b>	-	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	1
<b>% Bicycles on Road</b>	0.4%	0%	0%	<b>0.1%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	-	4
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%

\*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, T: Thru, U: U-Turn

# Chelsea - Route 16 and Union Street TM9 TMC - TMC

Thu Dec 6, 2018

PM Peak (Dec 06 2018 4:30PM - 5:30PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582715, Location: 42.403915, -71.037713

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Route 16 Northeastbound					Union Street Eastbound					
Time	T	BL	U	App	Ped*	BR	HL	U	App	Ped*	HR	T	U	App	Ped*	Int
2018-12-06 4:30PM	62	343	0	405	0	426	0	0	426	0	3	33	0	36	2	867
4:45PM	48	293	0	341	0	404	0	0	404	0	3	32	0	35	3	780
5:00PM	73	340	0	413	1	356	0	0	356	1	0	33	0	33	0	802
5:15PM	68	395	0	463	0	353	0	0	353	0	4	23	0	27	0	843
<b>Total</b>	251	1371	0	1622	1	1539	0	0	1539	1	10	121	0	131	5	3292
<b>% Approach</b>	15.5%	84.5%	0%	-	-	100%	0%	0%	-	-	7.6%	92.4%	0%	-	-	-
<b>% Total</b>	7.6%	41.6%	0%	49.3%	-	46.7%	0%	0%	46.7%	-	0.3%	3.7%	0%	4.0%	-	-
<b>PHF</b>	0.860	0.868	-	0.876	-	0.903	-	-	0.903	-	0.625	0.917	-	0.910	-	0.949
<b>Motorcycles</b>	0	0	0	0	-	1	0	0	1	-	0	0	0	0	-	1
<b>% Motorcycles</b>	0%	0%	0%	0%	-	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	-	0%
<b>Lights</b>	248	1343	0	1591	-	1500	0	0	1500	-	10	119	0	129	-	3220
<b>% Lights</b>	98.8%	98.0%	0%	98.1%	-	97.5%	0%	0%	97.5%	-	100%	98.3%	0%	98.5%	-	97.8%
<b>Single-Unit Trucks</b>	2	15	0	17	-	22	0	0	22	-	0	1	0	1	-	40
<b>% Single-Unit Trucks</b>	0.8%	1.1%	0%	1.0%	-	1.4%	0%	0%	1.4%	-	0%	0.8%	0%	0.8%	-	1.2%
<b>Articulated Trucks</b>	0	2	0	2	-	13	0	0	13	-	0	0	0	0	-	15
<b>% Articulated Trucks</b>	0%	0.1%	0%	0.1%	-	0.8%	0%	0%	0.8%	-	0%	0%	0%	0%	-	0.5%
<b>Buses</b>	1	11	0	12	-	3	0	0	3	-	0	1	0	1	-	16
<b>% Buses</b>	0.4%	0.8%	0%	0.7%	-	0.2%	0%	0%	0.2%	-	0%	0.8%	0%	0.8%	-	0.5%
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	5
<b>% Pedestrians</b>	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	100%

\*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, T: Thru, U: U-Turn



# Chelsea - Route 16 and Union Street TM9 TMC - TMC

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 12:15PM - 1:15PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582715, Location: 42.403915, -71.037713

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Route 16 Westbound					Route 16 Northeastbound					Union Street Eastbound					Int
	T	BL	U	App	Ped*	BR	HL	U	App	Ped*	HR	T	U	App	Ped*	
2018-12-08 12:15PM	46	339	0	<b>385</b>	0	375	0	0	<b>375</b>	1	1	34	0	<b>35</b>	0	<b>795</b>
12:30PM	39	333	0	<b>372</b>	0	376	0	0	<b>376</b>	0	3	32	0	<b>35</b>	0	<b>783</b>
12:45PM	51	311	0	<b>362</b>	0	376	0	0	<b>376</b>	0	2	39	0	<b>41</b>	0	<b>779</b>
1:00PM	31	370	0	<b>401</b>	0	367	0	0	<b>367</b>	1	5	34	0	<b>39</b>	0	<b>807</b>
<b>Total</b>	167	1353	0	<b>1520</b>	0	1494	0	0	<b>1494</b>	2	11	139	0	<b>150</b>	0	<b>3164</b>
<b>% Approach</b>	11.0%	89.0%	0%	-	-	100%	0%	0%	-	-	7.3%	92.7%	0%	-	-	-
<b>% Total</b>	5.3%	42.8%	0%	<b>48.0%</b>	-	47.2%	0%	0%	<b>47.2%</b>	-	0.3%	4.4%	0%	<b>4.7%</b>	-	-
<b>PHF</b>	0.819	0.914	-	<b>0.948</b>	-	0.993	-	-	<b>0.993</b>	-	0.550	0.891	-	<b>0.915</b>	-	0.980
<b>Motorcycles</b>	0	0	0	<b>0</b>	-	1	0	0	<b>1</b>	-	0	0	0	<b>0</b>	-	1
<b>% Motorcycles</b>	0%	0%	0%	<b>0%</b>	-	0.1%	0%	0%	<b>0.1%</b>	-	0%	0%	0%	<b>0%</b>	-	0%
<b>Lights</b>	167	1326	0	<b>1493</b>	-	1459	0	0	<b>1459</b>	-	11	138	0	<b>149</b>	-	3101
<b>% Lights</b>	100%	98.0%	0%	<b>98.2%</b>	-	97.7%	0%	0%	<b>97.7%</b>	-	100%	99.3%	0%	<b>99.3%</b>	-	98.0%
<b>Single-Unit Trucks</b>	0	22	0	<b>22</b>	-	21	0	0	<b>21</b>	-	0	1	0	<b>1</b>	-	44
<b>% Single-Unit Trucks</b>	0%	1.6%	0%	<b>1.4%</b>	-	1.4%	0%	0%	<b>1.4%</b>	-	0%	0.7%	0%	<b>0.7%</b>	-	1.4%
<b>Articulated Trucks</b>	0	3	0	<b>3</b>	-	7	0	0	<b>7</b>	-	0	0	0	<b>0</b>	-	10
<b>% Articulated Trucks</b>	0%	0.2%	0%	<b>0.2%</b>	-	0.5%	0%	0%	<b>0.5%</b>	-	0%	0%	0%	<b>0%</b>	-	0.3%
<b>Buses</b>	0	2	0	<b>2</b>	-	6	0	0	<b>6</b>	-	0	0	0	<b>0</b>	-	8
<b>% Buses</b>	0%	0.1%	0%	<b>0.1%</b>	-	0.4%	0%	0%	<b>0.4%</b>	-	0%	0%	0%	<b>0%</b>	-	0.3%
<b>Bicycles on Road</b>	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0	0	0	<b>0</b>	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	2	-	-	-	-	-	0
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-

\* Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, T: Thru, U: U-Turn

**Chelsea - Route 16 and Washington Avenue TM1... - TMC**

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582723, Location: 42.403771, -71.035999

Provided by: Precision Data Industries, LLC (PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Washington Avenue Southbound						Route 16 Westbound						Washington Avenue Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 6:00AM	123	180	48	0	351	4	21	1401	97	9	1528	13	24	79	116	0	219	1	144	609	61	0	814	11	2912
7:00AM	94	203	55	0	352	4	24	1348	193	17	1582	34	20	88	143	0	251	0	183	832	83	0	1098	53	3283
8:00AM	123	192	53	0	368	6	20	1246	186	10	1462	11	23	71	91	0	185	1	186	684	110	1	981	26	2996
3:00PM	97	167	72	0	336	11	47	1312	113	11	1483	39	37	204	145	0	386	3	193	1197	194	0	1584	20	3789
4:00PM	120	133	57	0	310	8	31	1264	135	20	1450	19	23	234	139	1	397	1	213	1141	218	0	1572	22	3729
5:00PM	101	155	53	0	309	5	51	1381	81	25	1538	16	24	227	129	0	380	0	227	1109	117	1	1454	23	3681
2018-12-08 11:00AM	139	143	79	0	361	2	33	1213	66	21	1333	6	36	125	107	0	268	2	145	1014	180	0	1339	8	3301
12:00PM	149	159	81	0	389	4	41	1215	76	19	1351	15	38	162	103	0	303	1	179	1193	172	1	1545	10	3588
1:00PM	137	146	49	0	332	0	40	1266	78	19	1403	10	50	112	102	0	264	1	187	1142	179	1	1509	7	3508
2018-12-09 11:00AM	126	155	59	0	340	1	31	1007	51	11	1100	14	33	121	99	0	253	0	113	777	142	0	1032	5	2725
12:00PM	155	161	52	0	368	8	35	1079	66	13	1193	11	27	93	96	0	216	0	173	985	143	0	1301	12	3078
1:00PM	118	154	49	0	321	10	36	1164	85	17	1302	7	44	116	100	0	260	0	148	1074	205	0	1427	12	3310
<b>Total</b>	1482	1948	707	0	4137	63	410	14896	1227	192	16725	195	379	1632	1370	1	3382	10	2091	11757	1804	4	15656	209	39900
<b>% Approach</b>	35.8%	47.1%	17.1%	0%	-	-	2.5%	89.1%	7.3%	1.1%	-	-	11.2%	48.3%	40.5%	0%	-	-	13.4%	75.1%	11.5%	0%	-	-	-
<b>% Total</b>	3.7%	4.9%	1.8%	0%	10.4%	-	1.0%	37.3%	3.1%	0.5%	41.9%	-	0.9%	4.1%	3.4%	0%	8.5%	-	5.2%	29.5%	4.5%	0%	39.2%	-	-
<b>Motorcycles</b>	2	2	0	0	4	-	0	9	0	0	9	-	0	0	0	0	0	-	2	2	2	0	6	-	19
<b>% Motorcycles</b>	0.1%	0.1%	0%	0%	0.1%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0.1%	0%	0.1%	0%	0%	-	0%
<b>Lights</b>	1454	1837	696	0	3987	-	397	14501	1194	190	16282	-	376	1541	1319	1	3237	-	2020	11332	1778	4	15134	-	38640
<b>% Lights</b>	98.1%	94.3%	98.4%	0%	96.4%	-	96.8%	97.3%	97.3%	99.0%	97.4%	-	99.2%	94.4%	96.3%	100%	95.7%	-	96.6%	96.4%	98.6%	100%	96.7%	-	96.8%
<b>Single-Unit Trucks</b>	16	23	6	0	45	-	8	270	13	1	292	-	2	18	14	0	34	-	27	240	16	0	283	-	654
<b>% Single-Unit Trucks</b>	1.1%	1.2%	0.8%	0%	1.1%	-	2.0%	1.8%	1.1%	0.5%	1.7%	-	0.5%	1.1%	1.0%	0%	1.0%	-	1.3%	2.0%	0.9%	0%	1.8%	-	1.6%
<b>Articulated Trucks</b>	0	2	0	0	2	-	0	71	0	0	71	-	0	1	1	0	2	-	2	133	0	0	135	-	210
<b>% Articulated Trucks</b>	0%	0.1%	0%	0%	0%	-	0%	0.5%	0%	0%	0.4%	-	0%	0.1%	0.1%	0%	0.1%	-	0.1%	1.1%	0%	0%	0.9%	-	0.5%
<b>Buses</b>	10	82	5	0	97	-	5	45	20	1	71	-	1	71	35	0	107	-	39	48	8	0	95	-	370
<b>% Buses</b>	0.7%	4.2%	0.7%	0%	2.3%	-	1.2%	0.3%	1.6%	0.5%	0.4%	-	0.3%	4.4%	2.6%	0%	3.2%	-	1.9%	0.4%	0.4%	0%	0.6%	-	0.9%
<b>Bicycles on Road</b>	0	2	0	0	2	-	0	0	0	0	0	-	0	1	1	0	2	-	1	2	0	0	3	-	7
<b>% Bicycles on Road</b>	0%	0.1%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0.1%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	63	-	-	-	-	-	195	-	-	-	-	-	10	-	-	-	-	-	209	-
<b>% Pedestrians</b>	-	-	-	-	-	-100%	-	-	-	-	-	-100%	-	-	-	-	-	-100%	-	-	-	-	-	-100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Chelsea - Route 16 and Washington Avenue TM1... - TMC**

Thu Dec 6, 2018

AM Peak (Dec 06 2018 7:15AM - 8:15AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582723, Location: 42.403771, -71.035999

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Washington Avenue Southbound						Route 16 Westbound						Washington Avenue Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 7:15AM	24	52	12	0	88	3	7	358	51	2	418	10	6	27	37	0	70	0	44	197	15	0	256	9	832
7:30AM	22	61	11	0	94	1	3	284	46	7	340	6	6	21	37	0	64	0	38	198	19	0	255	16	753
7:45AM	20	47	21	0	88	0	4	366	47	5	422	9	6	12	34	0	52	0	58	246	16	0	320	21	882
8:00AM	35	55	17	0	107	2	4	323	60	1	388	4	8	24	26	0	58	1	48	187	29	0	264	8	817
<b>Total</b>	101	215	61	0	377	6	18	1331	204	15	1568	29	26	84	134	0	244	1	188	828	79	0	1095	54	3284
% Approach	26.8%	57.0%	16.2%	0%	-	-	1.1%	84.9%	13.0%	1.0%	-	-	10.7%	34.4%	54.9%	0%	-	-	17.2%	75.6%	7.2%	0%	-	-	-
% Total	3.1%	6.5%	1.9%	0%	11.5%	-	0.5%	40.5%	6.2%	0.5%	47.7%	-	0.8%	2.6%	4.1%	0%	7.4%	-	5.7%	25.2%	2.4%	0%	33.3%	-	-
PHF	0.721	0.881	0.726	-	0.881	-	0.643	0.909	0.850	0.536	0.929	-	0.813	0.778	0.899	-	0.880	-	0.810	0.840	0.681	-	0.855	-	0.930
Motorcycles	1	0	0	0	1	-	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	2
% Motorcycles	1.0%	0%	0%	0%	0.3%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%
Lights	91	194	59	0	344	-	16	1256	199	15	1486	-	25	75	124	0	224	-	181	760	75	0	1016	-	3070
% Lights	90.1%	90.2%	96.7%	0%	91.2%	-	88.9%	94.4%	97.5%	100%	94.8%	-	96.2%	89.3%	92.5%	0%	91.8%	-	96.3%	91.8%	94.9%	0%	92.8%	-	93.5%
Single-Unit Trucks	7	4	2	0	13	-	2	47	3	0	52	-	1	1	4	0	6	-	3	37	3	0	43	-	114
% Single-Unit Trucks	6.9%	1.9%	3.3%	0%	3.4%	-	11.1%	3.5%	1.5%	0%	3.3%	-	3.8%	1.2%	3.0%	0%	2.5%	-	1.6%	4.5%	3.8%	0%	3.9%	-	3.5%
Articulated Trucks	0	0	0	0	0	-	0	11	0	0	11	-	0	0	0	0	0	-	1	20	0	0	21	-	32
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.8%	0%	0%	0.7%	-	0%	0%	0%	0%	0%	-	0.5%	2.4%	0%	0%	1.9%	-	1.0%
Buses	2	17	0	0	19	-	0	16	2	0	18	-	0	8	5	0	13	-	3	10	1	0	14	-	64
% Buses	2.0%	7.9%	0%	0%	5.0%	-	0%	1.2%	1.0%	0%	1.1%	-	0%	9.5%	3.7%	0%	5.3%	-	1.6%	1.2%	1.3%	0%	1.3%	-	1.9%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	1	-	0	1	0	0	1	-	2
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0.7%	0%	0.4%	-	0%	0.1%	0%	0%	0.1%	-	0.1%
Pedestrians	-	-	-	-	-	6	-	-	-	-	-	29	-	-	-	-	-	1	-	-	-	-	-	54	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Chelsea - Route 16 and Washington Avenue TM1... - TMC**

Thu Dec 6, 2018

PM Peak (Dec 06 2018 3PM - 4PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582723, Location: 42.403771, -71.035999

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Washington Avenue Southbound						Route 16 Westbound						Washington Avenue Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 3:00PM	30	48	16	0	94	3	13	320	31	4	368	17	10	52	39	0	101	0	45	314	62	0	421	8	984
3:15PM	19	37	14	0	70	3	17	351	27	3	398	8	6	54	38	0	98	1	51	275	23	0	349	6	915
3:30PM	26	40	24	0	90	1	9	320	27	2	358	8	10	34	35	0	79	0	53	305	49	0	407	2	934
3:45PM	22	42	18	0	82	4	8	321	28	2	359	6	11	64	33	0	108	2	44	303	60	0	407	4	956
<b>Total</b>	97	167	72	0	336	11	47	1312	113	11	1483	39	37	204	145	0	386	3	193	1197	194	0	1584	20	3789
% Approach	28.9%	49.7%	21.4%	0%	-	-	3.2%	88.5%	7.6%	0.7%	-	-	9.6%	52.8%	37.6%	0%	-	-	12.2%	75.6%	12.2%	0%	-	-	-
% Total	2.6%	4.4%	1.9%	0%	8.9%	-	1.2%	34.6%	3.0%	0.3%	39.1%	-	1.0%	5.4%	3.8%	0%	10.2%	-	5.1%	31.6%	5.1%	0%	41.8%	-	-
PHF	0.808	0.870	0.750	-	0.894	-	0.691	0.934	0.911	0.688	0.932	-	0.841	0.793	0.929	-	0.891	-	0.910	0.952	0.782	-	0.940	-	0.962
Motorcycles	0	1	0	0	1	-	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	2
% Motorcycles	0%	0.6%	0%	0%	0.3%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%
Lights	95	152	69	0	316	-	45	1247	108	11	1411	-	37	189	141	0	367	-	183	1136	190	0	1509	-	3603
% Lights	97.9%	91.0%	95.8%	0%	94.0%	-	95.7%	95.0%	95.6%	100%	95.1%	-	100%	92.6%	97.2%	0%	95.1%	-	94.8%	94.9%	97.9%	0%	95.3%	-	95.1%
Single-Unit Trucks	0	3	0	0	3	-	1	40	2	0	43	-	0	3	1	0	4	-	6	36	2	0	44	-	94
% Single-Unit Trucks	0%	1.8%	0%	0%	0.9%	-	2.1%	3.0%	1.8%	0%	2.9%	-	0%	1.5%	0.7%	0%	1.0%	-	3.1%	3.0%	1.0%	0%	2.8%	-	2.5%
Articulated Trucks	0	0	0	0	0	-	0	14	0	0	14	-	0	0	0	0	0	-	0	16	0	0	16	-	30
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	1.1%	0%	0%	0.9%	-	0%	0%	0%	0%	0%	-	0%	1.3%	0%	0%	1.0%	-	0.8%
Buses	2	11	3	0	16	-	1	10	3	0	14	-	0	11	3	0	14	-	4	8	2	0	14	-	58
% Buses	2.1%	6.6%	4.2%	0%	4.8%	-	2.1%	0.8%	2.7%	0%	0.9%	-	0%	5.4%	2.1%	0%	3.6%	-	2.1%	0.7%	1.0%	0%	0.9%	-	1.5%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	0	1	0	0	1	-	2
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.5%	0%	0%	0.3%	-	0%	0.1%	0%	0%	0.1%	-	0.1%
Pedestrians	-	-	-	-	-	11	-	-	-	-	-	39	-	-	-	-	-	3	-	-	-	-	-	20	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Chelsea - Route 16 and Washington Avenue TM1... - TMC**

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 12:15PM - 1:15PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582723, Location: 42.403771, -71.035999

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Washington Avenue Southbound						Route 16 Westbound						Washington Avenue Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-08 12:15PM	35	42	17	0	94	1	12	322	17	7	358	6	8	60	23	0	91	0	52	328	43	0	423	1	966
12:30PM	43	41	24	0	108	0	5	312	19	4	340	1	9	25	21	0	55	1	38	295	58	0	391	2	894
12:45PM	40	39	20	0	99	3	17	283	16	2	318	1	16	41	30	0	87	0	46	311	38	0	395	2	899
1:00PM	44	36	6	0	86	0	10	326	25	2	363	2	13	30	32	0	75	0	40	271	50	0	361	1	885
<b>Total</b>	162	158	67	0	387	4	44	1243	77	15	1379	10	46	156	106	0	308	1	176	1205	189	0	1570	6	3644
<b>% Approach</b>	41.9%	40.8%	17.3%	0%	-	-	3.2%	90.1%	5.6%	1.1%	-	-	14.9%	50.6%	34.4%	0%	-	-	11.2%	76.8%	12.0%	0%	-	-	-
<b>% Total</b>	4.4%	4.3%	1.8%	0%	10.6%	-	1.2%	34.1%	2.1%	0.4%	37.8%	-	1.3%	4.3%	2.9%	0%	8.5%	-	4.8%	33.1%	5.2%	0%	43.1%	-	-
<b>PHF</b>	0.920	0.940	0.698	-	0.896	-	0.647	0.953	0.770	0.536	0.950	-	0.719	0.650	0.828	-	0.846	-	0.846	0.918	0.815	-	0.928	-	0.943
<b>Motorcycles</b>	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	1
<b>% Motorcycles</b>	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Lights</b>	160	151	66	0	377	-	43	1219	76	15	1353	-	45	152	104	0	301	-	171	1172	188	0	1531	-	3562
<b>% Lights</b>	98.8%	95.6%	98.5%	0%	97.4%	-	97.7%	98.1%	98.7%	100%	98.1%	-	97.8%	97.4%	98.1%	0%	97.7%	-	97.2%	97.3%	99.5%	0%	97.5%	-	97.7%
<b>Single-Unit Trucks</b>	2	2	1	0	5	-	1	20	0	0	21	-	1	0	0	0	1	-	3	21	0	0	24	-	51
<b>% Single-Unit Trucks</b>	1.2%	1.3%	1.5%	0%	1.3%	-	2.3%	1.6%	0%	0%	1.5%	-	2.2%	0%	0%	0%	0.3%	-	1.7%	1.7%	0%	0%	1.5%	-	1.4%
<b>Articulated Trucks</b>	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	0	9	0	0	9	-	12
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	-	0%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0.7%	0%	0%	0.6%	-	0.3%
<b>Buses</b>	0	5	0	0	5	-	0	0	1	0	1	-	0	4	2	0	6	-	2	3	1	0	6	-	18
<b>% Buses</b>	0%	3.2%	0%	0%	1.3%	-	0%	0%	1.3%	0%	0.1%	-	0%	2.6%	1.9%	0%	1.9%	-	1.1%	0.2%	0.5%	0%	0.4%	-	0.5%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	4	-	-	-	-	-	10	-	-	-	-	-	1	-	-	-	-	-	6	-
<b>% Pedestrians</b>	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Chelsea - Route 16 at Webster Avenue and Gar... - TMC**

Thu Dec 6, 2018

Full Length (6AM-9AM, 3PM-6PM, 11AM-2PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582724, Location: 42.40439, -71.029896

Provided by: Precision Data Industries, LLC (PDI)

46 Morton Street,

Framingham, MA, MA, 01702, US

Leg Direction Time	Garfield Avenue Southbound						Route 16 Westbound						Webster Avenue Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-06 6:00AM	223	124	166	0	513	0	3	1501	211	100	1815	12	122	70	208	0	400	0	101	587	0	0	688	0	3416
7:00AM	194	174	233	0	601	0	4	1688	168	166	2026	11	174	155	191	0	520	0	107	857	0	0	964	4	4111
8:00AM	119	127	295	0	541	2	12	1490	72	225	1799	13	166	134	154	0	454	1	46	778	0	0	824	1	3618
3:00PM	172	0	250	0	422	2	12	1262	0	252	1526	22	280	321	330	1	932	2	0	1367	0	0	1367	13	4247
4:00PM	175	0	226	0	401	2	13	1194	0	266	1473	16	219	349	288	0	856	1	0	1325	0	0	1325	8	4055
5:00PM	122	122	139	0	383	0	18	1250	80	179	1527	24	155	405	291	0	851	0	115	1131	0	1	1247	3	4008
2018-12-08 11:00AM	161	155	168	0	484	0	12	1140	135	193	1480	12	162	210	277	0	649	0	157	1092	0	0	1249	3	3862
12:00PM	161	181	186	0	528	0	10	1183	138	187	1518	8	215	213	290	0	718	0	162	1159	0	0	1321	1	4085
1:00PM	159	149	183	0	491	6	12	1175	131	183	1501	16	211	221	290	0	722	0	177	1157	0	3	1337	2	4051
2018-12-09 11:00AM	167	103	139	0	409	3	15	996	116	188	1315	12	164	179	207	0	550	0	74	832	0	1	907	7	3181
12:00PM	137	155	174	0	466	5	15	1091	139	188	1433	15	168	203	242	0	613	0	148	941	0	0	1089	3	3601
1:00PM	170	159	175	0	504	1	23	1169	132	177	1501	14	185	216	250	0	651	0	145	1120	0	0	1265	4	3921
<b>Total</b>	1960	1449	2334	0	5743	21	149	15139	1322	2304	18914	175	2221	2676	3018	1	7916	4	1232	12346	0	5	13583	49	46156
% Approach	34.1%	25.2%	40.6%	0%	-	-	0.8%	80.0%	7.0%	12.2%	-	-	28.1%	33.8%	38.1%	0%	-	-	9.1%	90.9%	0%	0%	-	-	-
% Total	4.2%	3.1%	5.1%	0%	12.4%	-	0.3%	32.8%	2.9%	5.0%	41.0%	-	4.8%	5.8%	6.5%	0%	17.2%	-	2.7%	26.7%	0%	0%	29.4%	-	-
Motorcycles	1	0	0	0	1	-	0	2	0	0	2	-	1	4	1	0	6	-	0	6	0	1	7	-	16
% Motorcycles	0.1%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	20.0%	0.1%	-	0%
Lights	1924	1431	2288	0	5643	-	142	14803	1309	2282	18536	-	2185	2620	2907	0	7712	-	1212	11921	0	4	13137	-	45028
% Lights	98.2%	98.8%	98.0%	0%	98.3%	-	95.3%	97.8%	99.0%	99.0%	98.0%	-	98.4%	97.9%	96.3%	0%	97.4%	-	98.4%	96.6%	0%	80.0%	96.7%	-	97.6%
Single-Unit Trucks	18	14	30	0	62	-	4	229	10	19	262	-	31	28	70	0	129	-	11	248	0	0	259	-	712
% Single-Unit Trucks	0.9%	1.0%	1.3%	0%	1.1%	-	2.7%	1.5%	0.8%	0.8%	1.4%	-	1.4%	1.0%	2.3%	0%	1.6%	-	0.9%	2.0%	0%	0%	1.9%	-	1.5%
Articulate d Trucks	2	0	5	0	7	-	0	59	2	1	62	-	0	2	13	0	15	-	2	120	0	0	122	-	206
% Articulate d Trucks	0.1%	0%	0.2%	0%	0.1%	-	0%	0.4%	0.2%	0%	0.3%	-	0%	0.1%	0.4%	0%	0.2%	-	0.2%	1.0%	0%	0%	0.9%	-	0.4%
Buses	15	4	11	0	30	-	2	44	1	2	49	-	4	19	26	0	49	-	7	47	0	0	54	-	182
% Buses	0.8%	0.3%	0.5%	0%	0.5%	-	1.3%	0.3%	0.1%	0.1%	0.3%	-	0.2%	0.7%	0.9%	0%	0.6%	-	0.6%	0.4%	0%	0%	0.4%	-	0.4%
Bicycles on Road	0	0	0	0	0	-	1	2	0	0	3	-	0	3	1	1	5	-	0	4	0	0	4	-	12
% Bicycles on Road	0%	0%	0%	0%	0%	-	0.7%	0%	0%	0%	0%	-	0%	0.1%	0%	100%	0.1%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	21	-	-	-	-	-	175	-	-	-	-	-	4	-	-	-	-	-	49	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**Chelsea - Route 16 at Webster Avenue and Gar... - TMC**

Thu Dec 6, 2018

AM Peak (Dec 06 2018 6:45AM - 7:45AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582724, Location: 42.40439, -71.029896

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Garfield Avenue Southbound						Route 16 Westbound						Webster Avenue Northbound						Route 16 Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2018-12-06 6:45AM	63	42	50	0	155	0	0	437	51	30	518	3	43	34	62	0	139	0	28	178	0	0	206	0	1018
7:00AM	67	50	46	0	163	0	0	470	62	38	570	1	42	37	51	0	130	0	34	182	0	0	216	0	1079
7:15AM	51	43	63	0	157	0	1	443	31	43	518	2	50	37	47	0	134	0	24	212	0	0	236	1	1045
7:30AM	41	39	62	0	142	0	3	387	36	40	466	4	46	41	48	0	135	0	18	240	0	0	258	1	1001
<b>Total</b>	222	174	221	0	617	0	4	1737	180	151	2072	10	181	149	208	0	538	0	104	812	0	0	916	2	4143
<b>% Approach</b>	36.0%	28.2%	35.8%	0%	-	-	0.2%	83.8%	8.7%	7.3%	-	-	33.6%	27.7%	38.7%	0%	-	-	11.4%	88.6%	0%	0%	-	-	-
<b>% Total</b>	5.4%	4.2%	5.3%	0%	14.9%	-	0.1%	41.9%	4.3%	3.6%	50.0%	-	4.4%	3.6%	5.0%	0%	13.0%	-	2.5%	19.6%	0%	0%	22.1%	-	-
<b>PHF</b>	0.828	0.870	0.877	-	0.946	-	0.333	0.924	0.726	0.878	0.909	-	0.905	0.909	0.839	-	0.968	-	0.765	0.846	-	-	0.888	-	0.960
<b>Motorcycles</b>	1	0	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	2
<b>% Motorcycles</b>	0.5%	0%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%
<b>Lights</b>	221	172	218	0	611	-	4	1685	178	147	2014	-	175	141	188	0	504	-	100	742	0	0	842	-	3971
<b>% Lights</b>	99.5%	98.9%	98.6%	0%	99.0%	-	100%	97.0%	98.9%	97.4%	97.2%	-	96.7%	94.6%	90.4%	0%	93.7%	-	96.2%	91.4%	0%	0%	91.9%	-	95.8%
<b>Single-Unit Trucks</b>	0	1	1	0	2	-	0	41	2	3	46	-	5	4	5	0	14	-	2	38	0	0	40	-	102
<b>% Single-Unit Trucks</b>	0%	0.6%	0.5%	0%	0.3%	-	0%	2.4%	1.1%	2.0%	2.2%	-	2.8%	2.7%	2.4%	0%	2.6%	-	1.9%	4.7%	0%	0%	4.4%	-	2.5%
<b>Articulated Trucks</b>	0	0	1	0	1	-	0	8	0	1	9	-	0	1	0	0	1	-	0	23	0	0	23	-	34
<b>% Articulated Trucks</b>	0%	0%	0.5%	0%	0.2%	-	0%	0.5%	0%	0.7%	0.4%	-	0%	0.7%	0%	0%	0.2%	-	0%	2.8%	0%	0%	2.5%	-	0.8%
<b>Buses</b>	0	1	1	0	2	-	0	3	0	0	3	-	1	3	15	0	19	-	2	8	0	0	10	-	34
<b>% Buses</b>	0%	0.6%	0.5%	0%	0.3%	-	0%	0.2%	0%	0%	0.1%	-	0.6%	2.0%	7.2%	0%	3.5%	-	1.9%	1.0%	0%	0%	1.1%	-	0.8%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	10	-	-	-	-	-	0	-	-	-	-	-	2	
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Chelsea - Route 16 at Webster Avenue and Gar... - TMC**

Thu Dec 6, 2018

PM Peak (Dec 06 2018 3:15PM - 4:15PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582724, Location: 42.40439, -71.029896

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Garfield Avenue Southbound						Route 16 Westbound						Webster Avenue Northbound						Route 16 Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2018-12-06 3:15PM	51	0	54	0	105	0	4	337	0	64	405	5	80	70	80	0	230	0	0	374	0	0	374	4	1114
3:30PM	45	0	63	0	108	1	3	317	0	60	380	2	66	91	69	0	226	1	0	368	0	0	368	5	1082
3:45PM	31	0	60	0	91	0	1	296	0	64	361	8	64	82	100	0	246	1	0	334	0	0	334	1	1032
4:00PM	52	0	57	0	109	0	5	328	0	74	407	1	69	95	72	0	236	0	0	338	0	0	338	0	1090
<b>Total</b>	179	0	234	0	413	1	13	1278	0	262	1553	16	279	338	321	0	938	2	0	1414	0	0	1414	10	4318
% Approach	43.3%	0%	56.7%	0%	-	-	0.8%	82.3%	0%	16.9%	-	-	29.7%	36.0%	34.2%	0%	-	-	0%	100%	0%	0%	-	-	-
% Total	4.1%	0%	5.4%	0%	9.6%	-	0.3%	29.6%	0%	6.1%	36.0%	-	6.5%	7.8%	7.4%	0%	21.7%	-	0%	32.7%	0%	0%	32.7%	-	-
PHF	0.861	-	0.929	-	0.947	-	0.650	0.948	-	0.885	0.954	-	0.872	0.889	0.803	-	0.953	-	-	0.945	-	-	0.945	-	0.969
Motorcycles	0	0	0	0	0	-	0	1	0	0	1	-	0	1	0	0	1	-	0	2	0	0	2	-	4
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0.3%	0%	0%	0.1%	-	0%	0.1%	0%	0%	0.1%	-	0.1%
Lights	173	0	229	0	402	-	13	1253	0	260	1526	-	273	329	303	0	905	-	0	1348	0	0	1348	-	4181
% Lights	96.6%	0%	97.9%	0%	97.3%	-	100%	98.0%	0%	99.2%	98.3%	-	97.8%	97.3%	94.4%	0%	96.5%	-	0%	95.3%	0%	0%	95.3%	-	96.8%
Single-Unit Trucks	2	0	4	0	6	-	0	13	0	2	15	-	5	5	13	0	23	-	0	39	0	0	39	-	83
% Single-Unit Trucks	1.1%	0%	1.7%	0%	1.5%	-	0%	1.0%	0%	0.8%	1.0%	-	1.8%	1.5%	4.0%	0%	2.5%	-	0%	2.8%	0%	0%	2.8%	-	1.9%
Articulated Trucks	0	0	0	0	0	-	0	5	0	0	5	-	0	0	4	0	4	-	0	12	0	0	12	-	21
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.4%	0%	0%	0.3%	-	0%	0%	1.2%	0%	0.4%	-	0%	0.8%	0%	0%	0.8%	-	0.5%
Buses	4	0	1	0	5	-	0	6	0	0	6	-	1	3	1	0	5	-	0	12	0	0	12	-	28
% Buses	2.2%	0%	0.4%	0%	1.2%	-	0%	0.5%	0%	0%	0.4%	-	0.4%	0.9%	0.3%	0%	0.5%	-	0%	0.8%	0%	0%	0.8%	-	0.6%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	1
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	16	-	-	-	-	-	2	-	-	-	-	-	10	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Chelsea - Route 16 at Webster Avenue and Gar... - TMC**

Sat Dec 8, 2018

Midday Peak (WKND) (Dec 08 2018 12:15PM - 1:15PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road)

All Movements

ID: 582724, Location: 42.40439, -71.029896

Provided by: Precision Data Industries, LLC  
(PDI)  
46 Morton Street,  
Framingham, MA, MA, 01702, US

Leg Direction	Garfield Avenue Southbound						Route 16 Westbound						Webster Avenue Northbound						Route 16 Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2018-12-08 12:15PM	37	43	44	0	124	0	1	316	34	60	411	2	37	45	64	0	146	0	40	303	0	0	343	0	1024
12:30PM	37	44	42	0	123	0	1	283	33	40	357	2	65	58	65	0	188	0	45	330	0	0	375	1	1043
12:45PM	37	46	49	0	132	0	6	296	34	42	378	4	67	50	84	0	201	0	45	281	0	0	326	0	1037
1:00PM	35	44	52	0	131	4	2	310	35	41	388	4	43	50	78	0	171	0	53	317	0	0	370	0	1060
<b>Total</b>	146	177	187	0	510	4	10	1205	136	183	1534	12	212	203	291	0	706	0	183	1231	0	0	1414	1	4164
<b>% Approach</b>	28.6%	34.7%	36.7%	0%	-	-	0.7%	78.6%	8.9%	11.9%	-	-	30.0%	28.8%	41.2%	0%	-	-	12.9%	87.1%	0%	0%	-	-	-
<b>% Total</b>	3.5%	4.3%	4.5%	0%	12.2%	-	0.2%	28.9%	3.3%	4.4%	36.8%	-	5.1%	4.9%	7.0%	0%	17.0%	-	4.4%	29.6%	0%	0%	34.0%	-	-
<b>PHF</b>	0.986	0.962	0.899	-	0.966	-	0.417	0.953	0.971	0.763	0.933	-	0.791	0.871	0.866	-	0.877	-	0.863	0.933	-	-	0.943	-	0.983
<b>Motorcycles</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	1
<b>% Motorcycles</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%
<b>Lights</b>	144	176	184	0	504	-	10	1184	133	181	1508	-	210	202	282	0	694	-	180	1203	0	0	1383	-	4089
<b>% Lights</b>	98.6%	99.4%	98.4%	0%	98.8%	-	100%	98.3%	97.8%	98.9%	98.3%	-	99.1%	99.5%	96.9%	0%	98.3%	-	98.4%	97.7%	0%	0%	97.8%	-	98.2%
<b>Single-Unit Trucks</b>	2	1	3	0	6	-	0	16	2	1	19	-	1	0	7	0	8	-	1	19	0	0	20	-	53
<b>% Single-Unit Trucks</b>	1.4%	0.6%	1.6%	0%	1.2%	-	0%	1.3%	1.5%	0.5%	1.2%	-	0.5%	0%	2.4%	0%	1.1%	-	0.5%	1.5%	0%	0%	1.4%	-	1.3%
<b>Articulate d Trucks</b>	0	0	0	0	0	-	0	4	1	0	5	-	0	0	2	0	2	-	1	6	0	0	7	-	14
<b>% Articulate d Trucks</b>	0%	0%	0%	0%	0%	-	0%	0.3%	0.7%	0%	0.3%	-	0%	0%	0.7%	0%	0.3%	-	0.5%	0.5%	0%	0%	0.5%	-	0.3%
<b>Buses</b>	0	0	0	0	0	-	0	1	0	1	2	-	1	0	0	0	1	-	1	2	0	0	3	-	6
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0.5%	0.1%	-	0.5%	0%	0%	0%	0.1%	-	0.5%	0.2%	0%	0%	0.2%	-	0.1%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	1
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.5%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	4	-	-	-	-	-	12	-	-	-	-	-	0	-	-	-	-	-	1	-
<b>% Pedestrians</b>	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



## **Spot Speed Data**

STA. 1 EB

LN. 1

NO SPEED DATA

MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/3/2018

Site Reference: 180480000417  
 Site ID: 220000000103  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: EAST  
 Lane: 1

STA. 1 EB  
 LN. 2

File: SPD-1-03-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
13:00	90	7	0	1	0	0	0	0	0	0	1	0	0	1	0	100
14:00	144	7	19	37	44	96	135	91	22	4	1	0	0	0	0	600
15:00	75	47	44	82	107	158	90	46	9	0	1	0	0	0	0	659
16:00	184	27	23	48	75	134	114	44	13	4	0	0	0	0	0	666
17:00	351	44	24	18	50	101	54	26	9	1	1	0	0	0	0	679
18:00	434	65	66	77	47	19	10	7	0	1	0	0	0	0	0	726
19:00	2	5	23	33	132	194	127	51	13	3	1	0	0	0	0	584
20:00	2	0	1	8	52	163	165	77	17	7	1	1	0	0	0	494
21:00	0	0	0	6	30	91	165	87	22	4	1	0	0	0	0	406
22:00	0	0	0	8	36	102	143	69	19	6	3	0	0	0	0	386
23:00	0	0	0	0	19	50	105	61	37	10	0	1	0	0	0	283
24:00	0	0	0	2	5	38	63	40	22	5	0	0	0	0	0	175
DAY TOTAL	1282	202	200	320	597	1146	1171	599	183	45	10	2	0	1	0	5758
PERCENTS	22.3%	3.6%	3.5%	5.6%	10.4%	20.0%	20.3%	10.4%	3.1%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 12.8 mph

85th Percentile Speed  
 48.9 mph

Median Speed  
 40.2 mph

Average Speed  
 34.8 mph

10 MPH Pace Speed  
 39 mph to 49 mph  
 2317 vehicles in pace  
 Representing 40.2% of the total vehicles

Vehicles > 65 MPH  
 13  
 0.2%



MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/4/2018

Site Reference: 180480000417  
 Site ID: 220000000103  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: EAST  
 Lane: 1

File: SPD-1-03-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	0	2	15	29	18	19	5	1	1	0	0	1	91
02:00	0	0	0	0	1	4	17	11	5	0	0	0	0	0	0	38
03:00	0	0	0	0	2	2	10	12	3	3	0	0	0	0	0	32
04:00	0	0	0	1	0	8	9	5	6	1	0	0	0	0	0	30
05:00	0	0	0	0	0	4	12	26	13	3	1	3	0	0	0	62
06:00	0	0	0	1	0	4	49	66	30	10	4	0	0	0	0	164
07:00	0	0	0	0	14	66	158	111	31	8	2	0	0	0	0	390
08:00	0	0	1	7	42	101	182	108	30	8	1	0	0	0	0	480
09:00	1	1	3	3	14	65	145	128	36	7	1	0	0	0	0	404
10:00	0	0	0	2	27	81	175	104	31	8	4	2	0	0	0	434
11:00	3	0	1	2	18	113	191	104	22	5	1	0	0	0	0	460
12:00	1	0	2	12	29	122	168	92	32	5	2	0	0	0	0	465
13:00	0	2	0	0	14	99	190	146	25	8	0	1	0	0	0	485
14:00	0	1	1	5	22	142	180	128	45	8	1	0	0	0	0	533
15:00	217	33	35	69	116	95	59	29	8	1	0	0	0	0	0	662
16:00	29	23	50	84	171	179	121	57	14	3	1	0	0	0	0	732
17:00	480	50	36	41	45	37	22	4	1	0	0	0	0	0	0	716
18:00	323	35	39	49	90	53	31	20	3	2	0	0	0	0	0	645
19:00	2	0	7	58	177	186	125	36	12	2	1	0	0	0	0	606
20:00	2	0	1	13	83	179	155	73	12	0	2	0	0	0	0	520
21:00	3	0	0	14	63	153	155	61	14	5	0	0	0	0	0	468
22:00	0	0	1	16	46	128	133	63	12	1	2	0	0	0	0	402
23:00	5	0	0	0	18	72	126	70	15	4	0	0	0	0	0	310
24:00	0	0	0	1	11	58	87	35	23	3	1	3	0	0	0	222
DAY TOTAL	1066	145	177	378	1005	1966	2529	1507	442	100	25	10	0	0	1	9351
PERCENTS	11.4%	1.6%	1.9%	4.1%	10.8%	21.1%	27.0%	16.1%	4.7%	1.0%	0.2%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
29.2 mph

85th Percentile Speed  
51.3 mph

Median Speed  
43.9 mph

Average Speed  
40.3 mph

10 MPH Pace Speed  
39 mph to 49 mph  
4495 vehicles in pace  
Representing 48.0% of the total vehicles

Vehicles > 65 MPH  
36  
0.4%

MassDOT Highway Division  
 SPEED SUMMARY  
 Wed 12/5/2018

Site Reference: 180480000417  
 Site ID: 220000000103  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: EAST  
 Lane: 1

File: SPD-1-03-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	1	6	20	26	29	9	2	1	0	1	0	0	95
02:00	0	0	0	0	5	16	16	16	4	0	0	0	0	0	0	57
03:00	0	0	0	0	2	3	12	8	3	1	0	0	0	0	2	31
04:00	0	0	0	1	1	8	13	11	1	0	0	0	0	0	0	35
05:00	0	0	0	0	1	2	27	25	13	2	0	1	0	0	0	71
06:00	0	0	0	0	0	26	58	52	33	7	4	0	0	0	0	180
07:00	0	0	0	0	9	84	153	106	22	6	0	0	0	0	0	380
08:00	0	0	0	7	51	107	177	114	28	2	3	0	0	0	0	489
09:00	0	0	0	2	53	135	135	106	16	6	0	1	0	0	0	454
10:00	0	0	0	0	11	151	191	86	24	3	0	0	0	0	0	466
11:00	1	1	2	3	46	132	175	95	14	2	0	2	0	0	0	473
12:00	2	2	0	3	73	152	160	62	26	7	3	0	0	0	0	490
13:00	0	3	1	3	60	162	186	86	24	3	1	0	0	0	0	529
14:00	2	0	1	8	52	122	201	111	16	4	1	0	0	0	0	518
15:00	12	14	20	48	95	200	160	73	18	1	0	0	0	0	0	641
16:00	300	67	53	39	88	83	56	30	7	0	0	0	0	0	0	723
17:00	7	22	44	75	177	162	126	55	9	2	0	0	0	0	0	679
18:00	128	78	104	96	164	79	45	11	2	1	0	0	0	0	0	708
19:00	0	5	7	74	157	190	131	39	12	2	1	0	0	0	0	618
20:00	0	0	0	20	87	158	153	43	17	0	0	0	0	0	0	478
21:00	0	0	0	2	25	142	178	76	10	0	0	0	0	0	0	433
22:00	1	0	0	2	79	165	148	82	15	8	2	0	0	0	0	502
23:00	0	0	0	2	20	83	145	68	11	7	1	2	0	0	0	339
24:00	0	0	0	1	10	57	85	53	10	1	2	2	0	0	0	221
DAY TOTAL	453	192	232	387	1272	2439	2757	1437	344	67	19	8	1	0	2	9610
PERCENTS	4.8%	2.0%	2.5%	4.1%	13.3%	25.4%	28.7%	15.0%	3.5%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
34.7 mph

85th Percentile Speed  
50.5 mph

Median Speed  
43.7 mph

Average Speed  
41.9 mph

10 MPH Pace Speed  
39 mph to 49 mph  
5196 vehicles in pace  
Representing 54.0% of the total vehicles

Vehicles > 65 MPH  
30  
0.3%

MassDOT Highway Division  
 SPEED SUMMARY  
 Thu 12/6/2018

Site Reference: 180480000417  
 Site ID: 220000000103  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: EAST  
 Lane: 1

File: SPD-1-03-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	1	10	16	37	22	4	2	1	0	1	0	0	94
02:00	0	0	0	0	3	7	3	17	7	3	1	0	0	0	0	41
03:00	0	0	0	0	3	4	12	12	3	1	1	0	0	0	0	36
04:00	0	0	0	1	1	2	9	16	9	2	2	0	0	0	0	42
05:00	0	0	0	0	2	3	18	27	16	2	1	0	0	0	0	69
06:00	0	0	0	0	1	8	56	66	17	7	3	0	0	0	0	158
07:00	1	0	0	0	8	71	144	131	31	3	1	1	0	0	0	391
08:00	0	0	0	0	23	119	213	118	28	9	1	0	0	0	0	511
09:00	0	0	0	1	14	89	151	96	32	8	2	1	0	0	0	394
10:00	2	0	0	0	27	94	163	93	48	7	1	0	0	1	0	436
11:00	2	0	0	7	41	136	212	92	25	7	2	0	0	0	0	524
12:00	0	0	0	1	34	114	197	120	28	7	4	0	0	0	0	505
13:00	0	0	1	2	18	104	172	151	34	12	2	0	0	0	0	496
14:00	3	0	1	9	42	129	213	118	43	11	2	2	0	1	0	574
15:00	29	8	18	51	118	193	173	66	23	2	2	0	0	0	0	683
16:00	30	24	47	81	150	200	118	74	17	3	0	0	0	0	0	744
17:00	128	74	87	92	157	109	67	28	3	1	0	0	0	0	0	746
18:00	116	88	90	143	134	77	30	20	3	1	0	0	0	0	0	702
19:00	1	6	19	55	151	186	125	50	7	4	0	1	0	0	0	605
20:00	0	0	2	19	101	175	136	60	18	3	0	0	0	0	0	514
21:00	0	0	0	12	77	160	142	61	14	8	1	1	0	0	0	476
22:00	0	0	1	6	36	101	165	69	18	3	3	1	0	0	0	403
23:00	0	0	0	5	23	87	102	66	30	4	1	0	0	0	0	318
24:00	2	0	0	0	1	51	88	65	17	7	2	0	0	1	0	234
DAY TOTAL	314	200	266	486	1175	2235	2746	1638	475	117	33	7	1	3	0	9696
PERCENTS	3.3%	2.1%	2.8%	5.1%	12.2%	23.1%	28.3%	16.8%	4.8%	1.2%	0.3%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
34.8 mph

85th Percentile Speed  
51.5 mph

Median Speed  
44.3 mph

Average Speed  
42.7 mph

10 MPH Pace Speed  
39 mph to 49 mph  
4981 vehicles in pace  
Representing 51.3% of the total vehicles

Vehicles > 65 MPH  
44  
0.5%



MassDOT Highway Division  
 SPEED SUMMARY  
 Fri 12/7/2018

Site Reference: 180480000417  
 Site ID: 220000000103  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: EAST  
 Lane: 1

File: SPD-1-03-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	0	5	23	51	48	9	3	1	0	0	0	0	140
02:00	0	0	0	2	2	10	29	24	6	2	0	0	0	0	0	75
03:00	1	0	0	0	3	6	16	10	5	0	1	0	1	0	0	43
04:00	0	0	0	0	0	6	6	12	4	5	3	1	0	0	0	37
05:00	0	0	0	0	0	3	11	25	15	4	1	0	0	0	0	59
06:00	0	0	0	0	4	11	29	74	40	10	2	0	0	0	0	170
07:00	0	0	0	0	3	39	113	102	30	12	2	0	0	0	0	301
08:00	0	0	0	10	40	120	205	100	40	5	1	0	1	0	0	522
09:00	1	0	0	3	30	103	179	108	26	7	1	0	0	0	0	458
10:00	0	0	0	1	16	93	155	108	23	4	0	0	0	0	0	400
11:00	0	0	0	0	9	77	149	113	37	4	1	0	0	0	0	390
12:00	1	7	0	3	27	69	137	108	39	9	4	1	0	0	0	405
13:00	0	0	0	0	17	90	164	130	29	14	4	0	0	0	0	448
14:00	0	0	0	1	25	103	202	116	51	8	4	0	0	0	0	510
15:00	0	5	22	30	86	166	153	108	30	6	3	0	0	0	0	609
16:00	1	1	17	25	73	180	174	90	25	5	4	1	0	0	0	596
17:00	0	0	6	36	110	176	161	90	19	5	3	0	0	0	0	606
18:00	0	0	0	6	49	127	130	74	20	13	1	0	0	0	0	420
19:00	0	0	0	5	57	103	116	91	21	5	1	0	0	0	0	399
20:00	0	0	0	26	76	149	147	66	15	2	2	0	1	0	0	484
21:00	0	0	0	5	63	177	155	65	15	2	1	0	0	0	0	483
22:00	0	0	0	1	40	125	134	80	18	2	2	1	0	0	0	403
23:00	0	1	8	2	29	112	121	64	10	4	2	0	0	0	0	353
24:00	0	0	0	2	36	89	110	64	25	6	0	0	1	0	0	333
DAY TOTAL	4	14	53	158	800	2157	2847	1870	552	137	44	4	4	0	0	8644
PERCENTS	0.1%	0.2%	0.7%	1.9%	9.3%	25.0%	32.9%	21.6%	6.3%	1.5%	0.5%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
39.6 mph

Median Speed  
46.0 mph

10 MPH Pace Speed  
39 mph to 49 mph  
5004 vehicles in pace  
Representing 57.8% of the total vehicles

85th Percentile Speed  
52.5 mph

Average Speed  
46.0 mph

Vehicles > 65 MPH  
52  
0.6%

MassDOT Highway Division  
 SPEED SUMMARY  
 Sat 12/8/2018

Site Reference: 180480000417  
 Site ID: 220000000103  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: EAST  
 Lane: 1

File: SPD-1-03-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	0	2	44	55	84	13	5	1	1	2	1	0	208
02:00	0	0	1	0	4	23	36	27	12	1	2	0	2	0	0	108
03:00	0	0	0	0	1	14	34	22	11	3	1	0	0	0	0	86
04:00	0	0	0	0	2	6	19	15	9	6	1	0	0	0	0	58
05:00	0	0	0	0	1	6	11	11	8	1	1	0	0	0	0	39
06:00	0	0	0	0	3	5	16	23	13	2	1	1	0	0	0	64
07:00	0	0	1	0	3	14	45	40	20	6	1	2	0	0	0	132
08:00	0	0	0	0	4	17	58	77	26	8	2	1	0	2	0	195
09:00	0	0	0	0	6	45	84	86	30	9	3	1	0	0	0	264
10:00	0	0	0	0	7	31	132	113	32	14	3	1	0	0	0	333
11:00	0	2	0	2	7	64	146	145	41	9	2	0	0	0	0	418
12:00	0	0	0	1	25	131	194	137	35	5	0	0	0	0	0	528
13:00	1	0	0	0	25	102	211	159	32	6	1	0	0	0	0	537
14:00	0	0	3	14	53	189	203	100	36	6	2	0	0	0	0	606
15:00	1	3	5	27	103	187	182	102	11	5	2	1	0	0	0	629
16:00	1	5	15	40	85	179	187	96	27	4	1	0	0	0	0	640
17:00	0	0	0	9	60	149	188	102	22	7	1	0	0	0	0	538
18:00	3	0	0	5	77	173	165	85	17	4	1	0	1	0	0	531
19:00	0	0	2	13	61	141	158	77	23	2	2	0	0	0	0	479
20:00	0	1	0	7	64	170	138	74	12	3	4	0	0	0	0	473
21:00	1	1	0	3	30	97	106	73	17	5	1	1	0	0	1	336
22:00	16	1	3	4	36	90	84	68	9	5	1	0	0	0	0	317
23:00	59	3	0	0	23	48	67	28	14	0	0	0	0	0	0	242
24:00	2	5	0	2	15	96	100	51	8	4	2	0	0	0	0	285
DAY TOTAL	84	21	30	127	697	2021	2619	1795	478	120	36	9	5	3	1	8046
PERCENTS	1.1%	0.3%	0.4%	1.6%	8.7%	25.2%	32.6%	22.3%	5.9%	1.4%	0.4%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 39.6 mph

Median Speed  
 46.0 mph

10 MPH Pace Speed  
 39 mph to 49 mph  
 4640 vehicles in pace  
 Representing 57.6% of the total vehicles

85th Percentile Speed  
 52.5 mph

Average Speed  
 45.7 mph

Vehicles > 65 MPH  
 54  
 0.7%

STA. 1 WB

LN. 1

NO SPEED DATA



MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/3/2018

Site Reference: 180480000879  
 Site ID: 220000000104  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: WEST  
 Lane: 1

STA. 1 WB  
 LN. 2

File: SPD-1-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
13:00	118	73	50	30	51	75	31	12	1	0	0	0	0	0	0	441
14:00	4	0	0	9	57	198	241	89	9	1	1	0	0	0	0	609
15:00	5	0	0	8	63	227	238	75	5	1	0	0	0	0	0	622
16:00	0	0	0	13	96	255	232	79	15	0	0	0	0	0	0	690
17:00	0	0	0	2	100	265	184	79	9	2	1	0	0	0	0	642
18:00	0	0	0	5	124	288	194	53	5	0	2	1	0	1	0	673
19:00	0	0	0	9	84	230	158	53	6	1	0	0	0	0	0	541
20:00	0	0	0	4	50	151	117	39	11	0	0	0	0	0	0	372
21:00	0	0	0	4	42	116	88	30	4	2	0	0	1	0	0	287
22:00	2	0	0	0	27	59	92	31	13	3	0	0	0	0	0	227
23:00	0	0	0	0	8	54	56	34	12	3	0	0	0	0	0	167
24:00	0	0	0	0	5	35	40	27	6	2	2	0	0	0	0	117
DAY TOTAL	129	73	50	84	707	1953	1671	601	96	15	6	1	1	1	0	5388
PERCENTS	2.4%	1.4%	1.0%	1.6%	13.2%	36.3%	31.0%	11.1%	1.7%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 37.3 mph

Median Speed  
 43.2 mph

10 MPH Pace Speed  
 39 mph to 49 mph  
 3624 vehicles in pace  
 Representing 67.2% of the total vehicles

85th Percentile Speed  
 48.7 mph

Average Speed  
 42.6 mph

Vehicles > 65 MPH  
 9  
 0.2%

MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/4/2018

Site Reference: 180480000879  
 Site ID: 220000000104  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-1-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	0	2	19	21	13	8	2	0	0	0	0	0	65
02:00	0	0	0	0	4	7	10	8	1	1	0	0	0	0	0	31
03:00	0	0	0	0	2	9	12	10	4	1	1	0	0	0	0	39
04:00	0	0	0	0	3	12	9	15	2	3	0	0	0	0	0	44
05:00	1	0	0	0	8	20	76	42	12	2	2	0	0	0	0	163
06:00	2	0	0	3	26	171	221	83	16	2	2	0	0	0	0	526
07:00	15	1	1	14	103	313	275	74	12	4	0	0	0	0	0	812
08:00	40	15	9	24	116	244	180	35	5	0	0	0	0	0	0	668
09:00	453	8	7	6	2	0	0	0	2	0	0	0	0	0	0	478
10:00	213	0	0	14	46	99	121	47	10	1	0	0	0	0	0	551
11:00	0	0	0	1	35	211	210	83	8	3	0	0	0	0	0	551
12:00	0	0	0	2	45	170	213	68	14	1	0	0	0	0	0	513
13:00	3	0	0	6	37	171	222	91	21	0	0	0	0	0	0	551
14:00	2	0	0	3	46	226	222	85	10	1	2	0	0	0	0	597
15:00	3	1	4	16	79	197	216	57	10	2	0	0	0	0	0	585
16:00	0	0	0	17	146	254	188	54	6	2	0	0	0	0	0	667
17:00	5	0	0	6	118	266	186	73	11	2	1	1	0	0	0	669
18:00	4	0	0	22	148	281	179	42	5	0	0	0	0	0	0	681
19:00	2	0	1	19	86	202	133	47	4	1	0	0	0	0	0	495
20:00	0	0	0	8	43	155	152	39	8	4	2	0	0	0	0	411
21:00	0	0	0	2	36	94	110	44	3	1	2	1	0	1	0	294
22:00	0	0	0	0	10	65	89	50	9	1	2	0	0	0	0	226
23:00	0	0	0	2	15	53	66	30	12	2	1	0	0	0	0	181
24:00	0	0	0	1	9	27	55	26	6	0	0	0	0	0	0	124
DAY TOTAL	743	25	22	166	1165	3266	3166	1116	199	36	15	2	0	1	0	9922
PERCENTS	7.5%	0.3%	0.3%	1.7%	11.8%	32.9%	31.9%	11.2%	2.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 36.3 mph

85th Percentile Speed  
 48.8 mph

Median Speed  
 43.4 mph

Average Speed  
 41.4 mph

10 MPH Pace Speed  
 39 mph to 49 mph  
 6432 vehicles in pace  
 Representing 64.8% of the total vehicles

Vehicles > 65 MPH  
 18  
 0.2%

MassDOT Highway Division  
 SPEED SUMMARY  
 Wed 12/5/2018

Site Reference: 180480000879

Site ID: 220000000104

Location: RTE.16, WEST OF GLADSTONE ST.

Direction: WEST

Lane: 1

File: SPD-1-04-LN2.prn

City: EVERETT

County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	0	4	13	29	15	1	1	0	0	0	0	0	63
02:00	0	0	0	1	3	16	15	5	3	1	1	0	0	0	0	45
03:00	0	0	0	2	4	7	10	3	0	0	0	0	0	0	0	26
04:00	0	0	0	0	3	8	11	12	6	0	0	0	1	0	0	41
05:00	0	0	0	0	8	28	61	46	13	5	1	0	0	0	0	162
06:00	4	0	1	1	30	178	197	107	14	5	1	2	0	0	0	540
07:00	5	0	5	3	107	352	247	76	8	1	1	0	0	0	0	805
08:00	1	0	1	4	81	296	206	76	8	2	0	0	0	0	0	675
09:00	3	0	0	0	66	192	234	76	18	9	0	0	1	0	0	599
10:00	0	0	0	2	33	141	262	92	18	1	0	0	1	0	0	550
11:00	2	0	0	5	40	154	197	74	14	2	0	0	0	0	0	488
12:00	2	0	0	3	46	163	236	91	20	2	0	0	0	0	0	563
13:00	1	0	3	0	45	145	227	102	16	2	1	0	0	0	0	542
14:00	3	0	0	4	26	221	241	106	14	5	0	1	0	0	1	622
15:00	2	0	0	3	61	265	227	62	10	4	0	0	0	0	0	634
16:00	3	0	0	8	64	241	274	94	15	0	1	0	0	0	0	700
17:00	5	0	0	15	103	294	193	46	7	3	0	0	0	1	0	667
18:00	2	0	1	14	117	243	216	58	2	1	0	0	0	0	0	654
19:00	0	0	2	7	94	187	177	51	11	2	1	0	0	0	0	532
20:00	3	0	0	4	36	151	117	69	12	3	0	0	0	0	0	395
21:00	0	0	0	0	25	80	98	61	13	4	1	0	0	0	0	282
22:00	0	0	0	1	14	75	100	30	4	3	1	1	0	1	0	230
23:00	0	0	0	1	8	51	83	41	10	6	0	1	0	0	0	201
24:00	0	0	0	1	12	29	47	24	10	0	0	0	0	0	0	123
DAY TOTAL	36	0	13	79	1030	3530	3705	1417	247	62	9	5	3	2	1	10139
PERCENTS	0.4%	0.0%	0.2%	0.8%	10.2%	34.9%	36.6%	13.9%	2.4%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
39.5 mph

85th Percentile Speed  
49.8 mph

Median Speed  
44.5 mph

Average Speed  
44.6 mph

10 MPH Pace Speed  
39 mph to 49 mph  
7235 vehicles in pace  
Representing 71.3% of the total vehicles

Vehicles > 65 MPH  
20  
0.2%



MassDOT Highway Division  
 SPEED SUMMARY  
 Thu 12/6/2018

Site Reference: 180480000879

Site ID: 220000000104

Location: RTE.16, WEST OF GLADSTONE ST.

Direction: WEST

Lane: 1

File: SPD-1-04-LN2.prn

City: EVERETT

County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	0	7	15	24	18	4	5	1	0	0	0	0	74
02:00	0	0	0	0	0	11	8	10	7	2	0	0	0	0	0	38
03:00	0	0	0	0	1	8	11	9	4	1	1	0	0	0	0	35
04:00	0	0	0	0	7	8	16	12	7	0	1	1	0	0	0	52
05:00	0	0	0	1	1	17	47	58	21	1	1	0	0	0	0	147
06:00	0	0	0	2	32	157	244	102	17	5	2	0	0	0	0	561
07:00	4	0	1	8	142	336	261	57	4	1	0	0	0	0	0	814
08:00	0	0	4	10	99	257	225	55	6	1	1	0	0	0	0	658
09:00	2	0	2	3	65	208	232	67	11	1	0	0	0	0	0	591
10:00	0	0	4	5	19	169	220	129	15	3	0	0	0	0	0	564
11:00	0	0	0	6	42	222	191	89	13	1	1	0	0	0	0	565
12:00	0	0	0	2	45	207	219	95	12	2	0	0	0	0	0	582
13:00	0	0	0	6	51	200	198	95	20	5	1	0	0	0	0	576
14:00	1	0	0	1	59	242	229	83	4	2	1	0	0	0	0	622
15:00	6	0	5	6	82	252	153	74	10	1	1	0	0	0	0	590
16:00	2	0	1	0	49	260	279	87	9	2	0	0	0	0	0	689
17:00	3	0	0	3	129	298	206	62	4	0	0	0	0	0	0	705
18:00	1	0	4	26	121	347	187	56	5	1	0	0	0	0	0	748
19:00	0	0	0	8	123	209	189	49	8	4	1	0	0	0	0	591
20:00	1	0	0	4	44	164	149	47	10	2	1	0	0	0	0	422
21:00	0	0	0	1	30	107	119	38	9	3	1	1	0	0	0	309
22:00	0	0	0	3	22	91	68	32	6	5	1	0	0	0	0	228
23:00	3	0	0	4	11	50	84	39	8	2	1	0	1	0	0	203
24:00	3	0	0	1	14	25	52	37	13	0	0	0	0	0	0	145
DAY TOTAL	26	0	21	100	1195	3860	3611	1400	227	50	16	2	1	0	0	10509
PERCENTS	0.3%	0.0%	0.2%	1.0%	11.4%	36.8%	34.4%	13.3%	2.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
39.3 mph

85th Percentile Speed  
49.4 mph

Median Speed  
44.1 mph

Average Speed  
44.3 mph

10 MPH Pace Speed  
39 mph to 49 mph  
7471 vehicles in pace  
Representing 71.0% of the total vehicles

Vehicles > 65 MPH  
19  
0.2%

MassDOT Highway Division  
 SPEED SUMMARY  
 Fri 12/7/2018

Site Reference: 180480000879

Site ID: 220000000104

Location: RTE.16, WEST OF GLADSTONE ST.

Direction: WEST

Lane: 1

File: SPD-1-04-LN2.prn

City: EVERETT

County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	1	5	19	36	12	8	0	0	1	0	0	0	82
02:00	0	0	0	1	3	8	19	13	2	1	0	0	0	0	0	47
03:00	0	0	0	1	2	6	11	12	3	0	0	0	0	0	0	35
04:00	0	0	0	0	2	3	19	19	5	0	0	0	0	0	0	48
05:00	0	0	0	4	5	28	49	47	14	3	0	1	1	0	0	152
06:00	1	0	0	1	52	147	209	76	19	5	1	0	0	0	0	511
07:00	161	7	11	26	99	239	166	26	1	0	0	0	0	0	0	736
08:00	377	12	18	27	36	48	42	11	0	0	0	0	0	0	0	571
09:00	0	0	0	3	57	177	234	102	12	3	0	0	0	0	0	588
10:00	0	0	0	8	37	194	225	87	12	5	0	0	0	0	0	568
11:00	4	1	0	6	41	219	193	67	18	0	1	0	0	0	0	550
12:00	7	0	0	0	31	150	212	95	16	7	0	0	0	0	0	518
13:00	3	3	2	5	23	130	235	105	18	2	0	0	0	0	0	526
14:00	3	0	4	10	73	197	190	92	14	3	1	0	0	0	0	587
15:00	0	0	0	13	101	260	182	55	7	2	1	0	0	0	0	621
16:00	2	0	2	6	131	276	184	68	9	1	0	0	0	0	0	679
17:00	7	0	1	10	124	250	226	60	7	2	1	0	0	0	0	688
18:00	3	0	1	24	101	252	174	43	6	5	0	0	0	1	0	610
19:00	1	0	1	2	58	187	159	55	6	2	0	0	0	0	0	471
20:00	0	0	0	2	31	143	149	47	7	1	0	0	0	0	0	380
21:00	1	0	0	5	60	97	118	37	11	1	0	0	0	0	0	330
22:00	2	0	0	4	26	83	117	45	7	5	4	0	0	0	0	293
23:00	0	0	0	3	20	89	99	50	9	3	2	0	0	0	0	275
24:00	1	0	0	4	11	43	68	36	12	0	1	0	0	0	0	176

DAY TOTAL	573	23	40	166	1129	3245	3316	1260	223	51	12	2	1	1	0	10042
PERCENTS	5.8%	0.3%	0.4%	1.7%	11.2%	32.3%	33.0%	12.5%	2.2%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
37.1 mph

Median Speed  
43.8 mph

10 MPH Pace Speed  
39 mph to 49 mph  
6561 vehicles in pace  
Representing 65.3% of the total vehicles

85th Percentile Speed  
49.2 mph

Average Speed  
42.2 mph

Vehicles > 65 MPH  
16  
0.2%

MassDOT Highway Division  
 SPEED SUMMARY  
 Sat 12/8/2018

Site Reference: 180480000879  
 Site ID: 220000000104  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-1-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	1	5	28	33	16	4	1	1	2	0	0	0	91
02:00	0	0	0	0	9	17	26	19	5	2	0	2	0	0	0	80
03:00	0	0	0	1	4	9	20	15	8	0	1	0	0	0	0	58
04:00	0	0	0	0	7	8	16	14	2	1	1	0	0	0	0	49
05:00	0	0	0	1	3	14	20	19	8	6	1	0	0	0	0	72
06:00	4	0	0	0	5	33	51	61	20	1	2	0	0	0	0	177
07:00	0	0	1	3	22	81	103	91	6	2	0	0	0	0	0	309
08:00	1	0	0	0	19	96	148	101	19	7	0	0	0	0	0	391
09:00	0	0	0	1	20	140	167	97	19	3	0	0	1	0	0	448
10:00	1	0	0	4	36	169	194	79	11	7	2	0	1	0	0	504
11:00	2	0	0	3	29	172	223	102	13	2	0	0	0	0	0	546
12:00	1	0	0	0	21	183	242	109	27	5	1	0	0	0	0	589
13:00	1	0	0	0	36	194	242	116	16	3	2	0	0	0	0	610
14:00	1	0	0	2	39	203	240	91	21	5	0	0	0	0	0	602
15:00	2	0	0	6	66	234	228	73	12	3	2	0	0	0	0	626
16:00	1	0	3	11	80	217	200	60	5	2	0	0	0	0	0	579
17:00	3	0	2	11	69	199	175	63	8	1	0	0	0	1	0	532
18:00	0	0	0	5	62	147	181	46	6	4	1	0	0	0	0	452
19:00	0	0	0	8	57	151	146	41	9	2	1	0	0	0	0	415
20:00	0	0	0	1	48	118	140	53	7	4	0	0	1	0	0	372
21:00	0	0	0	5	36	109	106	41	11	1	0	1	0	0	0	310
22:00	0	0	0	1	31	91	98	35	5	1	1	0	0	0	0	263
23:00	0	0	0	8	30	72	88	37	8	2	0	1	0	0	0	246
24:00	0	0	0	2	8	40	61	47	9	4	0	0	0	0	0	171
DAY TOTAL	17	0	6	74	742	2725	3148	1426	259	69	16	6	3	1	0	8492
PERCENTS	0.3%	0.0%	0.1%	0.9%	8.8%	32.1%	37.1%	16.8%	3.0%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 39.8 mph

85th Percentile Speed  
 50.8 mph

Median Speed  
 45.1 mph

Average Speed  
 45.1 mph

10 MPH Pace Speed  
 39 mph to 49 mph  
 5873 vehicles in pace  
 Representing 69.1% of the total vehicles

Vehicles > 65 MPH  
 26  
 0.3%



MassDOT Highway Division  
 SPEED SUMMARY  
 Sun 12/9/2018

Site Reference: 180480000879  
 Site ID: 220000000104  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-1-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	1	10	21	50	20	10	0	1	0	0	1	0	114
02:00	0	0	0	0	4	17	28	23	7	1	0	0	0	0	0	80
03:00	0	0	0	0	6	8	23	11	2	2	4	0	0	0	1	57
04:00	0	0	0	0	0	10	24	4	2	2	0	0	1	0	0	43
05:00	0	0	0	2	3	7	16	10	10	5	1	0	0	0	0	54
06:00	0	0	0	2	3	15	36	23	8	3	0	0	0	0	1	91
07:00	2	0	0	0	1	23	56	40	12	4	2	0	0	0	0	140
08:00	0	0	0	0	4	35	50	53	22	6	0	2	0	0	0	172
09:00	0	0	0	0	6	51	102	67	17	3	0	1	1	0	0	248
10:00	3	0	0	2	11	96	178	98	23	5	1	1	0	0	0	418
11:00	2	0	0	3	15	103	197	110	25	3	1	1	0	0	0	460
12:00	0	0	0	2	16	155	209	87	11	9	0	0	1	0	0	490
13:00	0	0	0	0	27	125	257	104	15	4	0	0	0	0	0	532
14:00	4	0	0	3	37	144	211	87	19	5	2	0	0	0	0	512
15:00	3	0	1	6	66	162	172	64	13	2	0	0	0	0	0	489
16:00	1	0	0	5	34	166	195	71	7	2	3	0	1	0	0	485
17:00	0	0	0	12	65	213	169	43	11	1	0	0	0	0	0	514
18:00	3	0	0	2	67	141	145	43	4	1	1	0	0	0	0	407
19:00	1	0	0	4	52	178	127	30	8	1	1	0	0	0	0	402
20:00	0	0	0	3	21	120	104	44	11	3	1	0	0	0	0	307
21:00	0	0	0	0	16	89	79	47	9	2	1	0	0	0	0	243
22:00	0	0	0	0	7	45	92	43	9	4	1	0	0	0	0	201
23:00	0	0	0	0	8	47	82	33	8	2	1	0	0	0	0	181
24:00	0	0	0	0	6	19	33	29	8	2	0	1	0	0	0	98
DAY TOTAL	19	0	1	47	485	1990	2635	1184	271	72	21	6	4	1	2	6738
PERCENTS	0.3%	0.0%	0.1%	0.7%	7.2%	29.6%	39.2%	17.6%	4.0%	1.0%	0.3%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 40.2 mph

85th Percentile Speed  
 51.3 mph

Median Speed  
 45.6 mph

Average Speed  
 45.6 mph

10 MPH Pace Speed  
 39 mph to 49 mph  
 4625 vehicles in pace  
 Representing 68.6% of the total vehicles

Vehicles > 65 MPH  
 34  
 0.5%

MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/10/2018

Site Reference: 180480000879  
 Site ID: 220000000104  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-1-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	1	0	2	12	23	9	6	0	0	1	0	0	0	54
02:00	0	0	0	0	5	8	19	4	0	1	0	0	1	0	0	38
03:00	0	0	3	0	3	5	8	4	3	1	0	0	1	0	0	28
04:00	0	0	0	1	3	12	15	12	3	2	0	0	0	0	0	48
05:00	0	0	0	4	7	25	50	50	11	4	2	0	0	0	0	153
06:00	4	0	0	4	25	154	197	88	33	5	2	0	0	0	0	512
07:00	1	0	0	4	108	314	254	59	5	0	0	0	0	0	0	745
08:00	16	5	3	7	71	250	243	80	7	0	1	0	0	0	0	683
09:00	5	0	0	3	51	228	220	108	20	3	0	1	0	0	0	639
10:00	2	0	1	3	48	176	189	104	15	8	1	0	1	2	0	550
11:00	6	0	0	3	45	116	202	110	15	3	1	0	0	0	0	501
12:00	0	0	0	0	51	156	203	104	24	0	0	0	0	0	0	538
13:00	5	0	0	1	21	116	236	121	25	4	3	0	0	0	0	532
14:00	4	0	1	3	49	188	209	101	20	4	0	0	0	0	0	579
15:00	0	0	0	8	41	208	218	93	16	1	0	0	0	0	0	585
16:00	11	0	0	16	105	228	207	79	7	2	0	0	0	0	0	655
17:00	3	2	2	30	119	241	184	55	7	1	1	0	0	0	0	645
18:00	6	0	1	8	106	243	193	53	9	2	1	0	1	0	0	623
19:00	2	0	0	5	60	187	157	48	11	2	0	1	1	0	0	474
20:00	0	0	0	1	43	120	127	48	12	2	1	1	0	0	0	355
21:00	1	0	0	0	13	76	105	45	15	3	1	0	0	0	0	259
22:00	1	0	0	1	11	54	99	44	13	3	0	0	0	0	0	226
23:00	0	0	0	0	9	52	53	39	7	0	1	1	0	1	0	163
24:00	0	0	0	1	3	19	41	20	6	3	0	0	0	0	2	95
DAY TOTAL	67	7	12	103	999	3188	3452	1478	290	54	15	5	5	3	2	9680
PERCENTS	0.7%	0.1%	0.2%	1.1%	10.4%	33.0%	35.7%	15.3%	2.9%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 39.4 mph

Median Speed  
 44.7 mph

10 MPH Pace Speed  
 39 mph to 49 mph  
 6640 vehicles in pace  
 Representing 68.5% of the total vehicles

85th Percentile Speed  
 50.4 mph

Average Speed  
 44.6 mph

Vehicles > 65 MPH  
 30  
 0.3%

MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/11/2018

Site Reference: 180480000879  
 Site ID: 220000000104  
 Location: RTE.16, WEST OF GLADSTONE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-1-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	0	1	11	12	12	7	2	1	0	0	0	0	46
02:00	0	0	0	1	3	12	12	7	4	1	2	0	0	0	0	42
03:00	0	0	0	0	2	6	12	5	3	0	0	0	0	0	0	28
04:00	0	0	0	0	3	7	14	11	8	0	0	0	0	0	0	43
05:00	0	0	0	1	6	23	46	41	21	4	3	0	0	0	0	145
06:00	7	0	0	6	37	188	205	59	12	3	1	0	0	0	0	518
07:00	1	11	15	33	129	301	254	47	4	2	1	0	0	0	0	798
08:00	389	16	28	42	32	11	1	0	0	0	0	0	0	0	0	519
09:00	221	26	16	17	12	101	92	45	4	0	0	0	0	0	0	534
10:00	0	0	0	0	25	153	235	124	17	1	1	1	0	0	0	557
11:00	4	0	0	1	17	90	107	39	6	0	1	0	0	0	0	265
DAY TOTAL	622	53	59	101	267	903	990	390	86	13	10	1	0	0	0	3495
PERCENTS	17.8%	1.6%	1.7%	2.9%	7.7%	25.9%	28.4%	11.1%	2.4%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 16.0 mph

85th Percentile Speed  
 48.9 mph

Median Speed  
 42.6 mph

Average Speed  
 37.6 mph

10 MPH Pace Speed  
 39 mph to 49 mph  
 1893 vehicles in pace  
 Representing 54.1% of the total vehicles

Vehicles > 65 MPH  
 11  
 0.3%



STA. 4 EB

LN. 1

NO SPEED DATA

STA. 4 EB

LN. 2

NO SPEED DATA

MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/3/2018

Site Reference: 180480000761  
 Site ID: 110000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

STA. 4 WB  
 LN. 1

File: SPD-4-04-LN1.prn  
 City: EVERETT  
 County: SPEED LN-1 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
12:00	73	13	4	0	0	1	3	0	0	0	0	0	0	0	0	94
13:00	37	75	165	102	35	9	1	2	0	0	0	0	0	0	0	426
14:00	80	103	171	79	31	7	3	1	0	0	0	0	0	0	0	475
15:00	126	123	134	61	21	9	2	1	0	0	0	0	0	0	0	477
16:00	187	108	135	68	15	2	0	2	0	0	0	0	0	0	0	517
17:00	228	114	127	42	10	5	0	0	0	0	0	0	0	0	0	526
18:00	150	113	130	70	20	4	1	0	0	0	0	0	0	0	0	488
19:00	44	86	142	109	35	5	4	2	0	0	0	0	0	0	0	427
20:00	17	45	118	94	39	10	4	2	0	0	0	0	0	0	0	329
21:00	3	25	79	66	40	17	7	3	0	0	0	0	0	0	0	240
22:00	2	12	40	64	43	17	2	1	0	3	0	0	0	0	0	184
23:00	0	1	18	54	33	19	9	1	0	0	0	0	0	0	0	135
24:00	0	7	22	31	21	9	9	0	0	0	0	0	0	0	0	99
DAY TOTAL	947	825	1285	840	343	114	45	15	0	3	0	0	0	0	0	4417
PERCENTS	21.5%	18.7%	29.1%	19.1%	7.8%	2.5%	1.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 13.3 mph

85th Percentile Speed  
 33.2 mph

Median Speed  
 25.7 mph

Average Speed  
 24.4 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 2125 vehicles in pace  
 Representing 48.1% of the total vehicles

Vehicles > 65 MPH  
 0  
 0.0%



MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/4/2018

Site Reference: 180480000761  
 Site ID: 110000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN1.prn  
 City: EVERETT  
 County: SPEED LN-1 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	5	14	16	16	5	2	1	0	0	0	0	0	0	0	59
02:00	1	0	6	5	7	6	3	0	0	0	0	0	0	0	0	28
03:00	0	4	5	8	11	11	2	1	0	0	0	0	0	0	0	42
04:00	0	0	5	11	21	15	7	1	0	0	0	0	0	0	0	60
05:00	1	9	18	35	42	23	11	7	2	0	0	0	0	0	0	148
06:00	42	60	110	105	54	29	13	0	0	0	0	0	0	0	0	413
07:00	94	87	162	112	54	21	7	2	0	0	0	0	0	0	0	539
08:00	96	60	125	84	58	18	7	1	0	0	0	0	0	0	0	449
09:00	71	63	107	86	67	17	4	0	0	0	2	0	0	0	0	417
10:00	65	71	128	86	62	27	2	1	0	0	2	0	0	2	4	450
11:00	56	79	128	105	35	5	1	5	4	0	0	2	4	0	2	426
12:00	76	49	111	91	36	8	5	10	2	18	8	5	10	2	2	433
13:00	101	64	107	69	33	4	14	13	5	24	3	12	8	5	0	462
14:00	90	73	121	80	31	19	8	16	3	5	10	2	4	0	0	462
15:00	128	81	100	88	24	16	8	19	11	7	7	5	4	6	0	504
16:00	193	92	117	59	7	10	5	18	9	10	2	4	0	0	0	526
17:00	196	115	114	61	14	1	0	0	0	4	3	2	0	0	0	510
18:00	229	88	102	57	16	4	0	2	0	0	1	0	0	0	0	499
19:00	53	77	138	96	29	14	5	4	2	2	0	0	0	0	2	422
20:00	20	34	94	104	53	17	4	2	0	1	0	4	0	0	2	335
21:00	3	20	59	97	58	14	5	3	0	0	0	0	0	0	0	259
22:00	2	11	58	56	34	23	6	4	2	0	0	0	0	0	2	198
23:00	3	7	35	38	41	22	7	4	0	0	0	0	3	8	2	170
24:00	2	2	12	28	30	8	6	1	1	0	0	0	2	0	2	94
DAY TOTAL	1522	1151	1976	1577	833	337	132	115	41	71	38	36	35	23	18	7905
PERCENTS	19.3%	14.6%	25.0%	20.0%	10.6%	4.3%	1.7%	1.5%	0.6%	0.8%	0.4%	0.4%	0.4%	0.2%	0.2%	100%

Statistical Information...

15th Percentile Speed  
 14.8 mph

Median Speed  
 27.2 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 3553 vehicles in pace  
 Representing 44.9% of the total vehicles

85th Percentile Speed  
 37.0 mph

Average Speed  
 27.2 mph

Vehicles > 65 MPH  
 150  
 1.9%

MassDOT Highway Division  
 SPEED SUMMARY  
 Wed 12/5/2018

Site Reference: 180480000761  
 Site ID: 110000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN1.prn  
 City: EVERETT  
 County: SPEED LN-1 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	2	5	14	21	13	2	1	0	0	0	0	0	0	0	58
02:00	0	1	3	10	12	8	6	3	0	0	0	2	2	0	0	47
03:00	0	1	6	10	11	2	0	0	0	0	0	0	0	2	0	32
04:00	0	5	3	4	14	14	7	2	0	0	0	0	2	0	0	51
05:00	7	5	16	26	45	32	20	10	1	0	0	0	0	0	0	162
06:00	26	36	79	93	74	41	13	2	1	1	0	0	0	2	1	369
07:00	164	76	112	94	35	7	1	2	0	1	2	0	0	0	2	496
08:00	77	69	119	111	52	14	5	2	2	4	0	0	2	2	2	461
09:00	141	67	84	67	35	12	16	9	4	18	5	1	2	0	2	463
10:00	147	39	64	54	30	27	8	5	13	9	8	1	0	11	3	419
11:00	217	23	39	41	29	7	8	11	24	8	0	0	0	0	0	407
12:00	255	32	28	44	23	31	9	2	18	2	0	0	0	0	0	444
13:00	253	57	73	20	13	32	2	16	30	0	0	20	0	0	0	516
14:00	185	37	94	42	21	8	12	21	17	15	6	2	0	0	0	460
15:00	268	69	50	17	37	25	18	17	19	3	0	0	4	0	1	528
16:00	369	28	32	28	10	10	6	13	2	0	2	0	0	0	0	500
17:00	363	66	26	17	5	5	4	11	0	2	12	0	0	0	0	511
18:00	286	67	51	34	3	15	21	10	7	6	5	0	6	0	0	511
19:00	240	21	39	33	35	25	39	13	3	0	10	4	0	0	0	462
20:00	211	1	34	30	34	9	9	20	6	6	5	0	7	0	0	372
21:00	129	12	71	63	1	17	10	37	0	16	0	0	0	0	0	356
22:00	132	14	38	9	1	2	6	5	77	3	9	2	0	0	0	298
23:00	96	5	6	8	32	22	38	13	16	23	4	0	0	0	0	263
24:00	65	1	31	25	18	0	4	9	0	0	0	0	3	0	0	156
DAY TOTAL	3631	734	1103	894	591	378	264	234	240	117	68	32	28	17	11	8342
PERCENTS	43.6%	8.8%	13.3%	10.8%	7.1%	4.6%	3.1%	2.8%	2.8%	1.4%	0.8%	0.3%	0.3%	0.2%	0.1%	100%

Statistical Information...

15th Percentile Speed  
6.6 mph

85th Percentile Speed  
40.8 mph

Median Speed  
22.7 mph

Average Speed  
24.1 mph

10 MPH Pace Speed  
9 mph to 19 mph  
3631 vehicles in pace  
Representing 43.5% of the total vehicles

Vehicles > 65 MPH  
156  
1.9%

MassDOT Highway Division  
 SPEED SUMMARY  
 Sat 12/8/2018

Site Reference: 180480000761  
 Site ID: 110000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN1.prn  
 City: EVERETT  
 County: SPEED LN-1 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	2	29	41	19	22	1	2	2	0	2	0	0	2	2	124
02:00	2	1	15	28	17	15	4	0	0	4	4	0	0	0	0	90
03:00	2	3	6	22	23	9	4	0	0	2	0	4	0	2	0	77
04:00	0	1	3	19	13	14	5	1	2	0	4	6	4	0	0	72
05:00	2	11	9	22	20	20	8	1	6	0	8	8	0	2	0	117
06:00	18	3	22	38	40	32	11	5	4	4	3	5	7	2	0	194
07:00	20	13	55	52	59	22	2	6	3	1	2	2	2	1	0	240
08:00	33	28	80	90	54	18	9	3	0	0	1	0	0	0	0	316
09:00	13	33	95	122	51	26	6	0	2	0	4	2	2	4	0	360
10:00	33	63	113	85	66	20	11	5	5	1	0	4	0	0	0	406
11:00	55	49	130	114	57	22	9	1	4	4	0	6	2	0	1	454
12:00	101	74	123	99	40	18	3	9	4	7	7	3	8	2	2	500
13:00	132	88	125	99	36	10	4	8	3	1	4	2	3	2	0	517
14:00	71	126	134	122	53	10	6	4	1	5	2	2	3	2	0	541
15:00	96	83	163	108	45	15	8	3	4	1	0	2	0	0	0	528
16:00	97	78	113	84	41	19	7	4	5	5	6	8	2	0	4	473
17:00	87	96	141	78	49	11	5	3	0	0	2	0	2	0	0	474
18:00	28	68	117	120	53	18	1	5	0	1	4	1	0	0	0	416
19:00	42	49	90	131	35	16	7	1	1	2	0	0	1	3	2	380
20:00	22	52	100	81	50	20	4	2	1	0	0	0	0	0	0	332
21:00	2	19	90	104	57	17	5	5	0	0	3	0	2	0	0	304
22:00	8	18	60	73	44	22	5	2	3	1	2	2	0	0	0	240
23:00	2	20	51	53	48	24	12	1	0	2	2	0	0	0	2	217
24:00	0	6	35	48	44	24	6	2	2	0	0	0	0	0	0	167
DAY TOTAL	866	984	1899	1833	1014	444	143	73	52	41	60	57	38	22	13	7539
PERCENTS	11.5%	13.1%	25.2%	24.4%	13.5%	5.9%	1.9%	1.0%	0.7%	0.6%	0.7%	0.7%	0.5%	0.2%	0.1%	100%

Statistical Information...

15th Percentile Speed  
 20.4 mph

85th Percentile Speed  
 38.1 mph

Median Speed  
 29.1 mph

Average Speed  
 29.5 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 3732 vehicles in pace  
 Representing 49.5% of the total vehicles

Vehicles > 65 MPH  
 190  
 2.5%



MassDOT Highway Division  
 SPEED SUMMARY  
 Sun 12/9/2018

Site Reference: 180480000761  
 Site ID: 110000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN1.prn  
 City: EVERETT  
 County: SPEED LN-1 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	7	22	29	32	9	6	3	0	0	0	2	2	0	0	112
02:00	1	2	14	21	22	12	9	2	1	0	0	0	0	0	0	84
03:00	0	1	15	22	24	13	1	0	0	0	0	0	0	0	0	76
04:00	0	2	6	19	13	8	6	1	1	0	0	0	0	0	2	58
05:00	0	0	7	17	19	10	4	1	0	0	0	0	0	0	0	58
06:00	0	4	14	26	26	15	4	2	0	0	0	0	0	0	0	91
07:00	1	4	18	32	36	18	7	3	2	0	0	2	0	0	0	123
08:00	0	5	25	41	43	21	10	4	1	0	1	2	0	0	0	153
09:00	4	14	59	75	47	18	5	6	2	2	0	2	3	0	0	237
10:00	16	20	73	117	51	32	11	1	0	0	3	6	0	0	0	330
11:00	75	53	101	85	37	19	14	1	2	3	3	2	5	4	2	406
12:00	113	32	92	82	37	19	13	16	12	11	11	7	8	2	1	456
13:00	117	48	128	78	36	14	6	25	8	16	3	7	2	2	0	490
14:00	68	71	122	99	36	8	8	9	5	0	9	4	2	1	0	442
15:00	105	59	91	95	45	20	5	7	8	5	4	9	0	2	2	457
16:00	85	68	120	105	26	13	8	5	7	1	2	0	2	4	2	448
17:00	71	58	130	104	42	14	6	7	2	6	13	6	0	6	2	467
18:00	47	43	111	80	36	19	4	7	2	2	3	0	3	4	0	361
19:00	28	33	119	84	38	21	7	4	7	5	0	6	4	2	4	362
20:00	23	36	66	85	43	22	6	14	2	2	5	4	7	0	2	317
21:00	15	14	40	67	44	27	4	6	3	7	8	2	2	4	2	245
22:00	3	12	43	63	39	16	5	2	7	4	2	4	2	2	2	206
23:00	6	4	18	50	35	16	10	2	7	2	0	2	0	0	0	152
24:00	0	1	19	28	28	13	6	1	0	2	0	2	2	4	2	108
DAY TOTAL	778	591	1453	1504	835	397	165	129	79	68	67	69	44	37	23	6239
PERCENTS	12.5%	9.5%	23.3%	24.2%	13.4%	6.4%	2.7%	2.1%	1.3%	1.0%	1.0%	1.1%	0.7%	0.5%	0.3%	100%

Statistical Information...

15th Percentile Speed  
 20.3 mph

85th Percentile Speed  
 40.8 mph

Median Speed  
 30.0 mph

Average Speed  
 30.9 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 2957 vehicles in pace  
 Representing 47.3% of the total vehicles

Vehicles > 65 MPH  
 240  
 3.8%

MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/3/2018

STA. 4 WB  
 LN. 2

Site Reference: 180480000479  
 Site ID: 220000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
12:00	101	21	8	3	2	0	0	0	0	0	0	0	0	0	0	135
13:00	23	52	112	118	73	23	6	2	0	0	0	0	0	0	0	409
14:00	79	89	101	91	65	23	11	1	1	0	0	0	0	0	0	461
15:00	74	75	112	93	40	32	5	0	0	0	0	0	0	0	0	431
16:00	130	76	117	97	41	14	3	0	0	0	0	0	0	0	0	478
17:00	145	122	132	77	25	5	0	0	0	0	0	0	0	0	0	506
18:00	129	88	116	102	26	12	2	1	0	0	0	0	0	0	0	476
19:00	42	45	113	102	57	25	8	0	0	0	0	0	0	0	0	392
20:00	10	21	66	114	50	14	7	0	1	0	0	0	0	0	0	283
21:00	0	3	29	76	43	28	14	4	0	0	0	0	0	0	0	197
22:00	0	6	23	37	57	30	14	5	1	0	0	0	0	0	0	173
23:00	0	2	11	28	41	37	10	0	0	0	0	0	0	1	0	130
24:00	0	1	7	20	36	12	9	1	0	0	0	0	0	0	0	86
DAY TOTAL	733	601	947	958	556	255	89	14	3	0	0	0	0	1	0	4157
PERCENTS	17.7%	14.5%	22.8%	23.1%	13.4%	6.1%	2.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 16.2 mph

85th Percentile Speed  
 36.7 mph

Median Speed  
 27.9 mph

Average Speed  
 26.7 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 1905 vehicles in pace  
 Representing 45.8% of the total vehicles

Vehicles > 65 MPH  
 1  
 0.0%

MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/4/2018

Site Reference: 180480000479  
 Site ID: 220000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	4	7	10	10	10	3	0	0	0	0	0	0	0	44
02:00	0	0	2	7	6	6	2	1	0	0	0	0	0	0	0	24
03:00	0	0	1	2	10	5	4	3	0	0	0	0	0	0	0	25
04:00	0	0	2	3	9	9	5	5	1	0	0	0	0	0	0	34
05:00	1	0	8	13	42	29	19	9	4	0	0	0	0	0	0	125
06:00	31	17	75	138	92	32	13	4	0	0	0	0	0	0	0	402
07:00	84	55	105	156	77	48	9	2	1	0	0	0	0	0	0	537
08:00	72	38	100	109	75	50	12	3	1	0	0	0	0	0	0	460
09:00	30	42	96	121	69	48	14	2	1	0	0	0	0	0	0	423
10:00	25	50	80	109	104	49	14	2	2	0	0	0	0	0	0	435
11:00	31	43	98	123	92	21	4	1	0	0	0	0	0	0	0	413
12:00	15	34	92	107	64	33	10	5	0	0	0	0	0	0	0	360
13:00	30	38	97	137	70	12	6	0	1	0	0	0	0	0	0	391
14:00	45	36	111	129	58	14	7	1	0	0	1	0	0	0	0	402
15:00	35	60	121	121	69	20	7	0	0	0	0	0	0	0	0	433
16:00	104	128	142	96	35	13	2	0	0	0	0	0	0	0	0	520
17:00	123	116	127	94	18	3	0	1	0	0	0	0	0	0	0	482
18:00	168	113	121	82	35	13	2	0	0	0	0	0	0	0	0	534
19:00	56	45	105	96	55	14	0	2	0	0	0	0	0	0	0	373
20:00	21	24	68	73	78	33	16	3	0	0	0	0	0	0	0	316
21:00	3	10	32	61	53	37	10	6	0	1	0	0	0	0	0	213
22:00	1	9	23	40	40	36	11	6	0	0	0	0	0	0	0	166
23:00	0	2	14	29	36	42	13	4	1	0	0	0	0	0	0	141
24:00	0	0	7	13	39	16	11	3	0	0	0	0	0	0	0	89
DAY TOTAL	875	860	1631	1866	1236	593	201	66	12	1	1	0	0	0	0	7342
PERCENTS	12.0%	11.8%	22.3%	25.5%	16.8%	8.0%	2.7%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 20.3 mph

85th Percentile Speed  
 38.1 mph

Median Speed  
 29.8 mph

Average Speed  
 28.9 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 3497 vehicles in pace  
 Representing 47.6% of the total vehicles

Vehicles > 65 MPH  
 1  
 0.0%



MassDOT Highway Division  
 SPEED SUMMARY  
 Wed 12/5/2018

Site Reference: 180480000479  
 Site ID: 220000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	3	7	10	12	4	1	0	0	0	0	0	0	0	37
02:00	0	0	1	5	10	9	5	0	0	0	0	0	0	0	0	30
03:00	0	0	0	2	2	4	0	1	0	0	0	0	0	0	0	9
04:00	0	0	1	2	7	10	7	3	0	0	0	0	0	0	0	30
05:00	1	0	4	24	31	43	12	10	1	1	2	0	0	0	0	129
06:00	27	21	90	114	76	56	22	5	1	0	1	0	0	0	0	413
07:00	142	82	93	132	67	24	5	3	0	0	0	0	0	0	0	548
08:00	54	42	100	147	84	35	8	1	0	0	0	0	0	0	0	471
09:00	126	74	78	106	53	18	5	2	0	0	0	0	0	0	0	462
10:00	44	44	94	133	79	40	7	2	0	0	0	0	0	0	0	443
11:00	34	42	93	93	69	42	8	1	0	1	0	0	0	0	0	383
12:00	14	35	83	121	69	37	18	2	0	0	0	0	0	0	0	379
13:00	50	56	92	105	69	24	8	2	1	0	0	0	0	0	0	407
14:00	59	61	116	121	60	28	5	0	0	0	0	0	0	0	0	450
15:00	112	64	110	101	63	17	4	3	0	0	0	0	0	0	0	474
16:00	199	103	97	85	30	8	5	0	0	0	0	0	0	0	0	527
17:00	275	106	91	45	10	4	1	0	0	0	0	0	0	0	0	532
18:00	76	54	108	136	84	18	1	4	0	0	0	0	0	0	0	481
19:00	35	36	90	140	72	20	5	3	1	0	0	0	0	0	0	402
20:00	6	13	77	107	63	32	6	1	1	0	0	0	0	0	0	306
21:00	0	7	36	64	46	28	10	4	1	0	1	0	0	0	0	197
22:00	0	7	26	42	42	40	9	5	2	0	0	0	0	0	0	173
23:00	0	4	15	37	48	38	15	3	1	0	0	0	0	0	0	161
24:00	0	2	7	28	29	18	9	2	0	0	0	0	0	0	0	95
DAY TOTAL	1254	853	1505	1897	1173	605	179	58	9	2	4	0	0	0	0	7539
PERCENTS	16.7%	11.4%	20.0%	25.2%	15.6%	8.0%	2.3%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 17.1 mph

Median Speed  
 29.4 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 3402 vehicles in pace  
 Representing 45.1% of the total vehicles

85th Percentile Speed  
 37.8 mph

Average Speed  
 27.9 mph

Vehicles > 65 MPH  
 4  
 0.1%

MassDOT Highway Division  
 SPEED SUMMARY  
 Thu 12/6/2018

Site Reference: 180480000479  
 Site ID: 220000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	1	0	3	15	14	10	1	0	0	0	0	0	0	0	0	44
02:00	0	0	2	5	5	5	4	1	0	0	0	0	0	0	0	22
03:00	0	0	1	2	6	9	3	2	0	0	0	0	0	0	0	23
04:00	0	0	1	4	7	15	8	1	2	0	0	0	0	1	0	39
05:00	0	1	4	15	22	38	17	10	2	0	0	0	0	0	0	109
06:00	10	18	72	125	104	44	19	10	2	0	1	0	0	0	0	405
07:00	105	90	113	114	103	38	8	2	1	0	0	0	0	0	0	574
08:00	38	56	132	92	75	37	17	2	2	0	0	1	0	0	0	452
09:00	10	41	100	143	78	48	17	7	1	0	0	0	0	0	0	445
10:00	13	47	96	119	112	39	12	2	0	0	0	0	0	0	0	440
11:00	38	41	98	99	81	30	12	1	0	1	0	0	0	0	0	401
12:00	32	32	112	141	55	25	8	0	0	0	0	0	0	0	0	405
13:00	34	48	128	135	58	16	5	0	0	0	0	0	0	0	0	424
14:00	52	67	95	105	67	23	5	0	0	0	0	0	0	0	0	414
15:00	73	61	141	119	52	26	5	2	0	0	0	0	0	0	0	479
16:00	195	116	128	86	17	9	4	0	0	0	0	0	0	0	0	555
17:00	135	134	188	90	16	2	0	1	0	0	0	0	0	0	0	566
18:00	312	94	85	39	15	2	0	0	0	0	0	0	0	0	0	547
19:00	38	78	117	102	63	15	11	3	0	0	0	0	0	0	0	427
20:00	7	27	75	93	84	29	2	1	0	0	0	0	0	0	0	318
21:00	9	11	40	73	62	23	6	2	0	0	0	0	0	0	0	226
22:00	0	1	26	37	59	33	8	0	1	0	0	0	0	0	0	165
23:00	1	2	18	38	29	47	14	11	0	0	0	1	0	0	0	161
24:00	0	3	9	14	26	20	10	2	3	0	0	0	0	0	0	87
DAY TOTAL	1103	968	1784	1805	1210	583	196	60	14	1	1	2	0	1	0	7728
PERCENTS	14.3%	12.6%	23.1%	23.4%	15.7%	7.6%	2.5%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 19.3 mph

85th Percentile Speed  
 37.8 mph

Median Speed  
 29.0 mph

Average Speed  
 28.1 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 3589 vehicles in pace  
 Representing 46.4% of the total vehicles

Vehicles > 65 MPH  
 4  
 0.1%

MassDOT Highway Division  
 SPEED SUMMARY  
 Fri 12/7/2018

Site Reference: 180480000479  
 Site ID: 220000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	2	12	25	19	5	1	0	0	0	0	0	0	0	64
02:00	0	0	0	3	10	10	5	1	0	0	0	0	0	0	0	29
03:00	0	1	0	3	5	7	0	2	1	0	0	0	0	0	0	19
04:00	0	0	1	4	9	12	4	3	0	0	0	0	0	0	0	33
05:00	0	2	5	18	21	30	32	15	2	2	1	1	0	0	0	129
06:00	12	30	68	117	90	36	20	5	0	0	0	0	0	0	0	378
07:00	85	51	114	131	81	29	6	6	1	2	0	0	0	0	0	506
08:00	114	79	117	96	60	20	9	1	0	0	0	0	0	0	0	496
09:00	125	88	130	127	50	11	7	1	0	0	0	0	0	0	0	539
10:00	95	86	138	127	59	14	10	2	0	1	0	0	0	0	0	532
11:00	74	91	155	119	42	14	3	1	0	1	0	0	0	0	0	500
12:00	65	99	146	119	55	18	5	0	0	0	0	0	0	0	0	507
13:00	103	83	152	114	51	22	3	2	0	1	0	0	0	0	0	531
14:00	97	108	131	122	46	11	6	2	1	0	0	0	0	0	0	524
15:00	97	106	145	100	40	16	4	1	0	0	0	0	0	0	0	509
16:00	120	114	171	116	27	13	8	0	0	0	0	0	0	0	0	569
17:00	271	158	100	42	19	2	1	0	0	0	0	0	0	0	0	593
18:00	158	81	94	86	51	9	2	1	0	0	0	0	0	0	0	482
19:00	58	37	74	127	58	26	6	2	0	0	0	0	0	0	0	388
20:00	12	27	75	95	58	40	11	1	0	0	0	0	0	0	0	319
21:00	2	18	32	90	83	36	12	2	0	0	0	0	0	0	0	275
22:00	2	14	33	73	68	30	9	3	2	0	0	0	0	0	0	234
23:00	1	8	41	48	69	35	11	1	0	0	0	0	0	0	0	214
24:00	0	3	17	35	32	24	7	3	1	0	0	0	0	0	0	122
DAY TOTAL	1491	1284	1941	1924	1109	484	186	56	8	7	1	1	0	0	0	8492
PERCENTS	17.6%	15.2%	22.9%	22.7%	13.1%	5.7%	2.2%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 16.2 mph

85th Percentile Speed  
 36.6 mph

Median Speed  
 27.8 mph

Average Speed  
 26.7 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 3865 vehicles in pace  
 Representing 45.5% of the total vehicles

Vehicles > 65 MPH  
 2  
 0.0%



MassDOT Highway Division  
 SPEED SUMMARY  
 Sat 12/8/2018

Site Reference: 180480000479  
 Site ID: 220000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	6	9	16	20	13	3	0	0	0	0	0	0	0	67
02:00	0	0	6	18	27	12	5	1	0	0	0	0	0	0	0	69
03:00	0	0	1	7	22	16	2	1	0	0	0	0	0	0	0	49
04:00	0	0	0	4	11	8	6	2	0	0	0	0	0	0	0	31
05:00	0	0	0	10	12	18	13	0	0	0	0	0	0	0	0	53
06:00	0	1	15	28	32	20	17	9	6	0	1	0	0	0	0	129
07:00	0	3	23	49	54	40	18	4	4	0	0	0	0	0	0	195
08:00	7	14	38	75	76	48	13	5	0	0	0	0	0	0	0	276
09:00	4	26	66	83	82	49	9	4	1	0	0	0	0	0	0	324
10:00	26	26	58	101	112	56	15	4	0	0	0	0	0	0	0	398
11:00	30	27	90	102	99	58	10	3	0	0	0	1	0	0	0	420
12:00	50	57	80	123	68	38	16	1	1	0	0	0	0	0	0	434
13:00	92	62	119	119	46	22	12	2	0	0	0	0	0	0	0	474
14:00	41	68	119	151	86	24	5	3	0	0	0	0	0	0	0	497
15:00	50	69	106	140	58	12	5	1	1	0	0	0	0	0	0	442
16:00	57	63	94	102	82	27	11	4	0	0	0	0	0	0	0	440
17:00	72	56	121	101	48	18	5	1	0	0	0	0	0	0	0	422
18:00	20	43	85	96	79	24	8	4	1	0	0	0	0	0	0	360
19:00	19	24	65	83	99	41	7	4	0	0	0	0	0	0	0	342
20:00	7	14	56	92	87	27	14	0	3	0	0	0	0	0	0	300
21:00	0	4	40	83	72	36	4	3	0	0	0	0	0	0	0	242
22:00	2	9	49	66	61	24	9	1	0	0	0	0	0	0	0	221
23:00	2	7	28	67	39	26	13	4	1	0	0	0	0	0	0	187
24:00	0	3	6	30	46	34	12	1	0	0	0	0	0	0	0	132
DAY TOTAL	479	576	1271	1739	1414	698	242	65	18	0	1	1	0	0	0	6504
PERCENTS	7.4%	8.9%	19.6%	26.8%	21.8%	10.7%	3.7%	0.9%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
23.3 mph

85th Percentile Speed  
39.4 mph

Median Speed  
31.7 mph

Average Speed  
31.0 mph

10 MPH Pace Speed  
29 mph to 39 mph  
3153 vehicles in pace  
Representing 48.4% of the total vehicles

Vehicles > 65 MPH  
2  
0.0%

MassDOT Highway Division  
 SPEED SUMMARY  
 Sun 12/9/2018

Site Reference: 180480000479  
 Site ID: 220000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	4	17	27	19	14	3	2	0	0	0	0	0	0	86
02:00	0	0	4	6	21	22	6	0	2	0	0	0	0	0	0	61
03:00	0	0	0	7	19	14	5	2	0	0	0	0	0	0	0	47
04:00	0	1	1	2	8	11	6	0	1	0	0	0	0	0	0	30
05:00	0	0	1	1	9	5	7	2	0	0	0	0	0	0	0	25
06:00	0	0	2	6	16	16	13	0	3	0	0	0	0	0	0	56
07:00	0	0	4	8	35	25	13	8	0	0	0	0	0	0	0	93
08:00	0	2	5	16	33	27	20	10	3	0	0	0	0	0	0	116
09:00	0	7	33	54	56	25	20	1	1	0	0	0	0	0	0	197
10:00	13	15	51	82	63	38	13	8	0	0	1	0	0	0	0	284
11:00	20	36	71	119	65	27	17	5	0	0	0	0	0	0	0	360
12:00	20	26	50	130	91	46	14	4	1	0	0	0	0	0	0	382
13:00	41	35	92	98	75	43	11	8	3	0	0	0	0	0	0	406
14:00	26	45	131	125	56	35	10	3	0	0	0	0	0	0	0	431
15:00	40	49	99	104	61	33	6	2	1	0	0	0	0	0	0	395
16:00	36	40	91	104	71	42	2	1	0	0	0	0	0	0	0	387
17:00	40	53	70	129	46	22	13	5	2	0	0	0	0	0	0	380
18:00	13	32	62	114	79	21	10	4	0	0	0	0	0	0	0	335
19:00	13	11	70	89	61	43	5	2	0	0	0	0	0	0	0	294
20:00	3	15	40	58	65	54	14	2	0	0	0	0	0	0	0	251
21:00	0	11	29	52	44	28	13	2	0	0	0	0	0	0	0	179
22:00	0	7	15	43	39	30	20	2	1	1	0	0	0	0	0	158
23:00	0	0	8	24	52	31	10	6	1	0	0	0	0	0	0	132
24:00	0	0	5	15	13	9	11	3	2	0	0	0	0	0	0	58
DAY TOTAL	265	385	938	1403	1105	666	273	83	23	1	1	0	0	0	0	5143
PERCENTS	5.2%	7.5%	18.3%	27.3%	21.5%	12.9%	5.3%	1.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 24.7 mph

Median Speed  
 32.5 mph

10 MPH Pace Speed  
 29 mph to 39 mph  
 2508 vehicles in pace  
 Representing 48.7% of the total vehicles

85th Percentile Speed  
 41.1 mph

Average Speed  
 32.3 mph

Vehicles > 65 MPH  
 1  
 0.0%

MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/10/2018

Site Reference: 180480000479  
 Site ID: 220000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	3	9	7	4	5	1	0	0	0	0	0	0	0	29
02:00	0	1	1	6	9	10	2	0	0	0	0	0	0	0	0	29
03:00	0	0	1	4	4	1	4	5	0	0	0	0	0	0	0	19
04:00	0	1	4	2	8	11	4	3	1	0	0	0	0	0	0	34
05:00	1	1	5	15	32	24	20	12	1	1	0	0	0	0	0	112
06:00	35	44	45	104	77	39	21	4	1	0	0	0	0	0	0	370
07:00	79	71	109	123	86	22	7	0	0	0	0	0	0	0	0	497
08:00	104	79	94	115	74	27	6	2	0	0	0	0	0	0	0	501
09:00	127	116	123	106	44	13	11	1	0	0	0	0	0	0	0	541
10:00	57	86	146	124	60	36	3	5	0	1	0	0	0	0	0	518
11:00	92	91	143	89	35	17	7	2	0	0	0	0	0	0	0	476
12:00	48	79	107	138	67	27	5	3	0	0	0	0	0	0	0	474
13:00	90	80	110	114	49	21	8	2	0	1	0	0	0	0	0	475
14:00	74	88	134	121	53	16	7	0	0	0	0	0	0	0	0	493
15:00	47	81	160	129	44	24	8	0	0	0	0	0	0	0	0	493
16:00	157	142	127	90	38	5	5	0	0	0	0	0	0	0	0	564
17:00	116	135	134	97	27	8	1	0	0	0	0	0	0	0	0	518
18:00	90	61	131	129	44	8	3	0	1	0	0	0	0	0	0	467
19:00	31	33	84	110	61	26	5	2	0	0	0	0	0	0	0	352
20:00	3	12	36	90	70	37	11	0	0	0	0	0	0	0	0	259
21:00	5	12	13	57	51	29	13	1	2	0	0	0	0	0	0	183
22:00	1	6	23	37	38	38	14	3	1	0	0	0	0	0	0	161
23:00	2	0	7	28	51	27	12	7	0	0	0	0	0	0	0	134
24:00	0	0	6	17	19	9	10	6	1	0	0	0	0	0	0	68
DAY TOTAL	1159	1219	1746	1854	1048	479	192	59	8	3	0	0	0	0	0	7767
PERCENTS	15.0%	15.7%	22.5%	23.9%	13.5%	6.2%	2.4%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 19.0 mph

85th Percentile Speed  
 37.0 mph

Median Speed  
 28.3 mph

Average Speed  
 27.4 mph

10 MPH Pace Speed  
 24 mph to 34 mph  
 3600 vehicles in pace  
 Representing 46.3% of the total vehicles

Vehicles > 65 MPH  
 0  
 0.0%



MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/11/2018

Site Reference: 180480000479  
 Site ID: 220000000404  
 Location: RTE.16, WEST OF VALE ST.  
 Direction: WEST  
 Lane: 1

File: SPD-4-04-LN2.prn  
 City: EVERETT  
 County: SPEED LN-2 WB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	2	6	15	5	4	0	0	0	0	0	0	0	0	32
02:00	0	0	0	6	5	9	2	0	0	0	0	0	0	0	0	22
03:00	0	0	0	2	4	6	3	2	0	0	0	0	0	0	0	17
04:00	0	2	0	2	6	6	8	4	1	0	1	0	0	0	0	30
05:00	0	2	8	11	24	39	21	6	4	3	0	0	0	0	0	118
06:00	24	34	53	93	102	46	22	10	0	0	1	0	0	0	0	385
07:00	136	72	94	126	76	29	3	2	0	1	0	0	0	0	0	539
08:00	43	48	100	122	92	32	16	4	1	0	0	0	0	0	0	458
09:00	46	62	87	98	72	43	18	3	0	0	0	0	0	0	0	429
10:00	22	41	84	132	100	50	12	4	0	1	0	0	1	0	0	447
11:00	8	10	17	22	24	6	2	0	0	0	0	0	0	0	0	89
DAY TOTAL	279	271	445	620	520	271	111	35	6	5	2	0	1	0	0	2566
PERCENTS	10.9%	10.6%	17.4%	24.2%	20.3%	10.6%	4.4%	1.3%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 21.0 mph

85th Percentile Speed  
 39.9 mph

Median Speed  
 31.3 mph

Average Speed  
 30.3 mph

10 MPH Pace Speed  
 29 mph to 39 mph  
 1140 vehicles in pace  
 Representing 44.4% of the total vehicles

Vehicles > 65 MPH  
 3  
 0.1%

MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/3/2018

STA. 9 EB  
 LN. 1

Site Reference: 180450000788  
 Site ID: 110000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN1.prn  
 City: CHELSEA  
 County: SPEED LN-1 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
11:00	6	7	15	40	44	8	2	1	0	2	3	2	0	0	0	130
12:00	11	7	60	136	82	35	4	4	0	6	9	4	0	0	0	358
13:00	13	7	45	129	97	31	12	9	4	0	2	12	3	4	4	372
14:00	16	3	65	127	104	27	5	3	2	0	6	3	5	3	0	369
15:00	39	3	66	158	99	26	4	1	1	6	2	4	2	4	2	417
16:00	6	2	70	161	105	43	7	6	4	2	0	8	2	0	0	416
17:00	21	4	60	226	122	27	5	5	7	2	0	7	1	0	2	489
18:00	23	10	83	194	124	27	8	3	3	5	9	5	2	2	4	502
19:00	18	2	38	145	110	28	5	4	7	0	6	7	4	1	1	376
20:00	9	1	36	105	106	35	12	2	4	8	9	8	0	2	1	338
21:00	5	3	20	86	93	29	9	4	5	3	4	4	2	2	0	269
22:00	9	3	28	44	81	23	7	5	2	2	5	3	4	1	0	217
23:00	7	0	9	58	46	28	15	3	7	2	6	0	2	3	0	186
24:00	9	1	2	37	46	18	9	1	7	0	0	4	0	0	2	136
DAY TOTAL	192	53	597	1646	1259	385	104	51	53	38	61	71	27	22	16	4575
PERCENTS	4.2%	1.2%	13.1%	36.0%	27.6%	8.5%	2.3%	1.2%	1.1%	0.8%	1.3%	1.5%	0.5%	0.4%	0.3%	100%

Statistical Information...

15th Percentile Speed  
 27.7 mph

85th Percentile Speed  
 40.9 mph

Median Speed  
 33.4 mph

Average Speed  
 34.8 mph

10 MPH Pace Speed  
 29 mph to 39 mph  
 2905 vehicles in pace  
 Representing 63.4% of the total vehicles

Vehicles > 65 MPH  
 197  
 4.3%

MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/4/2018

Site Reference: 180450000788  
 Site ID: 110000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN1.prn  
 City: CHELSEA  
 County: SPEED LN-1 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	4	0	0	14	21	18	3	4	2	3	0	2	2	0	0	73
02:00	1	0	4	10	4	13	1	0	0	4	4	0	1	0	1	43
03:00	2	0	0	3	11	3	4	3	0	2	5	4	0	0	0	37
04:00	1	0	1	12	6	7	0	3	0	0	0	2	0	2	2	36
05:00	0	0	1	11	19	9	4	0	2	0	0	6	0	2	2	56
06:00	3	0	14	35	38	14	13	1	0	0	0	0	0	0	0	118
07:00	3	6	18	71	90	34	6	3	1	0	0	1	2	0	3	238
08:00	12	6	42	94	88	38	8	0	1	0	1	2	0	0	0	292
09:00	4	1	22	78	75	46	14	7	2	4	0	0	1	2	2	258
10:00	4	11	34	95	71	22	4	3	0	3	2	0	0	2	2	253
11:00	15	4	41	127	84	24	6	2	2	5	2	0	2	0	3	317
12:00	10	7	38	111	86	25	8	4	2	1	2	4	0	2	0	300
13:00	9	13	41	138	114	29	13	2	0	2	2	4	0	0	0	367
14:00	7	13	67	124	77	35	14	2	1	0	2	5	1	0	2	350
15:00	3	7	86	193	129	16	10	1	2	1	4	2	0	0	0	454
16:00	29	29	114	191	109	20	5	3	7	0	0	3	0	1	1	512
17:00	8	8	82	233	136	32	5	4	1	2	0	2	2	0	2	517
18:00	13	5	104	199	127	28	3	2	6	2	1	4	2	0	2	498
19:00	7	2	39	152	121	34	7	4	0	2	4	2	1	0	0	375
20:00	5	2	43	113	127	37	13	2	3	2	0	0	0	0	0	347
21:00	7	0	24	104	84	32	12	1	0	1	0	1	2	2	0	270
22:00	4	0	11	92	72	22	9	2	0	0	4	0	0	1	2	219
23:00	1	0	17	52	55	35	7	3	0	4	0	0	0	1	0	175
24:00	0	4	8	34	66	24	9	0	0	0	0	0	0	0	0	145
DAY TOTAL	152	118	851	2286	1810	597	178	56	32	38	33	44	16	15	24	6250
PERCENTS	2.5%	1.9%	13.7%	36.6%	29.0%	9.6%	2.9%	0.8%	0.5%	0.6%	0.5%	0.7%	0.2%	0.2%	0.3%	100%

Statistical Information...

15th Percentile Speed  
27.9 mph

85th Percentile Speed  
39.8 mph

Median Speed  
33.4 mph

Average Speed  
34.2 mph

10 MPH Pace Speed  
29 mph to 39 mph  
4096 vehicles in pace  
Representing 65.5% of the total vehicles

Vehicles > 65 MPH  
132  
2.1%



MassDOT Highway Division  
 SPEED SUMMARY  
 Wed 12/5/2018

Site Reference: 180450000788  
 Site ID: 110000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN1.prn  
 City: CHELSEA  
 County: SPEED LN-1 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	1	1	21	19	15	5	4	0	0	0	0	0	2	0	68
02:00	1	0	2	9	12	7	5	1	0	2	0	0	0	0	0	39
03:00	0	0	2	5	9	13	2	3	0	0	0	2	2	0	0	38
04:00	0	0	1	3	6	12	2	1	1	0	0	0	0	0	0	26
05:00	1	2	1	7	20	18	1	2	0	0	2	0	0	0	2	56
06:00	0	0	9	47	30	24	9	4	0	0	0	0	0	0	2	125
07:00	4	4	24	88	79	34	10	3	1	0	0	0	2	0	2	251
08:00	1	17	53	119	80	28	7	5	0	0	0	0	0	0	0	310
09:00	7	5	42	107	82	26	3	0	0	0	2	4	2	2	0	282
10:00	5	5	19	68	88	38	13	0	0	2	2	3	0	2	0	245
11:00	6	3	39	90	100	36	9	2	1	0	0	0	2	2	2	292
12:00	2	4	40	129	99	36	15	1	2	1	2	0	0	2	0	333
13:00	9	7	77	123	118	27	12	0	0	2	0	1	0	2	0	378
14:00	9	13	40	134	134	32	3	1	2	2	2	4	0	0	0	376
15:00	15	2	63	168	120	38	8	4	1	2	4	3	2	0	1	431
16:00	11	2	84	205	118	26	5	0	1	0	0	5	0	0	0	457
17:00	15	14	80	181	94	39	8	1	2	2	3	5	3	2	0	449
18:00	9	1	89	208	126	32	4	2	2	0	0	2	0	2	0	477
19:00	7	11	59	154	117	36	12	0	0	0	0	1	2	4	2	405
20:00	9	3	37	125	101	26	14	3	0	0	4	2	2	4	0	330
21:00	0	0	22	88	92	32	7	0	0	2	1	0	0	0	2	246
22:00	1	2	19	94	64	28	16	0	0	1	0	0	2	0	0	227
23:00	11	2	15	51	70	32	13	3	3	0	2	2	1	2	0	207
24:00	2	2	4	40	40	22	10	4	0	0	0	0	0	2	1	127
DAY TOTAL	125	100	822	2264	1818	657	193	44	16	16	24	34	20	28	14	6175
PERCENTS	2.1%	1.7%	13.4%	36.7%	29.5%	10.7%	3.1%	0.7%	0.2%	0.2%	0.3%	0.5%	0.3%	0.4%	0.2%	100%

Statistical Information...

15th Percentile Speed  
28.3 mph

85th Percentile Speed  
39.9 mph

Median Speed  
33.5 mph

Average Speed  
34.3 mph

10 MPH Pace Speed  
29 mph to 39 mph  
4082 vehicles in pace  
Representing 66.1% of the total vehicles

Vehicles > 65 MPH  
120  
1.9%

MassDOT Highway Division  
 SPEED SUMMARY  
 Thu 12/6/2018

Site Reference: 180450000788  
 Site ID: 110000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN1.prn  
 City: CHELSEA  
 County: SPEED LN-1 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	4	0	5	12	18	10	4	2	1	0	0	1	4	0	0	61
02:00	1	0	4	9	11	16	4	2	0	0	0	0	6	1	0	54
03:00	1	0	1	8	8	7	5	6	0	0	1	0	0	4	0	41
04:00	0	0	1	13	8	9	7	2	0	0	0	0	2	4	4	50
05:00	0	0	1	9	16	8	5	0	2	0	0	4	0	4	0	49
06:00	1	1	11	38	43	15	4	4	1	0	2	0	2	0	0	122
07:00	6	7	26	74	82	26	7	2	1	0	1	0	4	0	0	236
08:00	4	2	45	120	92	41	7	3	0	2	0	0	0	1	2	319
09:00	10	1	42	83	87	34	7	5	2	2	0	4	0	2	2	281
10:00	5	5	48	91	83	26	16	7	1	2	0	2	0	0	2	288
11:00	8	10	57	106	108	29	9	0	2	0	4	2	0	0	0	335
12:00	2	9	47	114	87	37	12	3	2	0	4	0	2	0	0	319
13:00	9	9	59	165	85	23	8	2	0	4	0	0	0	2	0	366
14:00	7	6	46	138	114	37	5	4	1	3	4	0	0	2	3	370
15:00	22	6	61	145	115	29	8	4	6	2	2	5	0	0	0	405
16:00	39	25	75	167	92	27	8	1	0	0	1	2	2	0	1	440
17:00	19	5	51	196	112	32	6	3	4	2	0	3	0	2	0	435
18:00	11	4	78	168	136	34	6	3	0	0	5	4	0	0	1	450
19:00	19	3	50	147	105	44	7	3	1	2	2	3	4	0	2	392
20:00	3	0	23	138	95	35	8	1	2	0	2	2	4	6	1	320
21:00	14	1	28	94	113	38	8	1	0	3	4	2	2	0	5	313
22:00	4	5	25	85	86	21	8	2	0	0	1	0	5	0	0	242
23:00	6	1	7	61	80	36	7	4	1	0	2	0	0	1	0	206
24:00	7	1	13	33	62	28	12	4	1	0	0	4	0	3	9	177
DAY TOTAL	202	101	804	2214	1838	642	178	68	28	22	35	38	37	32	32	6271
PERCENTS	3.3%	1.7%	12.9%	35.4%	29.4%	10.2%	2.8%	1.0%	0.4%	0.3%	0.5%	0.6%	0.5%	0.5%	0.5%	100%

Statistical Information...

15th Percentile Speed  
 28.0 mph

85th Percentile Speed  
 40.3 mph

Median Speed  
 33.6 mph

Average Speed  
 34.4 mph

10 MPH Pace Speed  
 29 mph to 39 mph  
 4052 vehicles in pace  
 Representing 64.6% of the total vehicles

Vehicles > 65 MPH  
 174  
 2.8%

MassDOT Highway Division  
 SPEED SUMMARY  
 Fri 12/7/2018

Site Reference: 180450000788  
 Site ID: 110000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN1.prn  
 City: CHELSEA  
 County: SPEED LN-1 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	1	4	16	26	16	6	6	0	0	4	2	2	0	0	83
02:00	0	0	3	7	11	12	6	1	0	0	0	2	0	4	2	48
03:00	4	3	6	6	16	14	7	1	0	0	0	0	0	0	1	58
04:00	2	1	1	5	13	5	6	2	1	3	0	0	2	2	2	45
05:00	0	2	4	10	16	9	2	0	0	0	0	2	2	0	0	47
06:00	2	5	10	32	35	22	3	1	0	0	0	0	0	2	0	112
07:00	0	11	28	91	81	33	5	1	0	4	0	2	4	2	4	266
08:00	12	2	47	124	85	32	9	4	1	0	0	3	1	1	0	321
09:00	4	3	33	106	85	33	9	2	6	0	0	4	0	1	0	286
10:00	4	3	16	88	83	40	8	8	0	2	4	4	2	0	0	262
11:00	6	6	32	97	71	43	18	4	2	2	2	5	0	2	0	290
12:00	8	1	26	120	101	38	6	2	0	2	6	4	2	2	2	320
13:00	9	3	32	109	99	48	9	0	9	0	3	4	0	6	2	333
14:00	13	13	53	135	111	38	9	7	0	4	6	3	0	1	0	393
15:00	13	6	42	157	113	29	7	8	2	1	0	4	2	9	1	394
16:00	30	7	87	167	99	26	6	0	2	3	2	2	2	1	0	434
17:00	14	6	28	136	128	41	11	1	0	1	3	4	0	2	0	375
18:00	5	11	50	136	109	30	7	2	8	0	0	0	0	4	0	362
19:00	13	3	35	115	114	29	8	2	0	0	2	1	3	0	1	326
20:00	9	6	26	129	101	35	13	4	1	8	2	0	1	2	2	339
21:00	9	0	27	118	76	40	8	2	0	2	1	0	2	2	2	289
22:00	5	0	17	91	79	39	12	0	3	0	7	0	0	0	0	253
23:00	3	2	22	64	79	31	10	4	3	0	2	0	2	0	1	223
24:00	1	0	10	37	68	30	14	1	2	3	0	0	1	0	4	171
DAY TOTAL	166	95	639	2096	1799	713	199	63	40	35	44	46	28	43	24	6030
PERCENTS	2.8%	1.6%	10.6%	34.8%	29.9%	11.9%	3.4%	1.1%	0.6%	0.5%	0.7%	0.7%	0.4%	0.7%	0.3%	100%

Statistical Information...

15th Percentile Speed  
29.0 mph

85th Percentile Speed  
41.3 mph

Median Speed  
34.1 mph

Average Speed  
35.1 mph

10 MPH Pace Speed  
29 mph to 39 mph  
3895 vehicles in pace  
Representing 64.5% of the total vehicles

Vehicles > 65 MPH  
185  
3.1%



MassDOT Highway Division  
 SPEED SUMMARY  
 Sat 12/8/2018

Site Reference: 180450000788

File: SPD-9-03-LN1.prn

Site ID: 110000000903

City: CHELSEA

Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE

County: SPEED LN-1 EB

Direction: EAST

Lane: 1

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	1	4	34	41	29	16	3	0	2	0	4	2	2	0	138
02:00	1	0	1	15	29	17	9	1	0	0	4	2	0	0	0	79
03:00	0	0	1	8	12	13	9	1	1	0	0	2	0	0	0	47
04:00	0	0	2	6	20	11	4	1	0	2	1	0	0	0	2	49
05:00	0	1	0	7	9	7	2	2	0	2	0	2	0	0	2	34
06:00	0	0	5	12	20	10	5	0	2	0	2	0	0	0	0	56
07:00	0	2	9	29	43	23	5	3	0	2	0	0	0	0	2	118
08:00	1	0	17	54	57	25	9	2	2	2	2	0	0	0	3	174
09:00	6	0	20	59	69	34	18	2	3	0	6	4	0	0	2	223
10:00	3	0	16	82	107	42	8	2	0	2	5	0	0	2	0	269
11:00	7	3	35	113	134	33	11	9	0	5	0	0	0	2	0	352
12:00	24	9	79	147	90	37	7	0	1	3	2	2	4	0	1	406
13:00	3	1	67	210	160	39	9	2	0	0	2	4	0	0	2	499
14:00	13	7	47	188	136	36	13	6	1	0	4	2	0	1	1	455
15:00	15	7	72	170	133	37	12	2	3	1	2	1	0	2	0	457
16:00	10	2	53	215	115	26	7	3	0	0	0	0	1	1	0	433
17:00	6	2	53	156	116	32	7	3	0	2	2	2	0	2	2	385
18:00	10	5	41	155	128	36	4	2	5	3	2	0	2	4	2	399
19:00	9	6	37	127	96	33	8	2	0	4	0	5	0	0	3	330
20:00	7	0	18	119	102	45	5	7	2	2	1	2	2	2	0	314
21:00	2	4	24	97	85	32	6	0	2	0	4	3	0	2	4	265
22:00	5	1	22	78	74	29	6	5	0	0	2	0	2	2	0	226
23:00	5	0	3	57	79	40	9	3	0	0	2	2	2	1	2	205
24:00	0	1	4	62	76	23	5	1	1	2	0	0	2	0	0	177
DAY TOTAL	127	52	630	2200	1931	689	194	62	23	29	48	37	17	23	28	6090
PERCENTS	2.1%	0.9%	10.4%	36.2%	31.8%	11.4%	3.2%	1.1%	0.3%	0.4%	0.7%	0.6%	0.2%	0.3%	0.4%	100%

Statistical Information...

15th Percentile Speed  
29.2 mph

85th Percentile Speed  
40.7 mph

Median Speed  
34.1 mph

Average Speed  
35.0 mph

10 MPH Pace Speed  
29 mph to 39 mph  
4131 vehicles in pace  
Representing 67.8% of the total vehicles

Vehicles > 65 MPH  
153  
2.5%

MassDOT Highway Division  
 SPEED SUMMARY  
 Sun 12/9/2018

Site Reference: 180450000788  
 Site ID: 110000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN1.prn  
 City: CHELSEA  
 County: SPEED LN-1 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	5	38	48	31	6	0	0	2	4	0	0	0	2	136
02:00	0	0	4	15	27	21	11	2	0	0	4	0	0	0	0	84
03:00	1	1	2	12	26	10	7	2	1	0	4	2	0	0	4	72
04:00	0	0	1	8	14	12	5	0	0	0	0	0	0	0	0	40
05:00	0	1	0	3	13	6	0	0	0	0	0	0	0	0	0	23
06:00	4	2	2	8	9	7	4	0	0	0	0	0	0	0	0	36
07:00	1	0	4	9	18	7	4	6	0	0	0	0	0	2	0	51
08:00	0	2	7	22	32	13	3	4	2	0	0	0	0	0	0	85
09:00	3	0	7	25	45	21	8	1	0	0	0	4	0	1	0	115
10:00	0	0	13	58	71	30	15	3	3	2	2	0	0	2	2	201
11:00	3	0	26	81	90	34	18	5	0	1	0	0	4	2	0	264
12:00	8	1	33	105	116	39	4	0	0	0	2	3	4	4	2	321
13:00	8	0	44	136	118	51	9	1	0	2	3	7	0	1	2	382
14:00	17	3	50	164	123	46	10	1	2	1	0	2	2	0	3	424
15:00	19	3	33	164	114	44	7	3	0	0	1	2	1	2	2	395
16:00	12	1	52	137	104	36	16	2	2	1	0	0	1	3	0	367
17:00	6	3	38	126	129	36	6	1	2	5	4	3	3	2	0	364
18:00	10	3	29	156	97	22	7	8	0	3	4	12	0	0	0	351
19:00	5	0	44	91	93	51	12	2	3	0	2	4	0	0	4	311
20:00	1	0	21	75	85	23	11	2	3	5	4	2	0	0	2	234
21:00	2	0	20	47	68	28	7	0	0	0	6	0	2	4	0	184
22:00	5	1	14	52	57	20	5	9	0	0	6	4	0	0	2	175
23:00	1	0	6	32	47	15	8	2	0	2	4	2	4	0	0	123
24:00	3	0	4	23	46	20	7	4	5	1	1	2	0	1	4	121
DAY TOTAL	109	21	459	1587	1590	623	190	58	23	25	51	49	21	24	29	4859
PERCENTS	2.3%	0.5%	9.5%	32.7%	32.8%	12.9%	4.0%	1.1%	0.4%	0.5%	1.0%	1.0%	0.4%	0.4%	0.5%	100%

Statistical Information...

15th Percentile Speed  
29.5 mph

85th Percentile Speed  
41.9 mph

Median Speed  
34.8 mph

Average Speed  
35.8 mph

10 MPH Pace Speed  
29 mph to 39 mph  
3177 vehicles in pace  
Representing 65.3% of the total vehicles

Vehicles > 65 MPH  
174  
3.6%

MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/10/2018

Site Reference: 180450000788

Site ID: 110000000903

Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE

Direction: EAST

Lane: 1

File: SPD-9-03-LN1.prn

City: CHELSEA

County: SPEED LN-1 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	1	5	13	16	15	2	1	0	0	0	0	0	0	0	53
02:00	0	0	6	6	12	6	4	0	2	0	0	2	0	0	0	38
03:00	0	0	4	6	11	7	1	2	0	0	0	0	0	0	0	31
04:00	0	0	4	10	9	8	4	0	0	0	0	0	0	0	0	35
05:00	0	1	2	12	17	5	6	4	0	0	4	0	0	0	0	51
06:00	3	1	7	24	38	20	11	2	0	0	4	4	0	0	0	110
07:00	2	0	22	80	66	31	10	0	5	4	2	4	3	0	4	233
08:00	13	5	33	111	80	24	10	1	3	0	2	2	0	2	0	286
09:00	7	2	37	106	88	19	7	0	3	2	2	2	0	2	0	277
10:00	13	1	25	107	85	23	11	5	1	2	2	2	1	0	0	278
11:00	13	2	40	108	78	28	7	8	0	4	4	0	4	2	0	298
12:00	12	4	45	104	90	34	4	5	0	0	1	6	0	3	0	308
13:00	16	11	63	139	98	37	7	1	2	0	7	4	0	0	0	385
14:00	12	6	56	136	90	33	11	1	0	4	2	7	0	1	0	359
15:00	19	10	60	177	126	28	7	1	4	4	6	5	3	0	2	452
16:00	24	16	65	176	123	31	7	6	0	2	3	7	3	0	0	463
17:00	26	4	60	138	141	33	8	1	1	0	3	7	2	1	2	427
18:00	17	17	87	177	119	27	1	4	1	5	6	0	0	2	0	463
19:00	10	2	48	147	107	25	3	4	2	0	0	1	0	2	0	351
20:00	13	1	30	116	95	36	8	0	3	2	2	4	0	8	2	320
21:00	11	2	27	84	92	35	12	1	6	2	3	4	3	1	0	283
22:00	6	1	16	68	67	29	3	2	4	0	1	2	0	0	2	201
23:00	6	1	9	48	56	28	8	2	2	0	5	1	6	2	0	174
24:00	6	1	6	45	60	19	14	2	1	0	4	2	2	2	4	168
DAY TOTAL	229	89	757	2138	1764	581	166	53	40	31	59	66	27	28	16	6044
PERCENTS	3.8%	1.5%	12.6%	35.4%	29.2%	9.7%	2.8%	0.9%	0.7%	0.5%	0.9%	1.0%	0.4%	0.4%	0.2%	100%

Statistical Information...

15th Percentile Speed  
27.9 mph

85th Percentile Speed  
40.4 mph

Median Speed  
33.6 mph

Average Speed  
34.5 mph

10 MPH Pace Speed  
29 mph to 39 mph  
3902 vehicles in pace  
Representing 64.5% of the total vehicles

Vehicles > 65 MPH  
196  
3.2%



MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/11/2018

Site Reference: 180450000788

Site ID: 110000000903

Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE

Direction: EAST

Lane: 1

File: SPD-9-03-LN1.prn

City: CHELSEA

County: SPEED LN-1 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	9	18	24	5	6	6	0	0	0	0	0	4	4	76
02:00	0	0	1	10	11	11	5	3	0	0	0	2	0	2	0	45
03:00	0	2	2	3	15	8	4	1	0	2	2	2	0	0	2	43
04:00	0	0	3	7	6	5	1	0	0	2	0	0	0	0	0	24
05:00	0	0	1	12	18	9	7	0	0	0	0	2	0	2	0	51
06:00	2	1	6	25	29	17	9	3	2	0	0	0	1	3	0	98
07:00	4	7	18	71	91	29	12	1	0	1	0	0	0	2	2	238
08:00	2	2	47	122	87	32	11	3	0	0	0	0	0	0	0	306
09:00	5	3	40	84	91	37	13	2	0	4	2	1	2	0	0	284
10:00	9	3	30	90	84	37	16	3	2	6	0	7	2	0	0	289
11:00	12	8	61	110	76	25	6	3	4	2	2	0	2	1	1	313
12:00	4	1	0	15	8	4	0	0	0	0	0	1	0	2	0	35
DAY TOTAL	38	27	218	567	540	219	90	25	8	17	6	15	7	16	9	1802
PERCENTS	2.2%	1.5%	12.1%	31.5%	30.0%	12.2%	5.0%	1.4%	0.5%	1.0%	0.3%	0.8%	0.3%	0.8%	0.4%	100%

Statistical Information...

15th Percentile Speed  
28.7 mph

85th Percentile Speed  
42.2 mph

Median Speed  
34.5 mph

Average Speed  
35.6 mph

10 MPH Pace Speed  
29 mph to 39 mph  
1107 vehicles in pace  
Representing 61.4% of the total vehicles

Vehicles > 65 MPH  
53  
2.9%

MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/3/2018

STA. 9 EB

Site Reference: 180480000468  
 Site ID: 220000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN2.prn  
 City: CHELSEA  
 County: SPEED LN-2 EB

LN.2

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
11:00	19	10	20	34	33	8	7	0	1	0	0	0	0	0	0	132
12:00	0	0	9	68	97	35	4	0	0	0	0	0	0	0	0	213
13:00	0	0	1	101	120	46	4	2	0	0	0	0	0	0	0	274
14:00	0	2	21	120	122	31	5	0	0	0	0	0	0	0	0	301
15:00	2	0	13	100	160	49	12	3	0	0	0	0	0	0	0	339
16:00	1	0	13	132	146	56	7	2	1	0	0	0	0	0	0	358
17:00	0	1	12	101	165	47	13	1	0	0	0	0	0	0	0	340
18:00	1	0	10	94	133	60	12	0	2	0	0	0	0	0	0	312
19:00	0	0	14	111	123	41	6	0	0	0	0	0	0	0	0	295
20:00	0	1	13	116	86	26	8	1	0	0	0	0	0	0	0	251
21:00	0	0	7	77	84	32	5	1	0	0	0	0	0	0	0	206
22:00	0	1	4	55	70	34	6	1	0	0	0	0	0	0	0	171
23:00	1	0	11	37	52	27	9	0	1	0	0	0	0	0	0	138
24:00	0	0	4	24	44	33	2	1	0	0	0	0	0	0	0	108
DAY TOTAL	24	15	152	1170	1435	525	100	12	5	0	0	0	0	0	0	3438
PERCENTS	0.7%	0.5%	4.5%	34.1%	41.7%	15.2%	2.9%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 30.4 mph

85th Percentile Speed  
 40.2 mph

Median Speed  
 35.3 mph

Average Speed  
 35.2 mph

10 MPH Pace Speed  
 29 mph to 39 mph  
 2605 vehicles in pace  
 Representing 75.7% of the total vehicles

Vehicles > 65 MPH  
 0  
 0.0%

MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/4/2018

Site Reference: 180480000468  
 Site ID: 220000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN2.prn  
 City: CHELSEA  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	0	18	21	11	1	0	0	0	0	0	0	0	0	51
02:00	0	0	1	6	12	10	4	0	0	0	0	0	0	0	0	33
03:00	0	1	2	2	1	10	2	2	0	0	0	0	0	0	0	20
04:00	0	0	1	3	3	2	5	0	0	0	0	0	0	0	0	14
05:00	0	0	0	4	9	5	2	2	1	0	0	0	0	0	0	23
06:00	0	0	0	17	37	9	0	0	0	0	0	0	0	0	0	63
07:00	0	0	6	39	107	27	2	0	1	0	0	0	0	0	0	182
08:00	1	1	13	116	126	38	6	0	0	0	0	0	0	0	0	301
09:00	3	1	7	67	100	44	5	0	0	0	0	0	0	0	0	227
10:00	6	2	9	94	90	29	2	0	0	0	0	0	0	0	0	232
11:00	17	1	8	87	114	25	2	0	0	0	0	0	0	0	0	254
12:00	14	4	9	86	101	24	3	0	0	0	0	0	0	0	0	241
13:00	23	1	16	66	107	28	3	0	0	0	0	0	0	0	0	244
14:00	56	0	11	78	79	22	3	0	0	0	0	0	0	0	0	249
15:00	61	0	18	96	90	13	0	0	0	0	0	0	0	0	0	278
16:00	23	6	39	141	120	36	5	3	0	0	0	0	0	0	0	373
17:00	3	0	22	111	139	53	14	1	0	0	0	0	0	0	0	343
18:00	1	4	11	90	168	60	9	0	0	0	0	0	0	0	0	343
19:00	1	1	13	91	102	43	10	1	0	0	0	0	0	0	0	262
20:00	2	0	14	107	131	27	6	1	0	0	0	0	0	0	0	288
21:00	1	2	1	87	111	24	2	0	0	0	0	0	0	0	0	228
22:00	1	0	9	77	75	35	5	0	0	0	0	0	0	0	0	202
23:00	0	0	3	54	71	21	5	3	0	0	0	0	0	0	0	157
24:00	1	0	2	44	56	18	6	1	0	0	0	0	0	0	0	128
DAY TOTAL	214	24	215	1581	1970	614	102	14	2	0	0	0	0	0	0	4736
PERCENTS	4.6%	0.6%	4.6%	33.4%	41.6%	12.9%	2.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
29.8 mph

85th Percentile Speed  
39.2 mph

Median Speed  
34.9 mph

Average Speed  
34.0 mph

10 MPH Pace Speed  
29 mph to 39 mph  
3551 vehicles in pace  
Representing 74.9% of the total vehicles

Vehicles > 65 MPH  
0  
0.0%



MassDOT Highway Division  
 SPEED SUMMARY  
 Wed 12/5/2018

Site Reference: 180480000468

File: SPD-9-03-LN2.prn

Site ID: 220000000903

City: CHELSEA

Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE

County: SPEED LN-2 EB

Direction: EAST

Lane: 1

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	2	17	20	7	4	4	0	0	0	0	0	0	0	54
02:00	0	0	2	7	16	9	1	0	0	1	0	0	0	0	0	36
03:00	0	0	2	4	7	5	1	1	0	0	0	0	0	0	0	20
04:00	0	0	0	5	4	2	4	0	0	0	0	0	0	0	0	15
05:00	0	0	1	3	8	7	5	1	0	0	0	0	0	0	0	25
06:00	0	0	2	14	35	19	3	0	0	0	0	0	0	0	0	73
07:00	0	0	6	54	101	39	7	1	0	0	0	0	0	0	0	208
08:00	0	1	16	102	153	48	2	1	0	0	0	0	0	0	0	323
09:00	1	4	14	90	92	29	3	0	0	0	0	0	0	0	0	233
10:00	2	0	8	75	108	33	7	0	0	0	0	0	0	0	0	233
11:00	0	0	8	74	112	41	7	2	0	0	0	0	0	0	0	244
12:00	2	0	14	75	88	31	9	1	0	0	0	0	0	0	0	220
13:00	2	0	11	104	118	32	8	0	0	0	0	0	0	0	0	275
14:00	7	1	13	112	104	49	8	0	1	0	0	0	0	0	0	295
15:00	3	0	20	147	150	39	5	0	0	0	0	0	0	0	0	364
16:00	1	0	10	103	168	49	9	0	0	0	0	0	0	0	0	340
17:00	1	7	9	129	136	63	4	3	0	0	0	0	0	0	0	352
18:00	2	0	13	96	134	53	15	1	1	0	0	0	0	0	0	315
19:00	1	0	10	100	116	47	13	0	0	0	0	0	0	0	0	287
20:00	0	1	23	81	122	29	8	0	0	0	0	0	0	0	0	264
21:00	0	0	8	76	100	28	3	1	0	0	0	0	0	0	0	216
22:00	0	0	6	52	101	32	5	1	0	0	0	0	0	0	0	197
23:00	1	0	1	44	95	32	9	4	0	0	0	0	0	0	0	186
24:00	0	2	7	34	40	18	8	0	0	0	0	0	0	0	0	109
DAY TOTAL	23	16	206	1598	2128	741	148	21	2	1	0	0	0	0	0	4884
PERCENTS	0.5%	0.4%	4.3%	32.8%	43.5%	15.1%	3.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
30.5 mph

85th Percentile Speed  
40.2 mph

Median Speed  
35.4 mph

Average Speed  
35.4 mph

10 MPH Pace Speed  
29 mph to 39 mph  
3726 vehicles in pace  
Representing 76.2% of the total vehicles

Vehicles > 65 MPH  
0  
0.0%

MassDOT Highway Division  
 SPEED SUMMARY  
 Thu 12/6/2018

Site Reference: 180480000468  
 Site ID: 220000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN2.prn  
 City: CHELSEA  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	1	0	0	12	21	17	4	2	0	0	0	0	0	0	0	57
02:00	0	0	0	7	14	7	2	1	0	0	0	0	0	0	0	31
03:00	0	0	0	3	6	5	4	0	0	0	0	0	0	0	0	18
04:00	0	0	1	5	7	5	4	0	0	0	0	0	0	0	0	22
05:00	0	0	1	5	12	10	3	0	0	0	0	0	0	0	0	31
06:00	0	0	0	13	36	9	7	4	0	0	0	0	0	0	0	69
07:00	0	0	6	52	87	49	5	1	0	0	0	0	0	0	0	200
08:00	0	0	14	96	154	37	6	0	0	0	0	0	0	0	0	307
09:00	0	1	9	78	116	35	6	1	0	0	0	0	0	0	0	246
10:00	1	0	8	69	84	51	12	0	1	0	0	0	0	0	0	226
11:00	3	1	15	102	105	29	5	1	1	0	0	0	0	0	0	262
12:00	5	0	7	98	119	36	4	2	0	0	0	0	0	0	0	271
13:00	3	0	12	109	111	34	6	0	1	0	0	0	0	0	0	276
14:00	4	0	13	106	120	34	4	0	0	0	0	0	0	0	0	281
15:00	3	3	22	105	154	36	10	1	0	0	0	0	0	0	0	334
16:00	21	13	25	120	145	56	6	1	0	0	0	0	0	0	0	387
17:00	2	0	14	82	155	55	11	1	0	0	0	0	0	0	0	320
18:00	2	0	13	120	120	51	11	0	0	0	0	0	0	0	0	317
19:00	1	0	9	70	122	41	13	4	0	0	0	0	0	0	0	260
20:00	1	1	18	107	94	23	5	2	0	0	0	0	0	0	0	251
21:00	0	1	8	95	111	45	4	0	0	0	0	0	0	0	0	264
22:00	3	0	9	72	89	24	2	0	1	0	0	0	0	0	0	200
23:00	6	0	5	55	76	29	6	0	0	0	0	0	0	0	0	177
24:00	13	0	1	23	60	30	4	0	0	0	0	0	0	0	0	131
DAY TOTAL	69	20	210	1604	2118	748	144	21	4	0	0	0	0	0	0	4938
PERCENTS	1.4%	0.5%	4.3%	32.5%	42.9%	15.1%	2.9%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 30.4 mph

85th Percentile Speed  
 40.2 mph

Median Speed  
 35.3 mph

Average Speed  
 35.2 mph

10 MPH Pace Speed  
 29 mph to 39 mph  
 3722 vehicles in pace  
 Representing 75.3% of the total vehicles

Vehicles > 65 MPH  
 0  
 0.0%

MassDOT Highway Division  
 SPEED SUMMARY  
 Fri 12/7/2018

Site Reference: 180480000468  
 Site ID: 220000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN2.prn  
 City: CHELSEA  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	12	1	0	24	35	14	1	0	0	0	0	0	0	0	0	87
02:00	2	1	2	13	11	2	2	0	0	0	0	0	0	0	0	33
03:00	2	0	4	12	9	3	3	0	0	0	0	0	0	0	0	33
04:00	0	0	0	4	11	3	4	0	0	0	0	0	0	0	0	22
05:00	0	0	1	10	7	7	1	0	0	0	0	0	0	0	0	26
06:00	0	0	2	15	32	11	5	2	0	0	0	0	0	0	0	67
07:00	1	1	1	43	86	33	8	0	0	0	0	0	0	0	0	173
08:00	4	0	25	98	143	28	9	0	0	0	0	0	0	0	0	307
09:00	3	0	14	92	120	34	1	0	0	0	0	0	0	0	0	264
10:00	18	0	2	64	93	31	1	0	0	0	0	0	0	0	0	209
11:00	87	0	3	45	72	8	0	0	0	0	0	0	0	0	0	215
12:00	92	1	11	34	33	0	0	0	0	0	0	0	0	0	0	171
13:00	143	3	1	22	37	6	0	0	0	0	0	0	0	0	0	212
14:00	126	6	5	45	52	6	0	0	0	0	0	0	0	0	0	240
15:00	116	0	21	45	65	8	0	0	0	0	0	0	0	0	0	255
16:00	44	0	18	107	132	34	6	0	0	0	0	0	0	0	0	341
17:00	15	0	16	89	144	29	12	0	0	0	0	0	0	0	0	305
18:00	14	0	6	94	103	34	8	0	0	0	0	0	0	0	0	259
19:00	11	1	11	113	96	34	4	0	0	0	0	0	0	0	0	270
20:00	0	0	15	75	102	47	9	1	0	0	0	0	0	0	0	249
21:00	1	0	6	72	131	32	5	0	0	0	0	0	0	0	0	247
22:00	2	0	5	59	99	36	7	3	0	0	0	0	0	0	0	211
23:00	0	0	7	61	99	33	8	0	1	0	0	0	0	0	0	209
24:00	0	0	9	60	65	29	5	1	0	0	0	0	0	0	0	169
DAY TOTAL	693	14	185	1296	1777	502	99	7	1	0	0	0	0	0	0	4574
PERCENTS	15.2%	0.4%	4.1%	28.4%	38.8%	10.9%	2.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 18.8 mph

85th Percentile Speed  
 38.8 mph

Median Speed  
 34.3 mph

Average Speed  
 31.3 mph

10 MPH Pace Speed  
 29 mph to 39 mph  
 3073 vehicles in pace  
 Representing 67.1% of the total vehicles

Vehicles > 65 MPH  
 0  
 0.0%



MassDOT Highway Division  
 SPEED SUMMARY  
 Sat 12/8/2018

Site Reference: 180480000468  
 Site ID: 220000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN2.prn  
 City: CHELSEA  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	1	0	3	37	49	19	6	2	2	0	0	0	0	0	0	119
02:00	0	0	2	22	32	13	2	0	0	0	0	0	0	0	0	71
03:00	0	0	0	16	17	13	6	0	0	0	0	0	0	0	0	52
04:00	1	0	1	8	13	7	2	0	0	0	0	0	0	0	0	32
05:00	0	0	1	6	5	4	2	1	0	0	0	0	0	0	0	19
06:00	0	0	0	6	10	10	3	0	0	0	0	0	0	0	0	29
07:00	0	0	1	23	39	20	3	0	0	0	0	0	0	0	0	86
08:00	0	0	11	29	49	34	7	0	0	0	0	0	0	0	0	130
09:00	0	0	0	44	76	25	7	5	0	0	0	0	0	0	0	157
10:00	0	0	2	35	95	56	11	3	0	0	0	0	0	0	0	202
11:00	0	0	6	75	112	33	11	2	0	0	0	0	0	0	0	239
12:00	1	0	15	101	135	46	6	2	0	0	0	0	0	0	0	306
13:00	0	0	7	81	141	69	20	2	0	0	0	0	0	0	0	320
14:00	2	0	5	77	122	71	9	2	0	0	0	0	0	0	0	288
15:00	0	0	24	90	127	47	12	6	1	0	0	0	0	0	0	307
16:00	1	0	23	96	116	49	10	1	0	0	0	0	0	0	0	296
17:00	0	2	11	86	132	43	21	1	0	0	0	0	0	0	0	296
18:00	0	0	17	84	119	44	7	0	0	0	0	0	0	0	0	271
19:00	0	0	18	118	106	47	5	2	0	0	0	0	0	0	0	296
20:00	0	1	15	82	105	30	7	1	0	0	0	0	0	0	0	241
21:00	0	4	12	57	100	24	3	0	0	0	0	0	0	0	0	200
22:00	0	0	4	69	111	29	5	2	0	0	0	0	0	0	0	220
23:00	0	1	1	46	79	31	6	0	0	0	0	0	0	0	0	164
24:00	0	0	1	50	66	35	6	2	0	0	0	0	0	0	0	160
DAY TOTAL	6	8	180	1338	1956	799	177	34	3	0	0	0	0	0	0	4501
PERCENTS	0.2%	0.2%	4.0%	29.8%	43.5%	17.7%	3.9%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
30.8 mph

85th Percentile Speed  
41.1 mph

Median Speed  
35.8 mph

Average Speed  
36.0 mph

10 MPH Pace Speed  
29 mph to 39 mph  
3294 vehicles in pace  
Representing 73.1% of the total vehicles

Vehicles > 65 MPH  
0  
0.0%

MassDOT Highway Division  
 SPEED SUMMARY  
 Sun 12/9/2018

Site Reference: 180480000468  
 Site ID: 220000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN2.prn  
 City: CHELSEA  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	1	27	53	25	9	2	0	1	0	0	0	0	0	118
02:00	0	0	2	8	26	8	6	0	0	0	0	0	0	0	0	50
03:00	0	0	1	8	27	14	2	3	1	0	0	0	0	0	0	56
04:00	0	0	1	6	10	3	2	1	0	0	0	0	0	0	0	23
05:00	0	0	1	2	2	4	2	1	0	0	0	0	0	0	0	12
06:00	0	0	0	2	8	6	2	0	0	0	0	0	0	0	0	18
07:00	0	0	0	5	8	7	1	1	1	1	0	0	0	0	0	24
08:00	0	0	0	9	28	17	5	2	1	0	0	0	0	0	0	62
09:00	0	0	0	17	29	25	6	1	1	0	0	0	0	0	0	79
10:00	0	0	1	33	61	33	8	1	0	0	0	0	0	0	0	137
11:00	0	0	5	46	91	28	12	4	0	0	1	0	0	0	0	187
12:00	1	0	9	41	102	52	6	6	1	0	0	0	0	0	0	218
13:00	0	0	9	103	128	43	9	1	0	0	0	0	0	0	0	293
14:00	1	0	20	98	116	42	13	2	0	0	0	0	0	0	0	292
15:00	0	0	12	96	111	53	9	2	0	0	0	0	0	0	0	283
16:00	0	0	12	97	134	43	4	2	0	0	0	0	0	0	0	292
17:00	0	1	16	78	125	41	1	2	1	0	0	0	0	0	0	265
18:00	0	1	13	117	102	26	11	3	0	0	0	0	0	0	0	273
19:00	1	0	7	82	111	43	8	1	1	0	0	0	0	0	0	254
20:00	0	0	3	57	74	33	4	1	0	0	0	0	0	0	0	172
21:00	0	0	5	37	89	35	12	1	0	0	0	0	0	0	0	179
22:00	0	0	5	38	79	31	3	1	0	0	0	0	0	0	0	157
23:00	0	0	3	29	65	13	5	2	0	0	0	0	0	0	0	117
24:00	0	0	0	21	46	24	4	3	2	0	0	0	0	0	0	100
DAY TOTAL	3	2	126	1057	1625	649	144	43	9	2	1	0	0	0	0	3661
PERCENTS	0.1%	0.1%	3.5%	28.9%	44.4%	17.8%	3.9%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 31.0 mph

85th Percentile Speed  
 41.3 mph

Median Speed  
 36.0 mph

Average Speed  
 36.2 mph

10 MPH Pace Speed  
 29 mph to 39 mph  
 2682 vehicles in pace  
 Representing 73.2% of the total vehicles

Vehicles > 65 MPH  
 1  
 0.0%

MassDOT Highway Division  
 SPEED SUMMARY  
 Mon 12/10/2018

Site Reference: 180480000468  
 Site ID: 220000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN2.prn  
 City: CHELSEA  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	1	17	20	9	4	0	1	0	0	0	0	0	0	52
02:00	0	1	0	1	6	10	3	1	0	0	0	0	0	0	0	22
03:00	0	0	1	2	6	1	3	0	0	0	0	0	0	0	0	13
04:00	0	0	1	1	3	4	2	0	0	0	0	0	0	0	0	11
05:00	0	0	1	2	6	11	1	2	0	0	0	0	0	0	0	23
06:00	0	0	0	4	32	19	7	3	0	0	0	0	0	0	0	65
07:00	0	0	3	36	93	40	9	0	0	0	0	0	0	0	0	181
08:00	0	0	17	113	104	29	6	1	0	0	0	0	0	0	0	270
09:00	0	0	11	89	108	30	6	1	0	0	0	0	0	0	0	245
10:00	2	0	1	40	90	39	7	0	1	0	0	0	0	0	0	180
11:00	1	0	10	77	89	40	15	4	0	0	0	0	0	0	0	236
12:00	0	0	8	100	98	20	9	1	0	0	0	0	0	0	0	236
13:00	0	1	9	87	134	51	4	6	0	0	0	0	0	0	0	292
14:00	2	0	10	139	104	34	7	1	0	0	0	0	0	0	0	297
15:00	0	3	24	107	136	59	12	3	0	0	0	0	0	0	0	344
16:00	2	0	10	115	137	67	16	2	1	0	0	0	0	0	0	350
17:00	1	1	24	102	132	55	10	2	0	0	0	0	0	0	0	327
18:00	0	2	16	125	126	49	10	0	0	1	0	0	0	0	0	329
19:00	1	0	15	108	117	29	8	1	0	0	0	0	0	0	0	279
20:00	0	0	16	104	88	27	3	1	0	0	0	0	0	0	0	239
21:00	0	0	4	69	98	39	5	0	0	0	0	0	0	0	0	215
22:00	1	0	14	33	111	23	9	1	0	0	0	0	0	0	0	192
23:00	2	0	4	42	63	24	3	0	2	0	0	0	0	0	0	140
24:00	1	1	5	36	49	24	5	0	0	0	0	0	0	0	0	121
DAY TOTAL	13	9	205	1549	1950	733	164	30	5	1	0	0	0	0	0	4659
PERCENTS	0.3%	0.2%	4.5%	33.3%	41.8%	15.7%	3.5%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
30.5 mph

85th Percentile Speed  
40.6 mph

Median Speed  
35.4 mph

Average Speed  
35.6 mph

10 MPH Pace Speed  
29 mph to 39 mph  
3499 vehicles in pace  
Representing 75.1% of the total vehicles

Vehicles > 65 MPH  
0  
0.0%



MassDOT Highway Division  
 SPEED SUMMARY  
 Tue 12/11/2018

Site Reference: 180480000468  
 Site ID: 220000000903  
 Location: RTE.16, WEST OF WEBSTER/GARFIELD AVE  
 Direction: EAST  
 Lane: 1

File: SPD-9-03-LN2.prn  
 City: CHELSEA  
 County: SPEED LN-2 EB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Total
01:00	0	0	6	21	19	11	4	2	0	0	0	0	0	0	0	63
02:00	0	0	2	5	12	10	3	0	0	0	0	0	0	0	0	32
03:00	0	0	1	1	6	7	3	1	0	0	0	0	0	0	0	19
04:00	0	0	0	4	5	9	3	0	0	0	0	0	0	0	0	21
05:00	0	0	0	4	9	4	2	1	0	0	0	0	0	0	0	20
06:00	0	0	0	13	29	15	7	3	2	0	0	0	0	0	0	69
07:00	3	0	12	45	83	34	10	1	0	0	0	0	0	0	0	188
08:00	0	0	13	98	155	48	9	0	0	0	0	0	0	0	0	323
09:00	1	1	12	79	112	47	7	0	0	0	0	0	0	0	0	259
10:00	0	0	6	51	90	38	8	0	0	0	0	0	0	0	0	193
11:00	5	16	20	70	92	23	6	2	2	0	0	0	0	0	0	236
12:00	2	0	1	7	7	0	0	0	0	0	0	0	0	0	0	17
DAY TOTAL	11	17	73	398	619	246	62	10	4	0	0	0	0	0	0	1440
PERCENTS	0.8%	1.2%	5.1%	27.7%	43.0%	17.1%	4.3%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed  
 30.5 mph

85th Percentile Speed  
 41.2 mph

Median Speed  
 35.8 mph

Average Speed  
 35.7 mph

10 MPH Pace Speed  
 29 mph to 39 mph  
 1017 vehicles in pace  
 Representing 70.6% of the total vehicles

Vehicles > 65 MPH  
 0  
 0.0%

STA. 9 WB

LN. 1

NO SPEED DATA

STA. 9 WB  
LN. 2  
NO SPEED DATA



# **Appendix C:**

# **Traffic Signal Data**

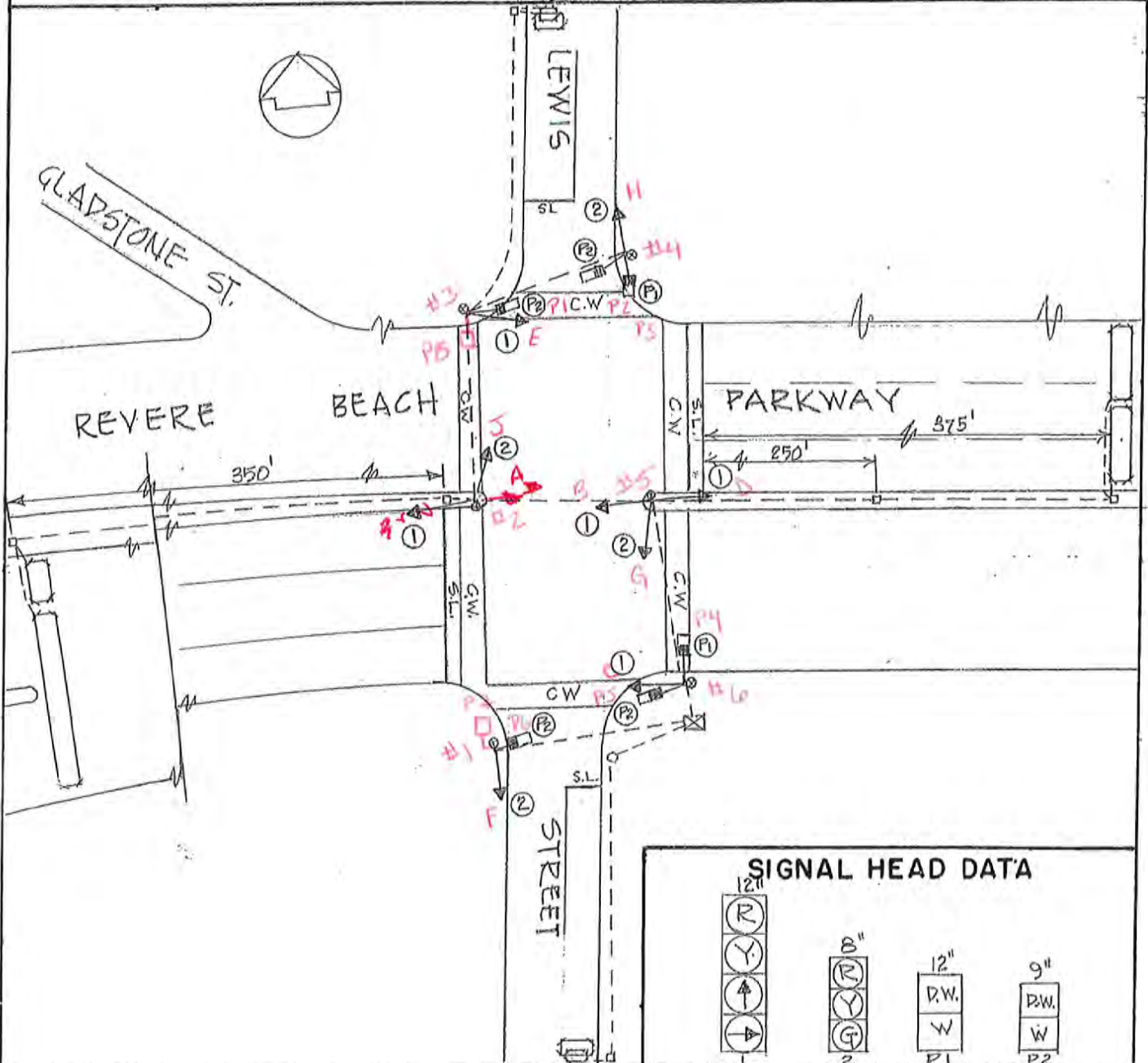
Existing Signal Timing Plans

# Existing Signal Timing Plans

# TRAFFIC SIGNAL LAYOUT

## REVERE BEACH PARKWAY AND LEWIS STREET, EVERETT

SCALE: 1" = 40' Traffic Control Device No. 212 DATE: MAY 27, 1976



**SIGNAL HEAD DATA**

12" R Y A P	8" R Y G	12" D.W. W	9" D.W. W
	2	P1	P2

**LEGEND**

VEHICLE SIGNAL	→	WOODEN POLE	○
PEDESTRIAN SIGNAL	—■—	SIGNAL POST	•
CONTROL CABINET	⊠	MAST ARM	┆
LOOP DETECTOR	○	PULL BOX	□
MAGNETIC DETECTOR	⊠	CONDUIT	---
PED. PUSH BUTTON	⊙	OVERHEAD CABLE	— · — ·
TRAFFIC SIGNAL ASSESSMENT SECTION	⊙	ELECTRIC MANHOLE	⊙ E.M.H.

**NOTES**





# Traffic Signal Inventory

## 2. Controller Data

Eagle                     
 Epac 300 M41                     
 115402/OSS #090906  
**Manufacturer**   
 **Model No.**   
 **Serial No.**

TYPE	CONDITION	CONTROLLER PHASE CAPABILITY
<input type="checkbox"/> Electromechanical <input type="checkbox"/> Non-NEMA <input type="checkbox"/> NEMA-Modular <input checked="" type="checkbox"/> NEMA-Keyboard	<input type="checkbox"/> Good <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> 2 Phase <input type="checkbox"/> 4 Phase <input checked="" type="checkbox"/> 8 Phase

CONTROLLER TYPE	SETTING TYPE
<input type="checkbox"/> Pretimed <input type="checkbox"/> Actuated <input checked="" type="checkbox"/> Semi-Actuated	<input type="checkbox"/> Pin <input type="checkbox"/> Thumbwheel <input type="checkbox"/> Dial <input checked="" type="checkbox"/> Keyboard

BACKPANEL SIZE	LOAD SWITCHES INSTALLED/TYPE	FLASH TRANSFER RELAYS INSTALLED
12P	3 – SSS-87-I/O	2 – Struthers-Dunn

SOFTWARE LEVEL SIZE	CONFLICT MONITOR MODEL/SIZE
3.33e May 2006	EDI MMU – 16E

FLASHER	INTERCONNECT CABLE (If Yes, List Size)	COORDINATED (If Yes, complete section 9)
PDC 204	No	Yes

DETECTOR/AMPLIFIERS	QUANTITY/TYPE
1 – EDI LMD 622t (2-channel)	

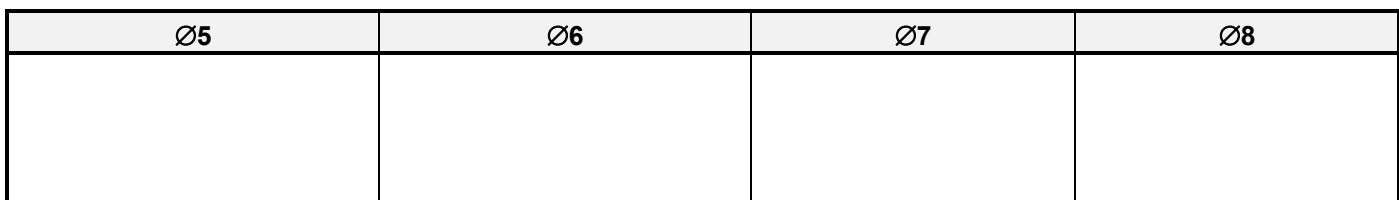
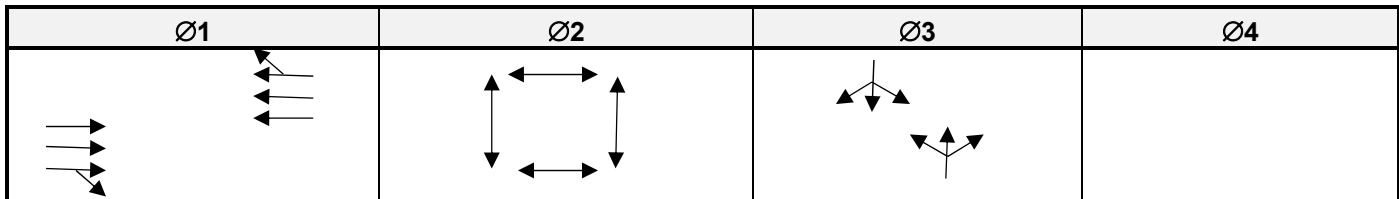


# Traffic Signal Inventory

## 7. Signal Timing Sheet

Ø1 Route 16 EB/WB	Ø2 Pedestrian	Ø3 Lewis Street NB/SB
Ø4	Ø5	Ø6
Ø7	Ø8	OLA
OLB	OLC	OLD

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Minimum Green (initial)	20		12					
Extension (passage)	5		5					
Vehicle Interval								
Yellow	4	3	4					
Red Clear	2	1	1					
Maximum Green I	50		20					
Maximum Green II	50		20					
Pedestrian Walk		7						
Pedestrian Clear		28						
Seconds Per Act								
Time to Reduce								
Before Reduction								
Minimum Gap								
Pedestrian Gap								
Walk (flash/steady)								
Recall	MAX		Off					
Memory	Lock		Lock					
Delay								
FDW thru Vehicle Clearance		1						





# Traffic Signal Inventory

## 8. *Time of Day Plans*

Daylight Savings / Equate Days				
DST Begin:	Month	3	Week	2
DST End:	Month	11	Week	1

Equate Days	
1	= Mon-Fri
	=

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events
1	0:00	Free			
	7:00	1/1/1			
	10:00	Free			
	15:00	2/1/1			
	19:00	Free			





# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	1	FREE	AUTO	MANUAL	---
Mode (Normal)	0	PERM	YIELD	PM YLD	PM OMIT
Maximum	0	M INH	MAX 1	MAX 2	---
Correction	2	DWELL	MX DW	SH WAY	SW+
Offset	0	BEGIN	END	---	---
Force	0	PLAN	CYCLE	---	---

CYCLE LENGTH	1	2	3	4
Split 1	110	150		
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1	55	80				
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

Cycle 1/Split 1	1	2	3	4	5	6	7	8	9
Time	52	37	21						
Mode	1								

Cycle 2/Split 1	1	2	3	4	5	6	7	8	9
Time	80	37	33						
Mode	1								

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

1 CD # 215

# REVERE BEACH PKWY AT SECOND ST EVERETT

EYE

PROP. POWER SOURCE

PROP. T.S. CONTROLLER, CABINET & FOUNDATION  
TRAFFIC SIGNAL CONTROL CABINET  
TO BE REMOVED & STACKED

R.S.S. FOUNDATION - CONSTRUCT  
18" X 18" E.H.H.  
CARNEY MOTORS  
PROP. R10-11

REN. & RESET

PARKWAY

S.W.L.L.

BEACH

PROP. OPENING IN  
MEDIAN

MET SEWER

S.W.L.L.

18" DRAIN

MET SEWER

PROP. H'CAP RAMP

PROP. R10-11

MARKET  
FORGE

R.S.S. R1-1  
PROP. R1-1

EXXON GAS STA.

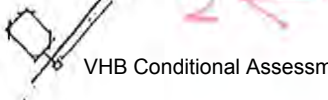
ANCHOR. GAS S

PROP. R10-11

STREET

18" WATER  
6" GAS  
10" SEWER

EXXON ST





# Traffic Signal Inventory

## 2. Controller Data

Eagle
Epac 300 M51
134722/OSS #130807

**Manufacturer**
**Model No.**
**Serial No.**

TYPE	CONDITION	CONTROLLER PHASE CAPABILITY
<input type="checkbox"/> Electromechanical <input type="checkbox"/> Non-NEMA <input type="checkbox"/> NEMA-Modular <input checked="" type="checkbox"/> NEMA-Keyboard	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> 2 Phase <input type="checkbox"/> 4 Phase <input checked="" type="checkbox"/> 8 Phase

CONTROLLER TYPE	SETTING TYPE
<input type="checkbox"/> Pretimed <input checked="" type="checkbox"/> Actuated <input type="checkbox"/> Semi-Actuated	<input type="checkbox"/> Pin <input type="checkbox"/> Thumbwheel <input type="checkbox"/> Dial <input checked="" type="checkbox"/> Keyboard

BACKPANEL SIZE	LOAD SWITCHES INSTALLED/TYPE	FLASH TRANSFER RELAYS INSTALLED
12P	1 – TSC Cube 200 2 – SSS-87-I/O	2 – Struthers Dunn

SOFTWARE LEVEL SIZE	CONFLICT MONITOR MODEL/SIZE
3.34g Feb 2010	EDI MMU-16E

FLASHER	INTERCONNECT CABLE (If Yes, List Size)	COORDINATED (If Yes, complete section 9)
PDC 204	No	Yes

DETECTOR/AMPLIFIERS	QUANTITY/TYPE
2 – EDI LMD 622t (2-channel)	



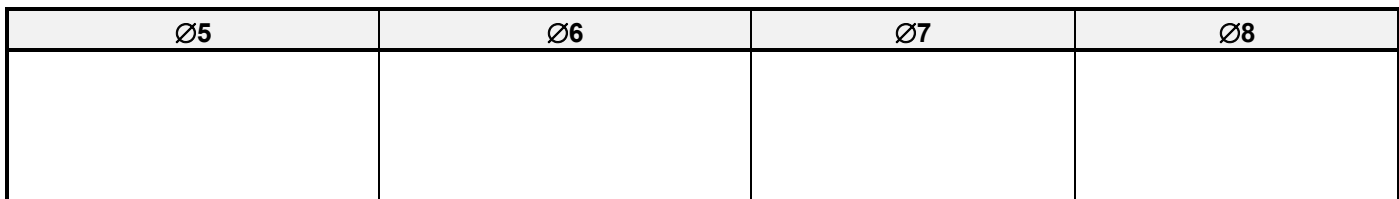
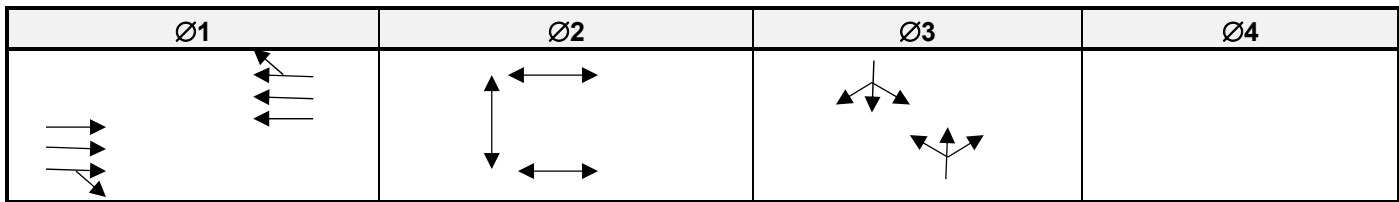


# Traffic Signal Inventory

## 7. Signal Timing Sheet

Ø1 Route 16 EB/WB	Ø2 Pedestrian	Ø3 Second Street NB/SB
Ø4	Ø5	Ø6
Ø7	Ø8	OLA
OLB	OLC	OLD

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Minimum Green (initial)	15		8					
Extension (passage) Vehicle Interval	1.2		4					
Yellow	4	3	4					
Red Clear	1	1	1					
Maximum Green I	60		40					
Maximum Green II	60		40					
Pedestrian Walk		7						
Pedestrian Clear		29						
Seconds Per Act								
Time to Reduce Before Reduction								
Minimum Gap Pedestrian Gap								
Walk (flash/steady)								
Recall	MAX		Off					
Memory	NL		NL					
Delay								
FDW thru Vehicle Clearance		1						





# Traffic Signal Inventory

## 8. Time of Day Plans

Daylight Savings / Equate Days				
DST Begin:	Month	<u>  3  </u>	Week	<u>  2  </u>
DST End:	Month	<u> 11 </u>	Week	<u>  1  </u>

Equate Days	
<u>  1  </u> =	<u> Mon-Fri </u>
_____ =	_____

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events
1	0:00	Free			
	7:00	1/1/1			
	10:00	Free			
	15:00	2/1/1			
	19:00	Free			



# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	1	FREE	AUTO	MANUAL	---
Mode (Normal)	0	PERM	YIELD	PM YLD	PM OMIT
Maximum	0	M INH	MAX 1	MAX 2	---
Correction	2	DWELL	MX DW	SH WAY	SW+
Offset	0	BEGIN	END	---	---
Force	0	PLAN	CYCLE	---	---

CYCLE LENGTH	1	2	3	4
Split 1	110	150		
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1	47	68				
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

Cycle 1/Split 1	1	2	3	4	5	6	7	8	9
Time	44	38	28						
Mode	1								

Cycle 2/Split 1	1	2	3	4	5	6	7	8	9
Time	64	38	48						
Mode	1								

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									



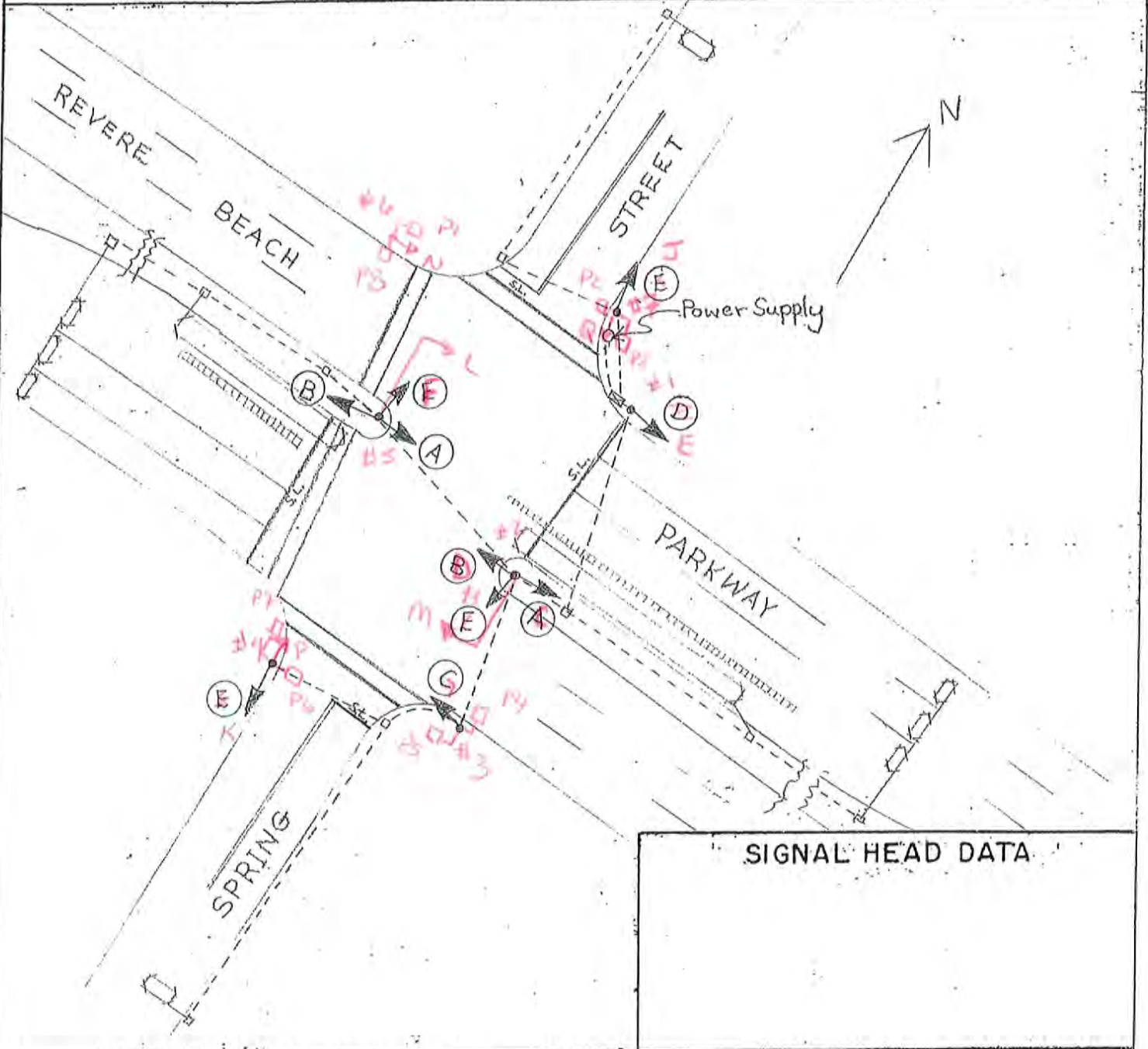
# TRAFFIC SIGNAL LAYOUT

REVERE BEACH PARKWAY AND SPRING STREET, EVERETT

SCALE: 1" = 40'

Traffic Control Device No. 217

DATE: \_\_\_\_\_



## SIGNAL HEAD DATA

## LEGEND

- |                   |   |                  |          |
|-------------------|---|------------------|----------|
| VEHICLE SIGNAL    | → | WOODEN POLE      | ⊙        |
| PEDESTRIAN SIGNAL | ⊠ | SIGNAL POST      | •        |
| CONTROL CABINET   | ⊞ | MAST ARM         | —•       |
| LOOP DETECTOR     | ⊕ | PULL BOX         | □        |
| MAGNETIC DETECTOR | ⊞ | CONDUIT          | ---      |
| PED. PUSH BUTTON  | ⊙ | OVERHEAD CABLE   | —•—•     |
| TRAFFIC SIGN      | ⊙ | ELECTRIC MANHOLE | ⊙ E.M.H. |

## NOTES



# Traffic Signal Inventory

## 2. Controller Data

Eagle
Epac 300 M41
111894 (OSS#010802)

Manufacturer
Model No.
Serial No.

TYPE	CONDITION	CONTROLLER PHASE CAPABILITY
<input type="checkbox"/> Electromechanical <input type="checkbox"/> Non-NEMA <input type="checkbox"/> NEMA-Modular <input checked="" type="checkbox"/> NEMA-Keyboard	<input type="checkbox"/> Good <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> 2 Phase <input type="checkbox"/> 4 Phase <input checked="" type="checkbox"/> 8 Phase

CONTROLLER TYPE	SETTING TYPE
<input type="checkbox"/> Pretimed <input checked="" type="checkbox"/> Actuated <input type="checkbox"/> Semi-Actuated	<input type="checkbox"/> Pin <input type="checkbox"/> Thumbwheel <input type="checkbox"/> Dial <input checked="" type="checkbox"/> Keyboard

BACKPANEL SIZE	LOAD SWITCHES INSTALLED/TYPE	FLASH TRANSFER RELAYS INSTALLED
12P	5 – PDC 200 1 – SSS-87-I/O	4

SOFTWARE LEVEL SIZE	CONFLICT MONITOR MODEL/SIZE
3.34g Feb 2010	EDI – MMU – 16E

FLASHER	INTERCONNECT CABLE (If Yes, List Size)	COORDINATED (If Yes, complete section 9)
1 – PDC 204	No	Yes

DETECTOR/AMPLIFIERS	QUANTITY/TYPE
3 - EDI LM 622t	

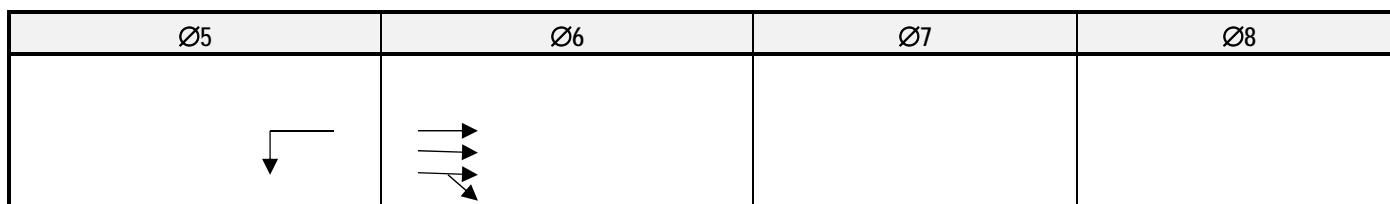
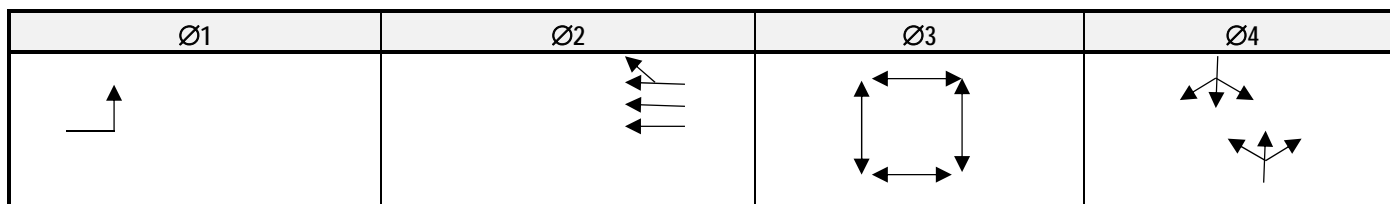


# Traffic Signal Inventory

## 7. Signal Timing Sheet

Ø1 Route 16 EB Left	Ø2 Route 16 WB	Ø3 Pedestrian
Ø4 Spring Street NB/SB	Ø5 Route 16 WB Left	Ø6 Route 16 EB
Ø7	Ø8	OLA
OLB	OLC	OLD

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Minimum Green (initial)	8	12		8	8	12		
Extension (passage) Vehicle Interval	1	7		7	1	7		
Yellow	4	4	4	4	4	4		
Red Clear	1	1	1	2	1	1		
Maximum Green I	15	55		18	10	55		
Maximum Green II	15	40		25	15	40		
Pedestrian Walk			7					
Pedestrian Clear			29					
Seconds Per Act								
Time to Reduce								
Before Reduction								
Minimum Gap								
Pedestrian Gap								
Walk (flash/steady)								
Recall	Off	Soft		Off	Off	Soft		
Memory	NL	Lock		Lock	NL	Lock		
Delay								
FDW thru Vehicle Clearance			1					







# Traffic Signal Inventory

## 8. Time of Day Plans

Daylight Savings / Equate Days				
DST Begin:	Month	<u>  3  </u>	Week	<u>  2  </u>
DST End:	Month	<u> 11 </u>	Week	<u>  1  </u>

Equate Days	
<u>  1  </u> =	<u> Mon-Fri </u>

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events
1	0:00	Free			
	7:00	1/1/1			
	10:00	Free			
	15:00	2/1/1			
	19:00	Free			



# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	1	FREE	AUTO	MANUAL	---
Mode (Normal)	0	PERM	YIELD	PM YLD	PM OMIT
Maximum	0	M INH	MAX 1	MAX 2	---
Correction	2	DWELL	MX DW	SH WAY	SW+
Offset	0	BEGIN	END	---	---
Force	0	PLAN	CYCLE	---	---

CYCLE LENGTH	1	2	3	4
Split 1	110	150		
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1	44	71				
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

Cycle 1/Split 1	1	2	3	4	5	6	7	8	9
Time	15	39	38	18	14	40			
Mode		1				1			

Cycle 2/Split 1	1	2	3	4	5	6	7	8	9
Time	20	68	38	24	15	73			
Mode		1				1			

Cycle __/Split__	1	2	3	4	5	6	7	8	9
Time									
Mode									

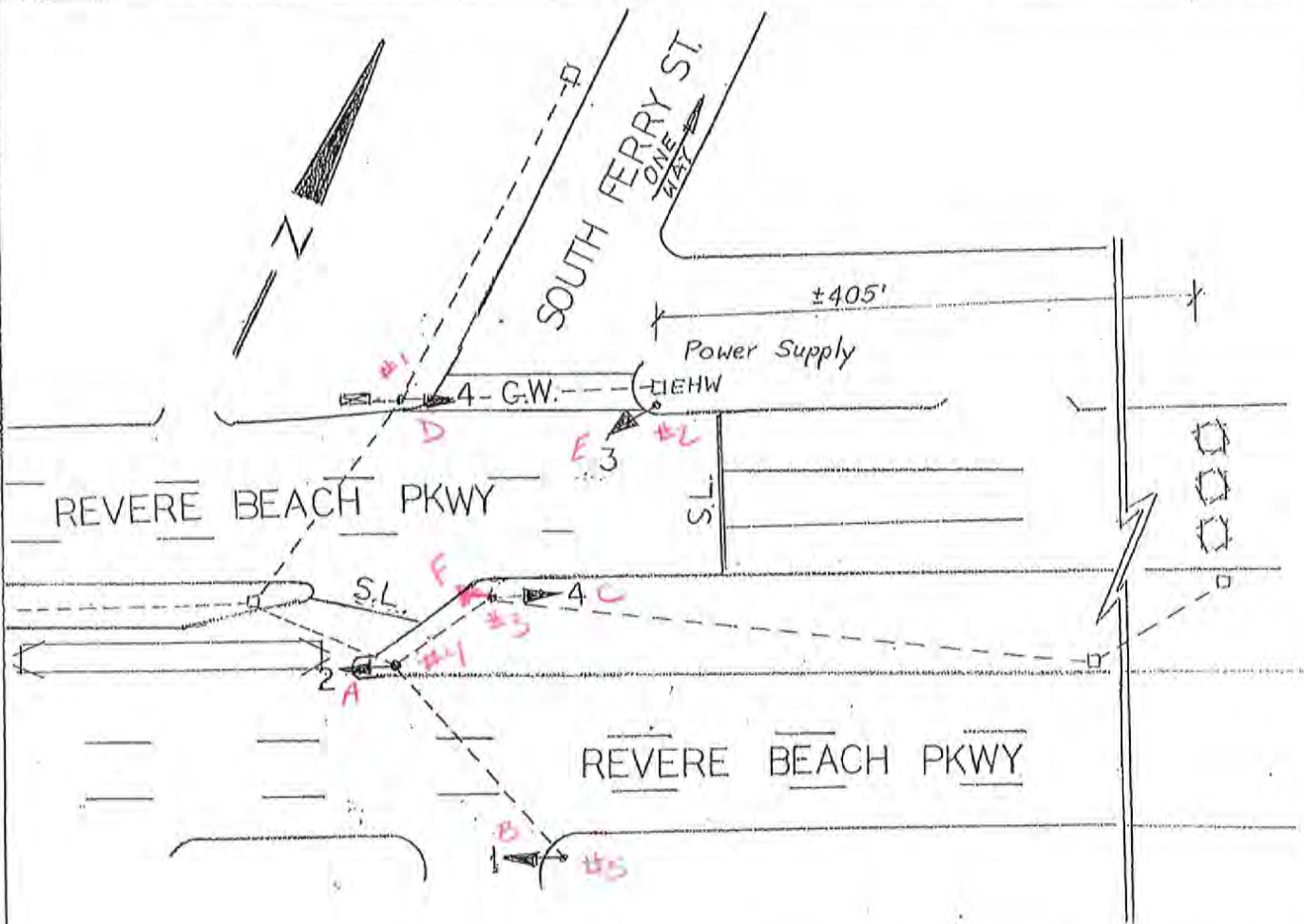
Cycle __/Split__	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle __/Split__	1	2	3	4	5	6	7	8	9
Time									
Mode									

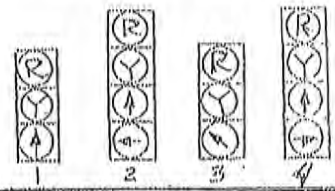
TRAFFIC SIGNAL LAYOUT  
 REVERE BEACH PKWY AND SOUTH FERRY ST.

SCALE: 1" = 40'

DATE: December 10, 2000



SIGNAL HEAD DATA



LEGEND

VEHICLE SIGNAL	→	WOODEN POLE	◇
PEDESTRIAN SIGNAL	—■	SIGNAL POST	•
CONTROL CABINET	⊠	MAST ARM	—
LOOP DETECTOR	⊙	PULL BOX	□
MAGNETIC DETECTOR	⊠	CONDUIT	---
PED. PUSH BUTTON	⊙	OVERHEAD CABLE	— · —
TRAFFIC SIGN	⊠	ELECTRIC MANHOLE	⊙ E.M.H.

NOTES





# Traffic Signal Inventory

## 2. Controller Data

Eagle
Epac 300 M51
#123149/OSS #110207

**Manufacturer**
**Model No.**
**Serial No.**

TYPE	CONDITION	CONTROLLER PHASE CAPABILITY
<input type="checkbox"/> Electromechanical <input type="checkbox"/> Non-NEMA <input type="checkbox"/> NEMA-Modular <input checked="" type="checkbox"/> NEMA-Keyboard	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> 2 Phase <input type="checkbox"/> 4 Phase <input checked="" type="checkbox"/> 8 Phase

CONTROLLER TYPE	SETTING TYPE
<input type="checkbox"/> Pretimed <input checked="" type="checkbox"/> Actuated <input type="checkbox"/> Semi-Actuated	<input type="checkbox"/> Pin <input type="checkbox"/> Thumbwheel <input type="checkbox"/> Dial <input checked="" type="checkbox"/> Keyboard

BACKPANEL SIZE	LOAD SWITCHES INSTALLED/TYPE	FLASH TRANSFER RELAYS INSTALLED
12P	3 – SSS-87-I/O	1 – STRUTHERS DUNN

SOFTWARE LEVEL SIZE	CONFLICT MONITOR MODEL/SIZE
3.35a Oct '09	EDI MMU-16E

FLASHER	INTERCONNECT CABLE (If Yes, List Size)	COORDINATED (If Yes, complete section 9)
1 – PDC 204	No	Yes

DETECTOR/AMPLIFIERS	QUANTITY/TYPE
2 – LMD 622t	



# Traffic Signal Inventory

## 7. Signal Timing Sheet

Ø1 Route 16 EB/WB	Ø2 Route 16 EB Left & Thru	Ø3
Ø4	Ø5	Ø6
Ø7	Ø8	OLA
OLB	OLC	OLD

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Minimum Green (initial)	7	7						
Extension (passage)	8	1						
Vehicle Interval								
Yellow	4	4						
Red Clear	2	1						
Maximum Green I	55	37						
Maximum Green II	55	37						
Pedestrian Walk								
Pedestrian Clear								
Seconds Per Act								
Time to Reduce								
Before Reduction								
Minimum Gap								
Pedestrian Gap								
Walk (flash/steady)								
Recall	Min	Off						
Memory	NL	NL						
Delay								
FDW thru Vehicle Clearance								

Ø1	Ø2	Ø3	Ø4

Ø5	Ø6	Ø7	Ø8



# Traffic Signal Inventory

## 8. *Time of Day Plans*

Daylight Savings / Equate Days				
DST Begin:	Month	3	Week	2
DST End:	Month	11	Week	1

Equate Days	
_ 1 _	= _ Mon-Fri _
_ _ _	=

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events
1	0:00	Free			
	7:00	1/1/1			
	10:00	Free			
	15:00	2/1/1			
	19:00	Free			





# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	1	FREE	AUTO	MANUAL	---
Mode (Normal)	0	PERM	YIELD	PM YLD	PM OMIT
Maximum	0	M INH	MAX 1	MAX 2	---
Correction	2	DWELL	MX DW	SH WAY	SW+
Offset	0	BEGIN	END	---	---
Force	0	PLAN	CYCLE	---	---

CYCLE LENGTH	1	2	3	4
Split 1	110	150		
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1	20	147				
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

Cycle 1/Split 1	1	2	3	4	5	6	7	8	9
Time	75	35							
Mode	1								

Cycle 2/Split 1	1	2	3	4	5	6	7	8	9
Time	89	61							
Mode	1								

Cycle __/Split __	1	2	3	4	5	6	7	8	9
Time									
Mode									

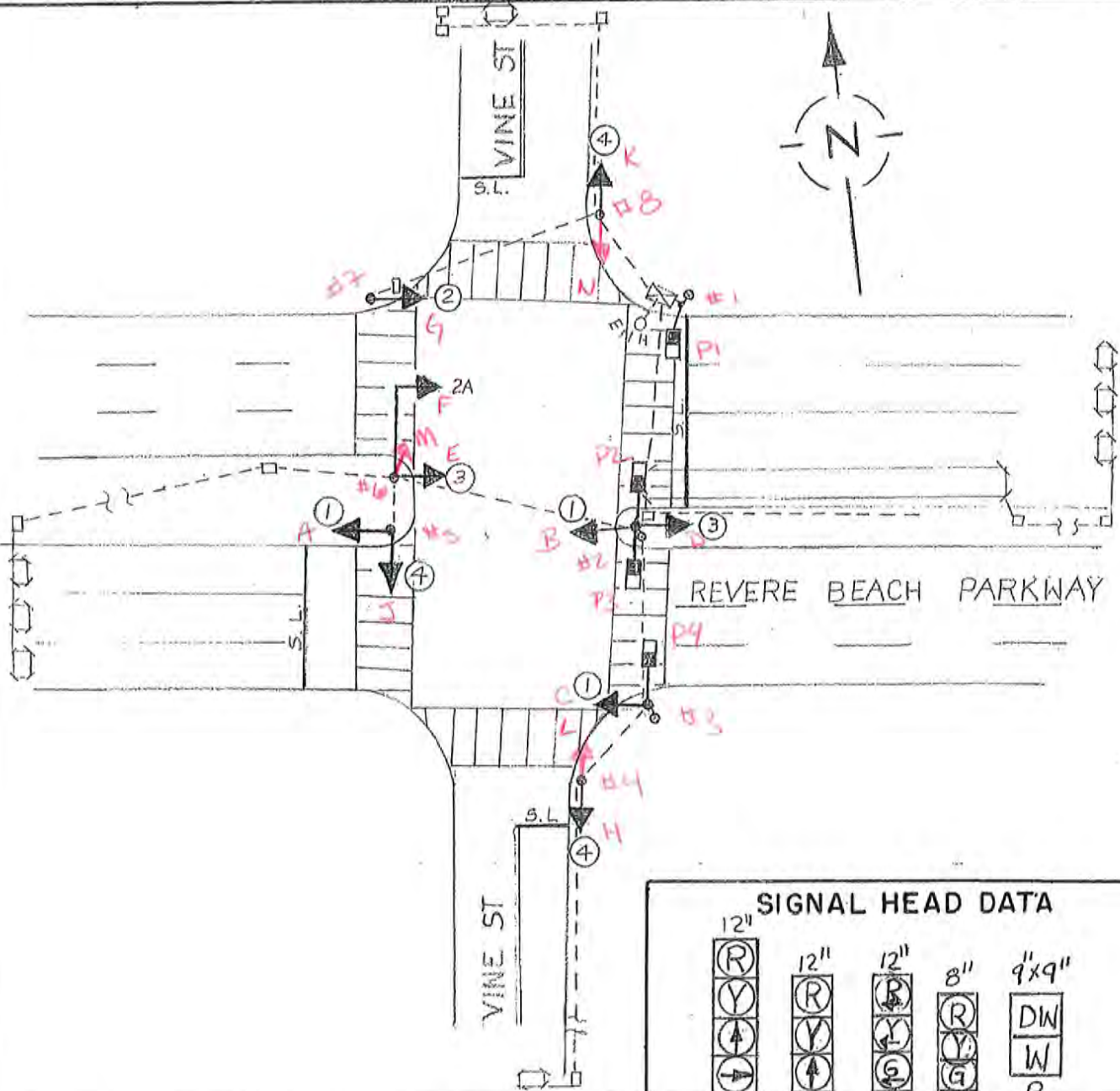
Cycle __/Split __	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle __/Split __	1	2	3	4	5	6	7	8	9
Time									
Mode									

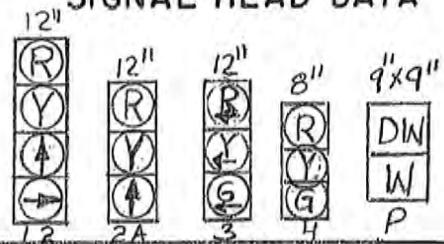
# TRAFFIC SIGNAL LAYOUT

REVERE BEACH PARKWAY AND VINE STREET, EVERETT

SCALE: 1" = 40' TRAFFIC CONTROL DEVICE NO 219 DATE: FEBRUARY 12, 1982



### SIGNAL HEAD DATA



### LEGEND

VEHICLE SIGNAL	→	WOODEN POLE	⊙
PEDESTRIAN SIGNAL	—■	SIGNAL POST	•
CONTROL CABINET	⊠	MAST ARM	—
LOOP DETECTOR	⊙	PULL BOX	□
MAGNETIC DETECTOR	⊠	CONDUIT	---
PED. PUSH BUTTON	⊙	OVERHEAD CABLE	— —
TRAFFIC SIGN	⊙	ELECTRIC MANHOLE	⊙ E.M.H.

### NOTES



# Traffic Signal Inventory

## 2. Controller Data

Eagle
Epac 300 M41
86761 (OSS#041008)

**Manufacturer**
**Model No.**
**Serial No.**

TYPE	CONDITION	CONTROLLER PHASE CAPABILITY
<input type="checkbox"/> Electromechanical <input type="checkbox"/> Non-NEMA <input type="checkbox"/> NEMA-Modular <input checked="" type="checkbox"/> NEMA-Keyboard	<input type="checkbox"/> Good <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Poor  *Controller has a Coviello Electric sticker (loaner?)	<input type="checkbox"/> 2 Phase <input type="checkbox"/> 4 Phase <input checked="" type="checkbox"/> 8 Phase

CONTROLLER TYPE	SETTING TYPE
<input type="checkbox"/> Pretimed <input checked="" type="checkbox"/> Actuated <input type="checkbox"/> Semi-Actuated Faults shown on Loop Amps	<input type="checkbox"/> Pin <input type="checkbox"/> Thumbwheel <input type="checkbox"/> Dial <input checked="" type="checkbox"/> Keyboard

BACKPANEL SIZE	LOAD SWITCHES INSTALLED/TYPE	FLASH TRANSFER RELAYS INSTALLED
12P	5 – SSS-87-I/O	3

SOFTWARE LEVEL SIZE	CONFLICT MONITOR MODEL/SIZE
3.33e May 2006	EDI MMU-16E

FLASHER	INTERCONNECT CABLE (If Yes, List Size)	COORDINATED (If Yes, complete section 9)
1 – PDC 204	NO	YES

DETECTOR/AMPLIFIERS	QUANTITY/TYPE
3 – EDI LM622t	



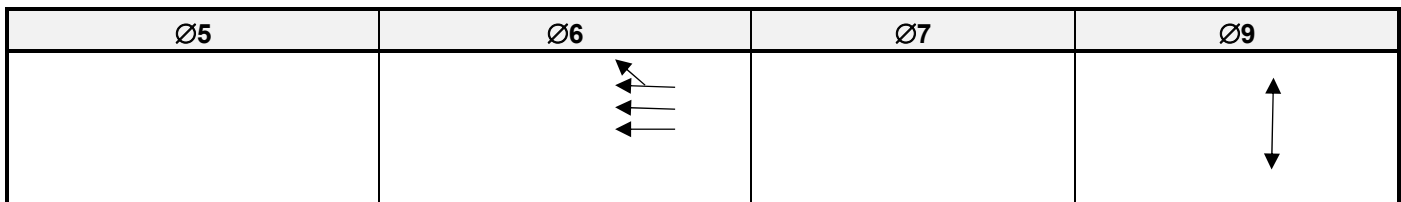
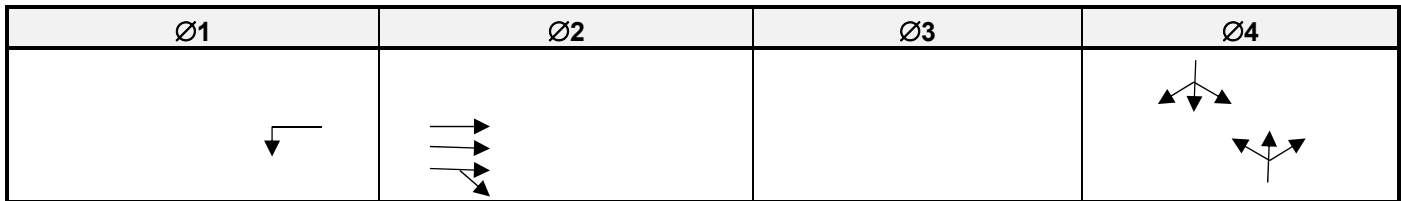


# Traffic Signal Inventory

## 7. Signal Timing Sheet

Ø1 Route 16 WB Left	Ø2 Route 16 EB	Ø3
Ø4 Vine Street NB/SB	Ø5	Ø6 Route 16 WB
Ø7	Ø8	Ø9 Pedestrian
OLA	OLB	OLC

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9
Minimum Green (initial)	8	12		8		12			
Extension (passage)	1	10		5		10			
Vehicle Interval									
Yellow	4	4		4		4			3
Red Clear	2	2		2		2			1
Maximum Green I	30	50		30		50			
Maximum Green II	30	50		30		50			
Pedestrian Walk		7		7		7		7	7
Pedestrian Clear		8		8		8		8	28
Seconds Per Act									
Time to Reduce									
Before Reduction									
Minimum Gap									
Pedestrian Gap									
Walk (flash/steady)									
Recall	Off	MAX		Off		MAX			
Memory	NL	Lock		Lock		Lock			
Delay									
FDW thru Vehicle Clearance									1





# Traffic Signal Inventory

## 8. *Time of Day Plans*

Daylight Savings / Equate Days				
DST Begin:	Month	3	Week	2
DST End:	Month	11	Week	1

Equate Days	
1	= Mon-Fri
	=

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events
1	0:00	Free			
	7:00	1/1/1			
	10:00	Free			
	15:00	2/1/1			
	19:00	Free			



# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	1	FREE	AUTO	MANUAL	---
Mode (Normal)	0	PERM	YIELD	PM YLD	PM OMIT
Maximum	0	M INH	MAX 1	MAX 2	---
Correction	2	DWELL	MX DW	SH WAY	SW+
Offset	0	BEGIN	END	---	---
Force	0	PLAN	CYCLE	---	---

CYCLE LENGTH	1	2	3	4
Split 1	110	150		
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1	1	0				
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

Cycle 1/Split 1	1	2	3	4	5	6	7	8	9
Time	27	29		29		56			25
Mode		1				1			

Cycle 2/Split 1	1	2	3	4	5	6	7	8	9
Time	15	72		38		87			25
Mode		1				1			

Cycle __/Split __	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle __/Split __	1	2	3	4	5	6	7	8	9
Time									
Mode									

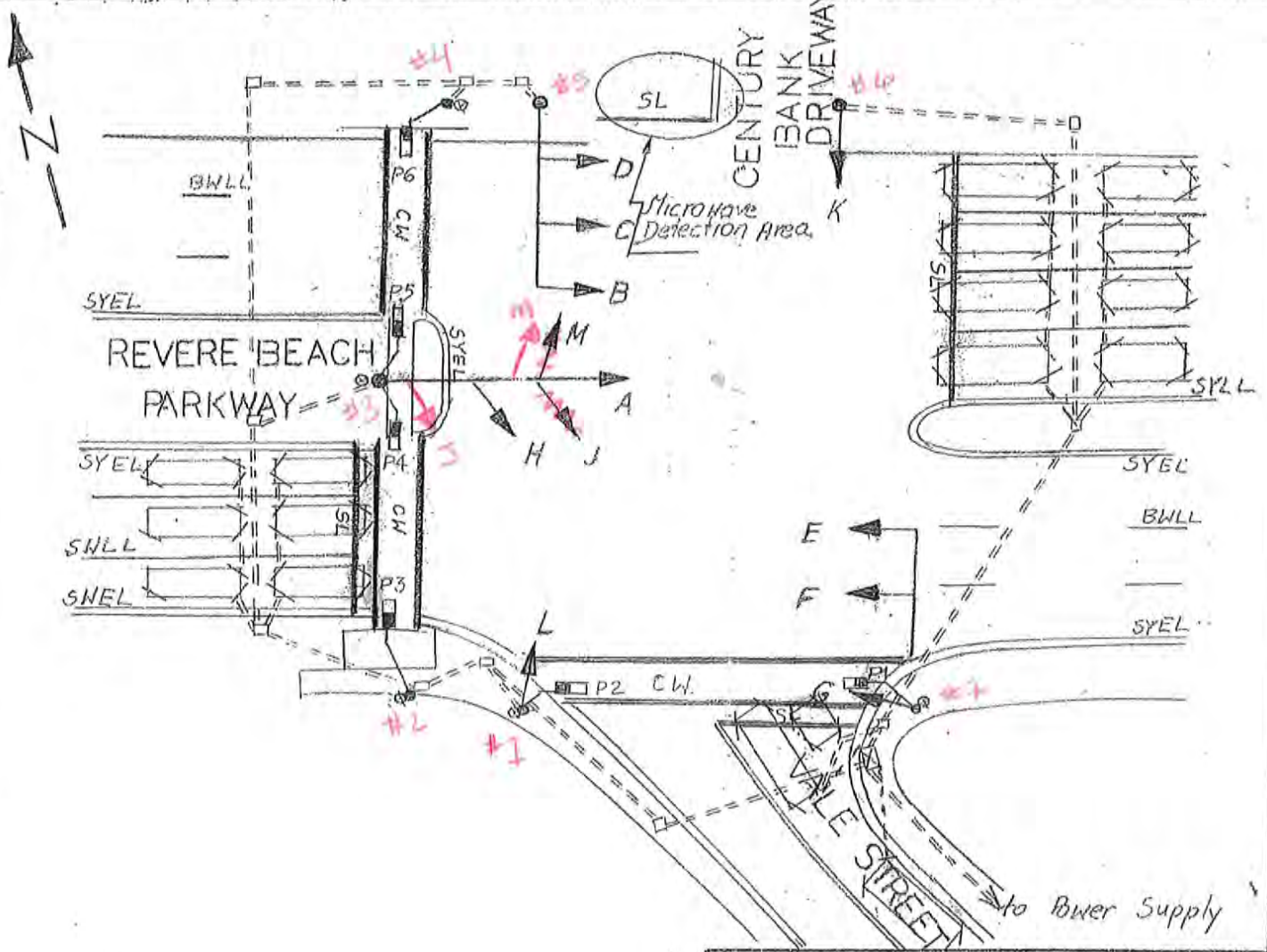
Cycle __/Split __	1	2	3	4	5	6	7	8	9
Time									
Mode									



# TRAFFIC SIGNAL LAYOUT

## REVERE BEACH PARKWAY AT VALE STREET, EVERETT

SCALE: 1"=40' Traffic Control Device No. 239 DATE: 1/11/02



SIGNAL HEAD DATA		
BCDEFGH	A	P1-P6
JKLM		
(R) (Y) (G)	(R) (Y) (G)	(P)
All 12" Lens		

LEGEND			
VEHICLE SIGNAL	→	WOODEN POLE	◇
PEDESTRIAN SIGNAL	—■—	SIGNAL POST	●
CONTROL CABINET	⊠	MAST ARM	—
LOOP DETECTOR	○	PULL BOX	□
MAGNETIC DETECTOR	⊠	CONDUIT	---
PED. PUSH BUTTON	○	OVERHEAD CABLE	---
TRAFFIC SIGN	⊠	ELECTRIC MANHOLE	○ E.M.H.

NOTES



# Traffic Signal Inventory

## 2. Controller Data

Eagle
Epac 300 M51
138908/OSS#011028

**Manufacturer**
**Model No.**
**Serial No.**

TYPE	CONDITION	CONTROLLER PHASE CAPABILITY
<input type="checkbox"/> Electromechanical <input type="checkbox"/> Non-NEMA <input type="checkbox"/> NEMA-Modular <input checked="" type="checkbox"/> NEMA-Keyboard	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> 2 Phase <input type="checkbox"/> 4 Phase <input checked="" type="checkbox"/> 8 Phase

CONTROLLER TYPE	SETTING TYPE
<input type="checkbox"/> Pretimed <input checked="" type="checkbox"/> Actuated <input type="checkbox"/> Semi-Actuated	<input type="checkbox"/> Pin <input type="checkbox"/> Thumbwheel <input type="checkbox"/> Dial <input checked="" type="checkbox"/> Keyboard

BACKPANEL SIZE	LOAD SWITCHES INSTALLED/TYPE	FLASH TRANSFER RELAYS INSTALLED
12P	6 – PDC 200	4

SOFTWARE LEVEL SIZE	CONFLICT MONITOR MODEL/SIZE
3.51b JAN 2013	EDI MMU-16E

FLASHER	INTERCONNECT CABLE (If Yes, List Size)	COORDINATED (If Yes, complete section 9)
1 – PDC 204	NO	YES

DETECTOR/AMPLIFIERS	QUANTITY/TYPE
4 – EDI LM622t	

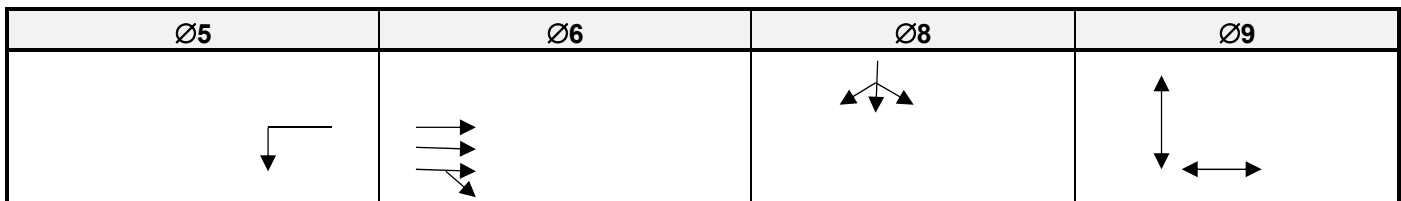
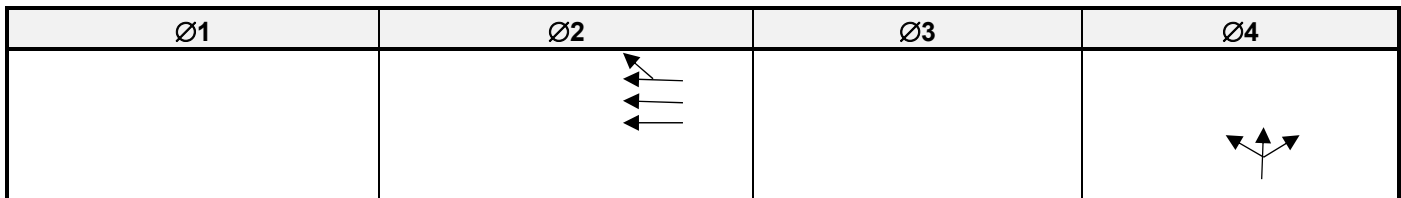


# Traffic Signal Inventory

## 7. Signal Timing Sheet

Ø1	Ø2 Route 16 WB	Ø3
Ø4 Vale Street NB	Ø5 Route 16 WB Left	Ø6 Route 16 EB
Ø7	Ø8 Bank Driveway SB	Ø9 Pedestrian
OLA	OLB	OLC

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9
Minimum Green (initial)		10		6	6	10		6	
Extension (passage)		2		2	2	2		1	
Vehicle Interval									
Yellow		4		4	4	4		4	4
Red Clear		1		1	1	1		1	1
Maximum Green I		50		25	10	50		10	
Maximum Green II									
Pedestrian Walk									7
Pedestrian Clear									26
Seconds Per Act									
Time to Reduce									
Before Reduction									
Minimum Gap									
Pedestrian Gap									
Walk (flash/steady)									
Recall		Soft		Off	Off	Soft		Off	
Memory		NL		NL	NL	NL		Lock	
Delay									
FDW thru Vehicle Clearance									1







# Traffic Signal Inventory

## 8. Time of Day Plans

Daylight Savings / Equate Days				
DST Begin:	Month	<u>  3  </u>	Week	<u>  2  </u>
DST End:	Month	<u> 11 </u>	Week	<u>  1  </u>

Equate Days	
<u>  1  </u> =	<u> Mon-Fri </u>
<u>    </u> =	<u>    </u>

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events
1	0:00	Free			
	7:00	1/1/1			
	10:00	Free			
	15:00	2/1/1			
	19:00	Free			



# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	1	FREE	AUTO	MANUAL	---
Mode (Normal)	0	PERM	YIELD	PM YLD	PM OMIT
Maximum	0	M INH	MAX 1	MAX 2	---
Correction	2	DWELL	MX DW	SH WAY	SW+
Offset	0	BEGIN	END	---	---
Force	0	PLAN	CYCLE	---	---

**Coordination  
Program/Splits not  
programmed**

CYCLE LENGTH	1	2	3	4
Split 1				
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1						
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

Cycle 1/Split 1	1	2	3	4	5	6	7	8	9
Time									
Mode									

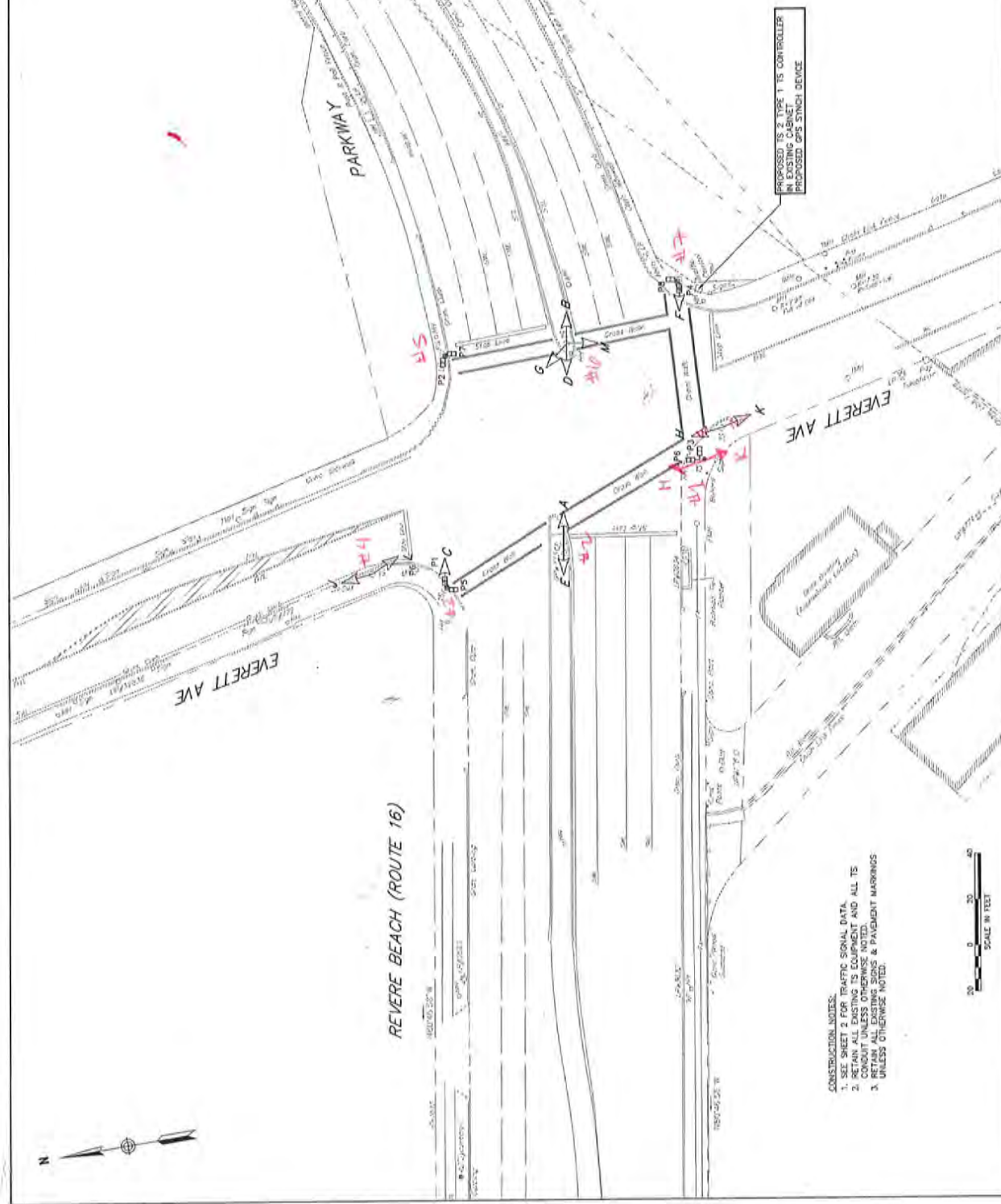
Cycle 2/Split 1	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

EVERETT  
 REVERE BEACH PARKWAY AT EVERETT AVE  
 TRAFFIC PLANS  
 SHEET 1 OF 2  
 SYSTEM 4  
 LOCATION 12



PROPOSED TYPE 1'S CONTROLLER  
 IN EXISTING SIGNAL CABINET  
 PROPOSED GPS STITCH DEVICE

- CONSTRUCTION NOTES:**
1. SEE SHEET 2 FOR MUTUAL SIGNAL DATA.
  2. CONSULT FOR ALL EQUIPMENT AND ALL ITS OPERATING DATA.
  3. RETAIN ALL EXISTING SIGNS & PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.







# Traffic Signal Inventory

## 2. Controller Data

Econolite

ASC/3-1000

Manufacturer

Model No.

Serial No.

TYPE	CONDITION	CONTROLLER PHASE CAPABILITY
<input type="checkbox"/> Electromechanical <input type="checkbox"/> Non-NEMA <input type="checkbox"/> NEMA-Modular <input checked="" type="checkbox"/> NEMA-Keyboard	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> 2 Phase <input type="checkbox"/> 4 Phase <input checked="" type="checkbox"/> 8 Phase

CONTROLLER TYPE	SETTING TYPE
<input type="checkbox"/> Pretimed <input checked="" type="checkbox"/> Actuated <input type="checkbox"/> Semi-Actuated	<input type="checkbox"/> Pin <input type="checkbox"/> Thumbwheel <input type="checkbox"/> Dial <input checked="" type="checkbox"/> Keyboard

BACKPANEL SIZE	LOAD SWITCHES INSTALLED/TYPE	FLASH TRANSFER RELAYS INSTALLED
16P	8 – SSS-87-I/O	6 STRUTHERS DUNN

SOFTWARE LEVEL SIZE	CONFLICT MONITOR MODEL/SIZE
APPLICATION VERSION 02.57.00 CONFIGURATION VERSION N3000.12	Reno MMU-1600D

FLASHER	INTERCONNECT CABLE (If Yes, List Size)	COORDINATED (If Yes, complete section 9)
TSC - 204	NO	YES

DETECTOR/AMPLIFIERS	QUANTITY/TYPE
3 – EDI LMD622t (2-CHANNEL)	

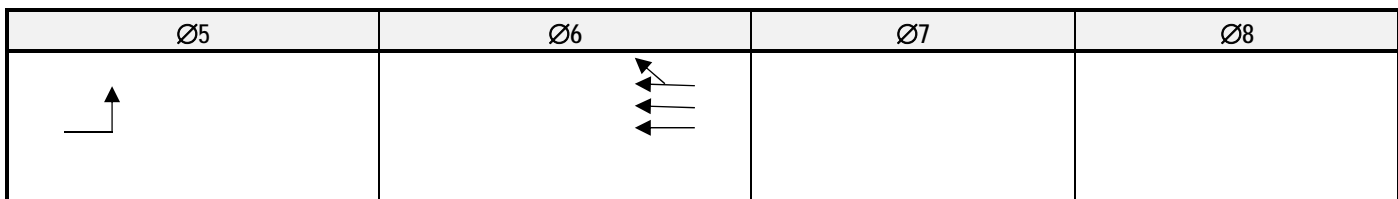
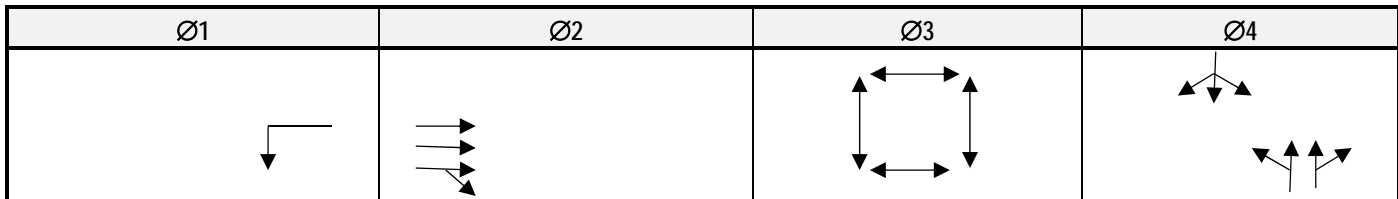


# Traffic Signal Inventory

## 7. Signal Timing Sheet

Ø1 Route 16 WB Left	Ø2 Route 16 EB	Ø3 Pedestrian
Ø4 Everett Avenue NB/SB	Ø5 Route 16 EB Left	Ø6 Route 16 WB
Ø7	Ø8	OLA
OLB	OLC	OLD

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Minimum Green (initial)	15	23		10	5	23		
Extension (passage) Vehicle Interval	2	4		5	2	4		
Yellow	3	4	3	4	3	4		
Red Clear	2	2	1	2	2	2		
Maximum Green I	25	47		30	25	47		
Maximum Green II	30	50		50	30	50		
Pedestrian Walk			7					
Pedestrian Clear			28					
Seconds Per Act								
Time to Reduce Before Reduction								
Minimum Gap								
Pedestrian Gap								
Walk (flash/steady)								
Recall	Off	On		Off	On	MIN		
Memory	NL	NL		NL	NL	NL		
Delay								
FDW thru Vehicle Clearance			1					





# Traffic Signal Inventory

## 8. *Time of Day Plans*

Daylight Savings / Equate Days				
DST Begin:	Month	__3__	Week	__2__
DST End:	Month	__11__	Week	__1__

Equate Days	
__1__ =	_Mon-Fri_
__ =	__ =

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events
1	0:00	Free			
	7:00	Action 1			
	10:00	Free			
	15:00	Action 2			
	19:00	Free			



# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	1	FREE	AUTO	MANUAL	---
Mode (Normal)		PERM	YIELD	PM YLD	PM OMIT
Maximum		M INH	MAX 1	MAX 2	---
Correction		DWELL	MX DW	SH WAY	SW+
Offset		BEGIN	END	---	---
Force		PLAN	CYCLE	---	---

CYCLE LENGTH	1	2	3	4
Split 1	110	150		
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1	82	145				
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

Cycle 1/Split 1	1	2	3	4	5	6	7	8	9
Time	21	48	10	31	19	50			
Mode		1				1			

Cycle 2/Split 1	1	2	3	4	5	6	7	8	9
Time	21	72	10	47	27	66			
Mode		1				1			

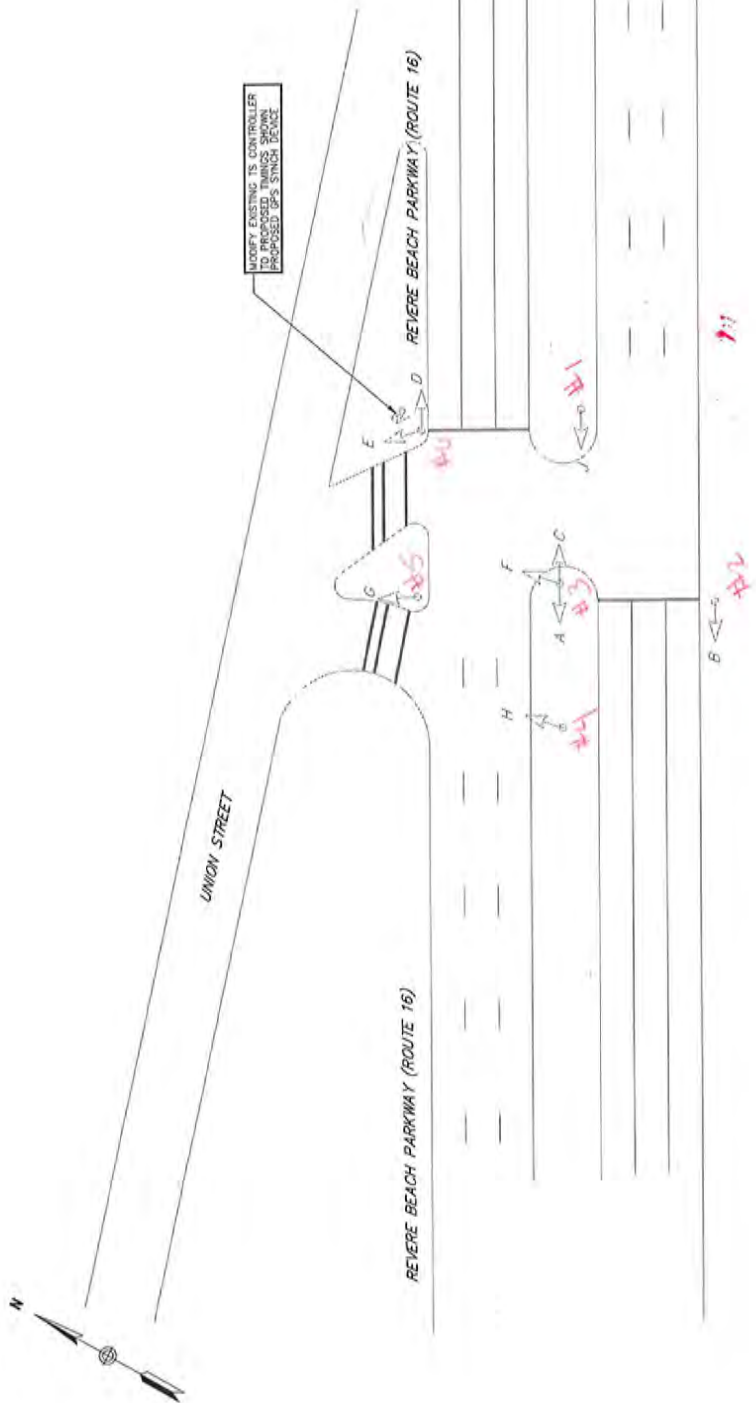
Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									



EVERETT  
 REVERE BEACH PKWY AT UNION STREET  
 TRAFFIC PLAN  
 SHEET 1 OF 2  
 SYSTEM 5  
 LOCATION 13



MODIFY EXISTING IS CONTROLLER  
 TO ACCOMMODATE PROPOSED SIGN DEVICE

CONSTRUCTION NOTICE:  
 1. SEE SHEET 2 FOR TRAFFIC SIGNAL DATA.  
 2. VERIFY ALL EXISTING CONDITIONS AND ALL ITS  
 CONDITIONS UNLESS OTHERWISE NOTED.  
 3. RETAIN ALL EXISTING SIGNS & PAVEMENT MARKINGS  
 UNLESS OTHERWISE NOTED.

SCALE  
 N.T.S.



# Traffic Signal Inventory

## 2. Controller Data

Eagle
Epac 300 M41
102695 OSS#070503

**Manufacturer**
**Model No.**
**Serial No.**

TYPE	CONDITION	CONTROLLER PHASE CAPABILITY
<input type="checkbox"/> Electromechanical <input type="checkbox"/> Non-NEMA <input type="checkbox"/> NEMA-Modular <input checked="" type="checkbox"/> NEMA-Keyboard	<input type="checkbox"/> Good <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> 2 Phase <input type="checkbox"/> 4 Phase <input checked="" type="checkbox"/> 8 Phase

CONTROLLER TYPE	SETTING TYPE
<input type="checkbox"/> Pretimed <input type="checkbox"/> Actuated <input checked="" type="checkbox"/> Semi-Actuated	<input type="checkbox"/> Pin <input type="checkbox"/> Thumbwheel <input type="checkbox"/> Dial <input checked="" type="checkbox"/> Keyboard

BACKPANEL SIZE	LOAD SWITCHES INSTALLED/TYPE	FLASH TRANSFER RELAYS INSTALLED
12P	2 – SSS-87-I/O	1 - Midtex

SOFTWARE LEVEL SIZE	CONFLICT MONITOR MODEL/SIZE
3.33e May '06	EDI MMN-16E

FLASHER	INTERCONNECT CABLE (If Yes, List Size)	COORDINATED (If Yes, complete section 9)
PDC 204	No	Yes

DETECTOR/AMPLIFIERS	QUANTITY/TYPE
1 - EDI LMD622t	

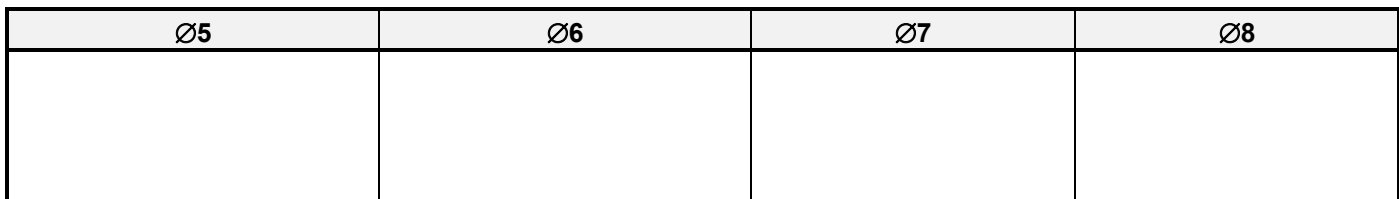
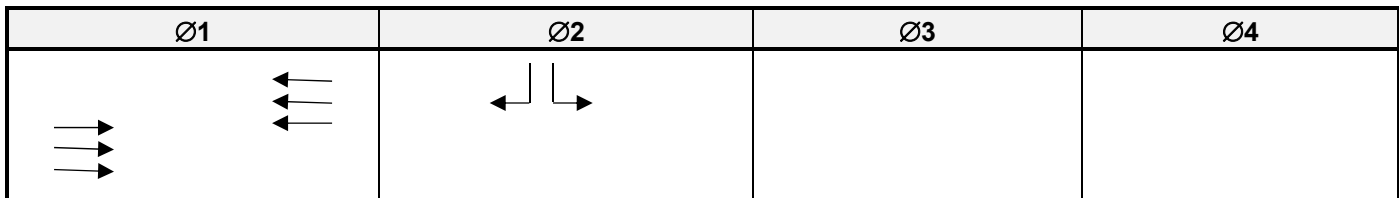


# Traffic Signal Inventory

## 7. Signal Timing Sheet

Ø1 Route 16 EB/WB	Ø2 Union Street SB	Ø3
Ø4	Ø5	Ø6
Ø7	Ø8	OLA
OLB	OLC	OLD

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Minimum Green (initial)	10	8						
Extension (passage)	1	2						
Vehicle Interval								
Yellow	4	4						
Red Clear	1	2						
Maximum Green I	40	30						
Maximum Green II	40	30						
Pedestrian Walk								
Pedestrian Clear								
Seconds Per Act								
Time to Reduce								
Before Reduction								
Minimum Gap								
Pedestrian Gap								
Walk (flash/steady)								
Recall	Max	None						
Memory	-	NL						
Delay								
FDW thru Vehicle Clearance								





# Traffic Signal Inventory

## 8. Time of Day Plans

Daylight Savings / Equate Days				
DST Begin:	Month	<u>  3  </u>	Week	<u>  2  </u>
DST End:	Month	<u> 11  </u>	Week	<u>  1  </u>

Equate Days	
<u>  1  </u> =	<u> Mon-Fri </u>
<u>      </u> =	<u>      </u>

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events
1	0:00	Free			
	7:00	1/1/1			
	10:00	Free			
	15:00	2/1/1			
	19:00	Free			





# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	1	FREE	AUTO	MANUAL	---
Mode (Normal)	0	PERM	YIELD	PM YLD	PM OMIT
Maximum	0	M INH	MAX 1	MAX 2	---
Correction	2	DWELL	MX DW	SH WAY	SW+
Offset	0	BEGIN	END	---	---
Force	0	PLAN	CYCLE	---	---

CYCLE LENGTH	1	2	3	4
Split 1	100	110		
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1	89	77				
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

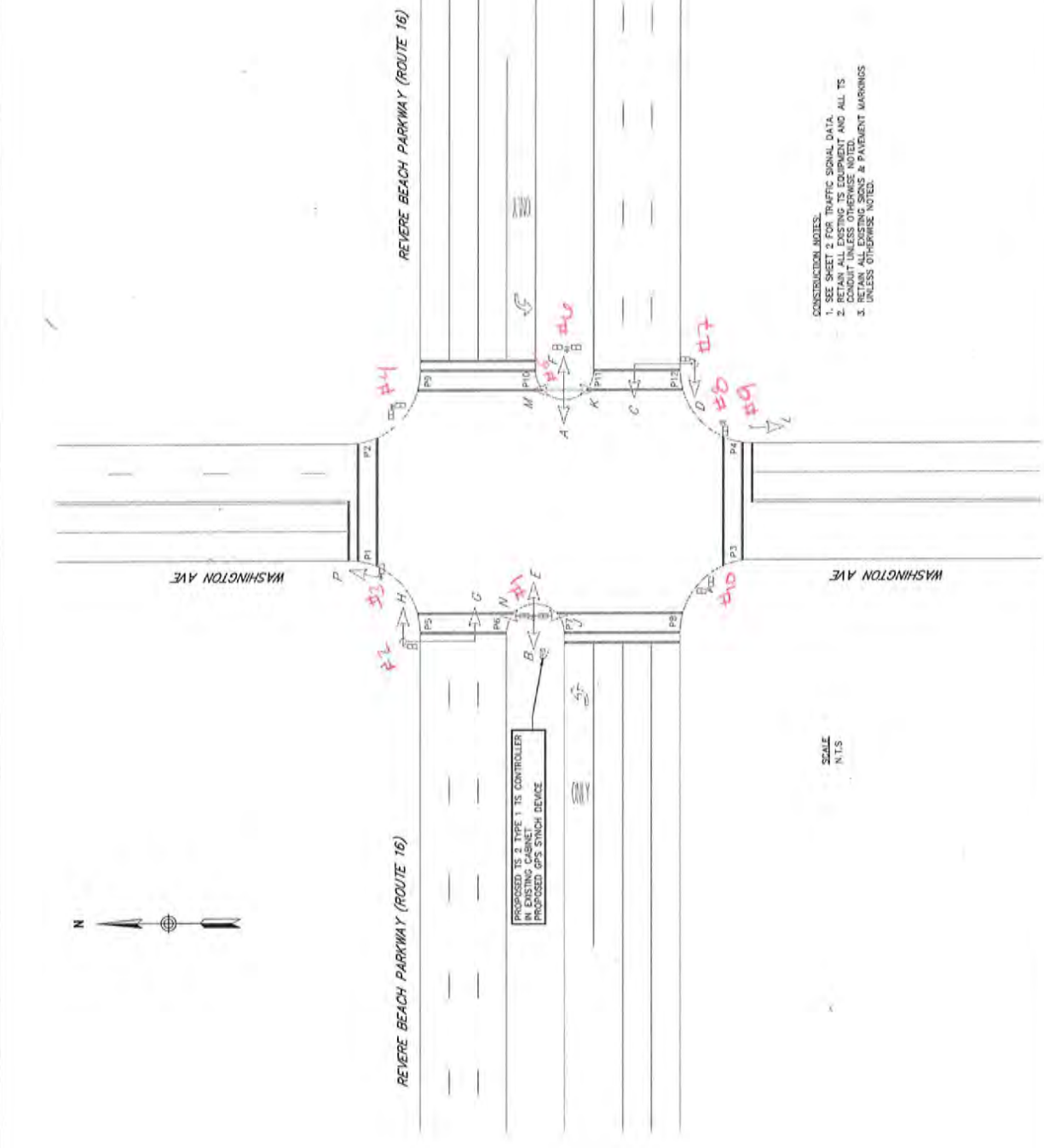
Cycle 1/Split 1	1	2	3	4	5	6	7	8	9
Time	70	30							
Mode	1								

Cycle 2/Split 1	1	2	3	4	5	6	7	8	9
Time	85	25							
Mode	1								

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle /Split	1	2	3	4	5	6	7	8	9
Time									
Mode									





# Traffic Signal Inventory

## 2. Controller Data

Econolite ASC-3-2100  
 \_\_\_\_\_  
 Manufacturer Model No. Serial No.

TYPE	CONDITION	CONTROLLER PHASE CAPABILITY
<input type="checkbox"/> Electromechanical <input type="checkbox"/> Non-NEMA <input type="checkbox"/> NEMA-Modular <input checked="" type="checkbox"/> NEMA-Keyboard	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> 2 Phase <input type="checkbox"/> 4 Phase <input checked="" type="checkbox"/> 8 Phase

CONTROLLER TYPE	SETTING TYPE
<input type="checkbox"/> Pretimed <input checked="" type="checkbox"/> Actuated <input type="checkbox"/> Semi-Actuated	<input type="checkbox"/> Pin <input type="checkbox"/> Thumbwheel <input type="checkbox"/> Dial <input checked="" type="checkbox"/> Keyboard

BACKPANEL SIZE	LOAD SWITCHES INSTALLED/TYPE	FLASH TRANSFER RELAYS INSTALLED
12P	3 – SSS-87-I/O 3 – PDC 200	3 – Struthers Dunn

SOFTWARE LEVEL SIZE	CONFLICT MONITOR MODEL/SIZE
	TCT LNM 12

FLASHER	INTERCONNECT CABLE (If Yes, List Size)	COORDINATED (If Yes, complete section 9)
PDC 204	No	Yes

DETECTOR/AMPLIFIERS	QUANTITY/TYPE
1 – Sarasota 516T 2 – Sarasota 515T	2 – detector systems 1 – ICC 3803

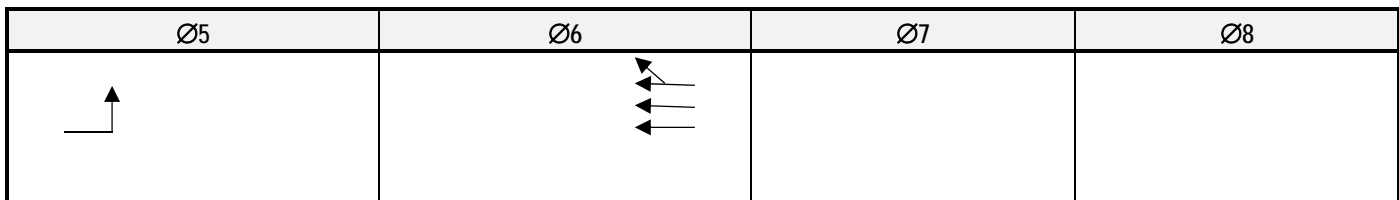
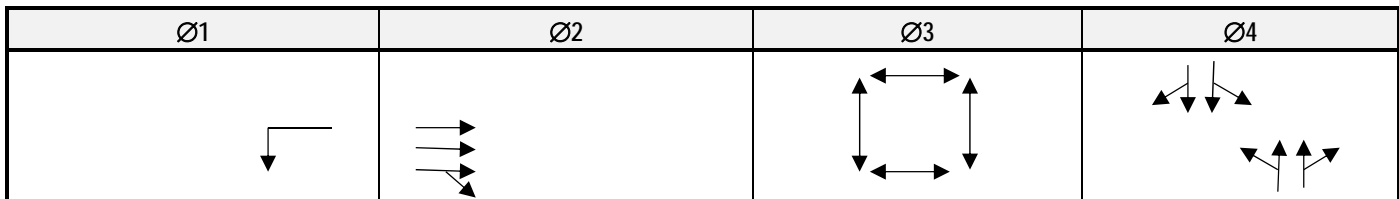


# Traffic Signal Inventory

## 7. Signal Timing Sheet

$\emptyset$ 1 Route 16 WB Left	$\emptyset$ 2 Route 16 EB	$\emptyset$ 3 Pedestrian
$\emptyset$ 4 Washington Avenue NB/SB	$\emptyset$ 5 Route 16 EB Left	$\emptyset$ 6 Route 16 WB
$\emptyset$ 7	$\emptyset$ 8	OLA
OLB	OLC	OLD

PHASE	$\emptyset$ 1	$\emptyset$ 2	$\emptyset$ 3	$\emptyset$ 4	$\emptyset$ 5	$\emptyset$ 6	$\emptyset$ 7	$\emptyset$ 8
Minimum Green (initial)	5	12		12	5	12		
Extension (passage) Vehicle Interval	2	4		2	2	4		
Yellow	3	4	3	4	3	4		
Red Clear	1	1	1	1	1	1		
Maximum Green I	20	60		25	15	35		
Maximum Green II	10	35		20	10	60		
Pedestrian Walk			7					
Pedestrian Clear			19					
Seconds Per Act								
Time to Reduce								
Before Reduction								
Minimum Gap								
Pedestrian Gap								
Walk (flash/steady)								
Recall	Off	MAX		MAX	Off	MAX		
Memory	NL			NL		NL		
Delay								
FDW thru Vehicle Clearance			1					







# Traffic Signal Inventory

## 8. Time of Day Plans

Daylight Savings / Equate Days				
DST Begin:	Month	_____	Week	_____
DST End:	Month	_____	Week	_____

Equate Days	
__ 1 __ =	_ Mon-Fri _
_____ =	_____

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events
1	0:00	Free			
	7:00	Action 1			
	10:00	Free			
	15:00	Action 2			
	19:00	Free			



# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	1	FREE	AUTO	MANUAL	---
Mode (Normal)		PERM	YIELD	PM YLD	PM OMIT
Maximum		M INH	MAX 1	MAX 2	---
Correction		DWELL	MX DW	SH WAY	SW+
Offset		BEGIN	END	---	---
Force		PLAN	CYCLE	---	---

CYCLE LENGTH	1	2	3	4
Split 1	100	110		
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1	0	0				
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

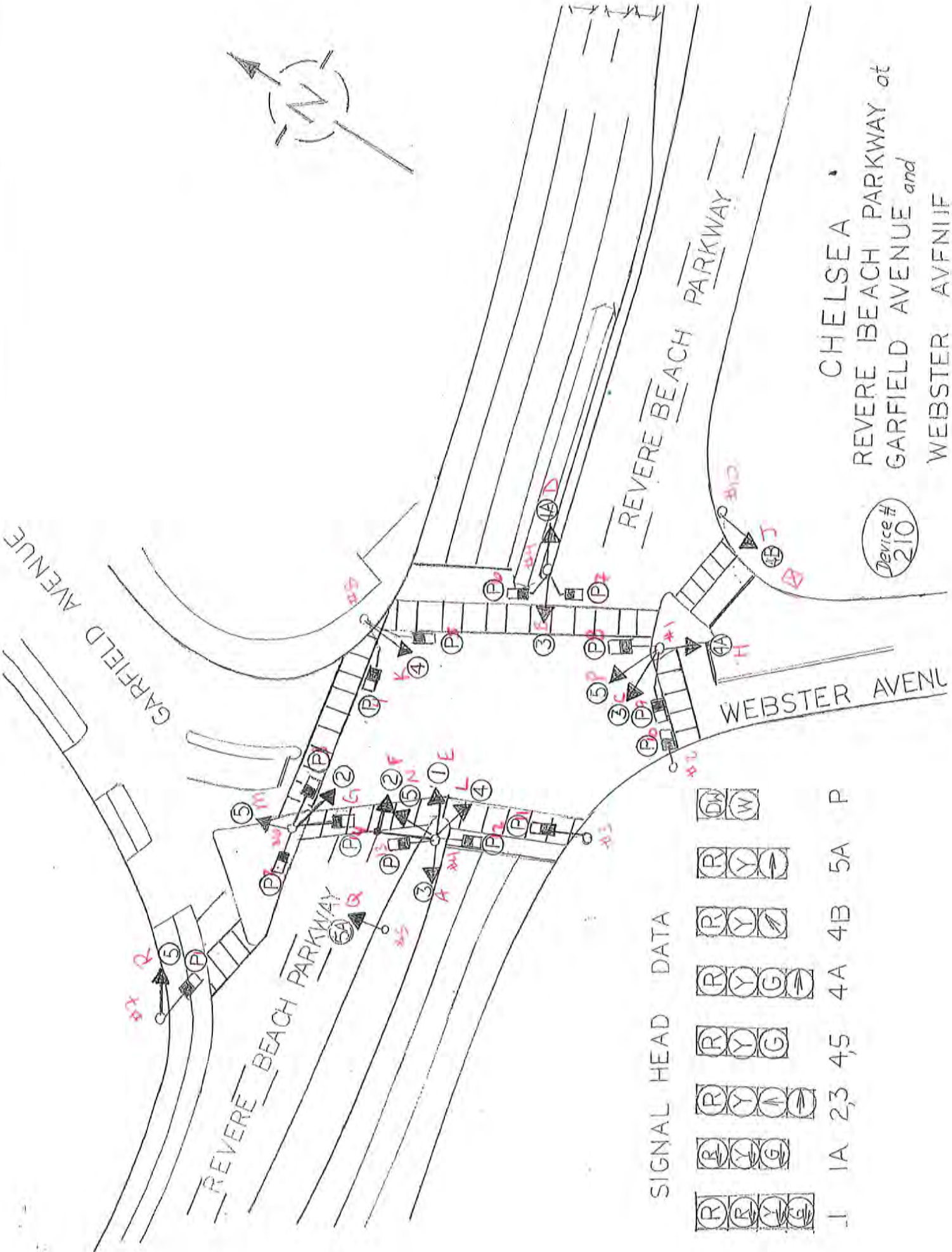
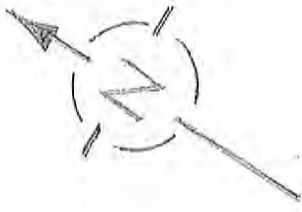
Cycle 1/Split 1	1	2	3	4	5	6	7	8	9
Time	14	36	28	22	14	36			
Mode		1				1			

Cycle 2/Split 1	1	2	3	4	5	6	7	8	9
Time	23	37	28	22	12	48			
Mode		1				1			

Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									



CHELSEA  
 REVERE BEACH PARKWAY at  
 GARFIELD AVENUE and  
 WEBSTER AVENUE

Device #  
 210

SIGNAL HEAD	DATA
J	IA 23 45
	4A 4B 4C 4D 4E 4F 4G 4H 4J 4K 4L 4M 4N 4P 4Q 4R 4S 4T 4U 4V 4W 4X 4Y 4Z



# Traffic Signal Inventory

## 3. Cabinet Data

Manufacturer

Model No.

Serial No.

OUTSIDE DIMENSIONS				TYPE OF SUPPORT	CONDITION
HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	HEIGHT OF BOTTOM OF CABINET (inches)		
P	P	P		<input type="checkbox"/> Side of Pole <input type="checkbox"/> Pedestal <input checked="" type="checkbox"/> Ground	<input type="checkbox"/> Good <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Poor

DOOR	VENT	FAN / THERMOSTAT	MANUAL CONTROL	TEST BUTTONS (If Yes, List Type)
<input checked="" type="checkbox"/> Single <input type="checkbox"/> Double <input checked="" type="checkbox"/> Police <input type="checkbox"/> Other	YES	YES	NONE	NONE

POLICE DOOR SWITCHES	DOCUMENTATION IN CABINET
Timer/Off Signal/Off Auto/Manual Signal/Flash Police Button	



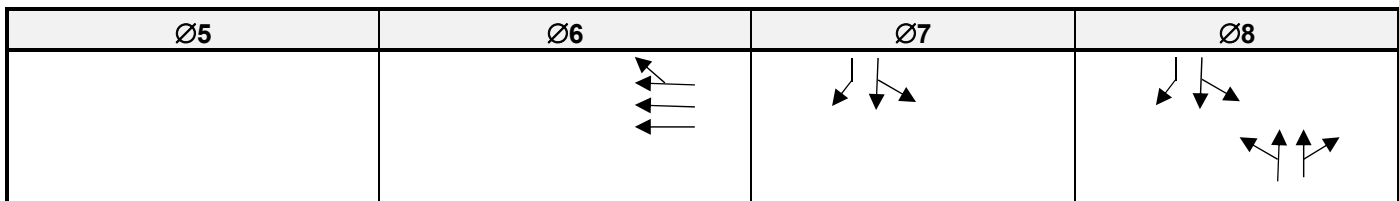
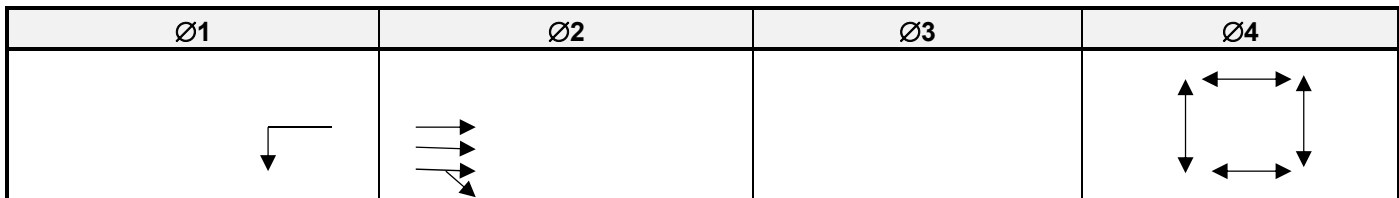


# Traffic Signal Inventory

## 7. Signal Timing Sheet

Ø1 Route 16 WB Left	Ø2 Route 16 EB	Ø3
Ø4 Pedestrian	Ø5	Ø6 Route 16 WB
Ø7 Webster NB	Ø8 Garfield/Webster NB/SB	OLA
OLB	OLC	OLD

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Minimum Green (initial)	9	15				15	20	10
Extension (passage)	2	4				4	1	4
Vehicle Interval								
Yellow	3	4		3		4	4	4
Red Clear	1	1		1		1	1	1
Maximum Green I	35	55				55	10	35
Maximum Green II	35	50				50	12	30
Pedestrian Walk				5				
Pedestrian Clear				23				
Seconds Per Act								
Time to Reduce		30				30		30
Before Reduction		20				20		20
Minimum Gap		5				5		0
Pedestrian Gap								
Walk (flash/steady)								
Recall	EXT	EXT				EXT	Off	Off
Memory		On				On	NL	NL
Delay								
FDW thru Vehicle Clearance				0				





# Traffic Signal Inventory

## 8. Time of Day Plans

Daylight Savings / Equate Days				
DST Begin:	Month	<u>3</u>	Week	<u>2</u>
DST End:	Month	<u>11</u>	Week	<u>1</u>

Equate Days	
<u>        </u>	= <u>        </u>
<u>        </u>	= <u>        </u>

DAY	TIME HH:MM	Coord Pattern	MAX 2 Phases	OMITS Phases	Aux Events



# Traffic Signal Inventory

## 9. Coordination Data for Eagle Controllers

SET-UP	CODE	0	1	2	3
Operation	0	FREE	AUTO	MANUAL	---
Mode (Normal)		PERM	YIELD	PM YLD	PM OMIT
Maximum		M INH	MAX 1	MAX 2	---
Correction		DWELL	MX DW	SH WAY	SW+
Offset		BEGIN	END	---	---
Force		PLAN	CYCLE	---	---

CYCLE LENGTH	1	2	3	4
Split 1				
Split 2				
Split 3				
Split 4				

CYCLE/OFFSET	1	2	3	4	5	6
1						
2						
3						
4						

**Cycle/Split Modes:** 0=Actuated; 1=Coord Phase; 2=Min Rec; 3=Max Rec; 4=Ped Rec; 5=Max+Ped Rec  
6=Phase Omitted; 7=Dual Coord Phase

Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									

Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									

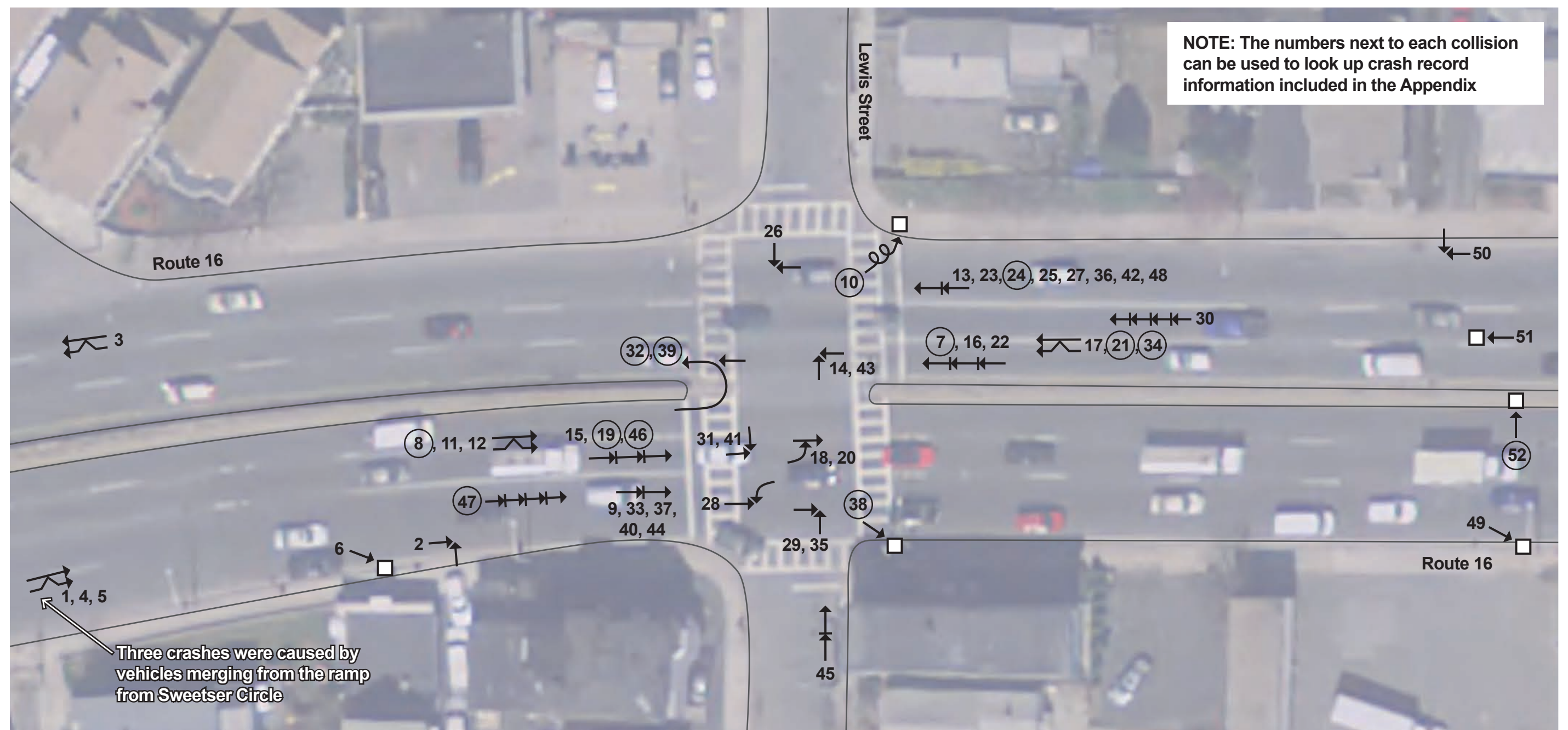
Cycle_/Split_	1	2	3	4	5	6	7	8	9
Time									
Mode									

# **Appendix D: Traffic Safety Data**

1. Collision Diagrams
2. Expected Crashes Analysis



# **Part 1: Collision Diagrams**



NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix

Three crashes were caused by vehicles merging from the ramp from Sweetser Circle



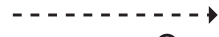












SYMBOLS		TYPES OF CRASH		SEVERITY	
 Moving Vehicle  Backing Vehicle  Non-Involved Vehicle  Pedestrian	 Parked Vehicle  Fixed Object  Bicycle  Animal	 Head On  Angle  Rear End	 Sideswipe  Out of Control	 Injury Accident	 Fatal Accident

Figure 1  
Collision Diagram: 2012–16 Police Data

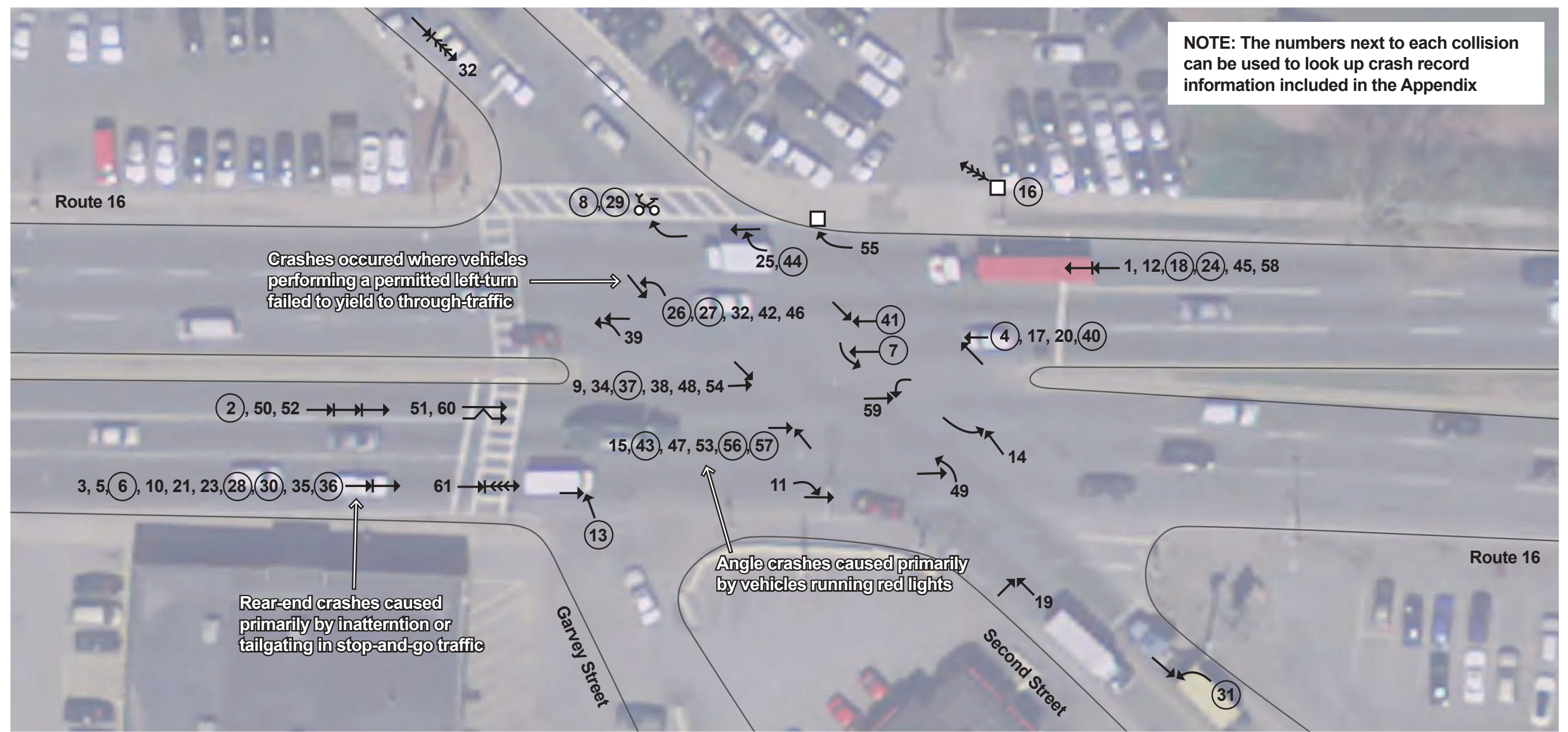


Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 west of Lewis Street	At Richie's Slush	3156093	2012-06-27	2:26 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Entering traffic lane	No improper action
2	Route 16 west of Lewis Street	Richie's Slush	3215954	2012-07-08	1:25 PM	Angle	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Entering traffic lane	No improper action
3	Route 16 west of Lewis Street	Revere Beach Parkway Rte 16 W / Gladstone Street	3786201	2014-03-30	1:45 AM	Sideswipe, same direction	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
4	Route 16 west of Lewis Street	Revere Beach Parkway Rte 16 E / Lewis Street	3863434	2014-05-22	7:00 PM	Sideswipe, same direction	Property damage only		Dry	Dusk	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
5	Route 16 west of Lewis Street	Rte 16 E / Lewis Street	4107570	2015-09-04	2:50 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
6	Route 16 west of Lewis Street	Revere Beach Parkway Rte Unknow / 2084	4107906	2015-11-05	7:15 AM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Backing	Other improper action
7	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 W / Lewis Street	3068770	2012-05-02	11:30 AM	Rear-end	Not Reported		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	
8	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 E / Lewis Street	3075130	2012-05-03	5:00 PM	Sideswipe, same direction	Not Reported		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Entering traffic lane	
9	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 E / Lewis Street	3226329	2012-08-05	8:30 PM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
10	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 / Lewis Street	3244896	2012-08-12	1:42 AM	Single vehicle crash	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Over-correcting/over-
11	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 E / Lewis Street	3252046	2012-08-30	11:09 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	No improper action
12	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 / Lewis Street	3366824	2012-10-01	4:30 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
13	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 W / Lewis Street	3285752	2012-10-29	6:40 PM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Rain	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Other improper action
14	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 / Lewis Street	3291002	2012-11-13	9:47 AM	Angle	Property damage only		Wet	Daylight	Rain	Peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
15	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 E / Lewis Street	3347225	2013-01-17	5:15 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Unknown	Peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Inattention
16	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 W / Lewis Street	3349822	2013-01-31	11:20 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Follow too closely
17	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 / Lewis Street	3349827	2013-02-04	7:56 AM	Sideswipe, same direction	Property damage only		Wet	Daylight	Unknown	Peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	Other improper action
18	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 / Lewis Street	3352306	2013-02-07	11:49 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	Made improper turn
19	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 E / Lewis Street	3367591	2013-03-05	11:10 AM	Rear-end	Non-fatal injury		Dry	Daylight	Unknown	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Driving too fast for conditions
20	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 E / Lewis Street	3491634	2013-06-29	6:55 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Unknown	Peak	V1:Not reported / V2:Eastbound	V1: Not reported / V2:Travelling straight ahead	
21	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 E / Lewis Street	3588785	2013-09-13	1:30 AM	Sideswipe, same direction	Non-fatal injury		Wet	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning right	No improper action
22	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 W / Lewis Street	3600677	2013-09-26	3:10 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead / V3:Travelling straight ahead	Follow too closely
23	Route 16 at Lewis Street	Silver Fox	3605474	2013-09-27	8:45 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
24	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 W / Lewis Street	3735568	2014-02-07	8:55 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Other improper action
25	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 W / Lewis Street	3802764	2014-05-17	7:20 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
26	Route 16 at Lewis Street	Rte 16 W / Lewis Street	3818280	2014-05-27	10:20 AM	Angle	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
27	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 W / Lewis Street	3963162	2014-10-08	5:20 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	Inattention
28	Route 16 at Lewis Street	Revere Beach Parkway Rte 16 E / Lewis Street	3974593	2014-11-12	10:15 AM	Angle	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	No improper action
29	Route 16 at Lewis Street	Lewis Street / Revere Beach Parkway Rte Sr16 E	4010793	2015-02-15	11:20 AM	Angle	Property damage only	ped	Snow/Ice	Daylight	Snow	Off-peak	V1:Eastbound / V2:Northbound	V1: Overtaking/passing / V2:Entering traffic lane	Driving too fast for conditions
30	Route 16 at Lewis Street	Rte 16 W / Lewis Street	4014986	2015-02-27	2:45 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound / V4:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	No improper action
31	Route 16 at Lewis Street	Lewis Street / Revere Beach Parkway Rte Sr16 E	4022740	2015-03-19	2:30 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	No improper action
32	Route 16 at Lewis Street	Rte 16 W / Lewis Street	4042230	2015-04-26	9:40 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Northbound / V2:Westbound	V1: Making U-turn / V2:Travelling straight ahead	Disregarding traffic signs
33	Route 16 at Lewis Street	Revere Beach Parkway Rte Sr16 E / Lewis Street	4058988	2015-06-09	7:28 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
34	Route 16 at Lewis Street	Revere Beach Parkway Rte Unknow W / Lewis Street	4060445	2015-07-05	4:49 PM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Turning left / V2:Overtaking/passing	No improper action
35	Route 16 at Lewis Street	Lewis Street / Revere Beach Parkway Rte Sr16 E	4089589	2015-09-08	1:25 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Northbound	V1: Travelling straight ahead	No improper action
36	Route 16 at Lewis Street	Revere Beach Parkway Rte Sr16 W / Lewis Street	4095539	2015-10-13	4:45 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Disregarding traffic signs
37	Route 16 at Lewis Street	Rte 16 E / Lewis Street	4120953	2015-11-19	5:00 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
38	Route 16 at Lewis Street	2066 Revere Beach Parkway	4142740	2016-01-24	8:25 PM	Single vehicle crash	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Over-correcting/over-
39	Route 16 at Lewis Street	Rte 16 W / Lewis Street	4151667	2016-02-13	7:12 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Disregarding traffic signs
40	Route 16 at Lewis Street	Lewis Street / Revere Beach Parkway Rte Sr16 E	4165491	2016-03-06	3:10 PM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
41	Route 16 at Lewis Street	Rte 16 E / Lewis Street	4169396	2016-03-25	2:00 AM	Angle	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
42	Route 16 at Lewis Street	Rte 16 W / Rte Lewis	4175972	2016-04-07	1:05 PM	Rear-end	Property damage only		Wet	Daylight	Rain	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Other improper action
43	Route 16 at Lewis Street	Richies Slush	4175964	2016-04-07	6:38 PM	Angle	Property damage only		Wet	Dusk	Rain	Peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Fail to yield right of way
44	Route 16 at Lewis Street	Richie's Slush	4201680	2016-04-28	9:50 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
45	Route 16 at Lewis Street	Revere Beach Parkway Rte Unknow E / Lewis Street	4187335	2016-05-07	11:02 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
46	Route 16 at Lewis Street	Lewis Street / Revere Beach Parkway Rte Sr16 E	4233999	2016-08-09	6:45 AM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Glare
47	Route 16 at Lewis Street	50 Feet W From Intersection Revere Beach Parkway Rte 16 E	4268188	2016-09-24	1:20 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound / V4:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	No improper action
48	Route 16 at Lewis Street	Revere Beach Parkway Rte Sr16 W / Lewis Street	4311618	2016-12-20	9:08 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Other improper action
49	Route 16 btwn Lewis and Second	Revere Beach Parkway Rte 16 / Lewis Street	3396240	2013-04-16	6:45 PM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Travelling straight ahead	
50	Route 16 btwn Lewis and Second	D'Angelo	3465050	2013-06-08	11:40 AM	Angle	Property damage only		Dry	Daylight	Unknown	Off-peak	V1:Not reported / V2:Not reported	V1: Other / V2:Not reported	



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51	Route 16 btwn Lewis and Second	Revere Beach Parkway Rte 16 E / Lewis Street	3737850	2014-02-07	8:20 AM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound	V1: Travelling straight ahead	No improper action
52	Route 16 btwn Lewis and Second	100 Feet W From Intersection Revere Beach Parkway Rte 16	4237717	2016-08-23	6:58 PM	Single vehicle crash	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Northbound	V1: Travelling straight ahead	Other improper action



SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [Trapezoid] Parked Vehicle	↔↔ Head On	↔ Sideswipe	○ Injury Accident	⊙ Fatal Accident
↔ Backing Vehicle	→ [Square] Fixed Object	↘↙ Angle	⌀ Out of Control		
- - - Non-Involved Vehicle	→ [Bicycle] Bicycle	→ Rear End			
→ [Stick Figure] Pedestrian	→ [Animal] Animal				

**Figure 2**  
Collision Diagram: 2012–16 Police Data

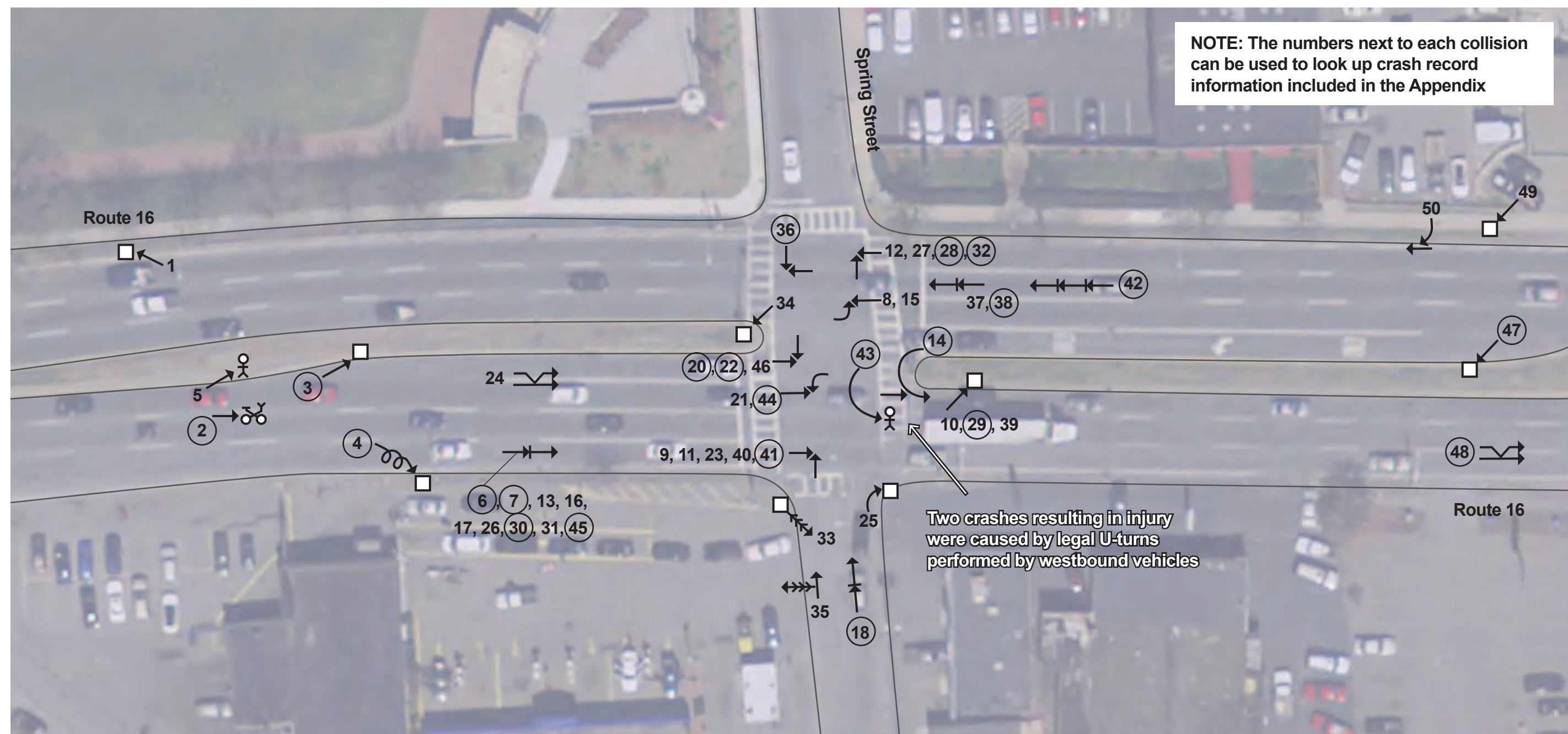


Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 at Second Street	Second Street / Revere Beach Parkway Rte 16 W	2922179	2012-02-17	3:10 PM	Rear-end	Property damage only		Dry	Daylight	Unknown	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Follow too closely
2	Route 16 at Second Street	Second Street	3378020	2012-03-08	3:02 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Inattention
3	Route 16 at Second Street	Town Fair Tire	3378024	2012-03-17	9:51 AM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
4	Route 16 at Second Street	Rte 16 / Second Street	3065665	2012-04-23	8:26 PM	Angle	Not Reported		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Not reported	V1: Travelling straight ahead / V2:Not reported	
5	Route 16 at Second Street	Revere Beach Parkway Rte 16 / Second Street	3044644	2012-04-23	9:15 PM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Inattention
6	Route 16 at Second Street	Rte 16 E / Garvey Street	3138859	2012-06-17	2:43 AM	Rear-end	Not Reported		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	
7	Route 16 at Second Street	Revere Beach Parkway Rte 16 / Garvey Street	3153380	2012-06-17	10:42 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
8	Route 16 at Second Street	Revere Beach Parkway Rte 16 W / Second Street	3241178	2012-07-14	8:53 PM	Angle	Non-fatal injury	ped	Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound	V1: Turning right	Fail to yield right of way
9	Route 16 at Second Street	Revere Beach Parkway Rte 16 / Garvey Street	3278620	2012-10-14	4:50 AM	Angle	Property damage only		Wet	Dark - lighted roadway	Unknown	Off-peak	V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
10	Route 16 at Second Street	Revere Beach Parkway Rte 16 W / Second Street	3293155	2012-11-19	2:45 PM	Rear-end	Property damage only		Dry	Daylight	Unknown	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Erratic or reckless
11	Route 16 at Second Street	Revere Beach Parkway Rte 16 E / Second Street	3322360	2012-12-21	6:29 AM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Unknown	Peak	V1:Eastbound / V2:Eastbound	V1: Turning right / V2:Travelling straight ahead	Fail to yield right of way
12	Route 16 at Second Street	Car Wash	3391096	2013-01-04	6:25 AM	Rear-end	Property damage only		Dry	Dawn	Unknown	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
13	Route 16 at Second Street	Revere Beach Parkway Rte 16 E / Second Street	3356228	2013-02-18	5:05 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	Disregarding traffic signs
14	Route 16 at Second Street	Dangelos	3369629	2013-03-16	8:39 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	No improper action
15	Route 16 at Second Street	Revere Beach Parkway Rte 16 E / Second Street	3381598	2013-03-25	7:10 AM	Angle	Property damage only		Dry	Daylight	Unknown	Peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
16	Route 16 at Second Street	Gallery K Pklot	3414416	2013-04-08	9:45 AM	Single vehicle crash	Unknown		Dry	Daylight	Clear	Peak	V1:Not reported	V1: Not reported	
17	Route 16 at Second Street	Revere Beach Parkway Rte 16 / Second Street	3396790	2013-04-19	12:04 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
18	Route 16 at Second Street	Revere Beach Parkway Rte 16 W / Second Street	3484058	2013-06-17	3:10 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
19	Route 16 at Second Street	Revere Beach Parkway / Second Street	3511215	2013-07-03	4:45 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Entering traffic lane / V2:Travelling straight ahead	
20	Route 16 at Second Street	Rte 16 E / Garvey Street	3508947	2013-07-07	2:25 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
21	Route 16 at Second Street	Revere Beach Parkway Rte 16 E / Lewis Street	3591065	2013-09-07	3:55 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Operating defective
22	Route 16 at Second Street	Revere Beach Parkway Rte 16 E / Garvey Street	3736079	2014-02-07	12:00 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
23	Route 16 at Second Street	Town Fair Tire	3789983	2014-04-05	1:15 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
24	Route 16 at Second Street	Rte 16 E / Second Street	3793957	2014-04-27	7:34 PM	Rear-end	Non-fatal injury		Wet	Daylight	Rain	Off-peak	V1:Southbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
25	Route 16 at Second Street	Revere Beach Parkway Rte Sr16 W / Second Street	3808677	2014-05-03	11:15 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	No improper action

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
26	Route 16 at Second Street	Rte 16 E / Second Street	3804375	2014-05-17	8:50 AM	Angle	Non-fatal injury		Wet	Daylight	Unknown	Peak	V1:Northbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
27	Route 16 at Second Street	Revere Beach Parkway Rte 16 / Second Street	3847258	2014-06-13	7:40 AM	Angle	Non-fatal injury		Wet	Daylight	Cloudy	Peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	No improper action
28	Route 16 at Second Street	Town Fair Tire	3880605	2014-07-13	2:38 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Other improper action
29	Route 16 at Second Street	Revere Beach Parkway Rte 16 W / Second Street	3909135	2014-08-08	8:40 PM	Angle	Non-fatal injury	cyc	Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound	V1: Turning right	
30	Route 16 at Second Street	Revere Beach Parkway Rte 16 E / Second Street	3924500	2014-08-27	5:25 PM	Rear-end	Non-fatal injury		Dry	Daylight	Unknown	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
31	Route 16 at Second Street	Revere Beach Parkway / Second Street	3954787	2014-09-12	11:00 AM	Head-on	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Not reported	V1: Turning right / V2:Turning left	
32	Route 16 at Second Street	Revere Beach Parkway Rte 16 / Second Street	3975331	2014-10-24	7:30 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
33	Route 16 at Second Street	Revere Beach Parkway Rte 16 W / Second Street	3980307	2014-11-24	8:46 AM	Rear-to-rear	Property damage only		Wet	Daylight	Rain	Peak	V1:Northbound / V2:Northbound	V1: Backing / V2:Slowing or stopped in traffic	Other improper action
34	Route 16 at Second Street	Revere Beach Parkway Rte Sr16 W / Second Street	3990196	2014-12-19	12:00 AM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
35	Route 16 at Second Street	Revere Beach Parkway Rte 16 E / Second Street	3988343	2014-12-29	12:35 PM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
36	Route 16 at Second Street	Revere Beach Parkway Rte 16 E / Garvey Street	3992669	2015-01-06	7:55 PM	Rear-end	Non-fatal injury		Snow/Ice	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Follow too closely
37	Route 16 at Second Street	Rte 16 W / Second Street	4011143	2015-01-28	7:20 PM	Angle	Non-fatal injury		Wet	Dark - lighted roadway	Clear	Off-peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
38	Route 16 at Second Street	Revere Beach Parkway Rte Sr16 W / Second Street	4040457	2015-04-12	1:52 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
39	Route 16 at Second Street	Revere Beach Parkway Rte Sr16 W / Second Street	4034662	2015-04-15	3:40 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Other improper action
40	Route 16 at Second Street	Revere Beach Parkway Rte Sr16 W / Second Street	4037189	2015-04-16	12:50 PM	Angle	Non-fatal injury		Dry	Daylight	Cloudy	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
41	Route 16 at Second Street	Rte 16 / Second Street	4069105	2015-08-01	11:50 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Southbound / V3:Northbound / V4:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead / V4:Travelling straight ahead	Disregarding traffic signs
42	Route 16 at Second Street	Rte 16 / Second Street	4068686	2015-08-02	12:15 AM	Head-on	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	Erratic or reckless
43	Route 16 at Second Street	Second Street / Revere Beach Parkway Rte Sr16 E	4074145	2015-08-06	8:45 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
44	Route 16 at Second Street	Revere Beach Parkway Rte Sr16 W / Second Street	4075506	2015-08-16	9:45 AM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Other improper action
45	Route 16 at Second Street	Rte 16 W / Second Street	4092650	2015-09-30	5:35 PM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
46	Route 16 at Second Street	Second Street / Revere Beach Parkway Rte Sr16 E	4104139	2015-10-15	12:31 PM	Head-on	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	
47	Route 16 at Second Street	Second Street / Revere Beach Parkway Rte Sr16 E	4099907	2015-10-22	6:10 AM	Angle	Property damage only		Dry	Dawn	Cloudy	Peak	V1:Eastbound / V2:Northbound	V1: Entering traffic lane / V2:Travelling straight ahead	Disregarding traffic signs
48	Route 16 at Second Street	Second Street / Revere Beach Parkway Rte Sr16 E	4118710	2015-12-04	4:35 AM	Angle	Property damage only		Dry	Dawn	Clear	Off-peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
49	Route 16 at Second Street	Garvey Street / Revere Beach Parkway Rte Sr16 E	4128720	2015-12-20	6:40 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Westbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	
50	Route 16 at Second Street	Second Street / Revere Beach Parkway Rte Sr16 E	4183083	2016-04-09	12:45 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	No improper action



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
51	Route 16 at Second Street	Revere Beach Parkway Rte Sr16 E / Second Street	4173882	2016-04-09	7:30 PM	Sideswipe, same direction	Property damage only		Dry	Not reported	Unknown	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Changing lanes	No improper action
52	Route 16 at Second Street	Town Fair Tire	4218800	2016-06-11	12:05 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Inattention
53	Route 16 at Second Street	Revere Beach Parkway Rte Sr16 W / Second Street	4229660	2016-07-29	7:00 PM	Angle	Property damage only		Dry	Daylight	Unknown	Peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
54	Route 16 at Second Street	Rte 16 E / Spring Street	4245154	2016-08-27	9:35 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
55	Route 16 at Second Street	Revere Beach Parkway Rte Sr16 E / Second Street	4242272	2016-09-04	3:35 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound	V1: Not reported	Erratic or reckless
56	Route 16 at Second Street	Rte 16 E / Second Street	4252081	2016-09-07	1:25 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
57	Route 16 at Second Street	Second Street / Revere Beach Parkway Rte Sr16 E	4263054	2016-10-01	5:15 AM	Angle	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
58	Route 16 at Second Street	Rte 16 E / Second Street	4294976	2016-11-20	1:20 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Follow too closely
59	Route 16 at Second Street	Second Street / Revere Beach Parkway Rte Sr16 E	4311658	2016-12-01	6:48 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	No improper action
60	Route 16 at Second Street	Rte 16 E / Garvey Street	4311678	2016-12-07	2:40 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Unknown	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
61	Route 16 at Second Street	Second Street / Revere Beach Parkway Rte Sr16 E	4311733	2016-12-24	1:40 PM	Rear-to-rear	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Backing	No improper action



SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [Trapezoid] Parked Vehicle	↔↔ Head On	↔ Sideswipe	○ Injury Accident	◉ Fatal Accident
↔ Backing Vehicle	→ [Square] Fixed Object	→↔ Angle	↻ Out of Control		
- - - Non-Involved Vehicle	→ [Bicycle] Bicycle	→↔ Rear End			
→ [Stick Figure] Pedestrian	→ [Animal] Animal				

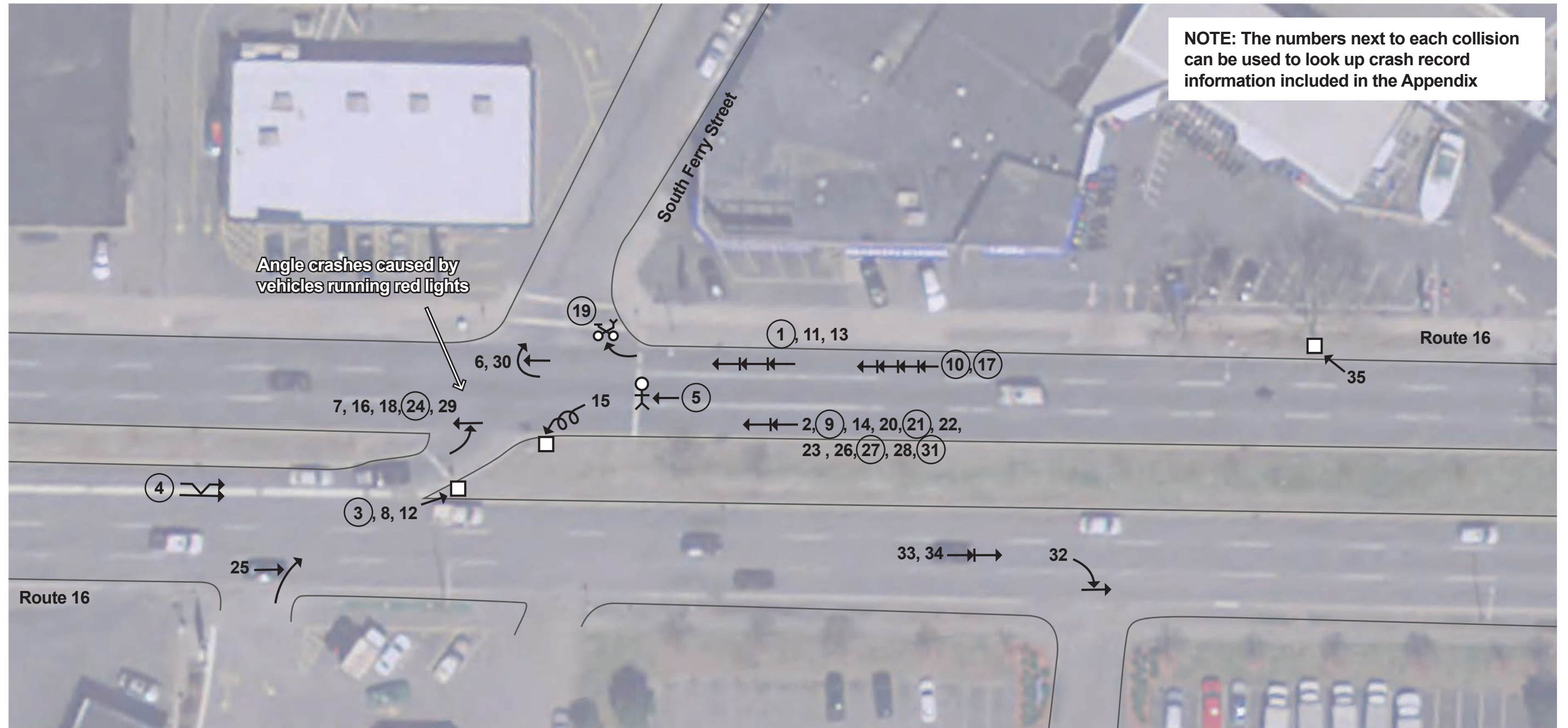
**Figure 3**  
Collision Diagram: 2012–16 Police Data



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 btwn Second and Spring	Revere Beach Parkway Rte 16 E / Second Street	3370375	2013-03-12	9:45 PM	Single vehicle crash	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound	V1: Travelling straight ahead	No improper action
2	Route 16 btwn Second and Spring	Revere Beach Parkway Rte 16 E / Second Street	3453010	2013-06-04	12:00 AM	Single vehicle crash	Non-fatal injury	cyc	Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Inattention
3	Route 16 btwn Second and Spring	Car Wash	3968119	2014-03-30	2:34 AM	Single vehicle crash	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Erratic or reckless
4	Route 16 btwn Second and Spring	Revere Beach Parkway Rte 16 / Second Street	3800665	2014-05-09	4:20 AM	Single vehicle crash	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Fatigued/Sleep
5	Route 16 btwn Second and Spring	Revere Beach Parkway Rte 16 E / Second Street	4119055	2015-12-02	12:15 AM	Single vehicle crash	Property damage only	ped	Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound	V1: Travelling straight ahead	No improper action
6	Route 16 at Spring Street	Rte 16 / Spring Street	3074858	2012-05-08	6:57 PM	Rear-end	Not Reported		Wet	Daylight	Rain	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	
7	Route 16 at Spring Street	@ Spring	3229290	2012-08-04	6:20 PM	Rear-end	Non-fatal injury		Dry	Daylight	Unknown	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Follow too closely
8	Route 16 at Spring Street	Revere Beach Parkway Rte 16 / Spring Street	3235152	2012-08-08	3:20 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	Disregarding traffic signs
9	Route 16 at Spring Street	Revere Beach Parkway Rte 16 / Spring Street	3346800	2013-01-26	7:56 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
10	Route 16 at Spring Street	Everett Stadium	3384428	2013-02-12	7:45 AM	Single vehicle crash	Property damage only		Wet	Daylight	Unknown	Peak	V1:Eastbound	V1: Turning left	
11	Route 16 at Spring Street	Revere Beach Parkway Rte 16 E / Spring Street	3388956	2013-04-03	8:45 AM	Angle	Property damage only		Dry	Daylight	Unknown	Peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
12	Route 16 at Spring Street	Revere Beach Parkway Rte 16 W / Spring Street	3423293	2013-05-18	6:45 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
13	Route 16 at Spring Street	Rte 16 / Spring Street	3434056	2013-05-30	10:52 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
14	Route 16 at Spring Street	Revere Beach Parkway Rte 16 E / Spring Street	3475907	2013-06-19	8:39 AM	Angle	Non-fatal injury		Dry	Daylight	Unknown	Peak	V1:Southbound / V2:Eastbound	V1: Making U-turn / V2:Travelling straight ahead	Fail to yield right of way
15	Route 16 at Spring Street	Revere Beach Parkway Rte 16 / Spring Street	3484249	2013-06-20	12:30 PM	Angle	Property damage only		Dry	Daylight	Unknown	Off-peak	V1:Northbound / V2:Westbound	V1: Turning left / V2:Turning right	
16	Route 16 at Spring Street	Revere Beach Parkway Rte 16 / Spring Street	3668232	2013-11-18	5:05 PM	Rear-end	Property damage only		Dry	Dusk	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Follow too closely
17	Route 16 at Spring Street	Revere Beach Parkway Rte 16 / Spring Street	3665834	2013-11-18	11:40 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
18	Route 16 at Spring Street	Spring St @ Rt 16 Eb	3743820	2013-12-10	12:05 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Follow too closely
19	Route 16 at Spring Street	Revere Beach Parkway Rte 16 W / Spring Street	3800825	2014-04-21	9:43 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Other improper action
20	Route 16 at Spring Street	Revere Beach Parkway Rte 16 E / Spring Street	3852786	2014-06-11	9:35 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
21	Route 16 at Spring Street	Revere Beach Parkway Rte 16 E / Spring Street	3896236	2014-07-31	10:00 AM	Angle	Property damage only		Dry	Daylight	Unknown	Peak	V1:Southbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	Disregarding traffic signs
22	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 E / Spring Street	3962125	2014-10-03	7:10 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Glare
23	Route 16 at Spring Street	Revere Beach Parkway Rte 16 E / Spring Street	3972923	2014-10-18	10:30 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
24	Route 16 at Spring Street	Revere Beach Parkway Rte 16 E / Spring Street	3989852	2014-12-23	4:45 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Travelling straight ahead	Made improper turn
25	Route 16 at Spring Street	Revere Beach Parkway Rte 16 / Spring Street	3994657	2015-01-09	3:35 PM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound	V1: Turning right	Failure to keep in proper lane

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
26	Route 16 at Spring Street	Rte 16 E / Spring Street	4018353	2015-02-28	5:45 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
27	Route 16 at Spring Street	Rte 16 / Spring Street	4026952	2015-03-11	1:00 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
28	Route 16 at Spring Street	Everett Stadium	4030676	2015-04-07	5:35 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
29	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 E / Spring Street	4059080	2015-07-03	10:30 PM	Single vehicle crash	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Failure to keep in proper lane
30	Route 16 at Spring Street	Rte 16 / Spring Street	4074360	2015-08-16	2:00 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Distracted
31	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 E / Spring Street	4076696	2015-08-22	10:15 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
32	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 W / Spring Street	4078802	2015-08-29	5:00 AM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
33	Route 16 at Spring Street	Rte 16 E / Spring Street	4093716	2015-09-30	12:32 PM	Single vehicle crash	Property damage only		Wet	Daylight	Cloudy	Off-peak	V1:Eastbound	V1: Backing	Other improper action
34	Route 16 at Spring Street	Revere Beach Parkway Rte 16 W / Spring Street	4126405	2015-12-18	6:20 PM	Single vehicle crash	Property damage only		Wet	Dark - lighted roadway	Unknown	Peak	V1:Westbound	V1: Travelling straight ahead	Cellphone
35	Route 16 at Spring Street	Car Wash	4183563	2016-02-28	12:30 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Northbound	V1: Backing / V2:Slowing or stopped in traffic	
36	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 W / Spring Street	4180024	2016-04-18	6:45 AM	Angle	Non-fatal injury		Dry	Daylight	Unknown	Peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
37	Route 16 at Spring Street	Rte 16 W / Spring Street	4195699	2016-05-25	2:30 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
38	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 W / Spring Street	4201677	2016-05-29	3:35 PM	Rear-end	Non-fatal injury		Dry	Daylight	Cloudy	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
39	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 W / Spring Street	4218718	2016-05-31	7:40 AM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Travelling straight ahead	Fatigued/Sleep
40	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 E / Spring Street	4204859	2016-06-07	9:45 PM	Angle	Property damage only		Wet	Dark - roadway not	Rain	Off-peak	V1:Eastbound / V2:Northbound / V3:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Slowing or stopped in traffic	Disregarding traffic signs
41	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 E / Spring Street	4219963	2016-06-22	7:00 AM	Angle	Non-fatal injury		Dry	Daylight	Unknown	Peak	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Inattention
42	Route 16 at Spring Street	150 Feet W From Intersection Revere Beach Parkway Rte 16	4219965	2016-06-22	7:30 AM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	No improper action
43	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 E / Spring Street	4221878	2016-06-29	2:20 PM	Single vehicle crash	Non-fatal injury	ped	Dry	Daylight	Clear	Off-peak	V1:Eastbound	V1: Making U-turn	No improper action
44	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 E / Spring Street	4229669	2016-08-04	7:28 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	No improper action
45	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 E / Spring Street	4270352	2016-10-17	7:55 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Distracted
46	Route 16 at Spring Street	Revere Beach Parkway Rte Sr16 E / Spring Street	4311642	2016-11-26	12:28 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Entering traffic lane	No improper action
47	Route 16 btwn Spring and S. Ferry	Revere Beach Parkway Rte Sr16 W / South Ferry Street	3786204	2014-04-07	10:40 PM	Single vehicle crash	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound	V1: Leaving traffic lane	Failure to keep in proper lane
48	Route 16 btwn Spring and S. Ferry	@ Dunkin Donuts	3993961	2014-11-26	12:35 PM	Sideswipe, same direction	Non-fatal injury		Wet	Daylight	Rain	Off-peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Travelling straight ahead	Inattention
49	Route 16 btwn Spring and S. Ferry	1919 Revere Beach Parkway Rte 16 W / 1919 South Ferry Street	4092278	2015-09-24	11:03 AM	Single vehicle crash	Property damage only		Dry	Daylight	Unknown	Off-peak	V1:Southbound	V1: Turning right	Made improper turn
50	Route 16 btwn Spring and S. Ferry	100 Feet W From Intersection Revere Beach Parkway Rte 16	4315295	2016-12-29	12:05 PM	Angle	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning right	No improper action





SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [Trapezoid] Parked Vehicle	↔↔↔ Head On	↔↔↔ Sideswipe	○ Injury Accident	○ Fatal Accident
↔↔↔ Backing Vehicle	→ [Square] Fixed Object	↔↔↔ Angle	↔↔↔ Out of Control		
- - - - - Non-Involved Vehicle	→ [Bicycle] Bicycle	→↔↔ Rear End			
→ [Stick Figure] Pedestrian	→ [Animal] Animal				

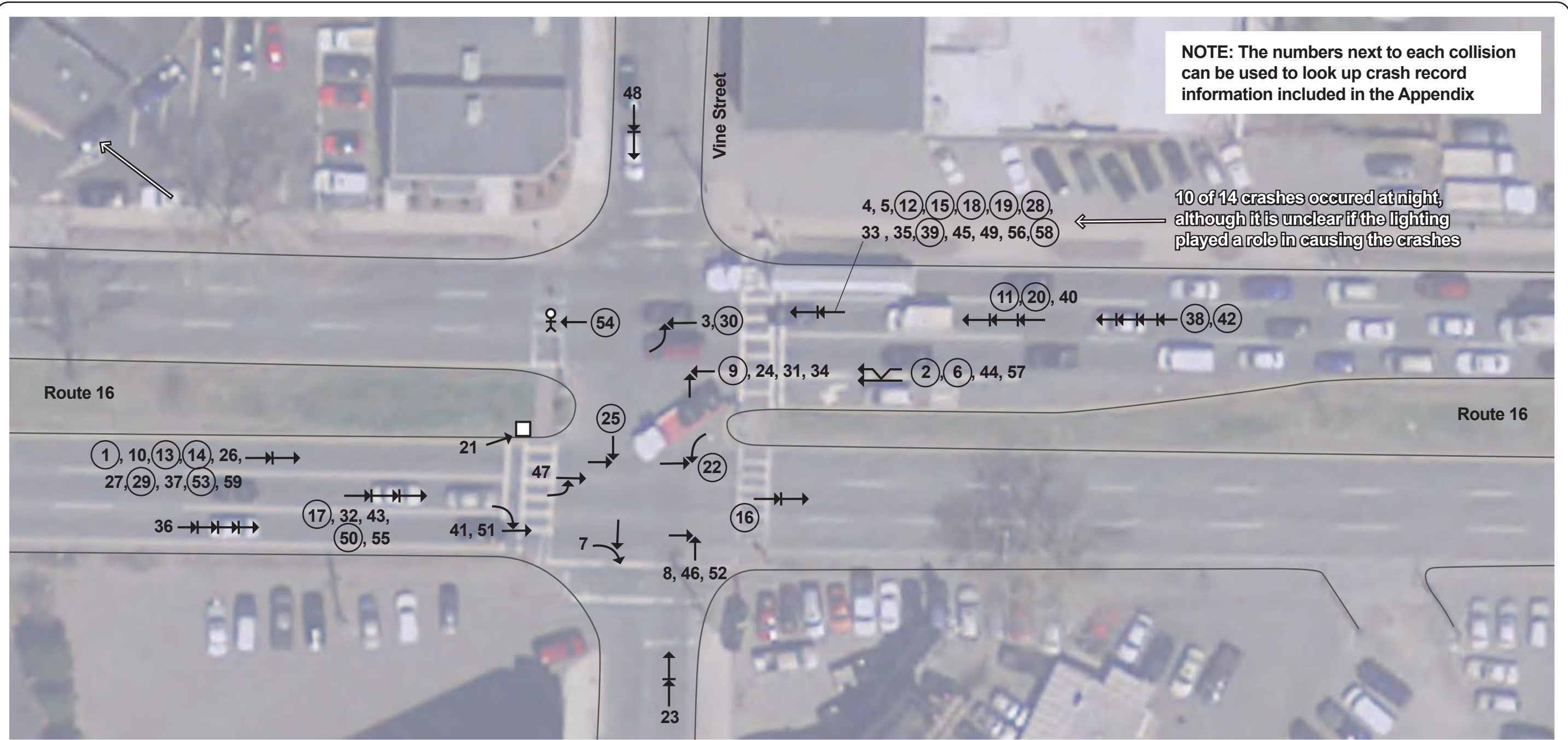
**Figure 4**  
Collision Diagram: 2012–16 Police Data



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 at South Ferry Street	By Pep Boys	3378015	2012-03-02	6:55 PM	Rear-end	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Inattention
2	Route 16 at South Ferry Street	Suzuki Dealership	3376025	2012-04-20	4:38 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
3	Route 16 at South Ferry Street	Revere Beach Parkway Rte 16 E / South Ferry Street	3150151	2012-06-19	1:34 PM	Single vehicle crash	Not Reported		Dry	Daylight	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	
4	Route 16 at South Ferry Street	Revere Beach Parkway Rte 16 E / South Ferry Street	3282061	2012-10-21	11:07 AM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Travelling straight ahead	Other improper action
5	Route 16 at South Ferry Street	@ Parkway Cycle	3309833	2012-11-15	5:25 PM	Single vehicle crash	Non-fatal injury	ped	Dry	Dark - lighted roadway	Clear	Peak	V1:Westbound	V1: Travelling straight ahead	Fail to yield right of way
6	Route 16 at South Ferry Street	Revere Beach Parkway Rte 16 W / South Ferry Street	3299689	2012-12-08	10:45 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning right	No improper action
7	Route 16 at South Ferry Street	Revere Beach Parkway Rte 16 W / South Ferry Street	3363523	2013-02-28	5:00 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Disregarding traffic signs
8	Route 16 at South Ferry Street	Revere Beach Parkway Rte 16 / South Ferry Street	3377087	2013-03-30	1:28 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Turning left	Failure to keep in proper lane
9	Route 16 at South Ferry Street	Rte 16 W / South Ferry Street	3560800	2013-08-13	9:15 PM	Rear-end	Non-fatal injury		Dry	Dusk	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Heart Condition/Epile
10	Route 16 at South Ferry Street	Revere Beach Parkway Rte 16 W / South Ferry Street	3725518	2014-01-28	6:42 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Distracted
11	Route 16 at South Ferry Street	Revere Beach Parkway Rte 16 W / South Ferry Street	3801642	2014-04-26	12:10 PM	Rear-end	Property damage only		Wet	Daylight	Rain	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	No improper action
12	Route 16 at South Ferry Street	Revere Beach Parkway Rte 16 E / South Ferry Street	3804376	2014-05-20	1:30 AM	Single vehicle crash	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Failure to keep in proper lane
13	Route 16 at South Ferry Street	Revere Beach Parkway Rte 16 W / South Ferry Street	3978694	2014-11-26	6:20 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	Other improper action
14	Route 16 at South Ferry Street	Revere Beach Parkway Rte Sr16 W / South Ferry Street	3977878	2014-11-27	10:49 PM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Snow	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Disregarding traffic signs
15	Route 16 at South Ferry Street	South Ferry St.	4020720	2015-03-11	6:10 AM	Single vehicle crash	Property damage only		Wet	Dark - lighted roadway	Cloudy	Peak	V1:Westbound	V1: Travelling straight ahead	Operating defective
16	Route 16 at South Ferry Street	South Ferry Street / Revere Beach Parkway Rte Sr16 W	4027866	2015-04-01	6:55 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
17	Route 16 at South Ferry Street	Parkway Cycle	4060456	2015-07-10	5:08 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound / V3:Westbound / V4:Westbound /	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	No improper action
18	Route 16 at South Ferry Street	South Ferry Street / Revere Beach Parkway Rte Sr16 W	4063365	2015-07-15	5:44 PM	Angle	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
19	Route 16 at South Ferry Street	By Parkway Cycle	4082964	2015-09-05	1:00 AM	Sideswipe, same direction	Non-fatal injury	cyc	Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	
20	Route 16 at South Ferry Street	Parkway Cycle	4139567	2016-01-19	5:57 AM	Rear-end	Property damage only		Snow/Ice	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
21	Route 16 at South Ferry Street	Rte 16 E / South Ferry Street	4143048	2016-01-24	12:30 PM	Rear-end	Non-fatal injury		Dry	Daylight	Cloudy	Off-peak	V1:Not reported / V2:Not reported	V1: Not reported / V2:Not reported	
22	Route 16 at South Ferry Street	Parkway Cycles	4169163	2016-03-20	5:49 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
23	Route 16 at South Ferry Street	Parkway Cycle	4169394	2016-03-25	1:15 AM	Rear-end	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	No improper action
24	Route 16 at South Ferry Street	Revere Beach Parkway Rte Sr16 E / South Ferry Street Rte South	4180777	2016-04-24	8:50 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	
25	Route 16 at South Ferry Street	0 Feet W From Intersection South Ferry Street	4187423	2016-04-29	5:15 PM	Angle	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Northbound / V2:Eastbound	V1: Changing lanes / V2:Travelling straight ahead	Failure to keep in proper lane

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
26	Route 16 at South Ferry Street	South Ferry Street / Revere Beach Parkway Rte Sr16 W	4266790	2016-10-18	8:50 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
27	Route 16 at South Ferry Street	South Ferry Street / Revere Beach Parkway Rte Sr16 W	4276155	2016-10-27	7:45 PM	Rear-end	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Follow too closely
28	Route 16 at South Ferry Street	South Ferry Street / Revere Beach Parkway Rte Sr16 W	4285265	2016-11-08	7:20 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Other improper action
29	Route 16 at South Ferry Street	South Ferry Street / Revere Beach Parkway Rte Sr16 W	4293791	2016-11-19	7:55 PM	Angle	Property damage only		Wet	Dark - lighted roadway	Cloudy	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
30	Route 16 at South Ferry Street	South Ferry Street / Revere Beach Parkway Rte Sr16 W	4311644	2016-11-27	7:25 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	No improper action
31	Route 16 at South Ferry Street	Revere Beach Parkway Rte Unknow / South Ferry Street	4311690	2016-12-11	2:53 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
32	Route 16 btwn S. Ferry and Vine	Revere Beach Parkway Rte 16 W / Vine Street	3721201	2014-01-18	3:42 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Turning right / V2:Travelling straight ahead	Made improper turn
33	Route 16 btwn S. Ferry and Vine	Dunkin Donuts	4142729	2016-01-04	3:00 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Westbound / V2:Westbound	V1: Entering traffic lane / V2:Travelling straight ahead	Fail to yield right of way
34	Route 16 btwn S. Ferry and Vine	1886 Revere Beach Parkway Rte 16 E	4218717	2016-05-30	6:20 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
35	Route 16 btwn S. Ferry and Vine	At Parkway Cycle	4219943	2016-06-18	11:05 PM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Changing lanes	No improper action





**NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix**

**10 of 14 crashes occurred at night, although it is unclear if the lighting played a role in causing the crashes**

SYMBOLS		TYPES OF CRASH		SEVERITY	
Moving Vehicle Backing Vehicle Non-Involved Vehicle Pedestrian	Parked Vehicle Fixed Object Bicycle Animal	Head On Angle Rear End	Sideswipe Out of Control	Injury Accident	Fatal Accident

**Figure 5**  
**Collision Diagram: 2012–16 Police Data**



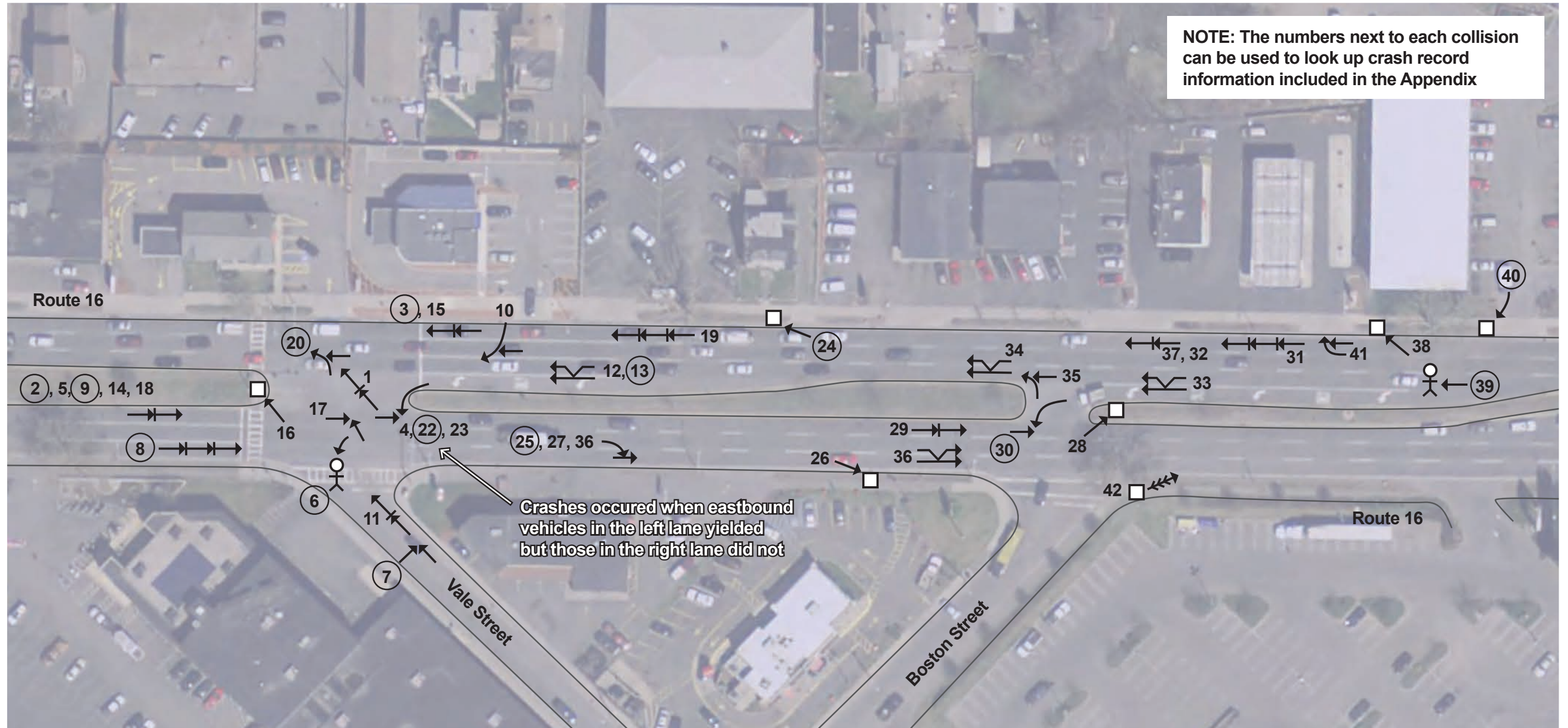


Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3068767	2012-05-01	11:10 AM	Rear-end	Not Reported		Wet	Daylight	Rain	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	
2	Route 16 at Vine Street	0 Feet E From Intersection Revere Beach Parkway Rte 16	3116223	2012-05-25	9:15 AM	Sideswipe, same direction	Not Reported		Dry	Daylight	Cloudy	Peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	
3	Route 16 at Vine Street	Revere Beach Parkway Rte 16 / Vine Street	3220422	2012-07-12	7:10 PM	Angle	Property damage only		Unknown	Not reported	Unknown	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	No improper action
4	Route 16 at Vine Street	Revere Beach Parkway Rte 16 W / Vine Street	3207732	2012-07-23	2:55 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
5	Route 16 at Vine Street	@Vine Street	3278619	2012-10-13	11:36 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Disregarding traffic signs
6	Route 16 at Vine Street	0 Feet E From Intersection Revere Beach Parkway Rte 16	3279363	2012-10-18	11:50 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	Other improper action
7	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3310194	2012-12-09	10:48 PM	Angle	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Southbound / V2:Southbound	V1: Turning right / V2:Travelling straight ahead	Disregarding traffic signs
8	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3322291	2012-12-18	8:15 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
9	Route 16 at Vine Street	Revere Beach Parkway Rte 16 W / Lewis Street	3346798	2013-01-23	10:08 AM	Angle	Non-fatal injury	ped	Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
10	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3392481	2013-04-12	12:00 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Not reported	V1: Slowing or stopped in traffic / V2:Not reported	No improper action
11	Route 16 at Vine Street	Revere Beach Parkway Rte 16 / Vine Street	3403068	2013-04-27	10:51 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	No improper action
12	Route 16 at Vine Street	Revere Beach Parkway Rte 16 W / Vine Street	3430448	2013-05-13	3:40 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
13	Route 16 at Vine Street	0 Feet W From Intersection Revere Beach Parkway Rte 16 E	3548341	2013-08-02	10:05 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
14	Route 16 at Vine Street	@ Vine St	3587252	2013-09-01	9:10 AM	Rear-end	Non-fatal injury		Dry	Daylight	Cloudy	Peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Slowing or stopped in traffic	Other improper action
15	Route 16 at Vine Street	Revere Beach Parkway Rte 16 W / Vine Street	3601443	2013-10-01	1:48 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
16	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3640969	2013-10-27	3:20 AM	Rear-end	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Follow too closely
17	Route 16 at Vine Street	Pep Boys	3665839	2013-11-22	9:25 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in traffic	Follow too closely
18	Route 16 at Vine Street	Rte 16 W / Vine Street	3721199	2014-01-16	3:20 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
19	Route 16 at Vine Street	1833 Revere Beach Parkway	3843931	2014-03-17	2:00 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Southbound	V1: Turning right / V2:Slowing or stopped in traffic	
20	Route 16 at Vine Street	Revere Beach Parkway Rte 16 / Vine Street	3773942	2014-03-18	12:00 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Slowing or stopped in traffic	No improper action
21	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3797785	2014-05-05	10:10 PM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Slowing or stopped in traffic	Inattention
22	Route 16 at Vine Street	Rte 16 E / Vine Street	3804318	2014-05-18	10:10 AM	Sideswipe, opposite	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	Disregarding traffic signs
23	Route 16 at Vine Street	Vine Street / Revere Beach Parkway	3886582	2014-06-12	3:00 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	
24	Route 16 at Vine Street	Revere Beach Parkway Rte 16 W / Vine Street	3866680	2014-06-28	2:19 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
25	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3922621	2014-08-25	6:40 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
26	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3924373	2014-08-28	5:15 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
27	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 E / Vine Street	3971361	2014-10-14	12:00 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Turning right / V2:Travelling straight ahead	No improper action
28	Route 16 at Vine Street	Revere Beach Parkway Rte 16 W / Vine Street	3975906	2014-11-10	9:50 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
29	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3977801	2014-11-22	2:23 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
30	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	3976527	2014-11-22	10:00 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Disregarding traffic signs
31	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4007246	2015-02-13	12:35 PM	Angle	Property damage only		Wet	Daylight	Clear	Off-peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
32	Route 16 at Vine Street	Revere Beach Parkway Rte Unknow E / Vine Street	4030673	2015-04-03	3:04 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	No improper action
33	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4031076	2015-04-09	1:45 AM	Rear-end	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Other improper action
34	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4039001	2015-04-21	2:00 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
35	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4047271	2015-05-25	2:30 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
36	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 E / Vine Street	4065806	2015-07-17	9:00 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound / V4:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Follow too closely
37	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 E / Vine Street	4067980	2015-07-25	6:10 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Fatigued/Sleep
38	Route 16 at Vine Street	0 Feet E From Intersection Rte 16 W / Vine Street	4081096	2015-08-30	9:40 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound / V4:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Follow too closely
39	Route 16 at Vine Street	Rte 16 W / Vine Street	4086747	2015-09-13	2:45 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Disregarding traffic signs
40	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4123008	2015-12-03	7:10 AM	Rear-end	Property damage only		Dry	Daylight	Unknown	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Other improper action
41	Route 16 at Vine Street	Vine Street / Revere Beach Parkway Rte Sr16 E	4128725	2015-12-28	3:30 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Turning right / V2:Travelling straight ahead	No improper action
42	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4135540	2016-01-09	12:15 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound / V4:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Other improper action
43	Route 16 at Vine Street	Revere Beach Parkway Rte 16 E / Vine Street	4139566	2016-01-15	8:40 PM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead / V3:Travelling straight ahead	Other improper action
44	Route 16 at Vine Street	Rte 16 W / Vine Street	4143065	2016-01-28	3:10 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
45	Route 16 at Vine Street	Revere Beach Parkway Rte 16 W / Vine Street	4155372	2016-02-23	10:25 PM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Follow too closely
46	Route 16 at Vine Street	Vine Street / Revere Beach Parkway Rte Sr16 E	4174744	2016-03-16	8:55 PM	Angle	Property damage only		Wet	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
47	Route 16 at Vine Street	Rte 16 E / Vine Street	4171138	2016-03-27	3:20 AM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Travelling straight ahead	Fail to yield right of way
48	Route 16 at Vine Street	Revere Beach Parkway Rte 16 / Vine Street	4197190	2016-05-18	8:10 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	
49	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4219873	2016-07-10	10:20 AM	Rear-end	Property damage only		Wet	Daylight	Rain	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Follow too closely
50	Route 16 at Vine Street	Revere Beach Parkway / Vine Street	4229839	2016-08-01	3:23 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Follow too closely

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
51	Route 16 at Vine Street	Vine Street / Revere Beach Parkway Rte Sr16 E	4245617	2016-08-20	9:50 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Turning right / V2:Travelling straight ahead	Made improper turn
52	Route 16 at Vine Street	Vine Street / Revere Beach Parkway Rte Sr16 E	4249185	2016-09-06	2:35 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
53	Route 16 at Vine Street	0 Feet W From Intersection Rte 16 E / Vine Street	4245843	2016-09-11	1:00 AM	Rear-end	Non-fatal injury		Wet	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
54	Route 16 at Vine Street	Vine Street / Revere Beach Parkway Rte Sr16 E	4255047	2016-09-19	9:50 AM	Angle	Non-fatal injury	ped	Dry	Daylight	Clear	Peak	V1:Westbound	V1: Turning left	No improper action
55	Route 16 at Vine Street	Vine Street / Revere Beach Parkway Rte Sr16 E	4264665	2016-10-14	3:00 PM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Inattention
56	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4284348	2016-11-05	8:20 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
57	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4311649	2016-11-29	2:30 PM	Sideswipe, same direction	Property damage only		Wet	Daylight	Rain	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Changing lanes / V3:Changing lanes	No improper action
58	Route 16 at Vine Street	Revere Beach Parkway Rte Sr16 W / Vine Street	4311689	2016-12-10	10:50 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
59	Route 16 at Vine Street	Vine Street / Revere Beach Parkway Rte Sr16 E	4321395	2016-12-24	2:40 PM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Not reported / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely

**NOTE:** The numbers next to each collision can be used to look up crash record information included in the Appendix



SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [trapezoid] Parked Vehicle	↔↔ Head On	↔ Sideswipe	○ Injury Accident	⊙ Fatal Accident
↔ Backing Vehicle	→ [square] Fixed Object	↘↙ Angle	↻ Out of Control		
- - - Non-Involved Vehicle	→ [bicycle] Bicycle	→ Rear End			
→ [stick figure] Pedestrian	→ [animal] Animal				

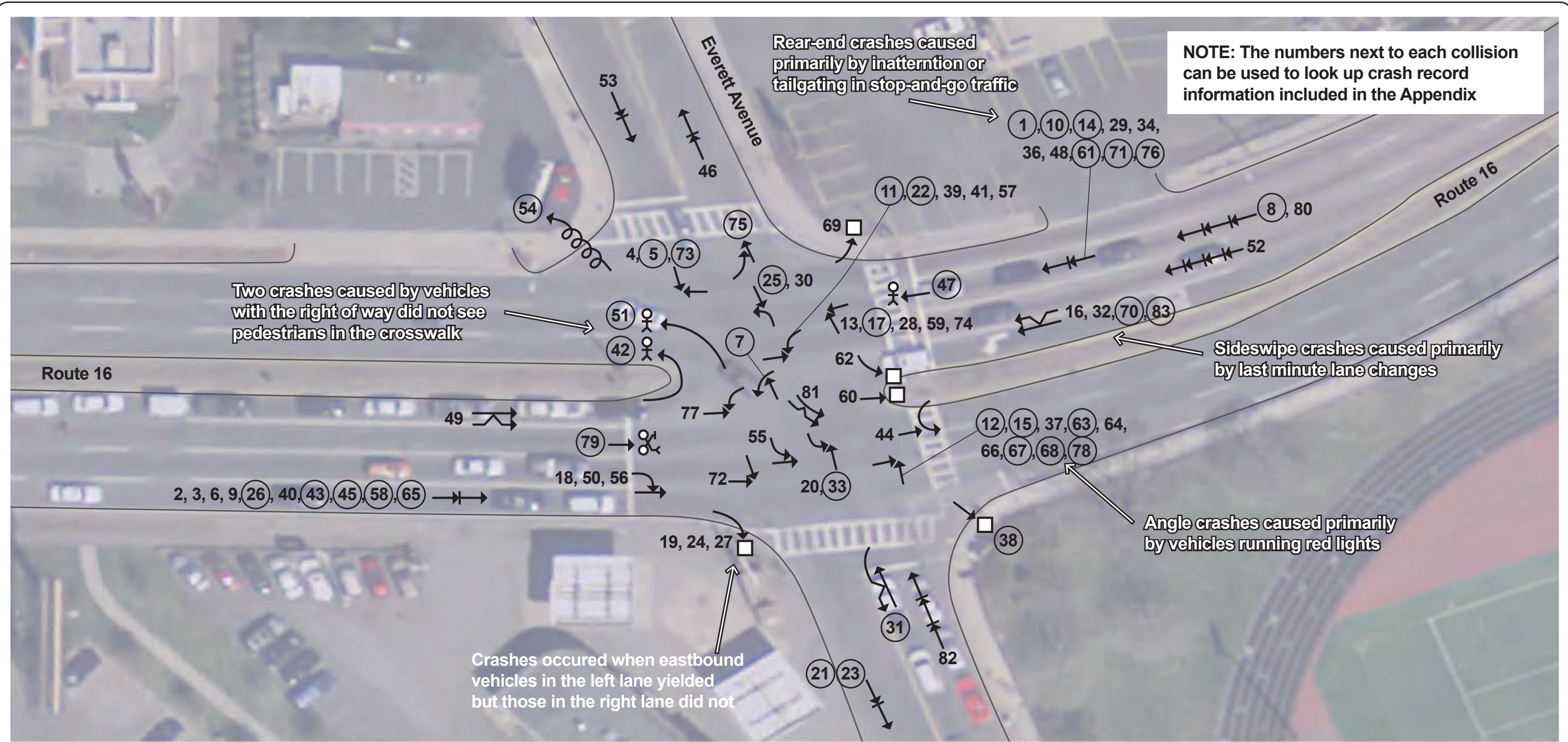
**Figure 6**  
Collision Diagram: 2012–16 Police Data





Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 at Vale Street	Revere Beach Parkway Rte 16 / Vale Street	3375850	2013-03-22	12:04 PM	Rear-end	Property damage only		Dry	Daylight	Unknown	Off-peak	V1:Northbound / V2:Northbound	V1: Backing / V2:Slowing or stopped in traffic	No improper action
2	Route 16 at Vale Street	Harley Davidson Dealership	3395084	2013-04-20	2:28 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	No improper action
3	Route 16 at Vale Street	Across From Harley Davidson	3532786	2013-07-19	9:07 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
4	Route 16 at Vale Street	Revere Beach Parkway Rte 16 E / Boston Street	3550020	2013-08-01	6:35 PM	Angle	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Southbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
5	Route 16 at Vale Street	Revere Beach Parkway Rte 16 E / Vale Street	3657961	2013-11-10	1:28 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
6	Route 16 at Vale Street	Valvoline Oil Change	3730894	2014-01-29	1:45 PM	Single vehicle crash	Non-fatal injury	ped	Dry	Daylight	Unknown	Off-peak	V1:Southbound	V1: Turning left	Glare
7	Route 16 at Vale Street	Vale St @ Route 16 East	3856866	2014-05-28	12:55 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Entering traffic lane / V2:Travelling straight ahead	Fail to yield right of way
8	Route 16 at Vale Street	Revere Beach Parkway Rte 16 E / Vine Street	3867493	2014-06-20	4:00 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	No improper action
9	Route 16 at Vale Street	0 Feet W From Intersection Revere Beach Parkway Rte 16 E	3926540	2014-08-28	4:50 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
10	Route 16 at Vale Street	Revere Beach Parkway Rte 16 W / Vale Street	3989088	2014-11-29	12:00 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Westbound	V1: Entering traffic lane / V2:Travelling straight ahead	Other improper action
11	Route 16 at Vale Street	Vale Street / Revere Beach Parkway	4030954	2014-12-09	5:50 PM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Rain	Peak	V1:Not reported / V2:Not reported	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	
12	Route 16 at Vale Street	0 Feet W From Intersection Revere Beach Parkway Rte 16	4045439	2015-04-28	12:05 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	Fail to yield right of way
13	Route 16 at Vale Street	Revere Beach Parkway Rte Sr16 W / Vale Street	4061435	2015-07-02	5:13 PM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Made improper turn
14	Route 16 at Vale Street	Revere Beach Parkway Rte 16 E / Vale Street	4093710	2015-09-13	3:05 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Not reported	V1: Slowing or stopped in traffic / V2:Not reported	No improper action
15	Route 16 at Vale Street	#1727 Rev. Bch. Pkwy.	4120260	2015-12-06	7:05 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Follow too closely
16	Route 16 at Vale Street	Vale Street / Revere Beach Parkway	4150792	2016-02-09	9:10 PM	Single vehicle crash	Property damage only		Snow/Ice	Dark - lighted roadway	Cloudy	Off-peak	V1:Northbound	V1: Travelling straight ahead	Erratic or reckless
17	Route 16 at Vale Street	Revere Beach Parkway Rte Sr16 E / Vale Street	4186581	2016-04-26	8:40 PM	Angle	Property damage only		Wet	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
18	Route 16 at Vale Street	Revere Beach Parkway Rte Sr16 E / Vale Street	4219999	2016-06-23	1:10 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
19	Route 16 at Vale Street	Revere Beach Parkway Rte Sr16 W / Vale Street	4234475	2016-08-05	10:25 AM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Slowing or stopped in traffic	No improper action
20	Route 16 at Vale Street	Revere Beach Parkway Rte Sr16 W / Vale Street	4250273	2016-09-13	4:15 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Westbound / V3:Southbound / V4:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Parked / V4:Parked	No improper action
22	Route 16 at Vale Street	Wendys	4255509	2016-09-24	1:20 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	No improper action
23	Route 16 at Vale Street	Revere Beach Parkway Rte Sr16 W / Vale Street	4311755	2016-12-30	6:00 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Eastbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	No improper action
24	Route 16 btwn Vale and Boston	Wendy's	2873743	2012-01-14	11:35 PM	Single vehicle crash	Non-fatal injury		Snow/Ice	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound	V1: Travelling straight ahead	Failure to keep in proper lane
25	Route 16 btwn Vale and Boston	Wendys	4058992	2015-06-10	6:00 PM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Unknown	Peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
26	Route 16 btwn Vale and Boston	@ Wendy'S	4059002	2015-06-14	3:10 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Not reported	Erratic or reckless

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
27	Route 16 btwn Vale and Boston	Revere Beach Parkway Rte 16 E / Vale Street	4108204	2015-11-04	6:45 AM	Sideswipe, same direction	Property damage only		Dry	Dawn	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Travelling straight ahead	Other improper action
28	Route 16 at Boston Street	Rte 16 E / Boston Street	3430447	2013-05-11	4:19 PM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Travelling straight ahead	No improper action
29	Route 16 at Boston Street	Revere Beach Parkway Rte 16 E / Boston Street	3537382	2013-05-21	12:10 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
30	Route 16 at Boston Street	Rte 16 E / Boston Street	3797319	2014-04-14	6:50 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
31	Route 16 at Boston Street	Autozone	3827998	2014-06-06	9:31 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Other improper action
32	Route 16 at Boston Street	Taco Bell	3878638	2014-07-13	8:22 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
33	Route 16 at Boston Street	Revere Beach Parkway Rte 16 / Everett Avenue	4002197	2015-01-20	1:33 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Unknown	Off-peak	V1:Westbound / V2:Westbound	V1: Turning left / V2:Turning left	Made improper turn
34	Route 16 at Boston Street	Revere Beach Parkway Rte Sr16 W / Boston Street	4059075	2015-07-02	4:30 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	Failure to keep in proper lane
35	Route 16 at Boston Street	Revere Beach Parkway / Boston Street	4118840	2015-11-17	10:55 AM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Made improper turn
36	Route 16 at Boston Street	1690 Revere Beach Parkway Rte 16 E	4175604	2016-01-20	7:55 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Overtaking/passing	
37	Route 16 at Boston Street	Taco Bell	4169111	2016-03-07	6:10 PM	Rear-end	Property damage only		Dry	Dusk	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
38	Route 16 btwn Boston and Everett	Taco Bell	3384421	2013-01-16	1:28 PM	Single vehicle crash	Property damage only		Wet	Daylight	Clear	Off-peak	V1:Westbound	V1: Travelling straight ahead	Physical impairment
39	Route 16 btwn Boston and Everett	Sunoco Gas	3507331	2013-06-30	9:30 PM	Single vehicle crash	Non-fatal injury	ped	Dry	Dark - roadway not	Cloudy	Off-peak	V1:Westbound	V1: Travelling straight ahead	No improper action
40	Route 16 btwn Boston and Everett	1683 Revere Beach Parkway	4056383	2015-01-09	6:46 PM	Single vehicle crash	Non-fatal injury		Wet	Dark - lighted roadway	Clear	Peak	V1:Not reported	V1: Turning right	
41	Route 16 btwn Boston and Everett	Taco Bell	4059037	2015-06-25	1:45 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Westbound / V2:Westbound	V1: Turning right / V2:Travelling straight ahead	Made improper turn
42	Route 16 btwn Boston and Everett	Revere Beach Parkway / Boston Street	4190613	2016-05-06	11:10 AM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound	V1: Backing	Visibility obstructed



**NOTE:** The numbers next to each collision can be used to look up crash record information included in the Appendix

SYMBOLS		TYPES OF CRASH		SEVERITY	
<ul style="list-style-type: none"> <li>→ Moving Vehicle</li> <li>← Backing Vehicle</li> <li>- - - Non-Involved Vehicle</li> <li>→ Pedestrian</li> </ul>	<ul style="list-style-type: none"> <li>→ [ ] Parked Vehicle</li> <li>→ [ ] Fixed Object</li> <li>→ [ ] Bicycle</li> <li>→ [ ] Animal</li> </ul>	<ul style="list-style-type: none"> <li>↔ Head On</li> <li>↘ ↙ Angle</li> <li>→ Rear End</li> </ul>	<ul style="list-style-type: none"> <li>↔ Sideswipe</li> <li>→ Out of Control</li> </ul>	<ul style="list-style-type: none"> <li>○ Injury Accident</li> <li>○ Fatal Accident</li> </ul>	

**Figure 7**  
Collision Diagram: 2012-16 Police Data



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	2915545	2012-02-15	8:25 AM	Rear-end	Non-fatal injury		Dry	Daylight	Cloudy	Peak	V1:Westbound / V2:Not reported / V3:Not reported / V4:Not reported	V1: Slowing or stopped in traffic / V2:Not reported / V3:Not reported / V4:Not reported	No improper action
2	Route 16 at Everett Avenue	@ Stop And Shop	2929078	2012-02-20	12:03 PM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Changing lanes	No improper action
3	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 / Everett Avenue	3168834	2012-03-04	9:40 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
4	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3168189	2012-03-05	7:35 AM	Angle	Property damage only		Dry	Daylight	Unknown	Peak	V1:Westbound / V2:Southbound	V1: Entering traffic lane / V2:Travelling straight ahead	Disregarding traffic signs
5	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3001193	2012-03-12	6:02 AM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
6	Route 16 at Everett Avenue	1691 Revere Beach Parkway Rte 16 E	3376013	2012-03-19	2:45 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
7	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3082034	2012-05-11	9:40 PM	Angle	Not Reported		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Southbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	
8	Route 16 at Everett Avenue	Revere Beach Parkway / Everett Avenue	3107244	2012-05-17	7:40 AM	Rear-end	Not Reported		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	
9	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 E / Everett Avenue	3201831	2012-07-22	1:01 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
10	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3221918	2012-07-25	9:54 AM	Rear-end	Non-fatal injury		Dry	Daylight	Unknown	Peak	V1:Southbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
11	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 E / Everett Avenue	3242487	2012-08-16	12:00 AM	Angle	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Northbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	No improper action
12	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 E / Everett Avenue	3376938	2012-08-23	12:00 AM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Eastbound / V3:Westbound / V4:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead / V4:Travelling straight ahead	Disregarding traffic signs
13	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3248876	2012-08-25	1:55 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
14	Route 16 at Everett Avenue	Revere Beach Parkway / Everett Avenue	3280528	2012-10-10	11:55 AM	Rear-end	Non-fatal injury		Wet	Daylight	Rain	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
15	Route 16 at Everett Avenue	By Everett Ave. Kfc	3376767	2012-11-05	8:33 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
16	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3293345	2012-11-14	5:20 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	Failure to keep in proper lane
17	Route 16 at Everett Avenue	0 Feet W From Intersection Revere Beach Parkway Rte 16 E	3364945	2013-03-06	3:20 AM	Angle	Non-fatal injury		Wet	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
18	Route 16 at Everett Avenue	Rte 16 E / Everett Avenue	3366659	2013-03-11	9:05 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Turning right / V2:Travelling straight ahead	Made improper turn
19	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 E / Everett Avenue	3404804	2013-05-03	11:00 AM	Single vehicle crash	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Southbound	V1: Turning right	Other improper action
20	Route 16 at Everett Avenue	Everett Avenue / Revere Beach Parkway	3427895	2013-05-19	9:35 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
21	Route 16 at Everett Avenue	Gas Station	3446044	2013-05-31	4:00 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
22	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3471550	2013-06-13	8:15 PM	Angle	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	Disregarding traffic signs
23	Route 16 at Everett Avenue	Stop And Shop	3510447	2013-06-17	9:00 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Not reported / V2:Not reported	V1: Turning right / V2:Not reported	
24	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 / Everett Avenue	3491568	2013-06-18	12:30 PM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound	V1: Turning right	No improper action
25	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 E / Everett Avenue	3561779	2013-08-02	5:54 AM	Head-on	Non-fatal injury		Dry	Daylight	Unknown	Off-peak	V1:Eastbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	No improper action



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
26	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 E / Everett Avenue	3588329	2013-09-14	12:00 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
27	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 E / Everett Avenue	3603380	2013-09-26	7:15 AM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Turning right	No improper action
28	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3623521	2013-10-27	5:25 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
29	Route 16 at Everett Avenue	Everett Avenue / Revere Beach Parkway Rte 16 W	3645890	2013-11-03	5:10 PM	Rear-end	Property damage only		Dry	Dark - unknown	Clear	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
30	Route 16 at Everett Avenue	Everett Avenue / Revere Beach Parkway	3657605	2013-11-08	7:00 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Northbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
31	Route 16 at Everett Avenue	Everett Avenue / Revere Beach Parkway Rte 16 S	3725546	2013-11-18	4:30 PM	Sideswipe, opposite	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	
32	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3743811	2014-02-16	8:25 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Entering traffic lane	No improper action
33	Route 16 at Everett Avenue	Everett Ave	3774033	2014-03-08	1:01 AM	Head-on	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	No improper action
34	Route 16 at Everett Avenue	Everett Ave	3772285	2014-03-15	1:15 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
36	Route 16 at Everett Avenue	Kentucky Fried Chicken	3842102	2014-06-12	7:00 AM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Slowing or stopped in traffic	Other improper action
37	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 E / Everett Avenue	3869401	2014-06-28	10:20 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
38	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	3887360	2014-07-21	7:12 AM	Single vehicle crash	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Travelling straight ahead	Illness
39	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 / Everett Avenue	3905101	2014-08-10	12:00 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	No improper action
40	Route 16 at Everett Avenue	Everett Ave	3959849	2014-08-15	10:05 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning right	Follow too closely
41	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 / Everett Avenue	3924082	2014-08-29	6:47 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Disregarding traffic signs
42	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	3924501	2014-08-30	11:49 AM	Angle	Non-fatal injury	ped	Dry	Daylight	Clear	Off-peak	V1:Eastbound	V1: Turning left	Other improper action
43	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	3962119	2014-09-27	4:00 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Parked / V2:Slowing or stopped in traffic	No improper action
44	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	3963060	2014-10-01	6:44 AM	Sideswipe, opposite	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Making U-turn	No improper action
45	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	3971081	2014-10-24	8:35 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
46	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3976523	2014-11-19	9:15 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Turning right / V2:Turning right	No improper action
47	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 E / Everett Avenue	3976525	2014-11-20	12:10 PM	Single vehicle crash	Non-fatal injury	ped	Dry	Daylight	Unknown	Off-peak	V1:Eastbound	V1: Travelling straight ahead	
48	Route 16 at Everett Avenue	@ Everett Ave	3985372	2014-11-27	9:50 AM	rear-end	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Operating defective
49	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3981847	2014-12-01	6:15 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
50	Route 16 at Everett Avenue	Stop And Shop	3989532	2014-12-01	7:00 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Travelling straight ahead	Failure to keep in proper lane
51	Route 16 at Everett Avenue	Revere Beach Parkway Rte Unknow / Everett Avenue	3990203	2014-12-10	9:35 AM	Single vehicle crash	Non-fatal injury	ped	Dry	Daylight	Cloudy	Peak	V1:Westbound	V1: Turning left	

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
52	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	3994274	2015-01-08	5:50 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound / V4:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead / V3:Travelling straight ahead /	Other improper action
53	Route 16 at Everett Avenue	Everett Avenue / Revere Beach Parkway	4011289	2015-02-08	9:43 AM	Rear-end	Property damage only		Snow/Ice	Daylight	Snow	Peak	V1:Not reported / V2:Not reported	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	
54	Route 16 at Everett Avenue	Everett Avenue / Revere Beach Parkway Rte Sr16 E	4022252	2015-03-16	9:00 AM	Single vehicle crash	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Eastbound	V1: Turning left / V2:Parked	Erratic or reckless
55	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4034220	2015-04-13	11:35 AM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	Disregarding traffic signs
56	Route 16 at Everett Avenue	Rte 16 E / Everett Avenue	4036118	2015-04-18	5:35 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Changing lanes	No improper action
57	Route 16 at Everett Avenue	Rte 16 W / Everett Avenue	4042828	2015-05-16	12:45 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	
58	Route 16 at Everett Avenue	Rte 16 E / Everett Avenue Rte 16	4061332	2015-06-12	6:25 PM	Rear-end	Non-fatal injury		Dry	Daylight	Unknown	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
59	Route 16 at Everett Avenue	Rte 16 E / Everett Avenue	4072084	2015-08-09	1:28 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
60	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4081551	2015-09-05	7:01 AM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Travelling straight ahead	
61	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	4084917	2015-09-10	6:35 PM	Rear-end	Non-fatal injury		Wet	Dusk	Rain	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
62	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4095532	2015-10-01	12:01 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Turning left	Erratic or reckless
63	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4093961	2015-10-05	11:55 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
64	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4107337	2015-11-03	2:30 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	No improper action
65	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4118708	2015-12-03	2:13 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
66	Route 16 at Everett Avenue	Rte 16 / Everett Avenue	4123190	2015-12-14	5:15 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	No improper action
67	Route 16 at Everett Avenue	Rte 16 W / Everett Avenue	4136162	2016-01-06	9:20 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
68	Route 16 at Everett Avenue	Rte 16 E / Everett Avenue	4155140	2016-02-18	7:32 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
69	Route 16 at Everett Avenue	Rte 16 W / Everett Avenue	4164389	2016-03-08	9:15 AM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Turning left	Made improper turn
70	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	4171486	2016-03-27	5:30 PM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Inattention
71	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	4177185	2016-04-13	7:08 AM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
72	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4191770	2016-04-28	1:11 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
73	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	4201663	2016-05-23	8:23 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
74	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	4218801	2016-06-11	5:27 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
75	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	4218807	2016-06-14	9:45 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Southbound / V3:Northbound	V1: Turning left / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	No improper action
76	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	4219861	2016-07-02	1:37 AM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
77	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	4225112	2016-07-24	1:35 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	Disregarding traffic signs
78	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4230168	2016-08-10	3:20 PM	Angle	Non-fatal injury		Dry	Daylight	Cloudy	Peak	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
79	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	4240908	2016-08-22	3:10 PM	Single vehicle crash	Non-fatal injury	cyc	Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Travelling straight ahead	Disregarding traffic signs
80	Route 16 at Everett Avenue	Revere Beach Parkway Rte 16 W / Everett Avenue	4267006	2016-09-25	12:01 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	
81	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4253505	2016-09-25	7:25 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Turning left / V2:Turning left	Made improper turn
82	Route 16 at Everett Avenue	Rte 16 E / Rte Everet	4278590	2016-11-01	11:25 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Northbound / V3:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Physical impairment
83	Route 16 at Everett Avenue	Revere Beach Parkway Rte Sr16 W / Everett Avenue	4290689	2016-11-28	3:25 PM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action





SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [Trapezoid] Parked Vehicle	↔↔ Head On	↔ Sideswipe	○ Injury Accident	⊙ Fatal Accident
↔ Backing Vehicle	→ [Square] Fixed Object	→↔ Angle	→ Out of Control		
- - - Non-Involved Vehicle	→ [Bicycle] Bicycle	→↔ Rear End			
→ [Stick Figure] Pedestrian	→ [Animal] Animal				

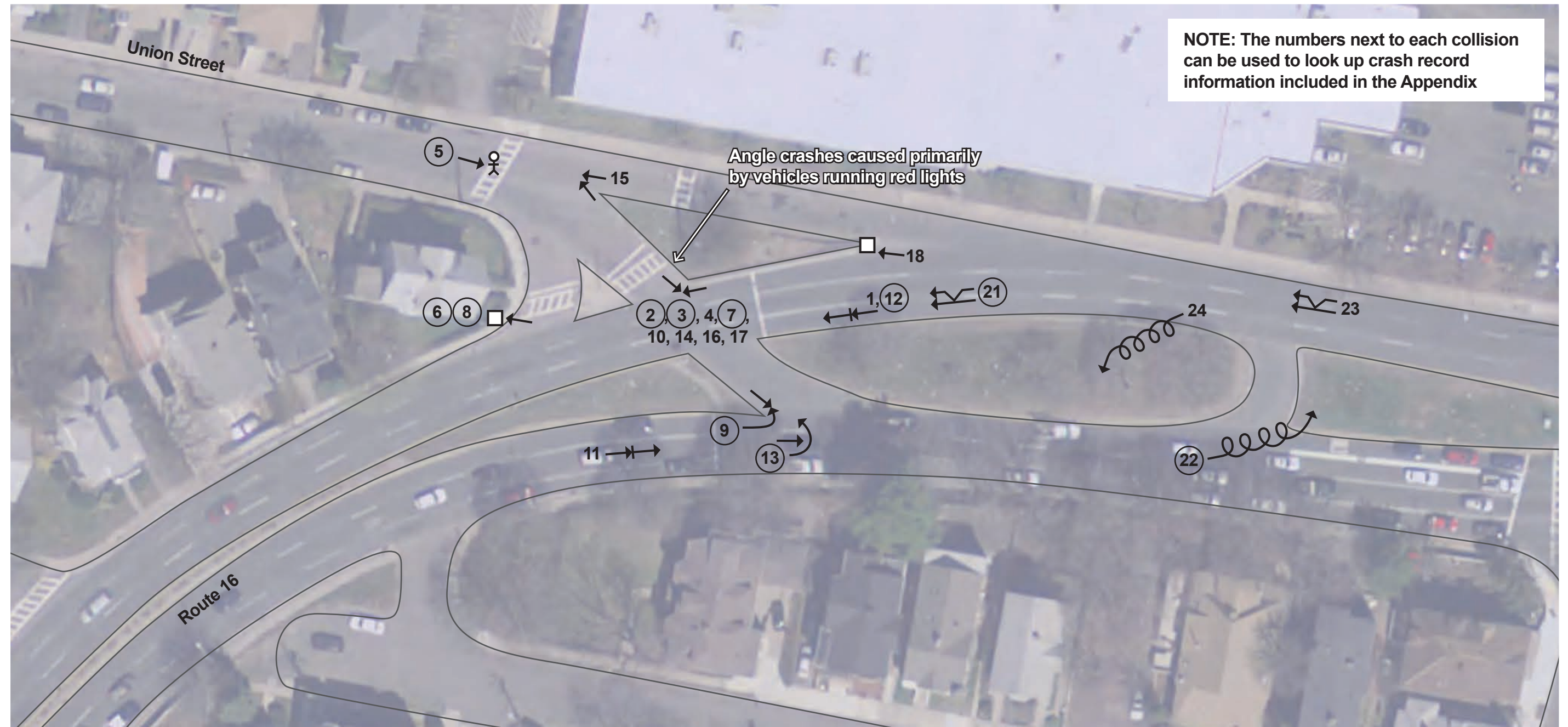
**Figure 8**  
Collision Diagram: 2012–16 Police Data





Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 E / Union Street	3168280	2012-03-04	4:50 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
2	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 W / Reynolds Avenue	3123337	2012-06-05	9:01 PM	Single vehicle crash	Not Reported		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound	V1: Travelling straight ahead	
3	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 E / Reynolds Avenue	3254379	2012-09-20	12:00 AM	Single vehicle crash	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Changing lanes	No improper action
4	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 W / Reynolds Avenue	3277672	2012-09-21	10:15 AM	Single vehicle crash	Non-fatal injury		Dry	Daylight	Unknown	Off-peak	V1:Westbound	V1: Overtaking/passing	Exceeding speed limit
5	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 E / County Road	3351877	2013-02-03	12:00 AM	Single vehicle crash	Not Reported		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound	V1: Travelling straight ahead	Failure to keep in proper lane
6	Route 16 btwn Everett and Union	Prior To Everett Ave.	3384545	2013-02-04	12:30 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
7	Route 16 btwn Everett and Union	Prior To Washington Ave	3391822	2013-04-15	1:51 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound	V1: Backing	Wrong side or wrong way
8	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 E / Evelyn Road	3594400	2013-09-21	10:35 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Changing lanes	No improper action
9	Route 16 btwn Everett and Union	Revere Beach Parkway Rte Unknow W / 66	3645986	2013-11-03	2:25 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound	V1: Travelling straight ahead	Physical impairment
10	Route 16 btwn Everett and Union	County Rd / Revere Beach Pkwy	3705514	2013-12-02	2:48 PM	Head-on	Non-fatal injury	cyc	Dry	Daylight	Cloudy	Off-peak	V1:Eastbound	V1: Travelling straight ahead	No improper action
11	Route 16 btwn Everett and Union	0 Feet E From Intersection Revere Beach Parkway Rte 16	3715391	2014-01-11	11:25 PM	Head-on	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
12	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 E / Everett Avenue	3721205	2014-01-21	7:15 PM	Rear-end	Property damage only		Snow/Ice	Dark - unknown	Snow	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
13	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 / Everett Avenue	3968120	2014-03-31	12:00 AM	Single vehicle crash	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound	V1: Travelling straight ahead	Erratic or reckless
14	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 E / Reynolds Avenue	3959850	2014-08-20	12:00 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Northbound	V1: Travelling straight ahead	Exceeding speed limit
15	Route 16 btwn Everett and Union	Everett Ave	3977404	2014-11-13	10:30 PM	Single vehicle crash	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound	V1: Travelling straight ahead	No improper action
16	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 E / County Road	3990175	2015-01-01	5:42 AM	Head-on	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Wrong side or wrong way
17	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 E / Orange Street	3999822	2015-01-17	12:15 PM	Angle	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Turning right / V2:Travelling straight ahead	Fail to yield right of way
18	Route 16 btwn Everett and Union	Revere Beach Parkway Rte Unknow W / Reynolds Avenue	4021966	2015-02-22	7:30 AM	Single vehicle crash	Non-fatal injury		Snow/Ice	Daylight	Snow	Peak	V1:Westbound	V1: Travelling straight ahead	Driving too fast for conditions
19	Route 16 btwn Everett and Union	Reynolds Ave	4029146	2015-03-28	2:30 AM	Single vehicle crash	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Southbound	V1: Travelling straight ahead	Erratic or reckless
20	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 W / County Road	4031961	2015-04-04	2:50 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
21	Route 16 btwn Everett and Union	Revere Beach Parkway Rte Sr16 E / Everett Avenue	4082252	2015-06-30	12:29 AM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Travelling straight ahead	Exceeding speed limit
22	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 W / County Road	4104145	2015-10-28	8:15 PM	Head-on	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	Erratic or reckless
23	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 W / County Road	4111344	2015-11-11	2:45 PM	Angle	Property damage only		Wet	Daylight	Cloudy	Off-peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	Other improper action
24	Route 16 btwn Everett and Union	Revere Beach Parkway Rte 16 E / Everett Avenue	4127772	2015-12-21	11:08 PM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	No improper action
25	Route 16 btwn Everett and Union	Rte 16 W / County Road	4252088	2016-09-23	9:39 PM	Sideswipe, same direction	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound / V2:Not reported	V1: Turning right / V2:Not reported	Made improper turn

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
26	Route 16 btwn Everett and Union	Everett Ave	4311650	2016-11-29	4:10 PM	Sideswipe, same direction	Property damage only		Wet	Dusk	Rain	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Failure to keep in proper lane



NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix

Angle crashes caused primarily by vehicles running red lights

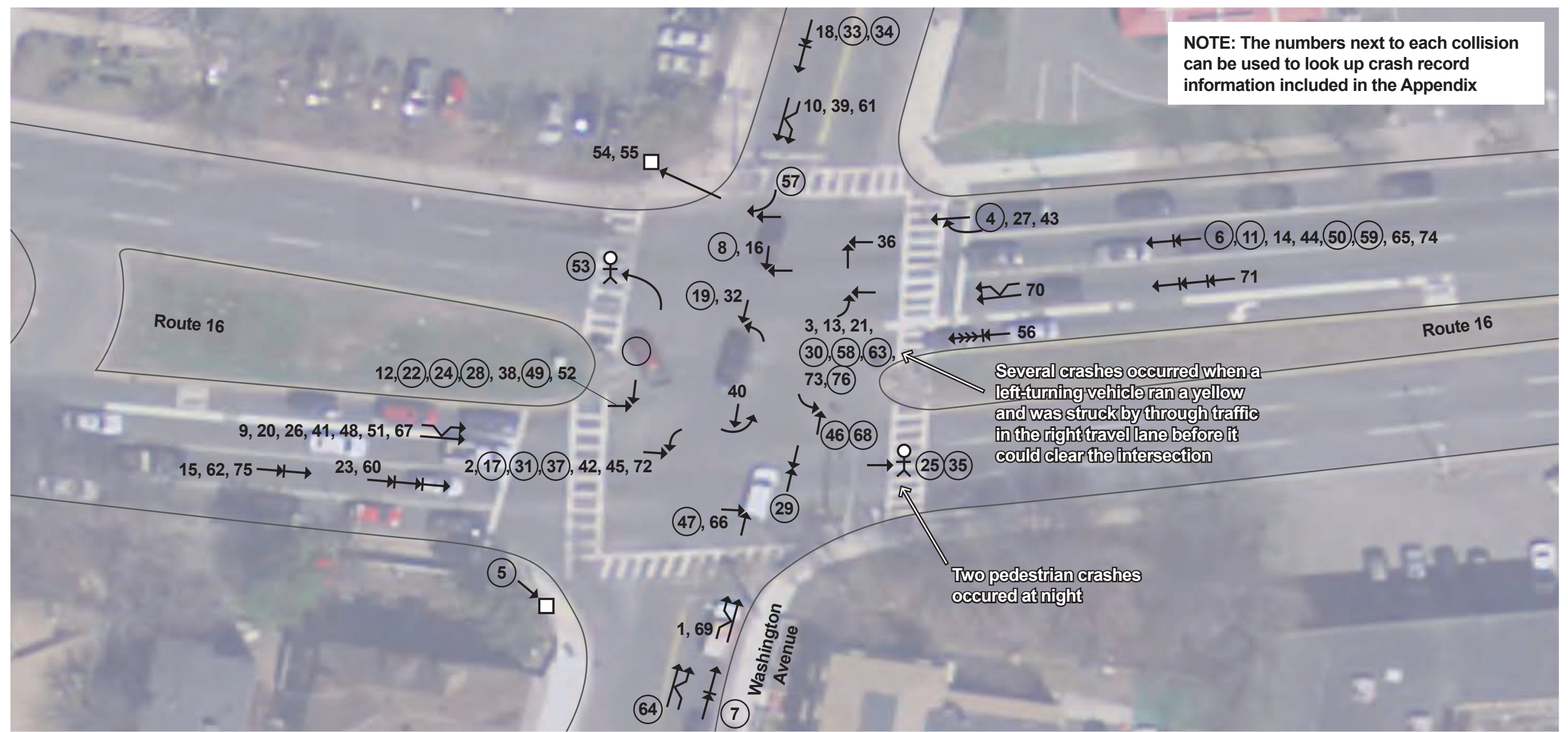
SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [trapezoid] Parked Vehicle	↔↔ Head On	↔ Sideswipe	○ Injury Accident	⊙ Fatal Accident
↔ Backing Vehicle	→ [square] Fixed Object	↘↙ Angle	→ [wavy] Out of Control		
- - - Non-Involved Vehicle	→ [bicycle] Bicycle	→ [vertical line] Rear End			
→ [stick figure] Pedestrian	→ [animal] Animal				

Figure 9  
Collision Diagram: 2012–16 Police Data



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 at Union Street	Revere Beach Parkway Rte 16 W / Union Street	3163043	2012-02-04	11:50 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
2	Route 16 at Union Street	Revere Beach Parkway Rte 16 / Union Street	3150532	2012-03-06	8:50 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
3	Route 16 at Union Street	Revere Beach Parkway Rte 16 W / Union Street	3068775	2012-05-01	1:45 PM	Angle	Not Reported		Wet	Daylight	Rain	Off-peak	V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
4	Route 16 at Union Street	Mcdonald&Apos;S	3379069	2012-07-18	11:05 AM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
5	Route 16 at Union Street	Revere Beach Pkwy / Union St	3523033	2013-06-18	3:03 PM	Single vehicle crash	Non-fatal injury	ped	Wet	Daylight	Rain	Peak	V1:Southbound	V1: Travelling straight ahead	No improper action
6	Route 16 at Union Street	Union Street	3527734	2013-07-01	12:00 AM	Single vehicle crash	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound	V1: Turning left	Failure to keep in proper lane
7	Route 16 at Union Street	Revere Beach Parkway Rte 16 W / Union Street	3699060	2013-12-20	10:00 AM	Angle	Non-fatal injury		Wet	Daylight	Clear	Peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
8	Route 16 at Union Street	Revere Beach Parkway Rte 16 W / Union Street	3735579	2014-02-05	8:30 AM	Single vehicle crash	Non-fatal injury		Snow/Ice	Daylight	Snow	Peak	V1:Westbound	V1: Travelling straight ahead	
9	Route 16 at Union Street	Revere Beach Parkway Rte 16 W / Union Street	3793478	2014-04-17	10:01 AM	Head-on	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	No improper action
10	Route 16 at Union Street	Revere Beach Parkway Rte Unknow / Union Street	3800672	2014-05-08	7:50 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
11	Route 16 at Union Street	Revere Beach Parkway Rte Sr16 E / Union Street	3971128	2014-10-14	1:45 PM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
12	Route 16 at Union Street	Revere Beach Parkway Rte 16 W / Union Street	3982616	2014-11-19	3:09 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
13	Route 16 at Union Street	Revere Beach Parkway Rte Sr16 E / Union Street	4069849	2015-07-29	12:40 PM	Angle	Non-fatal injury		Dry	Daylight	Unknown	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Making U-turn	No improper action
14	Route 16 at Union Street	Revere Beach Parkway Rte Unknow W / Union Street	4071840	2015-08-07	6:57 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
15	Route 16 at Union Street	Union Street / Revere Beach Parkway	4077568	2015-08-12	9:45 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Leaving traffic lane	No improper action
16	Route 16 at Union Street	Revere Beach Parkway Rte Sr16 W / Union Street	4097225	2015-10-12	11:40 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
17	Route 16 at Union Street	Revere Beach Parkway Rte Sr16 W / Union Street	4120774	2015-12-06	9:35 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
18	Route 16 at Union Street	Union Street / Revere Beach Parkway Rte 16 W	4125960	2015-12-21	6:30 PM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Westbound	V1: Leaving traffic lane	Failure to keep in proper lane
19	Route 16 at Union Street	Union St.	4181018	2016-04-24	7:30 PM	Angle	Non-fatal injury		Dry	Dusk	Clear	Off-peak	V1:Eastbound / V2:Not reported	V1: Travelling straight ahead / V2:Not reported	Disregarding traffic signs
20	Route 16 at Union Street	Revere Beach Parkway Rte Sr16 W / Union Street	4218818	2016-06-15	11:04 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
21	Route 16 at Union Street	100 Feet E From Intersection Revere Beach Parkway Rte 16	4234487	2016-08-13	2:50 PM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Changing lanes	No improper action
22	Route 16 btwn Union and Washington	Revere Beach Parkway Rte 16 W / Union Street	3400577	2013-04-26	3:15 PM	Single vehicle crash	Not Reported		Dry	Daylight	Clear	Peak	V1:Not reported	V1: Not reported	No improper action
23	Route 16 btwn Union and Washington	Revere Beach Parkway Rte 16 W / Union Street	4118718	2015-12-04	4:55 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Changing lanes	No improper action
24	Route 16 btwn Union and Washington	Revere Beach Parkway Rte Sr16 E / Union Street	4259052	2016-10-02	3:55 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound	V1: Turning right	





NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix

Several crashes occurred when a left-turning vehicle ran a yellow and was struck by through traffic in the right travel lane before it could clear the intersection

Two pedestrian crashes occurred at night

SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [trapezoid] Parked Vehicle	↔↔↔ Head On	↔↔ Sideswipe	○ Injury Accident	⊙ Fatal Accident
↔ Backing Vehicle	→ □ Fixed Object	→↙ Angle	↪ Out of Control		
- - - Non-Involved Vehicle	→ ⚙ Bicycle	→↘ Rear End			
→ ⤴ Pedestrian	→ 🐾 Animal				

Figure 10  
Collision Diagram: 2012–16 Police Data



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 at Washington Avenue	Revere Beach Pkwy / Washington Ave	2897830	2012-02-02	10:20 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Made improper turn
2	Route 16 at Washington Avenue	Rte 16 E / Washington Avenue	2932107	2012-02-29	11:27 PM	Angle	Property damage only		Wet	Dark - roadway not	Rain	Off-peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	
3	Route 16 at Washington Avenue	Revere Beach Parkway / Washington Avenue	3001231	2012-03-09	11:00 AM	Angle	Property damage only		Dry	Daylight	Unknown	Off-peak	V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	No improper action
4	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte 16 W	3168285	2012-03-20	2:30 PM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Turning right	No improper action
5	Route 16 at Washington Avenue	Mcdonalds	3175579	2012-03-25	5:12 AM	Single vehicle crash	Not Reported		Wet	Dusk	Cloudy	Off-peak	V1:Eastbound	V1: Travelling straight ahead	
6	Route 16 at Washington Avenue	Revere Beach Parkway / Washington Avenue	3106096	2012-05-17	10:55 AM	Rear-end	Not Reported		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	
7	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 / Washington Avenue	3122718	2012-06-06	12:19 PM	Rear-end	Not Reported		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Overtaking/passing	
8	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 / Washington Avenue	3157431	2012-06-26	8:45 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
9	Route 16 at Washington Avenue	@ Washington Ave	3168837	2012-06-30	5:40 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Unknown	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Changing lanes	No improper action
10	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 / Washington Avenue	3246611	2012-08-18	8:58 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	
11	Route 16 at Washington Avenue	@ Metro Credit Union	3265316	2012-09-24	7:10 AM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
12	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 W / Washington Avenue	3275888	2012-10-06	10:30 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Southbound / V3:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Slowing or stopped in traffic	Inattention
13	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte 16 W	3376955	2012-10-28	7:17 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	No improper action
14	Route 16 at Washington Avenue	West Of Mcdonalds	3384537	2013-01-11	9:40 PM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
15	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 E / Washington Avenue	3349829	2013-01-23	2:00 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
16	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 / Washington Avenue Rte Washin	3362529	2013-02-23	6:55 PM	Angle	Property damage only		Wet	Dark - lighted roadway	Rain	Peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
17	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 E / Washington Avenue	3373843	2013-03-18	12:35 PM	Angle	Non-fatal injury		Dry	Daylight	Cloudy	Off-peak	V1:Not reported / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	No improper action
18	Route 16 at Washington Avenue	Washington Ave / Revere Beach Pkwy	3391136	2013-04-10	8:12 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
19	Route 16 at Washington Avenue	Revere Beach Parkway / Washington Avenue	3402829	2013-04-20	1:05 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Not reported	V1: Travelling straight ahead / V2:Not reported	No improper action
20	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 E / Washington Avenue	3419694	2013-05-01	2:50 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Changing lanes	
21	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16	3463709	2013-06-09	2:00 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	No improper action
22	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 E / Washington Avenue	3491637	2013-06-16	11:50 AM	Angle	Non-fatal injury		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Southbound / V3:Northbound / V4:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Slowing or stopped in traffic	No improper action
23	Route 16 at Washington Avenue	Revere Beach Parkway / Washington Avenue	3510974	2013-06-29	1:10 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Inattention
24	Route 16 at Washington Avenue	Revere Beach Parkway Rte Unknow / Washington Avenue	3584873	2013-09-04	12:40 PM	Angle	Non-fatal injury	ped	Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Eastbound / V3:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Slowing or stopped in traffic	Disregarding traffic signs
25	Route 16 at Washington Avenue	Webster Ave	3593988	2013-09-14	12:00 AM	Single vehicle crash	Non-fatal injury	ped	Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound	V1: Not reported	

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
26	Route 16 at Washington Avenue	0 Feet W From Intersection Revere Beach Parkway Rte 16 E	3714614	2013-12-21	6:01 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
27	Route 16 at Washington Avenue	Rte 16 W / Washington Avenue	3736644	2014-01-18	3:10 PM	Sideswipe, same direction	Property damage only		Snow/Ice	Daylight	Snow	Peak	V1:Northbound / V2:Northbound	V1: Turning right / V2:Turning right	Made improper turn
28	Route 16 at Washington Avenue	Rte 16 E / Washington Avenue	3818303	2014-05-21	12:15 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
29	Route 16 at Washington Avenue	@ Washington Ave	3862002	2014-06-21	8:30 AM	Head-on	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Wrong side or wrong way
30	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 W / Washington Avenue	3880609	2014-06-28	5:30 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	No improper action
31	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	3933602	2014-08-28	12:12 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	
32	Route 16 at Washington Avenue	Revere Beach Pkwy	3964667	2014-10-01	9:40 PM	Angle	Property damage only		Wet	Daylight	Rain	Off-peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	Fail to yield right of way /
33	Route 16 at Washington Avenue	Revere Beach Pkwy	3969287	2014-10-30	8:25 AM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
34	Route 16 at Washington Avenue	Washington Ave / Revere Beach Parkway	3975739	2014-11-20	8:46 AM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Unknown
35	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 E / Washington Avenue	3985377	2014-12-03	10:51 PM	Single vehicle crash	Non-fatal injury	ped	Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound	V1: Travelling straight ahead	No improper action
36	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4000886	2015-01-20	10:55 AM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
37	Route 16 at Washington Avenue	Rte 16 E / Washington Avenue	4006747	2015-01-26	12:10 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Southbound / V3:Northbound	V1: Travelling straight ahead / V2:Turning left / V3:Slowing or stopped in traffic	Fail to yield right of way
38	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4000889	2015-01-28	1:00 PM	Angle	Property damage only		Snow/Ice	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Other improper action
39	Route 16 at Washington Avenue	Washington Avenue / Rte 16 W	4012641	2015-02-23	1:26 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Unknown
40	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4017910	2015-03-02	8:52 PM	Angle	Property damage only		Dry	Daylight	Unknown	Off-peak	V1:Northbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	No improper action
41	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4022256	2015-03-05	1:40 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Turning right / V2:Travelling straight ahead	Made improper turn
42	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4022263	2015-03-13	5:30 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	No improper action
43	Route 16 at Washington Avenue	Revere Beach Parkway Rte Unknow W / Washington Avenue	4035879	2015-04-21	11:20 AM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
44	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 W / Washington Avenue	4059090	2015-06-05	9:15 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Not reported	V1: Travelling straight ahead / V2:Not reported	Follow too closely
45	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4059118	2015-06-28	1:15 AM	Angle	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	Disregarding traffic signs
46	Route 16 at Washington Avenue	Revere Beach Parkway Rte Sr16 W / Washington Avenue	4065295	2015-07-18	4:50 AM	Angle	Non-fatal injury		Wet	Dawn	Rain	Off-peak	V1:Southbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	No improper action
47	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4068465	2015-07-19	8:45 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
48	Route 16 at Washington Avenue	Rte 16 E / Washington Avenue	4075707	2015-08-07	10:00 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Physical impairment
49	Route 16 at Washington Avenue	Washington Ave / Revere Beach Parkway	4096122	2015-10-07	8:14 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs /
50	Route 16 at Washington Avenue	Rte 16 W / Washington Avenue	4096336	2015-10-09	1:20 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
51	Route 16 at Washington Avenue	Rte 16 / Washington Avenue	4098651	2015-10-19	12:40 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
52	Route 16 at Washington Avenue	Revere Beach Parkway / Washington Avenue	4106529	2015-10-30	9:57 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
53	Route 16 at Washington Avenue	Revere Beach Parkway Rte Sr16 W / Washington Avenue	4129549	2015-12-07	1:53 PM	Single vehicle crash	Non-fatal injury	ped	Dry	Daylight	Clear	Off-peak	V1:Westbound	V1: Turning left	No improper action
54	Route 16 at Washington Avenue	Rte 16 W / Washington Avenue	4129127	2015-12-26	6:15 PM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Cloudy	Peak	V1:Westbound	V1: Not reported	Failure to keep in proper lane
55	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4129584	2016-01-01	3:31 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Erratic or reckless
56	Route 16 at Washington Avenue	Rte 16 W / Washington Avenue	4144282	2016-01-31	7:15 PM	Rear-to-rear	Property damage only		Dry	Dark - unknown	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Backing / V2:Slowing or stopped in traffic	Other improper action
57	Route 16 at Washington Avenue	Mcdonalds	4149768	2016-02-13	7:20 PM	Sideswipe, same direction	Not Reported		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound	V1: Turning right	No improper action
58	Route 16 at Washington Avenue	Revere Beach Parkway Rte Sr16 W / Washington Avenue	4153857	2016-02-13	11:40 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	No improper action
59	Route 16 at Washington Avenue	Revere Beach Parkway Rte 16 W / Washington Avenue	4152546	2016-02-19	7:05 AM	Rear-end	Non-fatal injury		Snow/Ice	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
60	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4175975	2016-04-07	1:50 PM	Rear-end	Property damage only		Wet	Daylight	Rain	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in traffic	Follow too closely
61	Route 16 at Washington Avenue	Revere Beach Pkwy / Washington Ave	4182027	2016-04-23	6:41 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Erratic or reckless
62	Route 16 at Washington Avenue	Rte 16 E / Washington Avenue	4194128	2016-05-20	11:05 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
63	Route 16 at Washington Avenue	Revere Beach Parkway Rte Sr16 E / Washington Avenue	4203384	2016-05-29	4:10 AM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	
64	Route 16 at Washington Avenue	Washington Ave / Revere Beach Pkwy	4201337	2016-06-01	3:51 PM	Sideswipe, same direction	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Northbound / V3:Northbound	V1: Leaving traffic lane / V2:Slowing or stopped in traffic / V3:Slowing or stopped in traffic	Inattention
65	Route 16 at Washington Avenue	Rte 16	4203804	2016-06-03	9:50 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
66	Route 16 at Washington Avenue	Rte 16 / County Road	4221392	2016-07-03	1:06 AM	Angle	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
67	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4227133	2016-07-28	5:45 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Other improper action
68	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4228987	2016-08-05	9:30 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Southbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Disregarding traffic signs
69	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4234486	2016-08-12	1:55 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Turning right / V2:Travelling straight ahead	Other improper action
70	Route 16 at Washington Avenue	Rte 16 W / Washington Avenue	4246392	2016-08-31	12:45 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Not reported	Inattention
71	Route 16 at Washington Avenue	Revere Beach Parkway Rte Sr16 W / Washington Avenue	4260337	2016-09-11	5:10 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead / V3:Slowing or stopped in traffic	No improper action
72	Route 16 at Washington Avenue	Revere Beach Parkway Rte Sr16 E / Washington Avenue	4248596	2016-09-13	8:40 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	No improper action
73	Route 16 at Washington Avenue	Washington Avenue / Revere Beach Parkway Rte Sr16 E	4255511	2016-09-23	11:24 PM	Angle	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Disregarding traffic signs
74	Route 16 at Washington Avenue	Mcdonalds	4260338	2016-10-02	4:50 AM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Not reported	No improper action
75	Route 16 at Washington Avenue	Revere Beach Parkway Rte Unknow E / Union Street	4277068	2016-10-30	2:36 PM	Rear-end	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	No improper action



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
76	Route 16 at Washington Avenue	Rte 16 E / Washington Avenue	4272628	2016-10-30	10:05 PM	Angle	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Westbound / V2:Eastbound	V1: Turning left / V2:Travelling straight ahead	



NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix

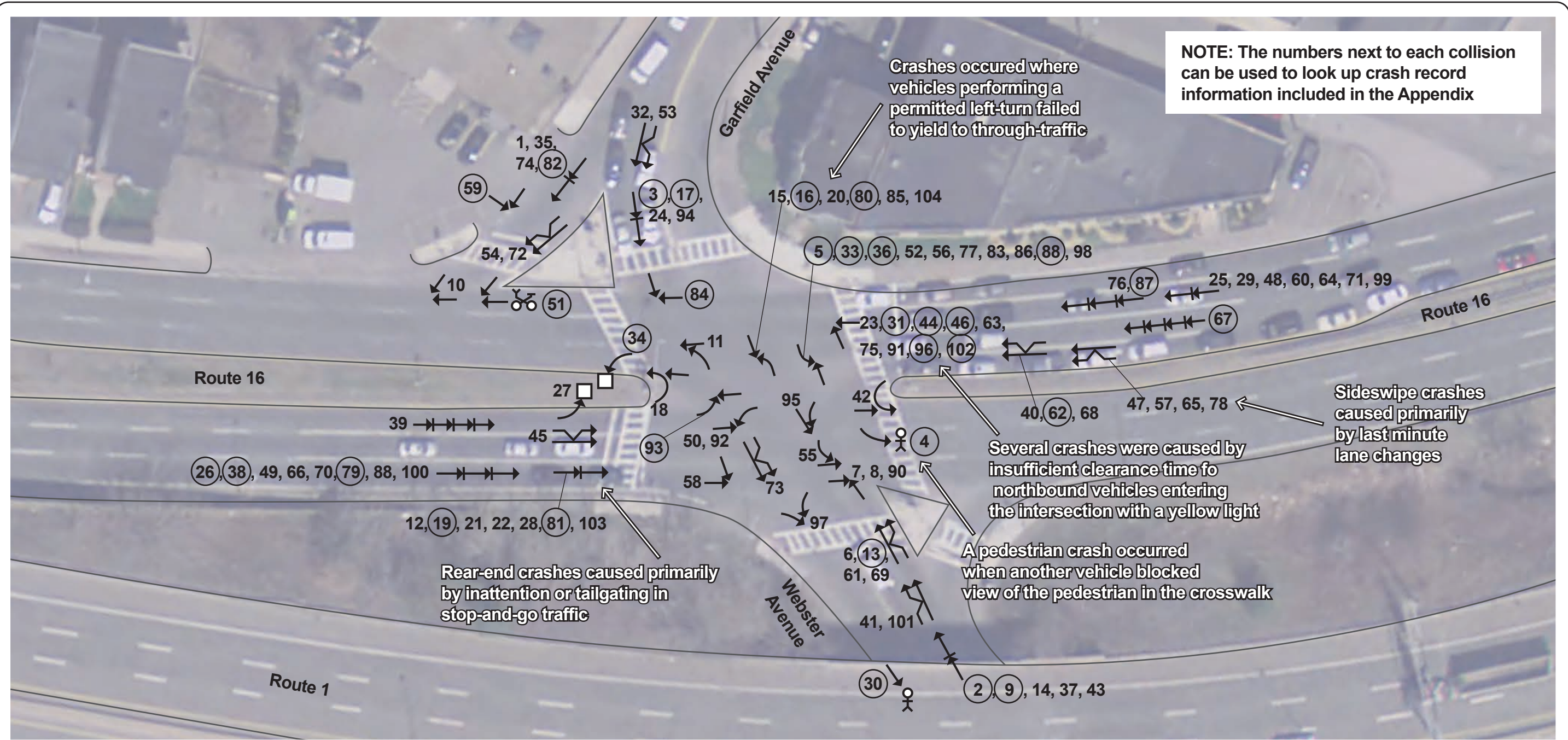
SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [trapezoid] Parked Vehicle	↔↔ Head On	↔ Sideswipe	○ Injury Accident	⊙ Fatal Accident
↔ Backing Vehicle	→ [square] Fixed Object	→↔ Angle	↻ Out of Control		
- - - Non-Involved Vehicle	→ [bicycle] Bicycle	→↔ Rear End			
→ [stick figure] Pedestrian	→ [animal] Animal				

Figure 11  
Collision Diagram: 2012–16 Police Data



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 btwn Washington and Garfield	Revere Beach Parkway Rte 16 W / Garfield Avenue	3158752	2012-01-04	5:17 PM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Unknown	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead / V3:Changing lanes	No improper action
2	Route 16 btwn Washington and Garfield	Nobrega'S	3168283	2012-03-17	12:50 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
3	Route 16 btwn Washington and Garfield	Revere Beach Pkwy / Murray St	3290229	2012-10-19	8:24 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound	V1: Slowing or stopped in traffic	No improper action
4	Route 16 btwn Washington and Garfield	Revere Beach Parkway Rte 16 W / Garfield Avenue	3491175	2013-06-24	4:05 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Other improper action
5	Route 16 btwn Washington and Garfield	Revere Beach Pkwy	3606751	2013-09-16	12:27 PM	Single vehicle crash	Property damage only	ped	Dry	Daylight	Clear	Off-peak	V1:Eastbound	V1: Turning right	Inattention
6	Route 16 btwn Washington and Garfield	Revere Beach Parkway Rte 16 E / Webster Avenue	3656080	2013-11-11	3:35 AM	Single vehicle crash	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	No improper action
7	Route 16 btwn Washington and Garfield	Revere Beach Pkwy	3862545	2014-06-18	2:05 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Unknown
8	Route 16 btwn Washington and Garfield	Revere Beach Parkway Rte 16 W / Ramp-Rt 1 Sb To Rt 16 Eb	3909413	2014-07-30	5:42 AM	Sideswipe, same direction	Property damage only		Dry	Dawn	Clear	Off-peak	V1:Westbound / V2:Not reported / V3:Westbound	V1: Changing lanes / V2:Not reported / V3:Travelling straight ahead	Made improper turn
9	Route 16 btwn Washington and Garfield	Webster Avenue / Revere Beach Parkway	3975741	2014-11-21	8:37 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Turning left / V2:Turning left	No improper action
10	Route 16 btwn Washington and Garfield	Area Of Murray St	4000887	2015-01-22	3:15 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
11	Route 16 btwn Washington and Garfield	@ Metro Credit Union	4011928	2015-02-11	1:46 PM	Angle	Property damage only		Wet	Daylight	Cloudy	Off-peak	V1:Southbound / V2:Westbound	V1: Entering traffic lane / V2:Travelling straight ahead	Fail to yield right of way
12	Route 16 btwn Washington and Garfield	Revere Beach Parkway Rte 16 E / Webster Avenue	4033432	2015-04-14	12:20 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Distracted
13	Route 16 btwn Washington and Garfield	Revere Beach Parkway Rte 16 W / Ramp-Rt 16 Wb To Rt 1 Sb	4068469	2015-07-30	5:30 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Changing lanes	Other improper action
14	Route 16 btwn Washington and Garfield	Mcdonald'S	4086410	2015-09-16	12:22 PM	Single vehicle crash	Non-fatal injury	ped	Dry	Daylight	Clear	Off-peak	V1:Westbound	V1: Travelling straight ahead	No improper action
15	Route 16 btwn Washington and Garfield	West Of Garfield Ave	4191123	2016-05-06	8:05 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	Inattention
16	Route 16 btwn Washington and Garfield	200 Feet W From Intersection Revere Beach Parkway Rte 16	4222446	2016-07-21	8:20 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action





SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [trapezoid] Parked Vehicle	↔↔ Head On	↔ Sideswipe	○ Injury Accident	⊙ Fatal Accident
↔ Backing Vehicle	→ [square] Fixed Object	→↔ Angle	↪ Out of Control		
- - - Non-Involved Vehicle	→ [bicycle] Bicycle	→↔ Rear End			
→ [stick figure] Pedestrian	→ [animal] Animal				

**Figure 12**  
Collision Diagram: 2012–16 Police Data





Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 at Garfield and Webster	Garfield Avenue / Revere Beach Parkway	3013796	2012-03-23	10:13 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
2	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3068774	2012-04-28	10:00 PM	Rear-end	Not Reported		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	
3	Route 16 at Garfield and Webster	Rte 16 W / Garfield Avenue	3122717	2012-05-30	6:50 AM	Rear-end	Not Reported		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	
4	Route 16 at Garfield and Webster	Revere Beach Parkway / Webster Avenue	3121044	2012-06-02	11:10 AM	Single vehicle crash	Non-fatal injury	ped	Wet	Daylight	Rain	Off-peak	V1:Eastbound	V1: Turning left	
5	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3117825	2012-06-03	12:00 AM	Angle	Not Reported		Wet	Dark - lighted roadway	Unknown	Off-peak	V1:Southbound / V2:Westbound / V3:Northbound	V1: Turning left / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	
6	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Pkwy	3155137	2012-06-11	11:30 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound	V1: Travelling straight ahead	No improper action
7	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 E / Webster Avenue	3153953	2012-06-23	4:00 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Northbound / V3:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Slowing or stopped in traffic	Disregarding traffic signs
8	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 E / Webster Avenue	3376914	2012-06-29	3:30 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
9	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Pkwy	3249748	2012-09-02	10:55 AM	Rear-end	Non-fatal injury		Dry	Daylight	Cloudy	Off-peak	V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
10	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Pkwy	3254334	2012-09-09	3:53 PM	Angle	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Northbound	V1: Slowing or stopped in traffic	No improper action
11	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3264698	2012-09-23	1:40 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Westbound	V1: Entering traffic lane / V2:Travelling straight ahead	Fail to yield right of way
12	Route 16 at Garfield and Webster	0 Feet E From Intersection Revere Beach Parkway /	3270139	2012-09-28	9:30 AM	Rear-end	Property damage only		Wet	Daylight	Rain	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Operating defective
13	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Pkwy	3264654	2012-09-30	10:06 AM	Sideswipe, same direction	Non-fatal injury		Wet	Daylight	Rain	Off-peak	V1:Westbound / V2:Westbound	V1: Overtaking/passing / V2:Entering traffic lane	No improper action
14	Route 16 at Garfield and Webster	Garfield Ave / Revere Beach Pkwy	3277637	2012-10-13	1:19 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Erratic or reckless
15	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 / Garfield Avenue	3301802	2012-12-04	12:20 PM	Angle	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Northbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
16	Route 16 at Garfield and Webster	Rte 16 E / Webster Avenue	3336939	2012-12-25	2:20 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	No improper action
17	Route 16 at Garfield and Webster	Garfield Ave / Revere Beach Pkwy	3367891	2013-03-10	1:46 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Unknown
18	Route 16 at Garfield and Webster	Rte 16 W / Webster Avenue	3399789	2013-04-22	8:55 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Turning left / V2:Making U-turn	Disregarding traffic signs
19	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 E / Webster Avenue	3396795	2013-04-22	9:19 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
20	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3414251	2013-04-23	9:40 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
21	Route 16 at Garfield and Webster	Revere Beach Parkway / Webster Avenue	3414259	2013-05-11	1:48 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Physical impairment
22	Route 16 at Garfield and Webster	Webster Avenue / Revere Beach Parkway Rte 16 E	3427903	2013-05-18	9:10 PM	Rear-end	Property damage only		Dry	Dark - roadway not	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Turning right / V2:Travelling straight ahead	No improper action
23	Route 16 at Garfield and Webster	Garfield Avenue / Revere Beach Parkway Rte 16 W / Webster	3475729	2013-06-14	4:30 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
24	Route 16 at Garfield and Webster	Garfield Ave / Revere Beach Pkwy	3549569	2013-07-26	5:34 PM	Rear-end	Property damage only		Wet	Daylight	Rain	Peak	V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
25	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 / Webster Avenue	3557013	2013-08-10	8:00 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Operating defective

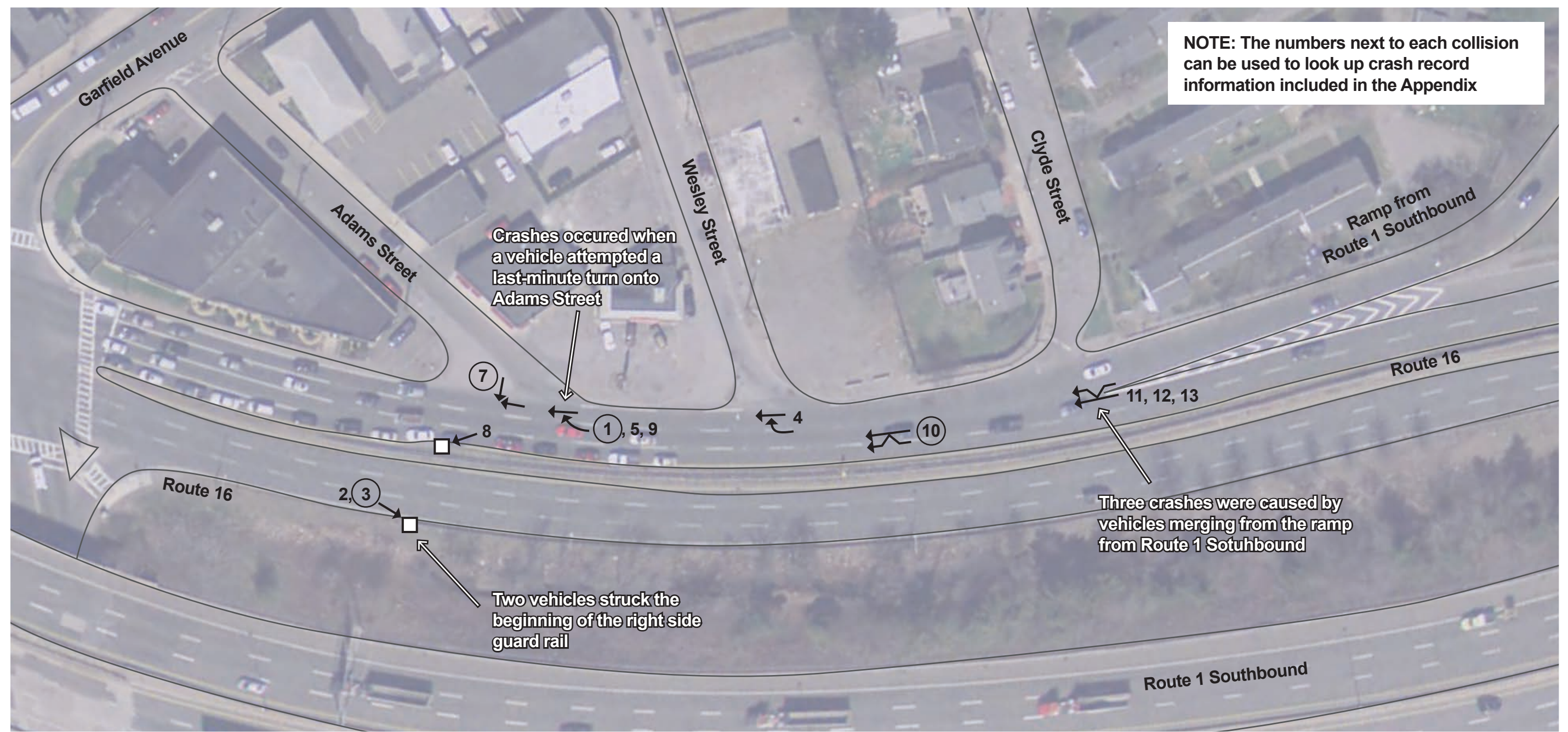
Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
26	Route 16 at Garfield and Webster	0 Feet W From Intersection Revere Beach Parkway Rte 16 E	3588787	2013-09-13	5:05 PM	Rear-end	Non-fatal injury		Wet	Daylight	Rain	Peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Distracted
27	Route 16 at Garfield and Webster	Webster Ave	3590565	2013-09-14	3:10 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	Fail to yield right of way
28	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Pkwy	3606763	2013-09-29	5:46 PM	Rear-end	Property damage only		Dry	Dusk	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
29	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3629112	2013-10-29	6:02 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Inattention
30	Route 16 at Garfield and Webster	Webster Avenue / Revere Beach Parkway Rte 16 E	3705507	2013-11-27	6:14 PM	Head-on	Non-fatal injury	ped	Wet	Dark - lighted roadway	Rain	Peak	V1:Southbound	V1: Travelling straight ahead	No improper action
31	Route 16 at Garfield and Webster	Webster Avenue / Revere Beach Parkway Rte 16 W / Garfield	3671833	2013-11-28	7:36 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
32	Route 16 at Garfield and Webster	Webster Avenue / Rte 16	3706039	2013-12-18	12:23 PM	Sideswipe, same direction	Property damage only		Snow/Ice	Daylight	Snow	Off-peak	V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
33	Route 16 at Garfield and Webster	Webster Ave/ Garfield Ave	3708653	2013-12-23	4:10 PM	Head-on	Non-fatal injury	ped	Wet	Dark - lighted roadway	Rain	Peak	V1:Northbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	Disregarding traffic signs
34	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 W / Webster Avenue / Garfield	3711098	2014-01-03	8:45 AM	Single vehicle crash	Non-fatal injury		Snow/Ice	Daylight	Snow	Peak	V1:Westbound	V1: Travelling straight ahead	Driving too fast for conditions
35	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Garfield Avenue	3711881	2014-01-04	3:45 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Entering traffic lane / V2:Entering traffic lane	No improper action
36	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 E / Webster Avenue	3713799	2014-01-05	12:00 AM	Angle	Non-fatal injury		Wet	Dark - lighted roadway	Cloudy	Off-peak	V1:Northbound / V2:Southbound	V1: Turning left / V2:Turning left	No improper action
37	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Parkway	3717615	2014-01-13	3:57 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
38	Route 16 at Garfield and Webster	Rte 16 E / Webster Avenue	3724036	2014-01-18	12:26 PM	Rear-end	Non-fatal injury		Wet	Daylight	Snow	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Follow too closely
39	Route 16 at Garfield and Webster	Prior To Webster Ave.	3730897	2014-01-29	10:30 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound / V4:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Inattention
40	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3743814	2014-02-20	6:18 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Turning left / V2:Turning left	Made improper turn
41	Route 16 at Garfield and Webster	Webster Avenue / Revere Beach Parkway	3741353	2014-02-25	12:46 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
42	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 E / Webster Avenue	3774432	2014-03-15	10:13 AM	Sideswipe, same direction	Property damage only		Wet	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Erratic or reckless
43	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Parkway	3782394	2014-03-23	3:22 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Unknown
44	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3781153	2014-03-26	4:25 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound / V3:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	No improper action
45	Route 16 at Garfield and Webster	0 Feet E From Intersection Revere Beach Parkway Rte 16 E	3790118	2014-04-11	12:35 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Changing lanes	No improper action
46	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 E / Webster Avenue	3793374	2014-04-12	8:05 AM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
47	Route 16 at Garfield and Webster	Rte 16 W / Garfield Avenue	3823237	2014-05-17	9:11 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Changing lanes	No improper action
48	Route 16 at Garfield and Webster	@ Russo'S Tux	3868065	2014-06-21	10:35 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
49	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 / Webster Avenue	3868821	2014-06-29	10:50 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Erratic or reckless
50	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 / Webster Avenue	3871514	2014-07-05	12:00 AM	Angle	Property damage only		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Eastbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
51	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Garfield Avenue	3889089	2014-07-16	3:10 PM	Sideswipe, same direction	Non-fatal injury	cyc	Wet	Daylight	Rain	Peak	V1:Westbound	V1: Entering traffic lane	Distracted
52	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 / Webster Avenue	3888346	2014-07-20	2:37 AM	Head-on	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Southbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
53	Route 16 at Garfield and Webster	Garfield Avenue / Revere Beach Parkway Rte 16 W	3901842	2014-07-28	1:33 PM	Sideswipe, same direction	Property damage only		Wet	Daylight	Clear	Off-peak	V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
54	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Pkwy	3909839	2014-08-17	8:18 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Turning right / V2:Turning right	Unknown
55	Route 16 at Garfield and Webster	@ Russo Tux	3922547	2014-08-22	6:49 PM	Angle	Property damage only		Dry	Dusk	Clear	Peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	No improper action
56	Route 16 at Garfield and Webster	Garfield Avenue / Revere Beach Parkway Rte 16 W	3938956	2014-09-13	6:00 PM	Angle	Property damage only		Wet	Daylight	Rain	Peak	V1:Northbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	
57	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3959851	2014-09-16	9:45 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Turning right / V2:Travelling straight ahead	Failure to keep in proper lane
58	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3959416	2014-09-19	3:45 PM	Angle	Property damage only		Dry	Daylight	Unknown	Peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
59	Route 16 at Garfield and Webster	Garfield Ave / Revere Beach Parkway	3964669	2014-10-02	2:26 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Unknown
60	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Garfield Avenue	3972477	2014-10-14	8:05 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
61	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Garfield Avenue	3984773	2014-12-05	6:20 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Inattention
62	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3990076	2014-12-17	11:05 AM	Sideswipe, same direction	Non-fatal injury		Wet	Daylight	Rain	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Erratic or reckless
63	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	3996328	2014-12-22	6:25 PM	Angle	Property damage only		Wet	Dark - lighted roadway	Rain	Peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
64	Route 16 at Garfield and Webster	@Webster/Garfield Ave	3999819	2015-01-07	8:55 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
65	Route 16 at Garfield and Webster	0 Feet E From Intersection Revere Beach Parkway Rte 16	3993970	2015-01-13	4:05 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Failure to keep in proper lane
66	Route 16 at Garfield and Webster	0 Feet W From Intersection Revere Beach Parkway Rte 16 E	4002302	2015-01-30	10:35 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	No improper action
67	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	4019881	2015-02-28	10:45 AM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound / V4:Westbound /	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	No improper action
68	Route 16 at Garfield and Webster	Rte 16 W / Webster Avenue	4023146	2015-03-14	11:55 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
69	Route 16 at Garfield and Webster	Webster Avenue / Garfield Avenue	4023925	2015-03-20	3:44 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	Unknown
70	Route 16 at Garfield and Webster	Rte 16 E / Webster Avenue	4032131	2015-04-04	12:35 AM	Rear-end	Property damage only		Wet	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	No improper action
71	Route 16 at Garfield and Webster	By Russo Tux Shop	4031962	2015-04-05	4:41 PM	Rear-end	Property damage only		Dry	Daylight	Unknown	Peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	No improper action
72	Route 16 at Garfield and Webster	Revere Beach Pkwy	4031496	2015-04-06	7:28 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Southbound	V1: Turning right / V2:Turning right	No improper action
73	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue	4033433	2015-04-14	4:00 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Changing lanes	No improper action
74	Route 16 at Garfield and Webster	Garfield Avenue Rte Unknow / Revere Beach Parkway	4038472	2015-04-30	12:20 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
75	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Unknow / Webster Avenue	4041349	2015-05-09	9:45 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action

Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
76	Route 16 at Garfield and Webster	Revere Beach Parkway Rte 16 W / Webster Avenue	4045001	2015-05-24	2:25 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Follow too closely
77	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Unknow / Webster Avenue	4059094	2015-06-09	11:05 AM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Southbound / V2:Northbound	V1: Turning left / V2:Turning left	
78	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 W / Webster Avenue / Garfield	4087549	2015-06-20	7:00 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Changing lanes	No improper action
79	Route 16 at Garfield and Webster	Rte 16 E / Webster Avenue	4059279	2015-06-29	5:00 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Follow too closely
80	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 W / Webster Avenue / Garfield	4063778	2015-07-11	3:24 AM	Head-on	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	Erratic or reckless
81	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue	4065293	2015-07-12	7:10 AM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
82	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Unknow / Garfield Avenue	4111347	2015-11-16	12:25 PM	Rear-end	Not Reported		Dry	Daylight	Clear	Off-peak	V1:Westbound	V1: Slowing or stopped in traffic	No improper action
83	Route 16 at Garfield and Webster	Rte 16 W / Webster Avenue	4125011	2015-12-10	6:51 AM	Head-on	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Southbound / V2:Northbound	V1: Turning left / V2:Turning left	No improper action
84	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 W / Webster Avenue / Garfield	4125013	2015-12-12	2:30 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding traffic signs
85	Route 16 at Garfield and Webster	Garfield Ave/ Webster Ave	4125962	2015-12-24	7:20 PM	Head-on	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	Fail to yield right of way
86	Route 16 at Garfield and Webster	0 Feet W From Intersection Rte 16 E / Webster Avenue	4133886	2016-01-08	4:40 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
87	Route 16 at Garfield and Webster	Russo Tux	4136048	2016-01-14	5:30 PM	Rear-end	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Peak	V1:Westbound / V2:Westbound / V3:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	Follow too closely
88	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue	4135553	2016-01-14	6:15 PM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead / V3:Travelling straight ahead	No improper action
89	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue / Garfield	4142800	2016-01-30	2:40 PM	Head-on	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Westbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield right of way
90	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue	4153339	2016-02-06	4:07 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
91	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 W / Webster Avenue / Garfield	4154717	2016-02-24	6:26 PM	Angle	Property damage only		Wet	Dark - lighted roadway	Rain	Peak	V1:Northbound / V2:Northbound	V1: Turning right / V2:Travelling straight ahead	Fail to yield right of way
92	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue	4164178	2016-03-03	2:45 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	No improper action
93	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 W / Webster Avenue / Garfield	4179412	2016-04-17	10:05 PM	Angle	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound / V2:Westbound / V3:Westbound	V1: Turning left / V2:Travelling straight ahead / V3:Travelling straight ahead	Disregarding traffic signs
94	Route 16 at Garfield and Webster	Adams St / Garfield Ave	4182030	2016-04-24	3:50 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Follow too closely / No
95	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 W / Webster Avenue	4185882	2016-05-03	5:45 PM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	
96	Route 16 at Garfield and Webster	Revere Beach Parkway / Webster Avenue	4223214	2016-07-25	3:10 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
97	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Parkway	4230043	2016-07-31	12:36 PM	Angle	Property damage only		Wet	Daylight	Rain	Off-peak	V1:Westbound / V2:Eastbound	V1: Turning left / V2:Turning right	Unknown
98	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue	4249473	2016-09-13	1:35 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	No improper action
99	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue	4252280	2016-09-14	6:45 AM	Rear-end	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	No improper action
100	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 W / Webster Avenue / Garfield	4267155	2016-10-15	12:25 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in	Cellphone



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
101	Route 16 at Garfield and Webster	Webster Ave / Revere Beach Pkwy	4278534	2016-10-27	7:21 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Northbound / V2:Northbound / V3:Northbound	V1: Overtaking/passing / V2:Travelling straight ahead / V3:Travelling straight ahead	Erratic or reckless
102	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 W / Webster Avenue / Garfield	4273975	2016-10-27	11:03 PM	Angle	Non-fatal injury		Wet	Dark - lighted roadway	Rain	Off-peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Fail to yield right of way
103	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue	4274844	2016-10-30	2:04 AM	Rear-end	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound / V2:Eastbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	No improper action
104	Route 16 at Garfield and Webster	Revere Beach Parkway Rte Sr16 E / Webster Avenue	4277073	2016-11-06	4:09 PM	Head-on	Property damage only		Dry	Daylight	Clear	Peak	V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	No improper action



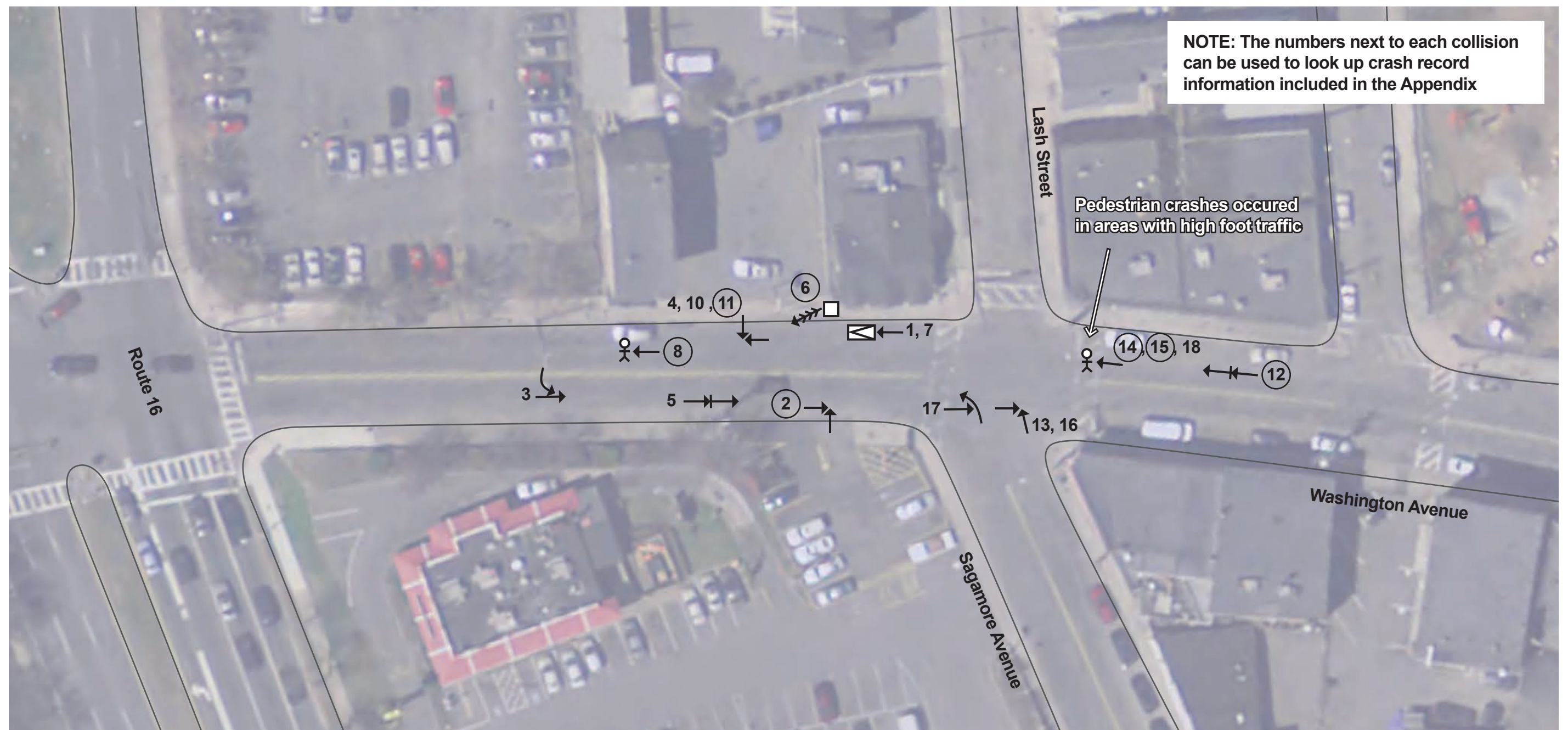
SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [Trapezoid] Parked Vehicle	↔↔ Head On	↔↔ Sideswipe	○ Injury Accident	⊙ Fatal Accident
↔ Backing Vehicle	→ [Square] Fixed Object	→↙ Angle	↪ Out of Control		
- - - Non-Involved Vehicle	→ [Bicycle] Bicycle	→↘ Rear End			
→ [Stick Figure] Pedestrian	→ [Animal] Animal				

Figure 13  
Collision Diagram: 2012–16 Police Data



Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Route 16 btwn Garfield and Route 1	Russo Tux Shop	3168279	2012-03-03	7:30 PM	Sideswipe, same direction	Non-fatal injury		Dry	Dark - lighted roadway	Unknown	Off-peak	V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning right	No improper action
2	Route 16 btwn Garfield and Route 1	Revere Beach Parkway Rte 16 / Webster Avenue	3370829	2013-03-16	3:19 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound	V1: Travelling straight ahead	No improper action
3	Route 16 btwn Garfield and Route 1	Revere Beach Parkway Rte 16 E / Webster Avenue	3702740	2013-12-20	7:55 AM	Single vehicle crash	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Eastbound	V1: Travelling straight ahead	
4	Route 16 btwn Garfield and Route 1	Revere Beach Parkway Rte 16 W / Wesley Street	3888231	2014-07-19	1:14 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Turning right / V2:Travelling straight ahead	Made improper turn
5	Route 16 btwn Garfield and Route 1	Revere Beach Parkway Rte 16 W / Adams Street	3962473	2014-10-04	8:45 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning right	No improper action
6	Route 16 btwn Garfield and Route 1	Revere Beach Parkway Rte 16 E / Webster Avenue	4033430	2015-04-10	12:30 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Eastbound / V2:Eastbound	V1: Changing lanes / V2:Travelling straight ahead	Failure to keep in proper lane
7	Route 16 btwn Garfield and Route 1	Revere Beach Parkway Rte Sr16 W / Adams Street	4070801	2015-07-17	3:30 PM	Angle	Non-fatal injury		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Entering traffic lane	
8	Route 16 btwn Garfield and Route 1	Rte 16 / Webster Avenue	4120138	2015-12-05	2:45 AM	Single vehicle crash	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound	V1: Travelling straight ahead	Erratic or reckless
9	Route 16 btwn Garfield and Route 1	Russo'S Tux	4185877	2016-04-26	11:55 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Changing lanes / V2:Travelling straight ahead	Inattention
10	Route 16 btwn Garfield and Route 1	100 Feet W From Intersection Revere Beach Parkway Rte 16	4292487	2016-11-19	2:55 AM	Sideswipe, same direction	Non-fatal injury		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Entering traffic lane / V2:Travelling straight ahead	Failure to keep in proper lane
11	Route 16 at Ramp From Route 1 SB	Revere Beach Parkway Rte 16 W	3453050	2013-05-31	4:15 PM	Sideswipe, same direction	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Not reported	V1: Changing lanes / V2:Not reported	Inattention
12	Route 16 at Ramp From Route 1 SB	Revere Beach Parkway Rte 16 W / Ramp-Rt 1 Sb To Rt 16 Wb	4111601	2015-11-17	6:10 PM	Sideswipe, same direction	Property damage only		Dry	Dark - lighted roadway	Clear	Peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
13	Route 16 at Ramp From Route 1 SB	Revere Beach Parkway Rte 16 W / Clyde Street	4149276	2016-02-01	8:55 AM	Sideswipe, same direction	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Westbound / V2:Westbound	V1: Entering traffic lane / V2:Travelling straight ahead	Fail to yield right of way





SYMBOLS		TYPES OF CRASH		SEVERITY	
→ Moving Vehicle	→ [Parked Vehicle Symbol] Parked Vehicle	↔↔ Head On	↔ Sideswipe	○ Injury Accident	⊙ Fatal Accident
↔ Backing Vehicle	→ [Fixed Object Symbol] Fixed Object	↘↙ Angle	↻ Out of Control		
- - - Non-Involved Vehicle	→ [Bicycle Symbol] Bicycle	→↔ Rear End			
→ [Pedestrian Symbol] Pedestrian	→ [Animal Symbol] Animal				

**Figure 14**  
Collision Diagram: 2012–16 Police Data





Index	Crash Location	Address	Crash Number	Crash Date	Crash Time	Manner of Collision	Crash Severity	Cyclist or Ped	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Is Peak?	Vehicle Travelled Direction	Vehicle Action	Driver Contributing Code
1	Washington Avenue btwn Route 16 and	Washington Avenue	2890137	2012-01-27	6:56 AM	Rear-end	Property damage only		Wet	Daylight	Rain	Peak	V1:Northbound / V2:Eastbound	V1: Parked / V2:Backing	No improper action
2	Washington Avenue btwn Route 16 and	Washington Ave	3244131	2012-08-10	12:48 PM	Angle	Non-fatal injury		Dry	Daylight	Cloudy	Off-peak	V1:Northbound / V2:Eastbound / V3:Not reported	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Parked	Inattention
3	Washington Avenue btwn Route 16 and	Washington Ave	3705442	2013-10-27	1:44 PM	Angle	Property damage only		Dry	Daylight	Cloudy	Off-peak	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	No improper action
4	Washington Avenue btwn Route 16 and	Washington Ave	3705520	2013-12-04	7:53 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Eastbound	V1: Travelling straight ahead	No improper action
5	Washington Avenue btwn Route 16 and	Washington Ave	4040850	2015-05-09	2:05 PM	Rear-end	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	Unknown
6	Washington Avenue btwn Route 16 and	Washington Ave	4042961	2015-05-16	9:40 PM	Rear-end	Not Reported		Dry	Dark - lighted roadway	Clear	Off-peak	V1:Northbound	V1: Backing	Unknown
7	Washington Avenue btwn Route 16 and	Washington Ave / Sagamore Avenue	4084744	2015-07-24	3:39 PM	Single vehicle crash	Property damage only		Dry	Daylight	Clear	Peak	V1:Westbound / V2:Northbound	V1: Turning right / V2:Parked	Unknown
8	Washington Avenue btwn Route 16 and	Washington Ave	4106095	2015-10-23	4:13 PM	Single vehicle crash	Non-fatal injury	ped	Dry	Daylight	Clear	Peak	V1:Southbound	V1: Travelling straight ahead	Unknown
9	Washington Avenue btwn Route 16 and	Sagamore Ave / Washington Ave	4175940	2016-04-12	6:21 AM	Angle	Property damage only		Dry	Daylight	Cloudy	Peak	V1:Westbound / V2:Southbound	V1: Turning left / V2:Making U-turn	No improper action
10	Washington Avenue btwn Route 16 and	350 Washington Ave	4230035	2016-07-27	7:24 PM	Angle	Property damage only		Dry	Daylight	Clear	Off-peak	V1:Eastbound / V2:Southbound	V1: Entering traffic lane / V2:Travelling straight ahead	Inattention
11	Washington Avenue btwn Route 16 and	368 Washington Ave	4306132	2016-12-30	3:44 PM	Sideswipe, same direction	Non-fatal injury		Dry	Dawn	Clear	Peak	V1:Northbound / V2:Northbound / V3:Not reported	V1: Travelling straight ahead / V2:Parked / V3:Parked	Inattention
12	Washington Avenue at Sagamore Avenue	Washington Ave / Sagamore Avenue	2906332	2012-02-12	2:19 PM	Rear-end	Non-fatal injury		Dry	Daylight	Clear	Off-peak	V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	Follow too closely
13	Washington Avenue at Sagamore Avenue	Washington Ave / Sagamore Ave	3269199	2012-10-07	9:46 AM	Angle	Property damage only		Dry	Daylight	Clear	Peak	V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Unknown
14	Washington Avenue at Sagamore Avenue	Washington Ave / Sagamore Ave	3290330	2012-10-19	6:58 PM	Single vehicle crash	Non-fatal injury	ped	Wet	Dark - lighted roadway	Rain	Peak	V1:Southbound	V1: Travelling straight ahead	No improper action
15	Washington Avenue at Sagamore Avenue	Sagamore Ave / Washington Ave	3475747	2013-06-07	11:56 PM	Single vehicle crash	Non-fatal injury	ped	Wet	Dark - lighted roadway	Rain	Off-peak	V1:Southbound	V1: Travelling straight ahead	Unknown
16	Washington Avenue at Sagamore Avenue	Washington Ave / Sagamore Ave	3736829	2014-02-20	5:22 PM	Angle	Property damage only		Wet	Dark - lighted roadway	Clear	Peak	V1:Westbound / V2:Northbound / V3:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	Unknown
17	Washington Avenue at Sagamore Avenue	Washington Ave / Sagamore Ave	3991549	2015-01-06	5:55 PM	Angle	Property damage only		Dry	Dark - lighted roadway	Cloudy	Peak	V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning right	No improper action
18	Washington Avenue at Sagamore Avenue	Washington Ave	4091051	2015-09-30	7:32 PM	Single vehicle crash	Property damage only	ped	Dry	Dark - lighted roadway	Cloudy	Off-peak	V1:Eastbound	V1: Travelling straight ahead	No improper action

## **Part 2: Expected Crashes Analysis**

**Table C-1  
Summary of Expected Crashes Analysis for Existing Conditions  
Route 16 in Everett and Chelsea**

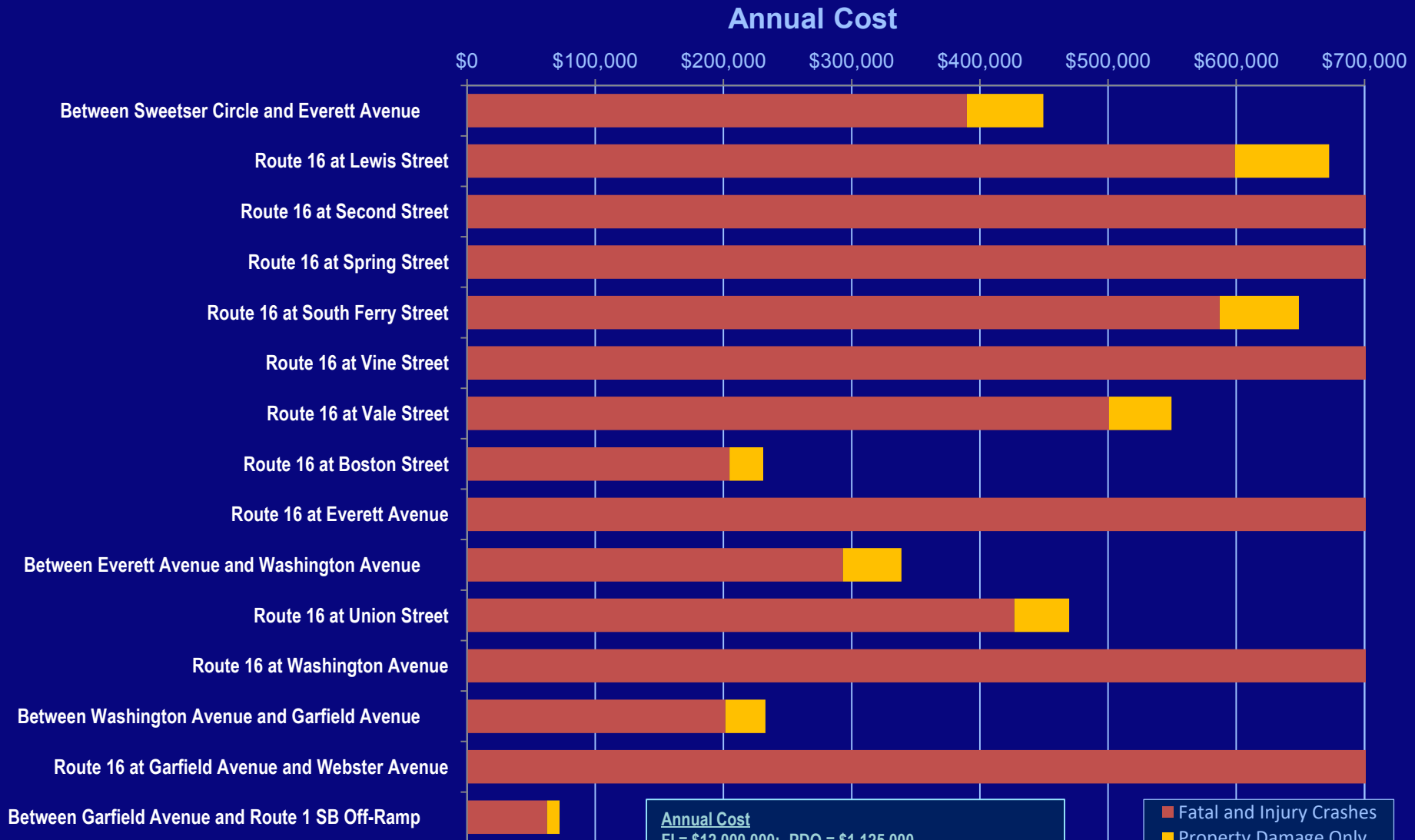
Location	Analysis Type	Total observed crashes	Average observed crashes	Average predicted crashes	Average expected crashes	Potential for Safety Improvement (PSI)	High-Risk Site	Observed crashes > Expected Crashes	FI Crash Rate	PDO Crash Rate	FI Cost	PDO Cost	Total Cost
Between Sweetser Circle and Everett Avenue	Segment	32	6.4	5.63	5.32	-0.31	-	Y	1.49	3.83	\$389,854	\$59,673	\$449,500
Route 16 at Lewis Street	Intersection	42	8.4	3.85	7.00	3.15	Y	Y	2.30	4.70	\$599,014	\$73,386	\$672,400
Route 16 at Second Street	Intersection	61	12.2	16.04	14.20	-1.84	N	N	5.33	8.87	\$1,389,807	\$138,389	\$1,528,200
Route 16 at Spring Street	Intersection	41	8.2	7.65	7.94	0.29	Y	Y	3.03	4.91	\$791,323	\$76,562	\$867,900
Route 16 at South Ferry Street	Intersection	31	6.2	6.14	6.21	0.07	Y	N	2.25	3.96	\$587,049	\$61,717	\$648,800
Route 16 at Vine Street	Intersection	59	11.8	11.36	13.32	1.96	Y	N	5.09	8.23	\$1,327,625	\$128,450	\$1,456,100
Route 16 at Vale Street	Intersection	22	4.4	6.40	5.05	-1.35	N	N	1.92	3.13	\$500,717	\$48,822	\$549,500
Route 16 at Boston Street	Intersection	10	2.0	5.28	2.47	-2.81	N	N	0.79	1.69	\$204,741	\$26,328	\$231,100
Route 16 at Everett Avenue	Intersection	82	16.4	10.04	15.67	5.63	Y	Y	6.21	9.46	\$1,618,586	\$147,618	\$1,766,200
Between Everett Avenue and Washington Avenue	Segment	29	5.8	2.35	4.05	1.71	-	Y	1.12	2.93	\$293,162	\$45,691	\$338,900
Route 16 at Union Street	Intersection	21	4.2	7.61	4.39	-3.23	N	N	1.64	2.75	\$426,810	\$42,902	\$469,700
Route 16 at Washington Avenue	Intersection	76	15.2	8.97	14.82	5.85	Y	Y	5.55	9.27	\$1,447,646	\$144,655	\$1,592,300
Between Washington Avenue and Garfield Avenue	Segment	16	3.2	2.39	2.78	0.38	-	Y	0.77	2.01	\$201,436	\$31,288	\$232,700
Route 16 at Garfield Avenue and Webster Avenue	Intersection	104	20.8	13.13	22.08	8.96	Y	N	8.27	13.81	\$2,156,739	\$215,510	\$2,372,200
Between Garfield Avenue and Route 1 SB Off-Ramp	Segment	10	2.0	1.30	0.86	-0.44	-	Y	0.24	0.62	\$62,439	\$9,712	\$72,200
<b>Entire Route 16 Corridor</b>		<b>636</b>	<b>127.2</b>	<b>108.15</b>	<b>126.17</b>	<b>9 of 15</b>	<b>7 of 11</b>	<b>8 of 15</b>	<b>46.0</b>	<b>80.2</b>	<b>\$11,996,948</b>	<b>\$1,250,702</b>	<b>\$13,247,700</b>

Notes:

**Analysis Type** = Highway Safety Manual (HSM) method of analysis. Intersection analyses use MassDOT corrected formulas.  
**Total observed crashes** = total number of crashes reported to Brookline Police between January 2013 and August 2018  
**Average observed crashes** = observed crashes / (5.67 years)  
**Average predicted crashes** = number of crashes per year predicted for an average facility with similar geometric and traffic characteristics  
**Average expected crashes** = predicted crashes, corrected using Empirical Bayes correlation and observed crashes  
**Potential for Safety Improvement (PSI)** = (average expected crashes) - (average predicted crashes). Represents the number of crashes per year occurring in excess of the predicted number

**High-Risk Site** = MassDOT designation for intersections with high safety risk  
**Observed crashes > Expected Crashes** = shows if recent crash history is above average  
**Fatal or Injury (FI) Crash Rate** = number of expected crashes per year that result in a fatality or injury  
**Property Damage Only (PDO) Crash Rate** = number of expected crashes per year that only result in property damage in excess of \$1,000  
**FI Cost** = annual cost of expected FI crashes. Uses MassDOT comprehensive crash cost of \$260,800 per FI crash  
**PDO Cost** = annual cost of expected PDO crashes. Uses MassDOT comprehensive crash cost of \$15,600 per PDO crash  
**Total Cost** = FI Cost + PDO Cost

# Annual Comprehensive Cost Estimate By Facility

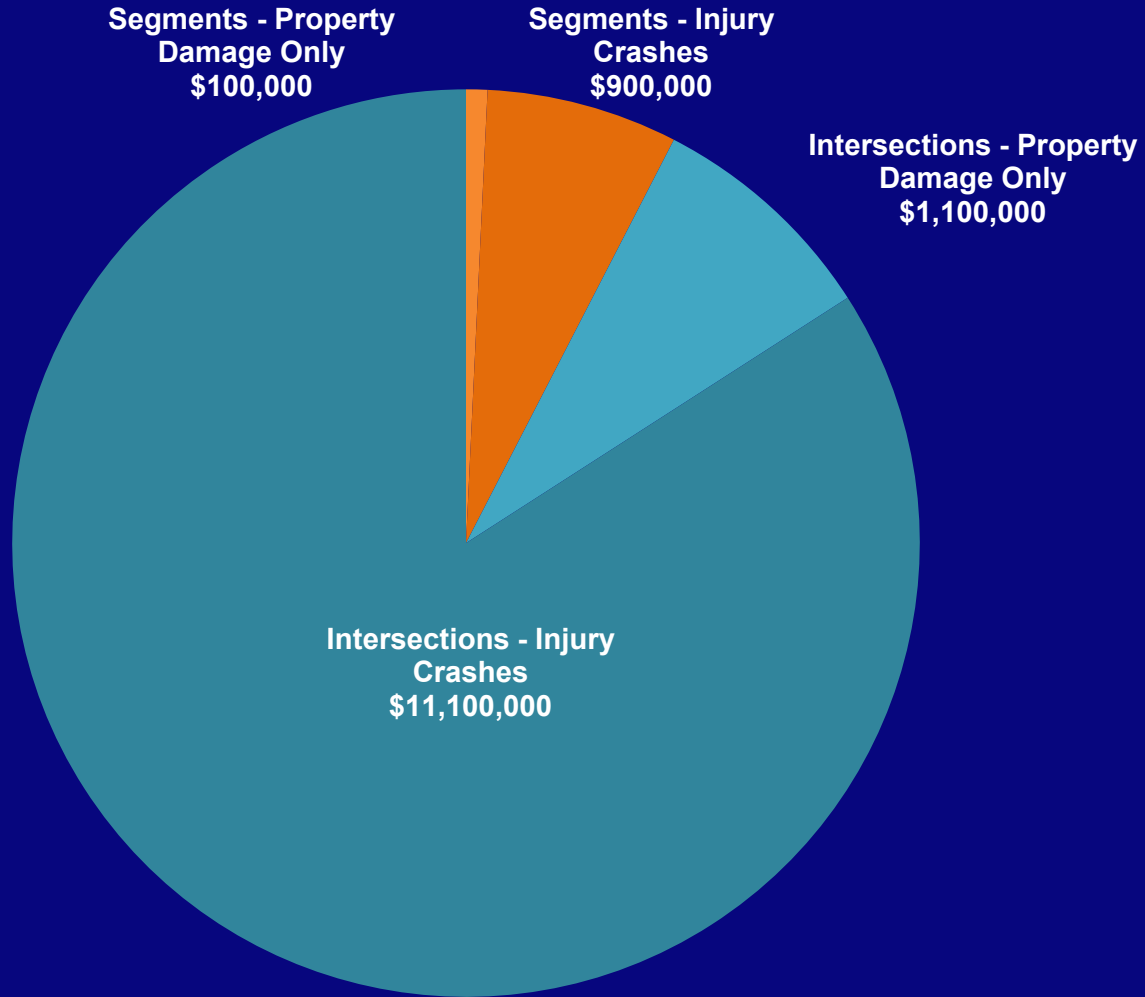


**Annual Cost**  
 FI = \$12,000,000; PDO = \$1,125,000  
 Total = \$13,125,000  
 Note: Recommended comprehensive crash cost costs are \$260,800 per FI crash and \$15,600 per PDO crash, from 2016 FHWA estimates adjusted for Massachusetts.

■ Fatal and Injury Crashes  
 ■ Property Damage Only



# Annual Comprehensive Cost Estimate: Existing Conditions



General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at Lewis Street
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012–16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012–16	40	42	3.39	3.85	1.35

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
40.00	8.40	16.97	3.85	-	0.38	31.19	35.01	7.00	Y	3.15	Y

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at Second Street
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012-16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012-16	59	61	13.15	16.04	4.20

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
59.00	12.20	65.76	16.04	-	0.14	59.93	71.00	14.20	N	-1.84	N

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at Spring Street
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012–16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012–16	34	41	6.21	7.65	4.65

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
34.00	8.20	31.03	7.65	-	0.25	33.25	39.71	7.94	Y	0.29	Y



General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at South Ferry Street
Agency or Company	CTPS	Intersection Type	3SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012–16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012–16	26	31	5.17	6.14	4.65

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
26.00	6.20	25.83	6.14	-	0.09	25.99	31.04	6.21	Y	0.07	N

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at Vine Street
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012-16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012-16	58	59	9.21	11.36	4.65

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
58.00	11.80	46.07	11.36	-	0.19	55.78	66.62	13.32	Y	1.96	N

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at Vale Street
Agency or Company	CTPS	Intersection Type	3SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012–16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012–16	20	22	5.23	6.40	6.27

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
20.00	4.40	26.17	6.40	-	0.09	20.53	25.25	5.05	N	-1.35	N

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at Boston Street
Agency or Company	CTPS	Intersection Type	3ST
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012-16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012-16	9	10	4.45	5.28	1.00

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
9.00	2.00	22.25	5.28	-	0.16	11.09	12.36	2.47	N	-2.81	N



General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at Everett Avenue
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012-16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012-16	71	82	7.96	10.04	5.60

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
71.00	16.40	39.79	10.04	-	0.21	64.47	78.34	15.67	Y	5.63	Y

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at Union Street
Agency or Company	CTPS	Intersection Type	3SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012–16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012–16	17	21	6.30	7.61	5.60

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
17.00	4.20	31.52	7.61	-	0.07	18.05	21.93	4.39	N	-3.23	N

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 16 at Washington Avenue
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012-16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012-16	70	76	7.36	8.97	4.15

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
70.00	15.20	36.82	8.97	-	0.22	62.63	74.12	14.82	Y	5.85	Y

General Information		Location Information	
Analyst	Ben Erban	Intersection	ute 16 at Garfield Avenue and Webster Avenue
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	Jan-19	Jurisdiction	MassDOT Highway District 6
City	Everett/Chelsea	Analysis Year	2012-16

Input Information					
Years	Oserved MV crashes	Observed total crashes	Annual Predicted MV crashes	Annual Predicted total crashes	Combined CMF for veh-ped crashes
2012-16	101	104	10.78	13.13	4.15

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
101.00	20.80	53.88	13.13	-	0.16	93.30	110.42	22.08	Y	8.96	N





# Highway Safety Software Urban Segment Report

## Project Information

Analyst	Ben Erban	Date	2/1/2019
Jurisdiction	MassDOT District 4	Analysis Year	2016
Project Description	Priority Corridors from LRTP Needs Mangement: Rt16		

## Input Data

Segment Type	Four-Lane Divided Segment (4D)		
Length of Segment (mi)	0.660	AADT (veh/day)	31621
Median Width (ft)	10	Lighting	Yes
Type of On-street Parking	None	Proportion w/On-street Parking	0.10
Automated Speed Enforcement	No	Posted Speed (mph)	35
Roadside Fixed Object Density	45	Offset to Roadside Fixed Obj. (ft)	5
# Major Commercial Driveways	0	# Minor Commercial Driveways	25
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	3
# Major Residential Driveways	0	# Minor Residential Driveways	5
# Other Driveways	0	Calibration Factor	1.00

## Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	0.914
Roadside Fixed Objects - CMF2	1.179	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.010	Combined CMF	1.089

## Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	1.582	2.398
Property Damage Only (PDO)	4.049	6.135
Total	5.632	8.533

## Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	1.495	2.265
Property Damage Only (PDO)	3.825	5.796
Total	5.320	8.061

## Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	1.495	\$236,483.23
Property Damage Only (PDO)	\$7,400.00	3.825	\$28,306.21
Total	-	5.320	\$264,789.44

# Highway Safety Software Urban Segment Report

## Project Information

Analyst	Ben Erban	Date	2/1/2019
Jurisdiction	MassDOT District 4	Analysis Year	2016
Project Description	Priority Corridors from LRTP Needs Mangement: Rt16		

## Input Data

Segment Type	Four-Lane Divided Segment (4D)		
Length of Segment (mi)	0.150	AADT (veh/day)	38299
Median Width (ft)	4	Lighting	Yes
Type of On-street Parking	None	Proportion w/On-street Parking	0.10
Automated Speed Enforcement	No	Posted Speed (mph)	35
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	10
# Major Commercial Driveways	0	# Minor Commercial Driveways	1
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	3
# Other Driveways	0	Calibration Factor	1.00

## Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	0.914
Roadside Fixed Objects - CMF2	1.058	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	0.967

## Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.362	2.412
Property Damage Only (PDO)	0.941	6.272
Total	1.303	8.683

## Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.239	1.596
Property Damage Only (PDO)	0.623	4.151
Total	0.862	5.747

## Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.239	\$37,875.41
Property Damage Only (PDO)	\$7,400.00	0.623	\$4,607.13
Total	-	0.862	\$42,482.54

# Highway Safety Software Urban Segment Report

## Project Information

Analyst	Ben Erban	Date	2/1/2019
Jurisdiction	MassDOT District 4	Analysis Year	2016
Project Description	Priority Corridors from LRTP Needs Mangement: Rt16		

## Input Data

Segment Type	Four-Lane Divided Segment (4D)		
Length of Segment (mi)	0.260	AADT (veh/day)	38299
Median Width (ft)	4	Lighting	Yes
Type of On-street Parking	None	Proportion w/On-street Parking	0.10
Automated Speed Enforcement	No	Posted Speed (mph)	35
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	5
# Major Commercial Driveways	0	# Minor Commercial Driveways	3
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	4
# Other Driveways	0	Calibration Factor	1.00

## Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	0.914
Roadside Fixed Objects - CMF2	1.108	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.012

## Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.666	2.560
Property Damage Only (PDO)	1.728	6.647
Total	2.394	9.207

## Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.772	2.971
Property Damage Only (PDO)	2.006	7.714
Total	2.778	10.685

## Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.772	\$122,190.25
Property Damage Only (PDO)	\$7,400.00	2.006	\$14,841.60
Total	-	2.778	\$137,031.85



# Highway Safety Software Urban Segment Report

## Project Information

Analyst	Ben Erban	Date	2/1/2019
Jurisdiction	MassDOT District 4	Analysis Year	2016
Project Description	Priority Corridors from LRTP Needs Mangement: Rt16		

## Input Data

Segment Type	Four-Lane Divided Segment (4D)		
Length of Segment (mi)	0.150	AADT (veh/day)	38299
Median Width (ft)	4	Lighting	Yes
Type of On-street Parking	None	Proportion w/On-street Parking	0.10
Automated Speed Enforcement	No	Posted Speed (mph)	35
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	10
# Major Commercial Driveways	0	# Minor Commercial Driveways	1
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	3
# Other Driveways	0	Calibration Factor	1.00

## Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	0.914
Roadside Fixed Objects - CMF2	1.058	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	0.967

## Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.362	2.412
Property Damage Only (PDO)	0.941	6.272
Total	1.303	8.683

## Expected Roadway Section Crashes

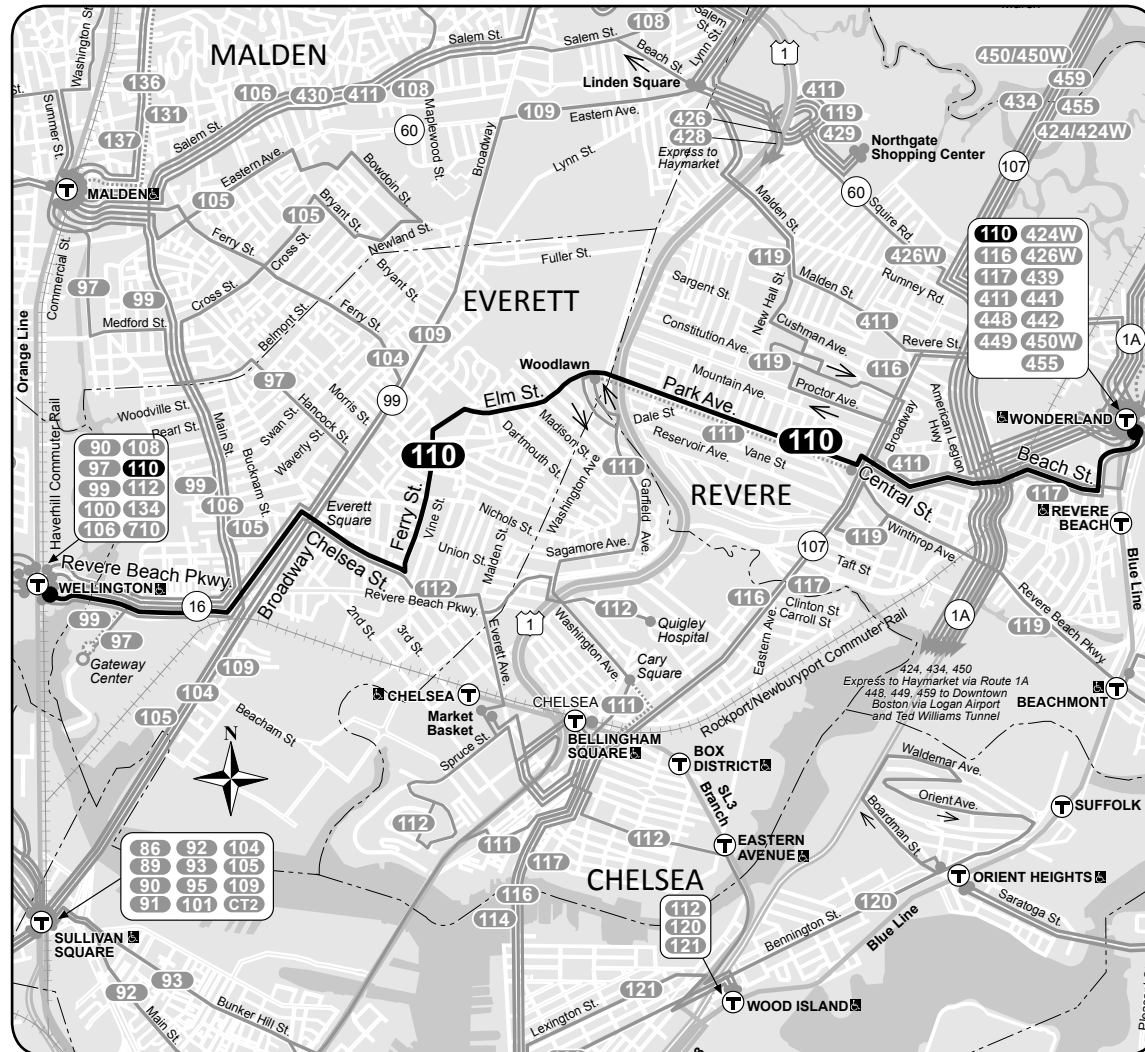
Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.239	1.596
Property Damage Only (PDO)	0.623	4.151
Total	0.862	5.747

## Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.239	\$37,875.41
Property Damage Only (PDO)	\$7,400.00	0.623	\$4,607.13
Total	-	0.862	\$42,482.54

## **Appendix E: Bus Schedules**

## Route 110 Wonderland or Broadway & Park Ave. - Wellington Station



schedule change

# 110

Effective June 23, 2019

## Wonderland or Broadway & Park Avenue-Wellington Station

New fares effective July 1, 2019

### Serving

- Bell Circle
- Revere Centre
- Woodlawn
- Everett Square
- Sweetser Circle
- Orange Line
- Blue Line
- Haverhill Commuter Rail



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110 Weekday			110 Saturday		
Inbound		Outbound	Inbound		Outbound
Leave Wonderland Station	Arrive Woodlawn	Arrive Wellington Station	Leave Wellington Station	Arrive Woodlawn	Arrive Wonderland Station
c 4:55A	4:58A	5:12A	d 5:25A	5:34A	.....
c 5:18	5:21	5:35	d 5:42	5:51	.....
c 5:36	5:39	5:53	d 5:59	6:08	.....
c 5:54	5:57	6:14	d 6:16	6:25	.....
c 6:12	6:15	6:33	6:35	6:49	7:03A
c 6:30	6:33	6:51	6:50	7:05	7:17
c 6:48	6:51	7:09	7:05	7:21	7:33
c 7:05	7:08	7:26	d 7:18	7:34	.....
7:08	7:19	7:39	7:33	7:49	8:01
7:18	7:29	7:49	7:51	8:04	8:17
7:28	7:39	7:59	8:11	8:23	8:36
c 7:45	7:48	8:10	8:20	8:32	8:45
7:48	7:59	8:19	8:40	8:52	9:05
8:08	8:19	8:36	9:00	9:12	9:25
8:27	8:40	8:57	9:25	9:39	9:52
8:45	8:58	9:18	9:55	10:09	10:22
9:00	9:12	9:32	10:35	10:49	11:01
9:20	9:32	9:49	11:05	11:22	11:34
9:40	9:51	10:07	11:40	11:57	12:09P
10:00	10:11	10:28			
10:30	10:41	10:58	12:15P	12:32P	12:44P
11:05	11:16	11:33	12:55	1:12	1:24
11:40	11:51	12:08P	1:25	1:43	1:56
			2:05	2:26	2:39
12:20P	12:31P	12:48P	2:55	3:16	3:29
12:50	1:01	1:25	3:25	3:46	3:59
1:30	1:41	2:04	3:40	4:01	4:14
2:10	2:22	2:40	4:00	4:21	4:34
2:50	3:02	3:20	4:20	4:41	4:54
3:20	3:32	3:50	d 4:30	4:47	.....
3:40	3:52	4:09	4:42	5:03	5:16
4:10	4:22	4:39	d 4:54	5:11	.....
4:25	4:37	4:54	5:06	5:27	5:40
4:42	4:54	5:11	d 5:18	5:35	.....
c 5:03	5:06	5:24	d 5:30	5:47	.....
5:05	5:17	5:34	5:42	6:03	6:14
c 5:23	5:26	5:41	d 5:54	6:10	.....
5:25	5:37	5:54	6:06	6:21	6:32
c 5:48	5:51	6:06	d 6:18	6:33	.....
5:55	6:07	6:24	6:30	6:45	6:56
c 6:18	6:21	6:35	6:50	7:05	7:16
6:25	6:35	6:50	7:15	7:30	7:41
6:45	6:55	7:10	8:15	8:30	8:41
7:05	7:15	7:30	9:15	9:30	9:41
7:50	8:00	8:12	10:15	10:30	10:39
8:50	8:59	9:11	11:15	11:28	11:37
9:50	9:59	10:11	12:10A	12:23A	12:32A
10:45	10:54	11:06	w 1:00	1:12	.....
11:45	11:53	12:05A			
12:35A	12:43A	12:55			

110 Saturday			110 Sunday		
Inbound		Outbound	Inbound		Outbound
Leave Wonderland Station	Arrive Woodlawn	Arrive Wellington Station	Leave Wellington Station	Arrive Woodlawn	Arrive Wonderland Station
5:00A	5:09A	5:22A	5:30A	5:40A	5:50A
6:00	6:09	6:22	6:30	6:42	6:52
7:00	7:10	7:26	7:30	7:42	7:52
8:00	8:10	8:26	8:30	8:42	8:52
9:00	9:11	9:28	9:30	9:42	9:52
10:00	10:11	10:28	10:05	10:18	10:30
10:35	10:46	11:03	10:35	10:48	11:00
11:10	11:21	11:38	11:10	11:23	11:35
11:45	11:56	12:13P	11:45	11:58	12:10P
12:20P	12:31P	12:48P	12:20P	12:33P	12:45P
12:55	1:06	1:23	12:55	1:08	1:20
1:30	1:41	1:58	1:30	1:43	1:55
2:05	2:15	2:37	2:05	2:18	2:30
2:40	2:50	3:12	2:40	2:53	3:05
3:15	3:25	3:47	3:15	3:33	3:42
3:50	4:01	4:19	3:50	4:08	4:17
4:25	4:35	4:52	4:25	4:43	4:52
5:00	5:10	5:27	5:00	5:18	5:27
5:35	5:45	6:01	5:35	5:50	5:59
6:10	6:20	6:34	6:10	6:25	6:34
6:45	6:55	7:07	6:40	6:55	7:04
7:15	7:24	7:36	7:10	7:25	7:34
7:45	7:54	8:06	d 7:40	7:55	.....
c 8:07	8:10	8:22	d 8:15	8:30	.....
c 8:37	8:40	8:52	d 9:15	9:30	.....
c 9:37	9:40	9:52	d 10:15	10:30	.....
c 10:37	10:40	10:52	d 11:15	11:27	.....
c 11:37	11:40	11:51	d 12:15A	12:27A	.....
c 12:37A	12:40A	12:51A	w 1:00	1:11	.....

c - From Broadway & Park Avenue to Wellington Station  
d - From Wellington Station to Broadway & Park Avenue  
w - Waits for last train to arrive at Wellington Station.

### Route 110 Wonderland or Broadway & Park Avenue-Wellington Station

110 Sunday			110 Sunday		
Inbound		Outbound	Inbound		Outbound
Leave Wonderland Station	Arrive Woodlawn	Arrive Wellington Station	Leave Wellington Station	Arrive Woodlawn	Arrive Wonderland Station
c 6:15A	6:18A	6:30A	d 6:35A	6:46A	.....
c 6:55	6:58	7:10	7:15	7:26	7:35A
7:45	7:54	8:09	8:15	8:26	8:36
8:45	8:54	9:10	9:15	9:26	9:36
9:45	9:54	10:10	10:15	10:26	10:36
10:45	10:54	11:10	11:15	11:29	11:40
11:45	11:55	12:12P			
			12:20P	12:35P	12:45P
12:55P	1:05P	1:22P	1:30	1:45	1:57
2:05	2:15	2:33	2:40	2:57	3:09
3:15	3:26	3:44	3:50	4:04	4:15
4:25	4:36	4:50	5:00	5:14	5:25
5:35	5:46	6:00	6:10	6:23	6:34
6:45	6:55	7:07	7:15	7:28	7:39
7:45	7:54	8:07	d 8:15	8:29	.....
c 8:35	8:38	8:49	d 9:15	9:29	.....
c 9:35	9:38	9:49	d 10:15	10:29	.....
c 10:35	10:38	10:49			

All buses are accessible to persons with disabilities

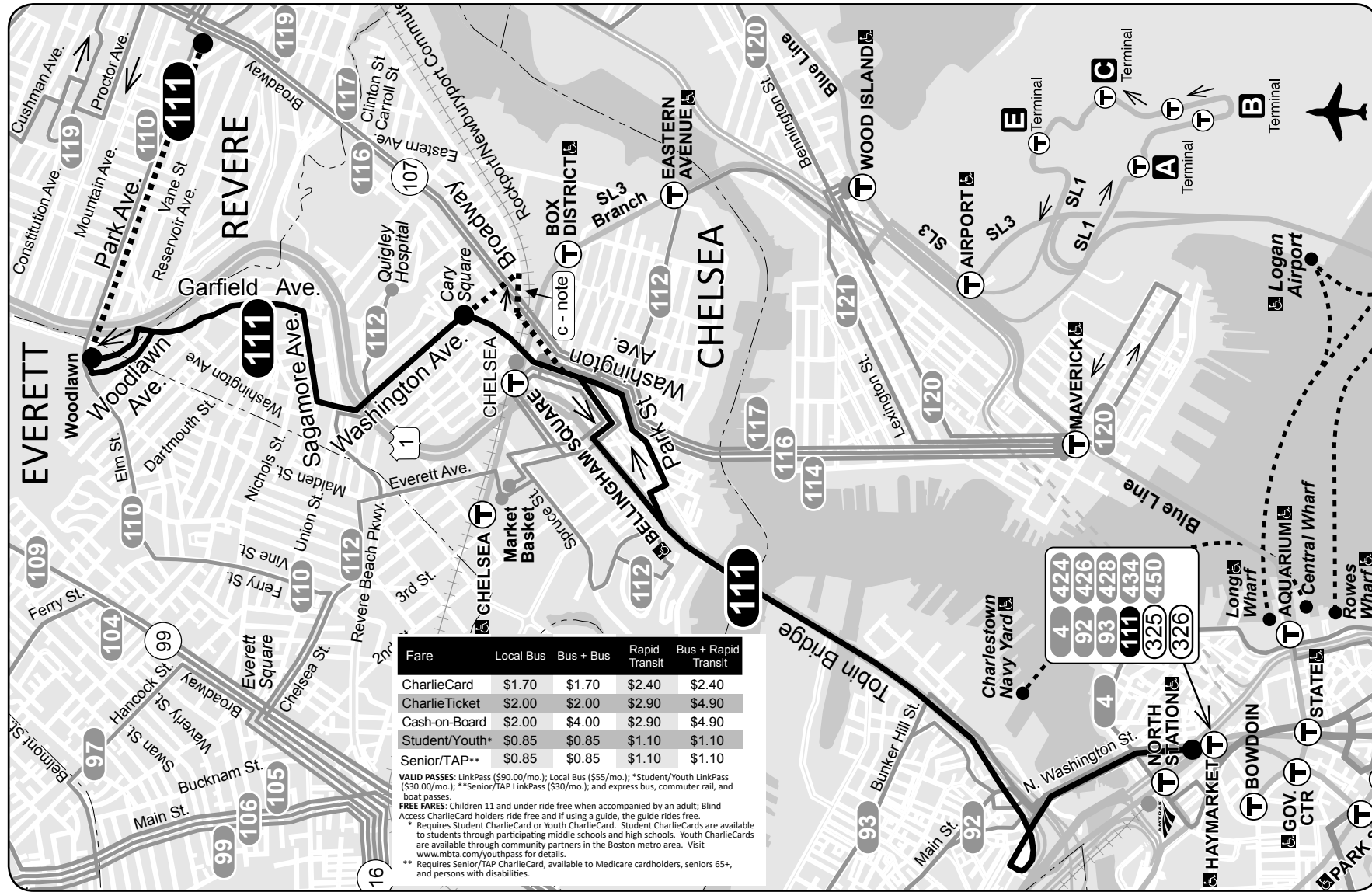
Fare	Local Bus	Bus + Bus	Rapid Transit	Bus + Rapid Transit
CharlieCard	\$1.70	\$1.70	\$2.40	\$2.40
CharlieTicket	\$2.00	\$2.00	\$2.90	\$4.90
Cash-on-Board	\$2.00	\$4.00	\$2.90	\$4.90
Student/Youth*	\$0.85	\$0.85	\$1.10	\$1.10
Senior/TAP**	\$0.85	\$0.85	\$1.10	\$1.10

**VALID PASSES:** LinkPass (\$90.00/mo.); Local Bus (\$55/mo.); \*Student/Youth LinkPass (\$30.00/mo.); \*\*Senior/TAP LinkPass (\$30/mo.); and express bus, commuter rail, and boat passes.  
**FREE FARES:** Children 11 and under ride free when accompanied by an adult; Blind Access CharlieCard holders ride free and if using a guide, the guide rides free.  
\* Requires Student CharlieCard or Youth CharlieCard. Student CharlieCards are available to students through participating middle schools and high schools. Youth CharlieCards are available through community partners in the Boston metro area. Visit [www.mbta.com/youthpass](http://www.mbta.com/youthpass) for details.  
\*\* Requires Senior/TAP CharlieCard, available to Medicare cardholders, seniors 65+, and persons with disabilities.

**Summer 2019 Holidays**  
7/4/19: see Sunday 9/2/19: see Sunday



**Route 111 Woodlawn or Broadway & Park Ave. - Haymarket Station**



# 111

Effective June 23, 2019

**Woodlawn or Broadway & Park Avenue-Haymarket Station**

New fares effective July 1, 2019

**Serving**

- Chelsea Square
- Bellingham Square
- Cary Square
- Green Line
- Orange Line

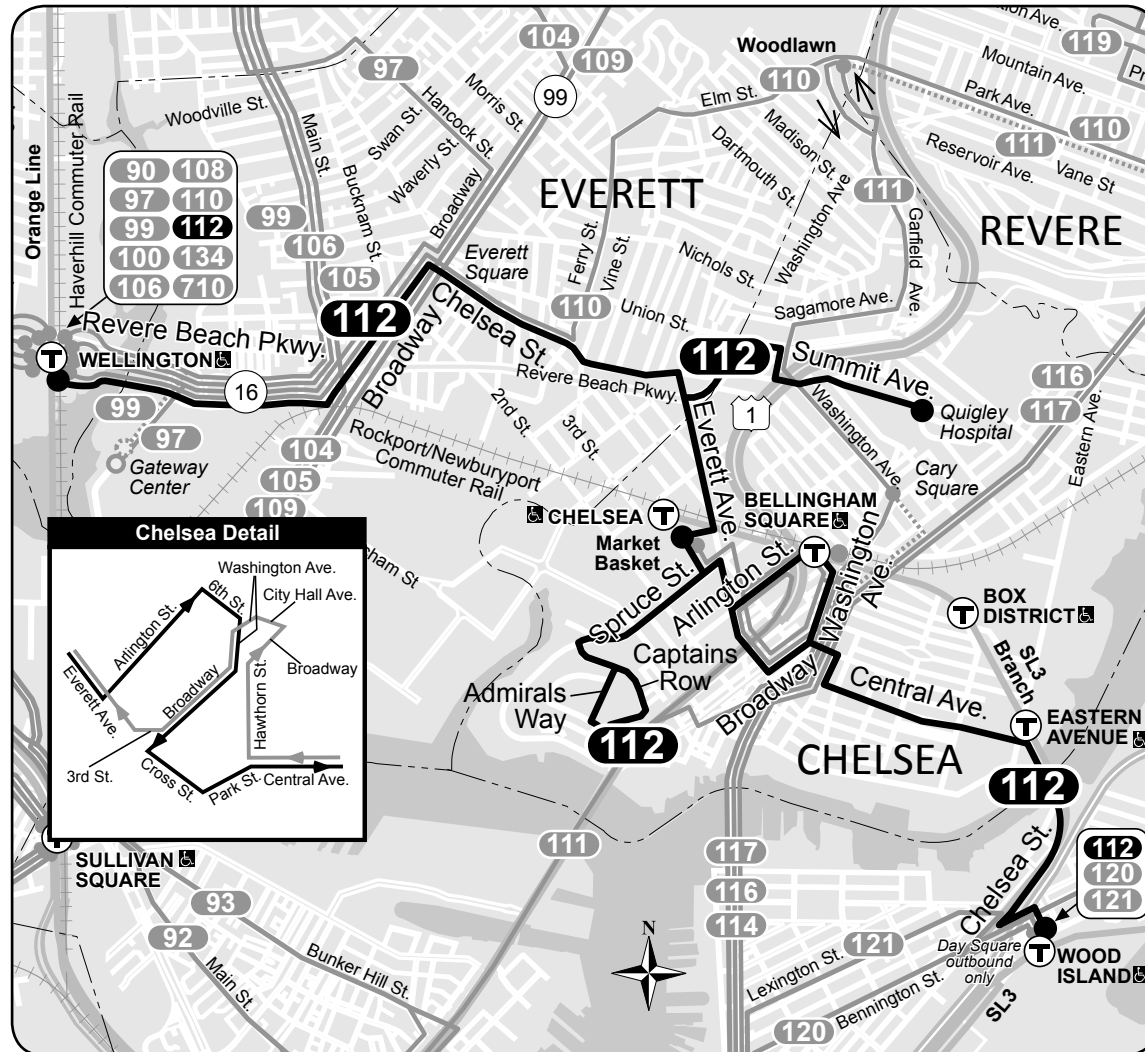


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## Route 112 Wellington Station - Wood Island Station



# 112

Effective June 23, 2019

## Wellington Station- Wood Island Station

New fares effective July 1, 2019

### Serving

- Everett Square
- Admiral's Hill
- Market Basket
- Bellingham Square
- Quigley Hospital
- Blue Line
- Orange Line
- Newburyport/Rockport Commuter Rail



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112 Weekday					
Inbound			Outbound		
Leave Wellington Station	Arrive Bellingham Square	Arrive Wood Island Station	Leave Wood Island Station	Arrive Bellingham Square	Arrive Wellington Station
6:20A	6:56A	7:10A	b 6:10A	6:17A	6:51A
7:05	7:44	7:58	6:45	6:51	7:33
7:50	8:29	8:43	7:25	7:33	8:19
8:35	9:14	9:26	8:10	8:18	8:56
9:20	9:55	10:07	8:55	9:01	9:38
10:05	10:40	10:52	9:40	9:47	10:29
10:55	11:30	11:45	10:25	10:32	11:14
11:45	12:23P	12:40P	11:15	11:22	12:04P
12:35P	1:11P	1:30P	12:05P	12:12P	12:56P
1:25	2:02	2:18	12:55	1:02	1:50
2:15	3:00	3:14	1:45	1:52	2:44
3:05	3:46	4:00	2:35	2:42	3:31
3:55	4:42	4:54	3:25	3:32	4:21
4:40	5:23	5:36	4:15	4:22	5:11
5:25	6:08	6:21	5:00	5:07	5:56
6:10	6:48	7:00	5:45	5:52	6:41
7:00	7:35	7:47	6:30	6:36	7:24
			7:15	7:21	7:59
			8:00	8:06	8:42

b-Omits Quigley Hospital

**EXCEPT WHERE NOTED:** Inbound buses toward Wood Island Station serve Market Basket then Admiral's Hill.

Outbound buses toward Wellington Station serve Admiral's Hill then Market Basket.

112 Saturday					
Inbound			Outbound		
Leave Wellington Station	Arrive Bellingham Square	Arrive Wood Island Station	Leave Wood Island Station	Arrive Bellingham Square	Arrive Wellington Station
7:00A	7:30A	7:34A	7:00A	7:06A	7:40A
7:50	8:19	8:26	7:50	7:56	8:30
8:40	9:09	9:17	8:40	8:47	9:21
9:30	10:07	10:15	9:30	9:37	10:11
10:20	10:57	11:05	10:20	10:27	11:05
11:10	11:47	11:58	11:10	11:16	11:54
11:50	12:27P	12:38P			
			12:00N	12:07P	12:49P
12:30P	1:07P	1:18P	12:45	12:52	1:34
1:10	1:46	1:57	1:25	1:32	2:14
1:50	2:24	2:35	2:05	2:12	2:54
2:30	3:04	3:15	2:45	2:52	3:34
3:10	3:44	3:55	3:25	3:32	4:14
3:50	4:24	4:35	4:05	4:12	4:54
4:30	5:05	5:17	4:45	4:52	5:34
5:10	5:48	5:58	5:25	5:32	6:14
5:50	6:27	6:37	6:05	6:12	6:54
6:30	7:07	7:17	6:45	6:52	7:28
			7:25	7:33	8:09

All buses are accessible to persons with disabilities

### Route 112 Wellington Station- Wood Island Station

112 Sunday					
Inbound			Outbound		
Leave Wellington Station	Arrive Bellingham Square	Arrive Wood Island Station	Leave Wood Island Station	Arrive Bellingham Square	Arrive Wellington Station
a 8:30A	8:57A	9:04A	a 9:15A	9:20A	9:55A
a 10:00	10:29	10:37	10:45	10:50	11:25
10:50	11:18	11:30	11:40	11:46	12:23P
11:40	12:10P	12:22P			
			12:35P	12:41P	1:20P
12:30P	1:00P	1:10P	1:35	1:41	2:20
1:30	2:03	2:13	2:35	2:43	3:26
2:30	3:03	3:13	3:35	3:41	4:18
3:30	4:03	4:15	4:35	4:41	5:16
4:30	5:03	5:11	5:30	5:36	6:09
5:30	6:01	6:11	6:15	6:20	6:53
6:15	6:44	6:53			
7:00	7:28	7:38			

a-Omits Market Basket



Fare	Local Bus	Bus + Bus	Rapid Transit	Bus + Rapid Transit
CharlieCard	\$1.70	\$1.70	\$2.40	\$2.40
CharlieTicket	\$2.00	\$2.00	\$2.90	\$4.90
Cash-on-Board	\$2.00	\$4.00	\$2.90	\$4.90
Student/Youth*	\$0.85	\$0.85	\$1.10	\$1.10
Senior/TAP**	\$0.85	\$0.85	\$1.10	\$1.10

**VALID PASSES:** LinkPass (\$90.00/mo.); Local Bus (\$55/mo.); \*Student/Youth LinkPass (\$30.00/mo.); \*\*Senior/TAP LinkPass (\$30/mo.); and express bus, commuter rail, and boat passes.

**FREE FARES:** Children 11 and under ride free when accompanied by an adult; Blind Access CharlieCard holders ride free and if using a guide, the guide rides free.

\* Requires Student CharlieCard or Youth CharlieCard. Student CharlieCards are available to students through participating middle schools and high schools. Youth CharlieCards are available through community partners in the Boston metro area. Visit [www.mbta.com/youthpass](http://www.mbta.com/youthpass) for details.

\*\* Requires Senior/TAP CharlieCard, available to Medicare cardholders, seniors 65+, and persons with disabilities.

**Summer 2019 Holidays**  
7/4/19: see Sunday 9/2/19: see Sunday



# **Appendix F:**

## **Level-of-Service Analysis**

Part 1: Existing and Future Pedestrian Report Card Assessment

Part 2: Existing Intersection Levels of Service

Part 3: Future Intersection Levels of Service

## Pedestrian Report Card Assessments

1. Existing Conditions
2. Future with Improvements



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Central Transportation Planning Staff (CTPS) to the Boston Region MPO:  
[www.ctps.org](http://www.ctps.org) | 857.702.3700 | [ctps@ctps.org](mailto:ctps@ctps.org)

Ryan Hicks, Congestion Management Process Manager:  
[www.ctps.org/cmp](http://www.ctps.org/cmp) | 857.702.3661 | [rhicks@ctps.org](mailto:rhicks@ctps.org)

Casey Claude, Bicycle and Pedestrian Program Manager:  
[www.ctps.org/bicycle-pedestrian-activities](http://www.ctps.org/bicycle-pedestrian-activities) | 857.702.3707 | [cclaude@ctps.org](mailto:cclaude@ctps.org)

# Pedestrian Report Card Assessment (PRCA): Roadway Segment

Roadway Segment Location		
Route 16 (Revere Beach Parkway) – Chelsea and Everett, MA – Existing Conditions		
Grading Categories	Score	Rating
Safety	1.0	Poor
System Preservation	1.0	Poor
Capacity Management and Mobility	1.7	Poor
Economic Vitality	1.5	Poor
Transportation Equity		
High Priority Area	√	
Moderate Priority Area		
Low Priority Area		

**Category Ratings**

**Good:** Score 2.3 to 3.0  
**Fair:** 2.3 > Score > 1.7  
**Poor:** Score 1.7 to 0

**Transportation Equity Priority**

**High:** Four (4) or Five (5) Factors  
**Moderate:** Two (2) or Three (3) Factors  
**Low:** Zero (0) or One (1) Factor

# Grading Categories: Scoring Breakdown Roadway Segment

Capacity Management and Mobility			
Performance Measure	Percentage	Score (out of 3.0)	Rating
Sidewalk Presence	50%	2	Fair
Crosswalk Presence	33%	1	Poor
Walkway Width	17%	2	Fair
<b>TOTAL</b> <small>(Sidewalk Presence Score * 0.5) + (Crosswalk Presence Score * 0.33) + (Walkway Width Score * 0.17)</small>	<b>100%</b>	<b>1.7</b>	<b>Poor</b>

Economic Vitality			
Performance Measure	Percentage	Score (out of 3.0)	Rating
Pedestrian Volumes	50%	2	Fair
Adjacent Bicycle Accommodations	50%	1	Poor
<b>TOTAL</b> <small>(Pedestrian Volumes Score * 0.5) + (Adjacent Bicycle Accommodations Score * 0.5)</small>	<b>100%</b>	<b>1.5</b>	<b>Poor</b>

### Meaning of Ratings

**Good:** 3.0

**Fair:** 2.0

**Poor:** 1.0

### Transportation Equity Priority

**High:** Four (4) or Five (5) Factors

**Moderate:** Two (2) or Three (3) Factors

**Low:** Zero (0) or One (1) Factor

Safety			
Performance Measure	Percentage	Score (out of 3.0)	Rating
Pedestrian Crashes	60%	1	Poor
Pedestrian-Vehicle Buffer	20%	1	Poor
Vehicle Travel Speed	20%	1	Poor
<b>TOTAL</b> <small>(Pedestrian Crashes Score * 0.6) + (Pedestrian-Vehicle Buffer Score * 0.2) + (Vehicle Travel Speed Score * 0.2)</small>	<b>100%</b>	<b>1</b>	<b>Poor</b>

System Preservation			
Performance Measure	Percentage	Score (out of 3.0)	Rating
Sidewalk Condition	100%	1	Poor

Transportation Equity Priority	
Area Condition	Yes/No
Low Income Population $\geq$ 32.32%	✓
Minority Population $\geq$ 28.19%	✓
6.69%+ of Population > 75 Years of Age	✓
16.15%+ of Households w/o Vehicle	✓
Within ¼ Mile of School/College	✓



# Roadway Segment Notes

## Detailed Performance Measure Information

Goal	Performance Measure	Features of Analyzed Locations
<b>Capacity Management and Mobility</b>	Sidewalk Presence	Sidewalks are present on two side of the street, but there are gaps on sidewalk network
	Crosswalk Presence	8 crosswalks in 1.5 miles = 5.3 crosswalks per mile
	Walkway Width	4-7 foot sidewalks
<b>Economic Vitality</b>	Pedestrian Volumes	Estimated 5 to 60 pedestrians
	Adjacent Bicycle Accommodations	No bicycle infrastructure, shoulders only 1-2 feet wide
<b>Safety</b>	Pedestrian Crashes	1 HSIP pedestrian cluster and several pedestrian crashes at intersections
	Pedestrian-Vehicle Buffer	Less than 2 feet
	Vehicle Travel Speed	= 35 MPH
<b>System Preservation</b>	Sidewalk Condition	Poor



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[www.ctps.org/cmp](http://www.ctps.org/cmp) | 857.702.3661 | [rhicks@ctps.org](mailto:rhicks@ctps.org)

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[www.ctps.org/bicycle-pedestrian-activities](http://www.ctps.org/bicycle-pedestrian-activities) | 857.702.3707 | [cclaude@ctps.org](mailto:cclaude@ctps.org)

# Pedestrian Report Card Assessment (PRCA): Roadway Segment

## Roadway Segment Location

Route 16 (Revere Beach Parkway) – Chelsea and Everett—Future Conditions with improvements

Grading Categories	Score	Rating
Safety	2.4	Good
System Preservation	3	Good
Capacity Management and Mobility	2.7	Good
Economic Vitality	2.5	Good

## Transportation Equity

High Priority Area	√
Moderate Priority Area	
Low Priority Area	

### Category Ratings

**Good:** Score 2.3 to 3.0

**Fair:** 2.3 > Score > 1.7

**Poor:** Score 1.7 to 0

### Transportation Equity Priority

**High:** Four (4) or Five (5) Factors

**Moderate:** Two (2) or Three (3) Factors

**Low:** Zero (0) or One (1) Factor

# Grading Categories: Scoring Breakdown Roadway Segment

Capacity Management and Mobility			
Performance Measure	Percentage	Score (out of 3.0)	Rating
Sidewalk Presence	50%	3	Good
Crosswalk Presence	33%	2	Fair
Walkway Width	17%	3	Good
<b>TOTAL</b> <small>(Sidewalk Presence Score * 0.5) + (Crosswalk Presence Score * 0.33) + (Walkway Width Score * 0.17)</small>	<b>100%</b>	<b>2.7</b>	<b>Good</b>

Economic Vitality			
Performance Measure	Percentage	Score (out of 3.0)	Rating
Pedestrian Volumes	50%	2	Fair
Adjacent Bicycle Accommodations	50%	3	Good
<b>TOTAL</b> <small>(Pedestrian Volumes Score * 0.5) + (Adjacent Bicycle Accommodations Score * 0.5)</small>	<b>100%</b>	<b>2.5</b>	<b>Good</b>

### Meaning of Ratings

**Good:** 3.0

**Fair:** 2.0

**Poor:** 1.0

### Transportation Equity Priority

**High:** Four (4) or Five (5) Factors

**Moderate:** Two (2) or Three (3) Factors

**Low:** Zero (0) or One (1) Factor

Safety			
Performance Measure	Percentage	Score (out of 3.0)	Rating
Pedestrian Crashes	60%	3	Good
Pedestrian-Vehicle Buffer	20%	1	Poor
Vehicle Travel Speed	20%	2	Fair
<b>TOTAL</b> <small>(Pedestrian Crashes Score * 0.6) + (Pedestrian-Vehicle Buffer Score * 0.2) + (Vehicle Travel Speed Score * 0.2)</small>	<b>100%</b>	<b>2.4</b>	<b>Good</b>

System Preservation			
Performance Measure	Percentage	Score (out of 3.0)	Rating
Sidewalk Condition	100%	3	Good

Transportation Equity Priority	
Area Condition	Yes/No
Low Income Population $\geq$ 32.32%	✓
Minority Population $\geq$ 28.19%	✓
6.69%+ of Population > 75 Years of Age	✓
16.15%+ of Households w/o Vehicle	✓
Within ¼ Mile of School/College	✓

# Roadway Segment Notes

## Detailed Performance Measure Information

Goal	Performance Measure	Features of Analyzed Locations
<b>Capacity Management and Mobility</b>	Sidewalk Presence	Five-foot sidewalk present on either side of roadway
	Crosswalk Presence	12 crosswalks in 1.5 miles about 8 crosswalks per mile
	Walkway Width	Sidewalks built to MassDOT standards
<b>Economic Vitality</b>	Pedestrian Volumes	Estimate 5-60 pedestrians per hour
	Adjacent Bicycle Accommodations	Multiuse path
<b>Safety</b>	Pedestrian Crashes	No HSIP pedestrian crash cluster
	Pedestrian-Vehicle Buffer	Less than 5 feet
	Vehicle Travel Speed	= 35 mph
<b>System Preservation</b>	Sidewalk Condition	Good



## Bicycle Report Cards Assessments

1. Existing Conditions
2. Future Conditions with Improvements



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION



# Bicycle Report Card

## Roadway Segment Location

Route 16 (Revere Beach Parkway) Chelsea and Everett (Existing Conditions)

Grading Categories	Score	Grade
Safety	8.5	F
System Preservation	0	F
Capacity Management and Mobility	50	F
Economic Vitality	50	F

## Transportation Equity

High Priority Area	√
Moderate Priority Area	
Low Priority Area	

Central Transportation Planning Staff (CTPS) to the Boston Region MPO:  
[www.ctps.org](http://www.ctps.org) | 857.702.3700 | [ctps@ctps.org](mailto:ctps@ctps.org)

Casey Claude, Bicycle and Pedestrian Program Manager:  
[www.ctps.org/bicycle-pedestrian-activities](http://www.ctps.org/bicycle-pedestrian-activities) | 857.702.3707 | [cclaude@ctps.org](mailto:cclaude@ctps.org)

### Grading

- A: 90–100 *Excellent*
- B: 80–89 *Satisfactory*
- C: 70–79 *Acceptable*
- D: 60–69 *Needs Improvement*
- F: 59–0 *Not recommended for bicycle travel*

### Transportation Equity Priority

- High:** Four (4) or Five (5) Factors
- Moderate:** Two (2) or Three (3) Factors
- Low:** Zero (0) or One (1) Factor

# Grading Categories: Scoring Breakdown

Capacity Management and Mobility			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Presence	50%	0	F
Proximity to Bike Network	33%	100	A
Proximity to Transit	17%	100	A
<b>Total</b>	<b>100%</b>	<b>50</b>	<b>F</b>

Economic Vitality			
Performance Measure	Percentage	Points	Grade
Bike Rack Presence	50%	0	F
Land Use	50%	100	A
<b>Total</b>	<b>100%</b>	<b>50</b>	<b>F</b>

## Grading

A: 90–100 *Excellent*

B: 80–89 *Satisfactory*

C: 70–79 *Acceptable*

D: 60–69 *Needs Improvement*

F: 59–0 *Not recommended for bicycle travel*

## Transportation Equity Priority

**High:** Four (4) or Five (5) Factors

**Moderate:** Two (2) or Three (3) Factors

**Low:** Zero (0) or One (1) Factor

Safety			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Presence	33%	0	F
Absence of Bicycle Crashes	33%	0	A
Bicyclist Operating Space	17%	0	F
Number of Travel Lanes	17%	50	A
<b>Total</b>	<b>100%</b>	<b>8.5</b>	<b>F</b>

System Preservation			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Continuity	50%	0	F
Bicycle Facility Condition	50%	0	F
<b>Total</b>	<b>100%</b>	<b>0</b>	<b>F</b>

Transportation Equity Priority	
Area Condition	Yes/No
Low Income Population => 32.32%	✓
Minority Population => 28.19%	✓
18.2%+ of Population < 16 Years Old	✓
16.15%+ of Households w/o Vehicle	✓
Within ¼ Mile of School/College	✓

# Notes

## Detailed Performance Measure Information

Goal	Performance Measure	Features of Analyzed Locations
<b>Capacity Management and Mobility</b>	Bicycle Facility Presence	No bicycle facility presence
	Proximity to Bike Network	North Strand Community and Chelsea Greenway bicycle facilities network within ¼ mile
	Proximity to Transit	Has bus routes 110, 111, and 112 cross it or run along portions of the corridor
<b>Economic Vitality</b>	Bike Rack Presence	No bicycle rack in the segment
	Land Use	Mixed use—educational, recreational, residential
<b>Safety</b>	Bicycle Facility Presence	No bicycle facility presence
	Absence of Bicycle Crashes	No HSIP bicycle crash cluster but there are 6 bicycle-related crashes in the corridor
	Bicyclist Operating Space	Bicycle operates in mixed traffic
	Number of Travel Lanes	Three travel lanes per direction
<b>System Preservation</b>	Bicycle Facility Continuity	No bicycle facility
	Bicycle Facility Condition	No bicycle facility





BOSTON REGION METROPOLITAN PLANNING ORGANIZATION



# Bicycle Report Card

## Roadway Segment Location

Route 16 (Revere Beach Parkway) Chelsea and Everett (Future Conditions with improvements)

Grading Categories	Score	Grade
Safety	81	B
System Preservation	75	C
Capacity Management and Mobility	75	C
Economic Vitality	100	A

## Transportation Equity

High Priority Area	√
Moderate Priority Area	
Low Priority Area	

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### Grading

- A: 90–100 *Excellent*
- B: 80–89 *Satisfactory*
- C: 70–79 *Acceptable*
- D: 60–69 *Needs Improvement*
- F: 59–0 *Not recommended for bicycle travel*

### Transportation Equity Priority

- High:** Four (4) or Five (5) Factors
- Moderate:** Two (2) or Three (3) Factors
- Low:** Zero (0) or One (1) Factor

# Grading Categories: Scoring Breakdown

Capacity Management and Mobility			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Presence	50%	50	F
Proximity to Bike Network	33%	100	A
Proximity to Transit	17%	100	A
<b>Total</b>	<b>100%</b>	<b>75</b>	<b>C</b>

Economic Vitality			
Performance Measure	Percentage	Points	Grade
Bike Rack Presence	50%	100	A
Land Use	50%	100	A
<b>Total</b>	<b>100%</b>	<b>100</b>	<b>A</b>

## Grading

A: 90–100 *Excellent*

B: 80–89 *Satisfactory*

C: 70–79 *Acceptable*

D: 60–69 *Needs Improvement*

F: 59–0 *Not recommended for bicycle travel*

## Transportation Equity Priority

**High:** Four (4) or Five (5) Factors

**Moderate:** Two (2) or Three (3) Factors

**Low:** Zero (0) or One (1) Factor

Safety			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Presence	33%	100	A
Absence of Bicycle Crashes	33%	70	C
Bicyclist Operating Space	17%	100	A
Number of Travel Lanes	17%	50	F
<b>Total</b>	<b>100%</b>	<b>81</b>	<b>B</b>

System Preservation			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Continuity	50%	50	F
Bicycle Facility Condition	50%	100	A
<b>Total</b>	<b>100%</b>	<b>75</b>	<b>C</b>

Transportation Equity Priority	
Area Condition	Yes/No
Low Income Population => 32.32%	✓
Minority Population => 28.19%	✓
18.2%+ of Population < 16 Years Old	✓
16.15%+ of Households w/o Vehicle	✓
Within ¼ Mile of School/College	✓

# Notes

## Detailed Performance Measure Information

Goal	Performance Measure	Features of Analyzed Locations
<b>Capacity Management and Mobility</b>	Bicycle Facility Presence	Multiuse path proposed for one-half of the corridor
	Proximity to Bike Network	North Strand Community and Chelsea Greenway bicycle facilities network within ¼ mile
	Proximity to Transit	Has bus routes 110, 111, and 112 cross it or run along portions of the corridor
<b>Economic Vitality</b>	Bike Rack Presence	Bicycle racks in the segment with multiuse path
	Land Use	Mixed use—educational, recreational, residential
<b>Safety</b>	Bicycle Facility Presence	Multiuse path proposed for one-half of the corridor
	Absence of Bicycle Crashes	No HSIP bicycle crash cluster
	Bicyclist Operating Space	Multiuse path one half of the corridor, bicycle operates in mixed traffic one half of the corridor
	Number of Travel Lanes	Three travel lanes per direction
<b>System Preservation</b>	Bicycle Facility Continuity	Propose multiuse path connects Chelsea Greenway and Northern Strand Community Trail
	Bicycle Facility Condition	Good





## **Part 2: Existing Intersection Levels of Service**

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↑			↑		
Traffic Volume (vph)	0	1584	8	0	2047	6	23	10	12	19	18	36	
Future Volume (vph)	0	1584	8	0	2047	6	23	10	12	19	18	36	
Satd. Flow (prot)	0	2021	0	0	2940	0	0	1709	0	0	1695	0	
Flt Permitted								0.810			0.908		
Satd. Flow (perm)	0	2021	0	0	2940	0	0	1406	0	0	1559	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	1712	0	0	2232	0	0	55	0	0	97	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		52.0			52.0		21.0	21.0		21.0	21.0		37.0
Total Lost Time (s)		6.0			6.0			5.0			5.0		
Act Effct Green (s)		80.6			80.6			14.0			14.0		
Actuated g/C Ratio		0.73			0.73			0.13			0.13		
v/c Ratio		1.16			1.04			0.31			0.49		
Control Delay		96.3			45.3			46.9			52.4		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		96.3			45.3			46.9			52.4		
LOS		F			D			D			D		
Approach Delay		96.3			45.3			46.9			52.4		
Approach LOS		F			D			D			D		
Queue Length 50th (ft)		~502			328			36			65		
Queue Length 95th (ft)		#731			m#597			66			93		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		1481			2155			211			234		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.16			1.04			0.26			0.41		

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 55 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.16  
 Intersection Signal Delay: 66.8  
 Intersection Capacity Utilization 63.0%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service B

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Lewis Street & Route 16

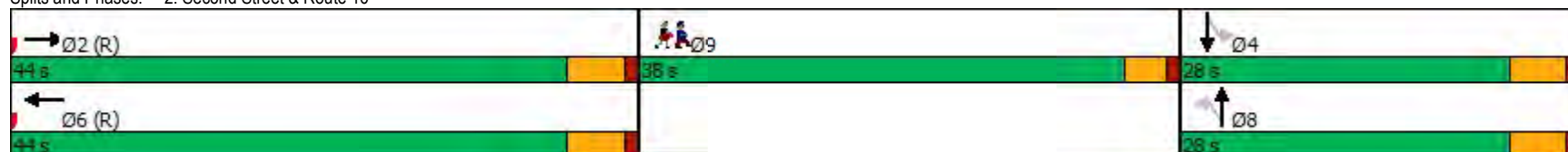


	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↑			↑		
Traffic Volume (vph)	0	1187	428	0	1790	92	178	37	3	28	56	73	
Future Volume (vph)	0	1187	428	0	1790	92	178	37	3	28	56	73	
Satd. Flow (prot)	0	4275	0	0	4996	0	0	632	0	0	1718	0	
Flt Permitted								0.630			0.925		
Satd. Flow (perm)	0	4275	0	0	4996	0	0	569	0	0	1601	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	1700	0	0	2139	0	0	273	0	0	200	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		44.0			44.0		28.0	28.0		28.0	28.0		38.0
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0		5.0
Act Effct Green (s)		39.0			39.0		56.6	56.6		56.6	56.6		56.6
Actuated g/C Ratio		0.35			0.35		0.51	0.51		0.51	0.51		0.51
v/c Ratio		1.12			1.21		0.93	0.93		0.93	0.24		0.24
Control Delay		87.6			111.3		66.7	66.7		66.7	17.9		17.9
Queue Delay		0.1			0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		87.7			111.3		66.7	66.7		66.7	17.9		17.9
LOS		F			F		E	E		E	B		B
Approach Delay		87.7			111.3		66.7	66.7		66.7	17.9		17.9
Approach LOS		F			F		E	E		E	B		B
Queue Length 50th (ft)		-506			-654		196	196		196	68		68
Queue Length 95th (ft)		m280			m#603		#477	#477		#477	131		131
Internal Link Dist (ft)		675			412		757	757		757	460		460
Turn Bay Length (ft)													
Base Capacity (vph)		1515			1771		292	292		292	823		823
Starvation Cap Reductn		0			8		0	0		0	0		0
Spillback Cap Reductn		54			0		0	0		0	0		0
Storage Cap Reductn		0			0		0	0		0	0		0
Reduced v/c Ratio		1.16			1.21		0.93	0.93		0.93	0.24		0.24

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 47 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.21  
 Intersection Signal Delay: 94.8  
 Intersection Capacity Utilization 70.2%  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Second Street & Route 16



	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↔	↔↔↔			↔↔↔	↔			↔			↔↔		
Traffic Volume (vph)	10	55	1139	8	19	13	1675	23	34	18	29	37	42	163	
Future Volume (vph)	10	55	1139	8	19	13	1675	23	34	18	29	37	42	163	
Satd. Flow (prot)	0	1405	4844	0	0	1347	4856	0	0	1316	0	0	1372	0	
Flt Permitted		0.950				0.950				0.809			*0.810		
Satd. Flow (perm)	0	1403	4844	0	0	1342	4856	0	0	1183	0	0	1234	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	78	1382	0	0	37	1951	0	0	100	0	0	244	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	15.0	15.0	40.0		14.0	14.0	39.0		18.0	18.0		18.0	18.0		38.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		9.5	46.3			8.2	42.3			39.9			39.9		
Actuated g/C Ratio		0.09	0.42			0.07	0.38			0.36			0.36		
v/c Ratio		0.64	0.68			0.37	1.04			0.23			0.55		
Control Delay		66.3	28.8			71.9	54.7			29.9			36.7		
Queue Delay		0.0	0.2			0.0	23.4			0.0			0.0		
Total Delay		66.3	29.0			71.9	78.0			29.9			36.7		
LOS		E	C			E	E			C			D		
Approach Delay			31.0			77.9				29.9			36.7		
Approach LOS			C			E				C			D		
Queue Length 50th (ft)		64	187			28	385			54			152		
Queue Length 95th (ft)		m65	m176			m42	#701			108			#337		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		132	2037			110	1868			429			447		
Starvation Cap Reductn		0	112			0	0			0			0		
Spillback Cap Reductn		0	0			0	394			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		0.59	0.72			0.34	1.32			0.23			0.55		

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 44 (40%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.04  
 Intersection Signal Delay: 55.9  
 Intersection Capacity Utilization 67.9%  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Spring Street & Route 16



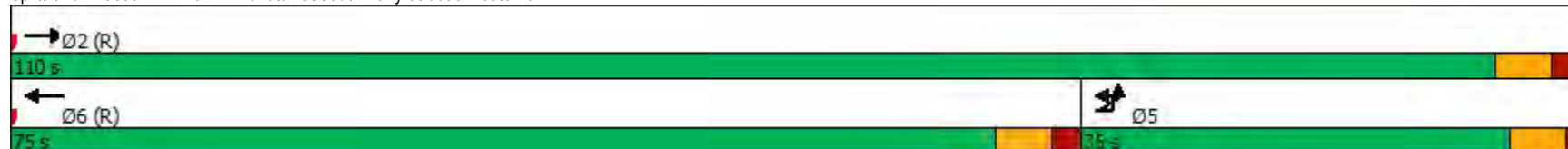


	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔↔↔			↔↔↔				↔			
Traffic Volume (vph)	15	126	977	0	0	1591	128	0	0	92	0	0	0
Future Volume (vph)	15	126	977	0	0	1591	128	0	0	92	0	0	0
Satd. Flow (prot)	0	1121	3409	0	0	3415	0	0	0	1406	0	0	0
Flt Permitted		0.800											
Satd. Flow (perm)	0	1120	4262	0	0	3415	0	0	0	1406	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	166	1149	0	0	1810	0	0	0	184	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	35.0	35.0	110.0			75.0				110.0			
Total Lost Time (s)		5.0	6.0			6.0				6.0			
Act Effct Green (s)		21.3	110.0			77.7				110.0			
Actuated g/C Ratio		0.19	1.00			0.71				1.00			
v/c Ratio		0.77	0.34			0.75				0.13			
Control Delay		54.9	1.3			29.7				0.2			
Queue Delay		0.0	0.0			0.8				0.0			
Total Delay		54.9	1.3			30.5				0.2			
LOS		D	A			C				A			
Approach Delay			8.1			30.5			0.2				
Approach LOS			A			C			A				
Queue Length 50th (ft)		156	10			520				0			
Queue Length 95th (ft)		230	23			m539				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		305	3409			2412				1406			
Starvation Cap Reductn		0	0			298				0			
Spillback Cap Reductn		0	0			0				0			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		0.54	0.34			0.86				0.13			

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 20 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 19.9  
 Intersection Capacity Utilization 50.6%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16



	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↔	↑↑↑			↕			↕		
Traffic Volume (vph)	0	970	99	1	38	1486	22	52	53	28	41	170	181	
Future Volume (vph)	0	970	99	1	38	1486	22	52	53	28	41	170	181	
Satd. Flow (prot)	0	4158	0	0	1301	4853	0	0	1166	0	0	1224	0	
Flt Permitted					0.900				0.545			0.940		
Satd. Flow (perm)	0	4158	0	0	1289	4853	0	0	705	0	0	1277	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1125	0	0	41	1587	0	0	180	0	0	516	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		29.0		27.0	27.0	56.0		29.0	29.0		29.0	29.0		25.0
Total Lost Time (s)		6.0			6.0	6.0			6.0			6.0		
Act Effct Green (s)		40.9			8.7	50.0			43.2			43.2		
Actuated g/C Ratio		0.37			0.08	0.45			0.39			0.39		
v/c Ratio		0.73			0.40	0.72			0.65			1.03		
Control Delay		32.7			53.7	25.6			43.1			82.1		
Queue Delay		0.0			0.0	0.2			0.7			16.4		
Total Delay		32.7			53.7	25.8			43.8			98.5		
LOS		C			D	C			D			F		
Approach Delay		32.7				26.5			43.8			98.5		
Approach LOS		C				C			D			F		
Queue Length 50th (ft)		307			32	253			117			421		
Queue Length 95th (ft)		#372			m68	494			#275			#765		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		1546			248	2205			276			501		
Starvation Cap Reductn		0			0	118			0			0		
Spillback Cap Reductn		0			0	0			12			22		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		0.73			0.17	0.76			0.68			1.08		

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 40.2  
 Intersection Capacity Utilization 66.0%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Vine Street & Route 16



	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR Ø9
Lane Configurations	↑↑↑			↓	↑↑↑	↘	
Traffic Volume (vph)	921	134	3	5	1425	117	2
Future Volume (vph)	921	134	3	5	1425	117	2
Satd. Flow (prot)	4178	0	0	1504	4868	1720	0
Flt Permitted				0.900		0.953	
Satd. Flow (perm)	4178	0	0	1479	4868	1712	0
Satd. Flow (RTOR)							
Lane Group Flow (vph)	1159	0	0	8	1566	151	0
Turn Type	NA		Prot	Prot	NA	Prot	
Protected Phases	2		1	1	6	8	9
Permitted Phases							
Total Split (s)	40.0		11.0	11.0	51.0	25.0	34.0
Total Lost Time (s)	5.0			5.0	5.0	5.0	
Act Effct Green (s)	78.6			6.0	80.8	14.0	
Actuated g/C Ratio	0.71			0.05	0.73	0.13	
v/c Ratio	0.39			0.10	0.44	0.69	
Control Delay	9.5			52.3	8.5	61.8	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	9.5			52.3	8.5	61.8	
LOS	A			D	A	E	
Approach Delay	9.5				8.7	61.8	
Approach LOS	A				A	E	
Queue Length 50th (ft)	9			6	105	104	
Queue Length 95th (ft)	m347			24	343	141	
Internal Link Dist (ft)	521				488	647	
Turn Bay Length (ft)				150			
Base Capacity (vph)	2986			82	3576	312	
Starvation Cap Reductn	0			0	0	0	
Spillback Cap Reductn	0			0	0	0	
Storage Cap Reductn	0			0	0	0	
Reduced v/c Ratio	0.39			0.10	0.44	0.48	

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 47 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 11.8  
 Intersection Capacity Utilization 42.5%  
 Analysis Period (min) 15  
 Description: Note: Splits and offsets need to be optimized via synchro due to lack of coordination data  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Vale Street & Route 16

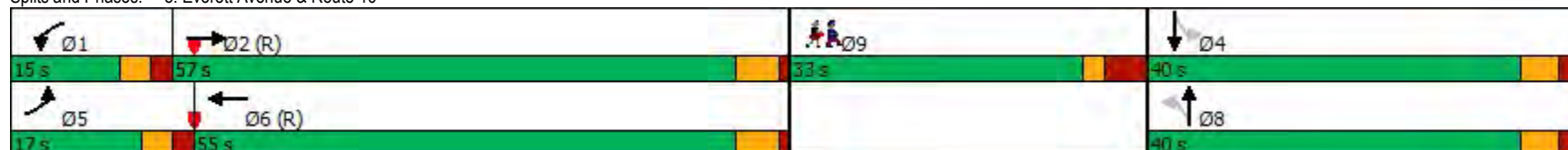


	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	73	745	146	76	1387	8	126	76	34	71	221	51	
Future Volume (vph)	73	745	146	76	1387	8	126	76	34	71	221	51	
Satd. Flow (prot)	1694	4457	0	1631	4808	0	1711	1606	0	1678	1735	0	
Flt Permitted	0.950			0.950			0.396			0.650			
Satd. Flow (perm)	1694	4457	0	1611	4808	0	709	1606	0	1143	1735	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	86	1048	0	79	1453	0	152	133	0	89	340	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	17.0	57.0		15.0	55.0		40.0	40.0		40.0	40.0		33.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5		
Act Effct Green (s)	10.5	52.6		9.4	51.5		54.3	54.3		54.3	54.3		
Actuated g/C Ratio	0.07	0.36		0.06	0.36		0.37	0.37		0.37	0.37		
v/c Ratio	0.70	0.65		0.75	0.85		0.57	0.22		0.21	0.52		
Control Delay	94.5	40.9		105.2	49.3		50.8	37.2		38.3	42.9		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	94.5	40.9		105.2	49.3		50.8	37.2		38.3	42.9		
LOS	F	D		F	D		D	D		D	D		
Approach Delay		44.9			52.2			44.4			42.0		
Approach LOS		D			D			D			D		
Queue Length 50th (ft)	80	303		74	470		96	72		48	210		
Queue Length 95th (ft)	132	329		#158	537		#246	156		109	369		
Internal Link Dist (ft)		406			387			396			538		
Turn Bay Length (ft)	150			100			100			100			
Base Capacity (vph)	140	1618		112	1708		265	601		428	649		
Starvation Cap Reductn	0	0		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.61	0.65		0.71	0.85		0.57	0.22		0.21	0.52		

Intersection Summary

Cycle Length: 145  
 Actuated Cycle Length: 145  
 Offset: 82 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 47.8  
 Intersection Capacity Utilization 71.9%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Everett Avenue & Route 16







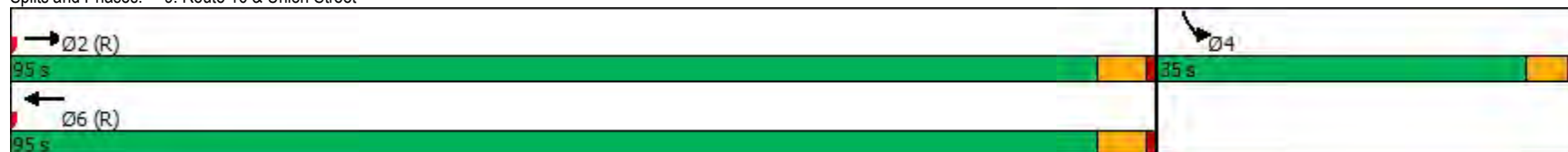
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑↑↑		↓	
Traffic Volume (vph)	0	852	1487	182	175	12
Future Volume (vph)	0	852	1487	182	175	12
Satd. Flow (prot)	0	4600	4703	0	1761	0
Flt Permitted					0.955	
Satd. Flow (perm)	0	4600	4703	0	1761	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	979	1721	0	205	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		95.0	95.0		35.0	
Total Lost Time (s)		5.0	5.0		4.5	
Act Effct Green (s)		101.0	101.0		19.5	
Actuated g/C Ratio		0.78	0.78		0.15	
v/c Ratio		0.27	0.47		0.78	
Control Delay		4.7	6.0		72.2	
Queue Delay		0.0	1.1		0.0	
Total Delay		4.7	7.2		72.2	
LOS		A	A		E	
Approach Delay		4.7	7.2		72.2	
Approach LOS		A	A		E	
Queue Length 50th (ft)		72	158		168	
Queue Length 95th (ft)		109	238		241	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3573	3653		413	
Starvation Cap Reductn		0	1582		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.27	0.83		0.50	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 89 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 10.9  
 Intersection Capacity Utilization 51.2%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 9: Route 16 & Union Street

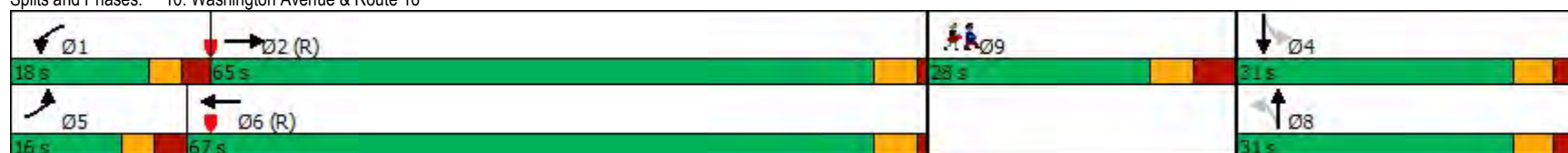


	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	80	769	178	179	1429	33	136	89	19	57	190	104	
Future Volume (vph)	80	769	178	179	1429	33	136	89	19	57	190	104	
Satd. Flow (prot)	1694	4510	0	1662	4742	0	1719	1655	0	1736	1642	0	
Flt Permitted	0.950			0.950			*0.600			0.633			
Satd. Flow (perm)	1687	4510	0	1662	4742	0	1059	1655	0	1118	1642	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	88	1041	0	197	1539	0	160	127	0	63	323	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	16.0	65.0		18.0	67.0		31.0	31.0		31.0	31.0		28.0
Total Lost Time (s)	6.0	5.0		5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)	10.1	60.0		19.8	69.1		34.5	34.5		34.5	34.5		
Actuated g/C Ratio	0.07	0.42		0.14	0.49		0.24	0.24		0.24	0.24		
v/c Ratio	0.73	0.55		0.85	0.67		0.62	0.32		0.23	0.81		
Control Delay	96.4	32.1		89.0	30.3		61.8	49.6		49.7	67.5		
Queue Delay	0.0	3.5		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	96.4	35.7		89.0	30.3		61.8	49.6		49.7	67.5		
LOS	F	D		F	C		E	D		D	E		
Approach Delay		40.4			36.9			56.4			64.6		
Approach LOS		D			D			E			E		
Queue Length 50th (ft)	80	261		169	359		128	93		45	272		
Queue Length 95th (ft)	#171	308		#401	489		#253	163		100	#538		
Internal Link Dist (ft)		319			1066			414			597		
Turn Bay Length (ft)	100			150			150			150			
Base Capacity (vph)	125	1905		231	2308		257	402		271	399		
Starvation Cap Reductn	0	749		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.70	0.90		0.85	0.67		0.62	0.32		0.23	0.81		

Intersection Summary

Cycle Length: 142  
 Actuated Cycle Length: 142  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 42.6  
 Intersection Capacity Utilization 79.6%  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16

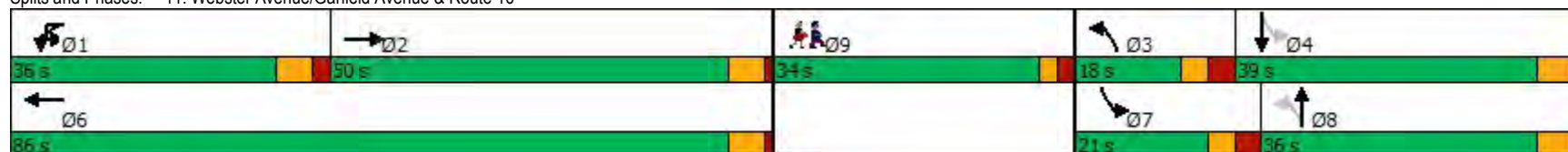


	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↔	↑↑↑		↔	↑		↔	↓		
Traffic Volume (vph)	0	748	113	136	203	1752	1	218	122	168	214	167	233	
Future Volume (vph)	0	748	113	136	203	1752	1	218	122	168	214	167	233	
Satd. Flow (prot)	0	4566	0	0	1661	4700	0	1641	1802	0	1770	1856	0	
Flt Permitted					0.950			*0.600			*0.600			
Satd. Flow (perm)	0	4566	0	0	1656	4700	0	1036	1802	0	1112	1856	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	978	0	0	414	1885	0	248	354	0	252	460	0	
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA		
Protected Phases		2		1	1	6		3	8		7	4		9
Permitted Phases								8			4			
Total Split (s)		50.0		36.0	36.0	86.0		18.0	36.0		21.0	39.0		34.0
Total Lost Time (s)		5.0		6.0	6.0	5.0		6.0	5.0		6.0	5.0		
Act Effct Green (s)		37.7		30.6	74.4	42.9		31.7	49.0		34.7			
Actuated g/C Ratio		0.25		0.21	0.50	0.29		0.21	0.33		0.23			
v/c Ratio		0.85		1.21	0.80	0.71		0.92	0.58		1.06			
Control Delay		61.4		167.2	35.9	57.1		87.6	48.3		113.5			
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0		0.0			
Total Delay		61.4		167.2	35.9	57.1		87.6	48.3		113.5			
LOS		E		F	D	E		F	D		F			
Approach Delay		61.4			59.6			75.0			90.4			
Approach LOS		E			E			E			F			
Queue Length 50th (ft)		291		-416	448	158		299	159		403			
Queue Length 95th (ft)		438		#764	771	#372		#583	314		#852			
Internal Link Dist (ft)		409			879			820			473			
Turn Bay Length (ft)				100		150			100					
Base Capacity (vph)		1411		342	2615	348		383	434		433			
Starvation Cap Reductn		0		0	0	0		0	0		0			
Spillback Cap Reductn		0		0	0	0		0	0		0			
Storage Cap Reductn		0		0	0	0		0	0		0			
Reduced v/c Ratio		0.69		1.21	0.72	0.71		0.92	0.58		1.06			

Intersection Summary

Cycle Length: 177  
 Actuated Cycle Length: 148.6  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.21  
 Intersection Signal Delay: 66.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 89.3%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 Description: Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16

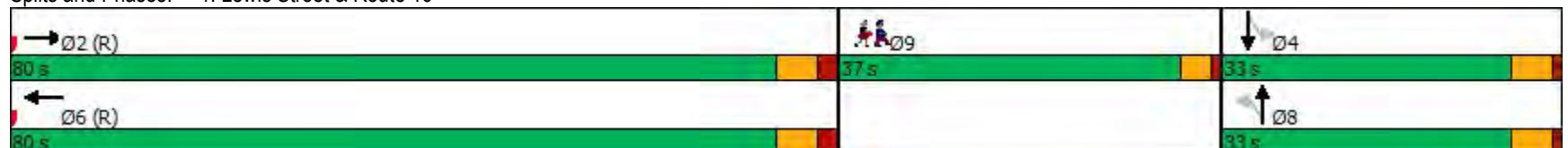


	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	2426	29	0	2154	5	22	14	9	9	14	27	
Future Volume (vph)	0	2426	29	0	2154	5	22	14	9	9	14	27	
Satd. Flow (prot)	0	2719	0	0	3131	0	0	1616	0	0	1530	0	
Flt Permitted								0.792			0.949		
Satd. Flow (perm)	0	2719	0	0	3131	0	0	1411	0	0	1610	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2612	0	0	2272	0	0	64	0	0	57	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		80.0			80.0		33.0	33.0		33.0	33.0		37.0
Total Lost Time (s)		6.0			6.0			5.0			5.0		
Act Effct Green (s)		120.6			120.6			13.6			13.5		
Actuated g/C Ratio		0.80			0.80			0.09			0.09		
v/c Ratio		1.20			0.90			0.50			0.40		
Control Delay		111.8			23.6			77.6			71.2		
Queue Delay		0.9			0.0			0.0			0.0		
Total Delay		112.7			23.6			77.6			71.2		
LOS		F			C			E			E		
Approach Delay		112.7			23.6			77.6			71.2		
Approach LOS		F			C			E			E		
Queue Length 50th (ft)		~1096			320			61			54		
Queue Length 95th (ft)		#1358			m#958			84			97		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		2185			2516			263			300		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		602			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.65			0.90			0.24			0.19		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 80 (53%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.20  
 Intersection Signal Delay: 71.3      Intersection LOS: E  
 Intersection Capacity Utilization 66.0%      ICU Level of Service C  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Lewis Street & Route 16





	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	2027	417	0	1839	128	268	51	2	45	41	52	
Future Volume (vph)	0	2027	417	0	1839	128	268	51	2	45	41	52	
Satd. Flow (prot)	0	4885	0	0	5029	0	0	895	0	0	1760	0	
Flt Permitted								0.651			0.801		
Satd. Flow (perm)	0	4885	0	0	5029	0	0	828	0	0	1432	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2573	0	0	1987	0	0	353	0	0	159	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		64.0			64.0		48.0	48.0		48.0	48.0		38.0
Total Lost Time (s)		5.0			5.0			5.0			5.0		
Act Effct Green (s)		59.0			59.0			76.6			76.6		
Actuated g/C Ratio		0.39			0.39			0.51			0.51		
v/c Ratio		1.34			1.00			0.83			0.22		
Control Delay		188.0			37.4			50.6			23.0		
Queue Delay		0.0			11.1			0.0			0.0		
Total Delay		188.0			48.5			50.6			23.0		
LOS		F			D			D			C		
Approach Delay		188.0			48.5			50.6			23.0		
Approach LOS		F			D			D			C		
Queue Length 50th (ft)		~1200			~215			269			78		
Queue Length 95th (ft)		m#880			m#810			#591			159		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)													
Base Capacity (vph)		1921			1978			423			731		
Starvation Cap Reductn		0			66			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.34			1.04			0.83			0.22		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 68 (45%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.34  
 Intersection Signal Delay: 118.6      Intersection LOS: F  
 Intersection Capacity Utilization 81.3%      ICU Level of Service D  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Second Street & Route 16

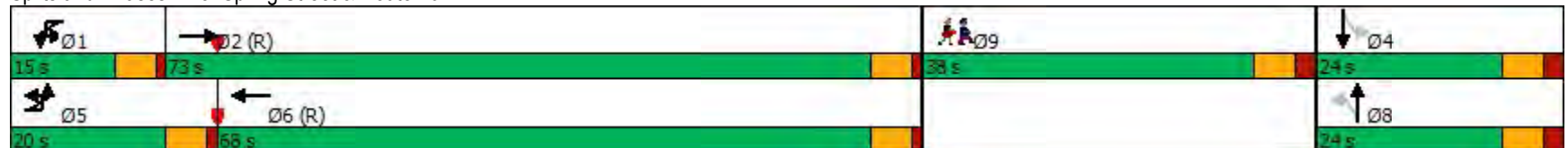


	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations		↔	↔↔↔			↔	↔↔↔			↔			↔		
Traffic Volume (vph)	35	114	1871	45	39	44	1742	50	49	50	60	26	35	132	
Future Volume (vph)	35	114	1871	45	39	44	1742	50	49	50	60	26	35	132	
Satd. Flow (prot)	0	1720	5111	0	0	1727	4894	0	0	1405	0	0	1371	0	
Flt Permitted		0.950				0.950				0.769			0.934		
Satd. Flow (perm)	0	1709	5111	0	0	1717	4894	0	0	1200	0	0	1422	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	178	2038	0	0	98	1829	0	0	194	0	0	242	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	20.0	20.0	73.0		15.0	15.0	68.0		24.0	24.0		24.0	24.0		38.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		15.0	68.4			9.6	63.0			46.4			46.4		
Actuated g/C Ratio		0.10	0.46			0.06	0.42			0.31			0.31		
v/c Ratio		1.03	0.88			0.88	0.89			0.52			0.55		
Control Delay		120.4	8.9			91.4	54.7			52.0			51.7		
Queue Delay		0.0	11.1			0.0	46.4			0.0			0.0		
Total Delay		120.4	20.0			91.4	101.1			52.0			51.7		
LOS		F	B			F	F			D			D		
Approach Delay			28.0				100.6			52.0			51.7		
Approach LOS			C				F			D			D		
Queue Length 50th (ft)		~190	55			92	694			157			197		
Queue Length 95th (ft)		m143	m41			m101	743			266			320		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		172	2329			115	2055			371			439		
Starvation Cap Reductn		0	305			0	462			0			0		
Spillback Cap Reductn		0	88			0	170			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		1.03	1.01			0.85	1.15			0.52			0.55		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 71 (47%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 60.9  
 Intersection Capacity Utilization 74.9%  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Spring Street & Route 16

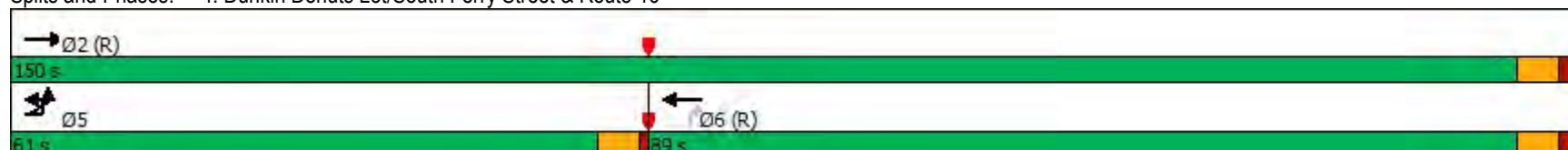


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↑↑↑			↑↑↑				↑			
Traffic Volume (vph)	21	330	1645	0	0	1808	69	0	0	72	0	0	0
Future Volume (vph)	21	330	1645	0	0	1808	69	0	0	72	0	0	0
Satd. Flow (prot)	0	1165	3576	0	0	3484	0	0	0	1655	0	0	0
Flt Permitted		0.800											
Satd. Flow (perm)	0	1163	4471	0	0	3484	0	0	0	1655	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	366	1714	0	0	1915	0	0	0	129	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										6			
Total Split (s)	61.0	61.0	150.0			89.0				89.0			
Total Lost Time (s)		5.0	6.0			6.0				6.0			
Act Effct Green (s)		50.0	150.0			89.0				89.0			
Actuated g/C Ratio		0.33	1.00			0.59				0.59			
v/c Ratio		0.94	0.48			0.93				0.13			
Control Delay		43.6	2.4			20.6				15.1			
Queue Delay		55.0	0.3			45.4				0.2			
Total Delay		98.6	2.7			66.0				15.4			
LOS		F	A			E				B			
Approach Delay			19.6			66.0			15.4				
Approach LOS			B			E			B				
Queue Length 50th (ft)		176	56			792				56			
Queue Length 95th (ft)		m326	0			m#901				57			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		434	3576			2067				982			
Starvation Cap Reductn		0	0			456				0			
Spillback Cap Reductn		164	1043			361				436			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		1.36	0.68			1.19				0.24			

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 147 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 41.0  
 Intersection Capacity Utilization 65.1%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16



	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙		
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↔	↑↑↑			↔			↔		
Traffic Volume (vph)	0	1631	86	18	24	1606	139	135	194	29	54	101	136	
Future Volume (vph)	0	1631	86	18	24	1606	139	135	194	29	54	101	136	
Satd. Flow (prot)	0	4862	0	0	1669	4846	0	0	1618	0	0	1397	0	
Flt Permitted					0.950				0.662			0.833		
Satd. Flow (perm)	0	4862	0	0	1643	4846	0	0	1089	0	0	1292	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1770	0	0	49	1799	0	0	421	0	0	343	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		50.0		14.0	14.0	64.0		51.0	51.0		51.0	51.0		35.0
Total Lost Time (s)		6.0			6.0	6.0			6.0			6.0		
Act Effct Green (s)		46.8			8.0	58.0			70.4			70.4		
Actuated g/C Ratio		0.31			0.05	0.39			0.47			0.47		
v/c Ratio		1.17			0.55	0.96			0.83			0.57		
Control Delay		120.9			103.3	48.9			51.0			36.3		
Queue Delay		0.4			0.0	43.8			0.0			0.0		
Total Delay		121.3			103.3	92.7			51.0			36.3		
LOS		F			F	F			D			D		
Approach Delay		121.3				92.9			51.0			36.3		
Approach LOS		F				F			D			D		
Queue Length 50th (ft)		~805			46	645			338			231		
Queue Length 95th (ft)		#899			m84	#479			#664			420		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		1517			89	1873			510			606		
Starvation Cap Reductn		0			0	34			0			0		
Spillback Cap Reductn		155			0	569			0			0		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		1.30			0.55	1.38			0.83			0.57		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.17  
 Intersection Signal Delay: 95.9      Intersection LOS: F  
 Intersection Capacity Utilization 81.2%      ICU Level of Service D  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Vine Street & Route 16



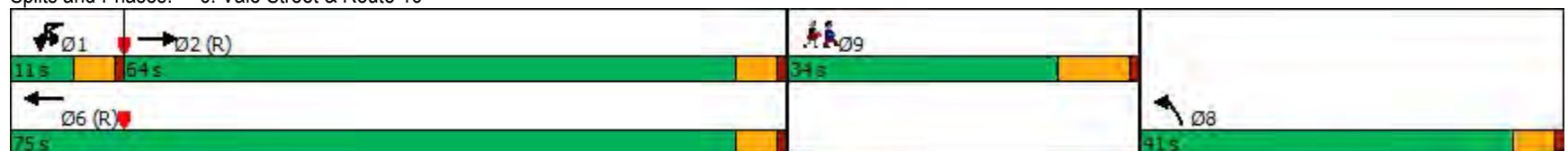


	→	↘	↙	←	↖	↗	Ø9
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↓	↑↑↑	↑	
Traffic Volume (vph)	1573	159	5	0	1415	372	8
Future Volume (vph)	1573	159	5	0	1415	372	8
Satd. Flow (prot)	4409	0	0	1504	4916	1787	0
Flt Permitted				0.900		0.953	
Satd. Flow (perm)	4409	0	0	1478	4916	1763	0
Satd. Flow (RTOR)							
Lane Group Flow (vph)	1805	0	0	5	1459	422	0
Turn Type	NA		Prot	Prot	NA	Prot	
Protected Phases	2		1	1	6	8	9
Permitted Phases							
Total Split (s)	64.0		11.0	11.0	75.0	41.0	34.0
Total Lost Time (s)	5.0			5.0	5.0	5.0	
Act Effct Green (s)	90.3			6.0	92.5	42.3	
Actuated g/C Ratio	0.60			0.04	0.62	0.28	
v/c Ratio	0.68			0.08	0.48	0.84	
Control Delay	10.0			72.6	17.9	66.1	
Queue Delay	0.6			0.0	0.1	0.0	
Total Delay	10.5			72.6	18.1	66.1	
LOS	B			E	B	E	
Approach Delay	10.5				18.3	66.1	
Approach LOS	B				B	E	
Queue Length 50th (ft)	149			5	250	386	
Queue Length 95th (ft)	m599			21	442	#529	
Internal Link Dist (ft)	521				488	647	
Turn Bay Length (ft)				150			
Base Capacity (vph)	2654			60	3032	503	
Starvation Cap Reductn	420			0	0	0	
Spillback Cap Reductn	0			0	540	0	
Storage Cap Reductn	0			0	0	0	
Reduced v/c Ratio	0.81			0.08	0.59	0.84	

**Intersection Summary**

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 14 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 20.0 Intersection LOS: B  
 Intersection Capacity Utilization 63.5% ICU Level of Service B  
 Analysis Period (min) 15  
 Description: Note: Splits and offsets need to be optimized via synchro due to lack of coordination data  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Vale Street & Route 16

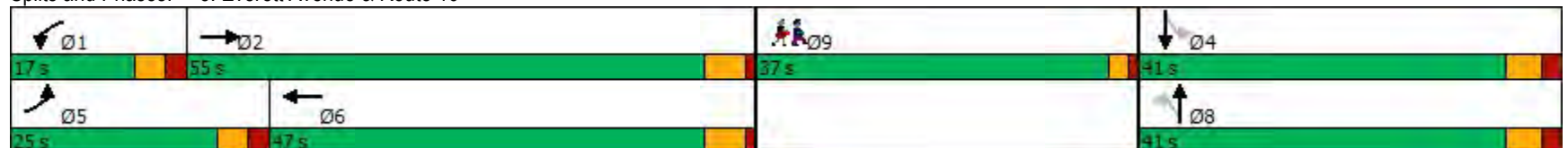


																Ø9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9			
Lane Configurations																
Traffic Volume (vph)	232	1377	158	65	1224	21	185	230	50	55	151	42				
Future Volume (vph)	232	1377	158	65	1224	21	185	230	50	55	151	42				
Satd. Flow (prot)	1728	4785	0	1678	4895	0	1694	1738	0	1601	1743	0				
Flt Permitted	0.950			0.950			0.507			0.295						
Satd. Flow (perm)	1720	4785	0	1663	4895	0	893	1738	0	493	1743	0				
Satd. Flow (RTOR)																
Lane Group Flow (vph)	264	1633	0	73	1284	0	208	346	0	76	210	0				
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA					
Protected Phases	5	2		1	6			8			4					9
Permitted Phases							8			4						
Total Split (s)	25.0	55.0		17.0	47.0		41.0	41.0		41.0	41.0					37.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5					
Act Effct Green (s)	20.4	56.3		9.2	42.8		36.2	36.2		36.2	36.2					
Actuated g/C Ratio	0.16	0.44		0.07	0.34		0.28	0.28		0.28	0.28					
v/c Ratio	0.96	0.77		0.60	0.78		0.82	0.70		0.55	0.43					
Control Delay	98.4	36.7		81.4	44.2		71.1	52.4		60.7	43.8					
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0					
Total Delay	98.4	36.7		81.4	44.2		71.1	52.4		60.7	43.8					
LOS	F	D		F	D		E	D		E	D					
Approach Delay		45.3			46.2			59.4			48.3					
Approach LOS		D			D			E			D					
Queue Length 50th (ft)	188	341		52	287		135	214		45	119					
Queue Length 95th (ft)	#467	#709		124	#536		#368	390		100	264					
Internal Link Dist (ft)		406			387			396			538					
Turn Bay Length (ft)	150			100			100			100						
Base Capacity (vph)	275	2115		161	1643		253	493		139	494					
Starvation Cap Reductn	0	0		0	0		0	0		0	0					
Spillback Cap Reductn	0	0		0	0		0	0		0	0					
Storage Cap Reductn	0	0		0	0		0	0		0	0					
Reduced v/c Ratio	0.96	0.77		0.45	0.78		0.82	0.70		0.55	0.43					

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 127.4  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 47.7  
 Intersection Capacity Utilization 78.2%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Everett Avenue & Route 16

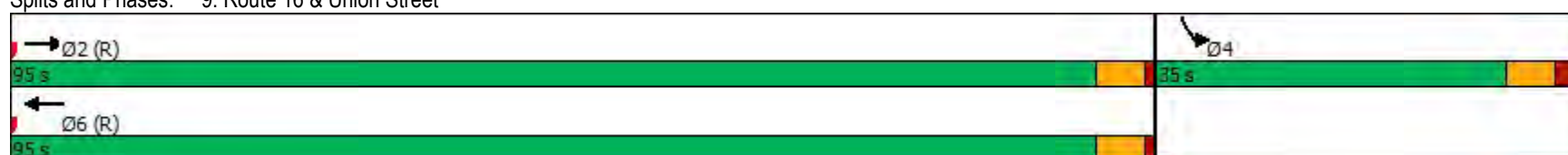


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↑	
Traffic Volume (vph)	0	1490	1299	224	126	11
Future Volume (vph)	0	1490	1299	224	126	11
Satd. Flow (prot)	0	4868	4797	0	1764	0
Flt Permitted					0.956	
Satd. Flow (perm)	0	4868	4797	0	1764	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	1620	1603	0	145	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		95.0	95.0		35.0	
Total Lost Time (s)		5.0	5.0		6.0	
Act Effct Green (s)		103.9	103.9		15.1	
Actuated g/C Ratio		0.80	0.80		0.12	
v/c Ratio		0.42	0.42		0.71	
Control Delay		4.6	4.6		73.5	
Queue Delay		0.0	0.9		0.0	
Total Delay		4.6	5.5		73.5	
LOS		A	A		E	
Approach Delay		4.6	5.5		73.5	
Approach LOS		A	A		E	
Queue Length 50th (ft)		124	123		120	
Queue Length 95th (ft)		183	183		184	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3891	3834		393	
Starvation Cap Reductn		0	1791		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.42	0.78		0.37	

**Intersection Summary**

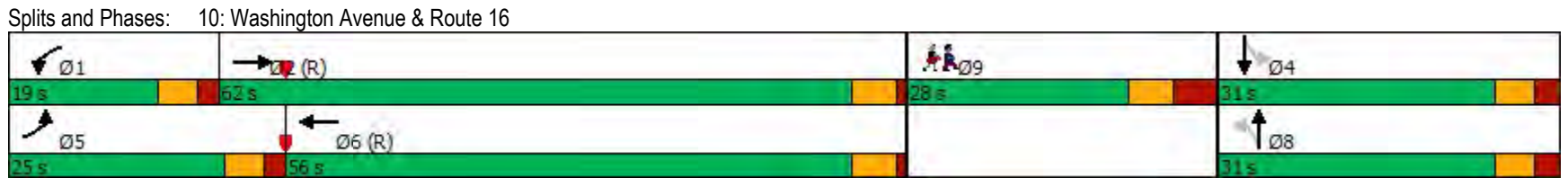
Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 77 (59%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 8.0 Intersection LOS: A  
 Intersection Capacity Utilization 47.0% ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 9: Route 16 & Union Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	218	1185	213	155	1264	31	139	234	23	57	133	120	
Future Volume (vph)	218	1185	213	155	1264	31	139	234	23	57	133	120	
Satd. Flow (prot)	1745	4734	0	1728	4891	0	1736	1801	0	1770	1656	0	
Flt Permitted	0.950			0.950			0.413			0.414			
Satd. Flow (perm)	1738	4734	0	1727	4891	0	742	1801	0	760	1656	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	251	1607	0	174	1423	0	164	286	0	64	287	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	25.0	62.0		19.0	56.0		31.0	31.0		31.0	31.0		28.0
Total Lost Time (s)	5.5	5.0		5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)	19.5	57.0		13.5	51.0		42.6	42.6		42.6	42.6		
Actuated g/C Ratio	0.14	0.41		0.10	0.36		0.30	0.30		0.30	0.30		
v/c Ratio	1.03	0.83		1.05	0.80		0.73	0.52		0.28	0.57		
Control Delay	124.2	42.0		142.5	44.1		65.0	47.6		46.9	49.2		
Queue Delay	0.0	47.8		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	124.2	89.9		142.5	44.1		65.0	47.6		46.9	49.2		
LOS	F	F		F	D		E	D		D	D		
Approach Delay		94.5			54.8			54.0			48.7		
Approach LOS		F			D			D			D		
Queue Length 50th (ft)	~245	476		~171	423		118	191		39	195		
Queue Length 95th (ft)	#400	514		#321	485		#299	#397		103	#411		
Internal Link Dist (ft)		319			1066			414			597		
Turn Bay Length (ft)	100			150			150			150			
Base Capacity (vph)	243	1927		166	1781		225	547		231	503		
Starvation Cap Reductn	0	642		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	1.03	1.25		1.05	0.80		0.73	0.52		0.28	0.57		

**Intersection Summary**  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 71.5  
 Intersection LOS: E  
 Intersection Capacity Utilization 81.3%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.





	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙		
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↘	↑↑↑		↘	↑		↘	↑		
Traffic Volume (vph)	0	1164	181	266	111	1194	13	288	349	219	226	270	175	
Future Volume (vph)	0	1164	181	266	111	1194	13	288	349	219	226	270	175	
Satd. Flow (prot)	0	4775	0	0	1673	4783	0	1736	1919	0	1787	1916	0	
Flt Permitted					0.950			*0.600			*0.600			
Satd. Flow (perm)	0	4775	0	0	1660	4783	0	1091	1919	0	1122	1916	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1373	0	0	418	1326	0	327	617	0	251	529	0	
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA		
Protected Phases		2		1	1	6		3	8		7	4		9
Permitted Phases								8			4			
Total Split (s)		43.0		36.0	36.0	79.0		13.0	44.0		21.0	52.0		36.0
Total Lost Time (s)		5.0			6.0	5.0		6.0	5.5		6.0	5.5		
Act Effct Green (s)		38.0			30.0	74.0		45.0	38.5		59.0	46.5		
Actuated g/C Ratio		0.26			0.21	0.51		0.31	0.27		0.41	0.32		
v/c Ratio		1.09			1.20	0.54		0.88	1.20		0.48	0.86		
Control Delay		102.4			162.5	24.6		66.6	153.4		32.8	60.3		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		102.4			162.5	24.6		66.6	153.4		32.8	60.3		
LOS		F			F	C		E	F		C	E		
Approach Delay		102.4				57.6			123.3			51.5		
Approach LOS		F				E			F			D		
Queue Length 50th (ft)		~529			~474	298		221	~701		160	464		
Queue Length 95th (ft)		#627			#686	343		#360	#938		233	559		
Internal Link Dist (ft)		409				879			820			473		
Turn Bay Length (ft)					100			150			100			
Base Capacity (vph)		1260			348	2457		372	513		528	618		
Starvation Cap Reductn		0			0	0		0	0		0	0		
Spillback Cap Reductn		0			0	0		0	0		0	0		
Storage Cap Reductn		0			0	0		0	0		0	0		
Reduced v/c Ratio		1.09			1.20	0.54		0.88	1.20		0.48	0.86		

Intersection Summary

Cycle Length: 180  
 Actuated Cycle Length: 144  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.20  
 Intersection Signal Delay: 82.2  
 Intersection Capacity Utilization 111.0%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service H

Description: Note: turning movement counts show no volume heading southbound on Webster. Volumes shown were extrapolated from 2016 TMCs  
 Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min

\* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16



	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	2108	18	0	2045	24	15	8	9	24	20	21	
Future Volume (vph)	0	2108	18	0	2045	24	15	8	9	24	20	21	
Satd. Flow (prot)	0	2890	0	0	3372	0	0	1636	0	0	1612	0	
Flt Permitted								0.869			0.859		
Satd. Flow (perm)	0	2890	0	0	3372	0	0	1579	0	0	1535	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2192	0	0	2325	0	0	43	0	0	78	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		52.0			52.0		21.0	21.0		21.0	21.0		37.0
Total Lost Time (s)		6.0			6.0			5.0			5.0		
Act Effct Green (s)		49.3			49.3			11.0			11.0		
Actuated g/C Ratio		0.71			0.71			0.16			0.16		
v/c Ratio		1.07			0.98			0.17			0.32		
Control Delay		61.3			30.3			30.6			33.2		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		61.3			30.3			30.6			33.2		
LOS		E			C			C			C		
Approach Delay		61.3			30.3			30.6			33.2		
Approach LOS		E			C			C			C		
Queue Length 50th (ft)		~391			~310			16			29		
Queue Length 95th (ft)		#782			#776			44			77		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		2040			2380			374			364		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.07			0.98			0.11			0.21		

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 69.9  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 45.0  
 Intersection Capacity Utilization 59.3%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service B

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Lewis Street & Route 16



	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group													
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	1712	428	0	1702	132	306	74	8	43	60	61	
Future Volume (vph)	0	1712	428	0	1702	132	306	74	8	43	60	61	
Satd. Flow (prot)	0	4528	0	0	5083	0	0	1776	0	0	1771	0	
Flt Permitted								0.602			0.857		
Satd. Flow (perm)	0	4528	0	0	5083	0	0	1109	0	0	1537	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2253	0	0	2183	0	0	451	0	0	197	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		65.0			65.0		45.0	45.0		45.0	45.0		37.0
Total Lost Time (s)		5.0			5.0			5.0			5.0		
Act Effct Green (s)		60.3			60.3			40.2			40.2		
Actuated g/C Ratio		0.53			0.53			0.35			0.35		
v/c Ratio		0.94			0.81			1.16			0.37		
Control Delay		35.6			26.5			131.0			31.5		
Queue Delay		0.0			31.5			0.0			0.0		
Total Delay		35.6			58.1			131.0			31.5		
LOS		D			E			F			C		
Approach Delay		35.6			58.1			131.0			31.5		
Approach LOS		D			E			F			C		
Queue Length 50th (ft)		502			428			~367			100		
Queue Length 95th (ft)		#889			636			#669			190		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)													
Base Capacity (vph)		2387			2680			390			539		
Starvation Cap Reductn		0			627			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.94			1.06			1.16			0.37		

Intersection Summary

Cycle Length: 147  
 Actuated Cycle Length: 114.4  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.16  
 Intersection Signal Delay: 53.5  
 Intersection Capacity Utilization 85.9%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service E

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Second Street & Route 16



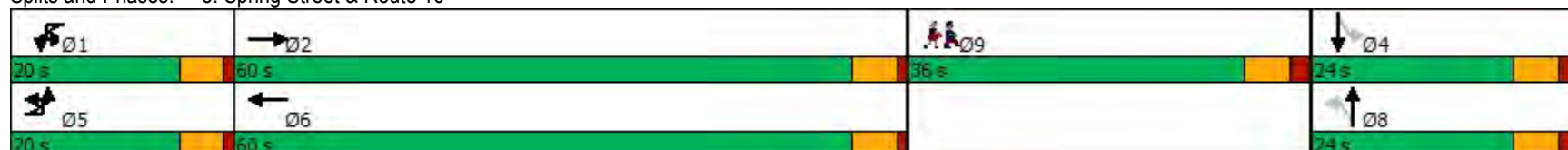
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations															
Traffic Volume (vph)	47	109	1561	46	66	54	1608	45	63	51	85	40	43	116	
Future Volume (vph)	47	109	1561	46	66	54	1608	45	63	51	85	40	43	116	
Satd. Flow (prot)	0	1504	5063	0	0	1465	4940	0	0	1420	0	0	1403	0	
Flt Permitted		0.900				0.900				*0.800			*0.810		
Satd. Flow (perm)	0	1501	5063	0	0	1458	4940	0	0	1262	0	0	1262	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	166	1640	0	0	160	1922	0	0	234	0	0	240	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	20.0	20.0	60.0		20.0	20.0	60.0		24.0	24.0		24.0	24.0		36.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		15.1	55.4			15.1	55.4			18.1			18.1		
Actuated g/C Ratio		0.14	0.51			0.14	0.51			0.17			0.17		
v/c Ratio		0.80	0.64			0.79	0.76			1.11			1.14		
Control Delay		73.7	21.9			73.2	25.2			139.3			148.2		
Queue Delay		0.0	1.1			0.0	0.4			0.0			0.0		
Total Delay		73.7	23.0			73.2	25.6			139.3			148.2		
LOS		E	C			E	C			F			F		
Approach Delay			27.7				29.2			139.3			148.2		
Approach LOS			C				C			F			F		
Queue Length 50th (ft)		118	265			114	344			~192			~202		
Queue Length 95th (ft)		#306	473			#221	563			#427			#425		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		208	2577			203	2514			210			210		
Starvation Cap Reductn		0	630			0	182			0			0		
Spillback Cap Reductn		0	0			0	0			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		0.80	0.84			0.79	0.82			1.11			1.14		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 108.8  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.14  
 Intersection Signal Delay: 41.0  
 Intersection Capacity Utilization 72.5%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service C

\* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Spring Street & Route 16





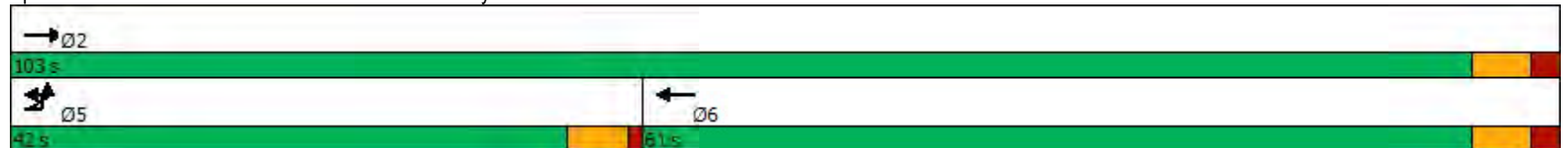
	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group													
Lane Configurations		↔	↑↑↑			↑↑↑				↗			
Traffic Volume (vph)	21	221	1510	0	0	1732	67	0	0	60	0	0	0
Future Volume (vph)	21	221	1510	0	0	1732	67	0	0	60	0	0	0
Satd. Flow (prot)	0	1170	3576	0	0	4295	0	0	0	1589	0	0	0
Flt Permitted		0.800											
Satd. Flow (perm)	0	1169	4471	0	0	4295	0	0	0	1589	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	263	1624	0	0	2044	0	0	0	65	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	42.0	42.0	103.0			61.0				103.0			
Total Lost Time (s)		5.0	6.0			6.0				6.0			
Act Effct Green (s)		25.8	98.2			61.2				98.2			
Actuated g/C Ratio		0.26	1.00			0.62				1.00			
v/c Ratio		0.86	0.45			0.76				0.04			
Control Delay		59.1	0.4			17.5				0.1			
Queue Delay		0.0	0.0			0.5				0.0			
Total Delay		59.1	0.4			18.0				0.1			
LOS		E	A			B				A			
Approach Delay			8.6			18.0			0.1				
Approach LOS			A			B			A				
Queue Length 50th (ft)		205	0			365				0			
Queue Length 95th (ft)		292	0			541				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		446	3576			2678				1589			
Starvation Cap Reductn		0	0			239				0			
Spillback Cap Reductn		0	0			0				0			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		0.59	0.45			0.84				0.04			

Intersection Summary

Cycle Length: 103  
 Actuated Cycle Length: 98.2  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 13.2  
 Intersection Capacity Utilization 57.6%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16



	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑			↑			↑		
Traffic Volume (vph)	0	1462	108	9	22	1540	95	127	103	37	75	120	132	
Future Volume (vph)	0	1462	108	9	22	1540	95	127	103	37	75	120	132	
Satd. Flow (prot)	0	4414	0	0	1504	4870	0	0	1630	0	0	1564	0	
Flt Permitted					0.900				0.483			0.811		
Satd. Flow (perm)	0	4414	0	0	1495	4870	0	0	804	0	0	1280	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1688	0	0	42	1703	0	0	294	0	0	359	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		56.0		22.0	22.0	78.0		36.0	36.0		36.0	36.0		36.0
Total Lost Time (s)		6.0			6.0	6.0			6.0			6.0		
Act Effct Green (s)		60.7			8.6	72.4			30.2			30.2		
Actuated g/C Ratio		0.51			0.07	0.61			0.25			0.25		
v/c Ratio		0.75			0.39	0.57			1.44			1.11		
Control Delay		27.7			65.5	15.9			259.2			123.5		
Queue Delay		0.4			0.0	0.5			0.0			0.0		
Total Delay		28.1			65.5	16.4			259.2			123.5		
LOS		C			E	B			F			F		
Approach Delay		28.1				17.6			259.2			123.5		
Approach LOS		C				B			F			F		
Queue Length 50th (ft)		347			32	239			~316			~319		
Queue Length 95th (ft)		#648			68	453			#627			#669		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		2256			204	2968			204			324		
Starvation Cap Reductn		181			0	704			0			0		
Spillback Cap Reductn		0			0	0			0			0		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		0.81			0.21	0.75			1.44			1.11		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 118.8  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.44  
 Intersection Signal Delay: 48.6  
 Intersection Capacity Utilization 70.2%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service C

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Vine Street & Route 16



	→	↘	↙	←	↖	↗	↘	↙
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø9
Lane Configurations	↑↑↑			↔	↑↑↑	↔		
Traffic Volume (vph)	1413	187	17	7	1442	224	1	
Future Volume (vph)	1413	187	17	7	1442	224	1	
Satd. Flow (prot)	4414	0	0	1504	4916	1791	0	
Flt Permitted				0.900		0.953		
Satd. Flow (perm)	4414	0	0	1504	4916	1779	0	
Satd. Flow (RTOR)								
Lane Group Flow (vph)	1860	0	0	25	1502	242	0	
Turn Type	NA		Prot	Prot	NA	Perm		
Protected Phases	2		1	1	6			9
Permitted Phases						8		
Total Split (s)	55.0		16.0	16.0	71.0	30.0		34.0
Total Lost Time (s)	5.0			5.0	5.0	5.0		
Act Effct Green (s)	52.3			6.9	56.6	16.4		
Actuated g/C Ratio	0.60			0.08	0.65	0.19		
v/c Ratio	0.70			0.21	0.47	0.72		
Control Delay	18.4			49.2	10.4	48.4		
Queue Delay	0.0			0.0	0.0	0.0		
Total Delay	18.4			49.2	10.4	48.4		
LOS	B			D	B	D		
Approach Delay	18.4				11.0	48.4		
Approach LOS	B				B	D		
Queue Length 50th (ft)	167			12	112	105		
Queue Length 95th (ft)	#644			53	350	276		
Internal Link Dist (ft)	521				488	647		
Turn Bay Length (ft)				150				
Base Capacity (vph)	2651			198	3897	534		
Starvation Cap Reductn	31			0	0	0		
Spillback Cap Reductn	0			0	0	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.71			0.13	0.39	0.45		

Intersection Summary

Cycle Length: 135  
 Actuated Cycle Length: 87.1  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 17.3  
 Intersection Capacity Utilization 52.3%  
 Analysis Period (min) 15  
 Description: Note: Splits and offsets need to be optimized via synchro due to lack of coordination data  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Vale Street & Route 16



															Ø9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9		
Lane Configurations															
Traffic Volume (vph)	186	1221	187	101	1213	18	230	173	82	90	219	76			
Future Volume (vph)	186	1221	187	101	1213	18	230	173	82	90	219	76			
Satd. Flow (prot)	1745	4806	0	1694	4900	0	1728	1716	0	1694	1749	0			
Flt Permitted	0.950			0.950			0.382			0.427					
Satd. Flow (perm)	1745	4806	0	1686	4900	0	690	1716	0	759	1749	0			
Satd. Flow (RTOR)															
Lane Group Flow (vph)	204	1437	0	123	1398	0	247	283	0	100	314	0			
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA				
Protected Phases	5	2		1	6			8			4				9
Permitted Phases							8			4					
Total Split (s)	17.0	52.0		15.0	50.0		40.0	40.0		40.0	40.0				33.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5				
Act Effct Green (s)	12.2	44.7		10.2	42.7		35.1	35.1		35.1	35.1				
Actuated g/C Ratio	0.11	0.40		0.09	0.39		0.32	0.32		0.32	0.32				
v/c Ratio	1.07	0.74		0.79	0.74		1.13	0.52		0.42	0.57				
Control Delay	132.3	32.1		85.0	33.5		138.9	38.2		40.8	39.3				
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0				
Total Delay	132.3	32.1		85.0	33.5		138.9	38.2		40.8	39.3				
LOS	F	C		F	C		F	D		D	D				
Approach Delay		44.5			37.6			85.1			39.7				
Approach LOS		D			D			F			D				
Queue Length 50th (ft)	~152	276		84	278		~194	157		53	177				
Queue Length 95th (ft)	m#414	518		#220	491		#482	339		146	377				
Internal Link Dist (ft)		406			387			396			538				
Turn Bay Length (ft)	150			100			100			100					
Base Capacity (vph)	191	2070		155	2020		218	542		239	553				
Starvation Cap Reductn	0	0		0	0		0	0		0	0				
Spillback Cap Reductn	0	0		0	0		0	0		0	0				
Storage Cap Reductn	0	0		0	0		0	0		0	0				
Reduced v/c Ratio	1.07	0.69		0.79	0.69		1.13	0.52		0.42	0.57				

Intersection Summary

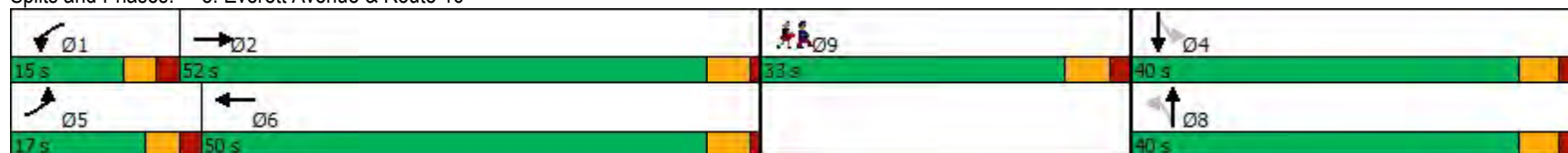
Cycle Length: 140  
 Actuated Cycle Length: 110.9  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.13  
 Intersection Signal Delay: 46.7  
 Intersection Capacity Utilization 80.8%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service D

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

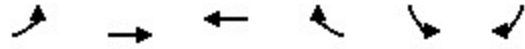
# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Everett Avenue & Route 16







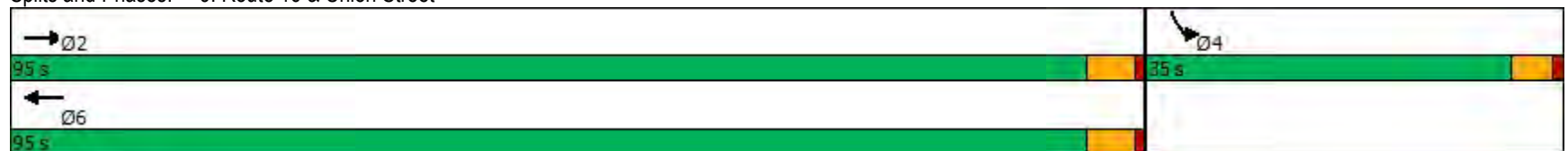
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑↑↑		↑	
Traffic Volume (vph)	0	1432	1315	175	146	11
Future Volume (vph)	0	1432	1315	175	146	11
Satd. Flow (prot)	0	4916	4828	0	1798	0
Flt Permitted					0.955	
Satd. Flow (perm)	0	4916	4828	0	1798	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	1446	1689	0	175	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		95.0	95.0		35.0	
Total Lost Time (s)		5.0	5.0		4.5	
Act Effct Green (s)		22.1	22.1		9.6	
Actuated g/C Ratio		0.53	0.53		0.23	
v/c Ratio		0.55	0.66		0.42	
Control Delay		7.3	8.4		18.8	
Queue Delay		0.0	0.0		0.0	
Total Delay		7.3	8.4		18.8	
LOS		A	A		B	
Approach Delay		7.3	8.4		18.8	
Approach LOS		A	A		B	
Queue Length 50th (ft)		64	82		33	
Queue Length 95th (ft)		115	142		93	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		4916	4828		1363	
Starvation Cap Reductn		0	83		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.29	0.36		0.13	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 41.5  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 8.4  
 Intersection Capacity Utilization 46.0%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 9: Route 16 & Union Street

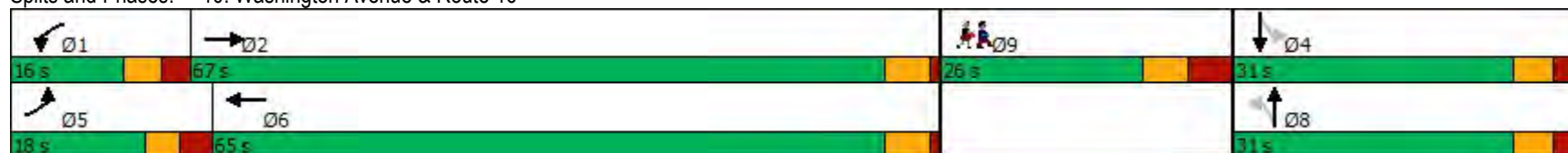


	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	Ø9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖		↖	↖		
Traffic Volume (vph)	212	1188	178	88	1224	38	113	123	55	60	158	153	
Future Volume (vph)	212	1188	178	88	1224	38	113	123	55	60	158	153	
Satd. Flow (prot)	1745	4758	0	1694	4896	0	1736	1753	0	1770	1706	0	
Flt Permitted	0.950			0.950			*0.450			0.515			
Satd. Flow (perm)	1740	4758	0	1692	4896	0	817	1753	0	955	1706	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	230	1438	0	116	1342	0	128	203	0	64	331	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	18.0	67.0		16.0	65.0		31.0	31.0		31.0	31.0		26.0
Total Lost Time (s)	6.0	5.0		6.0	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)	12.4	46.0		10.3	44.0		25.7	25.7		25.7	25.7		
Actuated g/C Ratio	0.12	0.44		0.10	0.43		0.25	0.25		0.25	0.25		
v/c Ratio	1.11	0.68		0.69	0.64		0.63	0.47		0.27	0.78		
Control Delay	137.5	25.1		69.9	25.5		54.5	41.5		41.5	52.8		
Queue Delay	0.0	0.2		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	137.5	25.3		69.9	25.5		54.5	41.5		41.5	52.8		
LOS	F	C		E	C		D	D		D	D		
Approach Delay		40.8			29.0			46.5			51.0		
Approach LOS		D			C			D			D		
Queue Length 50th (ft)	~158	241		70	226		70	105		32	189		
Queue Length 95th (ft)	#465	433		#182	400		#231	256		102	#534		
Internal Link Dist (ft)		319			1066			414			597		
Turn Bay Length (ft)	100			150			150			150			
Base Capacity (vph)	208	2937		168	2924		203	436		237	424		
Starvation Cap Reductn	0	662		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	1.11	0.63		0.69	0.46		0.63	0.47		0.27	0.78		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 103.4  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.11  
 Intersection Signal Delay: 37.9  
 Intersection Capacity Utilization 81.7%  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16

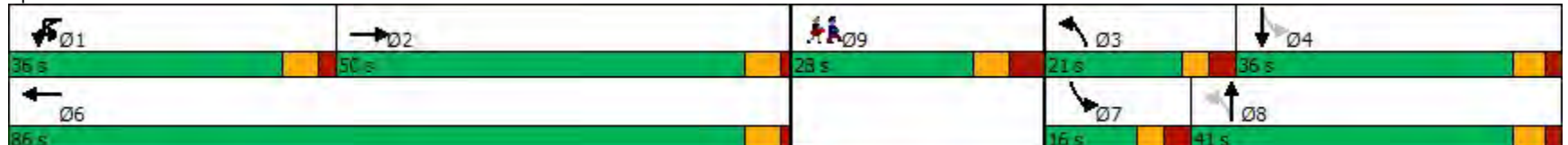


	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑		↑	↑		↑	↑		
Traffic Volume (vph)	0	1225	184	171	128	1172	13	299	209	229	190	170	146	
Future Volume (vph)	0	1225	184	171	128	1172	13	299	209	229	190	170	146	
Satd. Flow (prot)	0	4777	0	0	1652	4737	0	1752	1885	0	1787	1913	0	
Flt Permitted					0.950			*0.600			*0.600			
Satd. Flow (perm)	0	4777	0	0	1647	4737	0	1105	1885	0	1119	1913	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1515	0	0	329	1248	0	336	486	0	209	344	0	
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA		
Protected Phases		2		1	1	6		3	8		7	4		9
Permitted Phases								8			4			
Total Split (s)		50.0		36.0	36.0	86.0		21.0	41.0		16.0	36.0		28.0
Total Lost Time (s)		5.0			6.0	5.0		6.0	5.5		6.0	5.5		
Act Effct Green (s)		45.3			30.2	81.6		50.4	35.8		40.3	30.7		
Actuated g/C Ratio		0.29			0.20	0.53		0.33	0.23		0.26	0.20		
v/c Ratio		1.08			1.02	0.50		0.79	1.11		0.62	0.90		
Control Delay		98.4			114.3	25.6		60.7	130.0		54.5	87.3		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		98.4			114.3	25.6		60.7	130.0		54.5	87.3		
LOS		F			F	C		E	F		D	F		
Approach Delay		98.4				44.1			101.7			74.9		
Approach LOS		F				D			F			E		
Queue Length 50th (ft)		~525			305	241		248	~487		141	310		
Queue Length 95th (ft)		#849			#636	409		#503	#908		270	#616		
Internal Link Dist (ft)		409				879			820			473		
Turn Bay Length (ft)					100			150			100			
Base Capacity (vph)		1405			323	2507		424	437		335	381		
Starvation Cap Reductn		0			0	0		0	0		0	0		
Spillback Cap Reductn		0			0	0		0	0		0	0		
Storage Cap Reductn		0			0	0		0	0		0	0		
Reduced v/c Ratio		1.08			1.02	0.50		0.79	1.11		0.62	0.90		

Intersection Summary

Cycle Length: 171  
 Actuated Cycle Length: 154.2  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.11  
 Intersection Signal Delay: 76.9  
 Intersection Capacity Utilization 99.4%  
 Analysis Period (min) 15  
 Description: Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16



	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	1958	13	0	1726	6	20	5	9	7	9	16	
Future Volume (vph)	0	1958	13	0	1726	6	20	5	9	7	9	16	
Satd. Flow (prot)	0	2919	0	0	2919	0	0	1638	0	0	1583	0	
Flt Permitted								0.788			0.912		
Satd. Flow (perm)	0	2919	0	0	2919	0	0	1432	0	0	1601	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2054	0	0	2038	0	0	48	0	0	56	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		52.0			52.0		21.0	21.0		21.0	21.0		37.0
Total Lost Time (s)		6.0			6.0			5.0			5.0		
Act Effct Green (s)		51.1			51.1			10.0			10.1		
Actuated g/C Ratio		0.77			0.77			0.15			0.15		
v/c Ratio		0.91			0.90			0.22			0.23		
Control Delay		21.6			21.0			31.9			31.6		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		21.6			21.0			31.9			31.6		
LOS		C			C			C			C		
Approach Delay		21.6			21.0			31.9			31.6		
Approach LOS		C			C			C			C		
Queue Length 50th (ft)		~271			~257			18			21		
Queue Length 95th (ft)		#692			#628			45			41		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		2261			2261			362			405		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.91			0.90			0.13			0.14		

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 66  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 21.5  
 Intersection Capacity Utilization 56.1%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service B

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Lewis Street & Route 16





	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	1605	369	0	1445	77	267	96	13	48	55	20	
Future Volume (vph)	0	1605	369	0	1445	77	267	96	13	48	55	20	
Satd. Flow (prot)	0	4578	0	0	5091	0	0	1371	0	0	1818	0	
Flt Permitted								0.650			0.783		
Satd. Flow (perm)	0	4578	0	0	5091	0	0	989	0	0	1451	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2123	0	0	1730	0	0	430	0	0	190	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		65.0			65.0		45.0	45.0		45.0	45.0		37.0
Total Lost Time (s)		5.0			5.0			5.0			5.0		
Act Effct Green (s)		60.3			60.3			40.2			40.2		
Actuated g/C Ratio		0.53			0.53			0.35			0.35		
v/c Ratio		0.88			0.64			1.24			0.37		
Control Delay		30.0			21.7			163.5			31.8		
Queue Delay		0.0			1.7			0.0			0.0		
Total Delay		30.0			23.5			163.5			31.8		
LOS		C			C			F			C		
Approach Delay		30.0			23.5			163.5			31.8		
Approach LOS		C			C			F			C		
Queue Length 50th (ft)		443			293			~405			97		
Queue Length 95th (ft)		#798			482			#729			139		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)													
Base Capacity (vph)		2414			2684			347			509		
Starvation Cap Reductn		0			734			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.88			0.89			1.24			0.37		

Intersection Summary

Cycle Length: 147  
 Actuated Cycle Length: 114.4  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.24  
 Intersection Signal Delay: 40.4  
 Intersection Capacity Utilization 74.9%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service D

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Second Street & Route 16

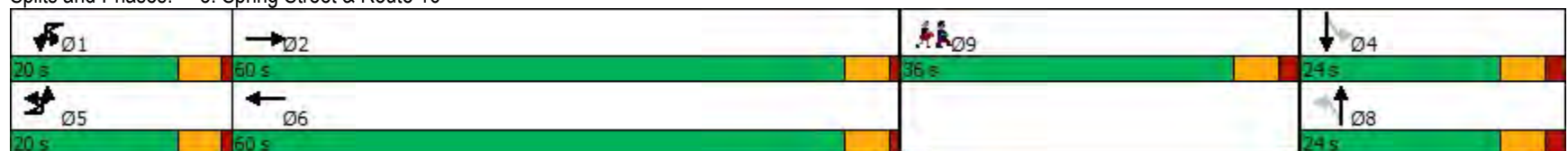


	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations		↔	↔↔↔			↔	↔↔↔			↔			↔		
Traffic Volume (vph)	38	106	1466	56	45	66	1345	39	23	55	67	30	46	117	
Future Volume (vph)	38	106	1466	56	45	66	1345	39	23	55	67	30	46	117	
Satd. Flow (prot)	0	1504	5048	0	0	1486	4938	0	0	1416	0	0	1401	0	
Flt Permitted		0.900				*0.900				*0.800			*0.810		
Satd. Flow (perm)	0	1500	5048	0	0	1471	4938	0	0	1258	0	0	1258	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	163	1602	0	0	139	1537	0	0	165	0	0	257	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	20.0	20.0	60.0		20.0	20.0	60.0		24.0	24.0		24.0	24.0		36.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		15.1	56.8			13.7	55.4			18.1			18.1		
Actuated g/C Ratio		0.14	0.52			0.13	0.51			0.17			0.17		
v/c Ratio		0.78	0.61			0.75	0.61			0.79			1.23		
Control Delay		72.1	20.8			71.0	21.5			71.2			177.8		
Queue Delay		0.0	0.7			0.0	0.1			0.0			0.0		
Total Delay		72.1	21.6			71.0	21.6			71.2			177.8		
LOS		E	C			E	C			E			F		
Approach Delay			26.2				25.7			71.2			177.8		
Approach LOS			C				C			E			F		
Queue Length 50th (ft)		115	256			96	244			116			~228		
Queue Length 95th (ft)		#289	458			#202	438			#297			#401		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		208	2636			206	2513			209			209		
Starvation Cap Reductn		0	631			0	207			0			0		
Spillback Cap Reductn		0	0			0	0			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		0.78	0.80			0.67	0.67			0.79			1.23		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 108.8  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.23  
 Intersection Signal Delay: 38.0  
 Intersection Capacity Utilization 64.7%  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Spring Street & Route 16

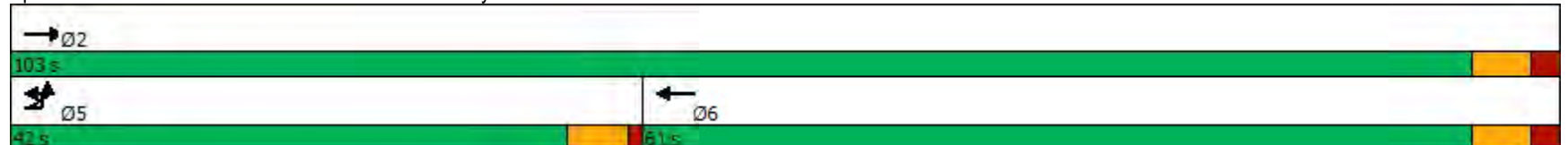


	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group													
Lane Configurations		↔	↑↑↑			↑↑↑				↔			
Traffic Volume (vph)	13	277	1318	0	0	1455	73	0	0	20	0	0	0
Future Volume (vph)	13	277	1318	0	0	1455	73	0	0	20	0	0	0
Satd. Flow (prot)	0	1164	3612	0	0	4328	0	0	0	1589	0	0	0
Flt Permitted		0.800											
Satd. Flow (perm)	0	1163	4515	0	0	4328	0	0	0	1589	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	326	1448	0	0	1643	0	0	0	22	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	42.0	42.0	103.0			61.0				103.0			
Total Lost Time (s)		5.0	6.0			6.0				6.0			
Act Effct Green (s)		29.8	96.9			56.1				96.9			
Actuated g/C Ratio		0.31	1.00			0.58				1.00			
v/c Ratio		0.91	0.40			0.66				0.01			
Control Delay		62.6	0.3			16.6				0.0			
Queue Delay		0.0	0.0			0.0				0.0			
Total Delay		62.6	0.3			16.6				0.0			
LOS		E	A			B				A			
Approach Delay			11.8			16.6							
Approach LOS			B			B							
Queue Length 50th (ft)		248	0			295				0			
Queue Length 95th (ft)		#408	0			387				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		448	3612			2503				1589			
Starvation Cap Reductn		0	0			0				0			
Spillback Cap Reductn		0	0			0				0			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		0.73	0.40			0.66				0.01			

Intersection Summary

Cycle Length: 103  
 Actuated Cycle Length: 96.9  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 14.0  
 Intersection Capacity Utilization 55.0%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16



	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑			↑			↑		
Traffic Volume (vph)	0	1262	76	2	17	1332	73	64	112	42	59	104	132	
Future Volume (vph)	0	1262	76	2	17	1332	73	64	112	42	59	104	132	
Satd. Flow (prot)	0	4462	0	0	1504	4922	0	0	1645	0	0	1596	0	
Flt Permitted					0.900				0.595			0.766		
Satd. Flow (perm)	0	4462	0	0	1497	4922	0	0	992	0	0	1234	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1486	0	0	27	1527	0	0	294	0	0	329	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		56.0		22.0	22.0	78.0		36.0	36.0		36.0	36.0		36.0
Total Lost Time (s)		6.0			6.0	6.0			6.0			6.0		
Act Effct Green (s)		64.0			8.2	72.4			30.2			30.2		
Actuated g/C Ratio		0.54			0.07	0.61			0.25			0.25		
v/c Ratio		0.62			0.26	0.51			1.17			1.05		
Control Delay		22.9			61.8	14.9			149.8			108.5		
Queue Delay		0.2			0.0	0.3			0.0			0.0		
Total Delay		23.1			61.8	15.2			149.8			108.5		
LOS		C			E	B			F			F		
Approach Delay		23.1				16.0			149.8			108.5		
Approach LOS		C				B			F			F		
Queue Length 50th (ft)		283			20	202			~274			~272		
Queue Length 95th (ft)		489			48	386			#442			#610		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		2404			204	3000			252			313		
Starvation Cap Reductn		224			0	771			0			0		
Spillback Cap Reductn		0			0	0			0			0		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		0.68			0.13	0.69			1.17			1.05		

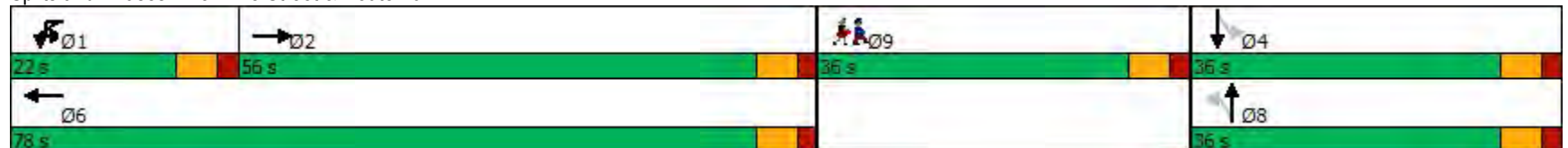
Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 118.8  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.17  
 Intersection Signal Delay: 37.9  
 Intersection Capacity Utilization 57.5%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service B

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Vine Street & Route 16





	→	↘	↙	←	↖	↗	↘	↙
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø9
Lane Configurations	↑↑↑			↔	↑↑↑	↔		
Traffic Volume (vph)	1363	2	20	7	1253	171	0	
Future Volume (vph)	1363	2	20	7	1253	171	0	
Satd. Flow (prot)	4468	0	0	1504	4964	1770	0	
Flt Permitted				0.900		0.950		
Satd. Flow (perm)	4468	0	0	1504	4964	1758	0	
Satd. Flow (RTOR)								
Lane Group Flow (vph)	1452	0	0	43	1408	184	0	
Turn Type	NA		Prot	Prot	NA	Perm		
Protected Phases	2		1	1	6			9
Permitted Phases						8		
Total Split (s)	55.0		16.0	16.0	71.0	30.0		34.0
Total Lost Time (s)	5.0			5.0	5.0	5.0		
Act Effct Green (s)	33.3			8.5	40.0	14.6		
Actuated g/C Ratio	0.48			0.12	0.57	0.21		
v/c Ratio	0.68			0.24	0.49	0.50		
Control Delay	19.2			42.8	10.3	36.3		
Queue Delay	0.0			0.0	0.0	0.0		
Total Delay	19.2			42.8	10.3	36.3		
LOS	B			D	B	D		
Approach Delay	19.2				11.3	36.3		
Approach LOS	B				B	D		
Queue Length 50th (ft)	160			17	86	67		
Queue Length 95th (ft)	445			54	306	215		
Internal Link Dist (ft)	521				488	647		
Turn Bay Length (ft)				150				
Base Capacity (vph)	3410			288	4366	766		
Starvation Cap Reductn	12			0	0	0		
Spillback Cap Reductn	0			0	0	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.43			0.15	0.32	0.24		

Intersection Summary

Cycle Length: 135  
 Actuated Cycle Length: 69.6  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 16.5  
 Intersection Capacity Utilization 44.2%  
 Analysis Period (min) 15  
 Description: Note: Splits and offsets need to be optimized via synchro due to lack of coordination data

Splits and Phases: 6: Vale Street & Route 16



	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖		↖	↖		
Traffic Volume (vph)	175	1153	176	56	1095	12	178	145	49	74	168	79	
Future Volume (vph)	175	1153	176	56	1095	12	178	145	49	74	168	79	
Satd. Flow (prot)	1728	4844	0	1711	4951	0	1745	1759	0	1728	1717	0	
Flt Permitted	0.950			0.950			0.436			0.496			
Satd. Flow (perm)	1728	4844	0	1707	4951	0	794	1759	0	899	1717	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	208	1444	0	102	1216	0	205	237	0	96	278	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	17.0	52.0		15.0	50.0		40.0	40.0		40.0	40.0		33.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5		
Act Effct Green (s)	12.2	44.5		9.7	42.0		35.1	35.1		35.1	35.1		
Actuated g/C Ratio	0.11	0.40		0.09	0.38		0.32	0.32		0.32	0.32		
v/c Ratio	1.09	0.74		0.68	0.65		0.81	0.42		0.34	0.51		
Control Delay	138.5	31.8		74.0	31.1		62.5	35.7		37.4	37.7		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	138.5	31.8		74.0	31.1		62.5	35.7		37.4	37.7		
LOS	F	C		E	C		E	D		D	D		
Approach Delay		45.3			34.4			48.2			37.6		
Approach LOS		D			C			D			D		
Queue Length 50th (ft)	~160	278		69	229		128	126		50	153		
Queue Length 95th (ft)	#385	518		93	423		#348	249		112	327		
Internal Link Dist (ft)		406			387			396			538		
Turn Bay Length (ft)	150			100			100			100			
Base Capacity (vph)	191	2100		157	2055		252	560		285	546		
Starvation Cap Reductn	0	0		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	1.09	0.69		0.65	0.59		0.81	0.42		0.34	0.51		

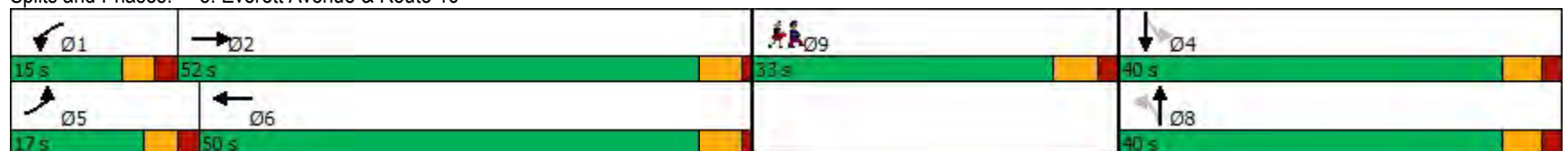
Intersection Summary

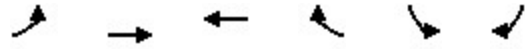
Cycle Length: 140  
 Actuated Cycle Length: 110.3  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 41.1  
 Intersection Capacity Utilization 72.5%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service C

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Everett Avenue & Route 16



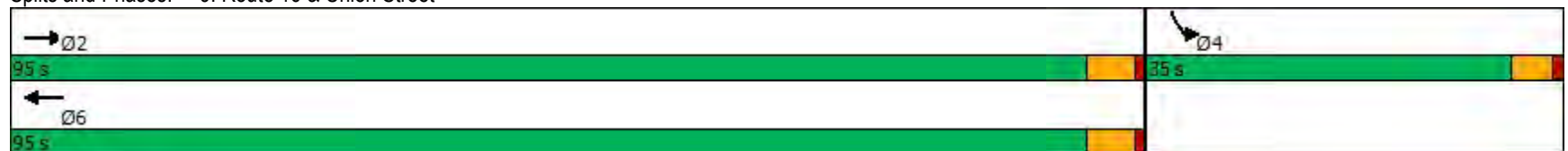


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↑	
Traffic Volume (vph)	0	1277	1199	183	153	4
Future Volume (vph)	0	1277	1199	183	153	4
Satd. Flow (prot)	0	4964	4858	0	1790	0
Flt Permitted					0.954	
Satd. Flow (perm)	0	4964	4858	0	1790	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	1316	1486	0	201	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		95.0	95.0		35.0	
Total Lost Time (s)		5.0	5.0		4.5	
Act Effct Green (s)		19.7	19.7		9.7	
Actuated g/C Ratio		0.50	0.50		0.25	
v/c Ratio		0.53	0.61		0.45	
Control Delay		7.4	8.2		17.5	
Queue Delay		0.0	0.0		0.0	
Total Delay		7.4	8.2		17.5	
LOS		A	A		B	
Approach Delay		7.4	8.2		17.5	
Approach LOS		A	A		B	
Queue Length 50th (ft)		57	68		35	
Queue Length 95th (ft)		103	123		82	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		4964	4858		1432	
Starvation Cap Reductn		0	25		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.27	0.31		0.14	

Intersection Summary

Cycle Length: 130	
Actuated Cycle Length: 39.1	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 43.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Route 16 & Union Street

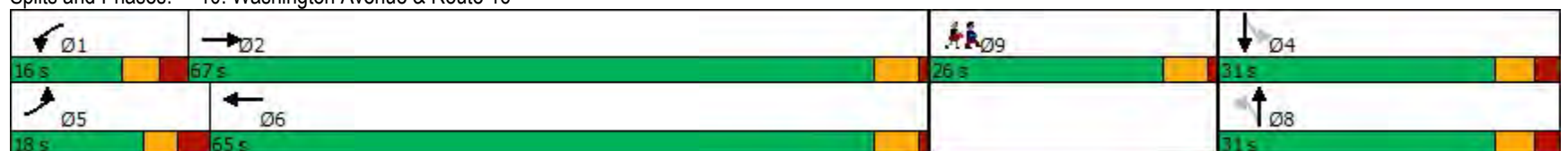


																Ø9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9			
Lane Configurations																
Traffic Volume (vph)	205	1077	148	102	1164	36	100	116	44	49	154	118				
Future Volume (vph)	205	1077	148	102	1164	36	100	116	44	49	154	118				
Satd. Flow (prot)	1745	4863	0	1745	4941	0	1752	1772	0	1770	1723	0				
Flt Permitted	0.950			0.950			*0.450			0.497						
Satd. Flow (perm)	1727	4863	0	1745	4941	0	819	1772	0	919	1723	0				
Satd. Flow (RTOR)																
Lane Group Flow (vph)	223	1361	0	134	1237	0	128	225	0	56	323	0				
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA					
Protected Phases	5	2		1	6			8			4					9
Permitted Phases							8			4						
Total Split (s)	18.0	67.0		16.0	65.0		31.0	31.0		31.0	31.0					26.0
Total Lost Time (s)	6.0	5.0		6.0	5.0		6.0	6.0		6.0	6.0					
Act Effct Green (s)	12.4	42.4		10.3	40.3		25.8	25.8		25.8	25.8					
Actuated g/C Ratio	0.12	0.43		0.10	0.41		0.26	0.26		0.26	0.26					
v/c Ratio	1.03	0.66		0.74	0.62		0.60	0.49		0.24	0.72					
Control Delay	113.7	24.5		70.7	24.9		50.5	39.8		38.9	47.0					
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0		0.0	0.0					
Total Delay	113.7	24.6		70.7	24.9		50.5	39.8		38.9	47.0					
LOS	F	C		E	C		D	D		D	D					
Approach Delay		37.2			29.4			43.7			45.8					
Approach LOS		D			C			D			D					
Queue Length 50th (ft)	133	221		77	201		65	110		26	170					
Queue Length 95th (ft)	#439	382		#208	346		#183	213		87	#447					
Internal Link Dist (ft)		319			1066			414			597					
Turn Bay Length (ft)	100			150			150			150						
Base Capacity (vph)	217	3130		181	3078		212	460		238	447					
Starvation Cap Reductn	0	630		0	0		0	0		0	0					
Spillback Cap Reductn	0	0		0	0		0	0		0	0					
Storage Cap Reductn	0	0		0	0		0	0		0	0					
Reduced v/c Ratio	1.03	0.54		0.74	0.40		0.60	0.49		0.24	0.72					

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 99.4  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 35.8  
 Intersection Capacity Utilization 78.0%  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16



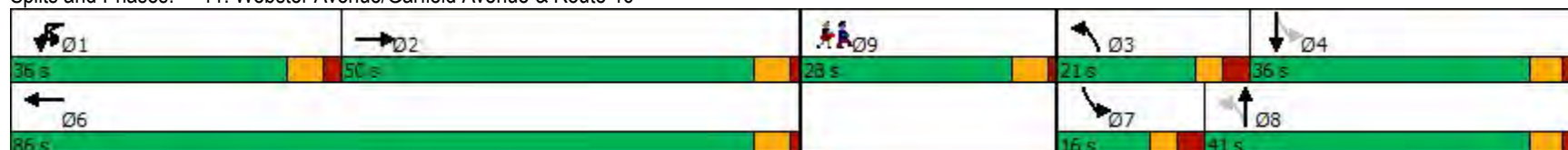


	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑		↑	↑		↑	↑		
Traffic Volume (vph)	0	1120	145	177	132	1169	23	250	216	185	175	159	170	
Future Volume (vph)	0	1120	145	177	132	1169	23	250	216	185	175	159	170	
Satd. Flow (prot)	0	4886	0	0	1685	4778	0	1787	1898	0	1787	1892	0	
Flt Permitted					0.950			*0.600			*0.600			
Satd. Flow (perm)	0	4886	0	0	1678	4778	0	1126	1898	0	1118	1892	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1291	0	0	344	1282	0	272	446	0	199	374	0	
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA		
Protected Phases		2		1	1	6		3	8		7	4		9
Permitted Phases								8			4			
Total Split (s)		50.0		36.0	36.0	86.0		21.0	41.0		16.0	36.0		28.0
Total Lost Time (s)		5.0			6.0	5.0		6.0	5.5		6.0	5.5		
Act Effct Green (s)		45.2			30.2	81.4		50.3	35.7		40.2	30.7		
Actuated g/C Ratio		0.30			0.20	0.53		0.33	0.23		0.26	0.20		
v/c Ratio		0.89			1.03	0.50		0.62	1.00		0.59	0.98		
Control Delay		60.1			115.8	24.5		49.4	100.5		51.2	101.5		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		60.1			115.8	24.5		49.4	100.5		51.2	101.5		
LOS		E			F	C		D	F		D	F		
Approach Delay		60.1				43.8			81.1			84.0		
Approach LOS		E				D			F			F		
Queue Length 50th (ft)		410			321	249		192	411		134	345		
Queue Length 95th (ft)		#615			#641	397		339	#774		241	#642		
Internal Link Dist (ft)		409				879			820			473		
Turn Bay Length (ft)					100			150			100			
Base Capacity (vph)		1452			333	2556		437	445		339	381		
Starvation Cap Reductn		0			0	0		0	0		0	0		
Spillback Cap Reductn		0			0	0		0	0		0	0		
Storage Cap Reductn		0			0	0		0	0		0	0		
Reduced v/c Ratio		0.89			1.03	0.50		0.62	1.00		0.59	0.98		

Intersection Summary

Cycle Length: 171  
 Actuated Cycle Length: 152.2  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 60.7  
 Intersection Capacity Utilization 93.8%  
 Analysis Period (min) 15  
 Description: Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16



Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	96.3	111.9	0.12	3.7	F
Second Street	III	35	18.3	87.6	105.9	0.14	4.9	F
Spring Street	III	35	12.6	28.8	41.4	0.09	8.1	F
Dunkin Donuts Lot	III	35	16.1	1.3	17.4	0.12	24.7	B
Vine Street	III	35	14.9	32.7	47.6	0.11	8.4	F
Vale Street	III	35	15.4	9.5	24.9	0.11	16.5	D
Everett Avenue	III	35	24.0	40.9	64.9	0.20	11.1	E
Union Street	III	35	32.0	4.7	36.7	0.27	26.1	B
Washington Avenue	III	35	10.2	32.1	42.3	0.08	6.4	F
Webster Avenue	III	35	37.2	61.4	98.6	0.31	11.3	E
Total	III		196.3	395.3	591.6	1.55	9.4	F

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	35.9	57.7	0.18	11.3	E
Washington Avenue	III	35	37.2	30.3	67.5	0.31	16.5	D
Union Street	III	35	10.2	6.0	16.2	0.08	16.8	D
Everett Avenue	III	35	32.0	49.3	81.3	0.27	11.8	E
Vale Street	III	35	24.0	8.5	32.5	0.20	22.1	C
Vine Street	III	35	15.4	25.6	41.0	0.11	10.0	F
South Ferry Street	III	35	14.9	29.7	44.6	0.11	8.9	F
Spring Street	III	35	16.1	54.7	70.8	0.12	6.1	F
Second Street	III	35	12.6	111.3	123.9	0.09	2.7	F
Lewis Street	III	35	18.3	45.3	63.6	0.14	8.1	F
Total	III		202.5	396.6	599.1	1.61	9.7	F

Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	111.8	127.4	0.12	3.3	F
Second Street	III	35	18.3	188.0	206.3	0.14	2.5	F
Spring Street	III	35	12.6	8.9	21.5	0.09	15.6	D
Dunkin Donuts Lot	III	35	16.1	2.4	18.5	0.12	23.2	C
Vine Street	III	35	14.9	120.9	135.8	0.11	2.9	F
Vale Street	III	35	15.4	10.0	25.4	0.11	16.1	D
Everett Avenue	III	35	24.0	36.7	60.7	0.20	11.8	E
Union Street	III	35	32.0	4.6	36.6	0.27	26.2	B
Washington Avenue	III	35	10.2	42.0	52.2	0.08	5.2	F
Webster Avenue	III	35	37.2	102.4	139.6	0.31	8.0	F
<b>Total</b>	<b>III</b>		<b>196.3</b>	<b>627.7</b>	<b>824.0</b>	<b>1.55</b>	<b>6.8</b>	<b>F</b>

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	24.6	46.4	0.18	14.1	D
Washington Avenue	III	35	37.2	44.1	81.3	0.31	13.7	E
Union Street	III	35	10.2	4.6	14.8	0.08	18.4	C
Everett Avenue	III	35	32.0	44.2	76.2	0.27	12.6	E
Vale Street	III	35	24.0	17.9	41.9	0.20	17.2	D
Vine Street	III	35	15.4	48.9	64.3	0.11	6.4	F
South Ferry Street	III	35	14.9	20.6	35.5	0.11	11.2	E
Spring Street	III	35	16.1	54.7	70.8	0.12	6.1	F
Second Street	III	35	12.6	37.4	50.0	0.09	6.7	F
Lewis Street	III	35	18.3	23.6	41.9	0.14	12.3	E
<b>Total</b>	<b>III</b>		<b>202.5</b>	<b>320.6</b>	<b>523.1</b>	<b>1.61</b>	<b>11.1</b>	<b>E</b>

Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	61.3	76.9	0.12	5.4	F
Second Street	III	35	18.3	35.6	53.9	0.14	9.6	F
Spring Street	III	35	12.6	21.9	34.5	0.09	9.7	F
Dunkin Donuts Lot	III	35	16.1	0.4	16.5	0.12	26.0	B
Vine Street	III	35	14.9	27.7	42.6	0.11	9.3	F
Vale Street	III	35	15.4	18.4	33.8	0.11	12.1	E
Everett Avenue	III	35	24.0	32.1	56.1	0.20	12.8	E
Union Street	III	35	32.0	7.3	39.3	0.27	24.4	B
Washington Avenue	III	35	10.2	25.1	35.3	0.08	7.7	F
Webster Avenue	III	35	37.2	98.4	135.6	0.31	8.2	F
Total	III		196.3	328.2	524.5	1.55	10.6	E

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	25.6	47.4	0.18	13.8	E
Washington Avenue	III	35	37.2	25.5	62.7	0.31	17.8	D
Union Street	III	35	10.2	8.4	18.6	0.08	14.6	D
Everett Avenue	III	35	32.0	33.5	65.5	0.27	14.6	D
Vale Street	III	32	25.4	10.4	35.8	0.20	20.1	C
Vine Street	III	35	15.4	15.9	31.3	0.11	13.1	E
South Ferry Street	III	35	14.9	17.5	32.4	0.11	12.3	E
Spring Street	III	35	16.1	25.2	41.3	0.12	10.4	E
Second Street	III	35	12.6	26.5	39.1	0.09	8.6	F
Lewis Street	III	35	18.3	30.3	48.6	0.14	10.6	E
Total	III		203.9	218.8	422.7	1.61	13.7	E



Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	21.6	37.2	0.12	11.2	E
Second Street	III	35	18.3	30.0	48.3	0.14	10.7	E
Spring Street	III	35	12.6	20.8	33.4	0.09	10.0	E
Dunkin Donuts Lot	III	35	16.1	0.3	16.4	0.12	26.2	B
Vine Street	III	35	14.9	22.9	37.8	0.11	10.5	E
Vale Street	III	35	15.4	19.2	34.6	0.11	11.8	E
Everett Avenue	III	35	24.0	31.8	55.8	0.20	12.9	E
Union Street	III	35	32.0	7.4	39.4	0.27	24.3	B
Washington Avenue	III	35	10.2	24.5	34.7	0.08	7.8	F
Webster Avenue	III	35	37.2	60.1	97.3	0.31	11.5	E
Total	III		196.3	238.6	434.9	1.55	12.8	E

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	24.5	46.3	0.18	14.1	D
Washington Avenue	III	35	37.2	24.9	62.1	0.31	18.0	D
Union Street	III	35	10.2	8.2	18.4	0.08	14.8	D
Everett Avenue	III	35	32.0	31.1	63.1	0.27	15.2	D
Vale Street	III	32	25.4	10.3	35.7	0.20	20.1	C
Vine Street	III	35	15.4	14.9	30.3	0.11	13.5	E
South Ferry Street	III	35	14.9	16.6	31.5	0.11	12.6	E
Spring Street	III	35	16.1	21.5	37.6	0.12	11.4	E
Second Street	III	35	12.6	21.7	34.3	0.09	9.8	F
Lewis Street	III	35	18.3	21.0	39.3	0.14	13.1	E
Total	III		203.9	194.7	398.6	1.61	14.6	D

## **Part 2 -Short- and Medium-Term Improvements**

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	0	1584	8	0	2047	6	23	10	12	19	18	36	
Future Volume (vph)	0	1584	8	0	2047	6	23	10	12	19	18	36	
Satd. Flow (prot)	0	2021	0	0	2772	0	0	1709	0	0	1691	0	
Flt Permitted								0.761			0.914		
Satd. Flow (perm)	0	2021	0	0	2772	0	0	1319	0	0	1566	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	1712	0	0	2232	0	0	55	0	0	97	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		71.0			71.0		22.0	22.0		22.0	22.0		37.0
Total Lost Time (s)		6.0			6.0			5.5			5.5		
Act Effct Green (s)		98.9			98.9			15.2			15.2		
Actuated g/C Ratio		0.76			0.76			0.12			0.12		
v/c Ratio		1.11			1.06			0.36			0.53		
Control Delay		79.2			54.9			58.0			63.7		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		79.2			54.9			58.0			63.7		
LOS		E			D			E			E		
Approach Delay		79.2			54.9			58.0			63.7		
Approach LOS		E			D			E			E		
Queue Length 50th (ft)		~583			~654			43			78		
Queue Length 95th (ft)		#815			#1004			76			108		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		1536			2107			177			210		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.11			1.06			0.31			0.46		


Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 65.5 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.11  
 Intersection Signal Delay: 65.3  
 Intersection Capacity Utilization 63.4%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service B

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Lewis Street & Route 16



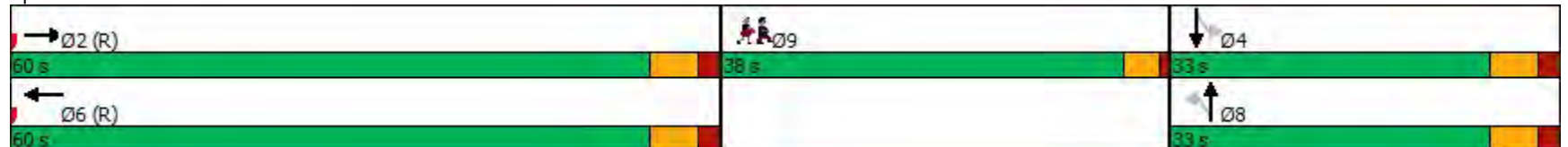


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↑			↑		
Traffic Volume (vph)	0	1187	428	0	1790	92	178	37	3	28	56	73	
Future Volume (vph)	0	1187	428	0	1790	92	178	37	3	28	56	73	
Satd. Flow (prot)	0	4275	0	0	4997	0	0	826	0	0	1718	0	
Flt Permitted								0.618			0.919		
Satd. Flow (perm)	0	4275	0	0	4997	0	0	638	0	0	1590	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	1700	0	0	2139	0	0	273	0	0	200	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		60.0			60.0		33.0	33.0		33.0	33.0		38.0
Total Lost Time (s)		6.0			6.0			6.0			6.0		
Act Effct Green (s)		54.0			54.0			60.6			60.6		
Actuated g/C Ratio		0.41			0.41			0.46			0.46		
v/c Ratio		0.96			1.04			0.93			0.27		
Control Delay		52.3			68.5			71.5			24.9		
Queue Delay		0.0			25.5			0.0			0.0		
Total Delay		52.3			94.0			71.5			24.9		
LOS		D			F			E			C		
Approach Delay		52.3			94.0			71.5			24.9		
Approach LOS		D			F			E			C		
Queue Length 50th (ft)		509			~716			248			95		
Queue Length 95th (ft)		#626			#777			#538			159		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)													
Base Capacity (vph)		1762			2059			295			735		
Starvation Cap Reductn		0			408			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.96			1.30			0.93			0.27		

Intersection Summary

Cycle Length: 131  
 Actuated Cycle Length: 131  
 Offset: 80 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.04  
 Intersection Signal Delay: 73.0 Intersection LOS: E  
 Intersection Capacity Utilization 72.7% ICU Level of Service C  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Second Street & Route 16





Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations															
Traffic Volume (vph)	10	55	1139	8	19	13	1675	23	34	18	29	37	42	163	
Future Volume (vph)	10	55	1139	8	19	13	1675	23	34	18	29	37	42	163	
Satd. Flow (prot)	0	1405	4844	0	0	1347	4856	0	0	1316	0	0	1372	0	
Flt Permitted		0.950				0.950				0.792			*0.810		
Satd. Flow (perm)	0	1404	4844	0	0	1342	4856	0	0	1158	0	0	1234	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	78	1382	0	0	37	1951	0	0	100	0	0	244	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	20.0	20.0	51.0		15.0	15.0	46.0		26.0	26.0		26.0	26.0		38.0
Total Lost Time (s)		5.0	5.0				5.0			6.0			6.0		
Act Effct Green (s)		13.6	62.1				8.5			43.8			43.8		
Actuated g/C Ratio		0.10	0.48				0.07			0.34			0.34		
v/c Ratio		0.53	0.60				0.42			0.26			0.59		
Control Delay		68.1	27.4				72.5			36.4			44.9		
Queue Delay		0.0	0.9				0.0			0.0			0.0		
Total Delay		68.1	28.3				72.5			36.4			44.9		
LOS		E	C				E			D			D		
Approach Delay			30.5				35.5			36.4			44.9		
Approach LOS			C				D			D			D		
Queue Length 50th (ft)		69	292				36			70			193		
Queue Length 95th (ft)		117	396				m50			121			#350		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150					225								
Base Capacity (vph)		162	2314				103			389			415		
Starvation Cap Reductn		0	597				0			0			0		
Spillback Cap Reductn		0	0				0			0			0		
Storage Cap Reductn		0	0				0			0			0		
Reduced v/c Ratio		0.48	0.80				0.36			0.26			0.59		

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 92.5 (71%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 34.2  
 Intersection Capacity Utilization 67.9%  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Spring Street & Route 16



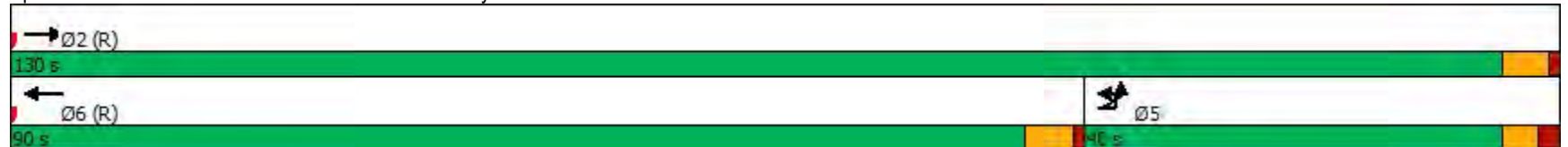
	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↑↑↑			↑↑↑				↗			
Traffic Volume (vph)	15	126	977	0	0	1591	128	0	0	92	0	0	0
Future Volume (vph)	15	126	977	0	0	1591	128	0	0	92	0	0	0
Satd. Flow (prot)	0	1121	3409	0	0	3415	0	0	0	1406	0	0	0
Flt Permitted		0.800											
Satd. Flow (perm)	0	1120	4262	0	0	3415	0	0	0	1406	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	166	1149	0	0	1810	0	0	0	184	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	40.0	40.0	130.0			90.0				130.0			
Total Lost Time (s)		5.0	5.0			5.0				5.0			
Act Effct Green (s)		24.9	130.0			95.1				130.0			
Actuated g/C Ratio		0.19	1.00			0.73				1.00			
v/c Ratio		0.78	0.34			0.72				0.13			
Control Delay		43.9	1.5			18.4				0.2			
Queue Delay		0.0	0.0			0.0				0.0			
Total Delay		43.9	1.5			18.4				0.2			
LOS		D	A			B				A			
Approach Delay			6.9			18.4			0.2				
Approach LOS			A			B			A				
Queue Length 50th (ft)		172	23			227				0			
Queue Length 95th (ft)		108	0			280				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		301	3409			2499				1406			
Starvation Cap Reductn		0	0			0				0			
Spillback Cap Reductn		0	0			0				0			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		0.55	0.34			0.72				0.13			

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 25.5 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 12.8  
 Intersection Capacity Utilization 49.8%  
 Analysis Period (min) 15

Intersection LOS: B  
ICU Level of Service A

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16

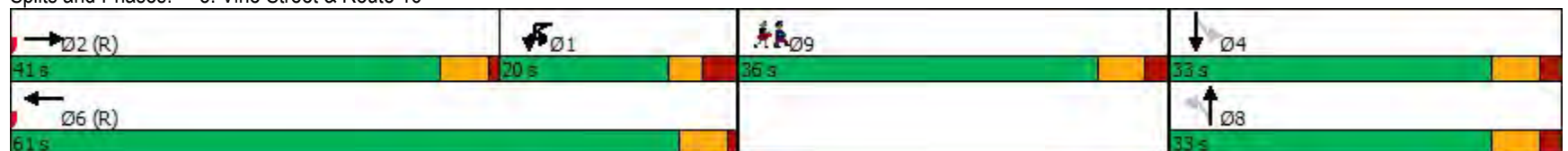


	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙		
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↔	↑↑↑			↔			↔		
Traffic Volume (vph)	0	970	99	1	38	1486	22	52	53	28	41	170	181	
Future Volume (vph)	0	970	99	1	38	1486	22	52	53	28	41	170	181	
Satd. Flow (prot)	0	4159	0	0	1301	4852	0	0	1166	0	0	1224	0	
Flt Permitted					0.900				0.580			0.940		
Satd. Flow (perm)	0	4159	0	0	1280	4852	0	0	750	0	0	1277	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1125	0	0	41	1587	0	0	180	0	0	516	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		41.0		20.0	20.0	61.0		33.0	33.0		33.0	33.0		36.0
Total Lost Time (s)		5.0			6.0	5.0			6.0			6.0		
Act Effct Green (s)		40.0			12.8	56.0			58.2			58.2		
Actuated g/C Ratio		0.31			0.10	0.43			0.45			0.45		
v/c Ratio		0.88			0.32	0.76			0.54			0.90		
Control Delay		72.1			72.4	51.8			36.2			54.5		
Queue Delay		0.0			0.0	0.2			0.0			0.0		
Total Delay		72.1			72.4	52.0			36.2			54.5		
LOS		E			E	D			D			D		
Approach Delay		72.1				52.6			36.2			54.5		
Approach LOS		E				D			D			D		
Queue Length 50th (ft)		366			40	522			125			458		
Queue Length 95th (ft)		#459			m83	295			228			#767		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		1279			140	2090			335			571		
Starvation Cap Reductn		0			0	83			0			0		
Spillback Cap Reductn		0			0	0			0			0		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		0.88			0.29	0.79			0.54			0.90		

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 57.5 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 58.4  
 Intersection Capacity Utilization 65.1%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Vine Street & Route 16

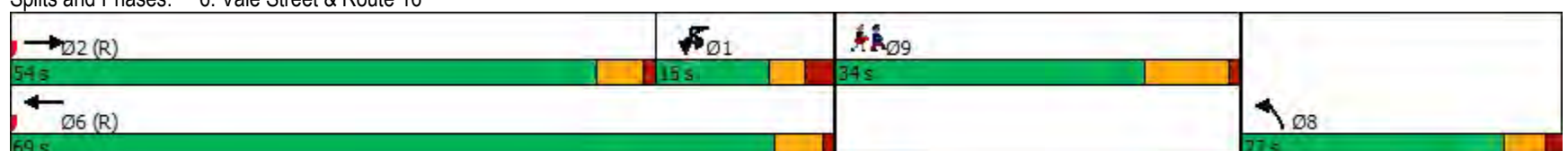


	→	↘	↙	←	↖	↗	↘	↙
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø9
Lane Configurations	↑↑↑			↘	↑↑↑	↘		
Traffic Volume (vph)	921	134	3	5	1425	117	2	
Future Volume (vph)	921	134	3	5	1425	117	2	
Satd. Flow (prot)	4178	0	0	1504	4868	1720	0	
Flt Permitted				0.900		0.953		
Satd. Flow (perm)	4178	0	0	1486	4868	1711	0	
Satd. Flow (RTOR)								
Lane Group Flow (vph)	1159	0	0	8	1566	151	0	
Turn Type	NA		Prot	Prot	NA	Prot		
Protected Phases	2		1	1	6	8		9
Permitted Phases								
Total Split (s)	54.0		15.0	15.0	69.0	27.0		34.0
Total Lost Time (s)	5.0			5.5	5.0	5.0		
Act Effct Green (s)	96.1			6.7	99.1	15.7		
Actuated g/C Ratio	0.74			0.05	0.76	0.12		
v/c Ratio	0.38			0.10	0.42	0.73		
Control Delay	1.6			56.7	10.8	74.2		
Queue Delay	0.0			0.0	0.0	0.0		
Total Delay	1.6			56.7	10.8	74.2		
LOS	A			E	B	E		
Approach Delay	1.6				11.1	74.2		
Approach LOS	A				B	E		
Queue Length 50th (ft)	16			5	127	125		
Queue Length 95th (ft)	m43			m6	m261	163		
Internal Link Dist (ft)	521				488	647		
Turn Bay Length (ft)				150				
Base Capacity (vph)	3088			109	3710	291		
Starvation Cap Reductn	0			0	0	0		
Spillback Cap Reductn	0			0	67	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.38			0.07	0.43	0.52		

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 72.5 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 10.6 Intersection LOS: B  
 Intersection Capacity Utilization 42.5% ICU Level of Service A  
 Analysis Period (min) 15  
 Description: Note: Splits and offsets need to be optimized via synchro due to lack of coordination data  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Vale Street & Route 16





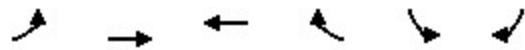
	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖		↖	↖		
Traffic Volume (vph)	73	745	146	76	1387	8	126	76	34	71	221	51	
Future Volume (vph)	73	745	146	76	1387	8	126	76	34	71	221	51	
Satd. Flow (prot)	1694	4453	0	1631	4808	0	1711	1606	0	1678	1736	0	
Flt Permitted	0.950			0.950			0.433			0.671			
Satd. Flow (perm)	1694	4453	0	1619	4808	0	776	1606	0	1181	1736	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	97	1048	0	107	1453	0	152	133	0	100	340	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	13.2	36.5		20.5	43.8		40.0	40.0		40.0	40.0		33.0
Total Lost Time (s)	5.5	5.0		5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)	12.3	40.3		15.0	42.9		53.4	53.4		53.4	53.4		
Actuated g/C Ratio	0.09	0.31		0.12	0.33		0.41	0.41		0.41	0.41		
v/c Ratio	0.61	0.76		0.57	0.91		0.48	0.20		0.21	0.48		
Control Delay	97.6	20.1		50.7	71.5		36.4	27.3		28.1	32.3		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	97.6	20.1		50.7	71.5		36.4	27.3		28.1	32.3		
LOS	F	C		D	E		D	C		C	C		
Approach Delay		26.6			70.1			32.2			31.3		
Approach LOS		C			E			C			C		
Queue Length 50th (ft)	86	60		92	479		93	72		54	209		
Queue Length 95th (ft)	#150	#385		126	#587		167	123		84	292		
Internal Link Dist (ft)		406			387			396			538		
Turn Bay Length (ft)	150			100			100			100			
Base Capacity (vph)	160	1379		188	1588		318	660		485	713		
Starvation Cap Reductn	0	0		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.61	0.76		0.57	0.91		0.48	0.20		0.21	0.48		

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 100.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 47.5 Intersection LOS: D  
 Intersection Capacity Utilization 73.7% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Everett Avenue & Route 16



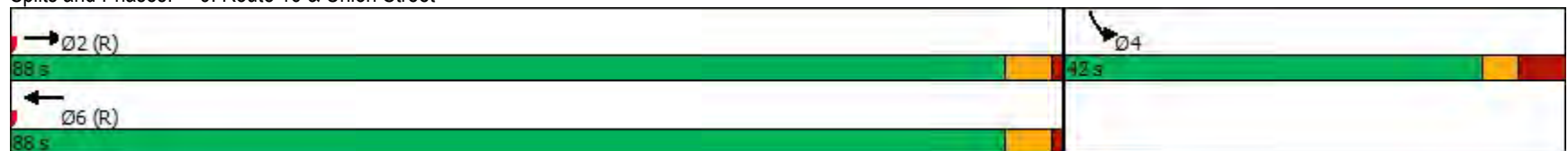


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↑	
Traffic Volume (vph)	0	852	1487	182	175	12
Future Volume (vph)	0	852	1487	182	175	12
Satd. Flow (prot)	0	4600	4703	0	1761	0
Flt Permitted					0.955	
Satd. Flow (perm)	0	4600	4703	0	1761	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	979	1721	0	205	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		88.0	88.0		42.0	
Total Lost Time (s)		5.0	5.0		7.0	
Act Effct Green (s)		98.4	98.4		19.6	
Actuated g/C Ratio		0.76	0.76		0.15	
v/c Ratio		0.28	0.48		0.77	
Control Delay		0.6	1.9		71.7	
Queue Delay		0.0	0.3		0.0	
Total Delay		0.6	2.3		71.7	
LOS		A	A		E	
Approach Delay		0.6	2.3		71.7	
Approach LOS		A	A		E	
Queue Length 50th (ft)		4	12		168	
Queue Length 95th (ft)		10	81		240	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3481	3559		474	
Starvation Cap Reductn		0	1079		0	
Spillback Cap Reductn		56	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.29	0.69		0.43	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 121.5 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 6.6  
 Intersection Capacity Utilization 53.2%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 9: Route 16 & Union Street

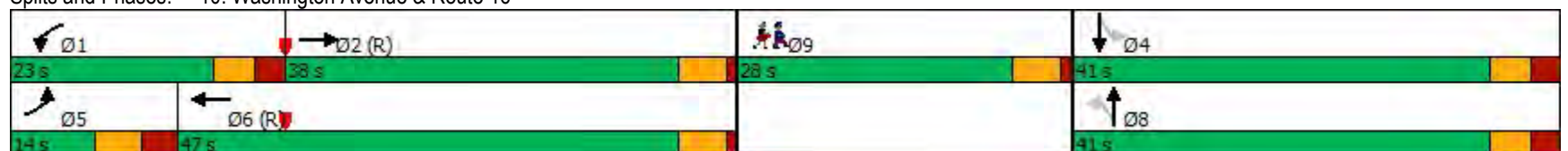


	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	∅9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	∅9
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖		↖	↖		
Traffic Volume (vph)	80	769	178	179	1429	33	136	89	19	57	190	104	
Future Volume (vph)	80	769	178	179	1429	33	136	89	19	57	190	104	
Satd. Flow (prot)	1694	4510	0	1662	4742	0	1719	1659	0	1736	1650	0	
Flt Permitted	0.950			0.950			0.406			0.669			
Satd. Flow (perm)	1685	4510	0	1662	4742	0	725	1659	0	1194	1650	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	98	1041	0	218	1539	0	160	127	0	72	323	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	14.0	38.0		23.0	47.0		41.0	41.0		41.0	41.0		28.0
Total Lost Time (s)	7.0	5.0		6.0	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)	13.1	40.6		23.0	49.4		44.8	44.8		44.8	44.8		
Actuated g/C Ratio	0.10	0.31		0.18	0.38		0.34	0.34		0.34	0.34		
v/c Ratio	0.57	0.74		0.74	0.85		0.64	0.22		0.18	0.57		
Control Delay	79.6	21.7		66.6	43.1		49.8	31.9		31.6	39.7		
Queue Delay	0.0	1.1		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	79.6	22.8		66.6	43.1		49.8	31.9		31.6	39.7		
LOS	E	C		E	D		D	C		C	D		
Approach Delay		27.7			46.0			41.8			38.2		
Approach LOS		C			D			D			D		
Queue Length 50th (ft)	78	178		173	426		110	73		41	214		
Queue Length 95th (ft)	#190	#263		#307	#593		#206	126		74	341		
Internal Link Dist (ft)		319			1066			414			597		
Turn Bay Length (ft)	100			150			150			150			
Base Capacity (vph)	171	1407		294	1803		250	572		411	568		
Starvation Cap Reductn	0	162		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.57	0.84		0.74	0.85		0.64	0.22		0.18	0.57		

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 39.0  
 Intersection Capacity Utilization 79.9%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16



														Ø9
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↔	↑↑↑		↔	↑		↔	↑		
Traffic Volume (vph)	0	748	113	136	203	1752	1	218	122	168	214	167	233	
Future Volume (vph)	0	748	113	136	203	1752	1	218	122	168	214	167	233	
Satd. Flow (prot)	0	4566	0	0	1661	4700	0	1641	1803	0	1770	1856	0	
Flt Permitted					0.950			*0.600			*0.600			
Satd. Flow (perm)	0	4566	0	0	1657	4700	0	1036	1803	0	1112	1856	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	978	0	0	414	1885	0	248	354	0	252	460	0	
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA		
Protected Phases		2		1	1	6		3	8		7	4		9
Permitted Phases								8			4			
Total Split (s)		34.0		34.0	34.0	68.0		15.0	33.0		15.0	33.0		34.0
Total Lost Time (s)		5.5			6.0	5.5		6.0	6.0		6.0	6.0		
Act Effct Green (s)		28.6			28.1	62.8		36.2	27.1		36.2	27.1		
Actuated g/C Ratio		0.24			0.23	0.52		0.30	0.22		0.30	0.22		
v/c Ratio		0.90			1.07	0.77		0.70	0.87		0.66	1.10		
Control Delay		57.1			110.0	26.9		45.9	68.2		43.1	118.0		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		57.1			110.0	26.9		45.9	68.2		43.1	118.0		
LOS		E			F	C		D	E		D	F		
Approach Delay		57.1				41.9			59.0			91.5		
Approach LOS		E				D			E			F		
Queue Length 50th (ft)		258			~332	380		138	254		139	~380		
Queue Length 95th (ft)		#427			#585	637		#295	#459		254	#707		
Internal Link Dist (ft)		409				879			820			473		
Turn Bay Length (ft)					100			150			100			
Base Capacity (vph)		1084			387	2448		356	405		383	418		
Starvation Cap Reductn		0			0	0		0	0		0	0		
Spillback Cap Reductn		0			0	0		0	0		0	0		
Storage Cap Reductn		0			0	0		0	0		0	0		
Reduced v/c Ratio		0.90			1.07	0.77		0.70	0.87		0.66	1.10		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 120.6  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.10  
 Intersection Signal Delay: 55.1  
 Intersection Capacity Utilization 90.5%  
 Analysis Period (min) 15  
 Description: Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16





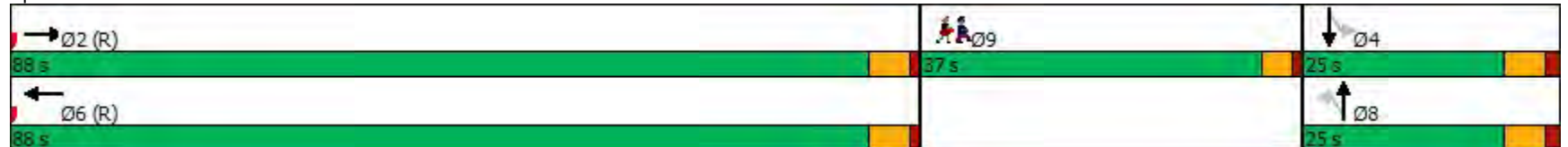
	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	2426	29	0	2154	5	22	14	9	9	14	27	
Future Volume (vph)	0	2426	29	0	2154	5	22	14	9	9	14	27	
Satd. Flow (prot)	0	2863	0	0	2891	0	0	1614	0	0	1523	0	
Flt Permitted								0.811			0.945		
Satd. Flow (perm)	0	2863	0	0	2891	0	0	1439	0	0	1595	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2612	0	0	2272	0	0	64	0	0	57	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		88.0			88.0		25.0	25.0		25.0	25.0		37.0
Total Lost Time (s)		5.0			5.0			5.5			5.5		
Act Effct Green (s)		121.0			121.0			13.6			13.5		
Actuated g/C Ratio		0.81			0.81			0.09			0.09		
v/c Ratio		1.13			0.97			0.49			0.40		
Control Delay		83.9			28.5			76.9			71.4		
Queue Delay		0.8			0.0			0.0			0.0		
Total Delay		84.6			28.5			76.9			71.4		
LOS		F			C			E			E		
Approach Delay		84.6			28.5			76.9			71.4		
Approach LOS		F			C			E			E		
Queue Length 50th (ft)		~1047			517			61			54		
Queue Length 95th (ft)		#1319			m#1061			84			97		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		2309			2331			187			207		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		575			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.51			0.97			0.34			0.28		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 80 (53%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.13  
 Intersection Signal Delay: 58.9  
 Intersection Capacity Utilization 65.6%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service C

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Lewis Street & Route 16



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	2027	417	0	1839	128	268	51	2	45	41	52	
Future Volume (vph)	0	2027	417	0	1839	128	268	51	2	45	41	52	
Satd. Flow (prot)	0	4885	0	0	5029	0	0	895	0	0	1759	0	
Flt Permitted								0.653			0.801		
Satd. Flow (perm)	0	4885	0	0	5029	0	0	830	0	0	1432	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2573	0	0	1987	0	0	353	0	0	159	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		67.0			67.0		45.0	45.0		45.0	45.0		38.0
Total Lost Time (s)		6.0			6.0			6.0			6.0		
Act Effct Green (s)		61.0			61.0			72.6			72.6		
Actuated g/C Ratio		0.41			0.41			0.48			0.48		
v/c Ratio		1.30			0.97			0.88			0.23		
Control Delay		170.7			35.2			58.9			25.5		
Queue Delay		0.1			6.6			0.0			0.0		
Total Delay		170.9			41.8			58.9			25.5		
LOS		F			D			E			C		
Approach Delay		170.9			41.8			58.9			25.5		
Approach LOS		F			D			E			C		
Queue Length 50th (ft)		~1175			231			286			83		
Queue Length 95th (ft)		m#946			m#380			#612			167		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)													
Base Capacity (vph)		1986			2045			402			693		
Starvation Cap Reductn		18			71			0			0		
Spillback Cap Reductn		97			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.36			1.01			0.88			0.23		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 61 (41%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.30  
 Intersection Signal Delay: 108.0      Intersection LOS: F  
 Intersection Capacity Utilization 83.0%      ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Second Street & Route 16



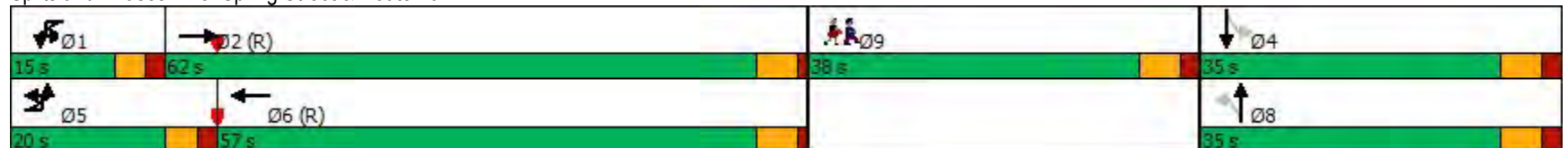
	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations		↔	↑↑↑			↔	↑↑↑			↔			↔		
Traffic Volume (vph)	35	114	1871	45	39	44	1742	50	49	50	60	26	35	132	
Future Volume (vph)	35	114	1871	45	39	44	1742	50	49	50	60	26	35	132	
Satd. Flow (prot)	0	1720	5111	0	0	1727	4894	0	0	1409	0	0	1374	0	
Flt Permitted		0.950				0.950				0.770			0.934		
Satd. Flow (perm)	0	1709	5111	0	0	1717	4894	0	0	1205	0	0	1425	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	178	2038	0	0	98	1829	0	0	194	0	0	242	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	20.0	20.0	62.0		15.0	15.0	57.0		35.0	35.0		35.0	35.0		38.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		19.1	67.3			10.6	58.8			46.6			46.6		
Actuated g/C Ratio		0.13	0.45			0.07	0.39			0.31			0.31		
v/c Ratio		0.82	0.89			0.81	0.95			0.52			0.55		
Control Delay		96.7	6.7			86.6	52.7			49.5			49.5		
Queue Delay		0.0	18.5			0.0	43.8			0.0			0.0		
Total Delay		96.7	25.3			86.6	96.5			49.5			49.5		
LOS		F	C			F	F			D			D		
Approach Delay			31.0				96.0			49.5			49.5		
Approach LOS			C				F			D			D		
Queue Length 50th (ft)		185	22			88	693			173			217		
Queue Length 95th (ft)		m137	m19			m105	#845			240			288		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		218	2292			126	1917			373			442		
Starvation Cap Reductn		0	316			0	372			0			0		
Spillback Cap Reductn		0	49			0	41			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		0.82	1.03			0.78	1.18			0.52			0.55		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 80 (53%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 60.1  
 Intersection Capacity Utilization 74.9%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service D

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Spring Street & Route 16

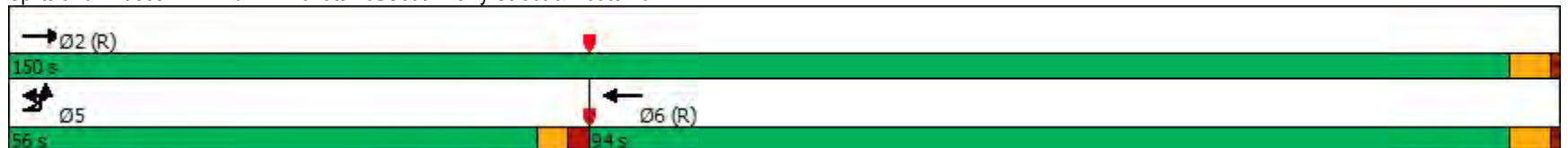


	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group													
Lane Configurations		↔	↑↑↑			↑↑↑				↔			
Traffic Volume (vph)	21	330	1645	0	0	1808	69	0	0	72	0	0	0
Future Volume (vph)	21	330	1645	0	0	1808	69	0	0	72	0	0	0
Satd. Flow (prot)	0	1165	3576	0	0	3484	0	0	0	1655	0	0	0
Flt Permitted		0.800											
Satd. Flow (perm)	0	1163	4471	0	0	3484	0	0	0	1655	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	366	1714	0	0	1915	0	0	0	129	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	56.0	56.0	150.0			94.0				150.0			
Total Lost Time (s)		5.0	5.0			5.0				5.0			
Act Effct Green (s)		48.6	150.0			91.4				150.0			
Actuated g/C Ratio		0.32	1.00			0.61				1.00			
v/c Ratio		0.97	0.48			0.90				0.08			
Control Delay		41.6	4.1			28.0				0.1			
Queue Delay		47.2	0.2			46.2				0.0			
Total Delay		88.8	4.3			74.2				0.1			
LOS		F	A			E				A			
Approach Delay			19.2			74.2			0.1				
Approach LOS			B			E			A				
Queue Length 50th (ft)		345	2			787				0			
Queue Length 95th (ft)		m#565	695			867				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		396	3576			2122				1655			
Starvation Cap Reductn		0	0			499				0			
Spillback Cap Reductn		85	932			427				431			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		1.18	0.65			1.18				0.11			

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 3 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 44.1  
 Intersection Capacity Utilization 64.3%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16





	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙		
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑				↑↑↑			↑			↑		
Traffic Volume (vph)	0	1631	86	18	24	1606	139	135	194	29	54	101	136	
Future Volume (vph)	0	1631	86	18	24	1606	139	135	194	29	54	101	136	
Satd. Flow (prot)	0	4862	0	0	1669	4846	0	0	1618	0	0	1396	0	
Flt Permitted					0.950				0.647			0.827		
Satd. Flow (perm)	0	4862	0	0	1654	4846	0	0	1064	0	0	1281	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1770	0	0	49	1799	0	0	421	0	0	343	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		50.0		20.0	20.0	70.0		45.0	45.0		45.0	45.0		35.0
Total Lost Time (s)		5.0			6.0	5.0			6.0			6.0		
Act Effct Green (s)		52.8			9.0	65.0			64.4			64.4		
Actuated g/C Ratio		0.35			0.06	0.43			0.43			0.43		
v/c Ratio		1.04			0.49	0.86			0.92			0.62		
Control Delay		70.8			105.8	25.0			67.7			42.4		
Queue Delay		11.2			0.0	47.4			4.4			0.2		
Total Delay		82.0			105.8	72.4			72.1			42.7		
LOS		F			F	E			E			D		
Approach Delay		82.0				73.3			72.1			42.7		
Approach LOS		F				E			E			D		
Queue Length 50th (ft)		~717			50	661			376			253		
Queue Length 95th (ft)		#859			m80	232			#722			450		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		1710			155	2099			456			549		
Starvation Cap Reductn		47			0	55			0			0		
Spillback Cap Reductn		0			0	687			16			20		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		1.06			0.32	1.27			0.96			0.65		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.04  
 Intersection Signal Delay: 74.3  
 Intersection Capacity Utilization 80.3%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service D

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Vine Street & Route 16





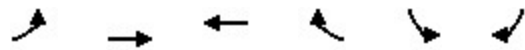
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	232	1377	158	65	1224	21	185	230	50	55	151	42	
Future Volume (vph)	232	1377	158	65	1224	21	185	230	50	55	151	42	
Satd. Flow (prot)	1728	4784	0	1678	4896	0	1694	1737	0	1601	1743	0	
Flt Permitted	0.950			0.950			0.551			0.385			
Satd. Flow (perm)	1722	4784	0	1666	4896	0	970	1737	0	643	1743	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	264	1633	0	73	1284	0	208	346	0	76	210	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	27.8	52.0		21.0	45.2		40.0	40.0		40.0	40.0		37.0
Total Lost Time (s)	5.5	5.0		5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)	27.2	54.1		15.1	42.1		54.7	54.7		54.7	54.7		
Actuated g/C Ratio	0.18	0.36		0.10	0.28		0.36	0.36		0.36	0.36		
v/c Ratio	0.85	0.95		0.43	0.94		0.59	0.55		0.32	0.33		
Control Delay	78.2	64.4		86.4	56.3		49.1	43.6		42.2	38.1		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	78.2	64.4		86.4	56.3		49.1	43.6		42.2	38.1		
LOS	E	E		F	E		D	D		D	D		
Approach Delay		66.3			57.9			45.7			39.2		
Approach LOS		E			E			D			D		
Queue Length 50th (ft)	270	413		76	487		163	265		53	147		
Queue Length 95th (ft)	#457	#770		131	#580		276	352		85	238		
Internal Link Dist (ft)		406			387			396			538		
Turn Bay Length (ft)	150			100			100			100			
Base Capacity (vph)	312	1726		173	1373		353	633		234	635		
Starvation Cap Reductn	0	0		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.85	0.95		0.42	0.94		0.59	0.55		0.32	0.33		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 110 (73%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 58.8  
 Intersection Capacity Utilization 85.3%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Everett Avenue & Route 16



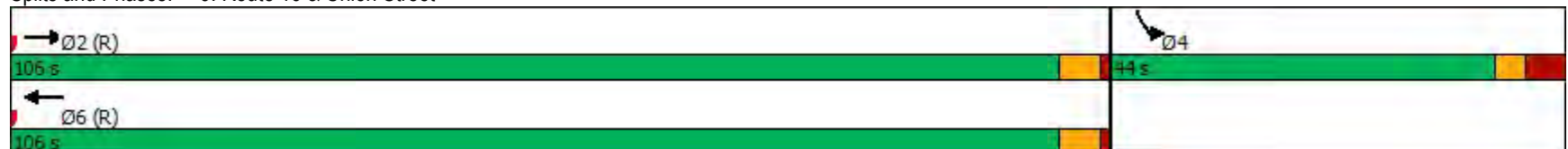


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↑	
Traffic Volume (vph)	0	1490	1299	224	126	11
Future Volume (vph)	0	1490	1299	224	126	11
Satd. Flow (prot)	0	4868	4797	0	1764	0
Flt Permitted					0.956	
Satd. Flow (perm)	0	4868	4797	0	1764	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	1620	1603	0	145	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		106.0	106.0		44.0	
Total Lost Time (s)		5.0	5.0		7.0	
Act Effct Green (s)		121.2	121.2		16.8	
Actuated g/C Ratio		0.81	0.81		0.11	
v/c Ratio		0.41	0.41		0.74	
Control Delay		14.3	8.3		85.2	
Queue Delay		0.3	0.8		0.0	
Total Delay		14.6	9.1		85.2	
LOS		B	A		F	
Approach Delay		14.6	9.1		85.2	
Approach LOS		B	A		F	
Queue Length 50th (ft)		561	143		140	
Queue Length 95th (ft)		m595	259		209	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3933	3876		435	
Starvation Cap Reductn		0	1803		0	
Spillback Cap Reductn		1388	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.64	0.77		0.33	

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 10 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 15.0  
 Intersection Capacity Utilization 47.8%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Route 16 & Union Street



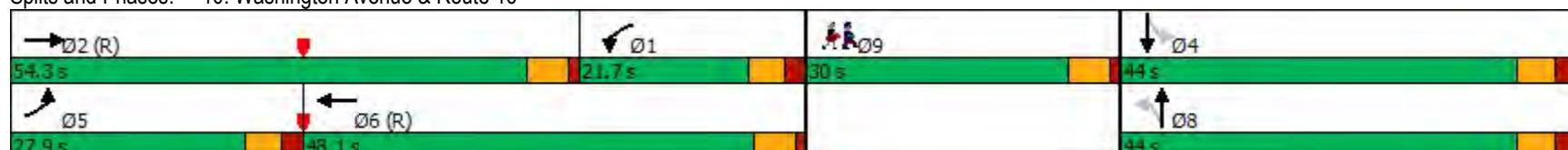


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9		
Lane Configurations															
Traffic Volume (vph)	218	1185	213	155	1264	31	139	234	23	57	133	120			
Future Volume (vph)	218	1185	213	155	1264	31	139	234	23	57	133	120			
Satd. Flow (prot)	1745	4734	0	1728	4891	0	1736	1802	0	1770	1665	0			
Flt Permitted	0.950			0.950			0.420			0.421					
Satd. Flow (perm)	1738	4734	0	1727	4891	0	757	1802	0	775	1665	0			
Satd. Flow (RTOR)															
Lane Group Flow (vph)	251	1607	0	174	1423	0	164	286	0	64	287	0			
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA				
Protected Phases	5	2		1	6			8			4		9		
Permitted Phases							8			4					
Total Split (s)	27.9	54.3		21.7	48.1		44.0	44.0		44.0	44.0		30.0		
Total Lost Time (s)	5.5	5.0		5.5	5.0		6.0	6.0		6.0	6.0				
Act Effct Green (s)	24.8	60.4		16.2	51.9		47.7	47.7		47.7	47.7				
Actuated g/C Ratio	0.17	0.40		0.11	0.35		0.32	0.32		0.32	0.32				
v/c Ratio	0.87	0.84		0.94	0.84		0.68	0.50		0.26	0.54				
Control Delay	66.2	48.8		116.2	51.2		61.2	45.5		42.3	47.2				
Queue Delay	0.0	5.4		0.0	0.0		0.2	0.0		0.0	0.0				
Total Delay	66.2	54.3		116.2	51.2		61.3	45.5		42.3	47.3				
LOS	E	D		F	D		E	D		D	D				
Approach Delay		55.9			58.3			51.3			46.4				
Approach LOS		E			E			D			D				
Queue Length 50th (ft)	252	602		172	461		135	220		45	224				
Queue Length 95th (ft)	#415	#684		#316	#632		223	331		92	331				
Internal Link Dist (ft)		319			1066			414			597				
Turn Bay Length (ft)	100			150			150			150					
Base Capacity (vph)	288	1907		186	1691		240	572		246	528				
Starvation Cap Reductn	0	250		0	0		0	0		0	0				
Spillback Cap Reductn	0	0		0	0		2	0		0	6				
Storage Cap Reductn	0	0		0	0		0	0		0	0				
Reduced v/c Ratio	0.87	0.97		0.94	0.84		0.69	0.50		0.26	0.55				

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 79 (53%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 55.5 Intersection LOS: E  
 Intersection Capacity Utilization 81.3% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16



														Ø9
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↔	↑↑↑		↔	↑	↑	↔	↑	↑	
Traffic Volume (vph)	0	1164	181	266	111	1194	13	288	349	219	226	270	175	
Future Volume (vph)	0	1164	181	266	111	1194	13	288	349	219	226	270	175	
Satd. Flow (prot)	0	4775	0	0	1673	4783	0	1736	1920	0	1787	1915	0	
Flt Permitted					0.950			*0.800			*0.800			
Satd. Flow (perm)	0	4775	0	0	1661	4783	0	1455	1920	0	1494	1915	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1373	0	0	418	1326	0	327	617	0	251	529	0	
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA		
Protected Phases		2		1	1	6		3	8		7	4		9
Permitted Phases								8			4			
Total Split (s)		48.0		37.0	37.0	85.0		14.0	45.0		14.0	45.0		36.0
Total Lost Time (s)		5.5			6.0	5.0		6.0	5.5		5.0	5.5		
Act Effct Green (s)		42.7			31.2	80.4		47.2	39.7		49.3	39.7		
Actuated g/C Ratio		0.28			0.20	0.52		0.31	0.26		0.32	0.26		
v/c Ratio		1.03			1.23	0.53		0.71	1.24		0.51	1.07		
Control Delay		86.0			175.4	26.1		55.8	170.5		45.4	112.1		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		86.0			175.4	26.1		55.8	170.5		45.4	112.1		
LOS		F			F	C		E	F		D	F		
Approach Delay		86.0				61.9			130.8			90.6		
Approach LOS		F				E			F			F		
Queue Length 50th (ft)		468			~463	270		238	~688		170	~505		
Queue Length 95th (ft)		#731			#819	426		402	#1130		306	#828		
Internal Link Dist (ft)		409				879			820			473		
Turn Bay Length (ft)					100			150			100			
Base Capacity (vph)		1331			340	2511		463	497		497	496		
Starvation Cap Reductn		0			0	0		0	0		0	0		
Spillback Cap Reductn		0			0	0		0	0		0	0		
Storage Cap Reductn		0			0	0		0	0		0	0		
Reduced v/c Ratio		1.03			1.23	0.53		0.71	1.24		0.51	1.07		

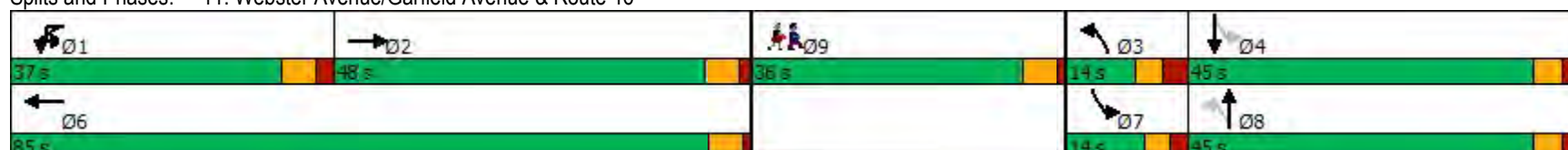
Intersection Summary

Cycle Length: 180  
 Actuated Cycle Length: 153.2  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.24  
 Intersection Signal Delay: 86.8  
 Intersection Capacity Utilization 110.6%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service H

Description: Note: turning movement counts show no volume heading southbound on Webster. Volumes shown were extrapolated from 2016 TMCs  
 Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min

\* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16



	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	2108	18	0	2045	24	15	8	9	24	20	21	
Future Volume (vph)	0	2108	18	0	2045	24	15	8	9	24	20	21	
Satd. Flow (prot)	0	3131	0	0	3131	0	0	1631	0	0	1612	0	
Flt Permitted								0.828			0.884		
Satd. Flow (perm)	0	3131	0	0	3131	0	0	1501	0	0	1574	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2192	0	0	2325	0	0	43	0	0	78	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		98.0			98.0		15.0	15.0		15.0	15.0		37.0
Total Lost Time (s)		5.0			5.0			5.5			5.5		
Act Effct Green (s)		115.4			115.4			15.3			15.3		
Actuated g/C Ratio		0.77			0.77			0.10			0.10		
v/c Ratio		0.91			0.97			0.28			0.49		
Control Delay		23.0			26.5			65.7			73.2		
Queue Delay		33.1			0.0			0.0			0.0		
Total Delay		56.1			26.5			65.7			73.2		
LOS		E			C			E			E		
Approach Delay		56.1			26.5			65.7			73.2		
Approach LOS		E			C			E			E		
Queue Length 50th (ft)		374			328			39			73		
Queue Length 95th (ft)		#957			m#1012			65			116		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		2408			2408			153			160		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		360			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.07			0.97			0.28			0.49		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 110 (73%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 41.6  
 Intersection Capacity Utilization 58.8%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Lewis Street & Route 16

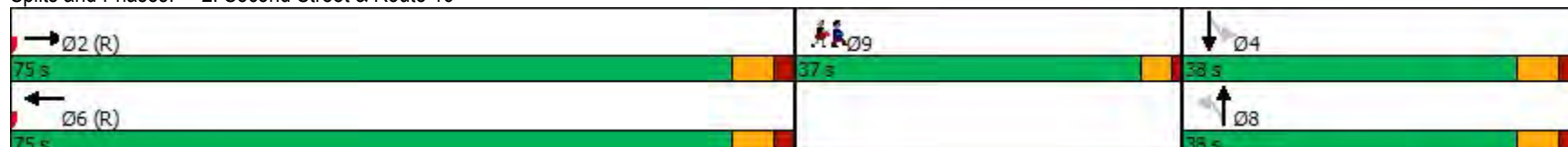


													Ø9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	1712	428	0	1702	132	306	74	8	43	60	61	
Future Volume (vph)	0	1712	428	0	1702	132	306	74	8	43	60	61	
Satd. Flow (prot)	0	4529	0	0	5083	0	0	1776	0	0	1770	0	
Flt Permitted								0.616			0.831		
Satd. Flow (perm)	0	4529	0	0	5083	0	0	1134	0	0	1490	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2253	0	0	2183	0	0	451	0	0	197	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		75.0			75.0		38.0	38.0		38.0	38.0		37.0
Total Lost Time (s)		6.0			6.0			6.0			6.0		
Act Effct Green (s)		69.0			69.0			60.2			60.2		
Actuated g/C Ratio		0.46			0.46			0.40			0.40		
v/c Ratio		1.08			0.93			0.99			0.33		
Control Delay		73.9			20.7			84.1			35.7		
Queue Delay		7.9			1.3			4.4			0.0		
Total Delay		81.9			22.0			88.5			35.7		
LOS		F			C			F			D		
Approach Delay		81.9			22.0			88.5			35.7		
Approach LOS		F			C			F			D		
Queue Length 50th (ft)		~902			799			390			118		
Queue Length 95th (ft)		#980			m118			#725			209		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)													
Base Capacity (vph)		2083			2338			455			597		
Starvation Cap Reductn		42			55			0			0		
Spillback Cap Reductn		104			0			8			11		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.14			0.96			1.01			0.34		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 120 (80%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 55.0 Intersection LOS: D  
 Intersection Capacity Utilization 88.4% ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Second Street & Route 16



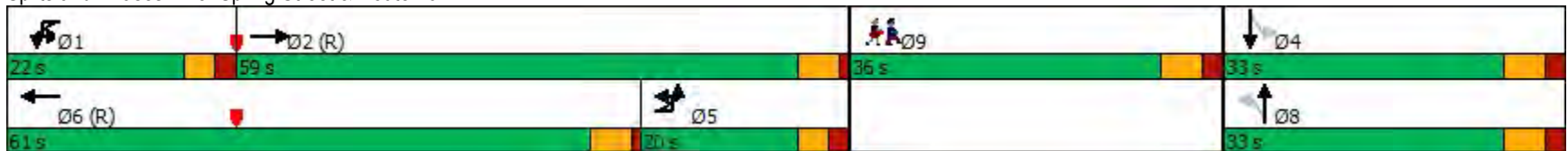


	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations		↔	↔↔↔			↔	↔↔↔			↔			↔		
Traffic Volume (vph)	47	109	1561	46	66	54	1608	45	63	51	85	40	43	116	
Future Volume (vph)	47	109	1561	46	66	54	1608	45	63	51	85	40	43	116	
Satd. Flow (prot)	0	1488	5063	0	0	1449	4940	0	0	1420	0	0	1403	0	
Flt Permitted		0.900				0.900				*0.800			*0.810		
Satd. Flow (perm)	0	1485	5063	0	0	1442	4940	0	0	1262	0	0	1262	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	166	1640	0	0	160	1922	0	0	234	0	0	240	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	20.0	20.0	59.0		22.0	22.0	61.0		33.0	33.0		33.0	33.0		36.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		15.0	63.9			19.5	68.3			41.1			41.1		
Actuated g/C Ratio		0.10	0.43			0.13	0.46			0.27			0.27		
v/c Ratio		1.12	0.76			0.85	0.85			0.68			0.70		
Control Delay		96.8	6.9			77.0	28.9			60.3			61.3		
Queue Delay		0.0	3.6			0.0	7.3			0.0			0.0		
Total Delay		96.8	10.4			77.0	36.2			60.3			61.3		
LOS		F	B			E	D			E			E		
Approach Delay			18.4				39.3			60.3			61.3		
Approach LOS			B				D			E			E		
Queue Length 50th (ft)		~208	19			143	663			225			233		
Queue Length 95th (ft)		m#185	m305			#256	#789			323			323		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		148	2155			188	2250			345			345		
Starvation Cap Reductn		0	415			0	150			0			0		
Spillback Cap Reductn		0	0			0	304			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		1.12	0.94			0.85	0.99			0.68			0.70		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 147 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.12  
 Intersection Signal Delay: 33.0  
 Intersection Capacity Utilization 72.5%  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Spring Street & Route 16



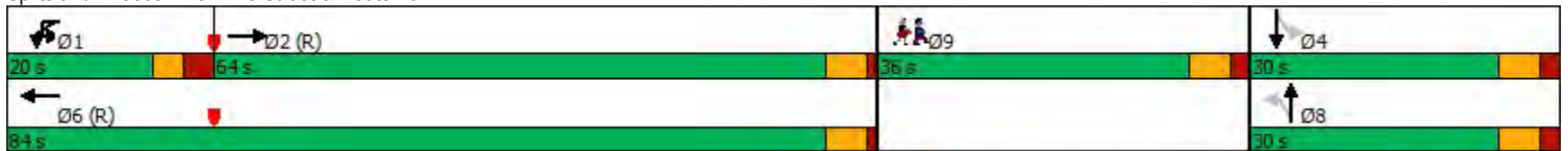


	↖	→	↘	↶	↷	←	↙	↘	↑	↖	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↔	↑↑↑			↔			↔		
Traffic Volume (vph)	0	1462	108	9	22	1540	95	127	103	37	75	120	132	
Future Volume (vph)	0	1462	108	9	22	1540	95	127	103	37	75	120	132	
Satd. Flow (prot)	0	4414	0	0	1504	4870	0	0	1629	0	0	1561	0	
Flt Permitted					0.900				0.572			0.828		
Satd. Flow (perm)	0	4414	0	0	1494	4870	0	0	951	0	0	1305	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1688	0	0	42	1703	0	0	294	0	0	359	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		64.0		20.0	20.0	84.0		30.0	30.0		30.0	30.0		36.0
Total Lost Time (s)		5.0			6.0	5.0			6.0			6.0		
Act Effct Green (s)		66.8			9.0	79.0			55.2			55.2		
Actuated g/C Ratio		0.45			0.06	0.53			0.37			0.37		
v/c Ratio		0.86			0.47	0.66			0.84			0.75		
Control Delay		55.9			75.0	25.9			64.9			52.5		
Queue Delay		3.5			0.0	0.5			0.0			0.0		
Total Delay		59.4			75.0	26.3			64.9			52.5		
LOS		E			E	C			E			D		
Approach Delay		59.4				27.5			64.9			52.5		
Approach LOS		E				C			E			D		
Queue Length 50th (ft)		620			45	421			272			317		
Queue Length 95th (ft)		#691			m76	499			#613			#679		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		1965			140	2564			350			480		
Starvation Cap Reductn		104			0	367			0			0		
Spillback Cap Reductn		197			0	382			0			0		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		0.95			0.30	0.78			0.84			0.75		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 80 (53%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 45.6  
 Intersection Capacity Utilization 69.3%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Vine Street & Route 16

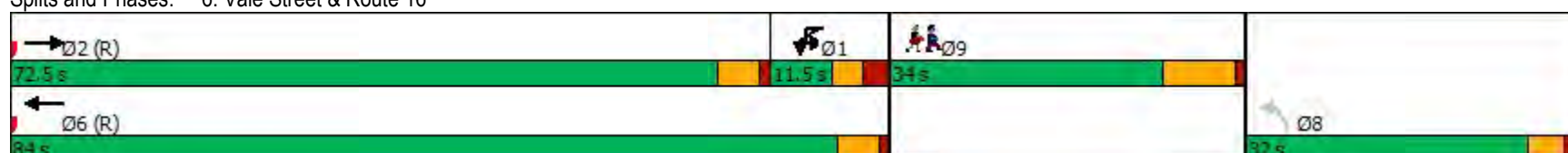


	→	↘	↙	←	↖	↗	↘	↙
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø9
Lane Configurations	↑↑↑			↔	↑↑↑	↔		
Traffic Volume (vph)	1413	187	17	7	1442	224	1	
Future Volume (vph)	1413	187	17	7	1442	224	1	
Satd. Flow (prot)	4816	0	0	1745	4916	1791	0	
Flt Permitted				0.950		0.953		
Satd. Flow (perm)	4816	0	0	1745	4916	1779	0	
Satd. Flow (RTOR)								
Lane Group Flow (vph)	1860	0	0	25	1502	242	0	
Turn Type	NA		Prot	Prot	NA	Perm		
Protected Phases	2		1	1	6			9
Permitted Phases						8		
Total Split (s)	72.5		11.5	11.5	84.0	32.0		34.0
Total Lost Time (s)	5.0			5.5	5.0	5.0		
Act Effct Green (s)	103.0			6.0	109.9	24.9		
Actuated g/C Ratio	0.69			0.04	0.73	0.17		
v/c Ratio	0.56			0.36	0.42	0.82		
Control Delay	9.5			69.3	12.9	81.7		
Queue Delay	0.8			0.0	0.0	1.6		
Total Delay	10.3			69.3	12.9	83.2		
LOS	B			E	B	F		
Approach Delay	10.3				13.8	83.2		
Approach LOS	B				B	F		
Queue Length 50th (ft)	30			21	175	231		
Queue Length 95th (ft)	706			m25	m234	314		
Internal Link Dist (ft)	521				488	647		
Turn Bay Length (ft)				150				
Base Capacity (vph)	3307			69	3601	336		
Starvation Cap Reductn	1005			0	0	0		
Spillback Cap Reductn	0			0	0	23		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.81			0.36	0.42	0.77		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 120 (80%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 16.7      Intersection LOS: B  
 Intersection Capacity Utilization 52.3%      ICU Level of Service A  
 Analysis Period (min) 15  
 Description: Note: Splits and offsets need to be optimized via synchro due to lack of coordination data  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Vale Street & Route 16



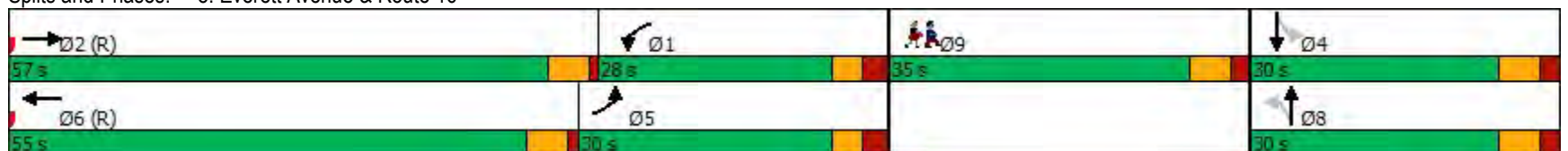


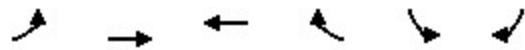
	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖		↖	↖		
Traffic Volume (vph)	186	1221	187	101	1213	18	230	173	82	90	219	76	
Future Volume (vph)	186	1221	187	101	1213	18	230	173	82	90	219	76	
Satd. Flow (prot)	1745	4806	0	1694	4900	0	1728	1714	0	1694	1746	0	
Flt Permitted	0.950			0.950			0.411			0.450			
Satd. Flow (perm)	1745	4806	0	1690	4900	0	742	1714	0	799	1746	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	204	1437	0	123	1398	0	247	283	0	100	314	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	30.0	57.0		28.0	55.0		30.0	30.0		30.0	30.0		35.0
Total Lost Time (s)	5.5	5.0		5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)	21.4	52.0		19.4	50.0		52.5	52.5		52.5	52.5		
Actuated g/C Ratio	0.14	0.35		0.13	0.33		0.35	0.35		0.35	0.35		
v/c Ratio	0.82	0.86		0.56	0.86		0.95	0.47		0.36	0.51		
Control Delay	89.4	38.6		43.8	45.0		91.8	45.2		46.5	46.0		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	89.4	38.6		43.8	45.0		91.8	45.2		46.5	46.0		
LOS	F	D		D	D		F	D		D	D		
Approach Delay		44.9			44.9			66.9			46.2		
Approach LOS		D			D			E			D		
Queue Length 50th (ft)	211	523		116	369		212	194		66	220		
Queue Length 95th (ft)	m#298	355		130	420		#508	366		155	#412		
Internal Link Dist (ft)		406			387			396			538		
Turn Bay Length (ft)	150			100			100			100			
Base Capacity (vph)	285	1666		254	1633		259	599		279	611		
Starvation Cap Reductn	0	0		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.72	0.86		0.48	0.86		0.95	0.47		0.36	0.51		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 47.9 Intersection LOS: D  
 Intersection Capacity Utilization 88.3% ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Everett Avenue & Route 16



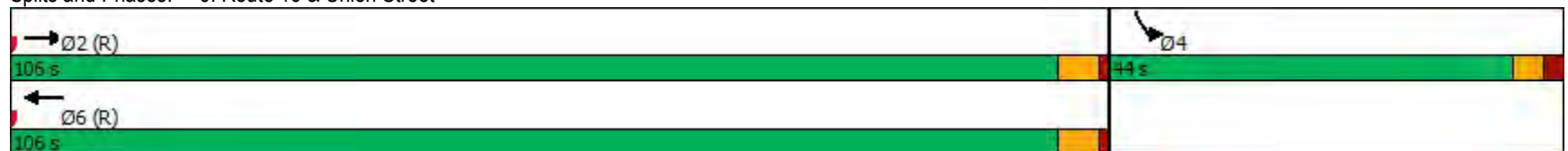


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑↑↑		↑	
Traffic Volume (vph)	0	1432	1315	175	146	11
Future Volume (vph)	0	1432	1315	175	146	11
Satd. Flow (prot)	0	4916	4828	0	1798	0
Flt Permitted					0.955	
Satd. Flow (perm)	0	4916	4828	0	1798	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	1446	1689	0	175	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		106.0	106.0		44.0	
Total Lost Time (s)		5.0	5.0		5.0	
Act Effct Green (s)		120.9	120.9		19.1	
Actuated g/C Ratio		0.81	0.81		0.13	
v/c Ratio		0.36	0.43		0.77	
Control Delay		2.1	0.9		83.9	
Queue Delay		0.0	0.1		0.0	
Total Delay		2.1	1.0		83.9	
LOS		A	A		F	
Approach Delay		2.1	1.0		83.9	
Approach LOS		A	A		F	
Queue Length 50th (ft)		13	44		168	
Queue Length 95th (ft)		84	8		239	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3962	3891		467	
Starvation Cap Reductn		0	794		0	
Spillback Cap Reductn		46	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.37	0.55		0.37	

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 120 (80%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 5.9  
 Intersection Capacity Utilization 46.4%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 9: Route 16 & Union Street

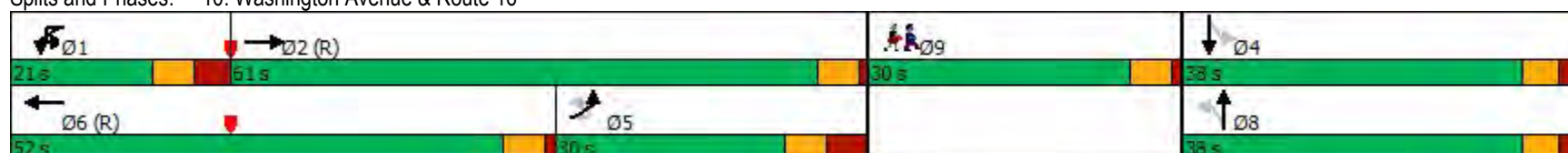


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9	
Lane Configurations															
Traffic Volume (vph)	212	1188	178	12	76	1224	38	113	123	55	60	158	153		
Future Volume (vph)	212	1188	178	12	76	1224	38	113	123	55	60	158	153		
Satd. Flow (prot)	1745	4757	0	0	1701	4895	0	1736	1754	0	1770	1708	0		
Flt Permitted	0.950				0.950			*0.450			0.460				
Satd. Flow (perm)	1742	4757	0	0	1694	4895	0	818	1754	0	854	1708	0		
Satd. Flow (RTOR)															
Lane Group Flow (vph)	230	1438	0	0	116	1342	0	128	203	0	64	331	0		
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA			
Protected Phases	5	2		1	1	6			8			4		9	
Permitted Phases								8			4				
Total Split (s)	30.0	61.0		21.0	21.0	52.0		38.0	38.0		38.0	38.0		30.0	
Total Lost Time (s)	8.0	5.0			7.5	5.0		5.5	5.5		5.5	5.5			
Act Effct Green (s)	22.0	75.6			13.1	66.2		34.1	34.1		34.1	34.1			
Actuated g/C Ratio	0.15	0.50			0.09	0.44		0.23	0.23		0.23	0.23			
v/c Ratio	0.90	0.60			0.78	0.62		0.69	0.51		0.33	0.85			
Control Delay	77.3	16.9			99.2	36.7		71.9	54.6		51.9	75.8			
Queue Delay	0.0	0.5			0.0	0.0		0.0	0.0		0.0	0.0			
Total Delay	77.3	17.4			99.2	36.7		71.9	54.6		51.9	75.8			
LOS	E	B			F	D		E	D		D	E			
Approach Delay		25.6				41.6			61.3			71.9			
Approach LOS		C				D			E			E			
Queue Length 50th (ft)	190	153			111	328		114	173		52	310			
Queue Length 95th (ft)	#375	241			#155	520		183	242		96	417			
Internal Link Dist (ft)		319				1066			414			597			
Turn Bay Length (ft)	100				150			150			150				
Base Capacity (vph)	255	2397			159	2160		194	416		203	406			
Starvation Cap Reductn	0	479			0	0		0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0		0	0			
Reduced v/c Ratio	0.90	0.75			0.73	0.62		0.66	0.49		0.32	0.82			

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 20 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 39.5  
 Intersection Capacity Utilization 84.2%  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16

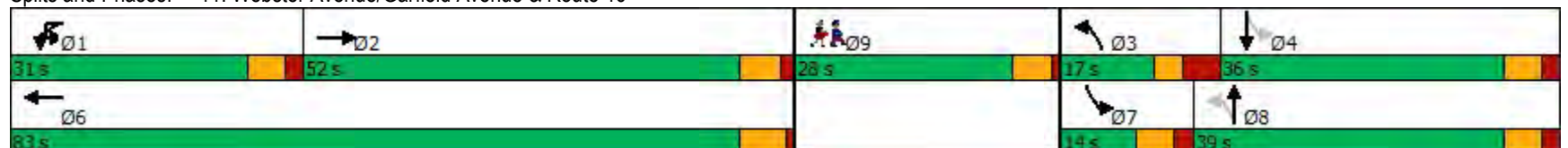


	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑		↑	↑		↑	↑		
Traffic Volume (vph)	0	1225	184	171	128	1172	13	299	209	229	190	170	146	
Future Volume (vph)	0	1225	184	171	128	1172	13	299	209	229	190	170	146	
Satd. Flow (prot)	0	4777	0	0	1652	4737	0	1752	1884	0	1787	1913	0	
Flt Permitted					0.950			*0.700			*0.600			
Satd. Flow (perm)	0	4777	0	0	1646	4737	0	1289	1884	0	1118	1913	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1515	0	0	329	1248	0	336	486	0	209	344	0	
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA		
Protected Phases		2		1	1	6		3	8		7	4		9
Permitted Phases								8			4			
Total Split (s)		52.0		31.0	31.0	83.0		17.0	39.0		14.0	36.0		28.0
Total Lost Time (s)		6.0			6.0	6.0		7.0	6.0		6.0	6.0		
Act Effct Green (s)		46.3			25.1	77.5		42.2	33.2		38.2	30.2		
Actuated g/C Ratio		0.32			0.17	0.53		0.29	0.23		0.26	0.21		
v/c Ratio		1.00			1.15	0.49		0.83	1.13		0.63	0.87		
Control Delay		70.9			152.6	23.5		64.3	132.9		53.4	78.0		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		70.9			152.6	23.5		64.3	132.9		53.4	78.0		
LOS		E			F	C		E	F		D	E		
Approach Delay		70.9				50.4			104.8			68.7		
Approach LOS		E				D			F			E		
Queue Length 50th (ft)		473			~325	228		243	~472		136	291		
Queue Length 95th (ft)		#746			#633	373		#496	#856		255	#559		
Internal Link Dist (ft)		409				879			820			473		
Turn Bay Length (ft)					100			150			100			
Base Capacity (vph)		1522			285	2526		407	431		331	397		
Starvation Cap Reductn		0			0	0		0	0		0	0		
Spillback Cap Reductn		0			0	0		0	0		0	0		
Storage Cap Reductn		0			0	0		0	0		0	0		
Reduced v/c Ratio		1.00			1.15	0.49		0.83	1.13		0.63	0.87		

Intersection Summary

Cycle Length: 164  
 Actuated Cycle Length: 145.2  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.15  
 Intersection Signal Delay: 69.6  
 Intersection Capacity Utilization 100.6%  
 Analysis Period (min) 15  
 Description: Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16



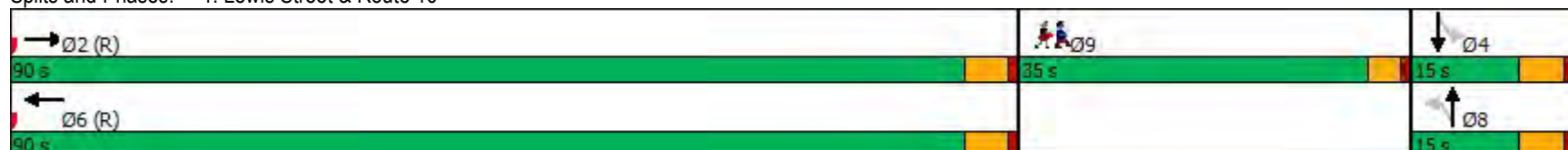


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	1958	13	0	1726	6	20	5	9	7	9	16	
Future Volume (vph)	0	1958	13	0	1726	6	20	5	9	7	9	16	
Satd. Flow (prot)	0	2919	0	0	2919	0	0	1636	0	0	1581	0	
Flt Permitted								0.863			0.934		
Satd. Flow (perm)	0	2919	0	0	2919	0	0	1565	0	0	1635	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2054	0	0	2038	0	0	38	0	0	36	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		90.0			90.0		15.0	15.0		15.0	15.0		35.0
Total Lost Time (s)		5.0			5.0			5.5			5.5		
Act Effct Green (s)		115.2			115.2			9.2			9.2		
Actuated g/C Ratio		0.82			0.82			0.07			0.07		
v/c Ratio		0.86			0.85			0.37			0.34		
Control Delay		16.8			17.2			73.1			71.3		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		16.8			17.2			73.1			71.3		
LOS		B			B			E			E		
Approach Delay		16.8			17.2			73.1			71.3		
Approach LOS		B			B			E			E		
Queue Length 50th (ft)		247			250			34			32		
Queue Length 95th (ft)		#808			m427			73			70		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		2402			2402			106			110		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.86			0.85			0.36			0.33		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 40 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 18.0  
 Intersection Capacity Utilization 55.7%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Lewis Street & Route 16

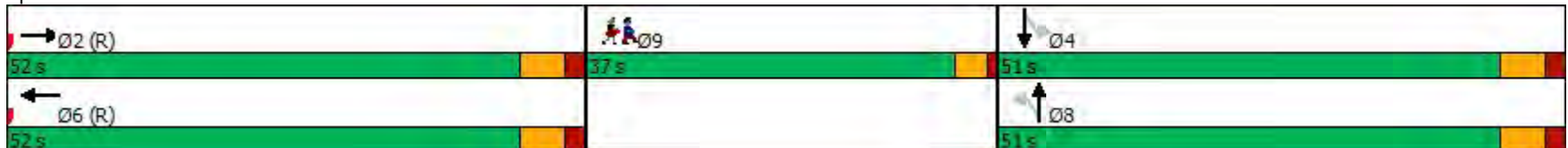


	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			⇕			⇕		
Traffic Volume (vph)	0	1605	369	0	1445	77	267	96	13	48	55	20	
Future Volume (vph)	0	1605	369	0	1445	77	267	96	13	48	55	20	
Satd. Flow (prot)	0	4578	0	0	5091	0	0	1516	0	0	1819	0	
Flt Permitted								0.645			0.781		
Satd. Flow (perm)	0	4578	0	0	5091	0	0	1085	0	0	1448	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2123	0	0	1730	0	0	430	0	0	190	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		52.0			52.0		51.0	51.0		51.0	51.0		37.0
Total Lost Time (s)		6.0			6.0			6.0			6.0		
Act Effct Green (s)		74.2			74.2			45.0			45.0		
Actuated g/C Ratio		0.53			0.53			0.32			0.32		
v/c Ratio		0.88			0.64			1.24			0.41		
Control Delay		28.8			20.7			168.7			40.4		
Queue Delay		11.4			0.3			0.0			0.0		
Total Delay		40.2			21.0			168.7			40.4		
LOS		D			C			F			D		
Approach Delay		40.2			21.0			168.7			40.4		
Approach LOS		D			C			F			D		
Queue Length 50th (ft)		477			200			~530			135		
Queue Length 95th (ft)		#864			238			#715			142		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)													
Base Capacity (vph)		2426			2698			348			465		
Starvation Cap Reductn		0			360			0			0		
Spillback Cap Reductn		321			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.01			0.74			1.24			0.41		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 60 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.24  
 Intersection Signal Delay: 45.1      Intersection LOS: D  
 Intersection Capacity Utilization 76.6%      ICU Level of Service D  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Second Street & Route 16



	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations		↔	↔↔↔			↔	↔↔↔			↔			↔		
Traffic Volume (vph)	38	106	1466	56	45	66	1345	39	23	55	67	30	46	117	
Future Volume (vph)	38	106	1466	56	45	66	1345	39	23	55	67	30	46	117	
Satd. Flow (prot)	0	1745	5048	0	0	1724	4938	0	0	1419	0	0	1401	0	
Flt Permitted		0.950				0.950				*0.800			*0.810		
Satd. Flow (perm)	0	1740	5048	0	0	1706	4938	0	0	1261	0	0	1259	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	163	1602	0	0	139	1537	0	0	165	0	0	257	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	19.0	19.0	58.0		19.0	19.0	58.0		30.0	30.0		30.0	30.0		33.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		21.7	53.0			21.7	53.0			44.5			44.5		
Actuated g/C Ratio		0.16	0.38			0.16	0.38			0.32			0.32		
v/c Ratio		0.60	0.84			0.52	0.82			0.41			0.64		
Control Delay		79.7	17.9			65.8	20.3			43.8			51.2		
Queue Delay		0.0	3.9			0.0	0.2			0.0			0.0		
Total Delay		79.7	21.8			65.8	20.5			43.8			51.2		
LOS		E	C			E	C			D			D		
Approach Delay			27.1				24.3			43.8			51.2		
Approach LOS			C				C			D			D		
Queue Length 50th (ft)		106	488			127	168			132			224		
Queue Length 95th (ft)		m#198	197			#190	415			230			297		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		270	1911			266	1869			401			400		
Starvation Cap Reductn		0	232			0	36			0			0		
Spillback Cap Reductn		0	0			0	0			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		0.60	0.95			0.52	0.84			0.41			0.64		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 60 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 28.2      Intersection LOS: C  
 Intersection Capacity Utilization 64.7%      ICU Level of Service C  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Spring Street & Route 16

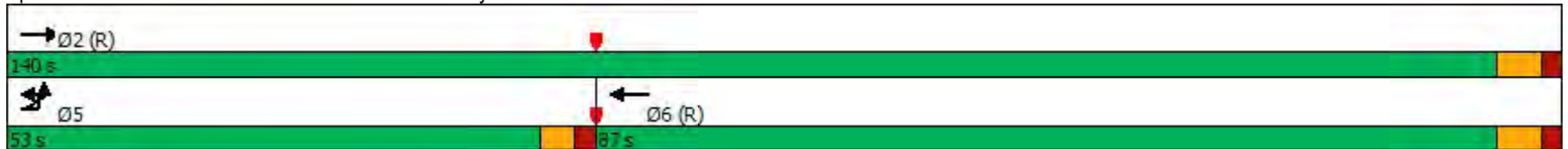


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	13	277	1318	0	0	1455	73	0	0	20	0	0	0
Future Volume (vph)	13	277	1318	0	0	1455	73	0	0	20	0	0	0
Satd. Flow (prot)	0	1728	3612	0	0	4328	0	0	0	1589	0	0	0
Flt Permitted		0.950											
Satd. Flow (perm)	0	1726	4515	0	0	4328	0	0	0	1589	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	326	1448	0	0	1643	0	0	0	22	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	53.0	53.0	140.0			87.0				140.0			
Total Lost Time (s)		5.0	6.0			6.0				6.0			
Act Effct Green (s)		30.6	140.0			98.4				140.0			
Actuated g/C Ratio		0.22	1.00			0.70				1.00			
v/c Ratio		0.86	0.40			0.54				0.01			
Control Delay		46.1	2.1			12.1				0.0			
Queue Delay		0.0	0.0			0.1				0.0			
Total Delay		46.1	2.1			12.2				0.0			
LOS		D	A			B				A			
Approach Delay			10.2			12.2							
Approach LOS			B			B							
Queue Length 50th (ft)		309	30			97				0			
Queue Length 95th (ft)		m381	13			406				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		592	3612			3042				1589			
Starvation Cap Reductn		0	0			363				0			
Spillback Cap Reductn		0	0			0				0			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		0.55	0.40			0.61				0.01			

**Intersection Summary**

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 20 (14%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 11.1                                      Intersection LOS: B  
 Intersection Capacity Utilization 55.0%                              ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16





	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑			↑			↑		
Traffic Volume (vph)	0	1262	76	2	17	1332	73	64	112	42	59	104	132	
Future Volume (vph)	0	1262	76	2	17	1332	73	64	112	42	59	104	132	
Satd. Flow (prot)	0	4462	0	0	1504	4922	0	0	1646	0	0	1597	0	
Flt Permitted					0.900				0.729			0.845		
Satd. Flow (perm)	0	4462	0	0	1491	4922	0	0	1216	0	0	1362	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1486	0	0	27	1527	0	0	294	0	0	329	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		48.0		14.0	14.0	62.0		42.0	42.0		42.0	42.0		36.0
Total Lost Time (s)		5.0			6.0	6.0			6.0			6.0		
Act Effct Green (s)		61.2			8.0	68.6			54.6			54.6		
Actuated g/C Ratio		0.44			0.06	0.49			0.39			0.39		
v/c Ratio		0.76			0.32	0.63			0.62			0.62		
Control Delay		31.0			65.8	22.1			42.8			42.0		
Queue Delay		0.0			0.0	0.2			0.0			0.0		
Total Delay		31.0			65.8	22.3			42.8			42.0		
LOS		C			E	C			D			D		
Approach Delay		31.0				23.0			42.8			42.0		
Approach LOS		C				C			D			D		
Queue Length 50th (ft)		253			27	368			238			267		
Queue Length 95th (ft)		#636			m50	548			289			415		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		1951			85	2412			473			530		
Starvation Cap Reductn		0			0	227			0			0		
Spillback Cap Reductn		0			0	0			0			0		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		0.76			0.32	0.70			0.62			0.62		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 70 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 29.6  
 Intersection Capacity Utilization 57.5%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Vine Street & Route 16

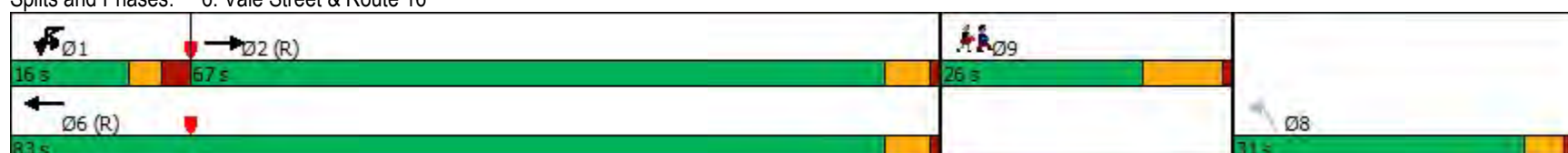


	→	↘	↙	↘	←	↙	↘	Ø9
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø9
Lane Configurations	↑↑↑			↘	↑↑↑	↘		
Traffic Volume (vph)	1363	2	20	7	1253	171	0	
Future Volume (vph)	1363	2	20	7	1253	171	0	
Satd. Flow (prot)	4468	0	0	1653	4964	1770	0	
Flt Permitted				0.900		0.950		
Satd. Flow (perm)	4468	0	0	1653	4964	1758	0	
Satd. Flow (RTOR)								
Lane Group Flow (vph)	1452	0	0	43	1408	184	0	
Turn Type	NA		Prot	Prot	NA	Perm		
Protected Phases	2		1	1	6			9
Permitted Phases						8		
Total Split (s)	67.0		16.0	16.0	83.0	31.0		26.0
Total Lost Time (s)	5.0			5.5	5.0	5.0		
Act Effct Green (s)	54.4			45.9	105.8	19.0		
Actuated g/C Ratio	0.39			0.33	0.76	0.14		
v/c Ratio	0.84			0.08	0.38	0.78		
Control Delay	20.5			34.6	5.6	79.2		
Queue Delay	0.2			0.0	0.0	0.0		
Total Delay	20.7			34.6	5.6	79.2		
LOS	C			C	A	E		
Approach Delay	20.7				6.4	79.2		
Approach LOS	C				A	E		
Queue Length 50th (ft)	270			16	9	164		
Queue Length 95th (ft)	39			m51	432	237		
Internal Link Dist (ft)	521				488	647		
Turn Bay Length (ft)				150				
Base Capacity (vph)	1978			542	3752	326		
Starvation Cap Reductn	97			0	0	0		
Spillback Cap Reductn	0			0	172	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.77			0.08	0.39	0.56		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 70 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 17.5  
 Intersection Capacity Utilization 44.2%  
 Analysis Period (min) 15  
 Description: Note: Splits and offsets need to be optimized via synchro due to lack of coordination data  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Vale Street & Route 16

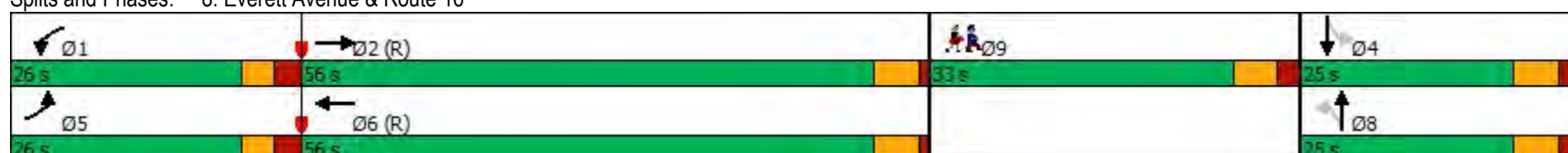


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	175	1153	176	56	1095	12	178	145	49	74	168	79	
Future Volume (vph)	175	1153	176	56	1095	12	178	145	49	74	168	79	
Satd. Flow (prot)	1728	4844	0	1711	4951	0	1745	1757	0	1728	1710	0	
Flt Permitted	0.950			0.950			0.452			0.507			
Satd. Flow (perm)	1728	4844	0	1709	4951	0	822	1757	0	917	1710	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	208	1444	0	102	1216	0	205	237	0	96	278	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	26.0	56.0		26.0	56.0		25.0	25.0		25.0	25.0		33.0
Total Lost Time (s)	5.5	5.0		5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)	19.1	58.8		12.7	52.4		47.2	47.2		47.2	47.2		
Actuated g/C Ratio	0.14	0.42		0.09	0.37		0.34	0.34		0.34	0.34		
v/c Ratio	0.89	0.71		0.66	0.66		0.74	0.40		0.31	0.48		
Control Delay	68.6	38.1		85.4	41.5		58.9	40.5		41.2	42.2		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	68.6	38.1		85.4	41.5		58.9	40.5		41.2	42.2		
LOS	E	D		F	D		E	D		D	D		
Approach Delay		42.0			44.9			49.0			41.9		
Approach LOS		D			D			D			D		
Queue Length 50th (ft)	165	493		99	275		156	156		61	189		
Queue Length 95th (ft)	#272	554		99	303		#378	265		119	#378		
Internal Link Dist (ft)		406			387			396			538		
Turn Bay Length (ft)	150			100			100			100			
Base Capacity (vph)	253	2034		250	1853		277	592		309	576		
Starvation Cap Reductn	0	0		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.82	0.71		0.41	0.66		0.74	0.40		0.31	0.48		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 43.8  
 Intersection Capacity Utilization 73.8%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Everett Avenue & Route 16





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑↑↑		↑	
Traffic Volume (vph)	0	1277	1199	183	153	4
Future Volume (vph)	0	1277	1199	183	153	4
Satd. Flow (prot)	0	4964	4858	0	1790	0
Flt Permitted					0.954	
Satd. Flow (perm)	0	4964	4858	0	1790	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	1316	1486	0	201	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		90.0	90.0		50.0	
Total Lost Time (s)		5.0	5.0		7.0	
Act Effct Green (s)		107.7	107.7		20.3	
Actuated g/C Ratio		0.77	0.77		0.14	
v/c Ratio		0.34	0.40		0.77	
Control Delay		1.9	2.6		76.6	
Queue Delay		0.0	0.1		0.0	
Total Delay		1.9	2.7		76.6	
LOS		A	A		E	
Approach Delay		1.9	2.7		76.6	
Approach LOS		A	A		E	
Queue Length 50th (ft)		39	52		179	
Queue Length 95th (ft)		31	106		213	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3817	3735		549	
Starvation Cap Reductn		0	592		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.34	0.47		0.37	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 7.3  
 Intersection Capacity Utilization 46.0%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 9: Route 16 & Union Street





													Ø9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	205	1077	148	102	1164	36	100	116	44	49	154	118	
Future Volume (vph)	205	1077	148	102	1164	36	100	116	44	49	154	118	
Satd. Flow (prot)	1745	4863	0	1745	4941	0	1752	1772	0	1770	1722	0	
Flt Permitted	0.950			0.950			*0.450			0.436			
Satd. Flow (perm)	1723	4863	0	1745	4941	0	819	1772	0	807	1722	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	223	1361	0	134	1237	0	128	225	0	56	323	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	17.0	68.0		15.0	66.0		30.0	30.0		30.0	30.0		27.0
Total Lost Time (s)	7.0	5.0		6.5	5.0		5.5	5.5		5.5	5.5		
Act Effct Green (s)	19.2	64.9		15.9	61.0		33.1	33.1		33.1	33.1		
Actuated g/C Ratio	0.14	0.46		0.11	0.44		0.24	0.24		0.24	0.24		
v/c Ratio	0.93	0.60		0.68	0.57		0.66	0.54		0.29	0.80		
Control Delay	101.0	21.6		76.7	31.1		67.4	53.5		50.9	66.1		
Queue Delay	0.0	0.7		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	101.0	22.3		76.7	31.1		67.4	53.5		50.9	66.1		
LOS	F	C		E	C		E	D		D	E		
Approach Delay		33.4			35.5			58.5			63.8		
Approach LOS		C			D			E			E		
Queue Length 50th (ft)	200	186		116	306		104	176		41	272		
Queue Length 95th (ft)	#484	298		#232	354		#169	212		87	#419		
Internal Link Dist (ft)		319			1066			414			597		
Turn Bay Length (ft)	100			150			150			150			
Base Capacity (vph)	239	2253		197	2152		193	418		190	406		
Starvation Cap Reductn	0	509		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.93	0.78		0.68	0.57		0.66	0.54		0.29	0.80		

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 39.7

Intersection LOS: D

Intersection Capacity Utilization 79.7%

ICU Level of Service D

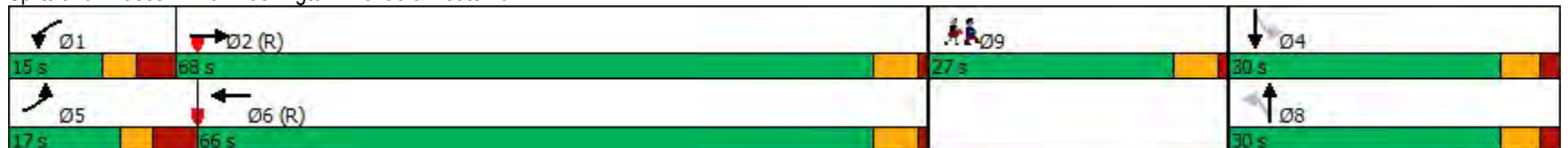
Analysis Period (min) 15

\* User Entered Value

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16



	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑		↑	↑		↑	↑		
Traffic Volume (vph)	0	1120	145	177	132	1169	23	250	216	185	175	159	170	
Future Volume (vph)	0	1120	145	177	132	1169	23	250	216	185	175	159	170	
Satd. Flow (prot)	0	4886	0	0	1685	4778	0	1787	1902	0	1787	1891	0	
Flt Permitted					0.950			*0.700			*0.700			
Satd. Flow (perm)	0	4886	0	0	1678	4778	0	1313	1902	0	1299	1891	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1291	0	0	344	1282	0	272	446	0	199	374	0	
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		Perm	NA		
Protected Phases		2		1	1	6		3	8			4		9
Permitted Phases								8			4			
Total Split (s)		44.0		32.0	32.0	76.0		15.0	46.0		31.0	31.0		28.0
Total Lost Time (s)		6.0			6.0	6.0		7.0	6.0		6.0	6.0		
Act Effct Green (s)		38.2			26.1	70.3		39.2	40.2		25.1	25.1		
Actuated g/C Ratio		0.30			0.21	0.56		0.31	0.32		0.20	0.20		
v/c Ratio		0.88			0.99	0.48		0.62	0.74		0.77	1.00		
Control Delay		50.1			96.0	18.7		45.2	48.1		69.5	96.8		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		50.1			96.0	18.7		45.2	48.1		69.5	96.8		
LOS		D			F	B		D	D		E	F		
Approach Delay		50.1				35.1			47.0			87.3		
Approach LOS		D				D			D			F		
Queue Length 50th (ft)		348			270	205		172	308		149	295		
Queue Length 95th (ft)		#564			#578	354		320	#577		#323	#599		
Internal Link Dist (ft)		409				879			820			473		
Turn Bay Length (ft)					100			150			100			
Base Capacity (vph)		1473			348	2654		436	603		257	375		
Starvation Cap Reductn		0			0	0		0	0		0	0		
Spillback Cap Reductn		0			0	0		0	0		0	0		
Storage Cap Reductn		0			0	0		0	0		0	0		
Reduced v/c Ratio		0.88			0.99	0.48		0.62	0.74		0.77	1.00		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 126.6  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 48.9  
 Intersection Capacity Utilization 95.7%  
 Analysis Period (min) 15  
 Description: Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16



Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	79.2	94.8	0.12	4.4	F
Second Street	III	35	18.3	52.3	70.6	0.14	7.3	F
Spring Street	III	35	12.6	27.4	40.0	0.09	8.4	F
Dunkin Donuts Lot	III	35	16.1	1.5	17.6	0.12	24.4	B
Vine Street	III	35	14.9	72.1	87.0	0.11	4.6	F
Vale Street	III	35	15.4	1.6	17.0	0.11	24.1	B
Everett Avenue	III	35	24.0	20.1	44.1	0.20	16.3	D
Union Street	III	35	32.0	0.6	32.6	0.27	29.4	B
Washington Avenue	III	35	10.2	21.7	31.9	0.08	8.5	F
Webster Avenue	III	35	37.2	57.1	94.3	0.31	11.8	E
Total	III		196.3	333.6	529.9	1.55	10.5	E

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	26.9	48.7	0.18	13.4	E
Washington Avenue	III	35	37.2	43.1	80.3	0.31	13.9	E
Union Street	III	35	10.2	1.9	12.1	0.08	22.5	C
Everett Avenue	III	35	32.0	71.5	103.5	0.27	9.3	F
Vale Street	III	35	24.0	10.8	34.8	0.20	20.7	C
Vine Street	III	35	15.4	51.8	67.2	0.11	6.1	F
South Ferry Street	III	35	14.9	18.4	33.3	0.11	11.9	E
Spring Street	III	35	16.1	34.8	50.9	0.12	8.4	F
Second Street	III	35	12.6	68.5	81.1	0.09	4.1	F
Lewis Street	III	35	18.3	54.9	73.2	0.14	7.0	F
Total	III		202.5	382.6	585.1	1.61	9.9	F

Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	83.9	99.5	0.12	4.2	F
Second Street	III	35	18.3	170.7	189.0	0.14	2.7	F
Spring Street	III	35	12.6	6.7	19.3	0.09	17.4	D
Dunkin Donuts Lot	III	35	16.1	4.1	20.2	0.12	21.3	C
Vine Street	III	35	14.9	70.8	85.7	0.11	4.6	F
Vale Street	III	35	15.4	22.3	37.7	0.11	10.9	E
Everett Avenue	III	35	24.0	64.4	88.4	0.20	8.1	F
Union Street	III	35	32.0	14.3	46.3	0.27	20.7	C
Washington Avenue	III	35	10.2	48.8	59.0	0.08	4.6	F
Webster Avenue	III	35	37.2	86.0	123.2	0.31	9.0	F
Total	III		196.3	572.0	768.3	1.55	7.2	F

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	26.1	47.9	0.18	13.7	E
Washington Avenue	III	35	37.2	51.2	88.4	0.31	12.6	E
Union Street	III	35	10.2	8.3	18.5	0.08	14.7	D
Everett Avenue	III	35	32.0	56.3	88.3	0.27	10.9	E
Vale Street	III	35	24.0	8.2	32.2	0.20	22.3	C
Vine Street	III	35	15.4	25.0	40.4	0.11	10.1	E
South Ferry Street	III	35	14.9	28.0	42.9	0.11	9.3	F
Spring Street	III	35	16.1	52.7	68.8	0.12	6.2	F
Second Street	III	35	12.6	35.2	47.8	0.09	7.0	F
Lewis Street	III	35	18.3	28.5	46.8	0.14	11.0	E
Total	III		202.5	319.5	522.0	1.61	11.1	E



Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	23.0	38.6	0.12	10.8	E
Second Street	III	35	18.3	73.9	92.2	0.14	5.6	F
Spring Street	III	35	12.6	6.9	19.5	0.09	17.2	D
Dunkin Donuts Lot	III	35	16.1	2.6	18.7	0.12	23.0	C
Vine Street	III	35	14.9	55.9	70.8	0.11	5.6	F
Vale Street	III	35	15.4	9.5	24.9	0.11	16.5	D
Everett Avenue	III	35	24.0	38.6	62.6	0.20	11.5	E
Union Street	III	35	32.0	2.1	34.1	0.27	28.1	B
Washington Avenue	III	35	10.2	16.9	27.1	0.08	10.0	E
Webster Avenue	III	35	37.2	70.9	108.1	0.31	10.3	E
Total	III		196.3	300.3	496.6	1.55	11.2	E

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	23.5	45.3	0.18	14.4	D
Washington Avenue	III	35	37.2	36.7	73.9	0.31	15.1	D
Union Street	III	35	10.2	0.9	11.1	0.08	24.5	B
Everett Avenue	III	35	32.0	45.0	77.0	0.27	12.5	E
Vale Street	III	32	25.4	12.9	38.3	0.20	18.8	C
Vine Street	III	35	15.4	25.9	41.3	0.11	9.9	F
South Ferry Street	III	35	14.9	12.6	27.5	0.11	14.5	D
Spring Street	III	35	16.1	28.9	45.0	0.12	9.5	F
Second Street	III	35	12.6	20.7	33.3	0.09	10.1	E
Lewis Street	III	35	18.3	26.5	44.8	0.14	11.5	E
Total	III		203.9	233.6	437.5	1.61	13.3	E

Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	16.8	32.4	0.12	12.9	E
Second Street	III	35	18.3	28.8	47.1	0.14	10.9	E
Spring Street	III	35	12.6	17.9	30.5	0.09	11.0	E
Dunkin Donuts Lot	III	35	16.1	2.1	18.2	0.12	23.6	C
Vine Street	III	35	14.9	31.0	45.9	0.11	8.7	F
Vale Street	III	35	15.4	20.5	35.9	0.11	11.4	E
Everett Avenue	III	35	24.0	38.1	62.1	0.20	11.6	E
Union Street	III	35	32.0	1.9	33.9	0.27	28.3	B
Washington Avenue	III	35	10.2	21.6	31.8	0.08	8.6	F
Webster Avenue	III	35	37.2	50.1	87.3	0.31	12.8	E
Total	III		196.3	228.8	425.1	1.55	13.1	E

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	18.7	40.5	0.18	16.1	D
Washington Avenue	III	35	37.2	31.1	68.3	0.31	16.3	D
Union Street	III	35	10.2	2.6	12.8	0.08	21.3	C
Everett Avenue	III	35	32.0	41.5	73.5	0.27	13.1	E
Vale Street	III	32	25.4	5.6	31.0	0.20	23.2	C
Vine Street	III	35	15.4	22.1	37.5	0.11	10.9	E
South Ferry Street	III	35	14.9	12.1	27.0	0.11	14.7	D
Spring Street	III	35	16.1	20.3	36.4	0.12	11.8	E
Second Street	III	35	12.6	20.7	33.3	0.09	10.1	E
Lewis Street	III	35	18.3	17.2	35.5	0.14	14.5	D
Total	III		203.9	191.9	395.8	1.61	14.7	D



## **Part 3: Future Intersection Levels of Service**







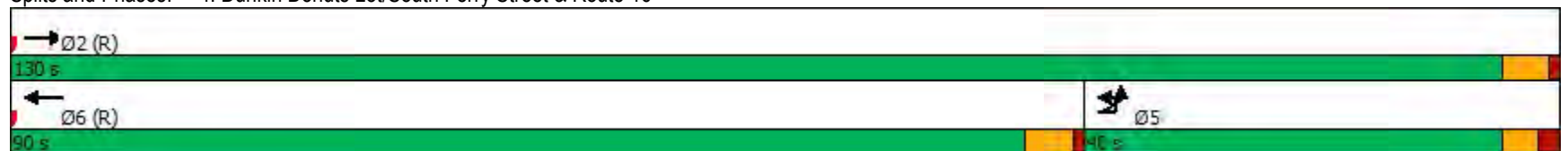


	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group													
Lane Configurations		↔	↑↑↑			↑↑↑				↔			
Traffic Volume (vph)	15	126	977	0	0	1591	128	0	0	92	0	0	0
Future Volume (vph)	15	126	977	0	0	1591	128	0	0	92	0	0	0
Satd. Flow (prot)	0	1121	3409	0	0	3415	0	0	0	1406	0	0	0
Flt Permitted		0.800											
Satd. Flow (perm)	0	1120	4262	0	0	3415	0	0	0	1406	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	168	1161	0	0	1827	0	0	0	186	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	40.0	40.0	130.0			90.0				130.0			
Total Lost Time (s)		5.0	5.0			5.0				5.0			
Act Effct Green (s)		25.0	130.0			95.0				130.0			
Actuated g/C Ratio		0.19	1.00			0.73				1.00			
v/c Ratio		0.78	0.34			0.73				0.13			
Control Delay		47.5	1.4			17.6				0.2			
Queue Delay		0.0	0.0			0.0				0.0			
Total Delay		47.5	1.4			17.6				0.2			
LOS		D	A			B				A			
Approach Delay			7.3			17.6			0.2				
Approach LOS			A			B			A				
Queue Length 50th (ft)		173	22			234				0			
Queue Length 95th (ft)		108	0			458				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		301	3409			2495				1406			
Starvation Cap Reductn		0	0			0				0			
Spillback Cap Reductn		0	0			0				0			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		0.56	0.34			0.73				0.13			

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 15 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 12.5  
 Intersection Capacity Utilization 50.2%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16





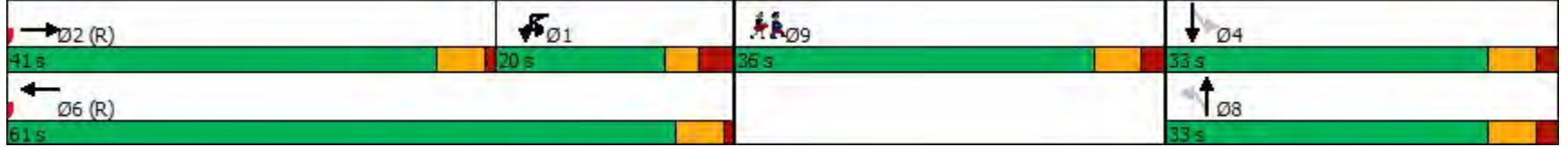
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations														
Traffic Volume (vph)	0	970	99	1	38	1486	22	52	53	28	41	170	181	
Future Volume (vph)	0	970	99	1	38	1486	22	52	53	28	41	170	181	
Satd. Flow (prot)	0	4557	0	0	1373	4853	0	0	1208	0	0	1224	0	
Flt Permitted					0.950				0.572			0.940		
Satd. Flow (perm)	0	4557	0	0	1351	4853	0	0	767	0	0	1277	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1136	0	0	41	1603	0	0	181	0	0	521	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		41.0		20.0	20.0	61.0		33.0	33.0		33.0	33.0		36.0
Total Lost Time (s)		5.0			6.0	5.0			6.0			6.0		
Act Effct Green (s)		40.0			12.8	56.0			58.2			58.2		
Actuated g/C Ratio		0.31			0.10	0.43			0.45			0.45		
v/c Ratio		0.81			0.31	0.77			0.53			0.91		
Control Delay		63.6			50.3	28.9			35.7			55.8		
Queue Delay		0.0			0.0	0.2			0.0			0.0		
Total Delay		63.6			50.3	29.1			35.7			55.8		
LOS		E			D	C			D			E		
Approach Delay		63.6				29.7			35.7			55.8		
Approach LOS		E				C			D			E		
Queue Length 50th (ft)		368			35	428			125			466		
Queue Length 95th (ft)		#429			m64	190			227			#776		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		1401			147	2090			343			571		
Starvation Cap Reductn		0			0	81			0			0		
Spillback Cap Reductn		0			0	0			0			0		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		0.81			0.28	0.80			0.53			0.91		

**Intersection Summary**

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 47 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 45.0 Intersection LOS: D  
 Intersection Capacity Utilization 65.7% ICU Level of Service C  
 Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Vine Street & Route 16

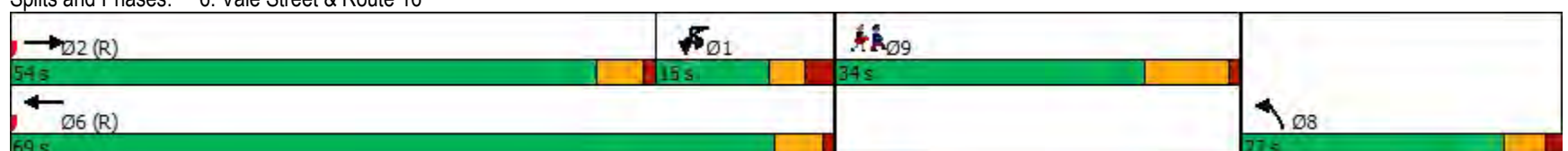


	→	↘	↶	↙	←	↖	↗	
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø9
Lane Configurations	↑↑↑			↘	↑↑↑	↖		
Traffic Volume (vph)	921	134	3	5	1425	117	2	
Future Volume (vph)	921	134	3	5	1425	117	2	
Satd. Flow (prot)	4178	0	0	1504	4868	1720	0	
Flt Permitted				0.900		0.953		
Satd. Flow (perm)	4178	0	0	1486	4868	1711	0	
Satd. Flow (RTOR)								
Lane Group Flow (vph)	1171	0	0	9	1582	153	0	
Turn Type	NA		Prot	Prot	NA	Prot		
Protected Phases	2		1	1	6	8		9
Permitted Phases								
Total Split (s)	54.0		15.0	15.0	69.0	27.0		34.0
Total Lost Time (s)	5.0			5.5	5.0	5.0		
Act Effct Green (s)	95.9			6.7	98.9	15.9		
Actuated g/C Ratio	0.74			0.05	0.76	0.12		
v/c Ratio	0.38			0.12	0.43	0.73		
Control Delay	1.7			61.2	7.9	74.1		
Queue Delay	0.0			0.0	0.3	0.0		
Total Delay	1.7			61.2	8.2	74.1		
LOS	A			E	A	E		
Approach Delay	1.7				8.5	74.1		
Approach LOS	A				A	E		
Queue Length 50th (ft)	16			7	118	126		
Queue Length 95th (ft)	m43			28	356	165		
Internal Link Dist (ft)	521				488	647		
Turn Bay Length (ft)				150				
Base Capacity (vph)	3082			109	3704	291		
Starvation Cap Reductn	0			0	1273	0		
Spillback Cap Reductn	0			0	0	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.38			0.08	0.65	0.53		

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 62 (48%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 9.2 Intersection LOS: A  
 Intersection Capacity Utilization 42.8% ICU Level of Service A  
 Analysis Period (min) 15  
 Description: Note: Splits and offsets need to be optimized via synchro due to lack of coordination data  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Vale Street & Route 16



	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations	↑↑↑		↘	↑↑↑	↖		
Traffic Volume (vph)	911	15	141	1433	1	42	
Future Volume (vph)	911	15	141	1433	1	42	
Satd. Flow (prot)	4586	0	1544	4821	1310	0	
Flt Permitted			0.950		0.999		
Satd. Flow (perm)	4586	0	1538	4821	1310	0	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	1051	0	155	1540	58	0	
Turn Type	NA		Prot	NA	Prot		
Protected Phases	2		1	6	8		9
Permitted Phases							
Total Split (s)	58.0		35.0	93.0	22.0		35.0
Total Lost Time (s)	6.0		6.0	6.0	6.0		
Act Effct Green (s)	92.7		22.0	121.9	13.2		
Actuated g/C Ratio	0.62		0.15	0.81	0.09		
v/c Ratio	0.37		0.69	0.39	0.50		
Control Delay	19.1		75.6	7.2	79.6		
Queue Delay	0.0		0.0	0.4	0.0		
Total Delay	19.1		75.6	7.6	79.6		
LOS	B		E	A	E		
Approach Delay	19.1			13.8	79.6		
Approach LOS	B			B	E		
Queue Length 50th (ft)	166		146	114	55		
Queue Length 95th (ft)	366		216	370	85		
Internal Link Dist (ft)	488			406	880		
Turn Bay Length (ft)			150				
Base Capacity (vph)	2833		298	3917	139		
Starvation Cap Reductn	0		0	1632	0		
Spillback Cap Reductn	0		0	0	0		
Storage Cap Reductn	0		0	0	0		
Reduced v/c Ratio	0.37		0.52	0.67	0.42		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 17.1  
 Intersection Capacity Utilization 47.7%  
 Analysis Period (min) 15

Intersection LOS: B  
ICU Level of Service A

Splits and Phases: 7: Boston Street & Route 16

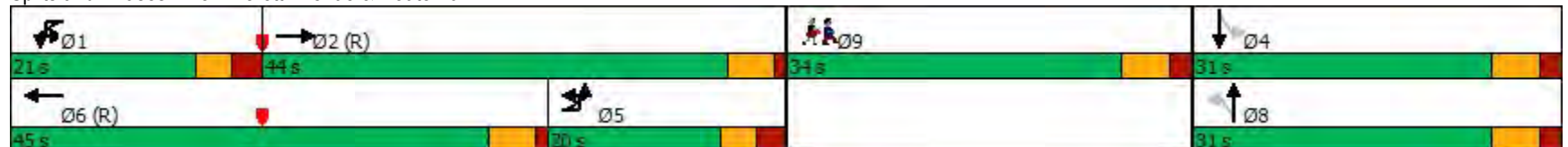


	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations		↔	↔↔↔			↔	↔↔↔		↔	↔		↔	↔		
Traffic Volume (vph)	10	63	745	146	2	74	1387	8	126	76	34	71	221	51	
Future Volume (vph)	10	63	745	146	2	74	1387	8	126	76	34	71	221	51	
Satd. Flow (prot)	0	1679	4455	0	0	1634	4808	0	1711	1605	0	1678	1561	0	
Flt Permitted		0.950				0.950			0.419			0.664			
Satd. Flow (perm)	0	1674	4455	0	0	1616	4808	0	751	1605	0	1167	1561	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	98	1058	0	0	108	1467	0	159	139	0	105	357	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	20.0	20.0	44.0		21.0	21.0	45.0		31.0	31.0		31.0	31.0		34.0
Total Lost Time (s)		5.5	5.0			5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)		14.5	39.4			15.1	40.0		54.2	54.2		54.2	54.2		
Actuated g/C Ratio		0.11	0.30			0.12	0.31		0.42	0.42		0.42	0.42		
v/c Ratio		0.52	0.78			0.57	0.99		0.51	0.21		0.22	0.55		
Control Delay		65.4	46.4			44.2	48.4		38.0	27.9		28.7	34.7		
Queue Delay		0.0	0.1			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		65.4	46.5			44.2	48.4		38.0	27.9		28.7	34.7		
LOS		E	D			D	D		D	C		C	C		
Approach Delay			48.1				48.1			33.3			33.4		
Approach LOS			D				D			C			C		
Queue Length 50th (ft)		79	298			74	463		91	69		52	209		
Queue Length 95th (ft)		114	331			98	#581		#212	141		97	352		
Internal Link Dist (ft)			406				387			396			538		
Turn Bay Length (ft)		150				100			100			100			
Base Capacity (vph)		187	1348			194	1479		312	669		486	650		
Starvation Cap Reductn		0	13			0	0		0	0		0	0		
Spillback Cap Reductn		0	0			0	0		0	0		0	0		
Storage Cap Reductn		0	0			0	0		0	0		0	0		
Reduced v/c Ratio		0.52	0.79			0.56	0.99		0.51	0.21		0.22	0.55		

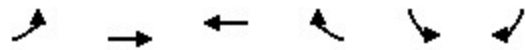
Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 63 (48%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 44.9  
 Intersection LOS: D  
 Intersection Capacity Utilization 74.4%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Everett Avenue & Route 16





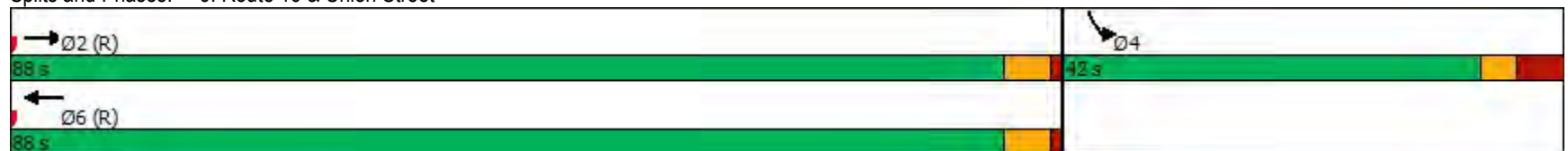


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↑	
Traffic Volume (vph)	0	852	1487	182	175	12
Future Volume (vph)	0	852	1487	182	175	12
Satd. Flow (prot)	0	4600	4703	0	1763	0
Flt Permitted					0.955	
Satd. Flow (perm)	0	4600	4703	0	1763	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	989	1738	0	207	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		88.0	88.0		42.0	
Total Lost Time (s)		5.0	5.0		7.0	
Act Effct Green (s)		98.3	98.3		19.7	
Actuated g/C Ratio		0.76	0.76		0.15	
v/c Ratio		0.28	0.49		0.78	
Control Delay		3.3	2.2		71.7	
Queue Delay		0.0	0.2		0.0	
Total Delay		3.4	2.5		71.7	
LOS		A	A		E	
Approach Delay		3.4	2.5		71.7	
Approach LOS		A	A		E	
Queue Length 50th (ft)		0	25		170	
Queue Length 95th (ft)		190	93		243	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3476	3554		474	
Starvation Cap Reductn		0	896		0	
Spillback Cap Reductn		365	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.32	0.65		0.44	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 111 (85%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 7.7  
 Intersection Capacity Utilization 53.7%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 9: Route 16 & Union Street



	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖		↖	↖		
Traffic Volume (vph)	80	769	178	179	1429	33	136	89	19	57	190	104	
Future Volume (vph)	80	769	178	179	1429	33	136	89	19	57	190	104	
Satd. Flow (prot)	1694	4510	0	1662	4742	0	1719	1660	0	1736	1651	0	
Flt Permitted	0.950			0.950			0.393			0.656			
Satd. Flow (perm)	1685	4510	0	1662	4742	0	703	1660	0	1173	1651	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	99	1052	0	220	1554	0	168	133	0	76	339	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	12.0	35.0		24.0	47.0		43.0	43.0		43.0	43.0		28.0
Total Lost Time (s)	5.0	5.0		4.5	5.0		5.5	5.5		5.5	5.5		
Act Effct Green (s)	13.4	42.2		21.3	49.6		46.9	46.9		46.9	46.9		
Actuated g/C Ratio	0.10	0.32		0.16	0.38		0.36	0.36		0.36	0.36		
v/c Ratio	0.57	0.72		0.81	0.86		0.66	0.22		0.18	0.57		
Control Delay	91.9	28.0		74.6	43.3		49.7	30.4		30.2	38.2		
Queue Delay	0.0	0.7		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	91.9	28.7		74.6	43.3		49.7	30.4		30.2	38.2		
LOS	F	C		E	D		D	C		C	D		
Approach Delay		34.2			47.2			41.2			36.7		
Approach LOS		C			D			D			D		
Queue Length 50th (ft)	86	319		177	433		114	75		42	221		
Queue Length 95th (ft)	#185	#449		#281	#602		#216	127		75	348		
Internal Link Dist (ft)		319			1066			414			597		
Turn Bay Length (ft)	100			150			150			150			
Base Capacity (vph)	173	1463		281	1809		253	598		423	595		
Starvation Cap Reductn	0	156		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.57	0.80		0.78	0.86		0.66	0.22		0.18	0.57		

**Intersection Summary**  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 41.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 78.5%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑		↔	↑↑↑		↑	↑		↑	↑		
Traffic Volume (vph)	0	748	113	203	1752	1	218	122	168	214	167	233	
Future Volume (vph)	0	748	113	203	1752	1	218	122	168	214	167	233	
Satd. Flow (prot)	0	4567	0	1668	4700	0	1641	1808	0	1770	1856	0	
Flt Permitted				0.950			*0.500			*0.600			
Satd. Flow (perm)	0	4567	0	1668	4700	0	863	1808	0	1112	1856	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	989	0	250	1904	0	260	371	0	264	483	0	
Turn Type		NA		Prot	NA		pm+pt	NA		Perm	NA		
Protected Phases		2		1	6		3	8			4		9
Permitted Phases							8			4			
Total Split (s)		36.0		30.0	66.0		15.0	57.0		42.0	42.0		28.0
Total Lost Time (s)		6.0		6.0	6.0		7.0	7.0		6.0	6.0		
Act Effct Green (s)		31.1		23.2	60.3		50.2	50.2		36.2	36.2		
Actuated g/C Ratio		0.24		0.18	0.47		0.39	0.39		0.28	0.28		
v/c Ratio		0.89		0.83	0.86		0.67	0.52		0.84	0.92		
Control Delay		57.8		73.1	35.4		40.9	34.1		67.1	68.5		
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		57.8		73.1	35.4		40.9	34.1		67.1	68.5		
LOS		E		E	D		D	C		E	E		
Approach Delay		57.8			39.8			36.9			68.0		
Approach LOS		E			D			D			E		
Queue Length 50th (ft)		279		190	464		144	217		195	368		
Queue Length 95th (ft)		#453		#343	#772		#281	356		#394	#687		
Internal Link Dist (ft)		409			879			820			473		
Turn Bay Length (ft)				100			150			100			
Base Capacity (vph)		1112		315	2220		388	711		315	526		
Starvation Cap Reductn		0		0	0		0	0		0	0		
Spillback Cap Reductn		0		0	0		0	0		0	0		
Storage Cap Reductn		0		0	0		0	0		0	0		
Reduced v/c Ratio		0.89		0.79	0.86		0.67	0.52		0.84	0.92		

Intersection Summary

Cycle Length: 151

Actuated Cycle Length: 127.6

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 48.0

Intersection LOS: D

Intersection Capacity Utilization 87.0%

ICU Level of Service E

Analysis Period (min) 15

Description: Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min

\* User Entered Value

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16



	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	2426	29	0	2154	5	22	14	9	9	14	27	
Future Volume (vph)	0	2426	29	0	2154	5	22	14	9	9	14	27	
Satd. Flow (prot)	0	3101	0	0	3131	0	0	1747	0	0	1677	0	
Flt Permitted								0.797			0.940		
Satd. Flow (perm)	0	3101	0	0	3131	0	0	1410	0	0	1585	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2742	0	0	2387	0	0	68	0	0	60	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		93.0			93.0		23.0	23.0		23.0	23.0		35.0
Total Lost Time (s)		5.0			5.0			5.5			5.5		
Act Effct Green (s)		117.0			117.0			14.2			14.1		
Actuated g/C Ratio		0.77			0.77			0.09			0.09		
v/c Ratio		1.14			0.98			0.52			0.41		
Control Delay		89.5			34.8			77.8			71.4		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		89.5			34.8			77.8			71.4		
LOS		F			C			E			E		
Approach Delay		89.5			34.8			77.8			71.4		
Approach LOS		F			C			E			E		
Queue Length 50th (ft)		~1081			479			65			57		
Queue Length 95th (ft)		#1453			#1187			88			100		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		2402			2426			167			187		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		1.14			0.98			0.41			0.32		

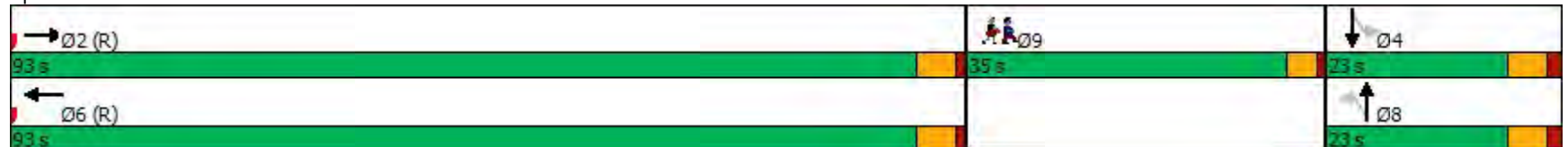
Intersection Summary

Cycle Length: 151  
 Actuated Cycle Length: 151  
 Offset: 34 (23%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.14  
 Intersection Signal Delay: 64.3  
 Intersection Capacity Utilization 68.1%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service C

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Lewis Street & Route 16





													Ø9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	0	2027	417	0	1839	128	268	51	2	45	41	52	
Future Volume (vph)	0	2027	417	0	1839	128	268	51	2	45	41	52	
Satd. Flow (prot)	0	4885	0	0	5029	0	1388	851	0	0	1759	0	
Flt Permitted							0.603	0.659			0.800		
Satd. Flow (perm)	0	4885	0	0	5029	0	875	797	0	0	1430	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2701	0	0	2086	0	182	188	0	0	166	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		67.0			67.0		45.0	45.0		45.0	45.0		38.0
Total Lost Time (s)		6.0			6.0		6.0	6.0			6.0		
Act Effct Green (s)		88.0			88.0		45.6	45.6			45.6		
Actuated g/C Ratio		0.59			0.59		0.30	0.30			0.30		
v/c Ratio		0.94			0.71		0.69	0.78			0.38		
Control Delay		37.0			7.9		58.6	68.5			42.4		
Queue Delay		26.2			0.5		0.0	0.0			1.0		
Total Delay		63.2			8.4		58.6	68.5			43.4		
LOS		E			A		E	E			D		
Approach Delay		63.2			8.4			63.6			43.4		
Approach LOS		E			A			E			D		
Queue Length 50th (ft)		812			77		193	174			127		
Queue Length 95th (ft)		#1348			m745		288	263			174		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)							300						
Base Capacity (vph)		2866			2951		272	248			445		
Starvation Cap Reductn		310			389		0	0			0		
Spillback Cap Reductn		199			0		0	0			120		
Storage Cap Reductn		0			0		0	0			0		
Reduced v/c Ratio		1.06			0.81		0.67	0.76			0.51		

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 70 (47%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 41.1

Intersection LOS: D

Intersection Capacity Utilization 77.0%

ICU Level of Service D

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Second Street & Route 16



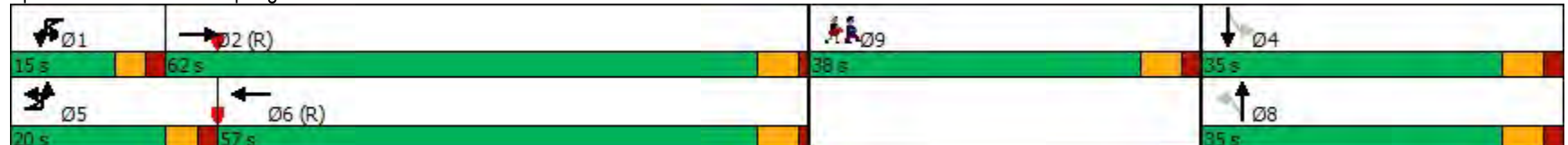
	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations		↔	↔↔↔			↔	↔↔↔			↔			↔		
Traffic Volume (vph)	35	114	1871	45	39	44	1742	50	49	50	60	26	35	132	
Future Volume (vph)	35	114	1871	45	39	44	1742	50	49	50	60	26	35	132	
Satd. Flow (prot)	0	1720	5111	0	0	1727	4894	0	0	1408	0	0	1374	0	
Flt Permitted		0.950				0.950				0.785			0.930		
Satd. Flow (perm)	0	1711	5111	0	0	1719	4894	0	0	1227	0	0	1419	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	187	2140	0	0	102	1920	0	0	203	0	0	253	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	20.0	20.0	62.0		15.0	15.0	57.0		35.0	35.0		35.0	35.0		38.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		19.0	62.0			11.1	54.0			51.4			51.4		
Actuated g/C Ratio		0.13	0.41			0.07	0.36			0.34			0.34		
v/c Ratio		0.86	1.01			0.80	1.09			0.48			0.52		
Control Delay		98.3	47.6			94.1	76.2			46.1			46.5		
Queue Delay		0.0	33.7			0.0	4.5			0.0			0.0		
Total Delay		98.3	81.3			94.1	80.7			46.1			46.5		
LOS		F	F			F	F			D			D		
Approach Delay			82.7				81.4			46.1			46.5		
Approach LOS			F				F			D			D		
Queue Length 50th (ft)		195	390			91	~738			174			220		
Queue Length 95th (ft)		m#238	#930			m107	#913			250			303		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		218	2111			129	1761			420			485		
Starvation Cap Reductn		0	277			0	204			0			0		
Spillback Cap Reductn		0	0			0	146			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		0.86	1.17			0.79	1.23			0.48			0.52		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 60 (40%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 78.7  
 Intersection Capacity Utilization 77.6%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service D

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Spring Street & Route 16

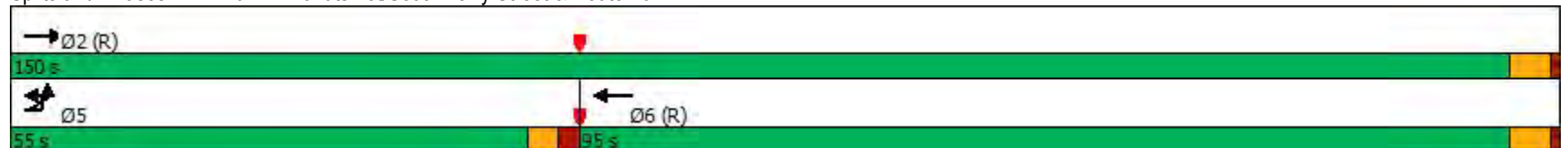


	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group													
Lane Configurations		↔	↑↑↑			↑↑↑↔				↔			
Traffic Volume (vph)	21	330	1645	0	0	1808	69	0	0	72	0	0	0
Future Volume (vph)	21	330	1645	0	0	1808	69	0	0	72	0	0	0
Satd. Flow (prot)	0	1310	3576	0	0	3484	0	0	0	1655	0	0	0
Flt Permitted		0.900											
Satd. Flow (perm)	0	1309	4471	0	0	3484	0	0	0	1655	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	384	1799	0	0	2011	0	0	0	135	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	55.0	55.0	150.0			95.0				150.0			
Total Lost Time (s)		5.0	5.0			5.0				5.0			
Act Effct Green (s)		46.3	150.0			93.7				150.0			
Actuated g/C Ratio		0.31	1.00			0.62				1.00			
v/c Ratio		0.95	0.50			0.92				0.08			
Control Delay		45.6	5.7			24.1				0.1			
Queue Delay		0.0	1.8			45.6				0.1			
Total Delay		45.6	7.5			69.7				0.2			
LOS		D	A			E				A			
Approach Delay			14.2			69.7			0.2				
Approach LOS			B			E			A				
Queue Length 50th (ft)		487	42			836				0			
Queue Length 95th (ft)		m502	m453			m#931				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		436	3576			2177				1655			
Starvation Cap Reductn		0	0			535				0			
Spillback Cap Reductn		0	1541			441				712			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		0.88	0.88			1.22				0.14			

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 3 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 39.6  
 Intersection Capacity Utilization 67.1%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16



	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑			↑			↑		
Traffic Volume (vph)	0	1631	86	18	24	1606	139	135	194	29	54	101	136	
Future Volume (vph)	0	1631	86	18	24	1606	139	135	194	29	54	101	136	
Satd. Flow (prot)	0	4863	0	0	1669	4846	0	0	1618	0	0	1396	0	
Flt Permitted					0.950				0.636			0.819		
Satd. Flow (perm)	0	4863	0	0	1649	4846	0	0	1046	0	0	1269	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1859	0	0	51	1888	0	0	443	0	0	360	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		55.0		15.0	15.0	70.0		45.0	45.0		45.0	45.0		35.0
Total Lost Time (s)		5.0			6.0	5.0			6.0			6.0		
Act Effct Green (s)		53.4			8.4	65.0			64.4			64.4		
Actuated g/C Ratio		0.36			0.06	0.43			0.43			0.43		
v/c Ratio		1.07			0.55	0.90			0.99			0.66		
Control Delay		99.7			86.1	47.7			81.2			43.9		
Queue Delay		11.0			0.0	46.8			0.0			0.0		
Total Delay		110.6			86.1	94.6			81.2			43.9		
LOS		F			F	F			F			D		
Approach Delay		110.6				94.4			81.2			43.9		
Approach LOS		F				F			F			D		
Queue Length 50th (ft)		~783			51	523			415			271		
Queue Length 95th (ft)		#893			m85	593			#781			#505		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		1731			100	2099			449			545		
Starvation Cap Reductn		49			0	24			0			0		
Spillback Cap Reductn		0			0	745			0			0		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		1.11			0.51	1.39			0.99			0.66		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 95.7  
 Intersection Capacity Utilization 83.9%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service E

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

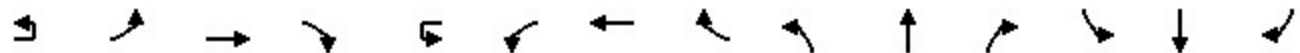
Splits and Phases: 5: Vine Street & Route 16









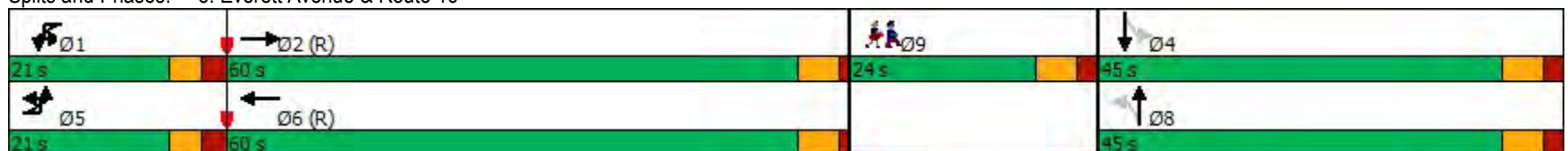


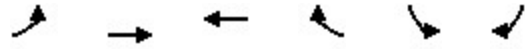
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		☞	☞☞☞			☞	☞☞☞		☞	☞		☞	☞		
Traffic Volume (vph)	49	184	1377	158	8	57	1224	21	185	230	50	55	151	42	
Future Volume (vph)	49	184	1377	158	8	57	1224	21	185	230	50	55	151	42	
Satd. Flow (prot)	0	1724	4786	0	0	1685	4896	0	1694	1738	0	1601	1744	0	
Flt Permitted		0.950				0.950			0.509			0.310			
Satd. Flow (perm)	0	1697	4786	0	0	1663	4896	0	897	1738	0	518	1744	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	278	1714	0	0	76	1348	0	218	363	0	80	220	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	21.0	21.0	60.0		21.0	21.0	60.0		45.0	45.0		45.0	45.0		24.0
Total Lost Time (s)		5.5	5.0			5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)		22.3	62.2			15.1	55.0		46.6	46.6		46.6	46.6		
Actuated g/C Ratio		0.15	0.41			0.10	0.37		0.31	0.31		0.31	0.31		
v/c Ratio		1.09	0.86			0.45	0.75		0.78	0.67		0.50	0.41		
Control Delay		135.4	34.5			71.4	52.0		68.1	53.5		57.3	45.0		
Queue Delay		0.0	1.4			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		135.4	35.8			71.4	52.0		68.1	53.5		57.3	45.0		
LOS		F	D			E	D		E	D		E	D		
Approach Delay			49.7				53.1			59.0			48.3		
Approach LOS			D				D			E			D		
Queue Length 50th (ft)		242	449			75	331		180	287		59	157		
Queue Length 95th (ft)		m#526	m#689			127	380		#372	403		101	271		
Internal Link Dist (ft)			406				387			396			538		
Turn Bay Length (ft)		150				100			100			100			
Base Capacity (vph)		256	1985			174	1795		278	539		160	541		
Starvation Cap Reductn		0	121			0	0		0	0		0	0		
Spillback Cap Reductn		0	0			0	0		0	0		0	0		
Storage Cap Reductn		0	0			0	0		0	0		0	0		
Reduced v/c Ratio		1.09	0.92			0.44	0.75		0.78	0.67		0.50	0.41		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 52.0      Intersection LOS: D  
 Intersection Capacity Utilization 87.5%      ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Everett Avenue & Route 16





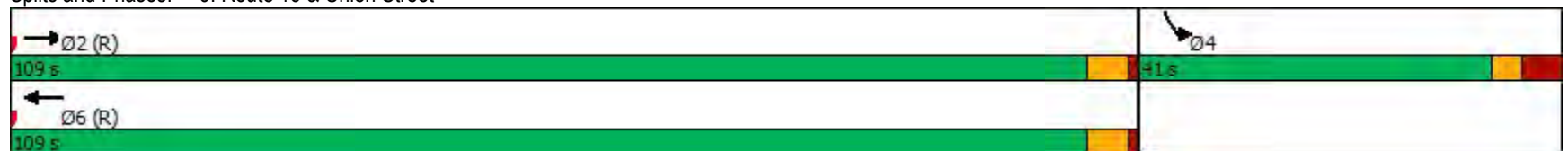
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↑	
Traffic Volume (vph)	0	1490	1299	224	126	11
Future Volume (vph)	0	1490	1299	224	126	11
Satd. Flow (prot)	0	4868	4797	0	1764	0
Flt Permitted					0.956	
Satd. Flow (perm)	0	4868	4797	0	1764	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	1701	1684	0	151	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		109.0	109.0		41.0	
Total Lost Time (s)		5.0	5.0		7.0	
Act Effct Green (s)		120.7	120.7		17.3	
Actuated g/C Ratio		0.80	0.80		0.12	
v/c Ratio		0.43	0.44		0.75	
Control Delay		10.6	1.9		85.3	
Queue Delay		15.5	0.4		0.0	
Total Delay		26.1	2.3		85.3	
LOS		C	A		F	
Approach Delay		26.1	2.3		85.3	
Approach LOS		C	A		F	
Queue Length 50th (ft)		207	49		145	
Queue Length 95th (ft)		328	45		215	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3918	3861		399	
Starvation Cap Reductn		0	1422		0	
Spillback Cap Reductn		2240	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		1.01	0.69		0.38	

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 100 (67%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 17.3  
 Intersection Capacity Utilization 49.7%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 9: Route 16 & Union Street





																Ø9
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9		
Lane Configurations																
Traffic Volume (vph)	218	1185	213	20	135	1264	31	139	234	23	57	133	120			
Future Volume (vph)	218	1185	213	20	135	1264	31	139	234	23	57	133	120			
Satd. Flow (prot)	1745	4734	0	0	1730	4891	0	1736	1799	0	1770	1665	0			
Flt Permitted	0.950				0.950			0.576			0.253					
Satd. Flow (perm)	1735	4734	0	0	1711	4891	0	1019	1799	0	467	1665	0			
Satd. Flow (RTOR)																
Lane Group Flow (vph)	263	1687	0	0	183	1494	0	172	300	0	67	302	0			
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		pm+pt	NA				
Protected Phases	5	2		1	1	6			8		7	4		9		
Permitted Phases								8			4					
Total Split (s)	20.0	55.0		20.0	20.0	55.0		26.0	26.0		19.0	45.0		30.0		
Total Lost Time (s)	6.5	5.0			6.5	5.0		5.5	5.5		6.0	5.5				
Act Effct Green (s)	22.9	51.2			21.7	50.0		35.6	35.6		50.4	50.9				
Actuated g/C Ratio	0.15	0.34			0.14	0.33		0.24	0.24		0.34	0.34				
v/c Ratio	0.99	1.04			0.73	0.92		0.71	0.70		0.26	0.53				
Control Delay	111.2	82.1			78.2	57.8		70.8	63.3		37.9	44.8				
Queue Delay	0.0	23.1			0.0	0.0		0.0	0.0		0.0	0.0				
Total Delay	111.2	105.2			78.2	57.8		70.8	63.3		37.9	44.8				
LOS	F	F			E	E		E	E		D	D				
Approach Delay		106.1				60.0			66.0			43.6				
Approach LOS		F				E			E			D				
Queue Length 50th (ft)	272	~627			169	514		153	266		43	226				
Queue Length 95th (ft)	#545	#699			#370	582		#306	#498		86	344				
Internal Link Dist (ft)		319				1066			414			597				
Turn Bay Length (ft)	100				150			150			150					
Base Capacity (vph)	266	1617			249	1630		242	427		274	565				
Starvation Cap Reductn	0	144			0	0		0	0		0	0				
Spillback Cap Reductn	0	0			0	0		0	0		0	0				
Storage Cap Reductn	0	0			0	0		0	0		0	0				
Reduced v/c Ratio	0.99	1.15			0.73	0.92		0.71	0.70		0.24	0.53				

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.04  
 Intersection Signal Delay: 79.4  
 Intersection Capacity Utilization 83.9%  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16

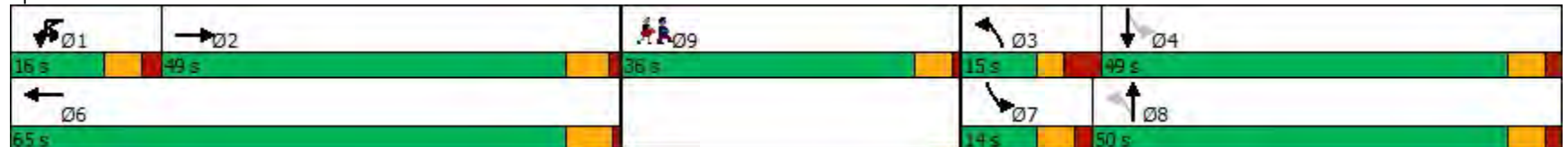


	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	∅9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	∅9
Lane Configurations		↑↑↑		↘	↑↑↑		↘	↑		↘	↑		
Traffic Volume (vph)	0	1164	181	111	1194	13	288	349	219	226	270	175	
Future Volume (vph)	0	1164	181	111	1194	13	288	349	219	226	270	175	
Satd. Flow (prot)	0	4775	0	1685	4783	0	1736	1923	0	1787	1916	0	
Flt Permitted				0.950			*0.900			*0.900			
Satd. Flow (perm)	0	4775	0	1683	4783	0	1638	1923	0	1682	1916	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	1441	0	128	1393	0	344	648	0	264	557	0	
Turn Type		NA		Prot	NA		pm+pt	NA		pm+pt	NA		
Protected Phases		2		1	6		3	8		7	4		9
Permitted Phases							8			4			
Total Split (s)		49.0		16.0	65.0		15.0	50.0		14.0	49.0		36.0
Total Lost Time (s)		6.0		6.0	6.0		7.0	6.0		6.0	6.0		
Act Effct Green (s)		43.6		10.1	59.8		51.7	44.6		51.7	43.6		
Actuated g/C Ratio		0.30		0.07	0.42		0.36	0.31		0.36	0.30		
v/c Ratio		0.99		1.08	0.70		0.58	1.08		0.43	0.95		
Control Delay		70.4		165.1	38.7		42.6	106.5		37.4	76.5		
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		70.4		165.1	38.7		42.6	106.5		37.4	76.5		
LOS		E		F	D		D	F		D	E		
Approach Delay		70.4			49.3			84.3			63.9		
Approach LOS		E			D			F			E		
Queue Length 50th (ft)		419		109	320		197	537		140	436		
Queue Length 95th (ft)		#761		#317	557		400	#1116		302	#822		
Internal Link Dist (ft)		409			879			820			473		
Turn Bay Length (ft)				100			150			100			
Base Capacity (vph)		1455		119	2000		597	599		614	584		
Starvation Cap Reductn		0		0	0		0	0		0	0		
Spillback Cap Reductn		0		0	0		0	0		0	0		
Storage Cap Reductn		0		0	0		0	0		0	0		
Reduced v/c Ratio		0.99		1.08	0.70		0.58	1.08		0.43	0.95		

Intersection Summary

Cycle Length: 165  
 Actuated Cycle Length: 143  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 65.5  
 Intersection LOS: E  
 Intersection Capacity Utilization 102.4%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 Description: Note: turning movement counts show no volume heading southbound on Webster. Volumes shown were extrapolated from 2016 TMCs  
 Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

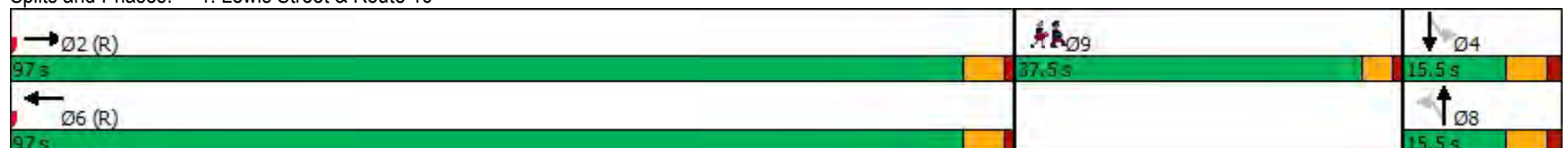
Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16



	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	∅9
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	∅9
Lane Configurations		↑↑↑			↑↑↑			↕			↕		
Traffic Volume (vph)	0	2108	18	0	2045	24	15	8	9	24	20	21	
Future Volume (vph)	0	2108	18	0	2045	24	15	8	9	24	20	21	
Satd. Flow (prot)	0	3305	0	0	4322	0	0	1773	0	0	1760	0	
Flt Permitted								*0.900			*0.900		
Satd. Flow (perm)	0	3305	0	0	4322	0	0	1633	0	0	1602	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2257	0	0	2395	0	0	44	0	0	81	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		97.0			97.0		15.5	15.5		15.5	15.5		37.5
Total Lost Time (s)		5.0			5.0			5.5			5.5		
Act Effct Green (s)		115.2			115.2			15.5			15.5		
Actuated g/C Ratio		0.77			0.77			0.10			0.10		
v/c Ratio		0.89			0.72			0.26			0.49		
Control Delay		21.2			30.3			64.5			72.9		
Queue Delay		2.8			3.0			0.0			45.2		
Total Delay		24.0			33.3			64.5			118.1		
LOS		C			C			E			F		
Approach Delay		24.0			33.3			64.5			118.1		
Approach LOS		C			C			E			F		
Queue Length 50th (ft)		366			799			40			76		
Queue Length 95th (ft)		#966			852			66			120		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		2538			3320			168			165		
Starvation Cap Reductn		0			795			0			0		
Spillback Cap Reductn		187			0			0			82		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.96			0.95			0.26			0.98		

**Intersection Summary**  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 36 (24%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 30.7  
 Intersection Capacity Utilization 57.8%  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Lewis Street & Route 16



	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group													
Lane Configurations		↑↑↑			↑↑↑		↑	↑			↑		
Traffic Volume (vph)	0	1712	428	0	1702	132	306	74	8	43	60	61	
Future Volume (vph)	0	1712	428	0	1702	132	306	74	8	43	60	61	
Satd. Flow (prot)	0	4881	0	0	5083	0	1665	1580	0	0	1767	0	
Flt Permitted							0.579	0.666			0.816		
Satd. Flow (perm)	0	4881	0	0	5083	0	1011	1167	0	0	1461	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2320	0	0	2249	0	227	238	0	0	203	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		81.0			81.0		34.0	34.0		34.0	34.0		35.0
Total Lost Time (s)		6.0			6.0		6.0	6.0			6.0		
Act Effct Green (s)		75.0			75.0		54.2	54.2			54.2		
Actuated g/C Ratio		0.50			0.50		0.36	0.36			0.36		
v/c Ratio		0.95			0.89		0.62	0.57			0.39		
Control Delay		52.1			16.0		51.0	47.7			41.1		
Queue Delay		28.7			0.5		7.2	3.8			0.9		
Total Delay		80.8			16.6		58.2	51.5			42.0		
LOS		F			B		E	D			D		
Approach Delay		80.8			16.6			54.8			42.0		
Approach LOS		F			B			D			D		
Queue Length 50th (ft)		748			128		173	176			133		
Queue Length 95th (ft)		926			m149		#343	318			231		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)							300						
Base Capacity (vph)		2440			2541		365	421			527		
Starvation Cap Reductn		259			64		0	0			0		
Spillback Cap Reductn		194			72		96	111			139		
Storage Cap Reductn		0			0		0	0			0		
Reduced v/c Ratio		1.06			0.91		0.84	0.77			0.52		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 110 (73%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 49.4  
 Intersection Capacity Utilization 79.7%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Second Street & Route 16



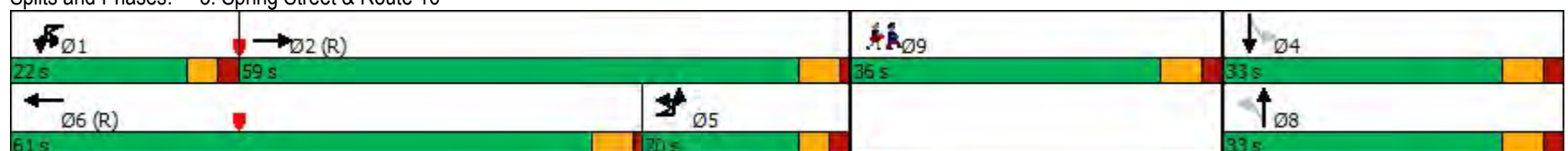


	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations		↔	↑↑↑			↔	↑↑↑			↔			↔		
Traffic Volume (vph)	47	109	1561	46	66	54	1608	45	63	51	85	40	43	116	
Future Volume (vph)	47	109	1561	46	66	54	1608	45	63	51	85	40	43	116	
Satd. Flow (prot)	0	1488	5063	0	0	1449	4940	0	0	1420	0	0	1403	0	
Flt Permitted		0.900				0.900				*0.800			*0.810		
Satd. Flow (perm)	0	1485	5063	0	0	1443	4940	0	0	1262	0	0	1262	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	171	1689	0	0	165	1980	0	0	241	0	0	247	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	20.0	20.0	59.0		22.0	22.0	61.0		33.0	33.0		33.0	33.0		36.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		15.0	61.4			20.4	66.9			42.5			42.5		
Actuated g/C Ratio		0.10	0.41			0.14	0.45			0.28			0.28		
v/c Ratio		1.16	0.81			0.84	0.90			0.67			0.69		
Control Delay		131.7	13.9			82.7	26.1			59.2			60.1		
Queue Delay		0.0	17.6			0.0	3.1			0.0			0.0		
Total Delay		131.7	31.5			82.7	29.1			59.2			60.1		
LOS		F	C			F	C			E			E		
Approach Delay			40.7				33.2			59.2			60.1		
Approach LOS			D				C			E			E		
Queue Length 50th (ft)		~224	287			153	554			231			238		
Queue Length 95th (ft)		m#250	m627			#267	#809			334			333		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		148	2073			197	2201			358			358		
Starvation Cap Reductn		0	423			0	144			0			0		
Spillback Cap Reductn		0	0			0	102			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		1.16	1.02			0.84	0.96			0.67			0.69		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 146 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.16  
 Intersection Signal Delay: 39.2      Intersection LOS: D  
 Intersection Capacity Utilization 74.3%      ICU Level of Service D  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Spring Street & Route 16



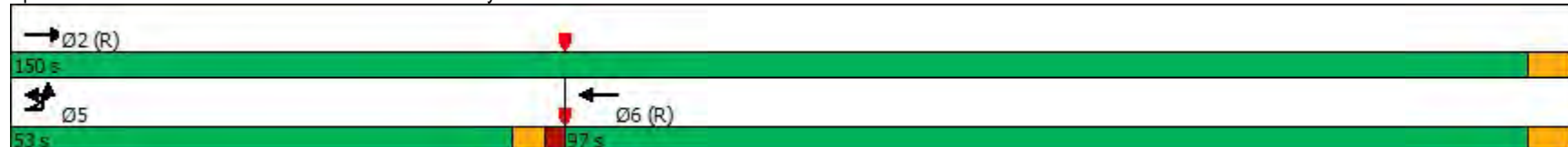
	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group													
Lane Configurations		↔	↑↑↑			↑↑↑↔				↔			
Traffic Volume (vph)	21	221	1510	0	0	1732	67	0	0	60	0	0	0
Future Volume (vph)	21	221	1510	0	0	1732	67	0	0	60	0	0	0
Satd. Flow (prot)	0	1170	3576	0	0	4295	0	0	0	1589	0	0	0
Flt Permitted		0.800											
Satd. Flow (perm)	0	1169	4471	0	0	4295	0	0	0	1589	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	271	1672	0	0	2105	0	0	0	67	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	53.0	53.0	150.0			97.0				150.0			
Total Lost Time (s)		5.0	5.0			5.0				5.0			
Act Effct Green (s)		38.0	150.0			102.0				150.0			
Actuated g/C Ratio		0.25	1.00			0.68				1.00			
v/c Ratio		0.92	0.47			0.72				0.04			
Control Delay		54.2	4.2			12.9				0.0			
Queue Delay		0.0	0.6			0.7				0.0			
Total Delay		54.2	4.8			13.7				0.1			
LOS		D	A			B				A			
Approach Delay			11.7			13.7			0.1				
Approach LOS			B			B			A				
Queue Length 50th (ft)		350	180			578				0			
Queue Length 95th (ft)		m435	497			935				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		374	3576			2921				1589			
Starvation Cap Reductn		0	0			446				0			
Spillback Cap Reductn		0	1358			313				603			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		0.72	0.75			0.85				0.07			

**Intersection Summary**

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 83 (55%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 12.5  
 Intersection Capacity Utilization 58.2%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16

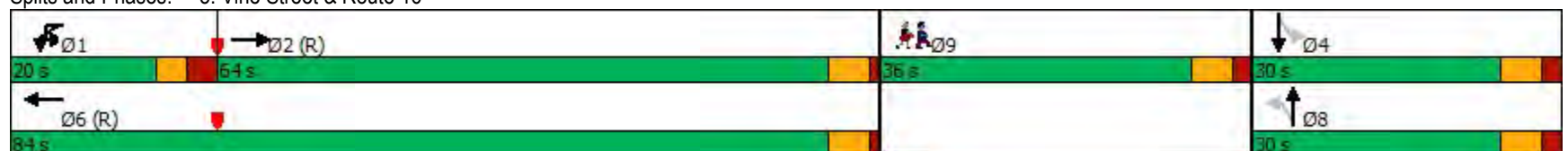


	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑			↑			↑		
Traffic Volume (vph)	0	1462	108	9	22	1540	95	127	103	37	75	120	132	
Future Volume (vph)	0	1462	108	9	22	1540	95	127	103	37	75	120	132	
Satd. Flow (prot)	0	4855	0	0	1504	4870	0	0	1790	0	0	1718	0	
Flt Permitted					0.900				0.587			0.831		
Satd. Flow (perm)	0	4855	0	0	1495	4870	0	0	1073	0	0	1441	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1739	0	0	44	1754	0	0	303	0	0	370	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		64.0		20.0	20.0	84.0		30.0	30.0		30.0	30.0		36.0
Total Lost Time (s)		5.0			6.0	5.0			6.0			6.0		
Act Effct Green (s)		66.7			9.1	79.0			55.2			55.2		
Actuated g/C Ratio		0.44			0.06	0.53			0.37			0.37		
v/c Ratio		0.81			0.48	0.68			0.77			0.70		
Control Delay		58.2			76.5	26.6			56.1			49.1		
Queue Delay		5.0			0.0	0.3			0.0			0.0		
Total Delay		63.2			76.5	26.8			56.1			49.1		
LOS		E			E	C			E			D		
Approach Delay		63.2				28.1			56.1			49.1		
Approach LOS		E				C			E			D		
Queue Length 50th (ft)		630			48	418			247			290		
Queue Length 95th (ft)		700			81	550			#548			#609		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		2158			140	2564			395			530		
Starvation Cap Reductn		178			0	214			0			0		
Spillback Cap Reductn		357			0	245			0			0		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		0.97			0.31	0.76			0.77			0.70		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 86 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 46.5  
 Intersection Capacity Utilization 71.1%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Vine Street & Route 16

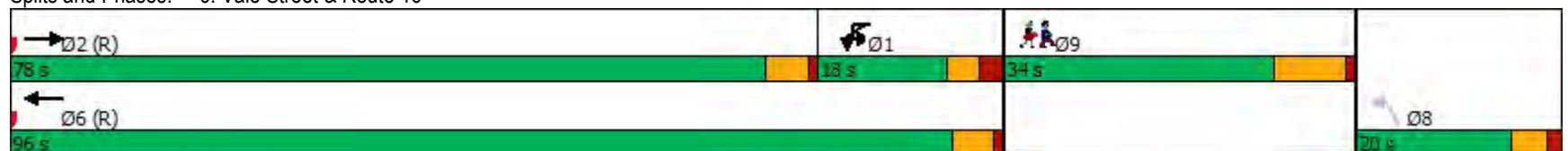


	→	↘	↙	←	↖	↗	↘	Ø9
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø9
Lane Configurations	↑↑↑			↔	↑↑↑	↔		
Traffic Volume (vph)	1413	187	17	7	1442	224	1	
Future Volume (vph)	1413	187	17	7	1442	224	1	
Satd. Flow (prot)	4816	0	0	1745	4916	1791	0	
Flt Permitted				0.950		0.953		
Satd. Flow (perm)	4816	0	0	1745	4916	1770	0	
Satd. Flow (RTOR)								
Lane Group Flow (vph)	1916	0	0	26	1547	249	0	
Turn Type	NA		Prot	Prot	NA	Perm		
Protected Phases	2		1	1	6			9
Permitted Phases						8		
Total Split (s)	78.0		18.0	18.0	96.0	20.0		34.0
Total Lost Time (s)	5.0			5.5	5.0	5.0		
Act Effct Green (s)	89.4			9.9	100.2	34.6		
Actuated g/C Ratio	0.60			0.07	0.67	0.23		
v/c Ratio	0.67			0.23	0.47	0.61		
Control Delay	16.1			54.2	9.8	60.4		
Queue Delay	2.7			0.0	0.0	1.6		
Total Delay	18.8			54.2	9.8	62.0		
LOS	B			D	A	E		
Approach Delay	18.8				10.5	62.0		
Approach LOS	B				B	E		
Queue Length 50th (ft)	478			19	124	224		
Queue Length 95th (ft)	736			m45	115	#410		
Internal Link Dist (ft)	521				488	335		
Turn Bay Length (ft)				150				
Base Capacity (vph)	2870			145	3284	408		
Starvation Cap Reductn	806			0	261	0		
Spillback Cap Reductn	168			0	0	57		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.93			0.18	0.51	0.71		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 111 (74%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 18.2 Intersection LOS: B  
 Intersection Capacity Utilization 53.6% ICU Level of Service A  
 Analysis Period (min) 15  
 Description: Note: Splits and offsets need to be optimized via synchro due to lack of coordination data  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Vale Street & Route 16





	→	↘	↙	←	↗	↖	↘	↙
Lane Group	EBT	EBR	WBU	WBL	WBT	NEL	NER	Ø9
Lane Configurations	↑↑↑			↓	↑↑↑	↑		
Traffic Volume (vph)	1386	63	23	91	1464	2	185	
Future Volume (vph)	1386	63	23	91	1464	2	185	
Satd. Flow (prot)	4874	0	0	1719	4916	1577	0	
Flt Permitted				0.950		0.999		
Satd. Flow (perm)	4874	0	0	1719	4916	1577	0	
Satd. Flow (RTOR)								
Lane Group Flow (vph)	1601	0	0	140	1621	213	0	
Turn Type	NA		Prot	Prot	NA	Prot		
Protected Phases	2		1	1	6	8		9
Permitted Phases								
Total Split (s)	61.0		22.0	22.0	83.0	31.0		36.0
Total Lost Time (s)	6.0			6.0	6.0	6.0		
Act Effct Green (s)	81.9			18.1	106.0	25.0		
Actuated g/C Ratio	0.55			0.12	0.71	0.17		
v/c Ratio	0.60			0.68	0.47	0.81		
Control Delay	7.8			75.5	5.7	83.8		
Queue Delay	0.4			0.0	0.2	0.0		
Total Delay	8.2			75.5	6.0	83.8		
LOS	A			E	A	F		
Approach Delay	8.2				11.5	83.8		
Approach LOS	A				B	F		
Queue Length 50th (ft)	136			140	76	204		
Queue Length 95th (ft)	658			m172	m218	153		
Internal Link Dist (ft)	488				406	316		
Turn Bay Length (ft)								
Base Capacity (vph)	2661			212	3474	262		
Starvation Cap Reductn	358			0	917	0		
Spillback Cap Reductn	502			0	0	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.74			0.66	0.63	0.81		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 146 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 14.3  
 Intersection Capacity Utilization 62.8%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Boston Street & Route 16



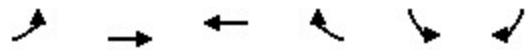
	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations		↔	↑↑↑			↔	↑↑↑		↔	↑		↔	↑		
Traffic Volume (vph)	59	127	1221	187	6	95	1213	18	230	173	82	90	219	76	
Future Volume (vph)	59	127	1221	187	6	95	1213	18	230	173	82	90	219	76	
Satd. Flow (prot)	0	1734	4807	0	0	1697	4900	0	1728	1713	0	1694	1745	0	
Flt Permitted		0.950				0.950			0.382			0.423			
Satd. Flow (perm)	0	1728	4807	0	0	1689	4900	0	689	1713	0	751	1745	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	211	1480	0	0	127	1441	0	255	292	0	103	323	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	25.0	25.0	60.0		25.0	25.0	60.0		27.0	27.0		27.0	27.0		38.0
Total Lost Time (s)		5.5	5.0			5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)		19.3	57.9			16.6	55.2		49.4	49.4		49.4	49.4		
Actuated g/C Ratio		0.13	0.39			0.11	0.37		0.33	0.33		0.33	0.33		
v/c Ratio		0.95	0.80			0.68	0.80		1.12	0.52		0.42	0.56		
Control Delay		116.9	29.1			73.3	75.8		141.8	47.8		50.0	48.7		
Queue Delay		0.0	0.7			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		116.9	29.8			73.3	75.8		141.8	47.8		50.0	48.7		
LOS		F	C			E	E		F	D		D	D		
Approach Delay			40.7				75.6			91.6			49.0		
Approach LOS			D				E			F			D		
Queue Length 50th (ft)		179	543			128	516		239	208		71	234		
Queue Length 95th (ft)		m#371	136			186	582		#539	379		163	#441		
Internal Link Dist (ft)			406				387			396			538		
Turn Bay Length (ft)		150				100			100			100			
Base Capacity (vph)		225	1854			220	1803		227	563		247	574		
Starvation Cap Reductn		0	132			0	0		0	0		0	0		
Spillback Cap Reductn		0	0			0	0		0	0		0	0		
Storage Cap Reductn		0	0			0	0		0	0		0	0		
Reduced v/c Ratio		0.94	0.86			0.58	0.80		1.12	0.52		0.42	0.56		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.12  
 Intersection Signal Delay: 61.0  
 Intersection Capacity Utilization 90.0%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Everett Avenue & Route 16



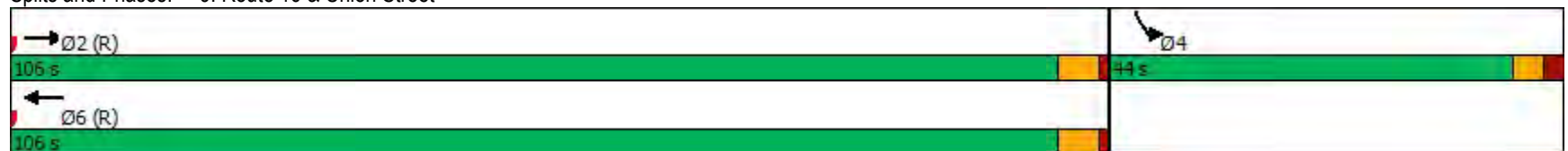


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↑	
Traffic Volume (vph)	0	1432	1315	175	146	11
Future Volume (vph)	0	1432	1315	175	146	11
Satd. Flow (prot)	0	4916	4828	0	1799	0
Flt Permitted					0.955	
Satd. Flow (perm)	0	4916	4828	0	1799	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	1490	1739	0	180	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		106.0	106.0		44.0	
Total Lost Time (s)		5.0	5.0		5.0	
Act Effct Green (s)		120.5	120.5		19.5	
Actuated g/C Ratio		0.80	0.80		0.13	
v/c Ratio		0.38	0.45		0.77	
Control Delay		1.4	2.4		83.8	
Queue Delay		0.0	0.1		0.0	
Total Delay		1.5	2.5		83.8	
LOS		A	A		F	
Approach Delay		1.5	2.5		83.8	
Approach LOS		A	A		F	
Queue Length 50th (ft)		13	61		173	
Queue Length 95th (ft)		79	105		243	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3949	3878		467	
Starvation Cap Reductn		0	888		0	
Spillback Cap Reductn		91	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.39	0.58		0.39	

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 6 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 6.3  
 Intersection Capacity Utilization 47.5%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 9: Route 16 & Union Street



														Ø9
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations														
Traffic Volume (vph)	212	1188	178	12	76	1224	38	113	123	55	60	158	153	
Future Volume (vph)	212	1188	178	12	76	1224	38	113	123	55	60	158	153	
Satd. Flow (prot)	1745	4757	0	0	1701	4891	0	1736	1756	0	1770	1708	0	
Flt Permitted	0.950				0.950			*0.450			0.457			
Satd. Flow (perm)	1741	4757	0	0	1695	4891	0	818	1756	0	848	1708	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	237	1481	0	0	119	1383	0	132	208	0	66	341	0	
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)	22.0	59.0		22.0	22.0	59.0		39.0	39.0		39.0	39.0		30.0
Total Lost Time (s)	8.0	5.0			7.5	5.0		5.5	5.5		5.5	5.5		
Act Effct Green (s)	29.7	74.3			13.6	57.7		35.0	35.0		35.0	35.0		
Actuated g/C Ratio	0.20	0.50			0.09	0.38		0.23	0.23		0.23	0.23		
v/c Ratio	0.69	0.63			0.78	0.74		0.69	0.51		0.34	0.86		
Control Delay	77.9	16.3			97.2	42.8		71.3	53.8		51.3	75.4		
Queue Delay	0.0	0.6			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	77.9	16.8			97.2	42.8		71.3	53.8		51.3	75.4		
LOS	E	B			F	D		E	D		D	E		
Approach Delay		25.3				47.1			60.6			71.5		
Approach LOS		C				D			E			E		
Queue Length 50th (ft)	238	156			114	397		118	177		54	319		
Queue Length 95th (ft)	#507	331			156	502		188	245		99	427		
Internal Link Dist (ft)		319				1066			414			597		
Turn Bay Length (ft)	100				150			150			150			
Base Capacity (vph)	344	2355			169	1880		199	428		206	416		
Starvation Cap Reductn	0	434			0	0		0	0		0	0		
Spillback Cap Reductn	0	0			0	0		0	0		0	0		
Storage Cap Reductn	0	0			0	0		0	0		0	0		
Reduced v/c Ratio	0.69	0.77			0.70	0.74		0.66	0.49		0.32	0.82		

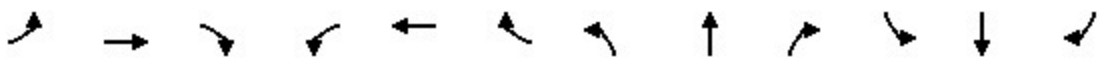
Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 26 (17%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 41.3  
 Intersection Capacity Utilization 85.9%  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16







Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑		↔	↑↑↑		↔	↑		↔	↑		
Traffic Volume (vph)	0	1225	184	128	1172	13	299	209	229	190	170	146	
Future Volume (vph)	0	1225	184	128	1172	13	299	209	229	190	170	146	
Satd. Flow (prot)	0	4777	0	1711	4906	0	1752	1886	0	1787	1913	0	
Flt Permitted				0.950			*0.800			*0.800			
Satd. Flow (perm)	0	4777	0	1711	4906	0	1474	1886	0	1492	1913	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	1561	0	145	1285	0	346	501	0	215	353	0	
Turn Type		NA		Prot	NA		pm+pt	NA		pm+pt	NA		
Protected Phases		2		1	6		3	8		7	4		9
Permitted Phases							8			4			
Total Split (s)		46.0		20.0	66.0		17.0	39.0		14.0	35.0		32.0
Total Lost Time (s)		6.0		6.0	6.0		7.0	6.0		6.0	6.0		
Act Effct Green (s)		40.2		13.7	59.9		42.2	33.2		38.2	30.2		
Actuated g/C Ratio		0.33		0.11	0.49		0.34	0.27		0.31	0.25		
v/c Ratio		1.00		0.77	0.54		0.66	0.99		0.45	0.75		
Control Delay		64.8		79.5	24.0		40.5	82.1		34.2	55.4		
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		64.8		79.5	24.0		40.5	82.1		34.2	55.4		
LOS		E		E	C		D	F		C	E		
Approach Delay		64.8			29.6			65.1			47.4		
Approach LOS		E			C			E			D		
Queue Length 50th (ft)		430		109	234		201	379		112	250		
Queue Length 95th (ft)		#720		#262	388		373	#763		225	#491		
Internal Link Dist (ft)		409			879			820			473		
Turn Bay Length (ft)				100			150			100			
Base Capacity (vph)		1558		195	2401		527	508		481	468		
Starvation Cap Reductn		0		0	0		0	0		0	0		
Spillback Cap Reductn		0		0	0		0	0		0	0		
Storage Cap Reductn		0		0	0		0	0		0	0		
Reduced v/c Ratio		1.00		0.74	0.54		0.66	0.99		0.45	0.75		

**Intersection Summary**

Cycle Length: 151  
 Actuated Cycle Length: 123.2  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 51.2                                  Intersection LOS: D  
 Intersection Capacity Utilization 93.4%                                  ICU Level of Service F  
 Analysis Period (min) 15  
 Description: Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

**Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16**

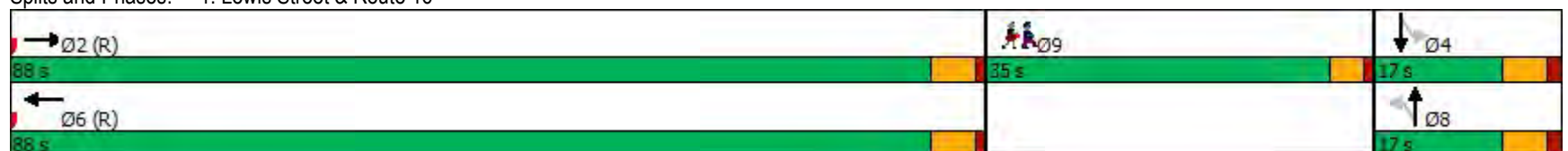


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑			↑			↑		
Traffic Volume (vph)	0	1958	13	0	1726	6	20	5	9	7	9	16	
Future Volume (vph)	0	1958	13	0	1726	6	20	5	9	7	9	16	
Satd. Flow (prot)	0	2919	0	0	3406	0	0	1639	0	0	1581	0	
Flt Permitted								0.846			0.924		
Satd. Flow (perm)	0	2919	0	0	3406	0	0	1538	0	0	1619	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2115	0	0	2099	0	0	39	0	0	36	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		88.0			88.0		17.0	17.0		17.0	17.0		35.0
Total Lost Time (s)		5.0			5.0			5.5			5.5		
Act Effct Green (s)		109.1			109.1			10.9			10.9		
Actuated g/C Ratio		0.78			0.78			0.08			0.08		
v/c Ratio		0.93			0.79			0.33			0.29		
Control Delay		26.2			19.8			67.8			66.0		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		26.2			19.8			67.8			66.0		
LOS		C			B			E			E		
Approach Delay		26.2			19.8			67.8			66.0		
Approach LOS		C			B			E			E		
Queue Length 50th (ft)		302			335			34			32		
Queue Length 95th (ft)		#957			#739			73			68		
Internal Link Dist (ft)		532			675			497			190		
Turn Bay Length (ft)													
Base Capacity (vph)		2275			2655			133			139		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.93			0.79			0.29			0.26		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 120 (86%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 23.8  
 Intersection Capacity Utilization 56.9%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Lewis Street & Route 16



	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑			↑↑↑		↖	↕			↕		
Traffic Volume (vph)	0	1605	369	0	1445	77	267	96	13	48	55	20	
Future Volume (vph)	0	1605	369	0	1445	77	267	96	13	48	55	20	
Satd. Flow (prot)	0	4578	0	0	5091	0	1577	1519	0	0	1818	0	
Flt Permitted							0.594	0.744			0.654		
Satd. Flow (perm)	0	4578	0	0	5091	0	1038	1255	0	0	1212	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	2187	0	0	1781	0	213	231	0	0	195	0	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		9
Permitted Phases							8			4			
Total Split (s)		67.0			67.0		36.0	36.0		36.0	36.0		37.0
Total Lost Time (s)		6.0			6.0		6.0	6.0			6.0		
Act Effct Green (s)		73.8			73.8		45.4	45.4			45.4		
Actuated g/C Ratio		0.53			0.53		0.32	0.32			0.32		
v/c Ratio		0.91			0.66		0.63	0.57			0.50		
Control Delay		25.5			25.9		50.4	45.9			43.6		
Queue Delay		5.3			0.8		0.0	0.0			0.0		
Total Delay		30.7			26.7		50.4	45.9			43.6		
LOS		C			C		D	D			D		
Approach Delay		30.7			26.7			48.1			43.6		
Approach LOS		C			C			D			D		
Queue Length 50th (ft)		542			270		174	192			144		
Queue Length 95th (ft)		#902			m308		268	276			150		
Internal Link Dist (ft)		675			412			757			460		
Turn Bay Length (ft)							300						
Base Capacity (vph)		2413			2683		336	407			392		
Starvation Cap Reductn		0			533		0	0			0		
Spillback Cap Reductn		190			134		0	0			0		
Storage Cap Reductn		0			0		0	0			0		
Reduced v/c Ratio		0.98			0.83		0.63	0.57			0.50		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 2 (1%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 31.4      Intersection LOS: C  
 Intersection Capacity Utilization 67.7%      ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Second Street & Route 16



	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group															
Lane Configurations															
Traffic Volume (vph)	38	106	1466	56	45	66	1345	39	23	55	67	30	46	117	
Future Volume (vph)	38	106	1466	56	45	66	1345	39	23	55	67	30	46	117	
Satd. Flow (prot)	0	1745	5047	0	0	1724	4938	0	0	1419	0	0	1401	0	
Flt Permitted		0.950				0.950				*0.800			*0.810		
Satd. Flow (perm)	0	1741	5047	0	0	1712	4938	0	0	1261	0	0	1259	0	
Satd. Flow (RTOR)															
Lane Group Flow (vph)	0	168	1650	0	0	143	1584	0	0	169	0	0	265	0	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	5	2		1	1	6			8			4		9
Permitted Phases									8			4			
Total Split (s)	25.0	25.0	52.0		25.0	25.0	52.0		30.0	30.0		30.0	30.0		33.0
Total Lost Time (s)		5.0	5.0			5.0	5.0			6.0			6.0		
Act Effct Green (s)		26.6	58.8			14.7	47.0			45.6			45.6		
Actuated g/C Ratio		0.19	0.42			0.10	0.34			0.33			0.33		
v/c Ratio		0.51	0.78			0.79	0.96			0.41			0.65		
Control Delay		69.0	12.7			91.4	59.2			43.1			50.6		
Queue Delay		0.0	1.8			0.0	0.0			0.0			0.0		
Total Delay		69.0	14.5			91.4	59.2			43.1			50.6		
LOS		E	B			F	E			D			D		
Approach Delay			19.5				61.8			43.1			50.6		
Approach LOS			B				E			D			D		
Queue Length 50th (ft)		93	387			139	479			134			230		
Queue Length 95th (ft)		m159	#632			m175	#601			235			#314		
Internal Link Dist (ft)			412				550			363			385		
Turn Bay Length (ft)		150				225									
Base Capacity (vph)		331	2120			246	1657			411			410		
Starvation Cap Reductn		0	298			0	0			0			0		
Spillback Cap Reductn		0	0			0	0			0			0		
Storage Cap Reductn		0	0			0	0			0			0		
Reduced v/c Ratio		0.51	0.91			0.58	0.96			0.41			0.65		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 25 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 41.0  
 Intersection Capacity Utilization 66.0%  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Spring Street & Route 16





	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group													
Lane Configurations		↔	↑↑↑			↑↑↑				↗			
Traffic Volume (vph)	13	277	1318	0	0	1455	73	0	0	20	0	0	0
Future Volume (vph)	13	277	1318	0	0	1455	73	0	0	20	0	0	0
Satd. Flow (prot)	0	1164	3612	0	0	4328	0	0	0	1589	0	0	0
Flt Permitted		0.800											
Satd. Flow (perm)	0	1163	4515	0	0	4328	0	0	0	1589	0	0	0
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	336	1492	0	0	1692	0	0	0	22	0	0	0
Turn Type	Prot	Prot	NA			NA				Perm			
Protected Phases	5	5	2			6							
Permitted Phases										2			
Total Split (s)	65.0	65.0	140.0			75.0				140.0			
Total Lost Time (s)		5.0	6.0			6.0				6.0			
Act Effct Green (s)		60.0	140.0			69.0				140.0			
Actuated g/C Ratio		0.43	1.00			0.49				1.00			
v/c Ratio		0.67	0.41			0.79				0.01			
Control Delay		63.7	2.3			21.3				0.0			
Queue Delay		0.0	0.0			0.2				0.0			
Total Delay		63.7	2.3			21.5				0.0			
LOS		E	A			C				A			
Approach Delay			13.6			21.5							
Approach LOS			B			C							
Queue Length 50th (ft)		391	42			204				0			
Queue Length 95th (ft)		m518	93			251				0			
Internal Link Dist (ft)			550			503			557			380	
Turn Bay Length (ft)		225											
Base Capacity (vph)		498	3612			2133				1589			
Starvation Cap Reductn		0	0			0				0			
Spillback Cap Reductn		0	0			74				0			
Storage Cap Reductn		0	0			0				0			
Reduced v/c Ratio		0.67	0.41			0.82				0.01			

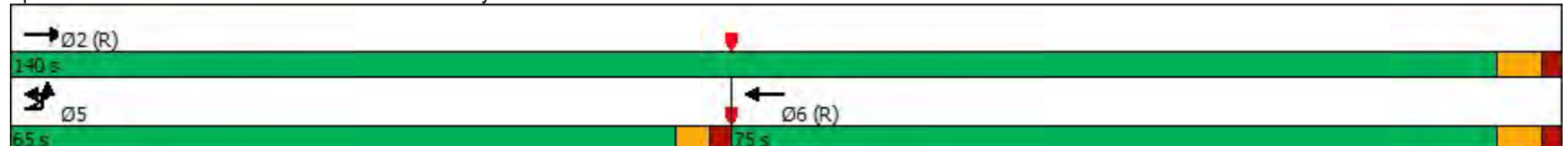
Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 20 (14%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 17.3  
 Intersection Capacity Utilization 56.4%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service B

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Dunkin Donuts Lot/South Ferry Street & Route 16



	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Group														
Lane Configurations		↑↑↑			↑	↑↑↑			↑			↑		
Traffic Volume (vph)	0	1262	76	2	17	1332	73	64	112	42	59	104	132	
Future Volume (vph)	0	1262	76	2	17	1332	73	64	112	42	59	104	132	
Satd. Flow (prot)	0	4462	0	0	1504	4922	0	0	1645	0	0	1596	0	
Flt Permitted					0.900				0.734			0.847		
Satd. Flow (perm)	0	4462	0	0	1498	4922	0	0	1224	0	0	1364	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	0	1531	0	0	28	1573	0	0	303	0	0	338	0	
Turn Type		NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)		49.0		22.0	22.0	71.0		33.0	33.0		33.0	33.0		36.0
Total Lost Time (s)		5.0			6.0	6.0			6.0			6.0		
Act Effct Green (s)		52.8			12.8	65.0			58.2			58.2		
Actuated g/C Ratio		0.38			0.09	0.46			0.42			0.42		
v/c Ratio		0.91			0.20	0.69			0.60			0.60		
Control Delay		34.5			81.5	48.8			39.6			38.9		
Queue Delay		0.4			0.0	3.8			1.4			1.3		
Total Delay		34.9			81.5	52.6			41.0			40.2		
LOS		C			F	D			D			D		
Approach Delay		34.9				53.1			41.0			40.2		
Approach LOS		C				D			D			D		
Queue Length 50th (ft)		~577			27	495			218			243		
Queue Length 95th (ft)		#656			m54	610			330			#523		
Internal Link Dist (ft)		503				521			407			333		
Turn Bay Length (ft)					100									
Base Capacity (vph)		1682			171	2285			508			566		
Starvation Cap Reductn		0			0	611			0			0		
Spillback Cap Reductn		18			0	0			80			89		
Storage Cap Reductn		0			0	0			0			0		
Reduced v/c Ratio		0.92			0.16	0.94			0.71			0.71		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 40 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 43.6  
 Intersection Capacity Utilization 59.0%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service B

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Vine Street & Route 16





	→	↘	↙	←	↗	↘	↙	∅9
Lane Group	EBT	EBR	WBU	WBL	WBT	NEL	NER	∅9
Lane Configurations	↑↑↑↑			↘	↑↑↑↑	↘		
Traffic Volume (vph)	1363	2	20	7	1253	171	0	
Future Volume (vph)	1363	2	20	7	1253	171	0	
Satd. Flow (prot)	4916	0	0	1711	4916	1711	0	
Flt Permitted				0.950		0.738		
Satd. Flow (perm)	4916	0	0	1711	4916	1329	0	
Satd. Flow (RTOR)								
Lane Group Flow (vph)	1528	0	0	30	1403	191	0	
Turn Type	NA		Prot	Prot	NA	Perm		
Protected Phases	2		1	1	6			9
Permitted Phases						8		
Total Split (s)	63.0		14.0	14.0	77.0	37.0		26.0
Total Lost Time (s)	6.0			6.0	6.0	6.0		
Act Effct Green (s)	91.8			9.9	102.1	25.9		
Actuated g/C Ratio	0.66			0.07	0.73	0.18		
v/c Ratio	0.47			0.25	0.39	0.78		
Control Delay	10.1			45.2	26.2	74.9		
Queue Delay	0.1			0.0	1.7	0.0		
Total Delay	10.2			45.2	27.9	74.9		
LOS	B			D	C	E		
Approach Delay	10.2				28.2	74.9		
Approach LOS	B				C	E		
Queue Length 50th (ft)	20			27	397	166		
Queue Length 95th (ft)	383			m34	m372	248		
Internal Link Dist (ft)	488				406	275		
Turn Bay Length (ft)								
Base Capacity (vph)	3222			122	3584	294		
Starvation Cap Reductn	311			0	1928	0		
Spillback Cap Reductn	369			0	0	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.54			0.25	0.85	0.65		

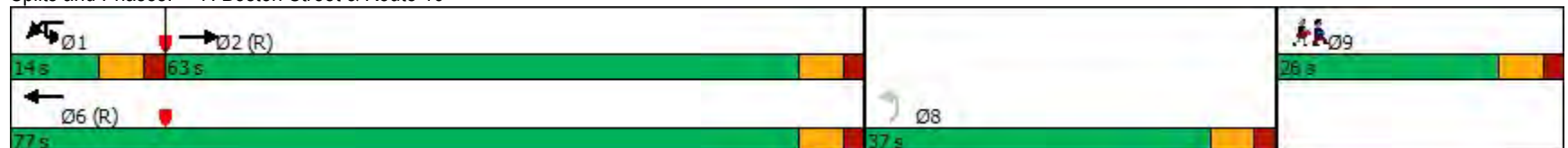
Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 100 (71%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 22.3  
 Intersection Capacity Utilization 46.9%  
 Analysis Period (min) 15

Intersection LOS: C  
 ICU Level of Service A

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Boston Street & Route 16



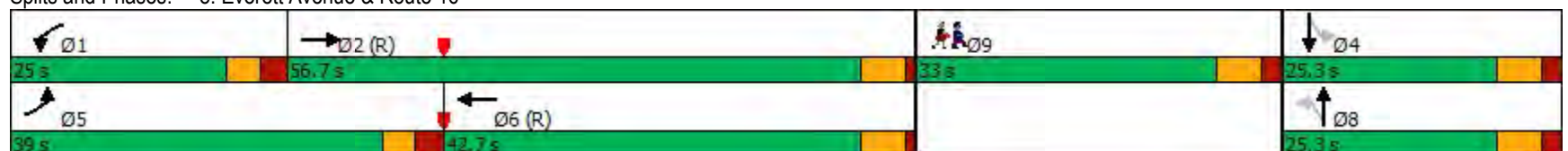


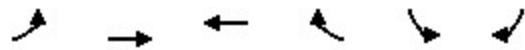
	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖		↖	↖		
Traffic Volume (vph)	175	1153	176	56	1095	12	178	145	49	74	168	79	
Future Volume (vph)	175	1153	176	56	1095	12	178	145	49	74	168	79	
Satd. Flow (prot)	1728	4844	0	1711	4951	0	1745	1757	0	1728	1710	0	
Flt Permitted	0.950			0.950			0.445			0.499			
Satd. Flow (perm)	1728	4844	0	1709	4951	0	809	1757	0	903	1710	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	215	1488	0	105	1253	0	211	244	0	99	285	0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8			4		9
Permitted Phases							8			4			
Total Split (s)	39.0	56.7		25.0	42.7		25.3	25.3		25.3	25.3		33.0
Total Lost Time (s)	5.5	5.0		5.5	5.0		6.0	6.0		6.0	6.0		
Act Effct Green (s)	33.5	51.7		19.5	37.7		47.5	47.5		47.5	47.5		
Actuated g/C Ratio	0.24	0.37		0.14	0.27		0.34	0.34		0.34	0.34		
v/c Ratio	0.52	0.83		0.44	0.94		0.77	0.41		0.32	0.49		
Control Delay	51.7	24.3		68.9	49.0		61.4	40.5		41.4	42.2		
Queue Delay	0.0	32.9		0.0	0.0		0.6	0.0		0.0	0.1		
Total Delay	51.7	57.2		68.9	49.0		62.0	40.5		41.4	42.2		
LOS	D	E		E	D		E	D		D	D		
Approach Delay		56.5			50.6			50.4			42.0		
Approach LOS		E			D			D			D		
Queue Length 50th (ft)	125	520		67	428		162	161		63	194		
Queue Length 95th (ft)	247	576		73	#517		#392	273		122	#390		
Internal Link Dist (ft)		406			387			396			538		
Turn Bay Length (ft)	150			100			100			100			
Base Capacity (vph)	413	1788		238	1333		274	596		306	579		
Starvation Cap Reductn	0	390		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		5	0		0	11		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.52	1.06		0.44	0.94		0.78	0.41		0.32	0.50		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 52.3  
 Intersection Capacity Utilization 82.9%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service E  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Everett Avenue & Route 16





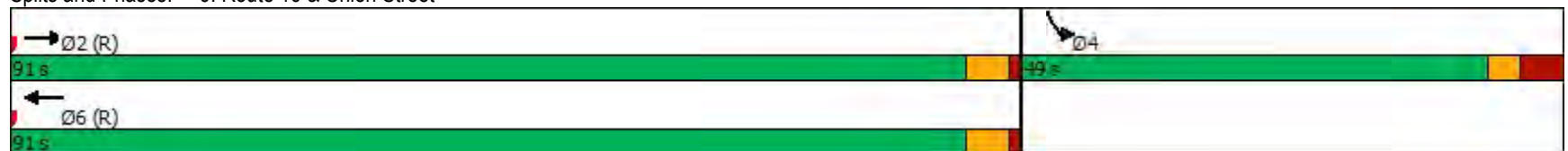
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↑	
Traffic Volume (vph)	0	1277	1199	183	153	4
Future Volume (vph)	0	1277	1199	183	153	4
Satd. Flow (prot)	0	4964	4858	0	1788	0
Flt Permitted					0.953	
Satd. Flow (perm)	0	4964	4858	0	1788	0
Satd. Flow (RTOR)						
Lane Group Flow (vph)	0	1356	1531	0	207	0
Turn Type		NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases						
Total Split (s)		91.0	91.0		49.0	
Total Lost Time (s)		5.0	5.0		7.0	
Act Effct Green (s)		107.2	107.2		20.8	
Actuated g/C Ratio		0.77	0.77		0.15	
v/c Ratio		0.36	0.41		0.78	
Control Delay		19.3	2.5		76.7	
Queue Delay		0.0	0.2		0.0	
Total Delay		19.3	2.6		76.7	
LOS		B	A		E	
Approach Delay		19.3	2.6		76.7	
Approach LOS		B	A		E	
Queue Length 50th (ft)		429	19		184	
Queue Length 95th (ft)		474	110		218	
Internal Link Dist (ft)		219	319		460	
Turn Bay Length (ft)						
Base Capacity (vph)		3801	3719		536	
Starvation Cap Reductn		0	1079		0	
Spillback Cap Reductn		172	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.37	0.58		0.39	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 60 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 14.9  
 Intersection Capacity Utilization 47.1%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 9: Route 16 & Union Street

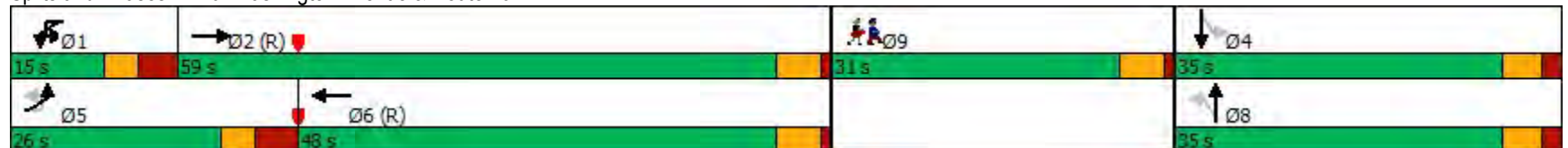


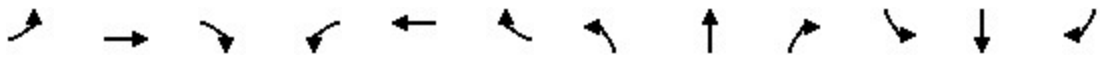
	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙		
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↑↑↑			↖	↑↑↑		↖	↑		↖	↑		
Traffic Volume (vph)	205	1077	148	17	85	1164	36	100	116	44	49	154	118	
Future Volume (vph)	205	1077	148	17	85	1164	36	100	116	44	49	154	118	
Satd. Flow (prot)	1745	4863	0	0	1745	4941	0	1752	1773	0	1770	1725	0	
Flt Permitted	0.950				0.950			*0.450			0.418			
Satd. Flow (perm)	1734	4863	0	0	1736	4941	0	821	1773	0	774	1725	0	
Satd. Flow (RTOR)														
Lane Group Flow (vph)	230	1402	0	0	138	1274	0	132	232	0	57	334	0	
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	1	6			8			4		9
Permitted Phases								8			4			
Total Split (s)	26.0	59.0		15.0	15.0	48.0		35.0	35.0		35.0	35.0		31.0
Total Lost Time (s)	7.0	5.0			6.5	5.0		5.5	5.5		5.5	5.5		
Act Effct Green (s)	37.7	64.1			17.0	43.0		32.6	32.6		32.6	32.6		
Actuated g/C Ratio	0.27	0.46			0.12	0.31		0.23	0.23		0.23	0.23		
v/c Ratio	0.49	0.63			0.65	0.84		0.69	0.56		0.32	0.83		
Control Delay	56.3	13.1			73.4	51.4		67.7	52.3		48.1	68.6		
Queue Delay	0.0	0.7			0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	56.3	13.9			73.4	51.4		67.7	52.3		48.1	68.6		
LOS	E	B			E	D		E	D		D	E		
Approach Delay		19.9				53.5			57.9			65.6		
Approach LOS		B				D			E			E		
Queue Length 50th (ft)	117	79			119	397		109	186		43	288		
Queue Length 95th (ft)	#374	525			#238	458		152	200		82	358		
Internal Link Dist (ft)		319				1066			414			597		
Turn Bay Length (ft)	100				150			150			150			
Base Capacity (vph)	469	2227			212	1517		196	424		185	413		
Starvation Cap Reductn	0	454			0	0		0	0		0	0		
Spillback Cap Reductn	0	0			0	0		0	0		0	0		
Storage Cap Reductn	0	0			0	0		0	0		0	0		
Reduced v/c Ratio	0.49	0.79			0.65	0.84		0.67	0.55		0.31	0.81		

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 70 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 40.7  
 Intersection Capacity Utilization 81.2%  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington Avenue & Route 16



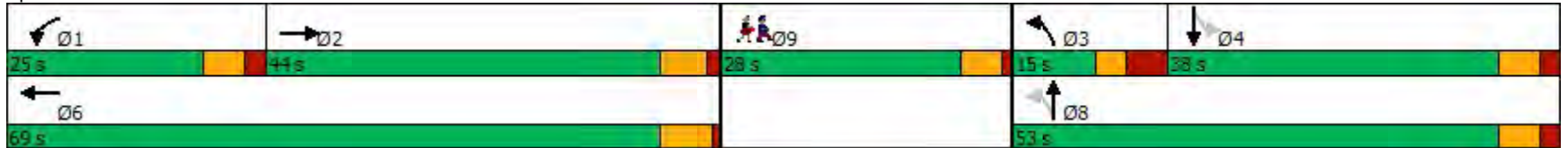


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↑↑↑		↘	↑↑↑		↘	↑		↘	↑		
Traffic Volume (vph)	0	1120	145	132	1169	23	250	216	185	175	159	170	
Future Volume (vph)	0	1120	145	132	1169	23	250	216	185	175	159	170	
Satd. Flow (prot)	0	4886	0	1685	4778	0	1787	1904	0	1787	1891	0	
Flt Permitted				0.950			*0.700			*0.700			
Satd. Flow (perm)	0	4886	0	1685	4778	0	1314	1904	0	1303	1891	0	
Satd. Flow (RTOR)													
Lane Group Flow (vph)	0	1329	0	151	1320	0	280	459	0	205	385	0	
Turn Type		NA		Prot	NA		pm+pt	NA		Perm	NA		
Protected Phases		2		1	6		3	8			4		9
Permitted Phases							8			4			
Total Split (s)		44.0		25.0	69.0		15.0	53.0		38.0	38.0		28.0
Total Lost Time (s)		6.0		6.0	6.0		7.0	6.0		6.0	6.0		
Act Effct Green (s)		38.2		19.1	63.4		45.2	46.2		31.1	31.1		
Actuated g/C Ratio		0.30		0.15	0.50		0.36	0.37		0.25	0.25		
v/c Ratio		0.89		0.59	0.55		0.56	0.66		0.64	0.82		
Control Delay		51.0		61.6	23.5		37.6	39.7		53.7	60.7		
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay		51.0		61.6	23.5		37.6	39.7		53.7	60.7		
LOS		D		E	C		D	D		D	E		
Approach Delay		51.0			27.4			38.9			58.3		
Approach LOS		D			C			D			E		
Queue Length 50th (ft)		362		112	245		162	290		142	282		
Queue Length 95th (ft)		#591		#228	405		306	523		269	#532		
Internal Link Dist (ft)		409			879			820			473		
Turn Bay Length (ft)				100			150			100			
Base Capacity (vph)		1486		256	2411		502	716		333	485		
Starvation Cap Reductn		0		0	0		0	0		0	0		
Spillback Cap Reductn		0		0	0		0	0		0	0		
Storage Cap Reductn		0		0	0		0	0		0	0		
Reduced v/c Ratio		0.89		0.59	0.55		0.56	0.64		0.62	0.79		

Intersection Summary

Cycle Length: 150  
 Actuated Cycle Length: 125.6  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 41.5  
 Intersection Capacity Utilization 87.8%  
 Analysis Period (min) 15  
 Description: Note: Phase 7 shows minimum green = 20 while maximum green = 12. Also, phases 1,2,6 show Recall = EXT - I used Min  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Webster Avenue/Garfield Avenue & Route 16





Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	35.9	51.5	0.12	8.1	F
Second Street	III	35	18.3	32.3	50.6	0.14	10.2	E
Spring Street	III	35	12.6	24.0	36.6	0.09	9.2	F
Dunkin Donuts Lot	III	35	16.1	1.4	17.5	0.12	24.5	B
Vine Street	III	35	14.9	63.6	78.5	0.11	5.1	F
Vale Street	III	35	15.4	1.7	17.1	0.11	24.0	C
Boston Street	III	35	14.5	19.1	33.6	0.11	11.5	E
Everett Avenue	III	35	12.4	46.4	58.8	0.09	5.6	F
Union Street	III	35	32.0	3.3	35.3	0.27	27.2	B
Washington Avenue	III	35	10.2	28.0	38.2	0.08	7.1	F
Webster Avenue	III	35	37.2	57.8	95.0	0.31	11.7	E
Total	III		199.2	313.5	512.7	1.55	10.9	E

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	35.4	57.2	0.18	11.4	E
Washington Avenue	III	35	37.2	43.3	80.5	0.31	13.8	E
Union Street	III	35	10.2	2.2	12.4	0.08	21.9	C
Everett Avenue	III	35	32.0	48.4	80.4	0.27	11.9	E
Boston Street	III	35	12.4	7.2	19.6	0.09	16.9	D
Vale Street	III	35	14.5	7.9	22.4	0.11	17.3	D
Vine Street	III	35	15.4	28.9	44.3	0.11	9.2	F
South Ferry Street	III	35	14.9	17.6	32.5	0.11	12.2	E
Spring Street	III	35	16.1	25.4	41.5	0.12	10.4	E
Second Street	III	35	12.6	34.7	47.3	0.09	7.1	F
Lewis Street	III	35	18.3	26.0	44.3	0.14	11.6	E
Total	III		205.4	277.0	482.4	1.61	12.0	E

Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	89.5	105.1	0.12	4.0	F
Second Street	III	35	18.3	37.0	55.3	0.14	9.3	F
Spring Street	III	35	12.6	47.6	60.2	0.09	5.6	F
Dunkin Donuts Lot	III	35	16.1	5.7	21.8	0.12	19.7	C
Vine Street	III	35	14.9	99.7	114.6	0.11	3.5	F
Vale Street	III	35	15.4	22.9	38.3	0.11	10.7	E
Boston Street	III	35	14.5	10.2	24.7	0.11	15.7	D
Everett Avenue	III	35	12.4	34.5	46.9	0.09	7.1	F
Union Street	III	35	32.0	10.6	42.6	0.27	22.5	C
Washington Avenue	III	35	10.2	82.1	92.3	0.08	2.9	F
Webster Avenue	III	35	37.2	70.4	107.6	0.31	10.4	E
Total	III		199.2	510.2	709.4	1.55	7.9	F

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	38.7	60.5	0.18	10.8	E
Washington Avenue	III	35	37.2	57.8	95.0	0.31	11.7	E
Union Street	III	35	10.2	1.9	12.1	0.08	22.5	C
Everett Avenue	III	35	32.0	52.0	84.0	0.27	11.4	E
Boston Street	III	35	12.4	6.6	19.0	0.09	17.4	D
Vale Street	III	35	14.5	10.5	25.0	0.11	15.5	D
Vine Street	III	35	15.4	47.7	63.1	0.11	6.5	F
South Ferry Street	III	35	14.9	24.1	39.0	0.11	10.2	E
Spring Street	III	35	16.1	76.2	92.3	0.12	4.7	F
Second Street	III	35	12.6	7.9	20.5	0.09	16.4	D
Lewis Street	III	35	18.3	34.8	53.1	0.14	9.7	F
Total	III		205.4	358.2	563.6	1.61	10.3	E

Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	21.2	36.8	0.12	11.3	E
Second Street	III	35	18.3	52.1	70.4	0.14	7.3	F
Spring Street	III	35	12.6	13.9	26.5	0.09	12.7	E
Dunkin Donuts Lot	III	35	16.1	4.2	20.3	0.12	21.2	C
Vine Street	III	35	14.9	58.2	73.1	0.11	5.4	F
Vale Street	III	35	15.4	16.1	31.5	0.11	13.0	E
Boston Street	III	35	14.5	7.8	22.3	0.11	17.4	D
Everett Avenue	III	35	12.4	29.1	41.5	0.09	8.0	F
Union Street	III	35	32.0	1.4	33.4	0.27	28.7	B
Washington Avenue	III	35	10.2	16.3	26.5	0.08	10.3	E
Webster Avenue	III	35	37.2	64.8	102.0	0.31	10.9	E
Total	III		199.2	285.1	484.3	1.55	11.5	E

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	24.0	45.8	0.18	14.3	D
Washington Avenue	III	35	37.2	42.8	80.0	0.31	13.9	E
Union Street	III	35	10.2	2.4	12.6	0.08	21.6	C
Everett Avenue	III	35	32.0	75.8	107.8	0.27	8.9	F
Boston Street	III	35	12.4	5.7	18.1	0.09	18.3	C
Vale Street	III	30	15.2	9.8	25.0	0.11	15.5	D
Vine Street	III	35	15.4	26.6	42.0	0.11	9.8	F
South Ferry Street	III	35	14.9	12.9	27.8	0.11	14.3	D
Spring Street	III	35	16.1	26.1	42.2	0.12	10.2	E
Second Street	III	35	12.6	16.0	28.6	0.09	11.7	E
Lewis Street	III	35	18.3	30.3	48.6	0.14	10.6	E
Total	III		206.1	272.4	478.5	1.61	12.1	E

Arterial Level of Service: EB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lewis Street	III	35	15.6	26.2	41.8	0.12	10.0	F
Second Street	III	35	18.3	25.5	43.8	0.14	11.8	E
Spring Street	III	35	12.6	12.7	25.3	0.09	13.3	E
Dunkin Donuts Lot	III	35	16.1	2.3	18.4	0.12	23.3	C
Vine Street	III	35	14.9	34.5	49.4	0.11	8.0	F
Vale Street	III	35	15.4	46.0	61.4	0.11	6.7	F
Boston Street	III	35	14.5	10.1	24.6	0.11	15.7	D
Everett Avenue	III	35	12.4	24.3	36.7	0.09	9.0	F
Union Street	III	35	32.0	19.3	51.3	0.27	18.7	C
Washington Avenue	III	35	10.2	13.1	23.3	0.08	11.7	E
Webster Avenue	III	35	37.2	51.0	88.2	0.31	12.6	E
Total	III		199.2	265.0	464.2	1.55	12.0	E

Arterial Level of Service: WB Route 16

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Garfield Avenue	III	35	21.8	23.5	45.3	0.18	14.4	D
Washington Avenue	III	35	37.2	51.4	88.6	0.31	12.6	E
Union Street	III	35	10.2	2.5	12.7	0.08	21.4	C
Everett Avenue	III	35	32.0	49.0	81.0	0.27	11.8	E
Boston Street	III	35	12.4	26.2	38.6	0.09	8.6	F
Vale Street	III	30	15.2	21.1	36.3	0.11	10.7	E
Vine Street	III	35	15.4	48.8	64.2	0.11	6.4	F
South Ferry Street	III	35	14.9	21.3	36.2	0.11	11.0	E
Spring Street	III	35	16.1	59.2	75.3	0.12	5.7	F
Second Street	III	35	12.6	25.9	38.5	0.09	8.7	F
Lewis Street	III	35	18.3	19.8	38.1	0.14	13.5	E
Total	III		206.1	348.7	554.8	1.61	10.5	E





# **Appendix G: Survey Comments**

## Chelsea-Everett Route 16 (Revere Beach Parkway) Survey

The Boston Region Metropolitan Planning Organization (MPO), in conjunction with the Massachusetts Department of Transportation (MassDOT) and the Cities of Chelsea and Everett, is conducting a transportation planning study for a segment of Route 16 in Chelsea and Everett. The segment of focus is from Route 99 to Garfield and Webster Avenues, as shown in the map below. The objectives of the study are to collect traffic data, analyze existing roadway conditions, identify transportation problems, and develop improvements for safe accommodation of all roadway users. This survey will help the MPO staff to understand the public's perception of the existing transportation problems and collect ideas to address them. The MPO staff will consider the survey responses as they develop recommendations for safe and efficient accommodations in the study corridor. Please take a few minutes to complete this brief survey.



**1. How do you typically use Route 16?  
(Check all that apply)**

- Vehicle driver
- Ride share (i.e. Uber or Lyft)
- Pedestrian
- Bicyclist
- Bus rider
- Other (please specify)

**2. Please indicate any problems that you encounter or that keep you from bicycling or walking on Route 16.**

**(Check all that apply)**

- High volume of traffic
- High speed of vehicles
- Lack of bike lanes or useable shoulders
- Gaps in sidewalk network
- Difficulty crossing Route 16
- Sidewalks in poor condition (damaged or lacking accessible curb/wheelchair ramps)
- Insufficient pedestrian crossing times at the signalized intersections
- Poor street lighting
- Personal safety concerns
- Lack of greenery or unwelcoming streetscape
- Not applicable
- Other (please specify)

**3. While driving on Route 16, what problems do you encounter?**

**(Check all that apply)**

- Traffic congestion
- Long wait times or delays at intersections with traffic signals
- Safety concerns and/or crashes
- Difficulty turning into and out of side streets
- Poor street lighting
- Not applicable
- Other (please specify)



4. Please use the space below to describe safety and operations problems at specific locations (intersections or roadway segments) that you would like to see addressed.

Click here to enter text.

5. Please indicate any improvements that you would like to see implemented in the Route 16 corridor. (Check all that apply)

- Increase safety for all road users and reduce crashes
- Improve traffic flow and circulation, and reduce congestion
- Enhance safety at intersections and reduce crashes
- Enhance walking and bicycling environment to accommodate pedestrians and bicyclists
- More greenery and a welcoming streetscape
- Other (please specify)

6. Please use the space below to describe specific improvements that you would like to see implemented in the Route 16 corridor.

Thank you!

Click here to enter text.

# FREE RESPONSES

## PROBLEMS

1. Entering and exiting the car wash on Route 16 is a big hazard. The car wash sometimes affects traffic on Route 16, Second Street and Spring Street.
2. Webster intersection is a death trap. Everyone runs the lights in Everett section of Route 16. Cars pulling out recklessly in front of businesses on Route 16
3. Everett Avenue intersection needs a turn only light and major improvements
4. Red light runners, illegal left turns, turning from incorrect lanes. Bike riders in lane that can keep up with traffic.
5. Really long, wait times at the intersection of Route 16 and Second Street, only 4-5 cars getting through, which then backs up traffic on Second Street.
6. The intersection at Everett Avenue is very bad for vehicles turning onto Route 16 because there is no left turning light.
7. Heading westbound, the merge of cars exiting the Sweetser Circle with cars already on Route 16 do not yield. Route 16 becomes even more congested in this area. Cars exiting the traffic circle need a traffic light.
8. Retime the traffic lights, some sections have longer wait times
9. Going east on Route 16 after the Route 99 underpass, the right lane is sometimes used as two lanes and sometimes one lane-depending on who happens to be driving there. It is technically one lane but two cars fit side by side and it is needed as a two lane lanes for much of the day and evening. Can we divide that lane into two lanes officially and paint the appropriate lines?
10. Garfield, Webster, and Washington Avenues crossing Route 16 should have split phase for traffic exiting and entering. When both light are green at the same time, it is a free for all to get through the intersection.
11. Eastbound drivers turning left onto Washington Avenue constantly run red lights. The lights at Garfield and Webster Avenues should have dual left turn arrows at the same time. Other intersections (like at Everett Avenue) have confusing signals with red & green lights at the same time.
12. The intersection of Webster and Route 16 is terrifying when trying to turn onto Route 16 from Webster Avenue or Garfield Avenue.
13. When turning left onto Route 16 from Webster Avenue, a green arrow would be helpful since there is already a delay. At that same intersection, a right turn only lane

backs up onto Webster Avenue (under Route 1 overpass). An earlier sign for Route 107 exit is not placed correctly; you cannot see it until you are on top of it.

14. When driving past Richie's ice people turn the far right lane into two lanes all the way down to the right hand turn onto Second Street. I am not sure how you would ever stop everyone from forming that fourth lane at this point so maybe it should be built to suit.
15. At Garfield and Webster Avenues, it would be nice to see painted lanes to show two lanes and have painted arrows on the road one for straight and one for left turn only. From Webster Avenue have a flashing yellow left turn arrow.
16. This is supposed to be a Parkway, yet there are no parks in sight. Please reclaim portions of the right of way for uses other than cars.
17. At Webster and Garfield intersection, the light cycle needs to be addressed.
18. Near the tuxedo shop in Chelsea, the pedestrian button does not work sometimes, and it is scary to cross sometimes because there is not enough time to cross.
19. Washington Avenue backs up for blocks into Prattville at Route 16 light since the left lane was changed to left turn only a couple of years ago. It is very unusable for the morning commute. Turning left onto Route 16 from Garfield is dangerous due to conflicts with backed up straight-through traffic in the oncoming direction.
20. Public streetlights needs attention.
21. Section from Route 99 to Everett Ave has too many lights poorly timed, which causes people to speed unnecessarily attempting to make green lights. Section from Everett Avenue to Washington Avenue is too narrow for three lanes
22. Traffic signal at Lewis Street should have timing reprogrammed to stay green longer for the majority, which is Route 16.
23. Second Street intersection--road conditions poor and light timing inconsistent
24. At Second Street, vehicles block the intersection and prevent them from entering the intersection from Second Street.
25. Webster Avenue at Route 16, the turn onto 16 from Webster Avenue has turns into a game of chicken.
26. Alignment between Everett Avenue and Washington Avenue
27. The intersection at Everett Avenue and Route 16 is challenging, especially if turning left onto Route 16 at that light.

28. A left arrow indication should be added when turning onto Route 16 westbound from Webster Avenue.
29. A dedicated left turn lane from Webster Avenue onto Route 16
30. Clearly marked lanes and stop lines in the corridor, especially Washington Avenue at Route 16, Second Street at Route 16, and Everett Avenue at Route 16.
31. It seems like the City of Everett is hostile to the concept of "green waves," where the entire street lights synch up so I do not have to stop at every intersection. In addition, DCR does not fill potholes (see the massive ones that always appear at Second Street every winter and spring). Also, the right eastbound lane is a mess—sometimes, drivers turning from Route 16 right onto Second Street, treat it as both a travel and a turning lane, and customers entering/exiting the Richie's Slush store nearly cause crashes with drivers on Route 16 or coming onto 16 via the ramp from Sweetser Circle. In addition, the Simoniz car wash customers create massive backups as they wait to turn into the business. I cannot wait to see the horrible traffic the new brewery across the street will create since Everett does not seem to be capable of adapting to new businesses' traffic volumes. Most importantly, every time it rains heavily, Route 16 from about Revere Street through Boston Street turns into a chain of deep lakes that sometimes stalls cars.
32. The 'yield' sign onto Route 16 eastbound from the Gateway Center is AWFUL. Drivers entering Route 16 barely ever yield because the signage is unclear.
33. Lights at Everett Avenue intersection are dangerous. Forward arrow and a red light means go?
34. Route 16 at Second Street in Everett: cars traveling on Route 16 eastbound block the intersection causing back-ups on other streets. Cars run the red lights at all intersections that are included in this study. Potholes are notorious on Route 16 especially at the bridge above the train tracks on Route 16 westbound.
35. Everett Avenue entering Route 16, put turn signals coming from each direction on Everett Avenue to turn left onto Route 16.
36. I travel more on Webster/Garfield and Washington Avenues, and there are certainly times where law is not followed, such as turning onto Garfield Avenue from Route 16 eastbound or turning left onto Webster Avenue from the straight-through lane of Route 16 westbound. In addition, there are new "Left Turn Must Turn Left" on both Webster and Garfield that people do not follow.
37. Taking a left from Garfield Avenue onto Route 16 is almost impossible due to light settings.
38. Getting onto Route 16 westbound from Route 1 south and then moving over to left lane to take left turn onto Webster Avenue is dangerous.



39. Traffic backups at the left turning lanes at all intersections.
40. The lights especially at the intersection of Webster Avenue to Route 16 heading into the Prattville neighborhood and out of the neighborhood are horrific. The light turns red in one direction and people plow through the intersection. It is a joke to play the guessing game of who can go straight and who is turning. That intersection is absolute chaos. I do not choose to travel through it and will make alternate plans to avoid in while riding in a car or walking to do errands. I should not have to worry about it but I have seen several accidents and people almost being hit when the crosswalk light was on and it is the pedestrians turn to cross.
41. On Everett Avenue between Carter St and the parkway has almost no lighting and the sidewalk is a mess.
42. There is no walking space throughout Route 16
43. Turning left onto 16 from Washington Street is a little hair-raising. There is no dedicated left turn arrow, and it is often hard to see traffic coming straight from the opposite direction because they will be blocked by cars waiting to turn left from other side.
44. The intersections of #8, #10, and #11 are a disgrace. The intersections are a complete mess. I think the best solution might be to have a turn only lane on Washington Avenue, Everett Avenue, and Webster Avenue and only have the light on the turn only lane be a green arrow instead of having both sides be both circular green at the same time. It is a nuance. Recently, there have been new signs put up which indicates that the left lane on this intersections are turn only lanes, however this has not helped the problem and actually has made it worse. The entire light cycles have to change in order to be safer for the community.
45. Intersection #11 is huge problem. If you are trying to gain access from Prattville neighborhood, you end up stuck in traffic for 15 minutes. If you are trying to get from Route 1 south to Route 16 east, you have to dive across four lanes. If you are trying to get to Prattville from Route 1 north, you just cannot get there especially during rush hour. The clover needs to be completed to allow traffic to flow better. Right now it just does not work
46. The light turning from eastbound 16 to Washington Avenue needs to be fixed. The intersection at Webster Avenue is very dangerous.
47. The traffic turning left while traveling east tend to keep traveling left through the light even after it turns red. Typically at the Kentucky Fried Chicken light and ALWAYS at the McDonalds light and then again the left onto Webster St.... HORRIBLE life threatening.
48. It is often difficult to turn left onto Route 16 from a side street, even when at a traffic signal.

49. Welling Circle is a nightmare
50. Awful congestion on Route 16 east at the Lewis St light
51. A dedicated left turn traffic light would be of great help to improve traffic from Webster Ave onto Route 16 West same and from Garfield Ave onto Route 16 East.
52. Excessive traffic on Webster Avenue causing heavy congestion and numerous accidents.
53. Vehicles exiting off the Route 1 to Route 16 westbound have to cut across the highway to turn onto Webster Avenue or make a U-turn—it is dangerous off ramp.
54. Several panhandlers interfering with vehicles.
55. Webster Avenue traffic light is heavily used and it takes several cycles to turn onto Webster Avenue from the westbound side. Several people run the lights and turn left from the second lane cutting drivers off in the turn lane.
56. The trash on the median strip and the underpass near Richie's Slush is unnecessary and disgusting.
57. Lights are not timed correctly at the Washington Avenue intersection
58. Drivers in such a hurry. No courtesy anymore!
59. Public safety concerns at night. Should have more police patrolling the area
60. Bicycling unsafe and unfriendly throughout the route.
61. Taking a left on Route 16 to Spring Street (by the stadium) is horrendous. The light changes too quickly, causing serious backups.
62. Poor and confusing lane markings, e.g. lanes unexpectedly converging as they go through an intersection.
63. Entry and exit to the Gateway Center - drivers rarely yield. Little to no pedestrian access from Main Street in Everett to Gateway Center—pedestrians have to cut across grass and medians.
64. The city put medians in the streets on Broadway that some people cannot get into their driveways which is making it unsafe now.
65. Crossing Route 16 at any of the traffic lights is a disaster. Drivers run red lights, do not pay attention to not blocking the roadway, and use zero common sense when turning. Everett Police Department should be actively watching and stopping incompetent and dangerous drivers.
66. Fixing length of lights, better flow of traffic with connecting cities that is the issue other cities have to be involved for better flow.

67. Intersection Everett ave and Route 16 bad intersection needs better signals. Light cycles to long.
68. Generally better light coordination
69. The issue with Route 16 is that there is constant "homeless people" that beg for change every day. They harass and follow pedestrians who walk in the corridor for money. It has happened to my wife and myself. We have put in numerous complaints but still nothing is done.
70. Traffic lights should be synchronized
71. Crossing to the shopping center is difficult.
72. Everett Avenue and Route 16 intersection is dangerous.
73. Panhandlers hold up traffic in these areas at the lights. Consider exclusive left-turn phasing at the traffic lights, this reduces the amount of cars trying to turn while others going straight, moves traffic along faster.
74. Wellington circle and Route 16 is always a mess, the traffic there always congested as too often motorists ignore traffic signals and congestion and block intersections.
75. Route 16 rotary by Best Buy and Target is very dangerous for bicyclists, especially coming back from Medford Station Landing towards Everett.
76. The congestion is ridiculous, people constantly blocking the intersection and take turns from wrong lanes.
77. Frequent traffic congestion, leading to blocked intersections
78. The traffic lights need to be synchronization; this would go a long way to create better traffic flow.
79. The city needs to manage the intersection of Everett Avenue and Route 16. It is dangerous with two opposing lanes both turning left while the other lanes are trying to traverse straight-through.
80. Poor street lighting, it is hard to see pedestrians at night. Traffic at the rotary is horrible and dangerous to enter in rush hours.
81. Excessive congestion by the rotary, which causes many problems.
82. The exit to Route 16 at Sweetser Circle that connects Main Street and Broadway can be problematic because of high speeds and drivers not signaling to turn. The side street at D'Angelo's that connects to Route 16 has long delays.
83. There are often cars ignoring lanes and merging (particularly on the eastbound side between Lewis Street and Second Avenue). This makes driving difficult and biking terrifying. There are many potholes along the road, which make biking horrible.

84. Nothing specific, just a lot of traffic. The road does not look or feel pedestrian friendly.
85. I worry for the children and parents walking to and from school in the morning - as well as the crossing guard. Traffic is often so congested that people spend time scrolling on the phone and are not paying attention. What a weight to bare should someone be seriously injured or even killed because they were just trying to get to school.
86. Tons of potholes, narrow lanes, extreme congestion.
87. Traffic is the biggest problem at most intersections and drivers blocking intersections
88. Drivers illegally turn from Route 16 onto Second Street.
89. I am a frustrated lifelong Everett resident:
- The intersections of Route 16 at Second Street and Spring Street are extremely dangerous for everyone. The lane markings have faded and the traffic lights are poorly timed. In addition, the off ramp from Sweetser Circle to Route 16 eastbound is used as two lanes, although it is not marked and it is very dangerous.
  - Route 16 and Vine Street intersection is dangerous, cars turning onto Route 16 from Vine Street are constantly running red light and blocking the intersection.
  - Route 16 and Everett Avenue intersection is dangerous, has poorly timed lights, no street markings, and cars turning left and going straight and going right all at the same time. Extremely dangerous for the students at Chelsea High School who cross the intersection.
  - Reconstruct the intersection of Route 16 and Second Street, it is has high volume of large produce trucks.
90. Rush hour traffic is terrible at Santilli and Sweetser circles. Please no bike lane on Route 16; someone will be killed because of high traffic volumes, speeds, and trucks. The whole parkway needs work.
91. Richie's Slush parking is a problem also the intersection at Lewis street crossing that street to the other side is a suicide mission with cars going through red lights and have witnessed many accidents at that intersection over the years.
92. Traffic queues at Lewis Street and Second Street intersections are constantly blocking the intersection. The short left turn lanes on Route 16 at Spring Street cause that intersection to back up forcing drivers to run through the red lights. The pedestrian signals at Vine Street intersection does not work well and needs longer crossing interval.
93. The traffic light at South Ferry street takes forever on weekends



94. There is a lot of traffic congestion at Route 16 and Second Street intersection, especially large 18-wheeler trucks. It is also difficult to turn left onto Route 16 from Everett Avenue (both approaches).
95. Queues always block traffic on the side streets from entering Route 16; it is a complete gridlock.
96. The intersection of Route 16 and Lewis Street is dangerous because run red lights and speed through causing accidents.
97. Drivers running red lights, especially large trucks turning out of Second Street. I have seen on multiple occasions the light turn red and not just one or two cars, but three and four will run the light.
98. At Second Street and Spring Street intersections, traffic block the intersections constantly, backing up traffic, and prevent side street traffic from entering Route 16. Vehicles entering and exiting the car wash backs up onto Route 16.
99. Wellington Circle is a nightmare, especially in the morning during the rush hour commute. It should not be a circle at all, it should be a four-way. The lanes that let you turn cause accidents and traffic jams. Get rid of them.
100. Long wait for left turns at Everett Avenue and Route 16 intersection. Long wait for left turn from Second Street into Route 16
101. Beautification, Glendale Square to the Central Fire station.
102. Low speed, more traffic signals, should be timed better.
103. Traffic merging onto Route 16 near Lewis Street is terrible.
104. Traffic lights needs to be more coordinated. Intersections are constantly blocked. Second Street always blocks traffic so driver cannot turn when the light changes.
105. Clean it up.
106. On Route 16 where Route 99 traffic merges is very congested and difficult to merge.
107. Trying to get into the Gateway is ridiculous. There should be an overpass so that people are not cutting each other off in all directions. That area makes no sense and is a hazard.
108. The intersections of Route 16 at Vine Street and Washington Avenue need to be completely reworked in order to allow side traffic to fully and safely complete turns.
109. Cars blocking intersections; and no police around to enforce the law.
110. At Lewis Street intersection, three lanes become four when you get to Second Street.

111. Pedestrian crossings that mimic the "natural paths" that have been worn into the green space at Santilli Circle - which area needs more pedestrian crossings to bring people from the Village to the Gateway Center safely and efficiently. Current pedestrian crossings there (if they even exist) do not make any sense to anyone walking to the Gateway Center. Also in Santilli Circle, it does not make sense that cars cannot take a left at the traffic light coming out of the Gateway Center. This seems like an easier way to reduce traffic at Santilli Highway leading to Best Buy/Teddie. In addition, the entire stretch of Route 16 in Everett/Revere Beach Parkway is just terrible for pedestrians, bicyclists and cars (it would be awful for public transit riders if a bus route existed here - which it should!). Sidewalks need repair, and new businesses should be accessible by pedestrians from the street - with storefronts in front and parking in back. This could be safer for pedestrians. Would be easier to do this on a map!
112. None of the left-turn lanes provides adequate room for demand, which renders the left lane useless and incites road rage and poor driving. This is true from Route 1 to Wellington Circle with few exceptions. The traffic light timing between Route 99 and Wellington Circle has been broken for months and the constant flow of cars entering the exit only right lane at the Best Buy is dangerous.
113. My entire commute from Arlington to Everett is on Route 16 and from Medford Square to Everett; the entire road is unsafe for bikes. In particular, all of the traffic circles are dangerous for bikes and there is no safe way to cross these intersections.
114. The lights are timed to keep the parkway traffic moving ignoring the needs of local drivers to simply get around. Going from stop and shop to Ferry Street is sometimes an adventure. The lights are uncoordinated so intersections just gridlock.
115. There are certain traffic signals that you sit at for a couple of minutes and are green for 30 seconds.
116. Large billboards that are distracting, advertising for products that are not healthy for the community.
117. The angles of the intersections between Santilli and Everett Avenue are wide and can be difficult for foot crossing.
118. The whole stretch just looks worn and kind of looks like a dump.
119. I would like to see the traffic lights have better timing, such as Spring Street intersection and Second Street intersection. There are also numerous breaks in the sidewalk, which I do not feel safe walking with my child.
120. Lights are timed poorly and do not allow traffic to flow smoothly.
121. Would be great to have separate lanes for turning vehicles.

122. It would be awesome if there was another sidewalk from Route 16 going into Gateway Center specifically the side where BLINDS TO GO, so that you do not have to walk the long way. In addition, going westbound on Route 16, the U-turn section near Wendy's is sometimes used illegally by drivers heading eastbound to turn. In addition, the intersection of Route 16 and Garfield Avenue can be made better so people can cross the streets to go to the shops at Parkway Plaza Shopping Center.
123. The invisible fourth lane which people make turning into second street
124. Too many people block the intersection at Second Street. The car wash traffic backs on to the parkway.
125. People running red lights and blocking intersections, especially at lower Ferry Street.
126. Better lights, lots of pot holes, even in the summer
127. There should be better streetlights and sidewalks and crosswalks need repairs. More posted speed limits signs. Very difficult to bike on the route.
128. Roads not well paved and lanes very narrow.
129. Pretty much the entirety of Route 16 is a concrete hell-scape. Any business that has traffic entering the highway means that they are parked right in the middle of the sidewalk for however long it takes them, which as a pedestrian, is extremely annoying.
130. The intersection of Everett Avenue and Route 16 is congested because of drive thru lines for fast food restaurants.
131. All intersections should have some work done to improve traffic efficiency.
132. Certain spots flood and are with poor streetlights. With the high volume of traffic becomes stressful.
133. The road conditions are awful. Poor lighting and lack of real planning for bike safety etc.
134. A more efficient flow of traffic, while maintaining a level of safety for drivers and pedestrians.
135. The roads are in rough shape, Route 16 eastbound is jammed pack from the hours of 3-6pm, and in the westbound, the new merges are awful in the morning. Left turn only lanes are pointless, not efficient, and creates outstanding traffic.
136. No left turn signal at Second Street coming from Medford.
137. The traffic pattern at the Gateway Center in Everett is horrible. The signage does not prepare you for the multiple required lane shifts over short distance.

138. People trying across to the turn lane to enter Ferry Street are causing congestion and accidents. Maybe a raised curb separating the turn lane.
139. Left hand turn lane cannot handle amount of vehicles turning.
140. Bridges near Santilli circle are in terrible condition
141. Lower Ferry and Route 16 very difficult to get into Ferry due to congestion and drivers illegally overlapping lights so you cannot turn.
142. Route 16 and South Ferry Street, streetlights missing, badly timed, faded pavement markings.
143. The timing of the traffic lights are not coordinated with the traffic—they all act independently and therefore create more congestion and gridlock than to alleviate it. It is awful lights should be optimized.
144. Traffic backs up from the intersection of 16 and the Fellsway in the morning all the way back to Santilli Circle. The traffic is horrible. In the afternoon, traffic backs up from the South Ferry Street intersection all the way back to the state police barracks. Also terrible.
145. It is shocking that no MBTA buses use this road, It makes sense to allow them in here since it runs directly past many businesses including stop and shop and traffics moved better than on Chelsea Street where thousands more people live are the cars are tied up at badly managed traffic lights.
146. More police presence at a turnaround spot before Taco Bell to get back to Chelsea Street.
147. Intersection of Route 16 and Everett Avenue, turning left backs up traffic into Chelsea.
148. Rotaries (and the road in general) are way too many lanes and are terrifying to drive on, let alone walk or bike on, for instance at the one near the Teddy peanut butter factory.
149. Traffic queue build-up at Washington Avenue intersection extend into Union Street intersection, making it difficult to enter Route 16 from Union Street.
150. Left hand turn onto South Ferry Street is always backed up.
151. Crossing Route 16 at Santilli Highway is very challenging. Pedestrian signals often do not work, and wait time is long. Lane configuration and traffic congestion makes navigating the traffic circle at this location in a car very difficult.
152. Second Street at Route 16 is often times difficult to cross due to congestion.
153. There should be crosswalks on all sides of an intersection, including at Second Street and Vale Street. Crosswalks across Route 16 are missing completely at

Boston Street and South Ferry Street. In addition, signals at all or most intersections do not seem to be MUTCD compliant signals.

154. There is no yield sign at the merge from the Route 99 rotary to Route 16 East (just prior to Richie's slush) - then that feeds into a one lane that is used as two lanes for right turns on Second Street toward Market Basket in Chelsea. The Chelsea Street/Norwood Avenue intersection is extremely dangerous, more needs to be done to prevent lane blockage by those crossing Route 16, and then the light is often extremely short, adding to the danger. Would like to see more yellow flashing "pedestrian crossing" lights, especially near the Santilli Circle.
155. I live near Spring Street. It is not pleasant to walk any length of Route 16. Crossing is awful as people run red lights. I would bike if I thought it was safe, but drivers are aggressive.
156. Simoniz Car Wash entrance/exit onto Route 16 should relocate. Cars entering/exiting the car wash/Bank of America ATM occasionally blocks traffic.
157. Santilli Circle merging. Overall, lanes throughout 16 are extremely narrow and markings are often missing.
158. Longer pedestrian intervals for crossing Route 16 and the following cross streets -- Lewis, Second, and Everett Avenue
159. I would like maybe a bus lane to help cut back on congestion with busing and maybe smart lights.
160. Traffic light phase interval for Second Street is too short. Only about three cars can get through and that is if the intersection is not blocked by cars on the Parkway.
161. Turning from Route 16 eastbound onto South Ferry Street is difficult; traffic on Route 16 westbound often blocks the flow of left-turn traffic once the light turns green. Turning onto Route 16 westbound from Webster Avenue across traffic from Garfield Avenue is a mess.
162. All the intersection are out dated. The road does not need a bike lane, it requires and upgrade of the roadway, signals and drainage.
163. Bus stops and service is a big problem because of construction so they do not stop and are heavily delayed on their route
164. Too wide a street to cross. Not pleasant walking so I tend to drive from store to store or avoid going at all to this Area. Also impossible to safely bike.
165. The lane to turn left onto Spring Street should be longer as during peak times like around 3:30-6:30 the queue gets longer and spills onto the through lanes interrupting traffic flow. Alternatively, the light should be green for longer.



166. Route 16 should be easier to cross overall, more crosswalks and pedestrian signals. It is too dangerous to walk across the parkway. For drivers, too much congestion during school time and getting out is hectic and dangerous. Better sidewalks and more adapted roads.
167. All the left turns offs are not long enough to handle the volume of vehicles.
168. More wheelchair accessible sidewalks.
169. The area of Webster Avenue and Sagamore Avenue is backed up with nowhere to go. People block the roads taking illegal left hand turns out of the side street.
170. Lights are poorly timed on 16. More police enforcing the gridlock law at the intersections around Everett stadium will also help.
171. Sidewalks are in poor condition
172. At the intersection of Second Street and Route 16, drivers (more than one) on Rt 16E run the red light and block the intersection, so that the already short green light for vehicles on Second Street is significantly affected, creating backups on Second Street that go back past Spring Street. A longer green light and police presence would alleviate the problem.
173. Many potholes and the street should be done over correctly.
174. More ways to decrease traffic going into Boston.
175. Entrance from Sweetser Rotary onto Route 16 going east needs improvement in merging of traffic onto Route 16.
176. Turning lanes do not seem sufficient in length during peak traffic hours or timing is off.
177. Traffic congestion, poor sidewalk conditions, no space for pedestrians or biking.
178. Lack of dedicated lanes to on-and-off-ramps at Sweetser Circle cause major congestion that lead to
179. Car wash on route 16 across from Everett stadium creates a huge traffic burden that should be addressed. Potentially dangerous and inconvenient for anyone traveling down Spring Street.
180. Fix the Gateway Center traffic pattern. In addition, the traffic circle at Broadway/ Main St in Everett at morning rush hour is not passable by bicycle.
181. There is so much congestion, too many large trucks, and an overall lack of politeness towards our fellow commuters.
182. I would like to see the roads be fixed especially the road part between the route 99 over pass and Santilli Circle

183. Too dangerous to cross Route 16 at Vale Street near Wendy's. Congestion near the rotary is too common and poor sidewalks and lack of greenery is common as well.
184. The intersection coming from the on-ramp from Sweetser Circle needs improvement, there is too much traffic from the ramp. Also, there are 3 lanes of traffic from the light at that location to the Second St intersection, drivers are making a fourth lane which causes issues.

## SUGGESTIONS FOR IMPROVEMENTS

1. Better street maintenance from the state, increased police patrol on Route 16, better light timing at Webster Avenue intersection and the intersections in Everett, and install bike lanes and decent pedestrian sidewalks.
2. Beautify Route 16 with streetscape to tone down ugly car repair shops and store fronts.
3. The intersections of Route 16 at Garfield/Webster Avenues and Washington Avenue should have split phasing. When both light are green at the same time, it is a free for all to get through the intersection.
4. Left turn green arrows and stop red arrows when turning from Webster Avenue to Route 16 in both directions.
5. The whole area in question looks and feels like it has not been addressed for decades. I am not sure how anyone can justify to taxpayers how this section of the city continues to look the way it does. The road need to be repaired, lines need to be painted, sidewalks need to be built, and street sweeping on a regular basis needs to be done.
6. Painted lanes and left turn arrows and flashing yellow turning light.
7. Two children died trying to cross the Route 16. Safe route needed from the shopping center. MBTA needs to make it easier to bus to shopping center.
8. Reduce lanes, intersections, and curb cuts. Provide safe, green environment for pedestrians and bicycles. Put the park back in parkway.
9. Better maintenance of the roadway, light cycles, better police patrols.
10. Greenery and nicer sidewalks and better street lighting near Everett Avenue intersection.
11. Streetlights along parkway not working for a couple of years.
12. Better timed lights, traffic-calming measures to prevent aggressive driving, speeding and tailgating.
13. Maybe one lane should be taken away to try to quell speeding drivers. Excessively many lanes makes the roadway look like a racetrack.
14. Less traffic and slower speeds, better-paved roads, improved crosswalks.
15. Separate bike lanes, which do not cross traffic, would be fantastic.
16. More visibility of local and state police.
17. I would like the ability to safely bike from Chelsea to Route 99—avoiding Beacham Street.

18. Put in protected bike lanes. People High vehicle speeds and too much heavy truck traffic call for protected bike lanes.
19. Improved signage (do not block intersection); improved street lighting; better roads; more police presence to prevent speeding and red light runners.
20. People cross at unsafe locations on Route 16 and crosswalk signals really can back up traffic significantly. What about some pedestrian bridges over 16? Perhaps for example the intersections of Route 16 at Everett Avenue and Washington Avenue.
21. A specific improvement would be to replace the "No Turn on Red" sign at Webster Avenue heading towards Route 16 eastbound to "Turn on Red after Stop." It is also worth putting the traffic light in a location where turning vehicles can actually see the lights. Last specific request is to paint lines on both Garfield and Webster to indicate a turn lane onto Route 16.
22. Provide enough time for left turn traffic to keep traffic flowing.
23. The addition of signals at intersections have compounded the traffic problems. Signal should be coordinated to relieve back-ups.
24. It is not safe, when it comes to the traffic lights at Webster/Garfield Avenue. This intersection needs to be looked at for better ways to improve safety and handle traffic flow so that pedestrians can cross the street without worry.
25. Fix the sidewalks; fill the potholes, and more greenery right down the medium of Route 16.
26. There are a few spots on Route 16 that I would like to walk or bicycle to, but it is such an ugly high traffic roadway it does not seem safe or enjoyable.
27. Fix the light at the intersections of Route 16 at Everett Avenue, Washington Avenue, and Garfield/Webster Avenues.
28. Time the lights on Route 16 correctly, so that motorists can actually move more than one intersection at a time
29. Stop 18-wheeler trucks from going on Webster Avenue, it was banned for years and recently the city removed it, it now causing more issues.
30. I live north of Route 16 and do everything I can to avoid crossing it on foot. It keeps me isolated from most of Chelsea. There also should be a redo of the whole Route 16 and Garfield/Webster Avenues intersection and the off-ramp from Route 1. It is all very dangerous.
31. Better traffic survey for better traffic flow.
32. Better timed lights.

33. A dedicated left signal traffic light would be of great help to improve traffic from Webster Avenue onto Route 16 westbound and from Garfield Avenue onto Route 16 eastbound.
34. Build a rapid transit tram right down the middle. Would be great.
35. Improve the drainage or, better yet, raise the road a foot.
36. Dedicated left turn traffic light at Route 16 and Webster and Garfield Avenues.
37. Widen the street and make a direct route to and from Tobin to casino from the road that comes through Chelsea fruit market
38. Please no bike lane Especially on route 16, High volume of traffic and A lot of 18 wheelers taking right turns not good for bike lanes, It would be disastrous
39. Make turn lanes longer.
40. More greenery landscaping and police patrol and less homeless people.
41. Good sidewalks and more trash cleanup.
42. Better coordination of light cycles. Road repairs to remove potholes. Do not allow bicycles.
43. Better traffic flow, fix sidewalks and wheelchair ramps, repair roads.
44. New traffic lights as to when right or left turns can be taken
45. Better signage
46. Better landscaping, other road options to avoid traffic/congestion.
47. Better timing of the lights
48. More efficient traffic signal timing.
49. Clean up, make safer for cyclists.
50. Better time traffics lights, clearly marked driving lanes that align with the flow of traffic
51. Longer turning lanes may help with the flow of vehicles
52. Improved street lighting. Traffic lights that warns pedestrian crossing
53. Protected bike lanes, clearer lane markers, and less potholes
54. More green space and pedestrian friendly space.
55. Again, the whole parkway needs to be revamped.
56. As well as the traffic congestion, I would love to see the strip beautified - similar to lower Broadway.



57. Safe crosswalks and cars stopping for red lights
58. A turning lane only into the side street of Lewis st. Better parking for richies slush and fix pot holes
59. Pedestrian refuge area in the median needs curb appeal
60. Trash and overgrown brush should be taken care of.
61. No potholes and better traffic flow coordination with traffic lights.
62. I think the timing of the lights needs improvement. I do not know what can be done or what would work, but some green lights are too short for the amount of traffic.
63. More police presence specifically at the Rte. 16 and Second Street intersection where cars consistently block intersection or run traffic lights.
64. Sidewalks added and made welcoming, bike lane added, trees planted, and signals synchronized. Congestion reduction measures.
65. It is ugly and industrial looking, and more trees, shrubs, and better-looking sidewalks are needed.
66. More greenery and better traffic flow.
67. There tends to be a lot trash and it would be nice to see it a bit more cleaned up. Some more greenery and more lighting would be nice.
68. More landscaping and greenery, and businesses should also be required to landscape in front of businesses.
69. Better traffic light timing. More consideration or room for left turn lanes. Stop the constant on ramp flow at the Best Buy. I have honestly never considered walking or biking on Route 16 as it is such a mess, don't know what to suggest there.
70. Traffic calming and multi-purpose paths on the side that are spacious enough for pedestrians and cyclists.
71. Cafes, art workshops, coffee houses with outdoor seating, more green spaces.
72. Lighting on center median to allow a more community type feel, add streetscape and trees
73. Less traffic and more beautification since area is being redeveloped.
74. There are too many drivers making left turns where signs state no left turns. Not sure how to correct this.
75. Fix the potholes and get rid of the ugly rundown buildings
76. More bike and pedestrian friendly

77. Walking bridges over highway to cross over.
78. Delayed green so people do not run lights and mess up intersections.
79. I really want to highlight the more greenery and welcoming streetscape option. There is nothing but concrete and cars on Route 16; it is extremely unwelcoming to anyone that is on a bike or walking along.
80. Definitely more greenery on the islands please. This will immensely improve Revere Beach Parkway.
81. Traffic diverted to other routes if possible. More safety for drivers and pedestrians
82. Roadways need repaired. Huge pot holes and ruts causing unsafe driving
83. More policing and better traffic light flow, more pedestrian places like breweries, restaurants, and custom shops.
84. Make it more walkable and bikeable, more attractive, and fix potholes
85. Add buses better crosswalk signals and lightning!!!!
86. Gap-free protected bicycle facilities, following the MassDOT Separated Bike Lane Planning & Design Guide. Shorter, lower-speed curb cuts for pedestrian & bicyclist safety. Bringing all sidewalks up to adequate width & good repair. Elimination of Level of Service as a design guideline.
87. Traffic light optimization. True rotaries instead of lights so traffic moves efficiently. Traffic guards at Wellington circle to stop people from blocking straight through lane on 16 and diving into left hand turn lanes.
88. Need protected bike lanes along the entire corridor, more pedestrian crossings, improved pedestrian crossings (shorter crossing distances, pedestrian friendly signal timing, etc.)
89. With increased residential properties and commercial use I think new ways of pedestrian access should be looked into
90. Better pedestrian facilities, more crosswalks, better street lighting, and a real game changer would be to add cycle tracks on both sides of Route 16.
91. Plenty of room for mature trees and some green space. How about a dedicated no turn lane that runs through Everett.
92. I would like to see dedicated bus lanes. You should be encouraging people to take public transportation.
93. Put lane markings between Route 16 and Lewis Street intersection and Route 16 and Second Street intersection. With this section being relatively wide, drivers turn this right lane into two lanes.

94. Add protected bike lanes Add east-west bus route(s) from Revere to Everett
95. Better merge with rotary ramp from Route 99 -- maybe lights
96. Synchronized traffic lights or removal of some.
97. Create left-turn lanes on Second Street.
98. Fewer lanes, add safe place for biking and walking with kids. Add trees!
99. As these communities grow and attract new residents, we are looking for beautification of the streets.
100. Police presence all day and night.
101. The entire section from Santilli Circle to Washington Avenue needs to be rebuilt to accommodate the high volume of traffic and proper drainage. This should also include greenery and healthy trees.
102. Better roundabout implementation, with improved signage.
103. Maintain better road conditions. Repave the road and fix the street that always floods.
104. Visibility and businesses could use better curb appeal
105. Cleaned up medians; more greenery; and more police patrolling to stop the speeding.
106. Greenery and better public transportation options (silver line).
107. There should be dedicated lanes for left hand turns and signals for left hand turns.
108. Better commercial industry, restaurants and attractions

**Appendix H:  
MassDOT Highway Division  
Project Development Process**

## Overview of the Project Development Process

Transportation decision-making is complex and can be influenced by legislative mandates, environmental regulations, financial limitations, agency programmatic commitments, and partnering opportunities. Decision-makers and reviewing agencies, when consulted early and often throughout the project development process, can ensure that all participants understand the potential impact these factors can have on project implementation. Project development is the process that takes a transportation improvement from concept through construction.

The MassDOT Highway Division has developed a comprehensive project development process which is contained in Chapter 2 of the *MassDOT Highway Division's Project Development and Design Guide*. The eight-step process covers a range of activities extending from identification of a project need, through completion of a set of finished contract plans, to construction of the project. The sequence of decisions made through the project development process progressively narrows the project focus and, ultimately, leads to a project that addresses the identified needs. The descriptions provided below are focused on the process for a highway project, but the same basic process will need to be followed for non-highway projects as well.

### **1. Needs Identification**

For each of the locations at which an improvement is to be implemented, MassDOT leads an effort to define the problem, establishes project goals and objectives, and defines the scope of the planning needed for implementation. To that end, it has to complete a Project Need Form (PNF), which states in general terms the deficiencies or needs related to the transportation facility or location. The PNF documents the problems and explains why corrective action is needed. For this study, the information defining the need for the project will be drawn primarily, perhaps exclusively, from the present report. Also, at this point in the process, MassDOT meets with potential participants, such as the Metropolitan Planning Organization (MPO) and community members, to allow for an informal review of the project.

The PNF is reviewed by the MassDOT Highway Division district office whose jurisdiction includes the location of the proposed project. MassDOT also sends the PNF to the MPO, for informational purposes. The outcome of this step determines whether the project requires further planning, whether it is already well supported by prior planning studies, and, therefore, whether it is ready to move forward into the design phase, or whether it should be dismissed from further consideration.

### **2. Planning**

This phase will likely not be required for the implementation of the improvements proposed in this planning study, as this planning report should constitute the outcome of this step. However, in general, the purpose of this implementation step is for the project proponent to identify issues, impacts, and approvals that may need to be obtained, so that the subsequent design and permitting processes are understood.

The level of planning needed will vary widely, based on the complexity of the project. Typical tasks include: define the existing context, confirm project need, establish goals and objectives, initiate public outreach, define the project, collect data, develop and analyze alternatives, make recommendations, and provide documentation. Likely outcomes include consensus on the project definition to enable it to move forward into environmental documentation (if needed) and design, or a recommendation to delay the project or dismiss it from further consideration.



### **3. Project Initiation**

At this point in the process, the proponent, MassDOT Highway Division, fills out a Project Initiation Form (PIF) for each improvement, which is reviewed by its Project Review Committee (PRC) and the MPO. The PRC is composed of the Chief Engineer, each District Highway Director, and representatives of the Project Management, Environmental, Planning, Right-of-Way, Traffic, and Bridge departments, and the MassDOT Federal Aid Program Office (FAPO). The PIF documents the project type and description, summarizes the project planning process, identifies likely funding and project management responsibility, and defines a plan for interagency and public participation. First the PRC reviews and evaluates the proposed project based on the MassDOT's statewide priorities and criteria. If the result is positive, MassDOT Highway Division moves the project forward to the design phase, and to programming review by the MPO. The PRC may provide a Project Management Plan to define roles and responsibilities for subsequent steps. The MPO review includes project evaluation based on the MPO's regional priorities and criteria. The MPO may assign project evaluation criteria score, a Transportation Improvement Program (TIP) year, a tentative project category, and a tentative funding category.

### **4. Environmental Permitting, Design, and Right-of-Way Process**

This step has four distinct but closely integrated elements: public outreach, environmental documentation and permitting (if required), design, and right-of-way acquisition (if required). The outcome of this step is a fully designed and permitted project ready for construction. However, a project does not have to be fully designed in order for the MPO to program it in the TIP. The sections below provide more detailed information on the four elements of this step of the project development process.

#### Public Outreach

Continued public outreach in the design and environmental process is essential to maintain public support for the project and to seek meaningful input on the design elements. The public outreach is often in the form of required public hearings, but can also include less formal dialogues with those interested in and affected by a proposed project.

#### Environmental Documentation and Permitting

The project proponent, in coordination with the Environmental Services section of the MassDOT Highway Division, will be responsible for identifying and complying with all applicable federal, state, and local environmental laws and requirements. This includes determining the appropriate project category for both the Massachusetts Environmental Protection Act (MEPA) and the National Environmental Protection Act (NEPA). Environmental documentation and permitting is often completed in conjunction with the **Preliminary Design** phase described below.

#### Design

There are three major phases of design. The first is **Preliminary Design**, which is also referred to as the 25-percent submission. The major components of this phase include full survey of the project area, preparation of base plans, development of basic geometric layout, development of preliminary cost estimates, and submission of a functional design report. Preliminary Design, although not required to, is often completed in conjunction with the Environmental Documentation and Permitting. The next phase is **Final Design**, which is also referred to as the 75-percent and 100-percent submission. The major components of this phase include preparation of a subsurface exploratory plan (if required), coordination of utility relocations, development of traffic management plans through construction zones, development of final cost estimates, and refinement and finalization of the construction plans. Once Final Design is complete, a full set of **Plans, Specifications, and Estimates (PS&E)** is developed for the project.

## Right-of-Way Acquisition

A separate set of Right-of-Way plans are required for any project that requires land acquisition or easements. The plans must identify the existing and proposed layout lines, easements, property lines, names of property owners, and the dimensions and areas of estimated takings and easements.

### **5. Programming (Identification of Funding)**

Programming, which typically begins during the design phase, can actually occur at any time during the process, from planning to design. In this step, which is distinct from project initiation, the proponent requests that the MPO place the project in the region's Transportation Improvement Program (TIP). The proponent requesting the project's listing on the TIP can be the community or it can be one of the MPO member agencies (the Regional Planning Agency, MassDOT, and the Regional Transit Authority). The MPO then considers the project in terms of state and regional needs, evaluation criteria, and compliance with the regional Transportation Plan and decides whether to place it in the draft TIP for public review and then in the final TIP.

### **6. Procurement**

Following project design and programming of a highway project, the MassDOT Highway Division publishes a request for proposals. It then reviews the bids and awards the contract to the qualified bidder with the lowest bid.

### **7. Construction**

After a construction contract is awarded, MassDOT Highway Division and the contractor develop a public participation plan and a management plan for the construction process.

### **8. Project Assessment**

The purpose of this step is to receive constituents' comments on the project development process and the project's design elements. MassDOT Highway Division can apply what is learned in this process to future projects.

## Project Development Schematic Timetable

Description	Schedule Influence	Typical Duration
<p><b>Step I: Problem/Need/Opportunity Identification</b> The proponent completes a Project Need Form (PNF). This form is then reviewed by the MassDOT District office which provides guidance to the proponent on the subsequent steps of the process.</p>	<p>The Project Need Form has been developed so that it can be prepared quickly by the proponent, including any supporting data that is readily available. The District office shall return comments to the proponent within one month of PNF submission.</p>	<p>1 to 3 months</p>
<p><b>Step II: Planning</b> Project planning can range from agreement that the problem should be addressed through a clear solution to a detailed analysis of alternatives and their impacts.</p>	<p>For some projects, no planning beyond preparation of the Project Need Form is required. Some projects require a planning study centered on specific project issues associated with the proposed solution or a narrow family of alternatives. More complex projects will likely require a detailed alternatives analysis.</p>	<p>Project Planning Report: 3 to 24+ months</p>
<p><b>Step III: Project Initiation</b> The proponent prepares and submits a Project Initiation Form (PIF) and a Transportation Evaluation Criteria (TEC) form in this step. The PIF and TEC are informally reviewed by the Metropolitan Planning Organization (MPO) and MassDOT District office, and formally reviewed by the PRC.</p>	<p>The PIF includes refinement of the preliminary information contained in the PNF. Additional information summarizing the results of the planning process, such as the Project Planning Report, are included with the PIF and TEC. The schedule is determined by PRC staff review (dependent on project complexity) and meeting schedule.</p>	<p>1 to 4 months</p>
<p><b>Step IV: Design, Environmental, and Right of Way</b> The proponent completes the project design. Concurrently, the proponent completes necessary environmental permitting analyses and files applications for permits. Any right of way needed for the project is identified and the acquisition process begins.</p>	<p>The schedule for this step is dependent upon the size of the project and the complexity of the design, permitting, and right-of-way issues. Design review by the MassDOT district and appropriate sections is completed in this step.</p>	<p>3 to 48+ months</p>
<p><b>Step V: Programming</b> The MPO considers the project in terms of its regional priorities and determines whether or not to include the project in the draft Regional Transportation Improvement Program (TIP) which is then made available for public comment. The TIP includes a project description and funding source.</p>	<p>The schedule for this step is subject to each MPO's programming cycle and meeting schedule. It is also possible that the MPO will not include a project in its Draft TIP based on its review and approval procedures.</p>	<p>3 to 12+ months</p>
<p><b>Step VI: Procurement</b> The project is advertised for construction and a contract awarded.</p>	<p>Administration of competing projects can influence the advertising schedule.</p>	<p>1 to 12 months</p>
<p><b>Step VII: Construction</b> The construction process is initiated including public notification and any anticipated public involvement. Construction continues to project completion.</p>	<p>The duration for this step is entirely dependent upon project complexity and phasing.</p>	<p>3 to 60+ months</p>
<p><b>Step VIII: Project Assessment</b> The construction period is complete and project elements and processes are evaluated on a voluntary basis.</p>	<p>The duration for this step is dependent upon the proponent's approach to this step and any follow-up required.</p>	<p>1 month</p>

Source: MassDOT Highway Division Project Development and Design Guide