



Route 9 Priority Corridor Study

Framingham and Natick, Massachusetts



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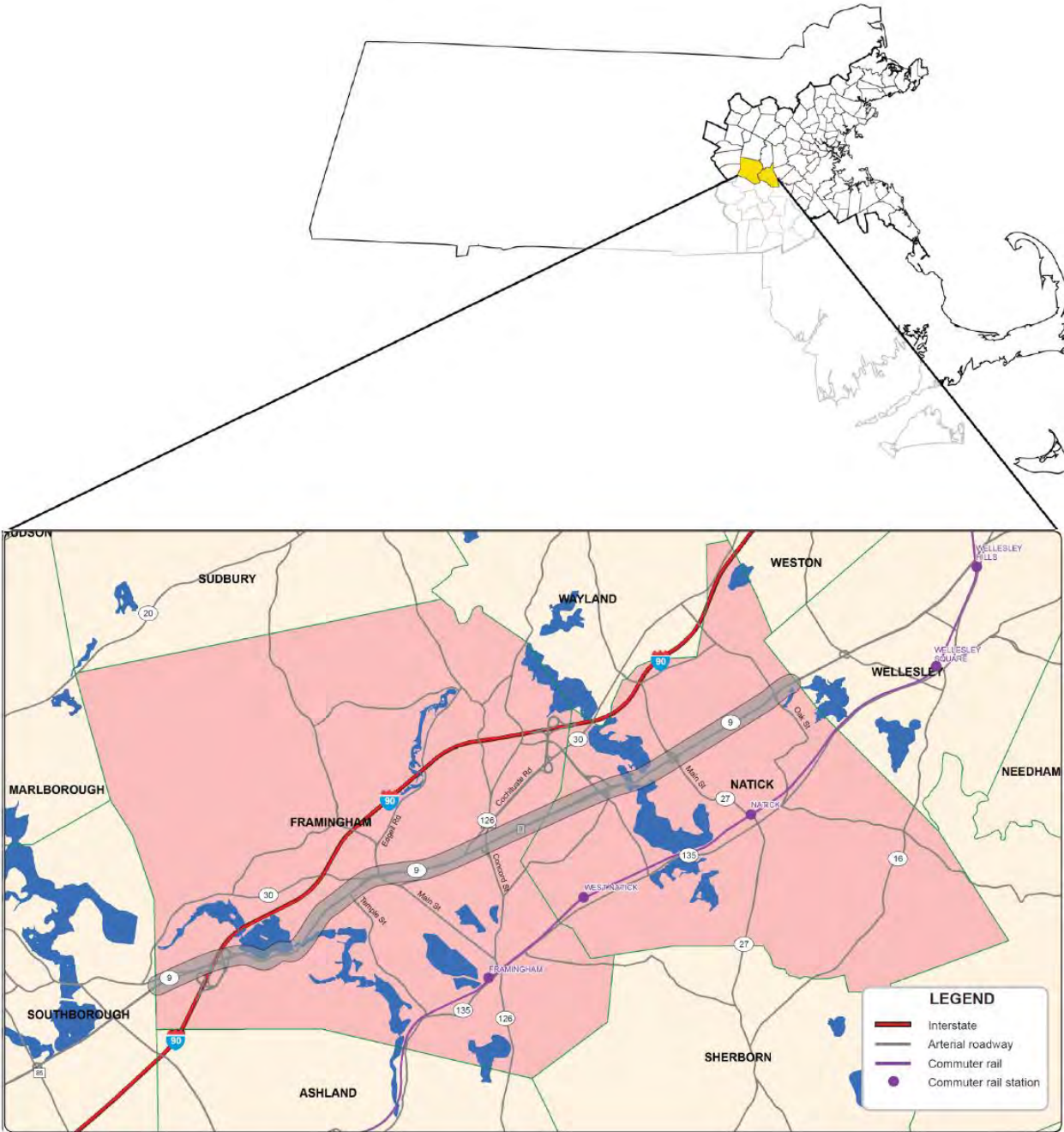
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Abstract

The *Route 9 Priority Corridor Study* focuses on one of the locations identified in the Needs Assessment for *Destination 2040*, the Metropolitan Planning Organization’s (MPO) Long-Range Transportation Plan (LRTP) endorsed in 2019. The LRTP is used to guide investment decisions regarding transportation infrastructure improvements in the Boston region. The MPO prioritized Route 9 in Framingham and Natick 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 local businesses, and promote multimodal transportation.

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Executive Summary

ES.1 BACKGROUND

The Boston Region Metropolitan Planning Organization (MPO) selected Route 9 in Framingham and Natick as the subject of a corridor study in federal fiscal year 2021. The study focused on one of the locations identified in the Needs Assessment for the MPO’s Long-Range Transportation Plan, *Destination 2040*. The location was prioritized 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. This report analyzes the existing conditions, assesses safety and operational problems, and develops improvements.

ES.2 EXISTING CONDITIONS AND NEEDS ASSESSMENT

Route 9 in Framingham and Natick is a two-way, four-lane principal arterial under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). A series of maps are included in this report. The maps in Figures 1 and 2 show the study area and the study intersections. Because of the long corridor (approximately nine miles) the study was focused on improving safety, operations, and multimodal transportation at key locations along the corridor. MassDOT Highway Division and MPO staff collected and assembled the data used to assess the existing conditions and identify problems in the corridor. The data included vehicular, pedestrian, and bicycle volumes; traffic speeds; and crashes.

Key concerns for people walking include poor accommodations such as crossing safety issues, poor sidewalk conditions, lack of pedestrian activated signals and pushbuttons on side streets, limited safe crossing opportunities, long crosswalks without refuge areas, gaps in the sidewalk network, insufficient crossing times, and curb ramps that are not compliant with the Americans with Disabilities Act (ADA).

Key concerns for people biking include, but are not limited to, lack of safe biking facilities such as separated bike lanes, high volumes and speeds of vehicles, crashes involving people biking, and lack of awareness for people biking. Although there are bikeable shoulders on Route 9, they are not marked as bike lanes, are of inconsistent width, and end at the signalized intersection where the shoulders are used as turn lanes. In addition, there is a considerable variation in posted speed limits throughout the corridor (40 miles per hour [mph] to 50 mph) that results in increased stress levels for people biking.

A key concern for people driving in the corridor is the greater-than-expected number of crashes: three intersections are on the list of the Top 200 high-crash locations in Massachusetts and eight intersections (including the three top 200 high-crash locations) are on the list of Highway Safety Improvement Program (HSIP) crash clusters.¹ For many of the crashes, the contributory factors include lack of advance intersection lane control signs, pavement markings, yellow retroreflective borders on signal head backplates, and inadequate street lighting leading to high number of nighttime crashes. Additional contributory factors are short acceleration and deceleration lanes, horizontal and vertical curves that limit sight distances, and lack of advance notifications. In addition, human factors such as failure to yield, inattention or distraction, following too closely, ignoring traffic control regulations, and other aggressive driving behaviors contributed to the high number of crashes.

People riding the bus are also presented with challenges in the corridor, which in many ways are similar to those walking or biking listed above. Additional challenges for bus operations and riders include lack of safe bus stops on Route 9 as several major intersections lack space for dedicated bus stops. In addition, congestion effects travel time and on-time performance of the buses as the corridor lacks transit signal priority equipment.

ES.3 IMPROVEMENTS

MPO staff, working with an advisory task force (representatives from MassDOT, the City of Framingham, and Town of Natick) developed short- and long-term improvement for the corridor.

Short-Term Improvements

The short-term improvements are typically low cost, relatively uncomplicated and inexpensive to implement, require minimal design efforts, and typically take fewer than five years to implement. These improvements can be included in MassDOT projects and in corridor or maintenance activities. They include upgrading sidewalks and curb ramps to MassDOT standards and ADA-compliance; adding countdown timers to help expedite pedestrian crossings; painting high visibility crosswalks; adding new or repainting pavement markings; upgrading signs and advance notifications; and repairing poor sidewalks. Additional short-term improvements include retiming signals to reduce congestion, modifying change

¹ 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 five), or a fatality (weighted by 10).

and clearance intervals to MassDOT standards, and adding retroreflective backplates with yellow borders to the signal heads to make them more visible to motorists.

Long-Term Improvements

The long-term improvements, generally high cost, require more design and engineering efforts and more funding resources. These improvements would focus on modernizing the roadway to make it safer and multimodal. They include reconstructing intersections, closing gaps and upgrading sidewalk network, adding separated bike lanes, and upgrading signal equipment. Additional long-term improvements include constructing new at-grade or grade-separated crossings for people walking and biking, upgrading emergency vehicle preemption systems, improving bus transit accommodations at selected locations, and installing bus transit priority signal systems.

ES.4 CONCLUSION

The concepts developed in this study provide MassDOT, the City of Framingham, the Town of Natick, and other stakeholders an opportunity to review the improvements for addressing deficiencies in the corridor before committing design and engineering funds to a roadway improvement project. This document provides a guide for possible improvements on this roadway; however, MassDOT, the City of Framingham, and the Town of Natick are not obligated to make these improvements. 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. The study aligns with the Boston Region MPO's goals of increasing safety on the region's highway system; 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; 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.² Municipalities in the region and the Massachusetts Department of Transportation (MassDOT) have been receptive to these studies, which provide the opportunity to review conceptual options to improve a specific arterial segment before committing design and engineering funds to a project. 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 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 listed in the LRTP that should be prioritized because the roadways require maintenance, modernization, and safety and mobility improvements. To address the problems that exist in some of these arterial segments, a LRTP priority corridor study was included in the federal fiscal year (FFY) 2021 Unified Planning Work Program (UPWP).³ Staff selected Route 9 in the City of Framingham and the Town of Natick as the subject of the priority corridor study. MPO staff selects locations for study (considering agency, municipal, subregional, and other public feedback) and collects data, conducts technical analysis, and recommends 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.

² Boston Region Metropolitan Planning Organization, *Destination 2040: The New Long-Range Transportation Plan of the Boston Region Metropolitan Planning Organization*, endorsed by the Boston Region MPO on August 29, 2019.

³ Boston Region Metropolitan Planning Organization, *Unified Planning Work Program, FFY 2021*, endorsed by the Boston Region Metropolitan Planning Organization on July 16, 2020.

Chapter 2— Study Location and Process

2.1 SELECTION PROCESS

On November 7, 2020, the Boston Region Metropolitan Planning Organization (MPO) identified Route 9 in the City of Framingham and the Town of Natick for 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.^{4,5,6,7,8,9} Figure 1 shows the study corridor and the surrounding area.

The study location was selected from a list of 44 arterial segments in 37 municipalities in the Boston Region MPO area.¹⁰ A copy of the technical memorandum describing the selection process is included in Appendix A. Massachusetts Department of Transportation (MassDOT) Highway Division District 3, the MassDOT Office of Transportation Planning, the City of Framingham, and the Town of Natick supported the study of Route 9 by collecting data needed for the analyses, reviewing documentation of existing conditions, identifying problems, and developing improvements to mitigate the problems.

⁴ 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).

⁵ 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.

⁶ 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 people who walk and bicycle and improve transit on the roadway; or there is a significant amount of truck traffic on the roadway serving regional commerce.

⁷ 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.

⁸ Regional Equity: To ensure that, over time, all subregions in the MPO's planning area receive support from the MPO in the form of UPWP 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.

⁹ 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.

¹⁰ Boston Region Metropolitan Planning Organization, *Selection of FFY 2020 LRTP Priority Corridor Study Location*, Technical Memorandum, November 7, 2019.

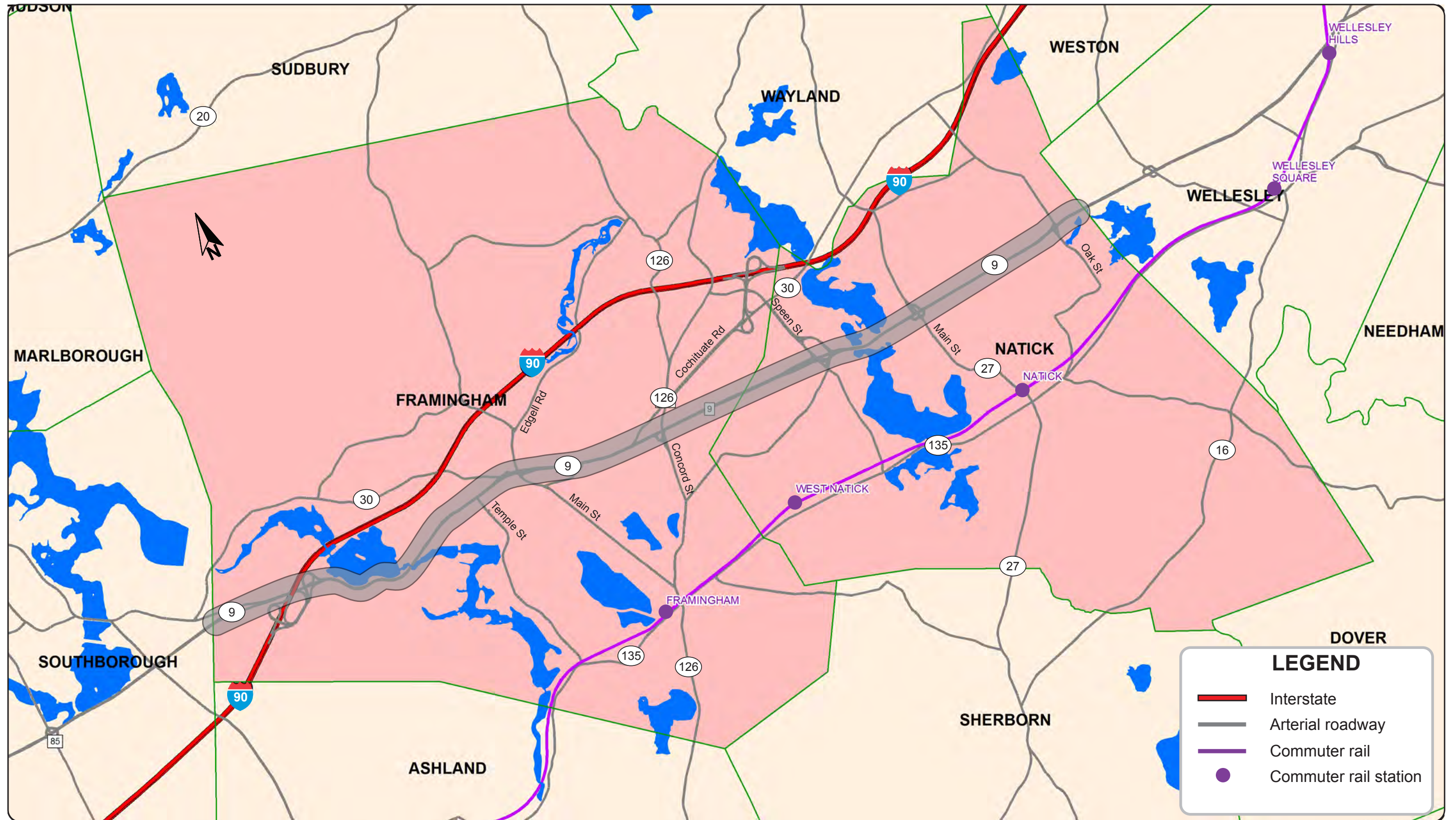


Figure 1
Regional Map

2.2 STUDY GOALS AND OBJECTIVES

MassDOT, the City of Framingham, and the Town of Natick have shown a commitment to improving conditions to transform this car-centric corridor into a route for everyone by

- increasing safety for motorists, pedestrians, and bicyclists;
- increasing the quality and quantity of walking and bicycling options;
- modernizing the roadway and making travel more efficient and reliable; and
- supporting economic vitality and livability of the communities.

Toward that end, the objectives of this study were to

- collect data on roadway conditions and users;
- analyze data and identify existing problems;
- determine the needs of the corridor considering people who walk, bicycle, drive, or take the bus; and
- develop improvement concepts to address problems and needs.

2.3 ADVISORY TASK FORCE

Stakeholder participation is a crucial part of any study. Hence, MPO staff used a number of methods to engage stakeholders in planning for improvements to Route 9. An advisory task force composed of representatives from Framingham, Natick, MassDOT, and MetroWest Regional Transit Authority was established to guide this study. MPO staff met with the task force to discuss existing problems and proposed improvements. MPO staff also participated in Road Safety Audits that were conducted for the corridor. This report reflects the task force's feedback as well as the safety audits members' feedback. Appendix A includes a list of task force members and comments.

Chapter 3—Roadway Characteristics

3.1 ROUTE 9 CORRIDOR

Route 9 in Framingham and Natick is a state highway. It is classified as an urban principal arterial and part of the National Highway System (NHS) program. The nine-mile-long corridor assumes the local road names of Worcester Road in Framingham and Worcester Street in Natick. It is a four-lane, two-way roadway that widens at the signalized intersections to accommodate turn lanes. Route 9 has no access control and open to all traffic including trucks. The roadway's right-of-way width varies between 85 feet and 105 feet, with the wider sections on the segment at the Framingham and Natick lines in the vicinity of the Shoppers' World and Natick Mall. This roadway serves regional and local traffic, carrying between 40,000 and 60,000 vehicles per day. The posted speed limit varies from 40 miles per hour (mph) to 50 mph throughout the corridor. Segments of roadway have different characteristics and contexts that define needs along the corridor as Route 9 serves uses including residential, recreational, educational, industrial and office parks, commercial, and open spaces. The corridor includes several MPO transportation equity zones such as low-income, minority populations, carless household, and low-English proficiency.

3.2 MAJOR CROSSING STREETS

Figure 2 shows the major streets intersecting Route 9 that were included in the study. They serve the mix of land uses in the corridor. These intersecting streets include major and minor arterials and collector roadways that connect to downtown and commercial areas, industrial and office parks, educational centers, and neighborhoods in Framingham and Natick. The following describes the intersecting streets of the major intersections included in the study.

3.2.1 California Avenue

California Avenue is located west of the study area. It is a two-lane, two-way street with one lane in each direction and widens at its approach to Route 9 to accommodate turn lanes. California Avenue is a city-owned street with a posted speed limit of 25 mph and is open to all traffic. It is classified as a local street and provides access to the Framingham industrial and office park, which houses companies such as Sanofi, Bose, and Genzyme. It has a six-foot sidewalk on the west side and street lights.



Figure 2
Study Intersections

3.2.2 Country Club Lane

Country Club Lane is located 0.9 miles east of California Avenue. It is a two-lane, two-way street with one lane in each direction and widens at its approach to Route 9 to accommodate turn lanes. Country Club Lane is a city-owned street with a posted speed limit of 25 mph and is open to all traffic. It is classified as an urban collector. It provides access to the Halstead Framingham Apartments and connects to Gates Street serving residential neighborhoods and the Framingham Country Club. There is no sidewalk on Country Club Lane, and it lacks street lights.

3.2.3 Temple Street

Temple Street is approximately one mile east of Country Club Lane. It is a two-lane, two-way street with one lane in each direction and widens at its approach to Route 9 to accommodate a northbound left-turn lane. Temple Street is a city-owned street with a posted speed limit of 25 mph and is open to all traffic. It is classified as an urban collector and provides access to the commercial area at its intersection with Route 9. In addition, it connects to Route 30, Salem End Road, and Old Worcester Road, all serving residential neighborhoods in Framingham. There is a sidewalk on the east side of Temple Street and street lights are present on the street.

3.2.4 Maynard Road

Maynard Road is approximately 0.4 miles east of Temple Street. It is a two-lane, two-way street with one lane in each direction. Maynard Road is a city-owned street with a posted speed limit of 25 mph and is open to all traffic. It is classified as a local road and provides access to residential areas north and south of Route 9. Through movements are prohibited at the intersections because of the median on Route 9 and only right-turn-in and right-turn-out are allowed. Maynard Road north of Route 9 connects to Route 30 and serves residential neighborhoods. South of Route 9, Maynard Road connects to the Framingham State University and Salem End Road. There are sidewalks on either side of Maynard Road north of Route 9 but none on the portion south of Route 9. Street lights are present on Maynard Road.

3.2.5 Main Street and Edgell Road

Main Street and Edgell Road is approximately 0.4 miles east of Maynard Road. Both streets are two-lane, two-way streets with one lane in each direction, and widen at their approaches to Route 9 to accommodate turn lanes. Main Street and Edgell Road are grade-separated over Route 9 in the vicinity of the Route 9 interchange. They are city-owned streets with posted speed limit of 30 mph and are open to all traffic. Both are classified as urban minor arterials and provide

access to the Framingham State University, Framingham Centre Common Historic District, and commercial and residential areas north and south of Route 9. They carry between 15,600 and 19,000 vehicles per day. There are sidewalks on either side of Main Street and Edgell Road and both have street lights.

3.2.6 Prospect Street

Prospect Street is approximately 0.65 miles east of the Main Street/Edgell Road. It is a two-lane, two-way street with one lane in each direction and widens at its approach to Route 9 to accommodate southbound left-turn and right-turn lanes. Prospect Street is a city-owned street with a posted speed limit of 30 mph and is open to all traffic. It is classified as an urban collector and serves residential areas north of Route 9 in Framingham. There is a sidewalk on the east side of Prospect Street and street lights are present on the street.

3.2.7 Cochituate Road

Cochituate Road is approximately 0.4 miles east of Prospect Street. It is a two-lane, two-way street with one lane in each direction. Cochituate Road is a city-owned street with posted speed limit of 30 mph and is open to all traffic. It is classified as an urban minor arterial and connects to the commercial areas in Framingham and Natick. There are sidewalks on either side of Cochituate Road and street lights are present on the street.

3.2.8 Concord Street (Route 126)

Concord Street is grade-separated over Route 9 and just 0.2 miles east of the Cochituate Road. It is a two-lane, two-way street with one lane in each direction. Concord Street is a city-owned street with a posted speed limit of 30 mph and is open to all traffic. It is classified as an urban principal arterial, part of the NHS, and connects several Framingham neighborhoods including the Downtown and Framingham Commuter Rail Station. Concord Street carries about 19,600 vehicles per day in both directions. There are sidewalks on either side of Concord Street and street lights are present on the street.

3.2.9 Caldor Road

Caldor Road is 0.5 miles east of the Concord Street. It is a two-lane, two-way street with one lane in each direction. Caldor Road is a privately owned local street that serves the Shoppers World commercial area. It is posted with a 15-mph speed limit and is open to all traffic. There is a sidewalk on the east side Caldor Road and street lights are present on the street.

3.2.10 Speen Street

Speen Street is grade separated over Route 9. In the vicinity of Route 9, it is four-lane, two-way divided roadway. It is a town-owned street; however, the ramps and overpasses are under Massachusetts Department of Transportation (MassDOT) jurisdiction. Speen Street is classified as minor arterial with a posted speed limit of 25 mph. It is a town-owned street; however, the ramps and overpasses are under MassDOT jurisdiction. There are sidewalks on both sides of the street and street lights are present on the street.

3.2.11 Oak Street

Oak Street is 3.5 miles east of the Caldor Road. It is a two-lane, two-way street with one lane in each direction. Oak Street is a city-owned street with a posted speed limit of 30 mph and is open to all traffic. It is classified as an urban minor arterial and serves residential neighborhoods in Natick. Oak Street carries about 19,600 vehicles per day in both directions. South of Route 9, Oak Street has a sidewalk only on the east side. North of Route 9, Oak Street has sidewalks on either side of the street. Street lights are present on the street.

3.3 STUDY INTERSECTIONS

Several cross streets and driveways intersect Route 9 as mentioned in the previous section, which creates safety and operations issues for users. Figure 2 shows the eight intersections identified in the Framingham segment with safety and operations problems and included for assessments. Chapters 5 and 6 include figures of the intersections showing the problems and proposed improvements, respectively. The following section describes the geometry, traffic and control, and land uses surrounding the signalized intersections. All of the intersections on Route 9 in the study area are under the jurisdiction of Massachusetts Department of Transportation.

3.3.1 Route 9 and California Avenue Intersection

California Avenue intersects Route 9 to form a four-leg signalized intersection. At the intersection, Route 9 eastbound approach has five travel lanes, two left-turn lanes, two through lanes, and a share through/right lane, while the westbound approach has four lanes, three through lanes and an exclusive right-turn lane. California Avenue southbound approach has three lanes, an exclusive left-turn lane, a shared left/through lane, and an exclusive right-turn lane. The driveway to the Route 9 East park-and-ride lot located south of the intersection, has two lanes on the approach, exclusive left-turn and right-turn lanes. The posted speed limits on Route 9 in the vicinity are 50 mph westbound and 45 mph eastbound and 25 mph on California Avenue. Sidewalk is present on the north side of Route 9 with a crosswalk across California Avenue. The intersection is equipped with a

fully actuated and isolated traffic signal with bicycle detection. The signal heads are mounted on span wires with backplates and no retroreflective yellow borders. There are street lights installed on the California Avenue and the driveway to the park-and-ride lot but not on Route 9. The MetroWest Regional Transit Authority serves the park-and-ride lot and the industrial and office park north of the intersection.

3.3.2 Route 9 and Country Club Lane Intersection

Country Club Lane intersects Route 9 to form a three-leg signalized intersection. It is located on a horizontal and vertical curve. The Foss Reservoir is located to the north of the intersection and the Halstead Framingham Apartments to the south. Each approach on Route 9 has two through lanes. In addition, the eastbound approach has an exclusive U-turn lane and right-turn lane while the westbound approach has an exclusive left-turn/U-turn lane. Country Club Lane has two lanes on the approach, an exclusive left-turn lane and a shared left-turn/right-turn lane at the approach. The intersection has a fully actuated and isolated traffic signal with bicycle detection. The signal heads are a mixture of mast arm and post mounts and have backplates without retroreflective yellow borders. Street lights are installed on the Country Club Lane but not on Route 9. There is a sidewalk on the north side of Route 9 but not on the south side.

3.3.3 Route 9 at Temple Street Intersection

Temple Street intersects Route 9 to form a five-leg signalized intersection. The intersection is located in a busy commercial area that includes Stop & Shop, Bank of America, CVS Pharmacy, Gulf Service Station, and McDonald's. At the intersection, Route 9 eastbound approach has two through lanes and exclusive left-turn and right-turn lanes. On the westbound approach of Route 9, there are three through lanes. All turns on the westbound approach must turn right onto Old Worcester Road to make a left turn/U-turn or continue onto Old Worcester or Temple Street northbound. Temple Street northbound approach has two travel lanes, an exclusive left-turn lane and a shared through/right-turn lane while the southbound approach has one lane serving all movements. The intersection is equipped with a fully actuated and isolated traffic signal system. The signal heads are a mixture of span wire, mast arm, and post mounts, and have backplates without retroreflective yellow borders. Crosswalks with wheelchair ramps with detectable warning plates are present on the east leg of Route 9, south leg of Temple Street, and east leg of Old Worcester Road. Some street lights are present on Temple Street and Route 9.

3.3.4 Route 9 at Edgell Road/Main Street Intersection

Main Street and Edgell Road intersect with the Route 9 ramps and High Street to form two closely spaced signalized intersections. Edgell Road and Route 9 westbound on-and-off ramps intersection is located north of Route 9. Edgell Road has two lanes on the southbound approach, a through lane and a shared through/right-turn lane, while the northbound approach has exclusive left-turn and through lanes. Route 9 westbound off-ramp has three lanes, two exclusive left-turn lanes, and a shared through/right-turn lane.

Edgell Road, Main Street, High Street, and Route 9 on-ramp is located south of Route 9. Edgell Road southbound approach and Main Street northbound approach each has two lanes, a shared left-turn/through lane, and a shared through/right-turn lane. High Street eastbound approach has three lanes, exclusive left-turn lane, shared left-turn/through lane, and exclusive right-turn lane.

The two intersections are equipped with a fully actuated and interconnected signal system that operates as a clustered intersection. The signal heads are a mixture of mast arm and post mounts and have backplates without retroreflective yellow borders. Crosswalks are present at the intersections, and they have wheelchair ramps with detectable warning plates and street lights. The intersection serves several land uses including Framingham State University to the south and the Framingham Historic and Commons District and commercial area to the north.

3.3.5 Route 9 at Prospect Street Intersection

Prospect Street intersects Route 9 at an oblique angle to form a three-leg signalized intersection. At the intersection, Route 9 eastbound approach has three lanes (two through lanes and shared through/right-turn lane), while the westbound approach has four lanes (three through lanes and an exclusive left-turn lane). Prospect Street southbound approach has three lanes (two left-turn lanes and a right-turn lane). The intersection is equipped with a fully actuated traffic signal system that is interconnected with the traffic signal at Route 9 and Main Street. The signal heads are a mixture of span wire and post mounts and have backplates with no retroreflective yellow borders. Crosswalks with wheelchair ramps and detectable warning plates are provided across the east leg of Route 9 and Prospect Street. Functioning pedestrian-activated pushbutton signals are present at the intersection. The intersection is located in a busy commercial area that includes Trader Joe's, Walgreens Drug Store, Whole Foods Market, and other retail stores.

3.3.6 Route 9 at Cochituate Road Interchange

Cochituate Road intersects Route 9 westbound at an oblique angle to form a three-leg unsignalized intersection. Only right-turns in and out of Cochituate Road can be made at the intersection. Route 9 westbound has two through lanes at the approach while Cochituate Road has one lane on the approach serving all traffic. A traffic beacon flashing red on Cochituate Road and yellow on Route 9 westbound has been installed at the intersection. Traffic on Cochituate Road is controlled by a stop sign, Route 9 westbound traffic is not controlled. A crosswalk is present across Cochituate Road with wheelchair ramps and detectable warning plates. Street lights are present at the intersection. The land uses near the intersection are mixed with the retail stores, offices, automobile dealers, and repair services.

3.3.7 Route 9 at Route 126 (Concord Street) Intersection

Concord Street intersects Route 9 to form a substandard clover-leaf interchange. Concord Street runs over Route 9 and connects to Route 9 through a series of substandard ramps. Most of the ramp terminals are controlled by stop signs. Route 9 has two lanes in each direction, while Concord Street has one lane in each direction. There are limited accommodations for people walking and biking at the intersection. The land uses near the intersection are mixed with the retail stores and offices and commercial areas on the north side of Route 9 and mostly residential areas on the south side of Route 9.

3.3.8 Route 9 at Caldor Road Intersection

Caldor Road intersects Route 9 to form a four-leg signalized intersection. At the intersection, Route 9 eastbound has five lanes (two left-turn lanes, two through lanes, and a shared through/right-turn lane). The westbound approach also has five lanes (two left-turn lanes, two through lanes, and a shared through/right-turn lane). Caldor Road has three lanes on the southbound approach (two left-turn lanes and a right-turn lane). The northbound approach has two lanes, an exclusive left-turn lane, and a shared left-turn/right-turn lane. The intersection is equipped with an adaptive traffic signal controller, which adjusts the signal timings to accommodate changing traffic patterns to ease traffic congestion. The signal heads are mounted on span wires and have backplates without yellow retroreflective borders. There are crosswalks at the intersection with wheelchair ramps, except for the west leg of Route 9. There are street lights present at the intersection. The land uses in the vicinity is primarily commercial including Shoppers' World, Natick Mall, and Sherwood Plaza.

3.3.9 Route 9 at Speen Street Interchange

Route 9 intersects with Speen Street ramps to form a complex nontraditional cloverleaf interchange. At the interchange, Speen Street is divided as the northbound and southbound passes over Route 9 via two overpasses. There are ramps and connectors for making all possible movements at the interchange, although many of the ramps are substandard. The ramp terminals are controlled by yield signs. There is no dedicated accommodation for people biking at the interchange; however, there are sidewalks along the west side of Speen Street southbound and east side of Speen Street northbound. The sidewalks are in poor conditions and do not meet MassDOT standards. In addition, there are streetlight poles in the sidewalks along Speen Street, particularly on the overpasses, that reduce the effective widths to less than four feet. The land uses near the interchange are mixed with commercial and retail stores, office park, residential, and recreational areas. During peak-hours of travel, the signalized intersections on Speen Street experience congestion and queueing.

3.3.10 Route 9 at Oak Street Intersection

Oak Street intersects Route 9 to form a four-leg signalized intersection. The intersection was reconstructed in 2015–16. At the intersection, each approach of Route 9 has two through lanes, an exclusive left-turn lane, and a shared through/right-turn lane. Oak Street has three lanes on each approach (a left-turn lane, a through lane, and a right-turn lane). The intersection is equipped with a fully actuated traffic system operating in isolation mode. The signal heads are mounted on span wires, and they have backplates without yellow retroreflective borders. There are crosswalks on all legs of the intersection with wheelchair ramps and detectable warning plates. Functioning pedestrian signals with pedestrian-activated pushbuttons are provided. Street lights are present at the intersection. The land uses surrounding the intersection is mixed with residential, educational, and commercial uses.

Chapter 4—Data Collection

Metropolitan Planning Organization (MPO) staff gathered data on vehicular traffic, volumes of people walking and biking, crashes, signal timing information, and roadway and intersection geometry data for existing conditions analyses. The information also includes planned and programmed projects in the corridor to address needs.

4.1 TRAFFIC DATA

Massachusetts Department of Transportation (MassDOT) Highway Division’s Traffic Data Collection section collected traffic data for the study. Automatic traffic recorder (ATR) counts were collected during a five-day period from Monday, May 3, 2021, to Friday, May 7, 2021. The ATR counts included daily traffic volumes, speeds, and traffic mix (light and heavy vehicles). MassDOT also collected turning-movement counts (TMC) in the study area on Tuesday, May 4, 2021. The TMC counts were performed 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). In all cases, heavy vehicles, pedestrians, and bicycles were recorded separately. Analysis of the traffic data is presented in Chapter 5 and the traffic data included in Appendix C

4.2 INTERSECTION LAYOUTS AND SIGNAL TIMING DATA

MassDOT provided MPO staff with existing signal timings, as-built traffic signal plans, and signal-phase sequences of the signalized intersections. Staff conducted field visits to verify modifications to the intersection layouts and signal timing plans. The signal information, layouts, and traffic data were used to assess the levels of service of the study intersections presented in Chapter 5. Appendix C includes the signal information

4.3 CRASH DATA

MPO staff used crash data obtained from MassDOT’s Registry of Motor Vehicles database from January 2015 through December 2019 to evaluate safety for motorists, pedestrians, and bicyclists in the study area. Analysis of the crash data is presented in Chapter 5 and the crash data and summary are included in Appendix E.

4.4 PROJECTS

MassDOT’s projects in the Route 9 corridor that address the study area problems are presented in Table 1. The table provides descriptions of the projects and their status.

Table 1
Route 9 Projects in Framingham and Natick

MassDOT Project Number	City/Town	Project Description	Status
608836	Framingham	Drainage Improvements and Related Work (Including Salt Shed Demolition) at the Intersection of Routes 9 and 126 Worcester Road and Concord Street	Construction
609003	Worcester, Shrewsbury, Westborough, Southborough, Framingham, Natick, Wellesley	Route 9 Connected Corridor (SPaT Challenge)	Construction
609247	Framingham	Framingham–Park and Ride Reconstruction and Salt Shed Depot Site Work on Route 9	Design
609402	Framingham-Natick	Resurfacing and Related Work on Route 9	Design
605313	Natick	Bridge Replacement, N-03-020, Route 27 (North Main Street) Over Route 9 Worcester Street and Interchange Improvements	Design

MassDOT = Massachusetts Department of Transportation. SPaT = Signal Phase and Timing.

Chapter 5—Existing Conditions

5.1 WALKING, BIKING, AND RIDING THE BUS

The Route 9 corridor support several land uses with the potential for generating and attracting walking and biking trips. Figures 3 and 4 show these locations and the sites where people can cross Route 9 such as at the signalized intersections and major bridges over the roadway. Spaces between the crossing sites can be as far part as 2.5 miles.

5.1.1 Walking and Biking Volumes

Table 2 presents the number of people walking and biking that were counted at the study intersections during the three-hour collection periods (weekday AM and PM peak periods). The low volumes were attributed to lack of safe walking and biking facilities, which create high stress environment and safety concerns.

Table 2
Peak Period Walking and Biking Volumes

Intersection	People Walking	People Biking	Total
Route 9 at California Avenue	8	0	8
Route 9 at Country Club Lane	0	0	0
Route 9 at Temple Street	47	5	52
Route 9 at Edgell Road/Main Street	41	1	42
Route 9 at Prospect Street	42	12	54
Route 9 at Cochituate Road	9	0	9
Route 9 at Concord Street (Route 126)	71	18	89
Route 9 at Caldor Road	57	12	69
Route 9 at Oak Street	5	7	12

Note: Weekday AM = 6:00 AM to 9:00 AM. Weekday PM = 3:00 PM to 6:00 PM.
Source: Central Transportation Planning Staff.

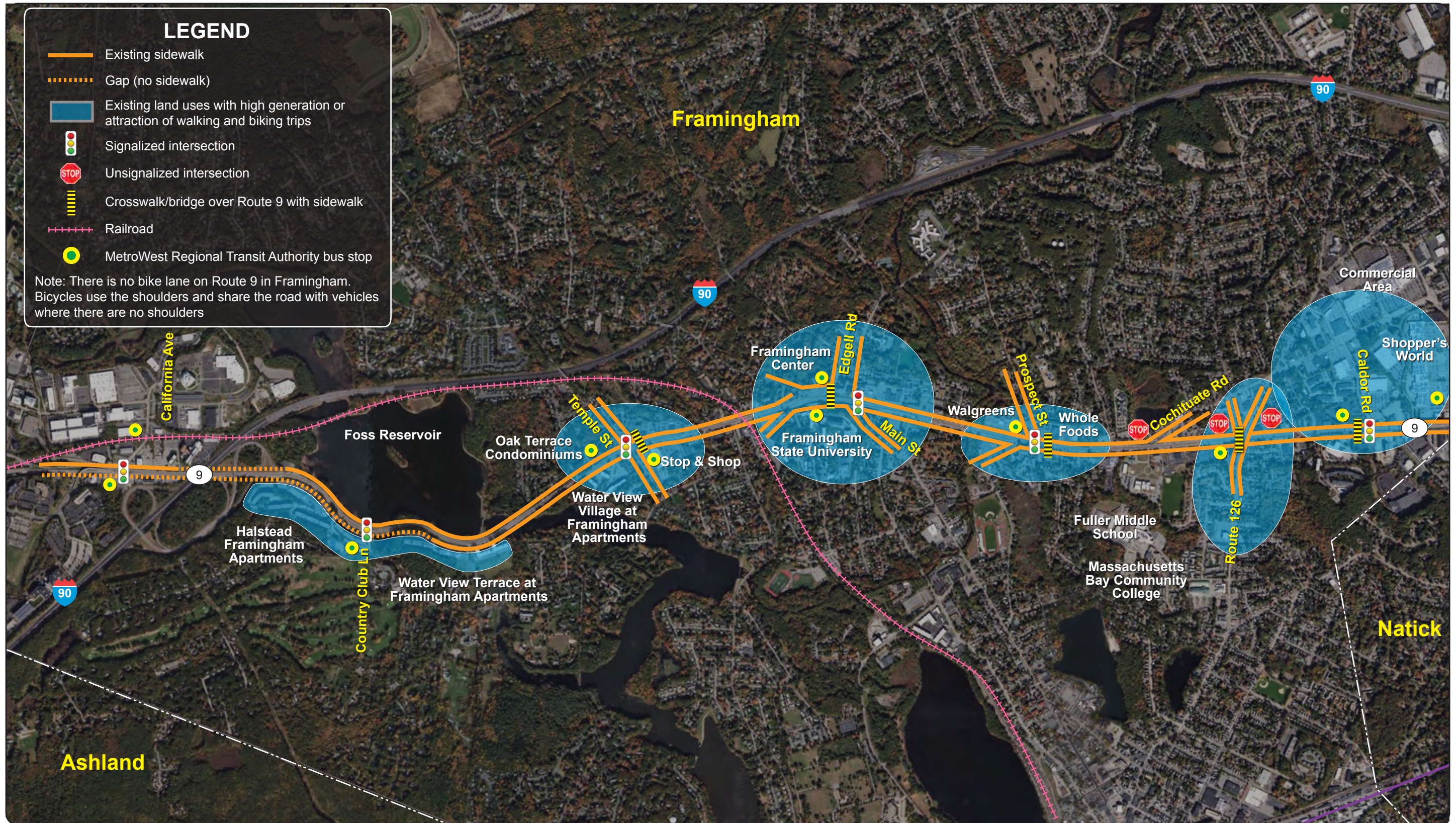


Figure 3
Areas with High Potential of Walking and Biking Trips: Framingham

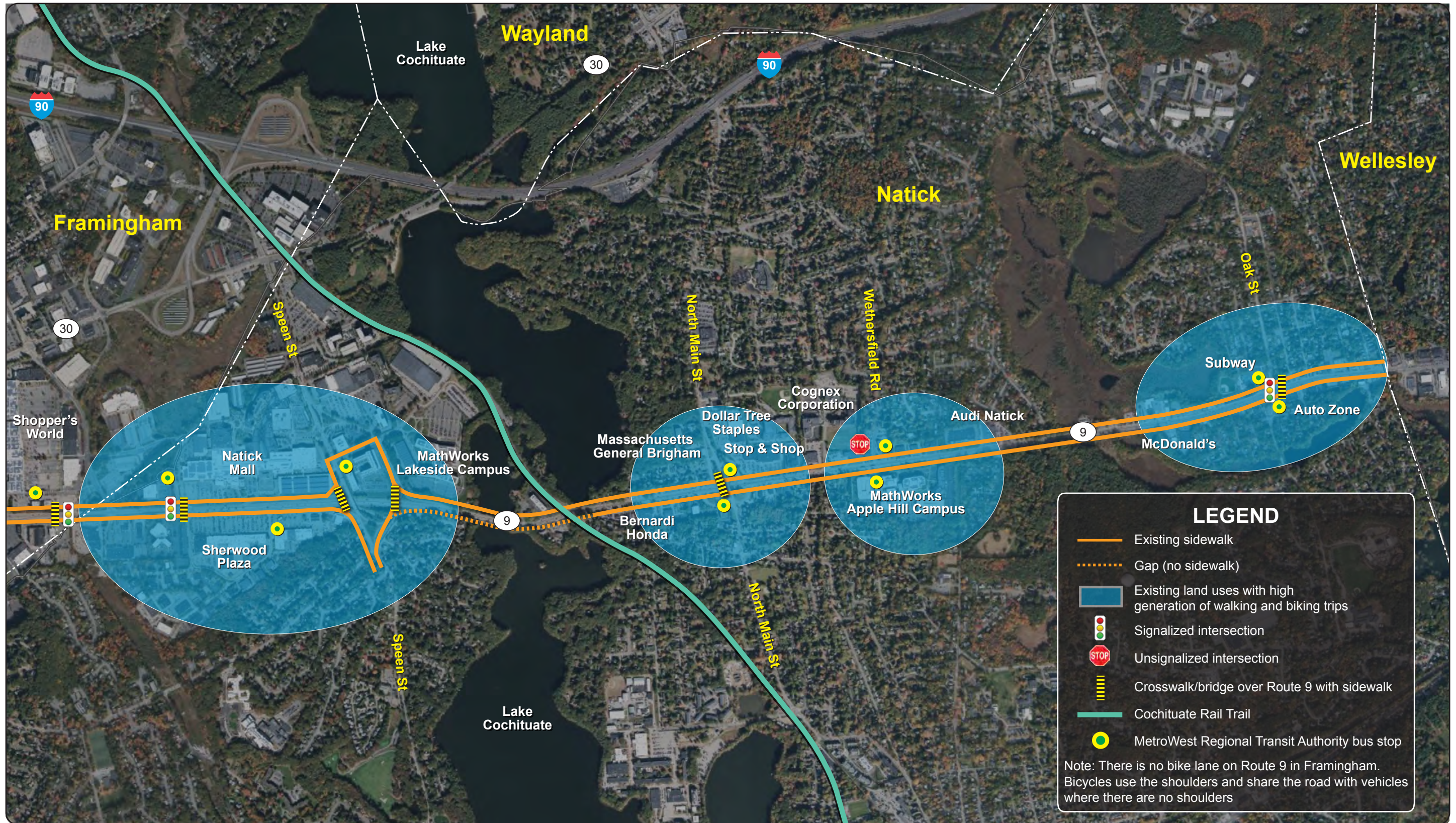


Figure 4
Areas with High Potential of Walking and Biking Trips: Natick

5.1.2 Challenging Environment for People Walking

People walking in the corridor are presented with a number of challenges. Out of the four fatal crashes in the corridor three involved people walking. Following analysis of crash data, field reconnaissance, review signal data, and road safety audits, these challenges were identified, some of which are shown in Figure 5.

- Crashes involving people crossing Route 9 or side streets: California Avenue, Main Street and Edgell Road, Prospect Street, Concord Street, Caldor Road
- Lack of crosswalks across some legs of Route 9 at the signalized intersections (California Avenue, Country Club Lane, Temple Street, Prospect Street, and Caldor Road)
- Lack of safe crossing opportunities—crossing opportunities in the corridor are available only at selected signalized intersections, which can be a mile or more apart
- Long crosswalks across Route 9 (about 100 feet long, all single-stage crossing)
- Lack of refuge areas in the long crosswalk across Route 9, which can be a problem for the elderly and people using assistive mobility devices
- Long pedestrian wait times and insufficient crossing intervals at the signalized intersections
- Lack of accessible pedestrian signals to assist people with assistive mobility devices such as Americans with Disabilities Act (ADA)-compliant curb ramps, audible signals, countdown timers
- Lack of pedestrian-activated pushbuttons on many of the side streets at the signalized intersections
- Gaps in the sidewalk network
- Poor sidewalk conditions (uneven surface, broken with cracks, overgrown with vegetation)
- Obstacles in sidewalk that reduce width to less than four feet (utility poles, street furniture, and outgrown vegetation)
- Curb cuts and sidewalk ramps do not meet ADA/Massachusetts Department of Transportation (MassDOT) standards
- Lack of signs alerting motorists of the presence of people walking and biking, especially at areas where they cross streets
- Lack of adequate street lighting pose safety and security concerns for people walking



Gap in sidewalk network near Water View Terrace at Framingham Apartments



Lack of a crosswalk across Route 9 at Country Club Lane



Lack of pedestrian signals and pushbuttons on Temple Street



Gap in sidewalk network on Concord Street at Route 9



Deteriorating staircase on Concord Street at Route 9



5.1.3 Walking Level of Service

The quality of walking travel is affected by the roadway infrastructure, such as whether there are sidewalks and crosswalks present or pedestrian signals that allow people walking time to cross an intersection before vehicles get a green light. To reflect the complex relationship between people walking and the travel environments, Metropolitan Planning Organization (MPO) staff developed a tool that grades a given roadway on its quality of walking travel and whether it reflects the following objectives: safety, system preservation, capacity management and mobility, and economic vitality.¹¹ Based on the tool, Route 9 in Framingham and Natick was rated *poor* for all the objectives. Overall, the assessment indicates that the roadway needs improvements to safely accommodate people walking. The ratings from this assessment tool are in Appendix B.

5.1.4 Challenging Environment for People Biking

Conditions in the corridor are not favorable for biking. Although there are bikeable shoulders on Route 9 and there are signs installed for people biking to share the road at locations without shoulders, the character of Route 9 does not encourage people to bike in the corridor for safety and security reasons. Following a similar process accessing the walking environment, the following challenges were identified, some of which are shown in Figure 6.

- Lack of safe accommodations for people biking (in general bike facilities are lacking in the corridor)
- High speeds of vehicles (speed limits in the corridor vary from 40 miles per hour [mph] to 50 mph) prevent people from biking due to safety concerns (even where there are bikeable shoulders; people biking choose to ride on the sidewalks)
- High volumes of traffic (47,000–60,000 vehicles per day) make people biking uncomfortable on the shoulders or sharing the road with vehicles
- Bikeable shoulders are present on Route 9, however
 - they are not marked as bike lanes,
 - they are of inconsistent width, and
 - they end at the signalized intersections.
- High stress environment for people biking (high vehicle speeds and volumes). Most people biking in the corridor are usually riding on the sidewalks, even at locations with adequate shoulders

¹¹ Ryan Hicks and Casey-Marie Claude, Pedestrian Level-of-Service Memorandum, Technical Memorandum to the Boston Region Metropolitan Planning Organization, January 19, 2017.

- Lack of connectivity of bike trips between Route 9 and crossing arterials
- Lack of adequate street lights in Route 9 corridor presents safety and security concerns for people biking



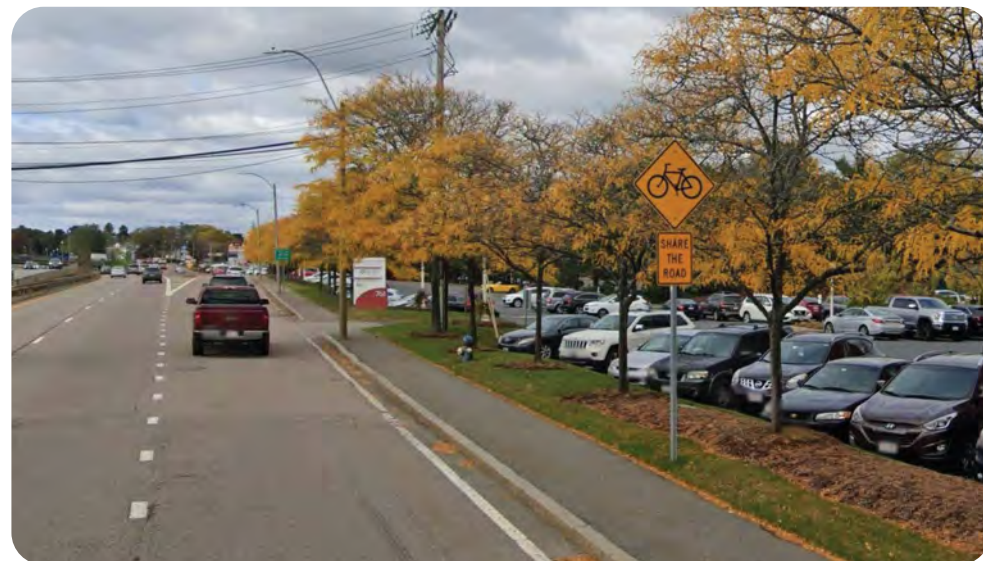
Biking on the sidewalk



Biking on the sidewalk



Biking on the sidewalk



Sign telling people biking to share the road



Biking on the sidewalk



5.1.5 Biking Level of Service (BLOS)

The quality of bicycling travel is affected by the character of the roadway, 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 to facilitate bicycle travel. The approach is similar to the Pedestrian Level of Service (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 correlate with the objectives emphasized for PLOS. Based on the BLOS tool, Route 9 in Framingham and Natick was rated *poor* in terms of safety, *poor* in terms of system preservation, *poor* in terms of economic vitality, and *poor* in capacity management and mobility. Overall, the assessment indicates that the roadway needs improvements to accommodate bicyclists. The ratings from this bicycle assessment tool are in Appendix B.

5.1.6 Challenging Environment for People Riding the Bus

The Route 9 corridor in Framingham and Natick and surrounding areas are served by buses operated by the MetroWest Regional Transit Authority (MWRTA). Figures 5 and 6 also shows the MWRTA service stops along Route 9. During weekdays, Route 9 connections can be made by bus routes 1, 2, 3, 4, 7, 8, 9, 10, and 11. On Saturdays, when there is limited service, Route 9 connections can be made by Routes 2, 3, 4, 7, and 10.

People riding the bus are also presented with challenges, which in many ways are similar to those walking or biking listed above. Additional challenges for bus operations and riders include

- lack of safe bus stops on Route 9 (Temple Street and Prospect Street intersections and several intersections along the corridor);
- congestion and travel delays affecting on-time performance of the buses; and
- lack of facilities to support safe and efficient transit such as safe crosswalks at bus stops and transit priority signals.

5.2 DRIVING IN THE CORRIDOR

Route 9 is an automobile centric corridor. It serves both local and regional travel, work and non-work-related travel, including shopping, recreation, and school trips. Like the walking and biking travel, automobile travel is also challenging in the corridor, resulting in many high-crash locations.

5.2.1 Vehicle Volumes

MassDOT Highway Division collected traffic data for analysis. The counts were taken in May 2021. Because of the COVID-19 pandemic, the traffic volumes were on the low side. By comparing the May 2021 counts to 2018 historical counts on Route 9 west of Route 27, it was determined that they were 20 percent lower. In addition, comparing the May 2021 counts to 2019 historical counts obtained from HNTB indicated that the turning volumes to and from the industrial and office parks along the corridor were on the low side. One reason for the low counts was that many workers were working from home or had a shorter workweek. The 2019 counts were used for many of the study intersections along with seasonal and growth factors. For the intersections of Route 9 at Main Street/Edgell Road and Route 9 at Concord Street (Route 126) where there were no 2019 counts, we followed methodology suggested by MassDOT. The May 2021 counts were adjusted up by 20 percent along with seasonal and growth factors. Figure 7 shows the turning movement volumes at nine intersections during weekday AM and PM peak hours. The turning movement data are included in Appendix C.

5.2.2 Intersection Levels of Service (LOS)

MPO staff conducted traffic operations analyses consistent with the Highway Capacity Manual (HCM) methodologies.¹² 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 3 presents the control delays (standards for comparison) associated with each LOS for signalized and unsignalized intersections.

Table 3
Intersection Level of Service Criteria

Level of Service	Signalized Intersection Control Delay (seconds per vehicle)	Unsignalized Intersection Control Delay (seconds per vehicle)
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.

¹² Transportation Research Board of the National Academies, *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis*, Washington, DC, September 2020.

LEGEND

- Study intersection
- AM (PM)
- 40 mile per hour
- 45 mile per hour
- 50 mile per hour

Weekday AM peak hour = 7:30 AM to 8:30 AM
 Weekday PM peak hour = 3:45 PM to 4:45 PM
 Counts taken on May 4, 2021

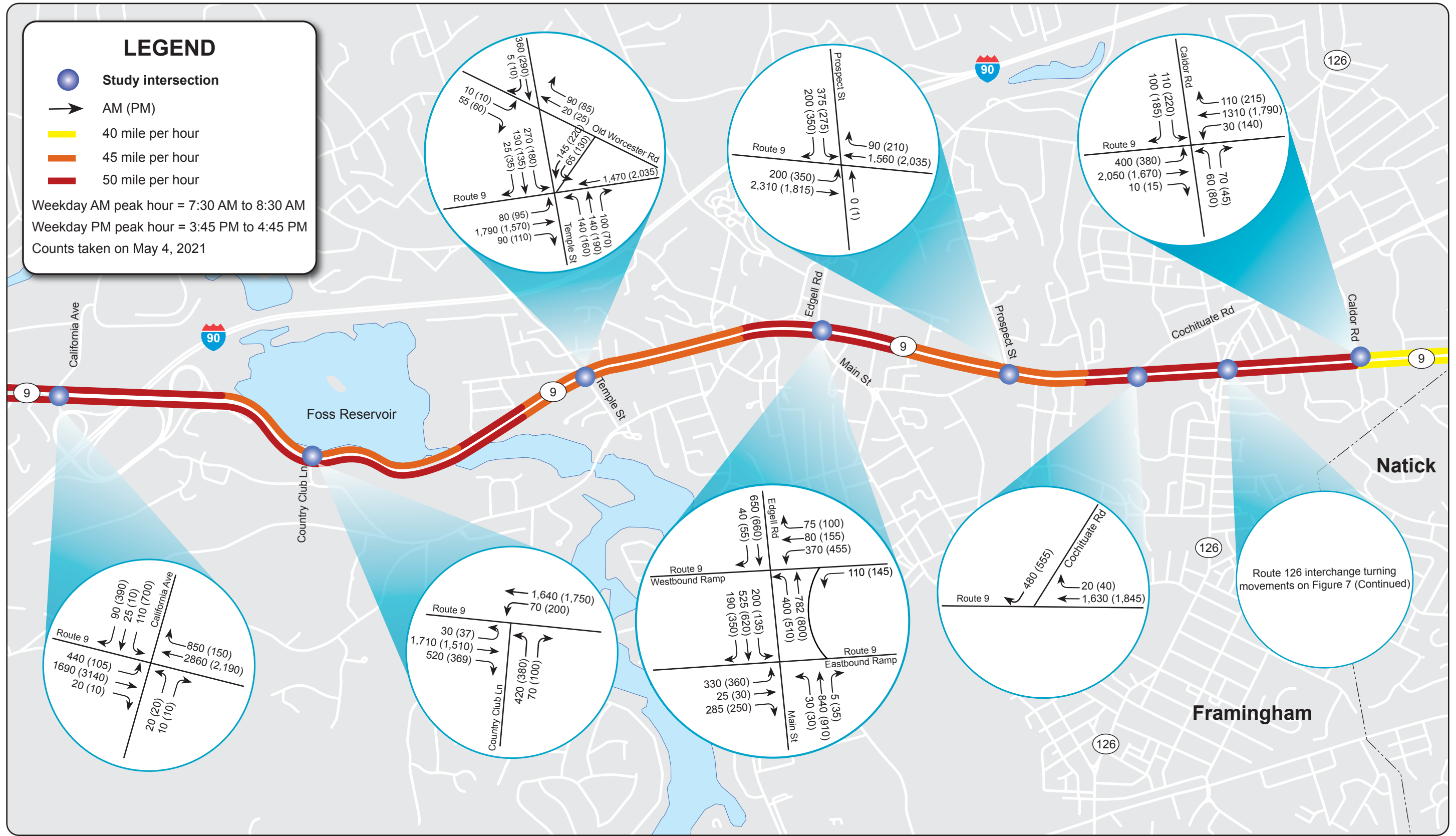


Figure 7
 Weekday Peak-Hour Turning Movement Volumes and Speed Regulation

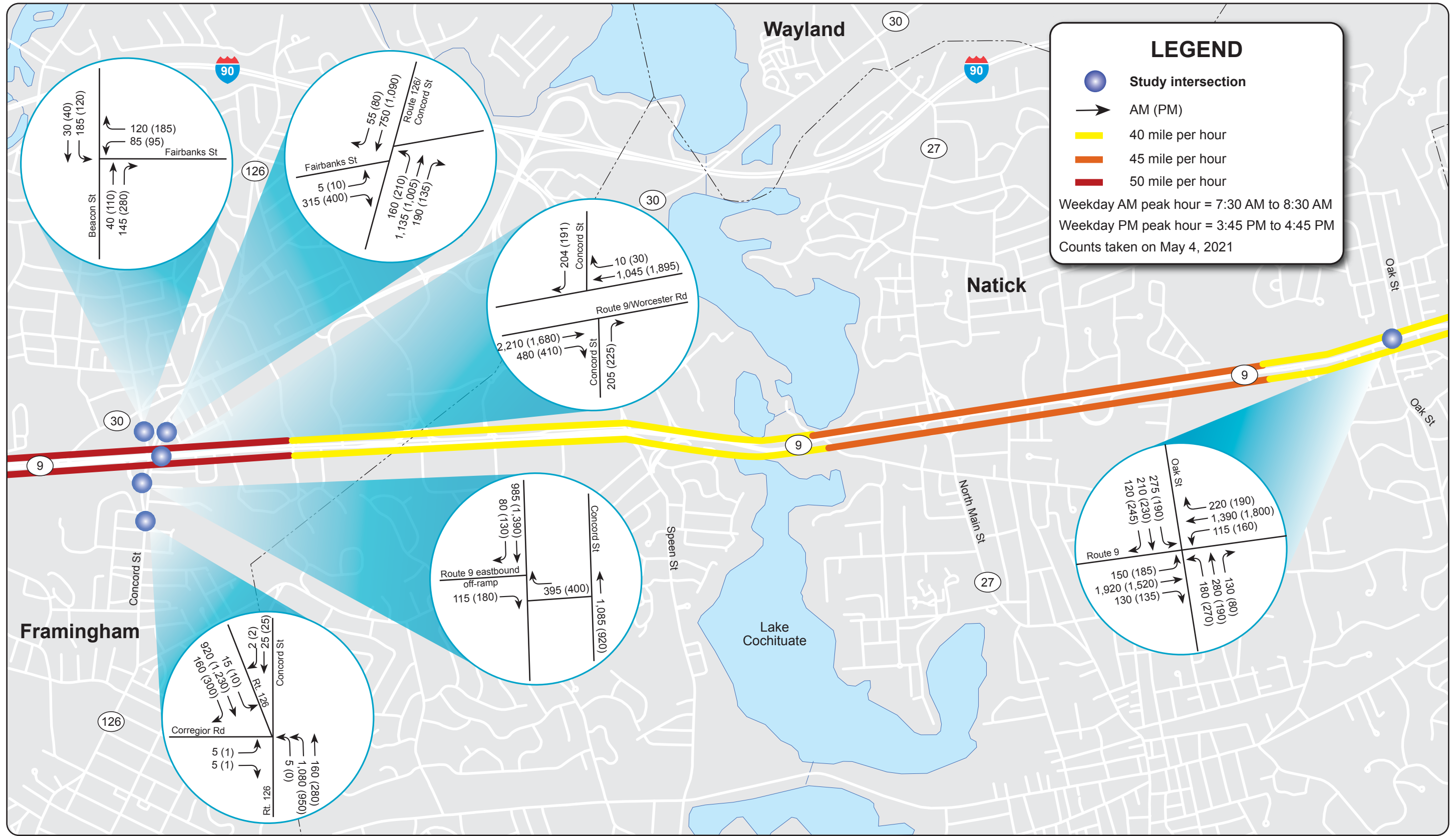


Figure 7
 Weekday Peak-Hour Turning Movement Volumes and Speed Regulations (Continued)

Using Synchro traffic analysis software, MPO assessed the capacity and levels of service of intersections.¹³ Figures 8 and 9 show the analysis results for the weekday AM and weekday PM, respectively. Appendix D presents the existing conditions LOS analysis worksheets. Based on the traffic operations analyses, the following intersections were found to operate under congested conditions and have long queues during peak travel hours:

- Route 9 at Temple Street
- Route 9 at Edgell Road/Main Street
- Route 9 at Prospect Street
- Route 9 at Cochituate Road
- Route 9 at Caldor Road
- Route 9 at Oak Street

¹³ CUBIC, Trafficware Inc., Synchro plus SimTraffic, Version 11.1 Build 1 version 6 (11.1.1.6), Sugar Land, Texas.

LEGEND

X, 0 = LOS, delay

- Intersection operates well with acceptable delay (LOS A, B, C or D)
- Intersection operates at capacity (LOS E)
- Intersection operates with unacceptable delay (LOS F)

Signalized Intersections

LOS	Control Delay per Vehicle (sec)
A	< 10
B	10–20
C	20–35
D	35–55
E	55–80
F	> 80

Unsignalized Intersections

LOS	Control Delay per Vehicle (sec)
A	< 10
B	10–15
C	15–25
D	25–35
E	35–50
F	> 50

LOS = level of service

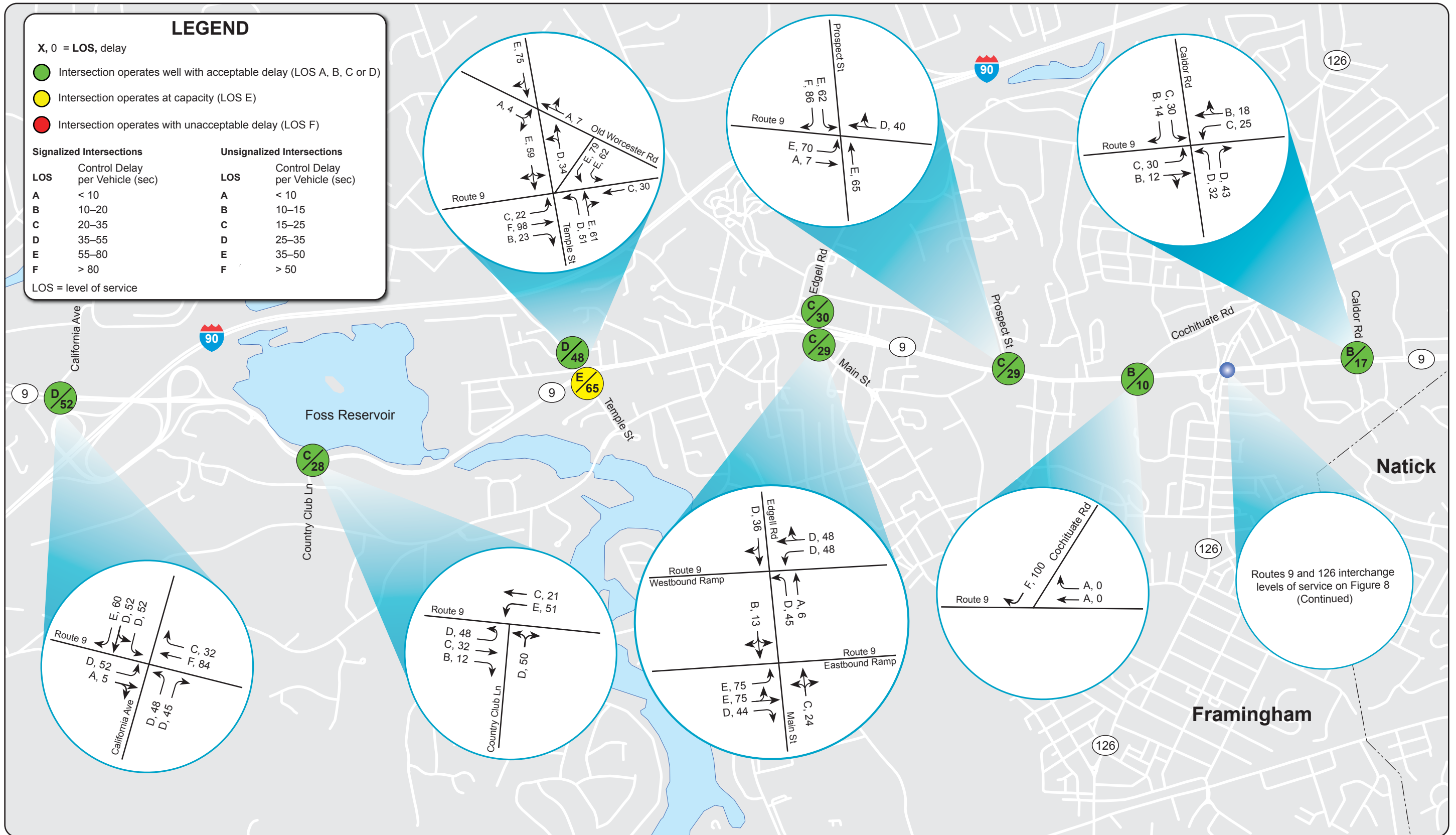


Figure 8
Existing Conditions
Weekday AM Peak-Hour Level of Service and Delays

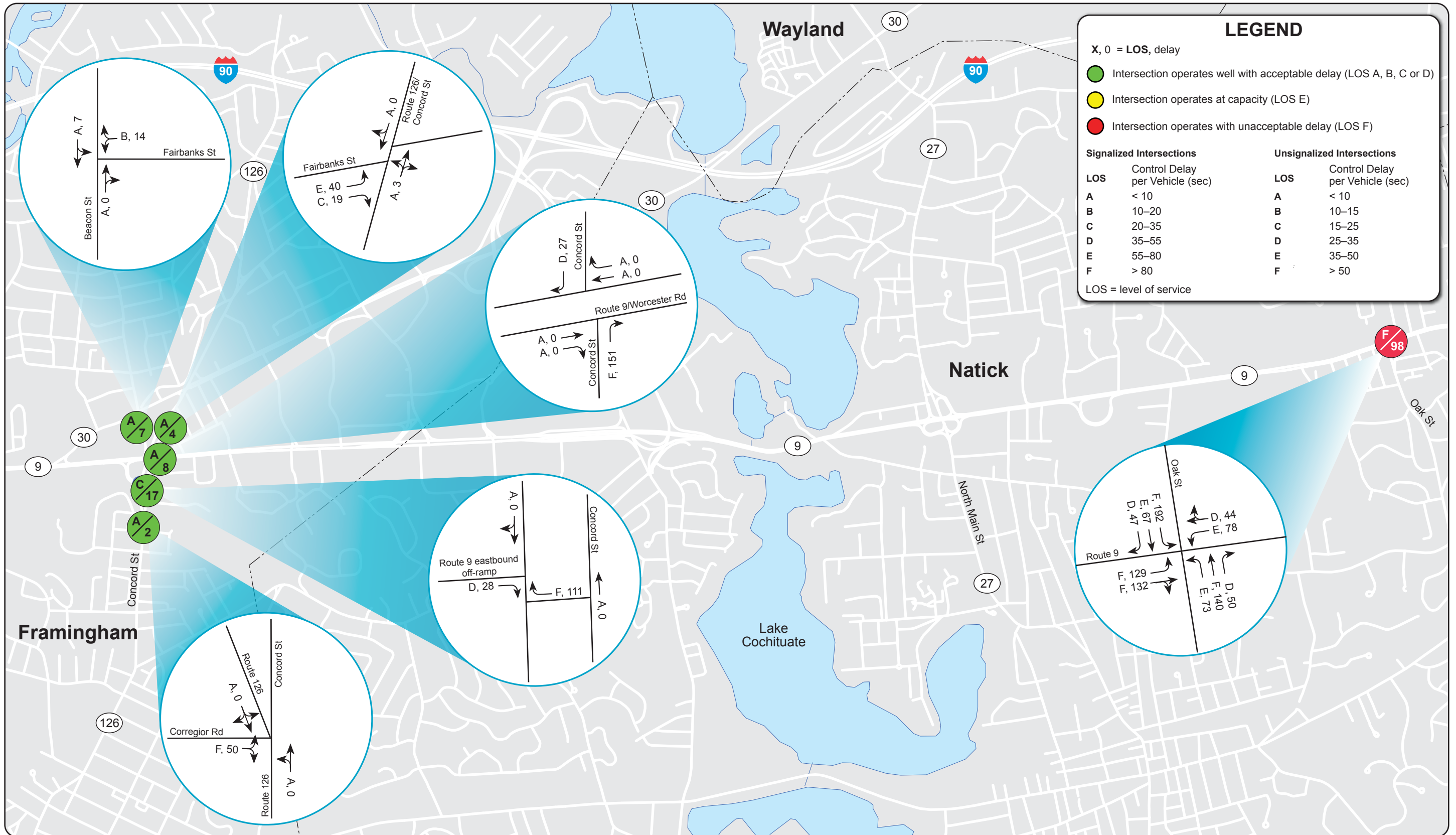


Figure 8
Existing Conditions
Weekday AM Peak-Hour Level of Service and Delays (Continued)

LEGEND

X, 0 = LOS, delay

- Intersection operates well with acceptable delay (LOS A, B, C or D)
- Intersection operates at capacity (LOS E)
- Intersection operates with unacceptable delay (LOS F)

Signalized Intersections

LOS	Control Delay per Vehicle (sec)
A	< 10
B	10–20
C	20–35
D	35–55
E	55–80
F	> 80

Unsignalized Intersections

LOS	Control Delay per Vehicle (sec)
A	< 10
B	10–15
C	15–25
D	25–35
E	35–50
F	> 50

LOS = level of service

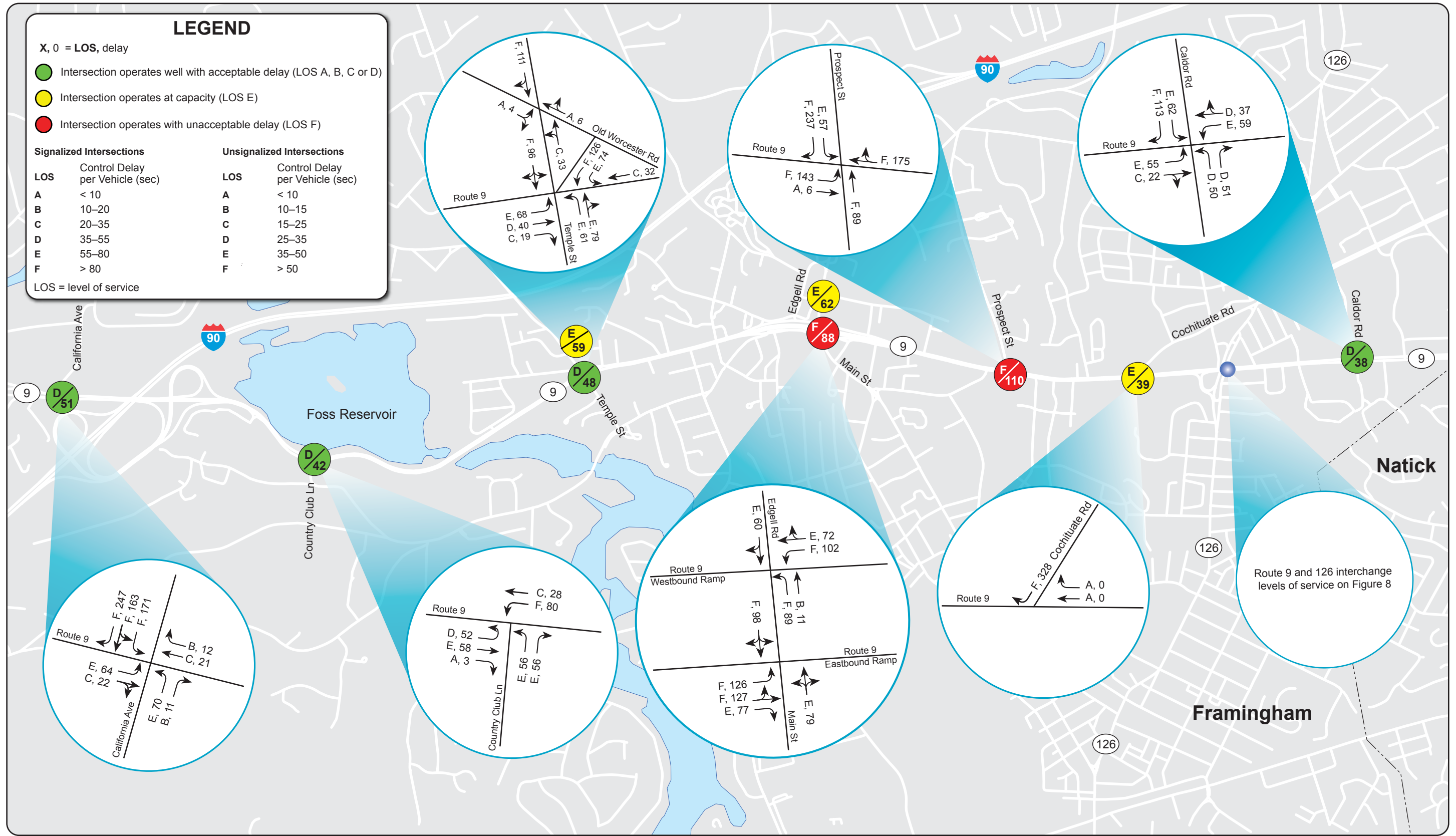


Figure 9
Existing Conditions
Weekday PM Peak-Hour Level of Service and Delays

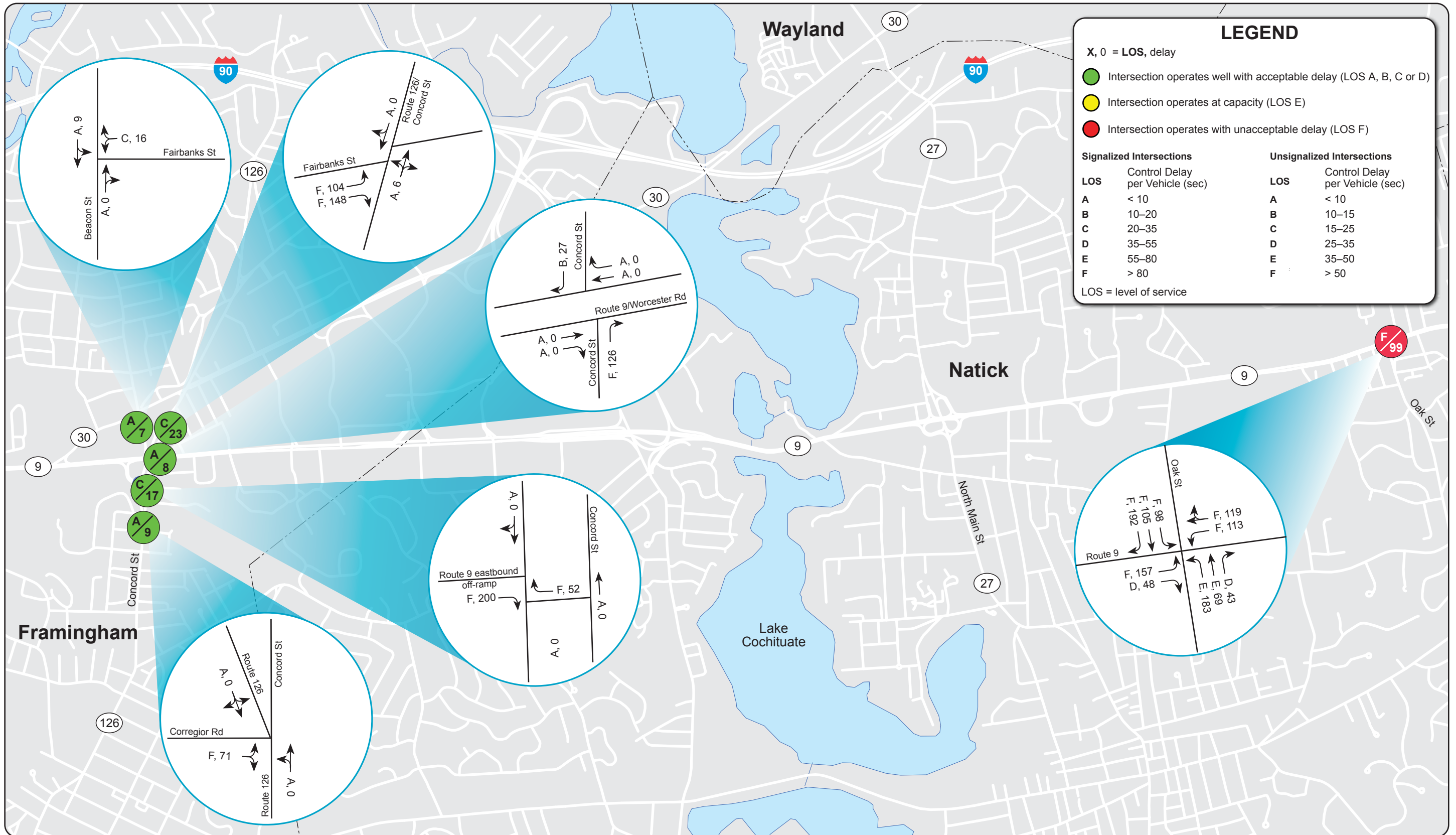


Figure 9
Existing Conditions
Weekday PM Peak-Hour Level of Service and Delays (Continued)

5.2.3 Crash Summaries

Analysis of Route 9 crash data obtained from MassDOT’s Registry of Motor Vehicles database from January 2015 through December 2019 is presented in Table 4. The data comprise crashes that occurred at the eight Highway Safety Improvement Program intersection clusters in the corridor and at the Maynard Road intersection and Routes 9 and 126 interchange. During the five-year analysis period, a total of 954 crashes were recorded in the corridor at the 10 locations. Table 4 presents a summary of the crash statistics.

**Table 4
Summary of Intersection Crash Statistics: 2015–19**

Crash Variable	5-Year Total	Percent
Total number of crashes	954	100
Severity: Property damage only	723	76
Severity: Possible injury	69	7
Severity: Non-incapacitating	136	14
Severity: Incapacitating	18	2
Severity: Fatality	4	0
Severity: Not reported/unknown	5	1
Collision type: Single vehicle	79	8
Collision type: Rear-end	465	49
Collision type: Angle	212	22
Collision type: Head-on	9	1
Collision type: Sideswipe, same direction	182	19
Collision type: Sideswipe, opposite direction	6	1
Collision type: Not reported/unknown	1	0
Daylight	662	69
Dark—lighted roadway	226	24
Dark—unlit roadway	24	3
Dark—unknown	4	0
Dawn	11	1
Dusk	25	3
Unknown/other	2	0
Involved pedestrian(s)	14	1
Involved cyclist(s)	6	1
Occurred during weekday peak periods*	309	32
Wet or icy pavement conditions	164	17
Dark conditions (lit or unlit)	254	27

* 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.

5.2.4 Analysis of Collision Diagrams

MPO staff prepared collision diagrams for the 10 locations to examine patterns within the crash data and factors contributing to the crashes. The collision diagrams are included in Appendix E. The associated tables may be used to look up additional details for specific crash events. The collision diagrams reveal the safety problems outlined in the following sections.

5.2.5 Characteristics of the Crashes

Based on the summaries and collision diagrams, the following characteristics were identified.

- Overall, 98 percent of the crashes at the high-crash locations were vehicle-to-vehicle collisions.
- Four fatal crashes, two involving people crossing Route 9 at the Prospect Street intersection, one involving a person crossing Route 9 at Caldor Road intersection, and one involving a person driving through the Oak Street intersection.
- Approximately 24 percent of the total crashes resulted in injury to at least one of the involved parties. There are several contributory factors including excessive speeds, restricted sight distances, poor signal visibility, disregard of signs and controls, and driver inattention and distraction.
- Approximately 22 percent of all crashes were angle crashes. Likely causes of the angle crashes in the corridor are poor signal visibility, restricted sight distance, inadequate advance intersection warning signs, excessive speeds on the approaches, inadequate signal timing, and high total intersection volume/congestion.
- Approximately 49 percent of all crashes were rear-end crashes. Probable causes of the rear-end crashes in the corridor are lack of signage, short sight distance, driver distraction, driver inattention, impaired driving, following too closely, speeding, lane drop, inadequate intersection identification, insufficient left-turn lane and acceleration/deceleration lanes, inadequate signal timing or phasing, lack of dilemma zone protection, poor visibility of signals, and sun glare issues due to the east-west direction of the roadway.
- Approximately 19 percent of all crashes were sideswipe, same direction crashes. Possible causes of these crashes in the corridor include inadequate signing, inadequate pavement markings, excessive speeds, and inadequate channelization.

- Approximately 32 percent of crashes took place during peak travel period (defined as 6:00 AM to 9:00 AM and 3:00 PM to 6:00 PM).
- Fourteen crashes involved people walking and six crashes involved people biking, representing about two percent of the crashes. Likely causes of these crashes are inadequate street lighting, restricted sight distance, inadequate protection for people walking and biking, inadequate signals and signal phasing, and high vehicle speeds.
- Approximately 27 percent of crashes occurred during dark (lit or unlit). Possible causes are poor visibility or lighting, and inadequate channelization or delineation.

5.3 NEEDS

Figures 10 through 20 show the problems at 11 intersections selected for study. Together, they show the need for following:

- measures to calm traffic
- measures to improve safety and security for people walking, biking, and taking the bus
- measures to reduce crashes in the corridor
- measures to reduce congestion in the corridor
- measures to improve wayfinding in the corridor
- measures to simplify movements at complex intersections or upgrade substandard interchanges and acceleration/deceleration lanes
- measures to support livability and economic vitality of the communities

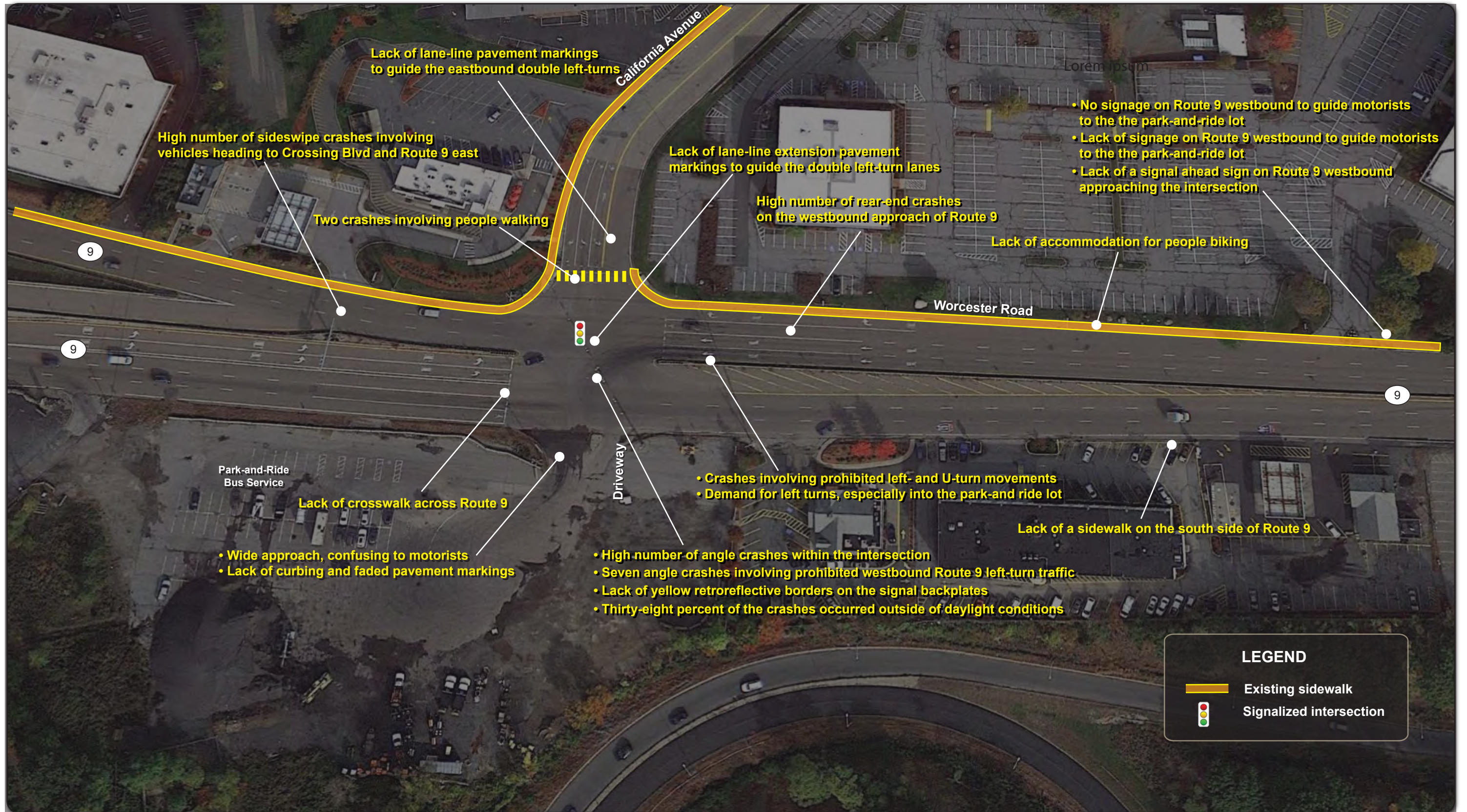


Figure 10
Problems: Route 9 and California Avenue Intersection

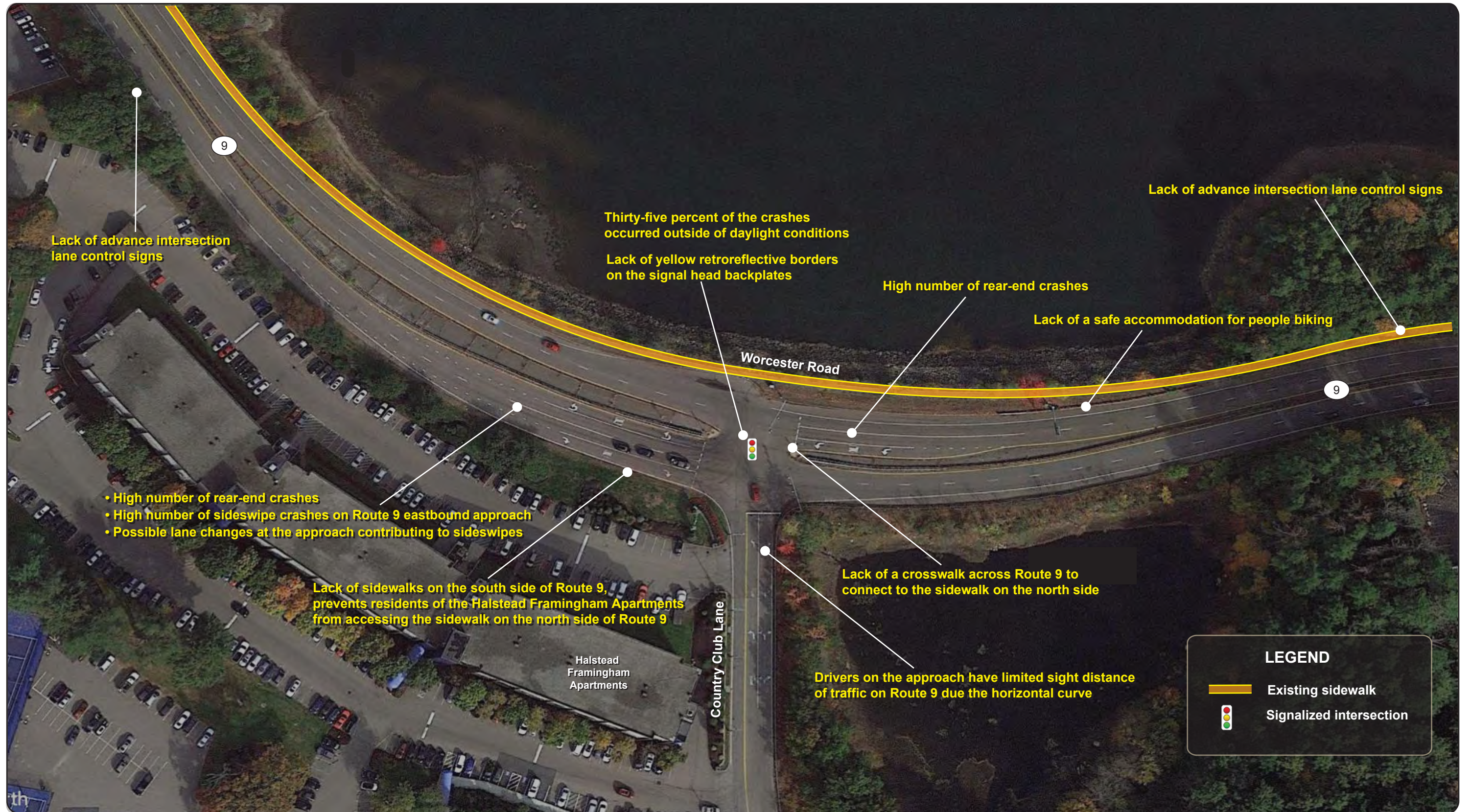
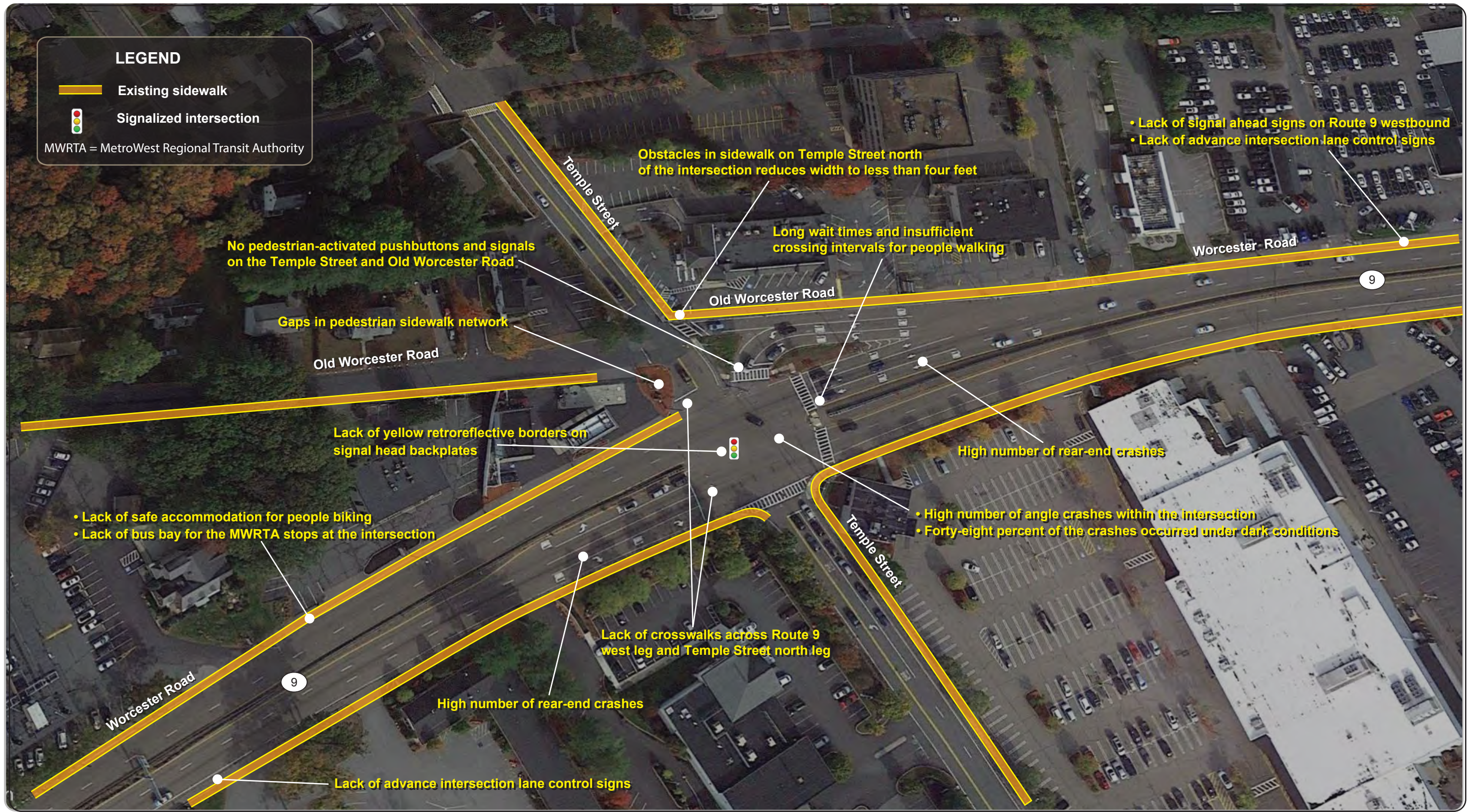


Figure 11
Problems: Route 9 and Country Club Lane Intersection

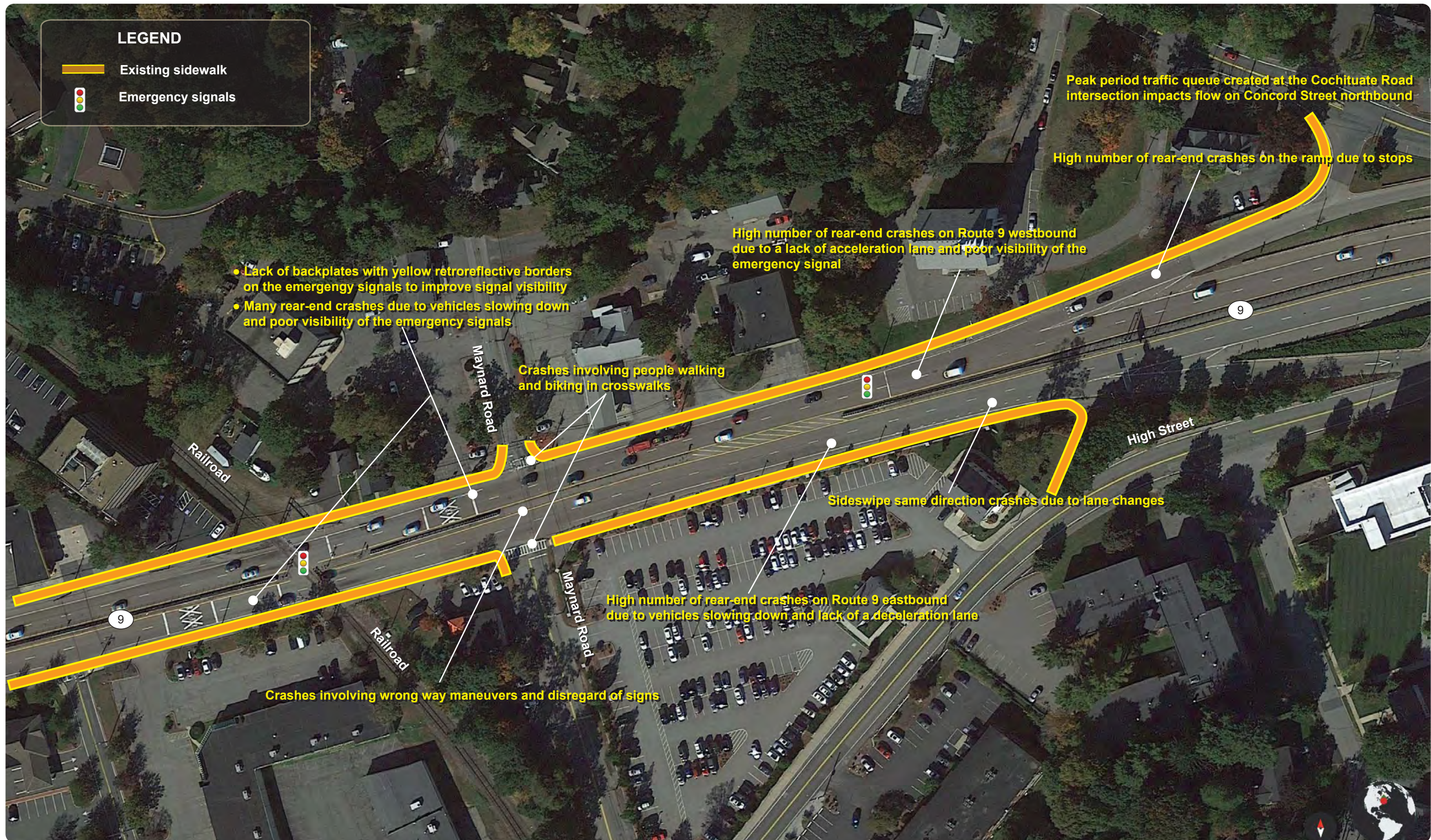


BOSTON REGION MPO

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Figure 12
Problems: Route 9 and Temple Street Intersection

Addressing Priority Corridors from the L RTP Needs Assessment: Route 9 in Framingham and Natick



BOSTON REGION MPO
 
Figure 13
Problems: Route 9 and Maynard Road Intersection

Addressing Priority Corridors from the L RTP Needs Assessment: Route 9 in Framingham and Natick

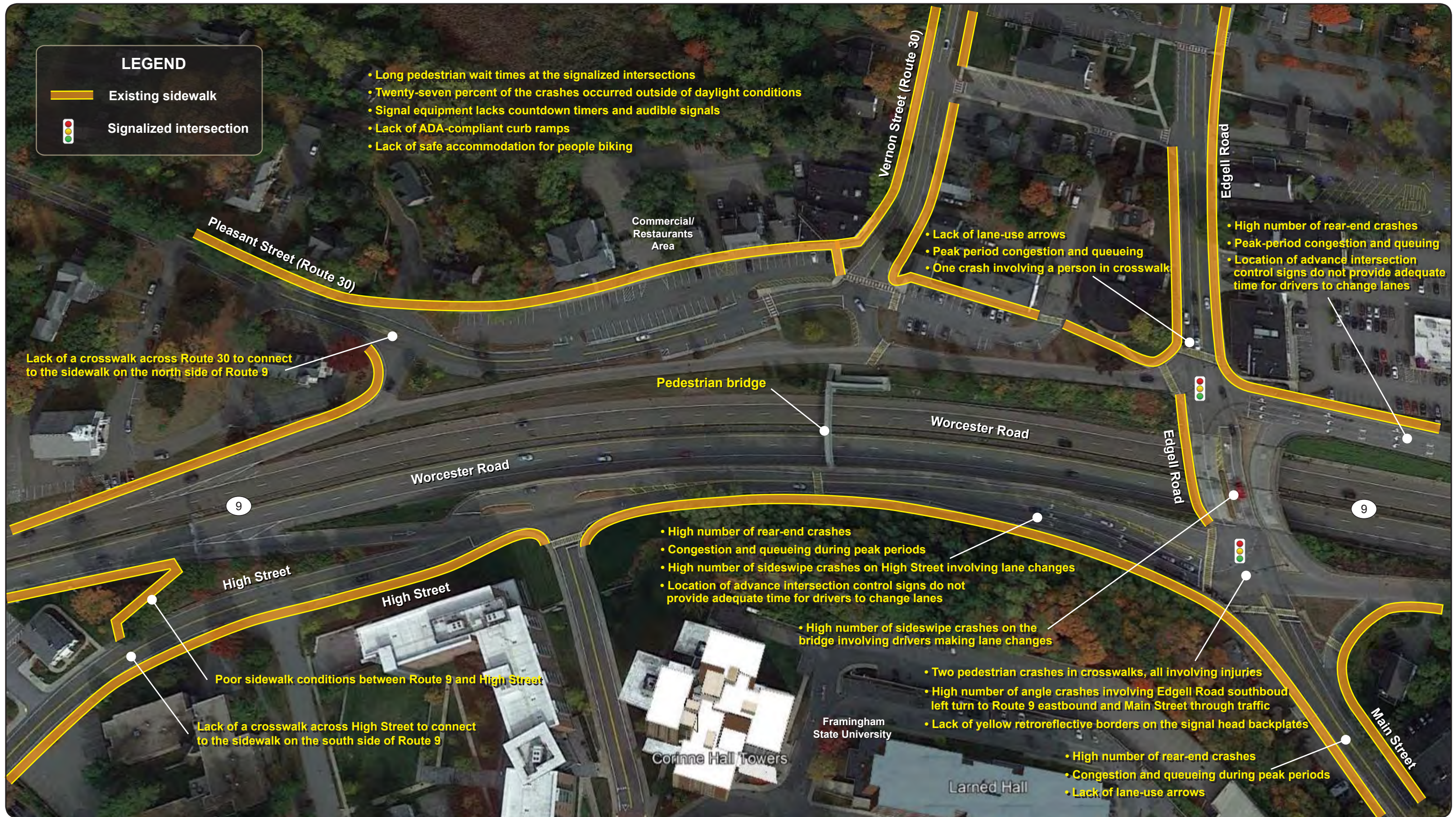


Figure 14
Problems: Route 9 and Main Street/Edgell Road Intersection

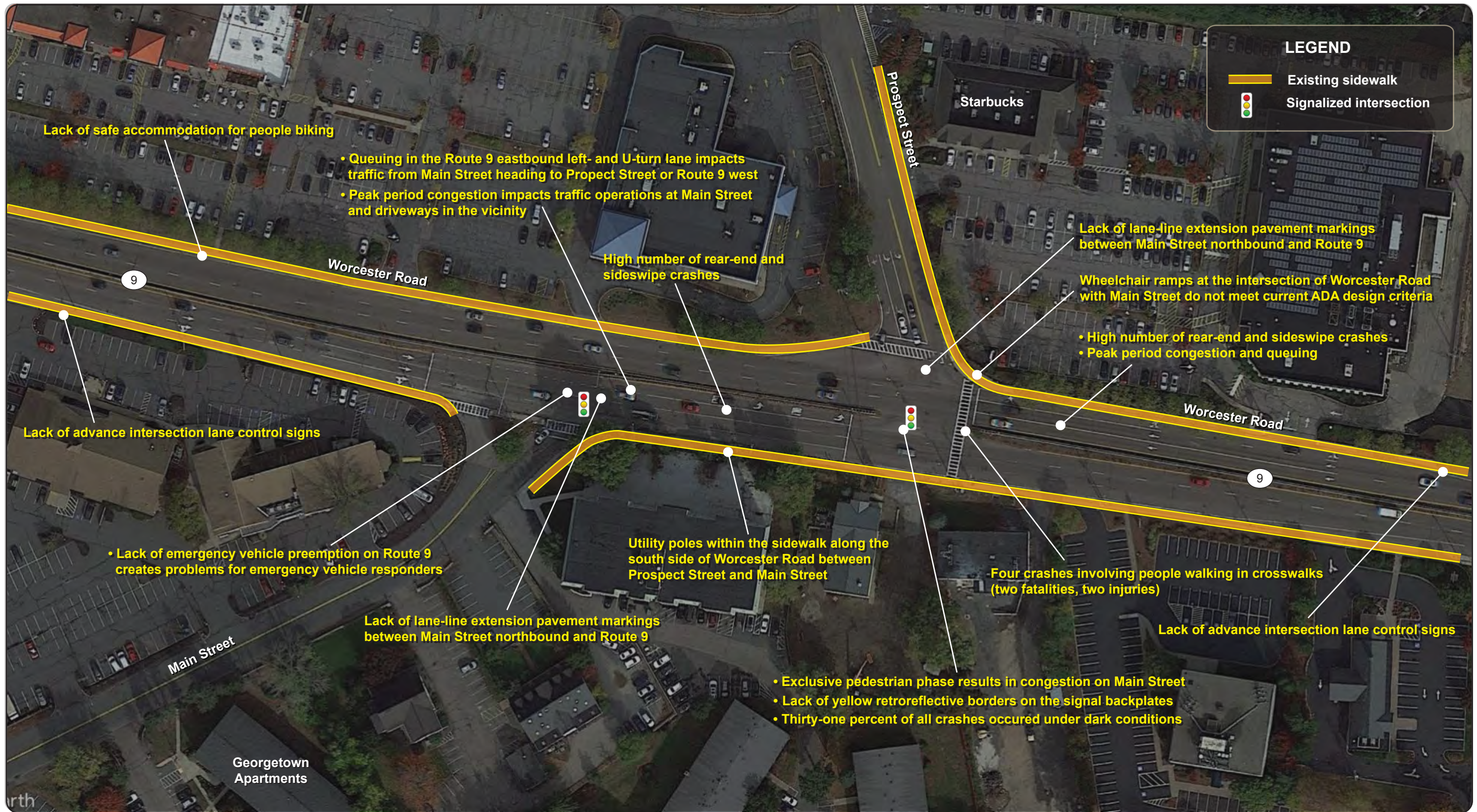


Figure 15
Problems: Route 9 and Prospect Street Intersection

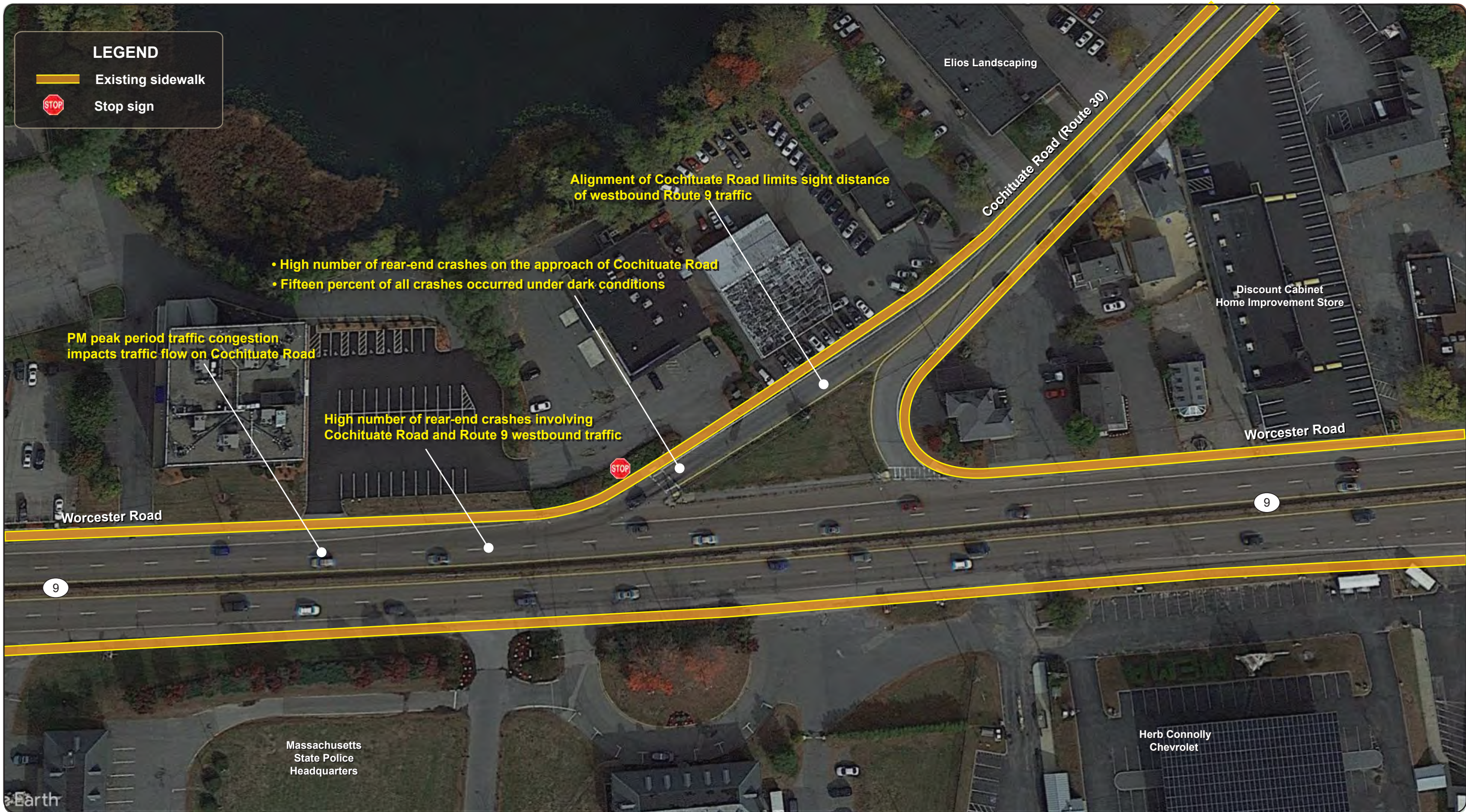


Figure 16
Problems: Route 9 and Cochituate Road Intersection



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Figure 17
 Problems: Route 9 and Concord Street (Route 126) Interchange

Addressing Priority Corridors from the L RTP Needs Assessment: Route 9 in Framingham and Natick

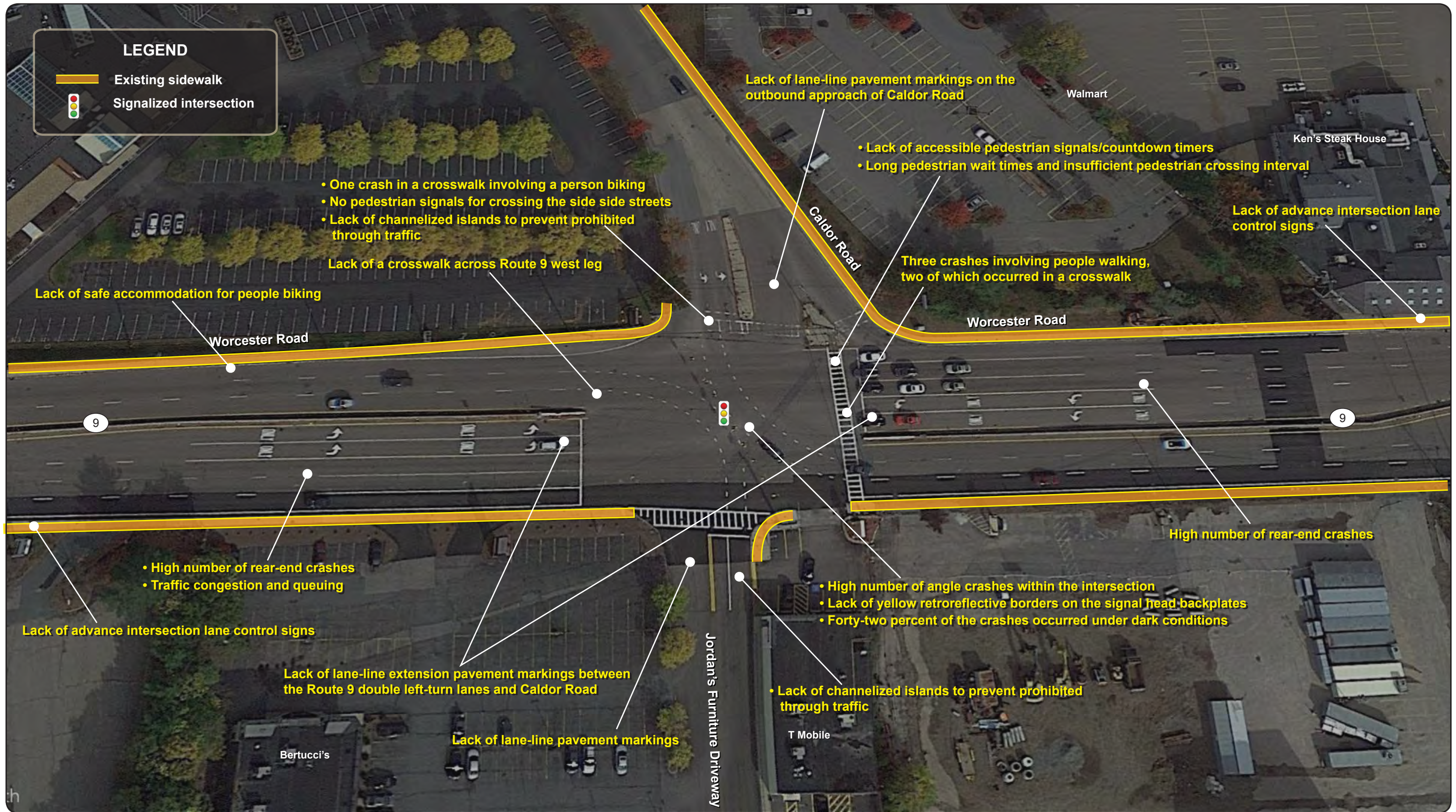


Figure 18
Problems: Route 9 and Caldor Road Intersection

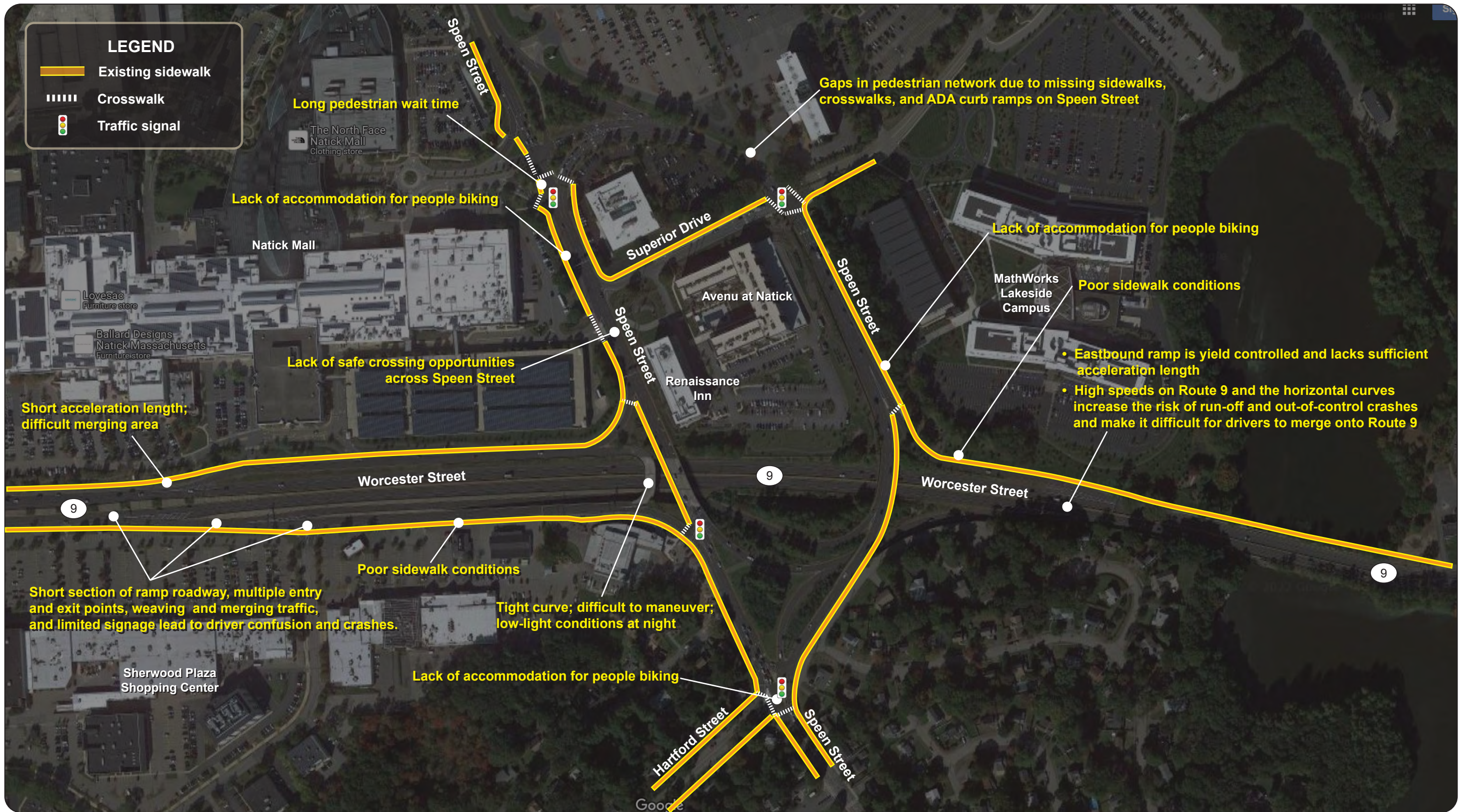


Figure 19
Problems: Route 9 and Speen Street Interchange

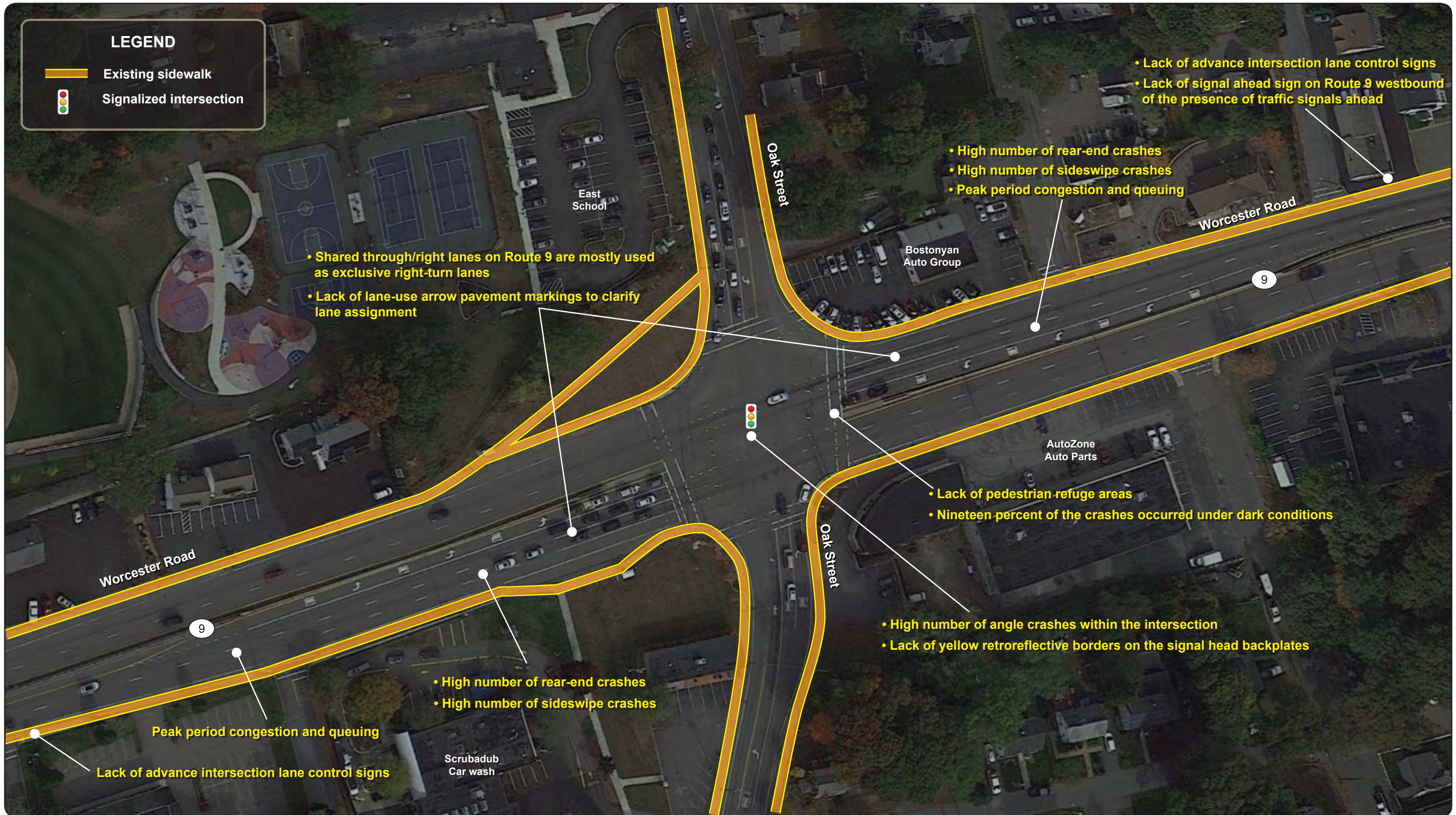


Figure 20
Problems: Route 9 and Oak Street Intersection

Chapter 6—Improvements

6.1 CORRIDOR-WIDE IMPROVEMENTS

The following improvements apply to the entire corridor.

- Improved roadway lighting to reduce crashes under dark conditions (street lighting on arterial roadways such as Route 9 is typically the responsibility of the municipality through agreement with the utility company)
- Adjust change (yellow) and clearance (all red) intervals to Massachusetts Department of Transportation (MassDOT) standards to reduce rear-end crashes at signalized intersections
- Remove and relocate obstacles in sidewalk that reduce width to less than four feet and obstructions in or too close to the roadway
- Install/improve advance warning devices and notifications to reduce crashes at intersections
- Install/upgrade emergency vehicle preemption systems (typically owned and maintained by the municipality)
- Supplement intersection pavement markings with appropriate advance intersection lane control signs to reduce crashes
- Install/improve curb ramps at intersections and driveways to MassDOT/Americans with Disabilities Act standards to assist people using assistive mobility devices
- Install/improve backplates with yellow retroreflective borders to increase signal visibility
- Install/improve overhead signals with mast-arm mounts
- Construct sidewalk-level separated bike lanes to increase safety and security for people biking
- Open Route 9 median at several locations to install safe crossing opportunities for people walking and biking and connect neighborhoods north and south of Route 9. Alternatively, consider building pedestrian bridges at vantage points for crossing Route 9 safely.
- Introduce measures to calm traffic and reduce speeding, such as uniform speed regulations and enforcement
- Move pedestrian signal phase to occur before Route 9 through traffic
- Retime traffic signals, optimize signal phasing and coordination, and fine tune adaptive signal control to reduce congestion

- Evaluate feasibility of adding median refuge areas for crosswalks across Route 9
- Consider uniform speed regulations throughout the corridor
- Install/improve wayfinding by adding advance street name signs, street name plaques, and directional signing
- Install/improve acceleration/deceleration lane for traffic entering/exiting Route 9 at the interchanges
- Install new crosswalks across Route 9 to facilitate safe crossing opportunities
- Install pedestrian signal heads and pushbuttons on the side streets to facilitate safe crossing opportunities
- Install/upgrade delineation to reduce crashes during dark conditions and on horizontal curves

6.2 INTERSECTION-RELATED IMPROVEMENTS

The intersection-related improvements are described in Figures 21 through 31. They include some of the corridor-wide improvements as well as specific measures to reduce crashes and congestion and accommodate people walking, biking, and taking the bus. All improvements fall within the roadway's right-of-way width and considers the needs of abutters and users.

6.3 SHORT-TERM IMPROVEMENTS

The time frame categorized as *short-term* is typically less than five years and the costs are typically low, which can be funded through maintenance budgets. Some of the short-term improvements could be included in MassDOT's projects that are currently under construction, in design, or through maintenance activities. These improvements include installing new signs, upgrading old signs, pavement stripping, painting high-visibility crosswalks, adding detectable warning plates to curb ramps, upgrading signal-head sections, and adding yellow retroreflective backplates. Additional improvements include adding countdown timers, retiming and coordinating signals, and repairing substandard sidewalks.

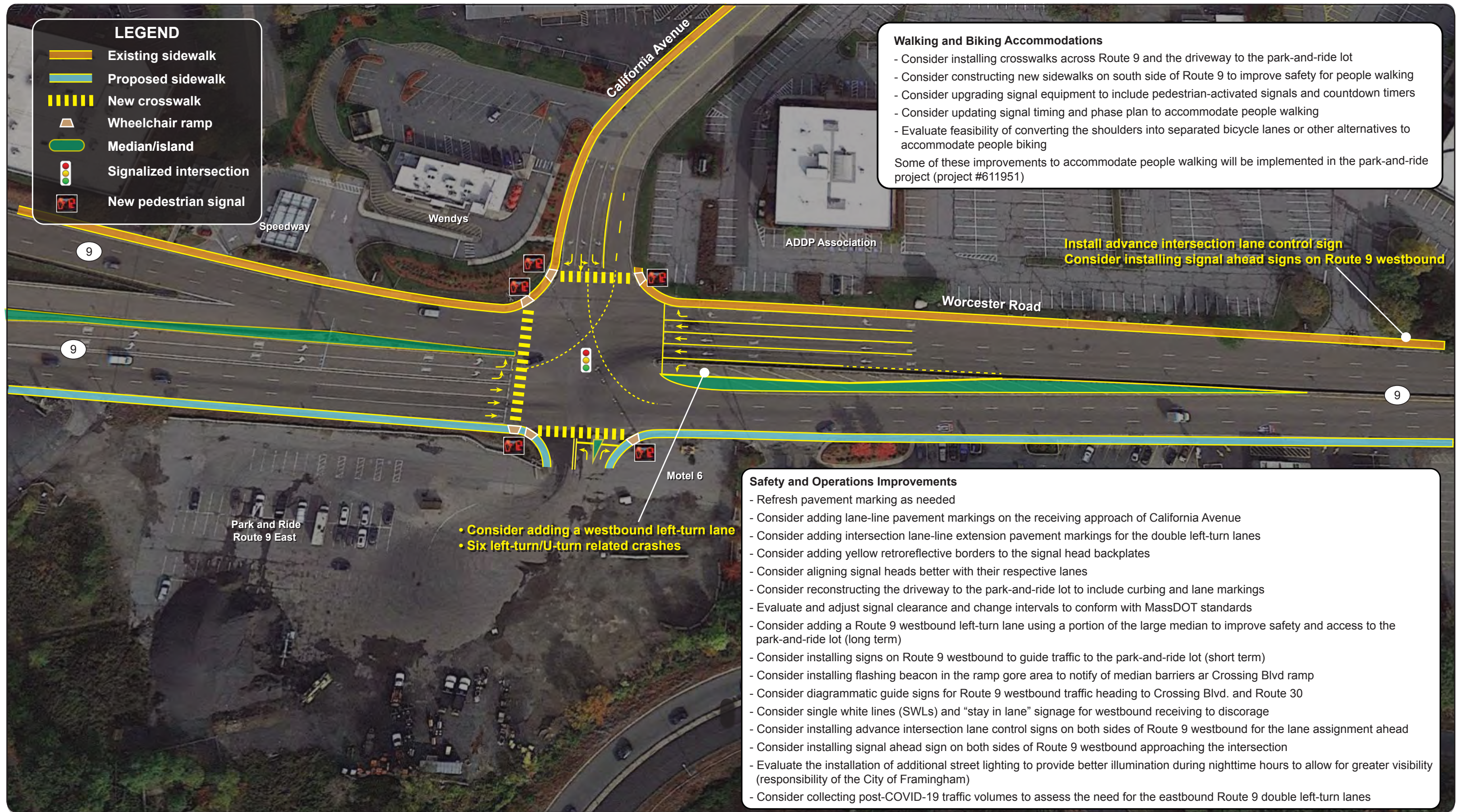










Figure 21
Improvements: Route 9 and California Avenue Intersection

LEGEND

-  Existing sidewalk
-  Proposed sidewalk
-  Proposed bike lane
-  New crosswalk
-  Wheelchair ramp
-  Median/island
-  Signalized intersection
-  New pedestrian signal

Walking and Biking Accommodation

- Consider installing new crosswalks with ADA-compliant wheelchair ramps across Route 9 and Country Club Lane to provide safe connection to the sidewalk on the north side of Route 9
- Consider constructing new sidewalks on the south side of Route 9 to provide safe access from Halstead Framingham Apartments to connect to the sidewalk on the north side of Route 9
- Consider upgrading the signal equipment to include pedestrian activated signals and countdown timers
- Consider retiming the traffic signals to include pedestrian crossing intervals
- Evaluate feasibility of converting the shoulders into separated bicycle lanes or other alternatives to accommodate people biking

Safety and Operations Improvements

- Consider installing advance intersection lane control signs on both approaches on Route 9
- Consider adding yellow retroreflective borders to the signal head backplates to increase visibility
- Evaluate and adjust change and clearance intervals to conform with current MassDOT standards
- Evaluate the installation of additional street lighting to provide better illumination during nighttime hours to allow for greater visibility (responsibility of the City of Framingham)
- Consider prohibiting right turn on red from Country Club Lane due to limited sight distance from the horizontal curve
- Evaluate speed regulations in relation to the reverse curves
- Evaluate potential for use of curve/advisory speed warning signage
- Consider using high friction surface treatment to help drivers take the curves
- Consider adding a green arrow for the EB right turn movement
- Consider use of flashing signal/queue warning signs

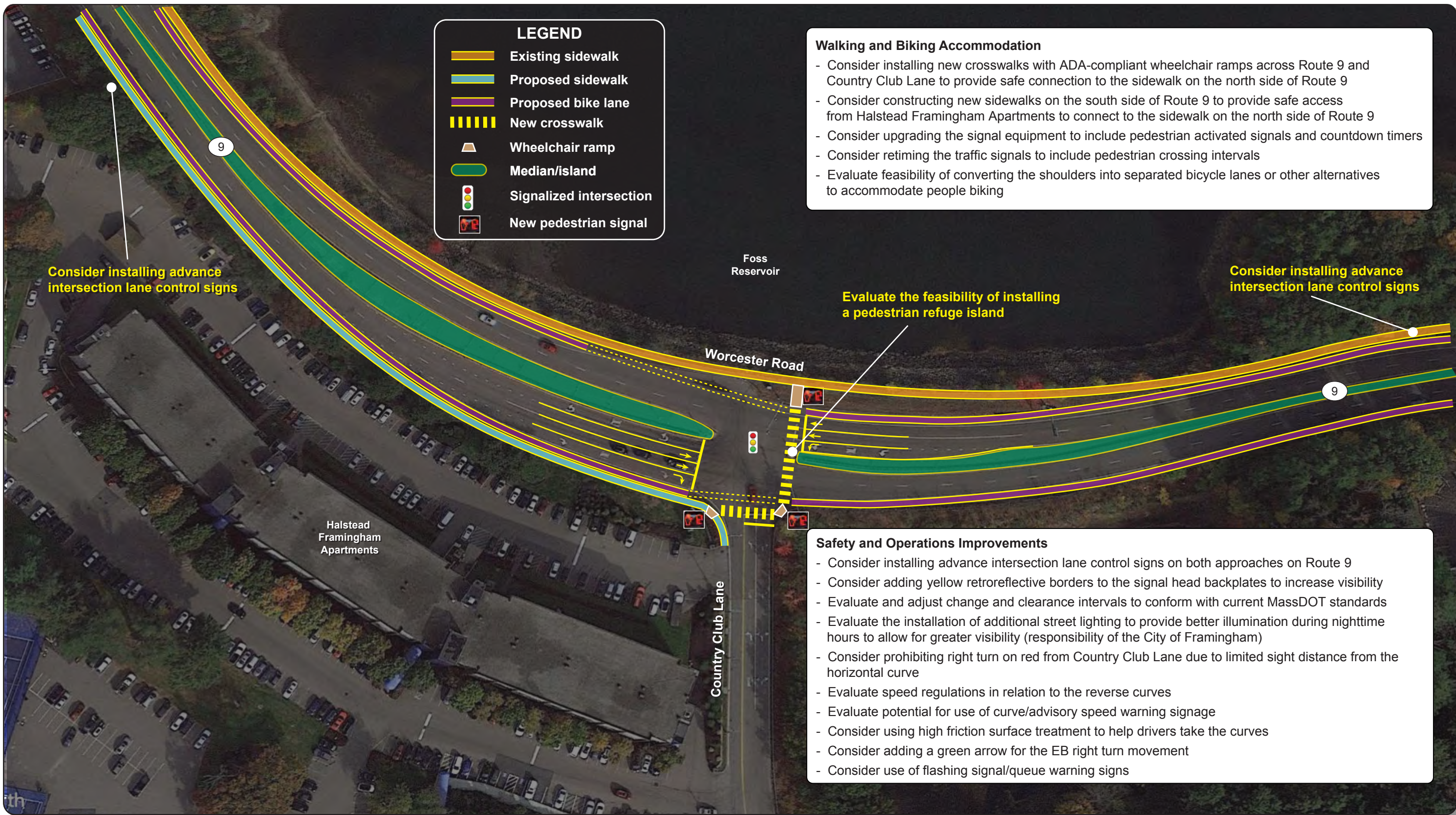
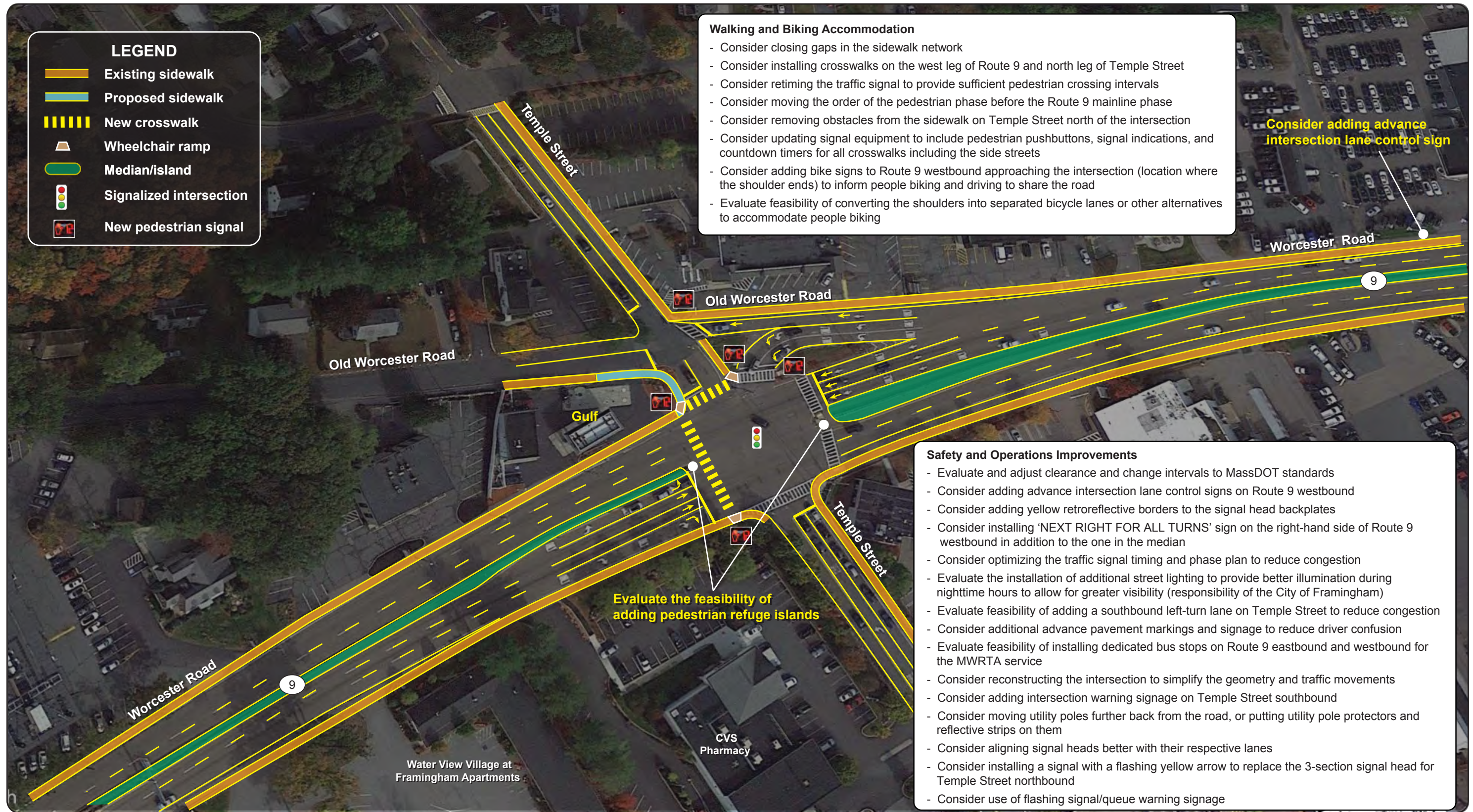


Figure 22
Improvements: Route 9 and Country Club Lane Intersection



LEGEND

- Existing sidewalk
- Proposed sidewalk
- New crosswalk
- Wheelchair ramp
- Median/island
- Signalized intersection
- New pedestrian signal

Walking and Biking Accommodation

- Consider closing gaps in the sidewalk network
- Consider installing crosswalks on the west leg of Route 9 and north leg of Temple Street
- Consider retiming the traffic signal to provide sufficient pedestrian crossing intervals
- Consider moving the order of the pedestrian phase before the Route 9 mainline phase
- Consider removing obstacles from the sidewalk on Temple Street north of the intersection
- Consider updating signal equipment to include pedestrian pushbuttons, signal indications, and countdown timers for all crosswalks including the side streets
- Consider adding bike signs to Route 9 westbound approaching the intersection (location where the shoulder ends) to inform people biking and driving to share the road
- Evaluate feasibility of converting the shoulders into separated bicycle lanes or other alternatives to accommodate people biking

Safety and Operations Improvements

- Evaluate and adjust clearance and change intervals to MassDOT standards
- Consider adding advance intersection lane control signs on Route 9 westbound
- Consider adding yellow retroreflective borders to the signal head backplates
- Consider installing 'NEXT RIGHT FOR ALL TURNS' sign on the right-hand side of Route 9 westbound in addition to the one in the median
- Consider optimizing the traffic signal timing and phase plan to reduce congestion
- Evaluate the installation of additional street lighting to provide better illumination during nighttime hours to allow for greater visibility (responsibility of the City of Framingham)
- Evaluate feasibility of adding a southbound left-turn lane on Temple Street to reduce congestion
- Consider additional advance pavement markings and signage to reduce driver confusion
- Evaluate feasibility of installing dedicated bus stops on Route 9 eastbound and westbound for the MWRTA service
- Consider reconstructing the intersection to simplify the geometry and traffic movements
- Consider adding intersection warning signage on Temple Street southbound
- Consider moving utility poles further back from the road, or putting utility pole protectors and reflective strips on them
- Consider aligning signal heads better with their respective lanes
- Consider installing a signal with a flashing yellow arrow to replace the 3-section signal head for Temple Street northbound
- Consider use of flashing signal/queue warning signage



Figure 23
Improvements: Route 9 and Temple Street Intersection

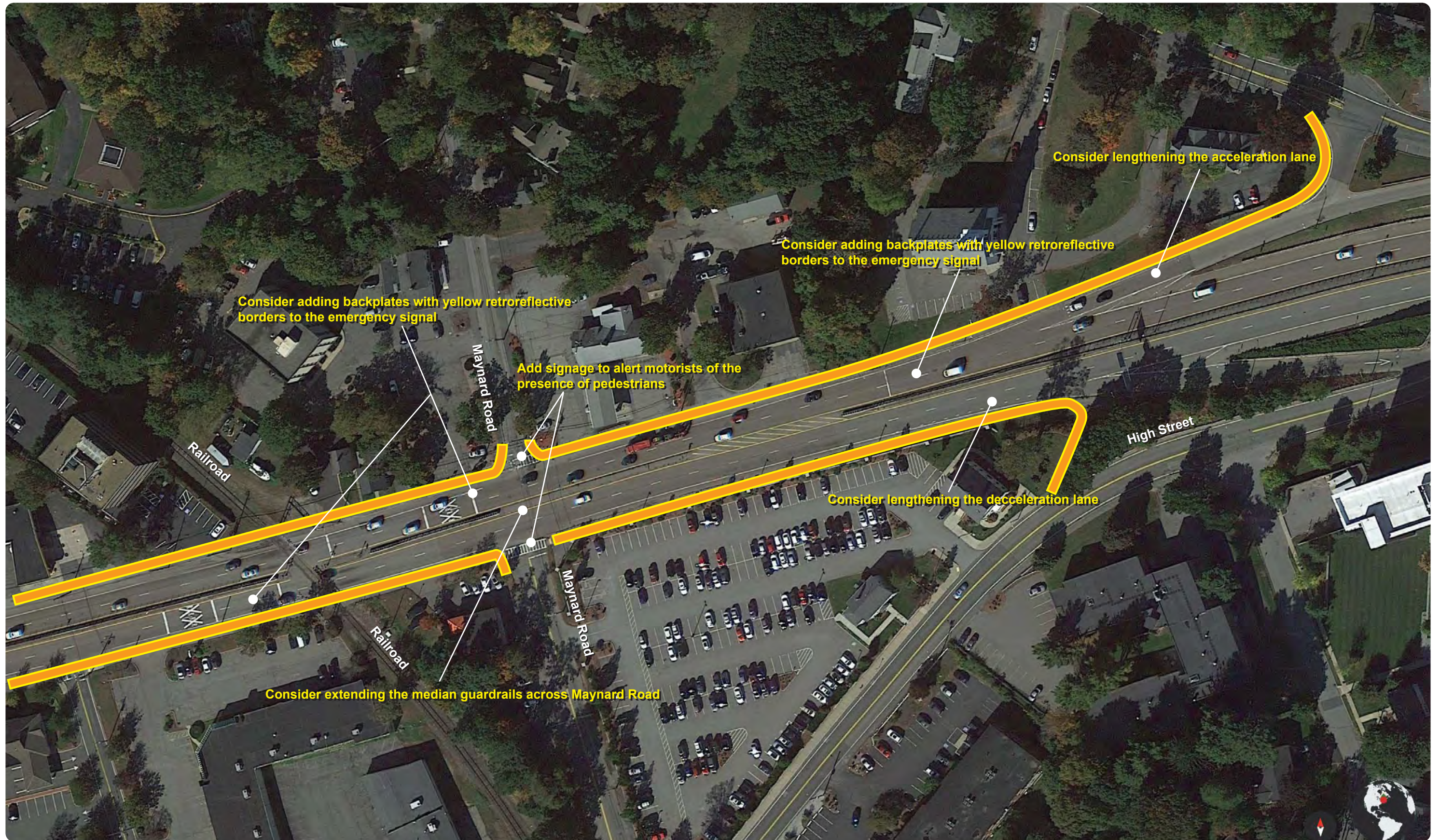


Figure 24
Improvements: Route 9 and Maynard Road Intersection

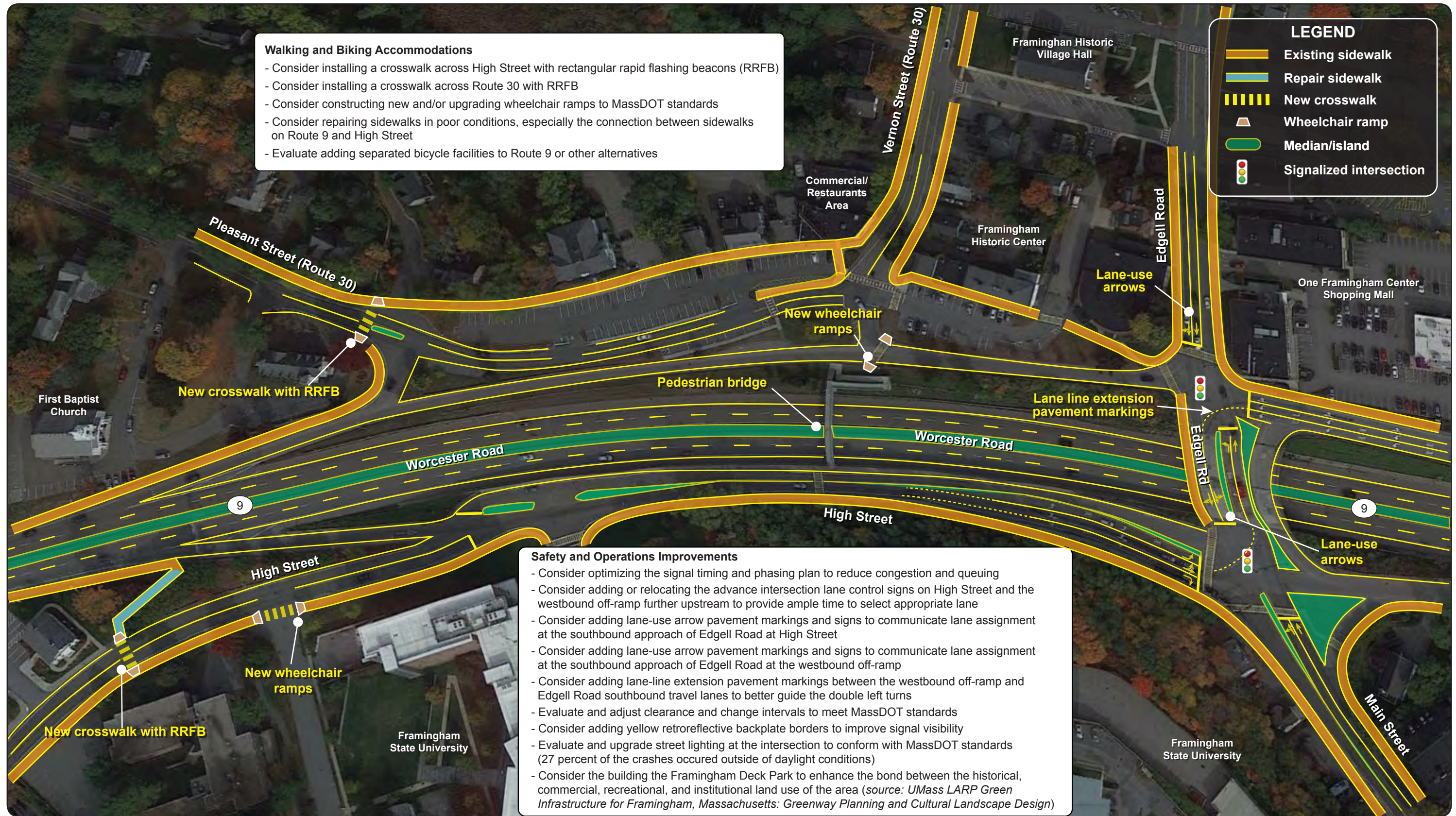
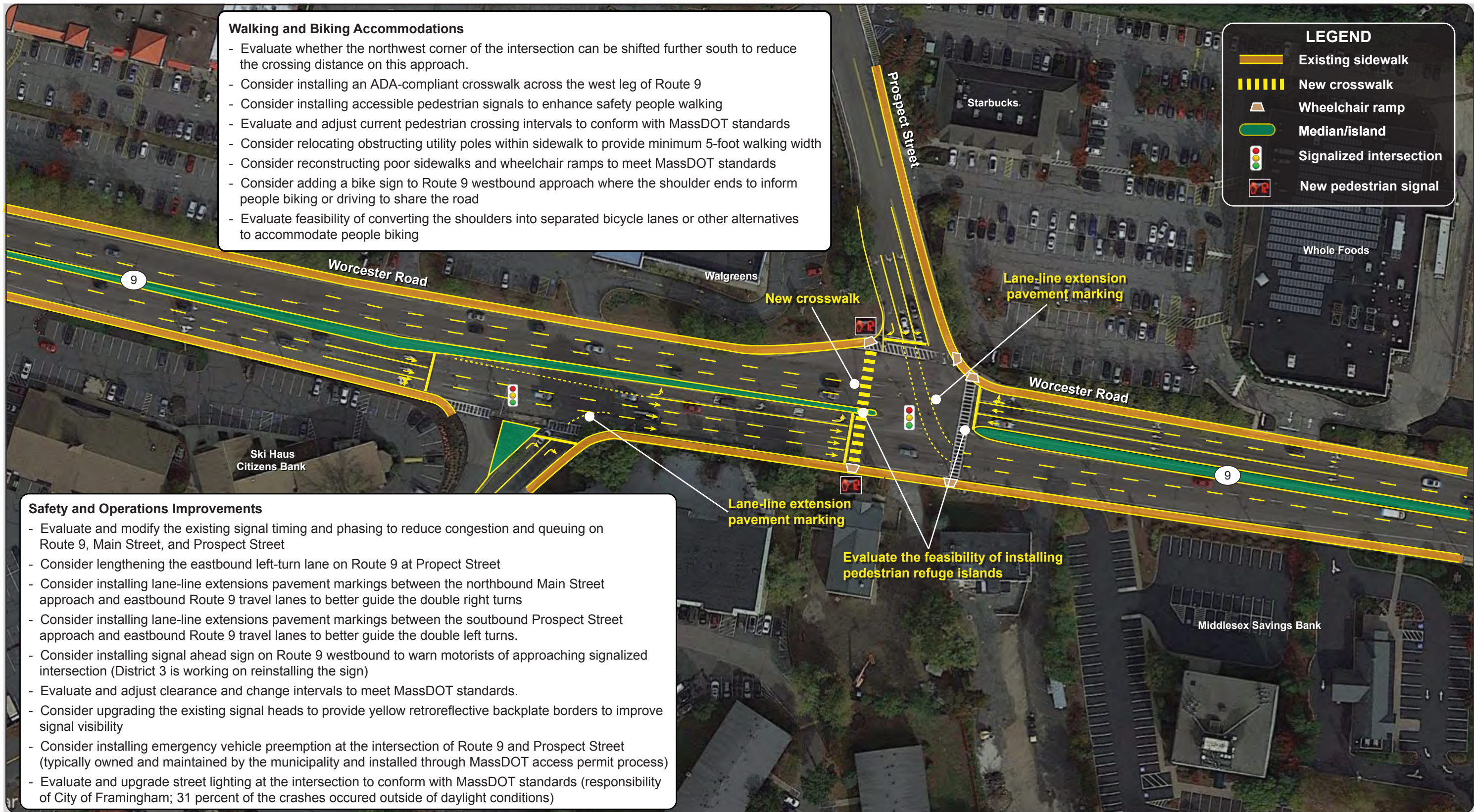


Figure 25
Improvements: Route 9 and Edgell Road/Main Street Intersection



Walking and Biking Accommodations

- Evaluate whether the northwest corner of the intersection can be shifted further south to reduce the crossing distance on this approach.
- Consider installing an ADA-compliant crosswalk across the west leg of Route 9
- Consider installing accessible pedestrian signals to enhance safety people walking
- Evaluate and adjust current pedestrian crossing intervals to conform with MassDOT standards
- Consider relocating obstructing utility poles within sidewalk to provide minimum 5-foot walking width
- Consider reconstructing poor sidewalks and wheelchair ramps to meet MassDOT standards
- Consider adding a bike sign to Route 9 westbound approach where the shoulder ends to inform people biking or driving to share the road
- Evaluate feasibility of converting the shoulders into separated bicycle lanes or other alternatives to accommodate people biking

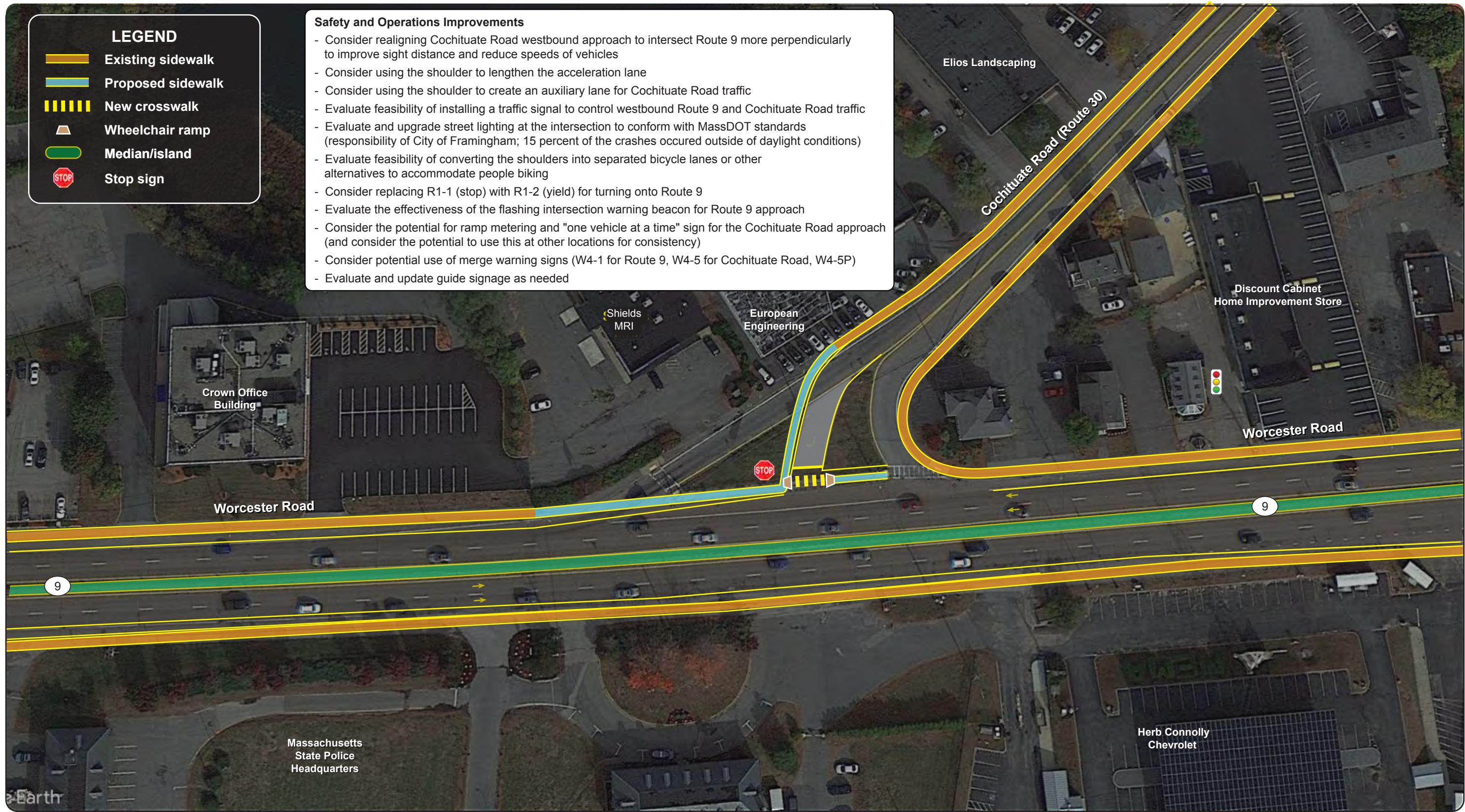
Safety and Operations Improvements

- Evaluate and modify the existing signal timing and phasing to reduce congestion and queuing on Route 9, Main Street, and Prospect Street
- Consider lengthening the eastbound left-turn lane on Route 9 at Propect Street
- Consider installing lane-line extensions pavement markings between the northbound Main Street approach and eastbound Route 9 travel lanes to better guide the double right turns
- Consider installing lane-line extensions pavement markings between the southbound Prospect Street approach and eastbound Route 9 travel lanes to better guide the double left turns.
- Consider installing signal ahead sign on Route 9 westbound to warn motorists of approaching signalized intersection (District 3 is working on reinstalling the sign)
- Evaluate and adjust clearance and change intervals to meet MassDOT standards.
- Consider upgrading the existing signal heads to provide yellow retroreflective backplate borders to improve signal visibility
- Consider installing emergency vehicle preemption at the intersection of Route 9 and Prospect Street (typically owned and maintained by the municipality and installed through MassDOT access permit process)
- Evaluate and upgrade street lighting at the intersection to conform with MassDOT standards (responsibility of City of Framingham; 31 percent of the crashes ocured outside of daylight conditions)

LEGEND

- Existing sidewalk
- New crosswalk
- Wheelchair ramp
- Median/island
- Signalized intersection
- New pedestrian signal

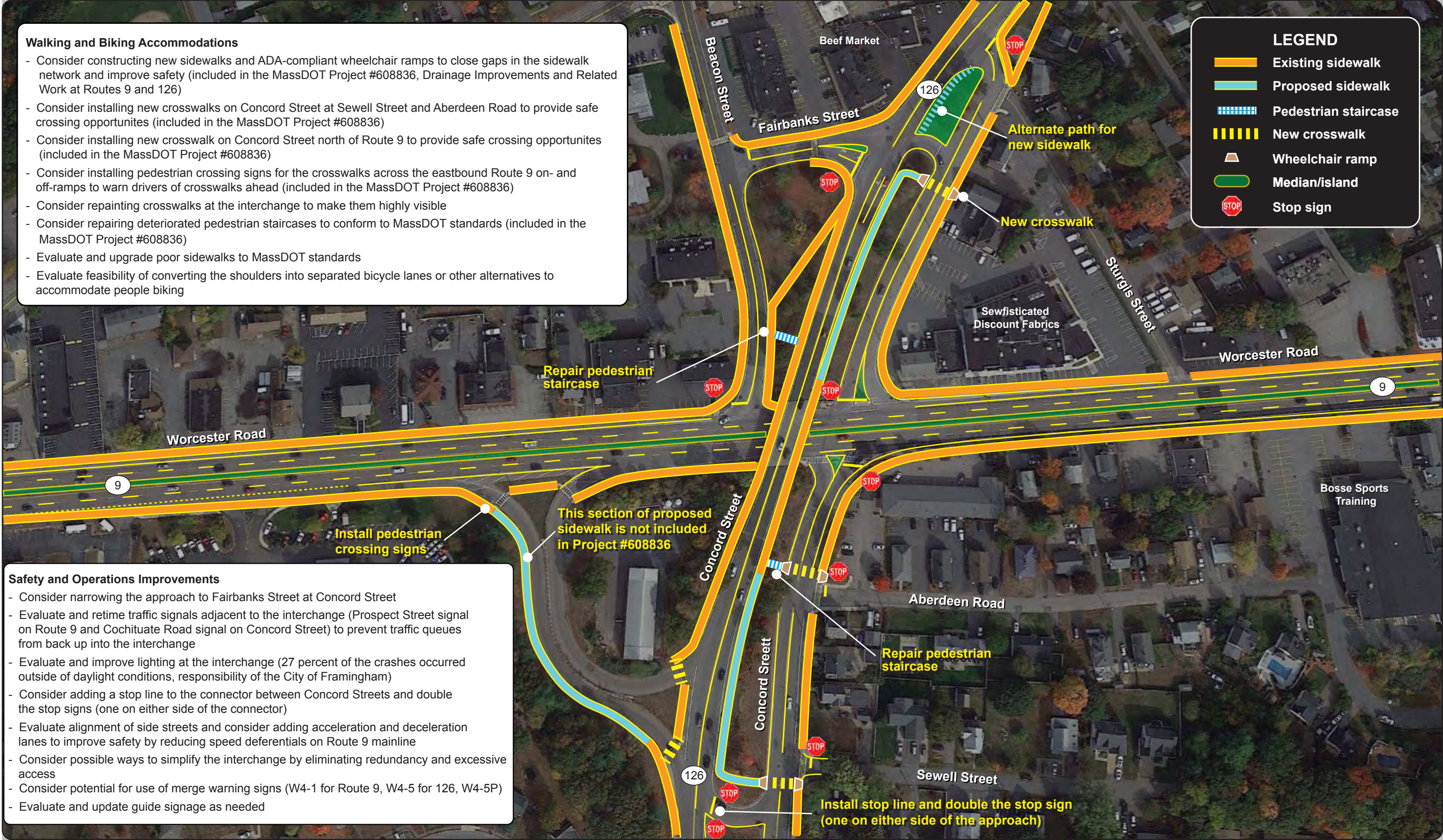
Figure 26
Improvements: Route 9 and Propect Street Intersection



LEGEND

- Existing sidewalk
- Proposed sidewalk
- New crosswalk
- Wheelchair ramp
- Median/island
- Stop sign

- Safety and Operations Improvements**
- Consider realigning Cochituate Road westbound approach to intersect Route 9 more perpendicularly to improve sight distance and reduce speeds of vehicles
 - Consider using the shoulder to lengthen the acceleration lane
 - Consider using the shoulder to create an auxiliary lane for Cochituate Road traffic
 - Evaluate feasibility of installing a traffic signal to control westbound Route 9 and Cochituate Road traffic
 - Evaluate and upgrade street lighting at the intersection to conform with MassDOT standards (responsibility of City of Framingham; 15 percent of the crashes occurred outside of daylight conditions)
 - Evaluate feasibility of converting the shoulders into separated bicycle lanes or other alternatives to accommodate people biking
 - Consider replacing R1-1 (stop) with R1-2 (yield) for turning onto Route 9
 - Evaluate the effectiveness of the flashing intersection warning beacon for Route 9 approach
 - Consider the potential for ramp metering and "one vehicle at a time" sign for the Cochituate Road approach (and consider the potential to use this at other locations for consistency)
 - Consider potential use of merge warning signs (W4-1 for Route 9, W4-5 for Cochituate Road, W4-5P)
 - Evaluate and update guide signage as needed



Walking and Biking Accommodations

- Consider constructing new sidewalks and ADA-compliant wheelchair ramps to close gaps in the sidewalk network and improve safety (included in the MassDOT Project #608836, Drainage Improvements and Related Work at Routes 9 and 126)
- Consider installing new crosswalks on Concord Street at Sewell Street and Aberdeen Road to provide safe crossing opportunities (included in the MassDOT Project #608836)
- Consider installing new crosswalk on Concord Street north of Route 9 to provide safe crossing opportunities (included in the MassDOT Project #608836)
- Consider installing pedestrian crossing signs for the crosswalks across the eastbound Route 9 on- and off-ramps to warn drivers of crosswalks ahead (included in the MassDOT Project #608836)
- Consider repainting crosswalks at the interchange to make them highly visible
- Consider repairing deteriorated pedestrian staircases to conform to MassDOT standards (included in the MassDOT Project #608836)
- Evaluate and upgrade poor sidewalks to MassDOT standards
- Evaluate feasibility of converting the shoulders into separated bicycle lanes or other alternatives to accommodate people biking

LEGEND

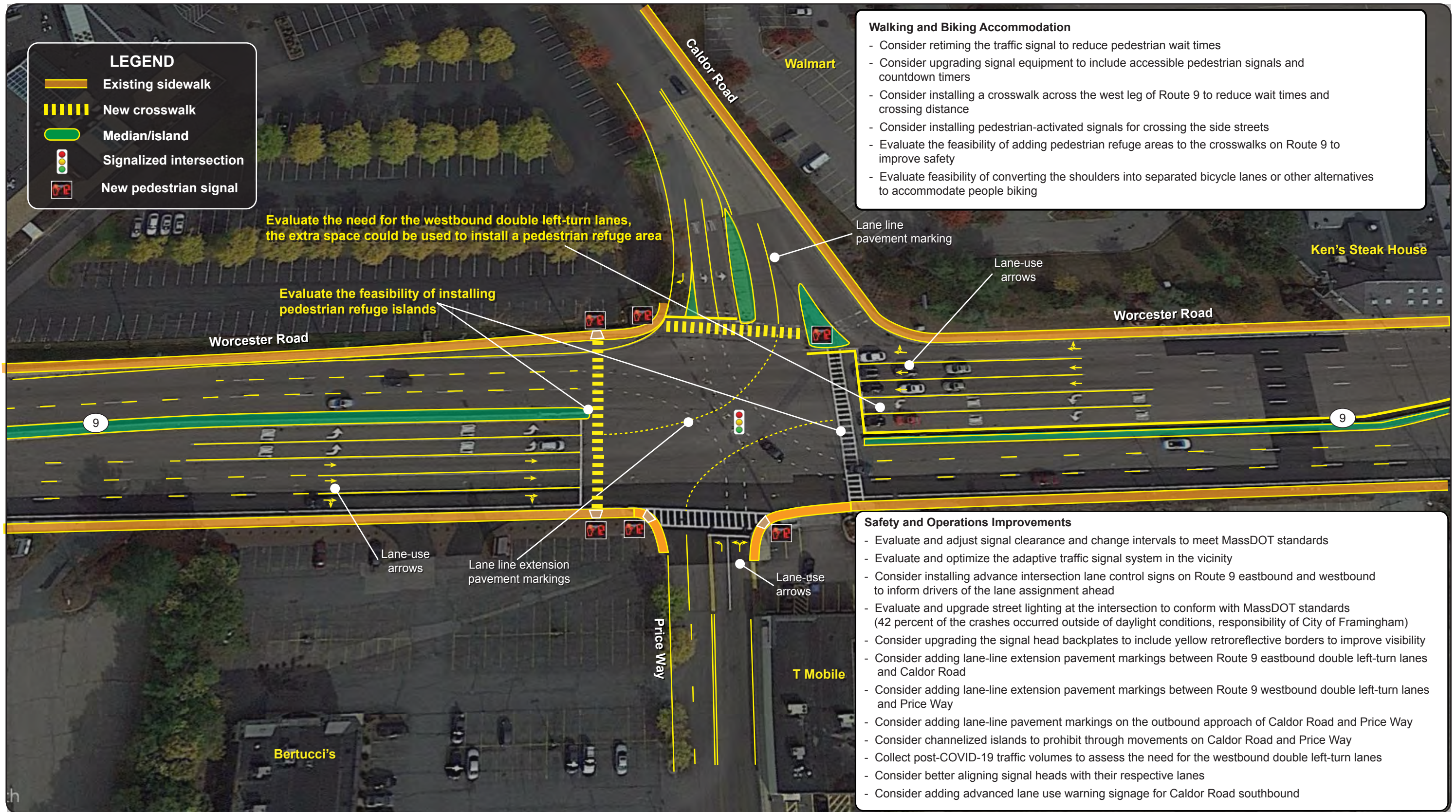
- Existing sidewalk
- Proposed sidewalk
- Pedestrian staircase
- New crosswalk
- Wheelchair ramp
- Median/island
- Stop sign

Safety and Operations Improvements

- Consider narrowing the approach to Fairbanks Street at Concord Street
- Evaluate and retime traffic signals adjacent to the interchange (Prospect Street signal on Route 9 and Cochituate Road signal on Concord Street) to prevent traffic queues from back up into the interchange
- Evaluate and improve lighting at the interchange (27 percent of the crashes occurred outside of daylight conditions, responsibility of the City of Framingham)
- Consider adding a stop line to the connector between Concord Streets and double the stop signs (one on either side of the connector)
- Evaluate alignment of side streets and consider adding acceleration and deceleration lanes to improve safety by reducing speed differentials on Route 9 mainline
- Consider possible ways to simplify the interchange by eliminating redundancy and excessive access
- Consider potential for use of merge warning signs (W4-1 for Route 9, W4-5 for 126, W4-5P)
- Evaluate and update guide signage as needed



Figure 28
Improvements: Route 9 and Concord Street (Route 126) Interchange



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Figure 29
Improvements: Route 9 and Caldor Road Intersection

Addressing Priority Corridors from the L RTP Needs Assessment: Route 9 in Framingham and Natick



Figure 30
Improvements: Route 9 and Speen Street Interchange

Walking and Biking Accommodation

- Remove obstacle in sidewalks that reduce the width of sidewalk to less than four feet
- Evaluate feasibility of converting the shoulders into separated bicycle lanes or other alternatives to accommodate people biking

Safety and Operations Improvements

- Evaluate and adjust clearance and change intervals to meet MassDOT standards
- Install advance intersection lane control signs on Route 9 (both directions) to alert drivers of the lane assignments ahead
- Consider installing "Signal Ahead" signs on Route 9 westbound
- Add lane-use arrow pavement markings to clearly define lane assignments on both approaches of Route 9
- Optimize traffic signal timing and phasing plan to reduce congestion and queuing during peak periods
- Upgrade the signal head backplates to include yellow retroreflective borders to improve visibility
- Evaluate and upgrade street lighting at the intersection to conform with MassDOT standards (responsibility of the Town of Natick; 19 percent of the crashes occurred at nighttime)

LEGEND

- Existing sidewalk
- Wheelchair ramp
- Median/island
- Stop sign
- Signalized intersection



Figure 31
Improvements: Route 9 and Oak Street Intersection

6.4 LONG-TERM IMPROVEMENTS

The time frame categorized as *long-term* is typically more than five years. Long-term improvements require design and engineering efforts and larger funding sources. The long-term improvements address safety and multimodal transportation needs, such as increased safety for people who walk, bicycle, or ride the bus, and to support livable communities and economic vitality. They include safety improvements such as upgrading major signal equipment and timing, adding separated bike facilities, constructing new sidewalk or upgrading sidewalks and curb ramps to MassDOT standards, opening the Route median at several locations to construct additional safe crossing opportunities for people walking and biking or building pedestrian bridges, and reconstructing intersections to improve safety. Figures 32 through 35 show some of the improvements to address walking and biking issues.

6.5 FUTURE LEVELS OF SERVICE (LOS)

The Boston Region MPO’s transportation planning model, which was adopted for the Long-Range Transportation Plan, was used for forecasting traffic. The model’s socioeconomic components are derived from forecasts produced by the Metropolitan Area Planning Council. Using this model, staff projected that between now and 2030, traffic volume on Route 9 in Framingham and Natick would grow by 0.25 percent annually in the AM peak period and 0.3 percent annually in the PM peak period. These growth rates also apply to the intersecting streets, as they are usually developed for areas, not specific streets.

6.5.1 Intersection LOS

The LOS analysis focused on using the future volumes and optimized signal timings, phase sequences, and pedestrian phases from the Signal Phase and Timing Challenge (SPaT C) to determine the effects of changes.^{14,15,16} The results of the future LOS analyses are shown in Figures 36 and 37. Appendix D presents the future LOS analysis worksheets. The existing and future LOS analyses indicated that the proposed improvements would prevent congestion from worsening—less than 3 percent increase delay from 2021 to 2030.

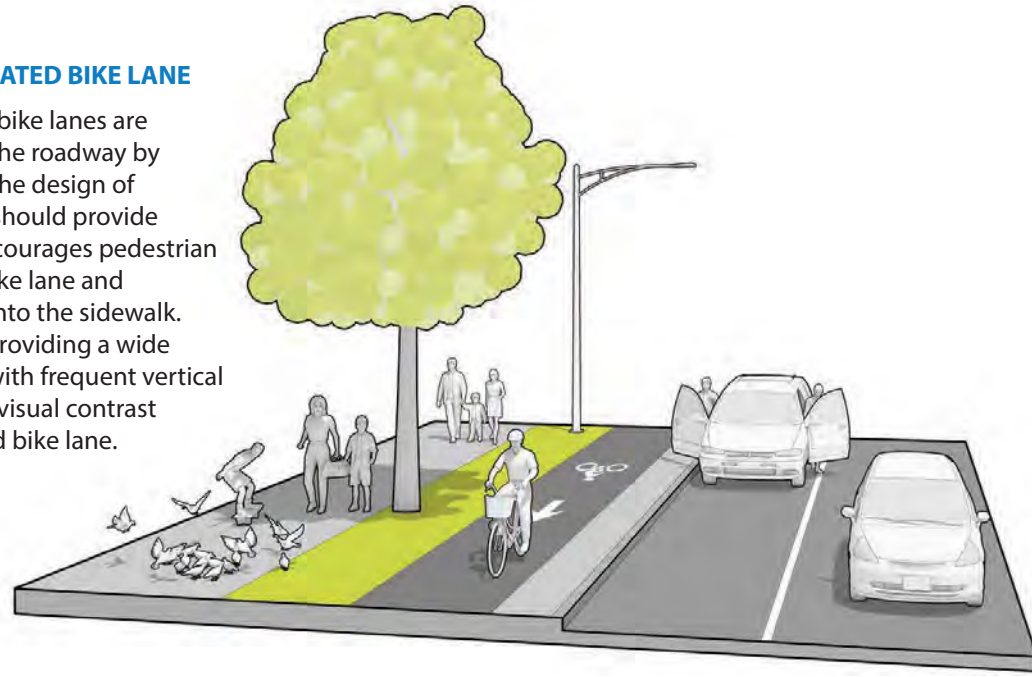
¹⁴ Signal Phase and Timing (SPaT) message defines the current intersection signal light phases. The current state of all lanes at the intersection are provided, as well as any active preemption or priority.

¹⁵ SPaT Challenge is for state and local public sector transportation infrastructure owners and operators to achieve deployment of dedicated short-range communications (DSRC) 5.9 GHz infrastructure with SPaT broadcasts in at least one corridor or network (approximately 20 signalized intersections) in each of the 50 states by January 2020 through cooperation and coordination

¹⁶ DSRC refers to two-way radio communication operating on the 5.9GHz band for the purpose of supporting vehicle-to-vehicle and vehicle-to-infrastructure traffic applications.

SIDEWALK-LEVEL SEPARATED BIKE LANE

Sidewalk-level separated bike lanes are typically separated from the roadway by a standard vertical curb. The design of sidewalk level bike lanes should provide a sidewalk buffer that discourages pedestrian encroachment into the bike lane and bicyclist encroachment onto the sidewalk. This can be achieved by providing a wide buffer, a sidewalk buffer with frequent vertical elements, or a significant visual contrast between the sidewalk and bike lane.



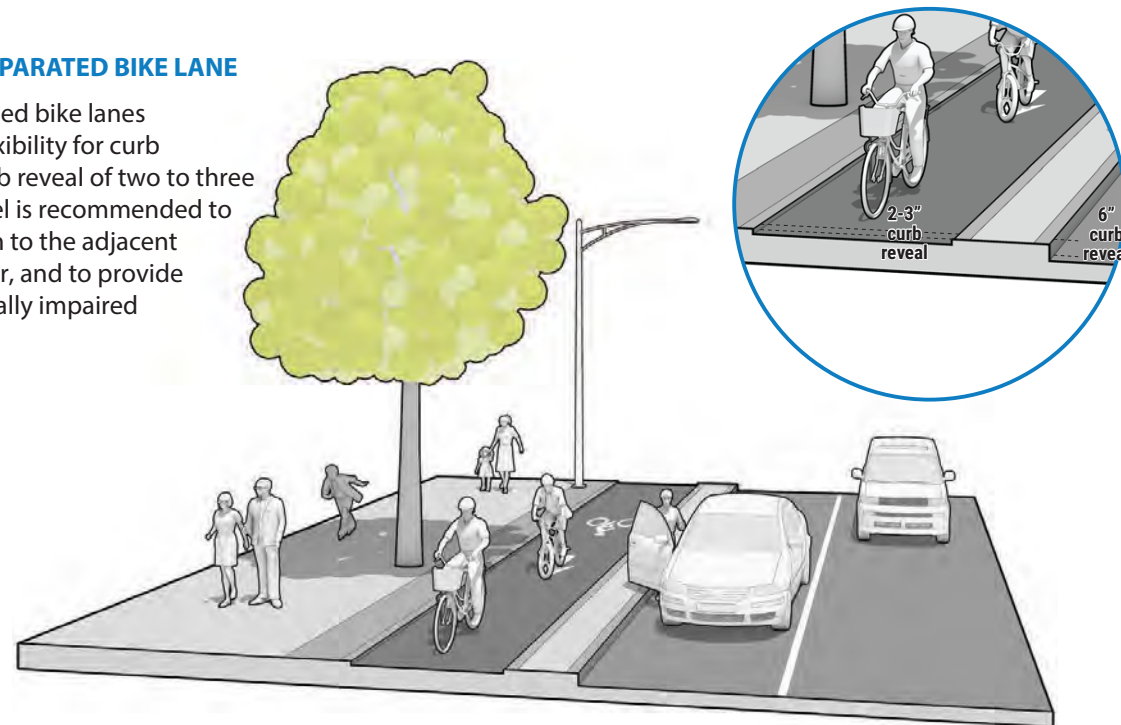
STREET-LEVEL SEPARATED BIKE LANE

Street-level separated bike lanes are common in retrofit situations where a separated bike lane is incorporated into the existing cross section of the street. They are also used for new construction where there is a desire to provide a strong delineation between the sidewalk and the bike lane in order to reduce pedestrian encroachment in the bike lane. Street-level separated bike lanes are usually compatible with accessible on-street parking and loading zones.



INTERMEDIATE-LEVEL SEPARATED BIKE LANE

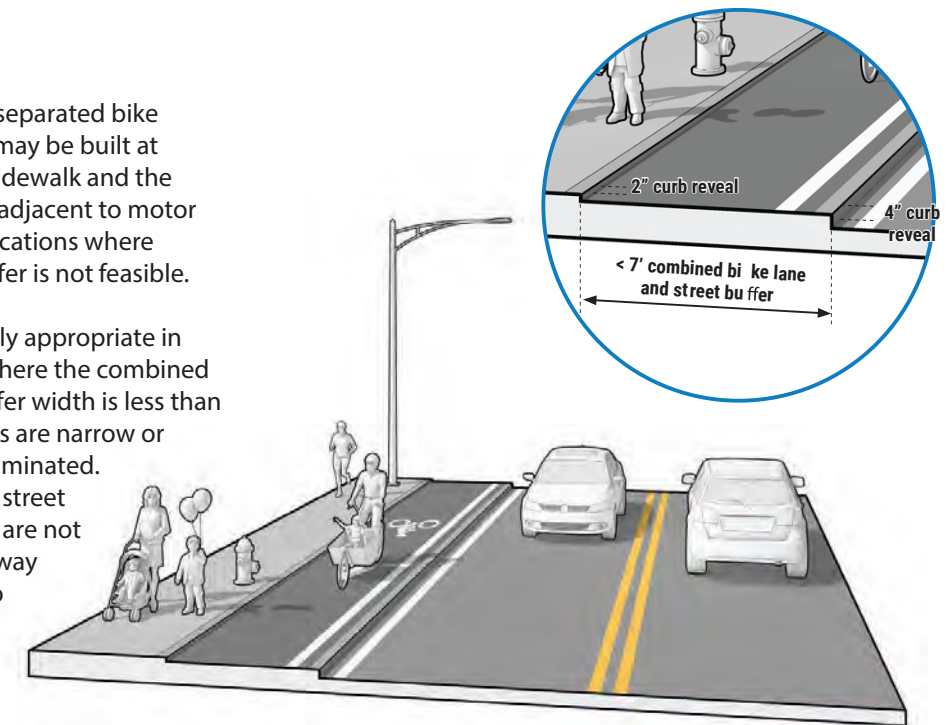
Intermediate-level separated bike lanes provide greater design flexibility for curb reveal and drainage. A curb reveal of two to three inches below sidewalk level is recommended to provide vertical separation to the adjacent sidewalk or sidewalk buffer, and to provide a detectable edge for visually impaired pedestrians.



RAISED BIKE LANE

Like intermediate-level separated bike lanes, raised bike lanes may be built at any level between the sidewalk and the street. They are directly adjacent to motor vehicle travel lanes at locations where provision of a street buffer is not feasible.

Raised bike lanes are only appropriate in constrained locations where the combined bike lane and street buffer width is less than seven feet and sidewalks are narrow or the sidewalk buffer is eliminated. Because of their narrow street buffer, raised bike lanes are not recommended for two-way operation or adjacent to on-street parking.



Source: MassDOT Separated Bike Lane Planning and Design Guide, 2015, pp. 25–28.

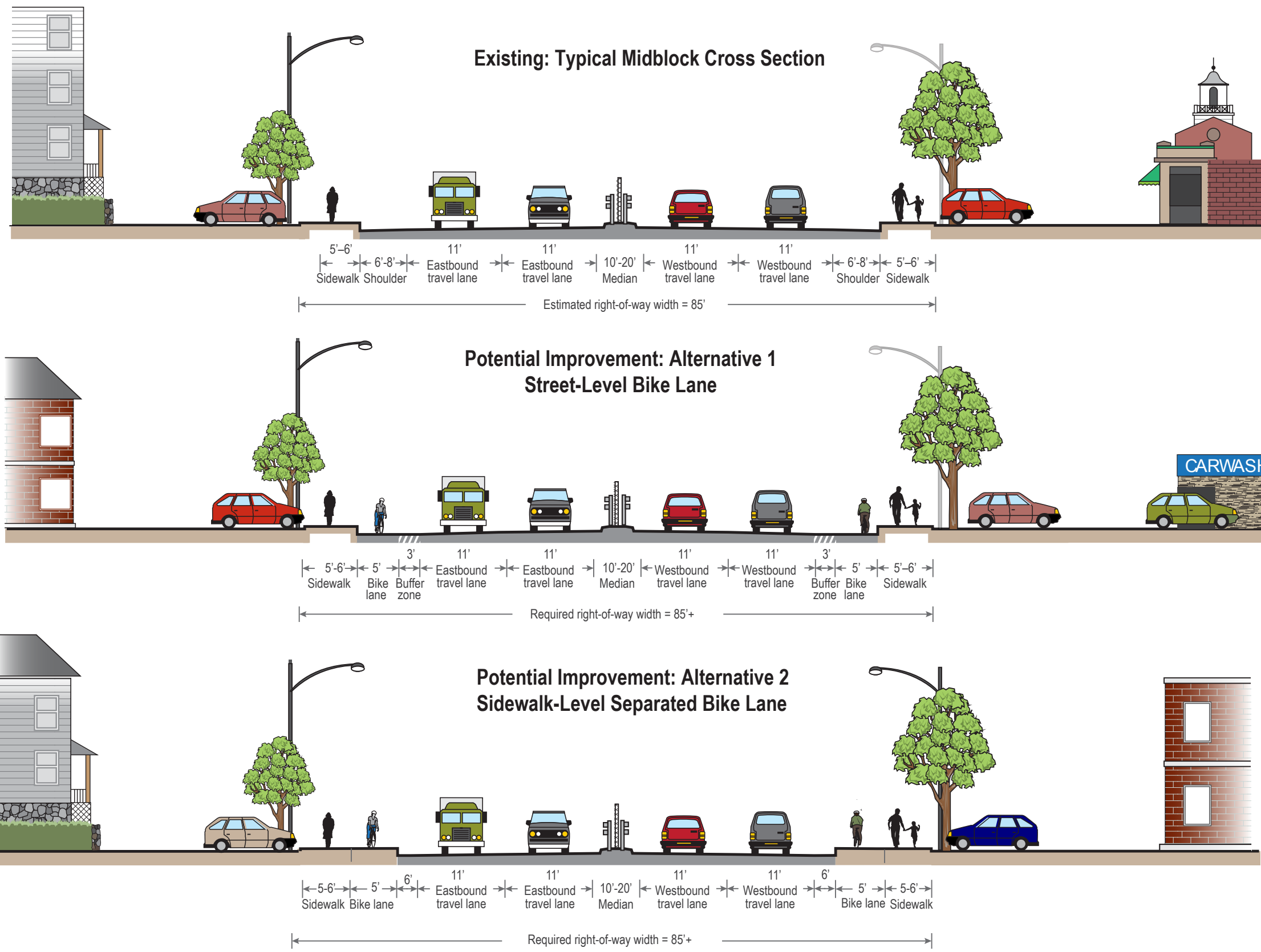


Figure 33
Roadway Accommodation Improvement Alternatives



Figure 34
Examples of Bike Accommodations

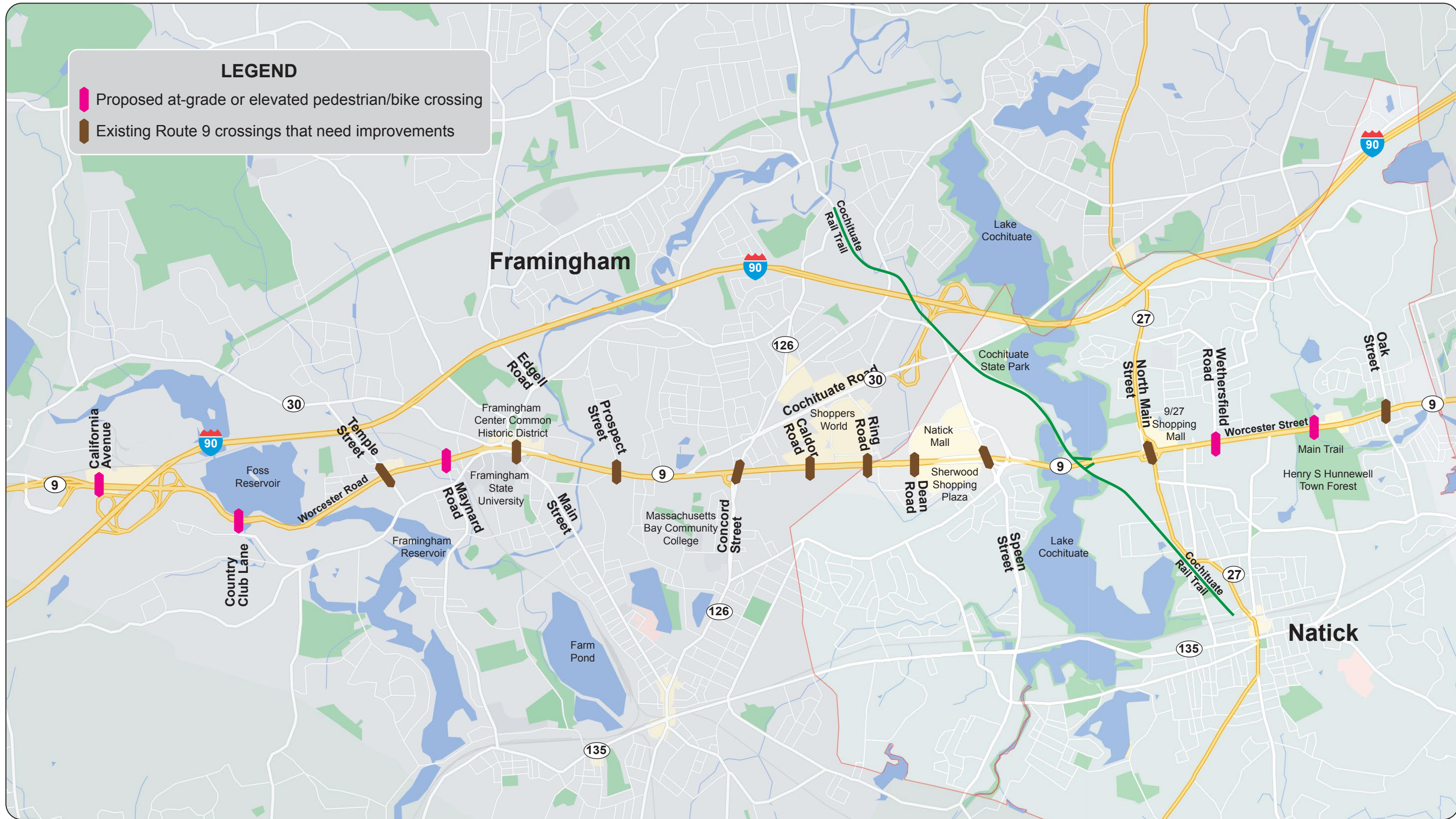


Figure 35
Safe Crossing Opportunities: Improvements for Walking and Biking

6.5.2 Pedestrian LOS

Currently, crossing Route 9 is possible at only a few locations at some signalized intersections and bridges over Route 9. Over the nine-mile corridor, there are only 10 locations where people walking and biking can safely cross Route 9: five locations in Framingham and another five locations in Natick. Opening the Route 9 median at several locations to install safe crossing opportunities for people walking and biking would enhance connections between neighborhoods north and south of Route 9. Alternatively, building pedestrian bridges at vantage points for crossing Route 9 safely would work. Additional improvements include ADA-compliant sidewalks and wheelchair ramps, accessible pedestrian signals, pedestrian refuge islands, adequate pedestrian crossing times, and moving pedestrian phases to occur before the Route 9 phases.

MPO staff evaluated what the future LOS for people walking would be if the pedestrian safety improvements from this study were implemented. Appendix B contains results of the LOS scorecard analyses. Based on the assessment, Route 9 was rated *good* in terms of meeting the MPO’s goals for safety, capacity management and mobility, and system preservation; and *fair* for economic vitality because of the prioritization of safe accommodations for people who walk.

6.5.3 Bicycle LOS

Presently, Route 9 lacks safe accommodations for people biking; MPO staff recommends long-term improvements to construct sidewalk-level or street-level separated bike lane. MPO staff evaluated what the future LOS for people biking would be if the sidewalk-level or street-level separated bike lane recommendations were implemented. Appendix B contains results of the LOS scorecard analyses. Based on the assessment, Route 9 was rated *excellent* in terms of meeting the MPO’s goals for capacity management and mobility and system preservation, and *acceptable* for safety and economic vitality because of the prioritization of safe accommodations for people who bike.

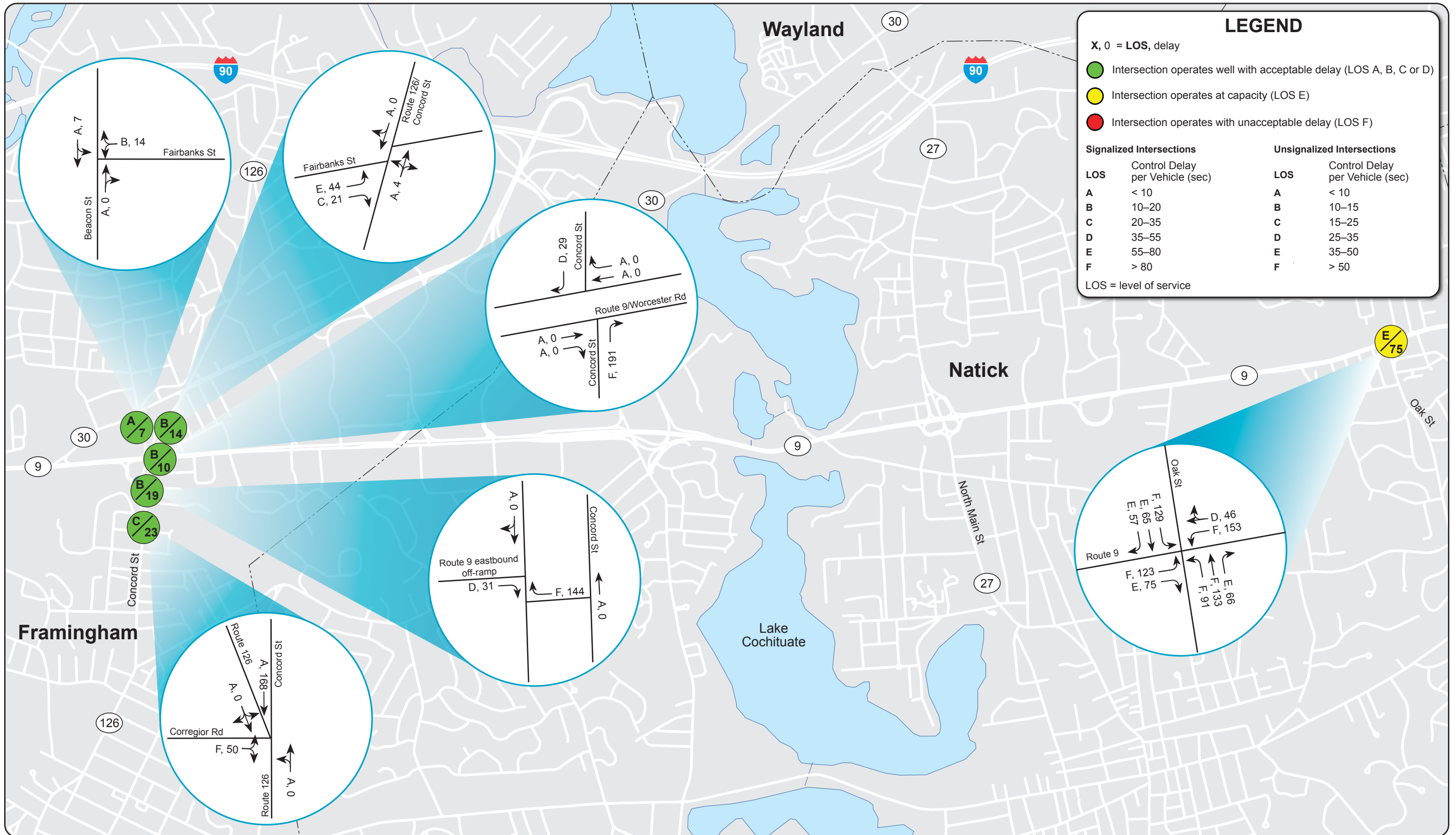


Figure 36
2030 Conditions
Weekday AM Peak-Hour Level of Service and Delays (Continued)

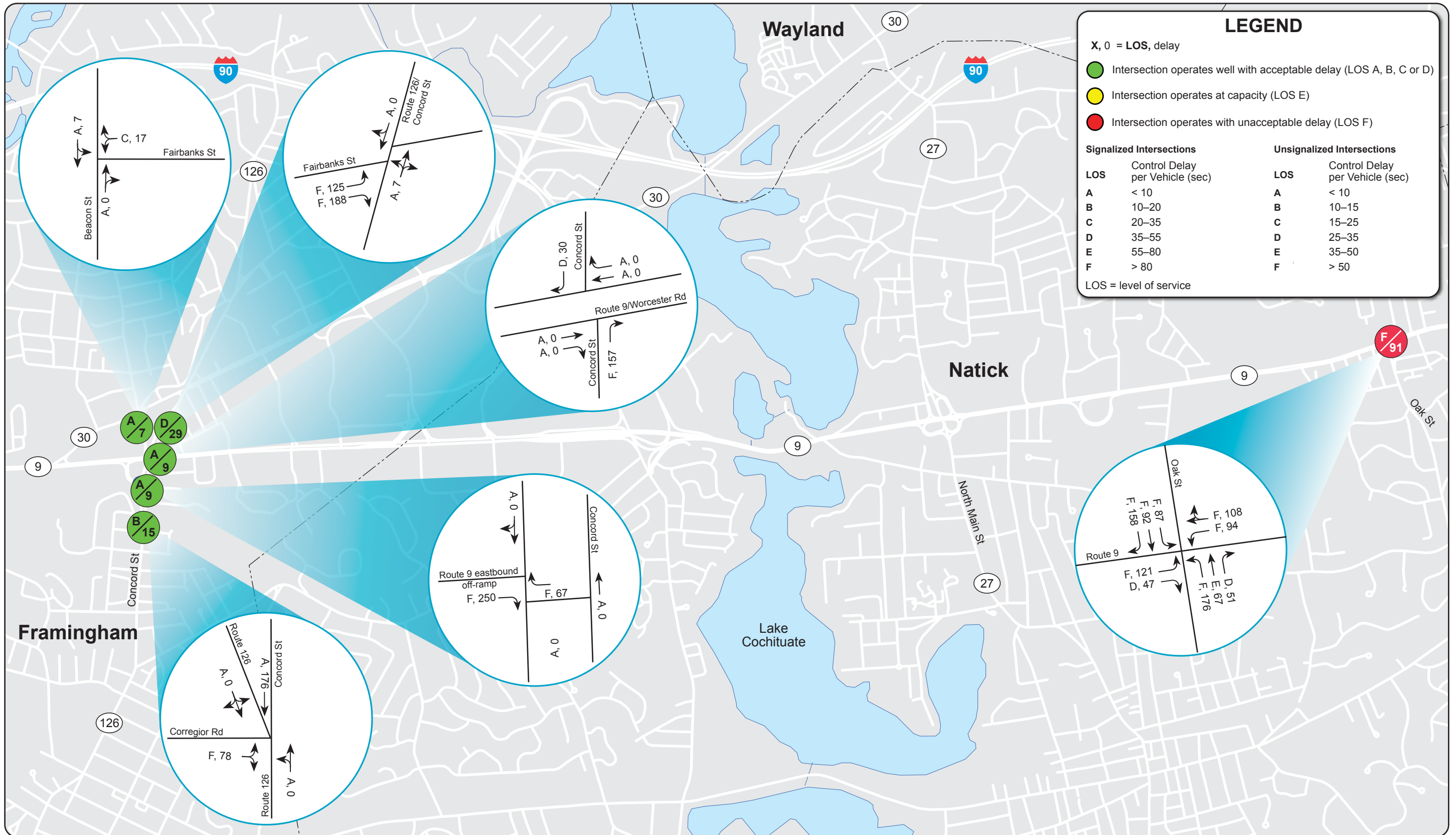


Figure 37
2030 Conditions
Weekday PM Peak-Hour Level of Service and Delays (Continued)

6.6 SAFETY IMPACTS OF PROPOSED IMPROVEMENTS

Each of the proposed improvements was chosen to target specific safety and operational deficiencies present in the study area. Due to limited financial resources available to implement highway safety improvements, it is important that safety improvements return the highest level of benefits. A primary benefit of safety improvements is to reduce injury crashes and fatalities, so it is useful for road owners to understand how much a particular safety improvement, or set of safety improvements, can reduce crashes. A crash modification factor is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site. These estimates have been developed by comparing crashes before implementation of a safety improvement against crashes after implementation.

- **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.¹⁷
- **Pedestrian Crossing Safety.** Improving the ability of pedestrians to cross Route 9 safely was a major priority in this study. The recommendations include fitting all signalized intersections with high-visibility crosswalks. Upgrading crossings has been shown to reduce vehicle-pedestrian collisions by about 40 percent. Providing pedestrian-activated crossing signals could reduce vehicle-pedestrian crashes by as much as 55 percent.
- **Midblock Pedestrian Crossing Safety.** Installing pedestrian hybrid beacon (PHB or HAWK) with advanced yield or stop markings and signs could reduce vehicle/pedestrian crashes by about 57 percent.
- **Pedestrian Countdown Timer.** Pedestrian countdown timers are lacking at signalized intersections in the corridor. The before-after studies show that installing them could significantly reduce vehicle/pedestrian crashes by 55–70 percent.
- **Rectangular Rapid Flashing Beacon (RRFB).** Installing RRFB have been found to be associated with reductions in pedestrian crash risk by as much as 47 percent.
- **Bicycle Safety.** The improvements in this study seek to provide people who bike with sidewalk-level or separated bicycle lanes. A 2014 analysis of bicycle crashes in Florida showed a 25 percent reduction in

¹⁷ US Department of Transportation Federal Highway Administration, Crash Modification Factors Clearinghouse, April 2022, [Crash Modification Factors Clearinghouse \(cmfclearinghouse.org\)](http://cmfclearinghouse.org)

vehicle/bicycle collision totals after installing sidewalk-level or separated bicycle lanes.¹⁸

- **Pavement Resurfacing.** A corridor project like this includes pavement resurfacing. 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.
- **Retiming and Coordinating Traffic Signals.** Retiming and coordinating traffic signals could reduce crashes by as much as 20 percent.
- **Advance Static Curve Warning Signs.** Providing advance curve warning signs could reduce crashes by as much as 30 percent.
- **Advance Street Name Signs.** Suggested corridor improvements include installing advance street name signs to improve wayfinding. Such installation could reduce sideswipe crashes by as much as 11 percent.
- **Chevron and Curve Warning Signs.** The study area includes a couple of locations with horizontal curves, where warning signs were suggested. Adding chevron and curve warning sign could reduce crashes by 30 to 40 percent.
- **Edge Line Striping.** Striping edge lines could reduce crashes by 10 to 20 percent.
- **Improve Signal Visibility.** At several of the signalized intersections, the suggested improvements include signal visibility such as installation of new backplates, addition of yellow retroreflective sheeting to signal backplates, and installation of additional signal heads. Overall systematic signing and visibility improvements could reduce crashes by approximately 15 percent.
- **Modify Change and Clearance Interval.** At several signalized intersections, the recommendations included modifying the change and clearance intervals to MassDOT standards. This countermeasure reduces crashes by as much as 10 percent.

¹⁸ P. Alluri, A. Raihan, D. Saha, et al. "Statewide Analysis of Bicycle Crashes." Florida Department of Transportation (May 2017).

Chapter 7—Conclusion and Next Steps

The improvements developed in this study provide Massachusetts Department of Transportation (MassDOT), the City of Framingham, the Town of Natick, and other stakeholders an opportunity to review options for addressing deficiencies in the corridor before committing design and engineering funds to a roadway improvement project. If implemented, the improvements would support economic vitality, increase travel choices in the corridor, and make it safer for people who walk, bicycle, drive, and ride the bus.

Project development is the process that takes transportation improvements from planning concept to construction. Successful implementation of the improvements would require cooperation among MassDOT Highway Division, the City of Framingham, and the Town of Natick. The 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 Metropolitan Planning Organization to program funding for the project in the Transportation Improvement Program. Appendix F contains an overview of the project development process.

Appendix A: Comments and Selection Process

1. Review Comments
2. Selection of Study Locations
3. Public Participation

Part 1: Review Comments

Summary of District 3 Comments on Route 9 REPORT CLIENT REVIEW.docx
Author: Leary S. Text Date: 5/31/2022 2:15:13 PM

Page: 2

General: Please proof read the writing throughout the report for errors in grammar, wording, descriptions, etc.

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Please note that some of these pedestrian improvements will be implemented in the park and ride project (Project # 611951)

Consider adding the following (paraphrased from the Route 9 RSA conducted on 2/1/2022):

- Consider aligning signal heads better with their respective lanes
- Refresh pavement markings as needed
- Consider SWL's and "stay in lane" signage for WB receiving to discourage sudden/dangerous merging to get to the ramp
- Consider installing flashing beacon in the ramp gore area to notify of median barriers at Crossing Blvd ramp

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Consider adding the following (paraphrased from the Route 9 RSA conducted on 2/1/2022):

- Evaluate speed regulations in relation to the reverse curves
- Evaluate potential for use of curve/advisory speed warning signage
- Consider using HFST (high friction surface treatment) to help drivers take the curves
- Consider adding a green arrow for the EB right turn movement
- Consider use of flashing signal/queue warning signs

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Consider adding the following (paraphrased from the Route 9 RSA conducted on 2/1/2022):

- Consider adding intersection warning signage on Temple St SB
- Consider moving utility poles further back from the road, or putting utility pole protectors and reflective strips on them
- Consider aligning signal heads better with their respective lanes
- Consider installing a signal with a FYA to replace the 3-section signal head for Temple St NB
- Consider use of flashing signal/queue warning signage

Page: 71

Consider adding the following (paraphrased from the Route 9 RSA conducted on 2/1/2022):

- Consider replacing R1-1 (stop) with R1-2 (yield) for turning onto Route 9
- Evaluate the effectiveness of the flashing intersection warning beacon for Route 9 approach
- Consider the potential for ramp metering and "1 vehicle at a time" sign for the Cochituate Rd approach (and consider the potential to use this at other locations for consistency)
- Consider potential use of merge warning signs (W4-1 for Route 9, W4-5 for Cochituate Rd, W4-5P)
- Evaluate and update guide signage as needed

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Consider adding the following (paraphrased from the Route 9 RSA conducted on 2/1/2022):

- Consider possible ways to simplify the interchange by eliminating redundancy and excessive access
- Consider potential for use of merge warning signs (W4-1 for Route 9, W4-5 for 126, W4-5P)
- Evaluate and update guide signage as needed

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Consider adding the following (paraphrased from the Route 9 RSA conducted on 2/1/2022):

- Consider better aligning signal heads with their respective lanes
- Consider adding advanced lane use warning signage for Caldor Rd SB

Natick Select Board

Paul R. Joseph, Chair
Michael J. Hickey, Jr., Vice Chair
Bruce T. Evans, Clerk
Kathryn M. Coughlin
PHONE 508-647-6410
EMAIL: selectboard@natickma.org



LOCATED AT
Town Hall
13 East Central Street
Natick, Massachusetts
01760

Town of Natick • Select Board Office

June 9, 2022

Seth Asante, Project Manager
Central Transportation Planning Staff
Boston Region Metropolitan Planning Organization
10 Park Plaza, Suite 2150
Boston, MA 02116

Dear Mr. Asante:

The Town of Natick appreciates the opportunity to comment on the Route 9 Priority Corridor Study ("Study") for Framingham and Natick. Copied on this letter is MassDOT's Office of Transportation Planning to demonstrate our support for District 3's request for a planning study of bicycle and pedestrian improvements on Route 9 and Speen Street.

The Town is grateful that the Route 9 corridor in Natick and Framingham was identified as a priority in *Destination 2040*, the MPO's Long-Range Transportation Plan.

We encourage the MPO and MassDOT to think proactively and sustainably when planning the future of Route 9. Historically, the development of the Worcester Turnpike reflected and accommodated the dominance of the automobile. In 2022, it is time to anticipate change by planning the next version of Route 9 as a future-ready corridor – one that supports multi-modal connections and non-automobile modes of transport within the communities it serves.

Route 9 is both a critical part of the region's transportation infrastructure as well as a significant barrier to the communities it serves. Indeed, this barrier is noted in the Town's Master Plan, Natick 2030+, which cites Natick's need for greater north-south access.

In addition to the at-grade intersection improvements cited in the Study, we encourage solutions that prioritize safe and efficient bicycle and pedestrian mobility to further connect neighborhoods, provide safer travel to schools and workplaces, and improve access to public transit. For example, there are several locations between intersections that are suitable for grade-separated, multi-modal crossings.

We also support fully separated and protected bicycle lanes (not unpleasant ones directly abutting high-speed travel lanes, which pose safety concerns and are unusable in the winter

Seth Asante, Project Manager

June 9, 2022

Page 2

due to their use as snow storage areas) suggested in the Study. As e-bikes become more widespread, and people seek more sustainable mobility options, the need for separated bike lanes continues to increase. This will complement the multi-use paths contemplated by other MassDOT projects, such as Lake Cochituate Path and the replacement Route 9/27 interchange.

We urge the MPO and MassDOT to undertake stakeholder outreach in upcoming planning, including with the employers who are locating and expanding in the region, and whose workforce is seeking active, safe, and convenient public transportation options.

Finally, the Town is leading a Golden Triangle planning study to envision the future of this important area, and the transportation improvements that are the subject of the CTPS Corridor Study and the proposed MassDOT Planning Study are highly complementary.

Natick looks forward to participating with the MPO and MassDOT to support successful planning along and near Route 9. Thank you for your consideration.

Sincerely,

Natick Select Board

A handwritten signature in black ink that reads "Paul R. Joseph". The signature is written in a cursive style with a large initial "P".

Paul R. Joseph, Chair

Cc: Barry Lorion, MassDOT District 3
Liz Williams, MassDOT Office of Transportation Planning
Sarkis Sarkisian, Director of Planning & Community Development, City of Framingham



Route 9 Priority Corridor Study Framingham and Natick

January 18, 2022

Seth Asante

Boston Region Metropolitan Planning Organization

January 18, 2022

AGENDA

1. Introductions
2. Existing conditions
3. Suggested improvements
4. Feedback and other matters

Projects

MassDOT Project #	City/Town	Project Description	Status
608836	Framingham	Drainage Improvements and Related Work (Including Salt Shed Demolition) at the Intersection of Routes 9 and 126 (Worcester Road and Concord Street)	Construction
609247	Framingham	Framingham- Park N' Ride Reconstruction and Salt Shed Depot Site Work on Route 9	Design
609402	Framingham-Natick	Resurfacing and Related Work on Route 9	Design
605313	Natick	Bridge Replacement, N-03-020, Route 27 (North Main Street) Over Route 9 (Worcester Street) and Interchange Improvements	Design

We recommend including the Route 9 - Connected Corridor (SPaT Challenge) project (Project No. 609003), which is in construction now and should be completed this year. The project extends from Shrewsbury to I-95 and includes all of the signalized intersections in the study area.



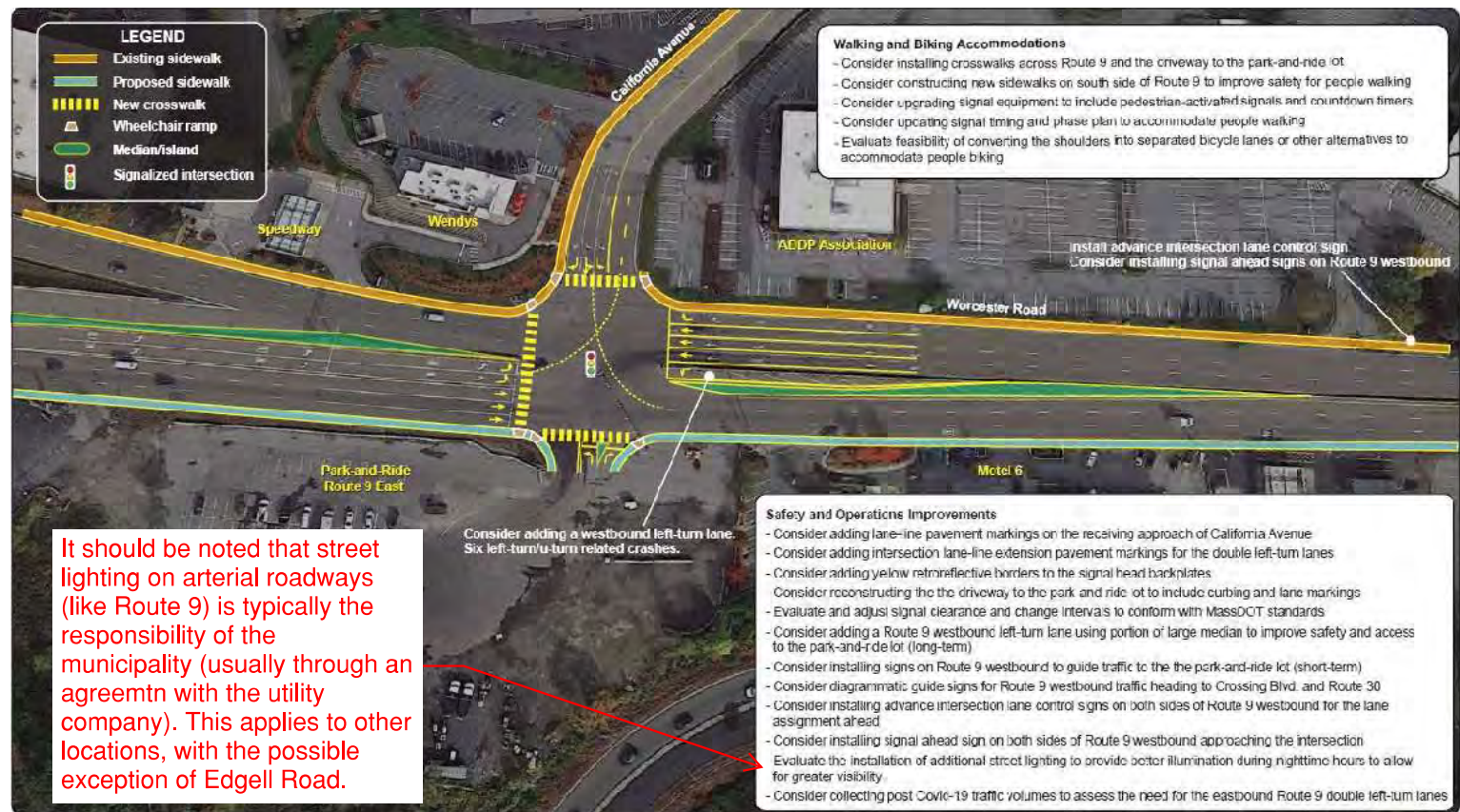
Technical difficulties? Call Róisín Foley at 857.702.3704 or email rfoley@ctps.org.

January 18, 2022

AGENDA

1. Introductions
2. Existing conditions
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Route 9 at California Avenue



It should be noted that street lighting on arterial roadways (like Route 9) is typically the responsibility of the municipality (usually through an agreement with the utility company). This applies to other locations, with the possible exception of Edgell Road.

Technical difficulties? Call Róisín Foley at 857.702.3704 or email rfoley@ctps.org.

January 18, 2022

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1. Introductions
2. Existing conditions
3. Suggested improvements
4. Feedback and other matters

Route 9 at Country Club Lane



Technical difficulties? Call Róisín Foley at 857.702.3704 or email rfoley@ctps.org.

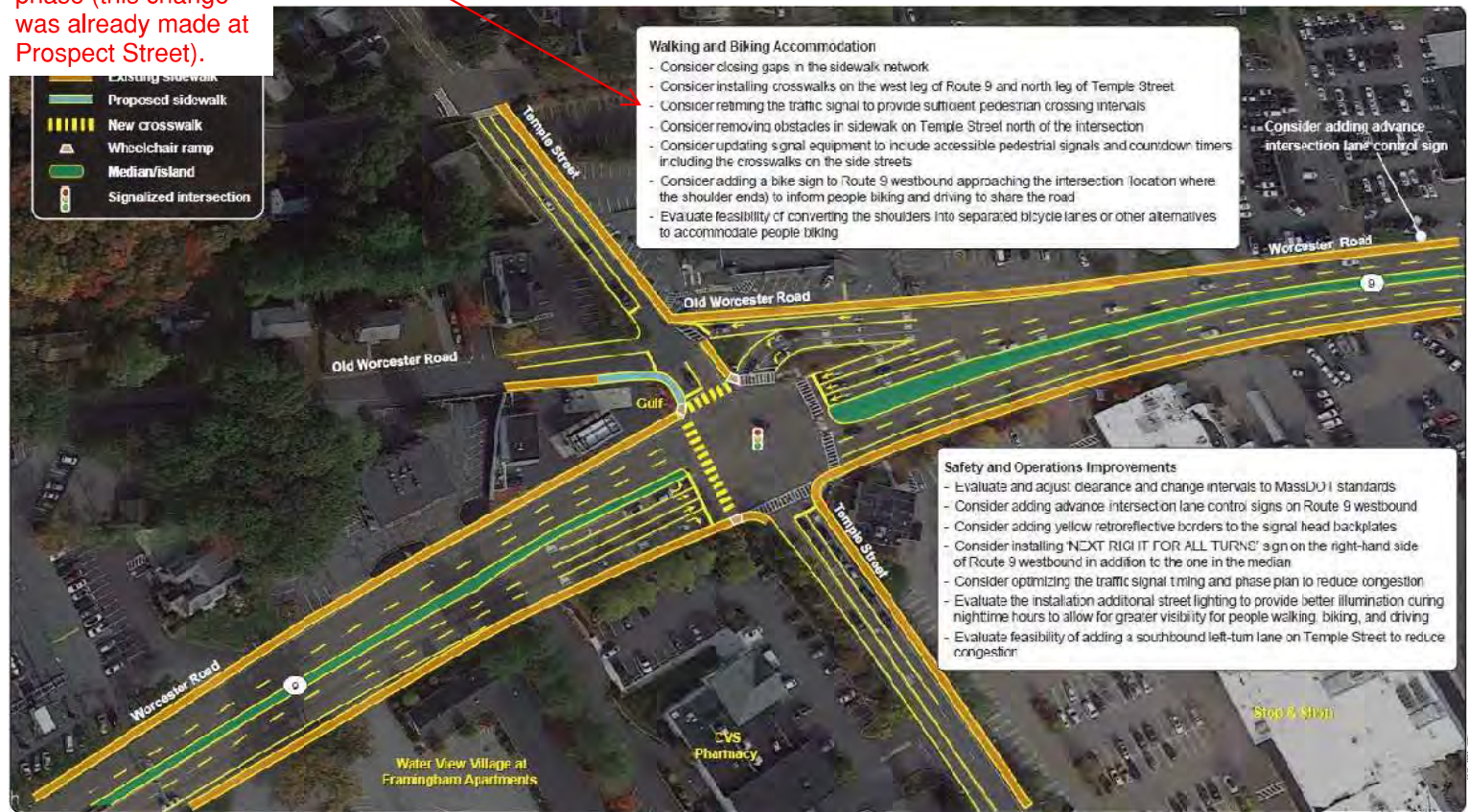
January 18, 2022

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1. Introductions
2. Existing conditions
3. Suggested improvements
4. Feedback and other matters

Another idea to consider is moving the order of the pedestrian phase to not have it immediately after the Route 9 mainline phase (this change was already made at Prospect Street).

Route 9 at Temple Street



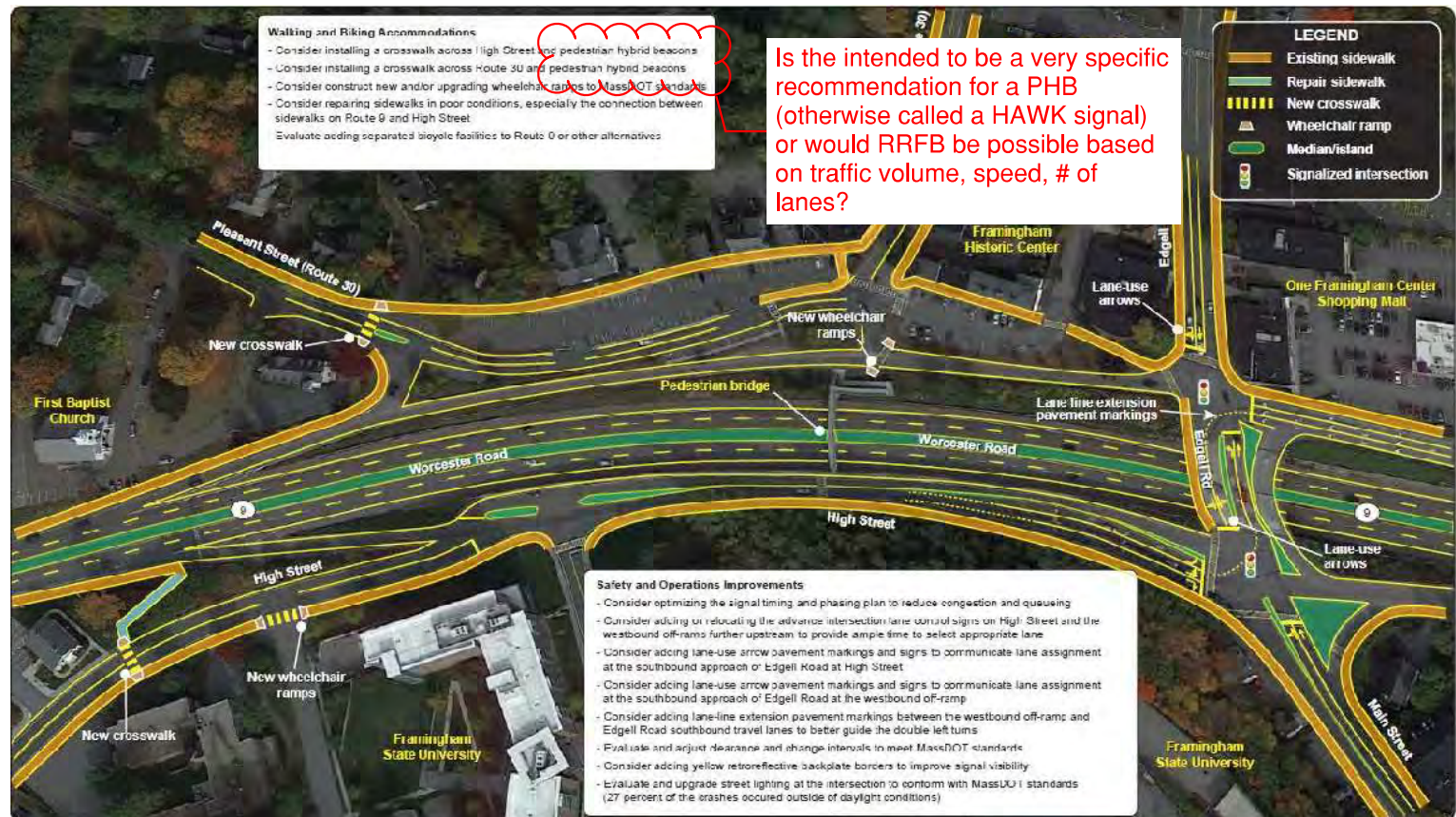
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January 18, 2022

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1. Introductions
2. Existing conditions
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Route 9 at Edgell Road/Main Street



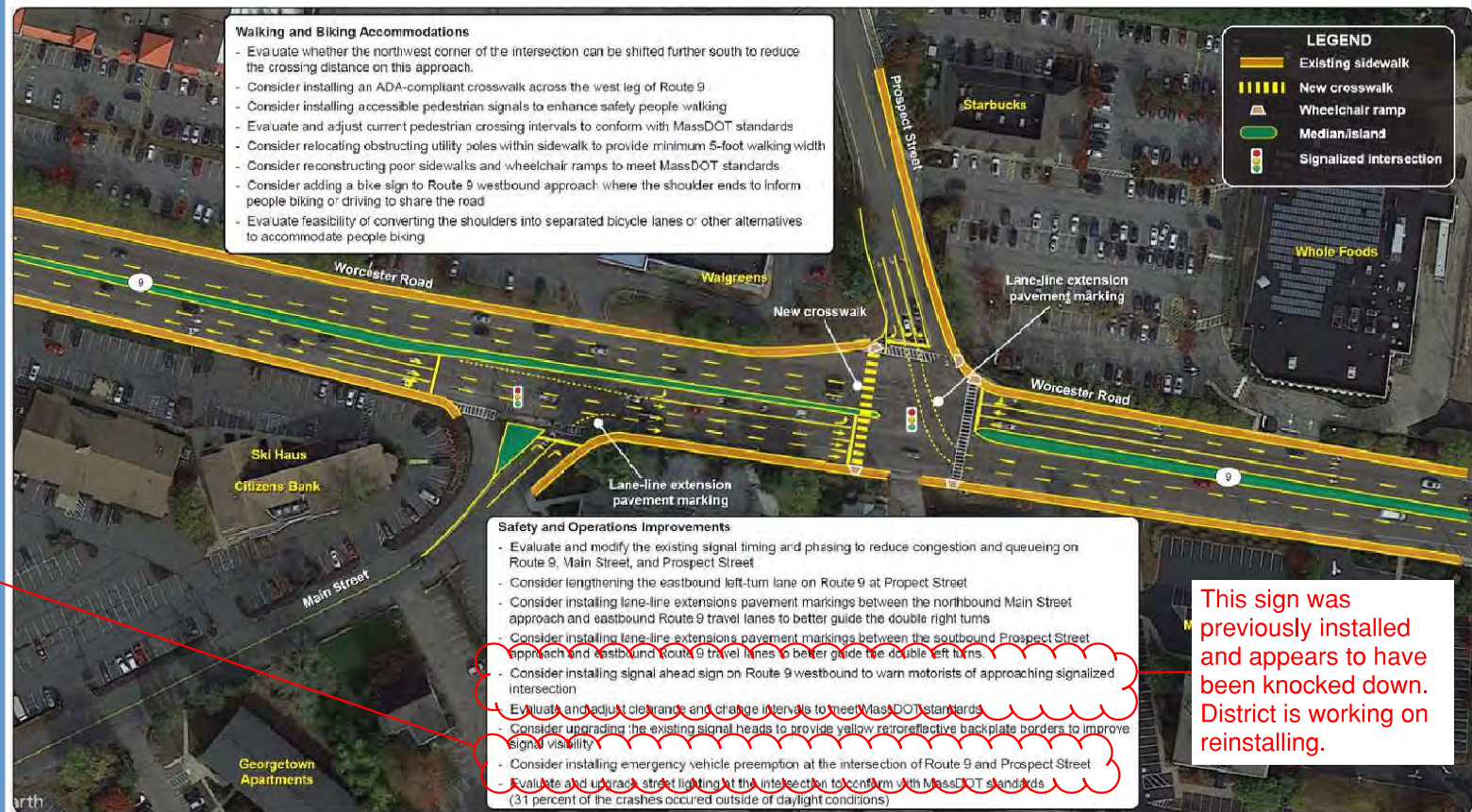
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January 18, 2022

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1. Introductions
2. Existing conditions
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4. Feedback and other matters

Route 9 at Prospect Street



Note that emergency pre-emption is typically owned and maintained by the municipality (through an agreement with DOT). Unless part of a MassDOT project, it is typically installed through our access permit process.

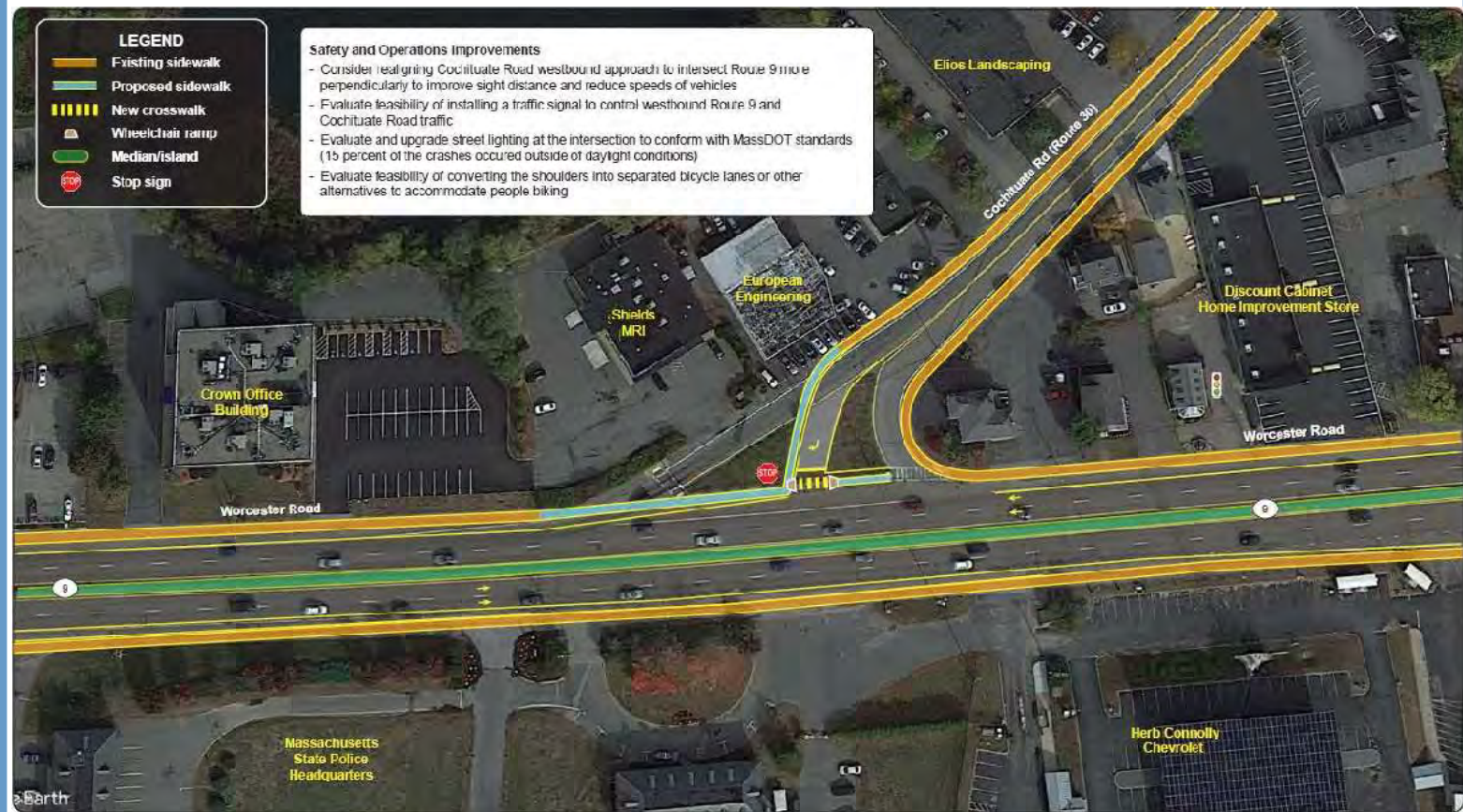
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January 18, 2022

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1. Introductions
2. Existing conditions
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4. Feedback and other matters

Route 9 at Cochituate Road



Technical difficulties? Call Róisín Foley at 857.702.3704 or email rfoley@ctps.org.

January 18, 2022

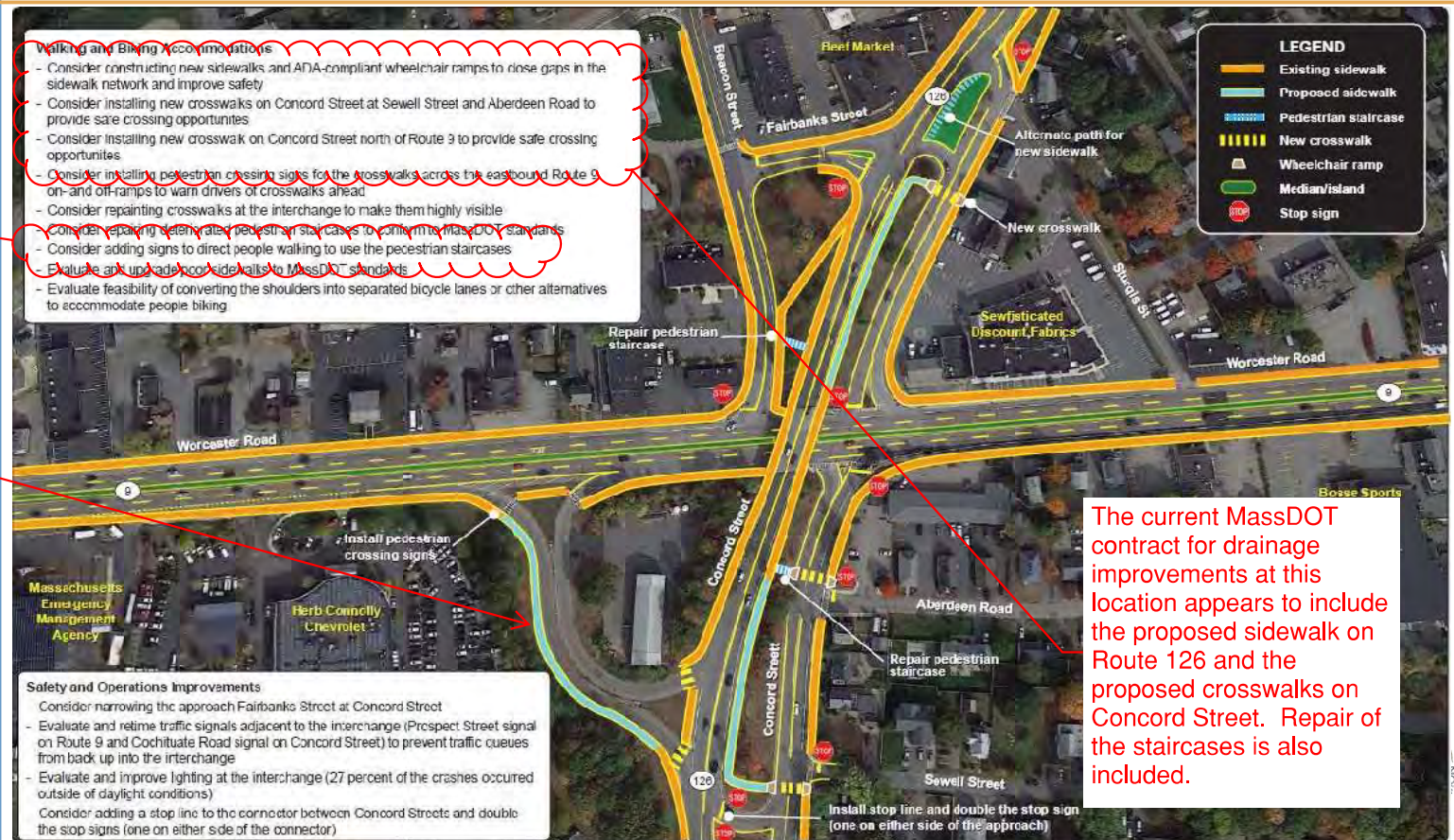
AGENDA

1. Introductions
2. Existing conditions
3. Suggested improvements
4. Feedback and other matters

Please provide more information on what is recommended. Signage may be difficult given that all users cannot use the staircase.

This section of proposed sidewalk is not included in the drainage improvement contract.

Route 9 at Route 126 (Concord Street)



The current MassDOT contract for drainage improvements at this location appears to include the proposed sidewalk on Route 126 and the proposed crosswalks on Concord Street. Repair of the staircases is also included.

Technical difficulties? Call Róisín Foley at 857.702.3704 or email rfoley@ctps.org.

January 18, 2022

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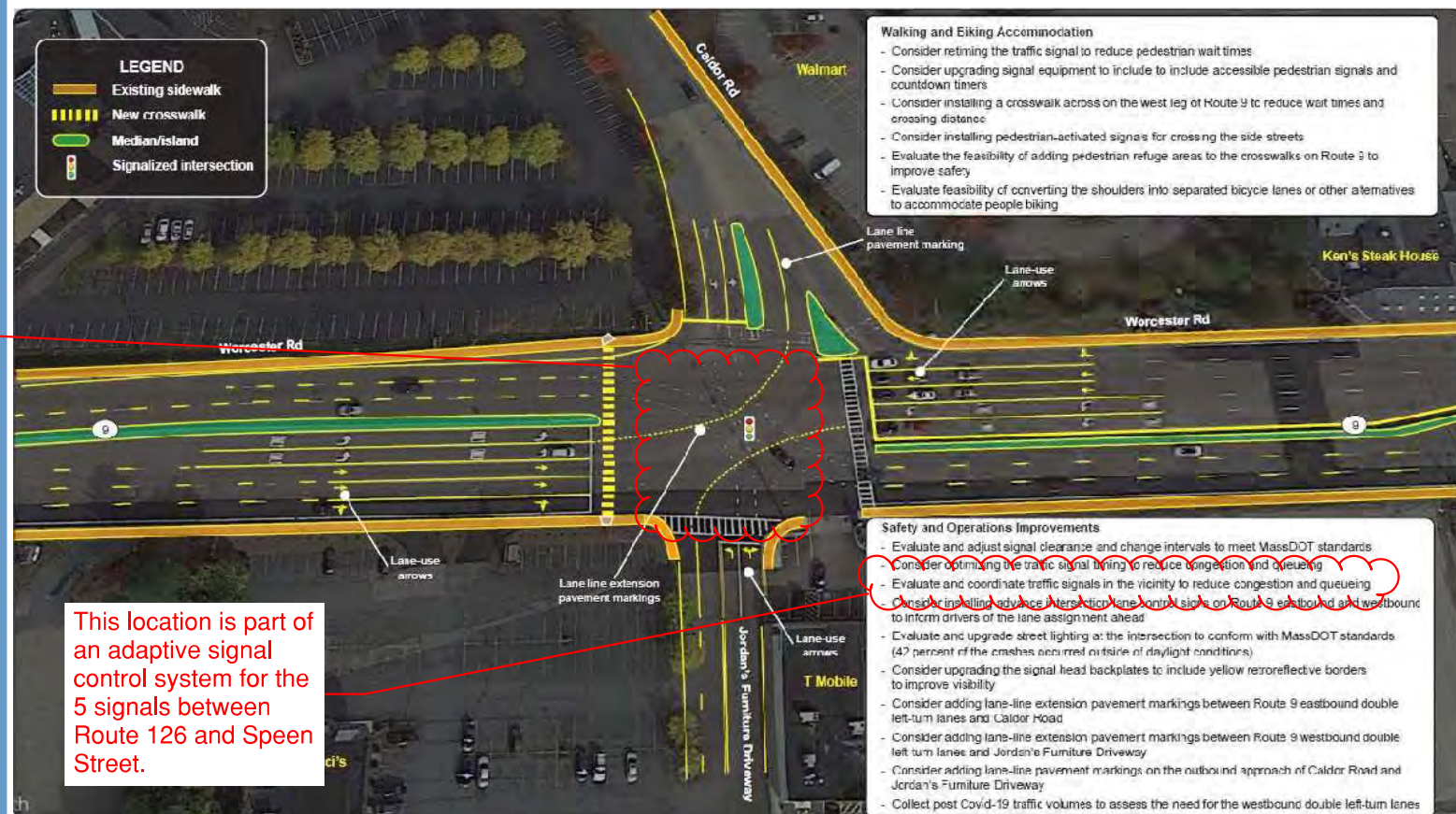
1. Introductions
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One safety issue at this location (and the other signals in front of Shoppers World and Natick Mall) is that the side street phases operate concurrently, and no through movements were considered (the lane use markings typically do not include a through arrow). However, the through movement is not physically prohibited.

This location is part of an adaptive signal control system for the 5 signals between Route 126 and Speen Street.

Technical difficulties? Call Róisín Foley at 857.702.3704 or email rfoley@ctps.org.

Route 9 at Caldor Road



January 18, 2022

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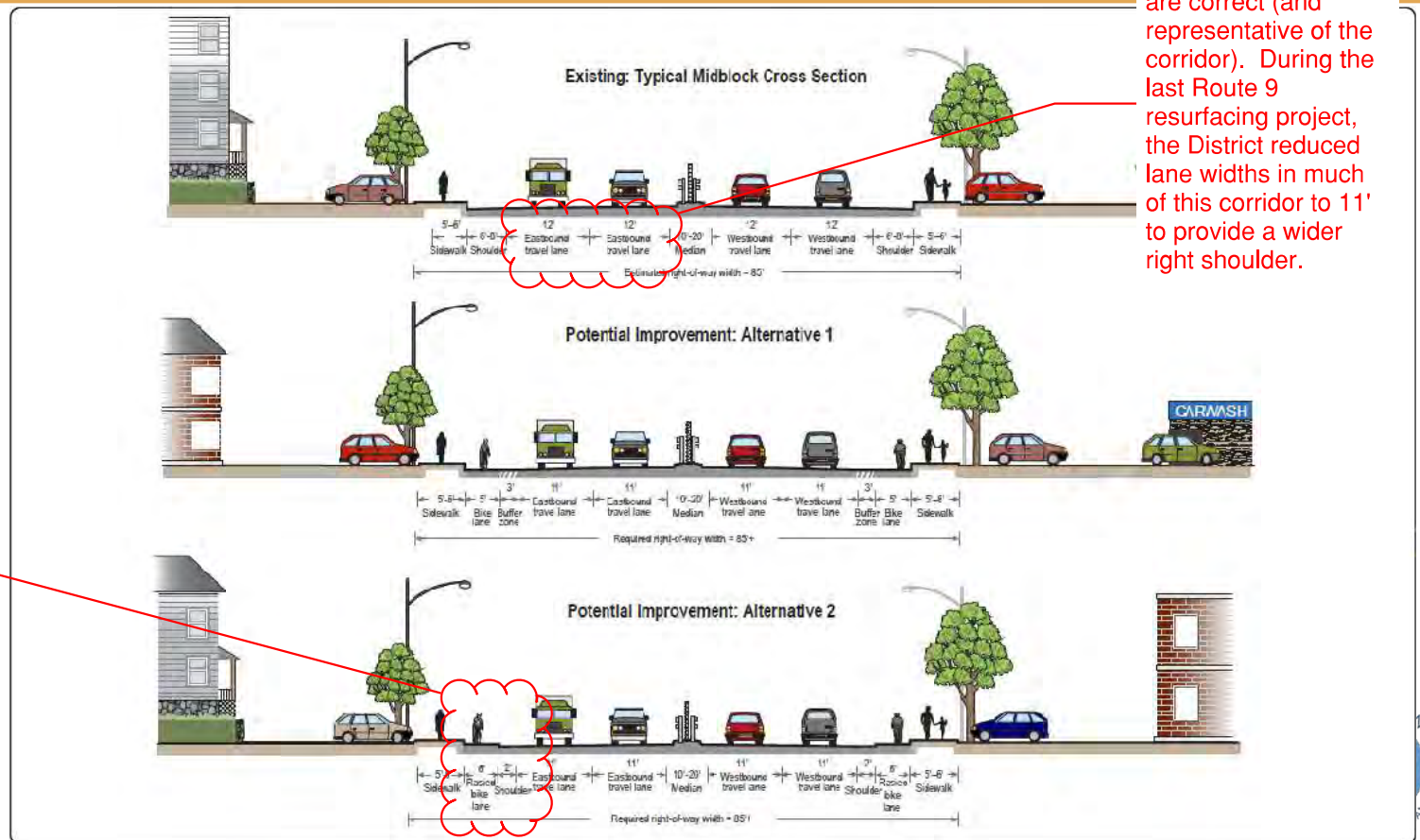
1. Introductions
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The discussion of improvements for bicyclists should include how the intersections (where the shoulders generally narrow today) and ramp conflict areas would be addressed.

Narrowing the roadway shoulder to 2 feet is concerning on a roadway like Route 9. It leaves our Maintenance forces with little space to perform routine work during the day (as any stopping on the roadway would require closing a lane).

Recommend verifying that these dimensions are correct (and representative of the corridor). During the last Route 9 resurfacing project, the District reduced lane widths in much of this corridor to 11' to provide a wider right shoulder.

Technical difficulties? Call Róisín Foley at 857.702.3704 or email rfoley@ctps.org.



January 18, 2022

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1. Introductions
2. Existing conditions
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4. Feedback and other matters

Questions and Comments

Thank You!



Technical difficulties? Call Róisín Foley at 857.702.3704 or email rfoley@ctps.org.

Part 2: Selection of Study Locations



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Stephanie Pollack, MassDOT Secretary and CEO and MPO Chair
Tegin L. Teich, Executive Director, MPO Staff

TECHNICAL MEMORANDUM

DATE: December 17, 2020
TO: Boston Region Metropolitan Planning Organization
FROM: Seth Asante, MPO Staff
RE: Selection of FFY 2021 LRTP Priority Corridor Study Location

1 BACKGROUND

During the development of the Boston Region Metropolitan Planning Organization's (MPO) Long-Range Transportation Plan (LRTP), *Destination 2040*, the MPO staff identified the existing needs for all transportation modes in the region.¹ 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

¹ *Destination 2040: The New Long-Range Transportation Plan of the Boston Region Metropolitan Planning Organization* was adopted by the Boston Region MPO in August 2019.

Civil Rights, nondiscrimination, and accessibility information is on the last page.

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) 2021 Unified Planning Work Program (UPWP).² This memorandum presents the results of the selection process and a recommendation for a location to study to the MPO board for discussion.

By focusing on arterial segments, 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 bicycle 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 and the interests and support of stakeholders are also considered.

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 the segments in need of improvements.
2. 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 43 arterial segments in 33 municipalities in the Boston region based on the following data sources:

- The Massachusetts Department of Transportation (MassDOT) Road Inventory File and 2013–17 crash database were used to assemble the following information for each arterial segment: roadway jurisdiction,

² The FFY 2021 UPWP was endorsed by the Boston Region MPO on June 16, 2020.

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 during 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's bike facilities were used to identify bicyclists' needs, including locations where connectivity between bicycle facilities and 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 transportation equity analysis zones were used to identify areas of concern as relates to transportation equity.
- Data selected from MassDOT's project-information database, the MPO's FFY 2021–25 TIP project database, 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 about each of the 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 a transportation equity 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 a transportation equity 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 11 or fewer points as *low* priority; those with a score of 12 to 13 points as *medium* priority; and those with a total score of 14 or more points as *high* priority. Staff gave 6 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 for which there were 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 segment with the highest score by applying the MPO's Pedestrian Report Card Assessment and Bicycle Level-of-Service Metric (Bicycle Report Card).³ These locations highly qualify based on pedestrian and bicycle accommodation or safety improvement requirements. Appendix A contains detailed results of the assessments for Route 9 in Framingham and Natick, the arterial segment with the highest score. Based on this evaluation, staff recommends studying the segment on Route 9 in Framingham and Natick. Figure 1 shows the study area with seven HSIP intersection crash clusters.

³ Ryan Hicks and Casey-Marie Claude, Boston Region Metropolitan Planning Organization, *Pedestrian Level-of-Service Memorandum*, January 19, 2017; Casey-Marie Claude, Boston Region Metropolitan Planning Organization, *Development of a Scoring System for Bicycle Travel in the Boston Region*, November 8, 2018.

3 ARTERIAL SEGMENT SELECTED FOR STUDY: ROUTE 9 IN FRAMINGHAM AND NATICK

The arterial segment on Route 9 in Framingham and Natick received a total score of 16, based on the selection criteria (safety, congestion, multimodal and regional significance, regional equity, and implementation potential). Route 9 runs east and west through Framingham and Natick and it serves residential, commercial, industrial, educational, and recreational areas. Within the selected corridor, there are several transportation equity zones that exceed the threshold of the MPO, including low-income households, minority, low English proficiency, and carless households.

Being a principal arterial, Route 9 carries local and commuter traffic to and from Boston and connects major north-south road Routes 27, 30, and 126, Main Street/Edgell Road, Speen Street, and Oak Street. Staff's evaluation indicates that there are safety and mobility problems in the segment. Seven locations along the segment contain HSIP-eligible crash clusters, two of which are in the top 200 of intersection crash clusters in Massachusetts. Also, accommodation for bicyclists is poor and better bicycle connections are needed in the corridor. Pedestrian accommodations need improvement as there are gaps in the sidewalk network.

MassDOT Highway District 3 has been fielding inquiries about improving the safety of pedestrian and bicycles along the corridor, pedestrian signal equipment, and phasing/timing changes. District 3, City of Framingham, and Town of Natick are looking for solutions to the problems (see Appendix B). MPO staff would focus on segments where safety and people who bike or walk would benefit the most. MPO staff would work with stakeholders to identify the problems and develop solutions that could be incorporated into MassDOT project number 609402. The recommended arterial segment meets the selection criteria of this study, especially by supporting the transportation improvement priorities of the MPO's LRTP.

4 NEXT STEPS

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

SA/sa

Table 1
Figure 1

Appendix A—Route 9 pedestrian and bicycle levels of service
Appendix B—Letter of support

The Boston Region Metropolitan Planning Organization (MPO) operates its programs, services, and activities in compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of race, color, or national origin (including limited English proficiency), be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination under any program or activity that receives federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, Federal Transit Administration, or both, prohibit discrimination on the basis of age, sex, and disability. The Boston Region MPO considers these protected populations in its Title VI Programs, consistent with federal interpretation and administration. In addition, the Boston Region MPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with U.S. Department of Transportation policy and guidance on federal Executive Order 13166.

The Boston Region MPO also complies with the Massachusetts Public Accommodation Law, M.G.L. c 272 sections 92a, 98, 98a, which prohibits making any distinction, discrimination, or restriction in admission to, or treatment in a place of public accommodation based on race, color, religious creed, national origin, sex, sexual orientation, disability, or ancestry. Likewise, the Boston Region MPO complies with the Governor's Executive Order 526, section 4, which requires that all programs, activities, and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background.

A complaint form and additional information can be obtained by contacting the MPO or at http://www.bostonmpo.org/mpo_non_discrimination. To request this information in a different language or in an accessible format, please contact

Title VI Specialist
Boston Region MPO
10 Park Plaza, Suite 2150
Boston, MA 02116
civilrights@ctps.org
857.702.3700 (voice)
617.570.9193 (TTY)

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 2015-17	Number of HSIP-Eligible Crash Clusters 2015-17**	Travel Time Index	Transit Service	Crowded or Late Bus	In or Near Transportation Equity Priority Area	Study, Project, or TIP Project	Safety Conditions***	Congested Conditions***	Multimodal Significance***	Regional Significance***	Regional Equity***	Implementation Potential***	Score	Priority Rating	Summary of Comments
Route 9	Framingham and Natick	MWRC	3	MassDOT	Yes	2	2	7	3.47	MWRTA Routes 1, 2, 3, 7, and 9	No data	Yes	MassDOT Project #609402, Framingham-Natick resurfacing and related work on Route 9; programmed FFY 2025. MassDOT Project #607732, Framingham-Natick Cochituate Rail Trail, the project involves construction of 2.4 miles of rail trail and includes a grade separated crossing at Routes 9 and 30; in construction. MassDOT Project #608006, Framingham Pedestrian Hybrid Beacon Installation at Route 9 and Maynard Road and the Framingham Fire Station; in design. MassDOT Project #608281, Installation of adaptive traffic control signal equipment, vehicle detection, and communication equipment at 5 traffic signals in Framingham and Natick on Route 9; in construction. MassDOT Project #608836, Drainage improvements on Route 9 at Route 126 interchange and salt shed relocation (Phase 1); in design.	3	2	3	4	1	3	16	High	This arterial segment was selected because staff's evaluation indicates that there are safety and mobility problems in the segment. Eight locations along the segment contain HSIP-eligible crash clusters, two of which are in the top 200 of intersection crash clusters in Massachusetts. Also, accommodation for people who bicycle is poor and better bicycle connections are needed in the corridor. Accommodations for people who walk need improvement as there are gaps in the sidewalk network. MassDOT Highway District 3 has been fielding inquiries about improving the safety of people who bicycle or walk along the corridor and better signal equipment and phasing/timing changes. Within the selected corridor, there are several transportation equity zones that exceed threshold of the MPO. Recommendations from the study could be incorporated into MassDOT project number 609402.
Route 37	Braintree	SSC	6	MassDOT	Yes	2	1	2	2.73	MBTA bus Routes 230 and 236 and travel on or across the segment.	Yes	Yes	MassDOT Project #608651, Adaptive traffic signal control on Route 37 (Granite Street). Installation of adaptive traffic control signal equipment, vehicle detection, communication equipment, and managing software at seven traffic signals on Route 37; in construction. MassDOT Project #607684, Bridge replacement, B-21-017, Washington Street (Route 37) over MBTA/CSX railroad; preliminary design.	3	2	2	4	2	2	15	High	The arterial segment has a 5- to 6-foot shoulder on either side of the roadway for most of the corridor. There are sidewalks on either side of the roadway throughout the corridor. In addition, MassDOT is installing adaptive traffic control signal equipment, vehicle detection, communication equipment, and managing software at seven traffic signals on Route 37, a project that is under construction.
Route 16	Medford	ICC	4	MassDOT	Yes	2, 3	1	7	3.04	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	MassDOT Project #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. The project is under construction. MassDOT Project #605531, Structure maintenance, E-12-004=M-12-018, Revere Beach Parkway (Route 16) over the Malden River (Woods Memorial Draw Bridge); in construction.	4	2	3	4	0	2	15	High	In FFY 2019, MPO staff studied Route 16 in Chelsea and Everett and suggested improvements to address safety, congestion, multimodal transportation, and pedestrian and bicycle accommodations. The section of Route 16 in Medford has five HSIP intersection clusters, including two pedestrian clusters. The roadway experiences congestion and high truck volumes. It also carries vehicular, pedestrian, and bicycle traffic to Wellington Station. Studying this segment in Medford will provide MassDOT with improvement concepts to comprehensively address safety, capacity management and mobility, and pedestrian and bicycle accommodations in the corridor.
Route 3A	Burlington	NSPC	4	MassDOT	Yes	3	0	2	1.67	MBTA bus Routes 350, 351, and 354 travel on or across the segment.	Yes	Yes	MassDOT Project #608068, will install an adaptive traffic control signal system on Cambridge Street, Middlesex Turnpike, and Burlington Mall Road. The project includes the installation of compatible traffic signal control equipment, video detection, communication devices and software to integrate 11 MassDOT and 16 Town-owned traffic signal locations into one adaptive signal system. The project is in construction.	3	1	3	4	2	1	14	High	On this segment, there are no accommodations for bicycles, gaps in sidewalk network, and travel lanes that are very wide (drivers form two lanes in each direction). Land use is mixed along the corridor. There are three MBTA bus routes operating in the corridor. Pedestrian and bicycle crashes have occurred in the corridor. The installation of an adaptive traffic control signal system is underway on Cambridge Street, Middlesex Turnpike, and Burlington Mall Road to integrate 11 MassDOT and 16 Town-owned traffic signal locations into one adaptive signal system.
Route 18	Weymouth	SSC	6	MassDOT	Yes	3	3	8	2.55	MBTA bus Route 225 MBTA commuter rail at South Weymouth	Yes	Yes	MassDOT Project #601630, Reconstruction and widening on Route 18 (Main Street) from Highland Place to Route 139 (4.0 miles) includes replacing W-32-013, Route 18 over the Old Colony Railroad (MBTA); in construction.	4	2	2	4	2	0	14	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.
Routes 38/129	Wilmington	NSPC	4	MassDOT and Wilmington	Yes	3	0	4	3.31	MBTA commuter rail at Wilmington, North Wilmington, Anderson/Woburn, and Reading	N/A	Yes	MassDOT Project #608051, Reconstruct Route 38 from Route 62 to the Woburn city line, add bike lanes, sidewalks, and turn lanes, and upgrade signals; programmed FFY 2024. MassDOT Project #609253, Intersection improvements at Lowell Street (Route 129) and Woburn Street; programmed FFY 2024. MassDOT Project #601732, Rehabilitation, Route 129 (Lowell Street) from Route 38 (Main Street) to Woburn Street; completed in 2009.	3	2	2	4	2	1	14	High	Several sections of the arterial have projects that are currently in design. These MassDOT projects would address problems in the corridor.
Route 2A/3	Arlington	ICC	4	Arlington	Yes	3	0	2	2.39	MBTA bus Routes 67, 77, 79, 80, 87, and 350 travel on or across the segment.	Yes	Yes	None	3	2	3	4	0	1	13	Medium	None
Route 203	Boston	ICC	6	MassDOT	Yes	3	5	13	2.94	MBTA bus Routes 14, 26, 201, 202, 215, and 217 travel on or across the segment.	Yes	Yes	MassDOT Project #606318, Intersection improvements at Gallivan Boulevard (Route 203) and Morton Street; in construction. MassDOT Project #608755, Intersection improvements Morton Street (Route 203) at Blue Hill Ave, at Courtland Road/Havelock Street, and at Harvard Street; programmed in the FFY 2019 TIP; in design. MassDOT Project #606896, Reconstruction on (Route 203) Gallivan Boulevard, from Neponset Circle to east of Morton Street intersection; in preliminary design. MassDOT Project #606897, Improvements on (Route 203) Morton Street, from west of Gallivan Boulevard to Shea Circle; in preliminary design.	4	2	2	4	0	1	13	Medium	The FFY 2012 Priority Corridors for LRTP Needs Assessment Study and several MassDOT projects in the corridor will address issues.
Route 2A	Cambridge	ICC	6	Cambridge and DCR	Yes	3	1	5	2.05	MBTA bus Routes 67, 77, 79, 80, 87, and 350 travel on or across the segment.	Yes	Yes	None	4	2	2	4	0	1	13	Medium	None

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Route 135	Framingham	MWRC	3	Framingham	Yes	3	1	2	1.63	MBTA commuter rail at Framingham. MWRTA Routes 4, 5, 6, and 11	No data	Yes	MassDOT Project #606109, Intersection improvements at Route 126/135/MBTA and CSX railroad.	4	1	2	4	1	1	13	Medium	MassDOT Project #606109: Intersection improvements at Route 126/135/MBTA and CSX railroad. Roadway has received improvements to address congestion and make it multimodal (accommodation for pedestrians and bicycles).
Route 107	Lynn	ICC	4	MassDOT and Lynn	Yes	3	4	11	1.87	MBTA bus Routes 424, 426, 435, 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	MassDOT Project #808817, Resurfacing of Route 107 and related improvements; programmed FFY 2021. MassDOT Project #608927, Reconstruction of Route 107 in Lynn and Salem; in preliminary design. MassDOT project #609246, Rehabilitation of Western Avenue (Route 107); in preliminary design. MassDOT Project #604952, Bridge Replacement, Route 107 over the Saugus River; programmed 2019. MassDOT Project #26710, Bridge Replacement, Route 107 over the Saugus River (Fox Hill Bridge); completed spring 2013.	4	1	3	4	0	1	13	Medium	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, which is in design.
Route 16	Milford	SWAP	3	MassDOT and Milford	Yes	3	0	4	3.58	MWRTA Route 14	No data	Yes	MassDOT Project #607428, Resurfacing and intersection improvements on Route 16 (Main Street), from Water Street west to approximately 120 feet west of the Milford/Hopedale town line and the intersection of Route 140; programmed FFY 2019. MassDOT Project #606142, Signal and intersection improvements on Route 16 (Main Street and East Main Street) at six locations; completed in 2013.	3	2	2	4	1	1	13	Medium	This corridor is not recommended for study. The corridor received improvements in 2013 based on a CTPS study and currently a MassDOT resurfacing and intersection improvement project has been programmed for FFY 2019.
Route 3A	Quincy	ICC	6	MassDOT, DCR, and Quincy	Yes	3	1	8	2.76	MBTA bus Routes 210, 211, 212, 214, 216, 217, 220, 221, 222, 225, 230, 236, 238, and 245 MBTA Red Line rapid transit at Quincy Center MBTA commuter rail at Quincy Center	Yes	Yes	MassDOT Project #608569, Intersection improvements at Route 3A (Southern Artery) and Broad Street; programmed FFY 2022 TIP. MassDOT Project #605729, Intersection and signal improvements at Hancock Street and East/West Squantum streets; completed in 2015. An FFY 2012 CTPS safety and operations study addressed problems at the Route 3A and Coddington Street intersection.	4	2	2	4	0	1	13	Medium	Route 3A (Hancock Street and Southern Artery) has received several improvement projects and was the focus of a CTPS study. The location was suggested in the 2017 MPO outreach program.
Route 28	Randolph	TRIC	6	MassDOT and Randolph	Yes	3	3	8	2.00	MBTA bus Routes 240 and 238 MBTA commuter rail at Holbrook/Randolph BAT Route 12	Yes	Yes	MassDOT Project #609399, Resurfacing and related work on Route 28; in preliminary design. Arterial Coordination Study, CTPS study (2010).	4	2	2	4	0	1	13	Medium	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	2.06	MBTA bus Routes 450, 451, 455, 456, and 465 MBTA commuter rail at Salem and Beverly; Ferry service	Yes	Yes	MassDOT Project #608521, Bridge Maintenance, North Street (Route 114) over Bridge Street (Route 107) and MBTA, in construction. MassDOT Project #605332, Bridge Replacement (Route 114) North Street over North River; in design stage.	3	2	2	4	1	1	13	Medium	This roadway has Complete Streets improvements, including sidewalks and bicycle lanes on either side of the roadway. The section that requires improvements to improve safety, capacity management and mobility, and accommodate bicycles is between Bridge Street (Route 107) and Route 128.
Route 16	Wellesley	MWRC	6	MassDOT and Wellesley	Yes	3	0	0	2.57	MBTA commuter rail at Wellesley Square, Wellesley Hills, Wellesley Farms and Waltham	N/A	Yes	MassDOT Project #94762, Bridge Rehabilitation, Br# W-13-014 Route 16 (Washington Street) over Route 9 including relocation of retaining wall.	3	2	2	4	1	1	13	Medium	The location was suggested in 2014 LRTP outreach through verbal comments at a 495/MetroWest Partnership meeting.
Route 20	Weston	MWRC	6	MassDOT	Yes	3	0	2	3.06	MBTA bus Route 70 MBTA commuter rail at Waltham and Kendal Green	Yes	Yes	Intersection improvements on Boston Post Road (Route 20) at Wellesley Street; in design stage.	3	2	2	4	1	1	13	Medium	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. A suggestion to study this location was resubmitted in a comment on the Draft FFY 2014 UPWP and during the 2017 MPO outreach program.
Route 3A	Weymouth	SSC	6	MassDOT	Yes	3	0	1	1.74	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	MassDOT Project #608231, Reconstruction of Route 3A including pedestrian and traffic signal improvements; in design. MassDOT Project #604382, Route 3A (Washington Street) Bridge; in construction. MassDOT Project #608483, Work consists of resurfacing on Route 3A; in preliminary design.	2	2	2	4	2	1	13	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 Project #608321, in design, will address problems and needs identified in the corridor.
Route 60	Arlington	ICC	4	Arlington	Yes	3	0	1	3.92	MBTA bus Routes 67, 77, 79, 80, 88, and 350 travel on or across the segment	Yes	Yes	CTPS and MAPC Community Transportation Technical Assistance Program evaluated the high-crash location at the intersection at Massachusetts Avenue in March 2010. MassDOT Project #606885 reconstructed the intersection of Route 3 and Route 60; the project was completed in 2017.	3	2	3	3	0	1	12	Medium	None

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Route 2/3/3A/16	Cambridge	ICC	6	DCR	Yes	2	3	5	4.80	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. MassDOT Project #608806, Multiuse Path Construction (Phase II), will create a multiuse greenway on the former B&M railroad right-of-way extending from Concord Avenue in Cambridge through the Fresh Pond Reservation, under Huron Avenue and Mount Auburn Street and into Watertown; this project is in construction. MassDOT Project #609290, Intersection improvements at Fresh Pond Parkway/Gerrys Landing Road, from Brattle Road to Memorial Drive.	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, particularly for young students who walk to Shady Hill School, because of high traffic volumes, environmental issues, and lack of livability.
Route 16	Chelsea and Everett	ICC	4	MassDOT	Yes	2	7	8	1.99	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	FFY 2019 Priority Corridor for LRTP Needs Assessment Study (Chelsea and Everett)	3	1	3	4	0	1	12	Medium	FFY 2019 Priority Corridors for LRTP Needs Assessment Study (Concord and Lincoln)
Route 2	Concord	MAGIC	4	MassDOT	Yes	2	0	2	5.93	MBTA commuter rail at West Concord, Concord, and Lincoln	N/A	Yes	MassDOT Project #602984, Crosby's Corner (Route 2 at Route 2A) Improvements; in construction. MassDOT Project #608015, Reconstruction and widening on Route 2, from Sandy Pond Road to Bridge over MBTA/B&M railroad. MassDOT Project #602091, Concord Rotary; in preliminary design. MassDOT Project #604069, Bridge Replacement over Sudbury River; in preliminary design. MassDOT Project #606223, Bruce Freeman Rail Trail Construction (Phase II-B) in Acton and Concord, will connect the trail across Route 2; programmed in the FFY 2019 TIP; in design.	2	2	2	4	1	1	12	Medium	FFY 2013 Priority Corridors for LRTP Needs Assessment Study (Concord and Lincoln) Route 2 was suggested during MPO outreach as a route experiencing congestion that affects MAGIC communities as well as Cambridge. There are many projects and studies conducted for this corridor, including the Route 2 (Crosby's Corner) improvements and Concord Rotary upgrade and improvements.
Route 99	Everett	ICC	4	Everett	Yes	3	0	1	2.23	MBTA bus Routes 97, 99, 104, 105, 106, 109, 110, and 112 travel on or across the segment	Yes	Yes	MassDOT Project #602383 reconstructed Route 99 with a traffic signal upgrade, from Second Street to the Malden city line; completed in 2008. MassDOT Project #602382 reconstructed Route 99 from Sweetser Circle to the Alford Street Bridge in 2013; completed spring 2013.	2	2	3	4	0	1	12	Medium	This roadway is not recommended for study because MassDOT completely reconstructed Route 99 with signal improvements from Alford Street Bridge to the Malden city line. Route 99 (Lower Broadway) has also received improvements, including pedestrian and bicycle accommodation, as a result of the Encore Boston Harbor mitigation improvements.
Route 3A	Hingham	SSC	5	MassDOT	Yes	3	0	2	1.69	MBTA commuter rail at Cohasset, Nantasket Junction, West Hingham, and East Weymouth Ferry service MBTA bus Routes 220 and 221	Yes	Yes	MassDOT Project #605168, Improvements on Route 3A from Otis Street/Cole Road including Summer Street and rotary; Rockland Street to George Washington Boulevard; in preliminary design. MassDOT Project #603137, Intersection Improvements on Route 3A at Kirby Street. There has been local interest in installing a traffic signal at this intersection; in preliminary design.	2	1	2	4	2	1	12	Medium	In FFY 2015, a subregional priority roadway study was conducted for Route 3A in Hingham and Hull. The location received strong support from the Towns of Hingham and Hull, as well as the South Shore Coalition and the MassDOT Highway Division District 5 Office.
Route 16	Holliston	MWRC	3	MassDOT and Holliston	Yes	3	0	2	1.76	MWRTA Routes 6 and 14	No data	Yes	2011 CTPS study, Route 126 Corridor: Transportation Improvement Study. 2008 CTPS study, Washington Street (Route 16/126) at Hollis Street.	2	1	2	4	1	2	12	Medium	This 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
Route 28	Milton	ICC and TRIC	6	MassDOT and Milton	Yes	3	1	4	2.48	MBTA bus Routes 240, 245, 24, 28, 29, 30, and 31 MBTA Red Line rapid transit at Mattapan/Ashmont Station, BAT Route 12	Yes	Yes	MassDOT Project #607342, Intersection and Signal Improvements at Route 28 (Randolph Avenue) and Chickatawbut Road; programmed FFY 2022. MassDOT Project #609396, Resurfacing and related work on Route 28; programmed FFY 2024. MassDOT Project # 106901, Reconstruction on Route 28 (Randolph Avenue) from Reedsdale Road to Quincy town line; completed in 2008.	4	2	3	3	0	0	12	Medium	This arterial segment was studied in FFY 2020. There are four HSIP intersection clusters in the segment. There is no accommodation for bicycles in the segment, which presents a significant connectivity problem because several of the side streets have bicycle lanes. There are peak period traffic congestion problems that create safety, operations, and mobility issues for the residents. The Town of Milton and MassDOT have expressed their support and will participate in the study. In addition, recommendations from the study could be incorporated into MassDOT Project #609396 or a new project.
Route 1	Norwood	TRIC	5	MassDOT	Yes	3	0	5	3.85	MBTA commuter rail at Islington, Dedham Corp. Center, Endicott, Norwood Depot, Norwood Central, Windsor Gardens, and Plimptonville	N/A	Yes	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 #609371, Median jersey barrier and fencing upgrade; programmed FFY 2019. MassDOT Project #608052, Route 1 at Morse Street (approved by PRC November 2014); programmed FFY 2023. MassDOT Project #605857, Route 1 at University Avenue and Everett Street; programmed FFY 2022. MassDOT Project #605321, Bridge Preservation, Route 1 over the Neponset River; in design stage. MassDOT Project #606545, Median jersey barrier and fencing upgrade; completed in 2012.	2	2	3	4	0	1	12	Medium	The location has MassDOT projects and studies and it is not recommended for study.

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Route 114	Peabody	NSTF	4	MassDOT and Peabody	Yes	3	0	1	3.60	MBTA bus Routes 435, 465	Yes	Yes	MassDOT Project # 608567, Improvements at Route 114 at Sylvan Street, Cross Street, Northshore Mall, Loris Road, Route 128 Interchange, and Esquire Drive; programmed FFY 2022.	3	2	2	3	1	1	12	Medium	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, which is programmed for FFY 2022.
Route 16 (Revere Beach Parkway)	Revere	ICC	4	MassDOT	Yes	2	0	1	2.93	MBTA bus Routes 110 and 116 travel on or across the segment MBTA rapid transit on Blue Line MBTA commuter rail at Chelsea	Yes	Yes	None	2	2	3	4	0	1	12	Medium	This location is not recommended for study because the Suffolk Downs Redevelopment project is evaluating several scenarios that would affect traffic on Route 16 and Route 1A.
Route 107	Salem	NSTF	4	MassDOT and Salem	Yes	3	0	2	2.84	MBTA bus Routes 450, 456, 461, and 465 MBTA commuter rail at Salem and Beverly Ferry service	Yes	Yes	Route 107 Corridor Study in Salem and Lynn; completed in 2016. MassDOT Project #608059, Stormwater improvements along Route 107 (Salem Bypass Road); in construction. MassDOT Project #608650, Adaptive Signal Controls on Route 107 (Highland Avenue); in construction. MassDOT Project #608817, Resurfacing and related work on Route 107; programmed FFY 2022 TIP. MassDOT Project #608927, reconstruction of Route 107; in preliminary design.	3	2	2	4	1	0	12	Medium	This arterial segment is not recommended for study. The Route 107 corridor in Lynn and Salem was studied in 2016 and many of the recommendations have advanced into MassDOT projects. Also, there is a FFY 2022 TIP project programmed for the corridor.
Route 1A	Salem	NSTF	4	MassDOT and Salem	Yes	2	0	0	1.59	16 MBTA bus stops MBTA bus Route 455 MBTA commuter rail at Salem Ferry service	Yes	Yes	MassDOT Project #605146, Reconstruction of Canal Street from Washington Street and Mill Street to Loring Avenue (Route 1A) and Jefferson Street; completed in 2018. MassDOT Project #601017, Reconstruction of Route 1A (Bridge Street) from the Beverly/Salem Bridge to Washington Street (6,000 feet); completed in 2013.	3	1	2	4	1	1	12	Medium	This arterial segment was not selected because the southern end of this arterial segment is included in the study of Route 1A at Vinnin Square in Marblehead and in Swampscott; this location was selected as the subject of the FFY 2016 Priority Corridors Study. The intersection of Route 1A and Jefferson Street and Canal Street was reconstructed in 2018.
Route 16	Sherborn	SWAP	3	Sherborn	Yes	3	0	2	3.20	None	N/A	Yes	None	2	2	1	4	1	2	12	Medium	This location was suggested during 2014 LRTP outreach at a 495/MetroWest Partnership meeting. The section that experiences the most crashes and congestion is in the town center, where Route 16 and Route 27 combine and split.
Route 20	Waltham	ICC	6	MassDOT and Waltham	Yes	3	0	4	2.45	MBTA bus Routes 70, 170, and 505 travel on or across the segment.	Yes	Yes	City of Waltham Transportation Master Plan, January 2017.	3	2	2	4	0	1	12	Medium	This location is not recommended for study because this location had been studied and improvements proposed in the Waltham Transportation Master Plan.
Route 60	Medford	ICC	4	Medford	No	3	0	0	3.00	MBTA bus Routes 95, 101, 134, 326, and 710 MBTA commuter rail at West Medford and Porter Square	Yes	Yes	None	3	2	3	2	0	1	11	Low	None
Route 138	Milton	ICC and TRIC	6	MassDOT	Yes	2	0	2	2.41	MBTA bus Routes 245 and 716 MBTA commuter rail at Route 128 Station MBTA Red Line rapid transit at Mattapan Station	Yes	Yes	MassDOT Project #608484, Roadway Improvements on Route 138, is planned to be funded through the Boston Region Metropolitan Planning Organization's FFY 2020 Transportation Improvement Program; the project will also incorporate work planned originally for Project #607763 (described below); programmed FFY 2020. FFY 2018 LRTP Priority Corridor Study	2	2	2	4	0	1	11	Low	FFY 2018 Priority Corridors for LRTP Needs Assessment Study. MassDOT Project #608484, Roadway Improvements on Route 138, programmed for FFY 2020, will address problems and needs in the corridor.
Route 9	Newton	ICC	6	MassDOT	Yes	2	0	3	4.98	MWRTA Route 1 MBTA bus Routes 60, 51, 52, and 59 travel on or across the segment MBTA Green Line	Yes	Yes	MassDOT Project #608821, Resurfacing and related work on Route 9; in preliminary design. 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 #606635, Reconstruction of Highland Avenue, Needham Street, and Charles River Bridge, from Webster Street to Route 9; programmed FFY 2019.	2	2	2	4	0	1	11	Low	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 129	Reading	NSPC	4	MassDOT and Reading	Yes	3	0	0	1.82	MBTA bus Route 136 MBTA commuter rail at Wakefield, Reading, and Woburn	Yes	Yes	No projects	3	1	2	2	2	1	11	Low	None

Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Number of Top-200 High-Crash Locations 2015-17	Number of HSIP-Eligible Crash Clusters 2015-17**	Travel Time Index	Transit Service	Crowded or Late Bus	In or Near Transportation Equity Priority Area	Study, Project, or TIP Project	Safety Conditions***	Congested Conditions***	Multimodal Significance***	Regional Significance***	Regional Equity***	Implementation Potential***	Score	Priority Rating	Summary of Comments
Route 1	Walpole	TRIC	5	MassDOT	Yes	3	0	1	1.53	MBTA commuter rail at Sharon and Walpole	N/A	Yes	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; programmed FFY 2020. MassDOT Project #608599, Stormwater Improvements to treat discharges from Route 1, I-95, and Route 1A to the Neponset River and an Unnamed Tributary; programmed FFY 2022.	2	1	3	4	0	1	11	Low	The location has MassDOT projects and studies and was not recommended for study by MassDOT Highway District 5.
Route 9	Wellesley	MWRC	6	MassDOT	Yes	2	0	3	1.77	MBTA commuter rail at Wellesley Hills and Wellesley Farms MWRTA bus Route 1	No data	Yes	MassDOT Project #608180, Resurfacing on Route 9, from limit of add-a-lane to east of Overbrook intersection; in construction. MassDOT Project #606530, Drainage improvements along Route 9 Boulder Brook Culvert (design only); in design. MassDOT Project #607340, Resurfacing and related work on Route 9 from Dearborn Street to Natick town line; in preliminary design. MassDOT Project #609402, Resurfacing and related work on Route 9; in preliminary design. MassDOT Project #94762, Bridge Rehabilitation, Route 16 (Washington Street) over Route 9, including relocation of retaining wall; completed summer 2010. MAPC Land Use/Corridor Study (fall 2013).	2	1	2	4	1	1	11	Low	MassDOT has completed a preliminary assessment of this corridor that will develop into 25 percent design plans for roadway improvements.
Route 1	Westwood	TRIC	6	MassDOT	Yes	3	0	0	3.49	MBTA commuter rail at Islington	N/A	Yes	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.	2	2	2	4	0	1	11	Low	This segment is the subject of MassDOT projects and studies.
Route 117	Bolton	MAGIC	3	Bolton			0	1	1.70	None	N/A	Yes	None	2	1	2	3	1	1	10	Low	None
Route 62	Concord	MAGIC	4	Concord	Yes	3	0	1	2.65	MBTA commuter rail at Concord and West Concord	N/A	Yes	MassDOT Project #604646, Reconstruction of Main Street (Route 62) from Water Street to the Acton town line; completed 2010.	2	2	2	2	1	1	10	Low	None
Route 135	Natick	MWRC	3	MassDOT and Natick	Yes	3	0	2	1.97	MWRTA bus Routes 10 and 11 MBTA commuter rail at Natick and West Natick	No data	Yes	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 were suspended (as of June 30, 2007). 2010 CTPS study, West Central Street (Route 135) at Speen Street.	3	1	2	2	1	1	10	Low	There is congestion in the downtown area. The 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.

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.

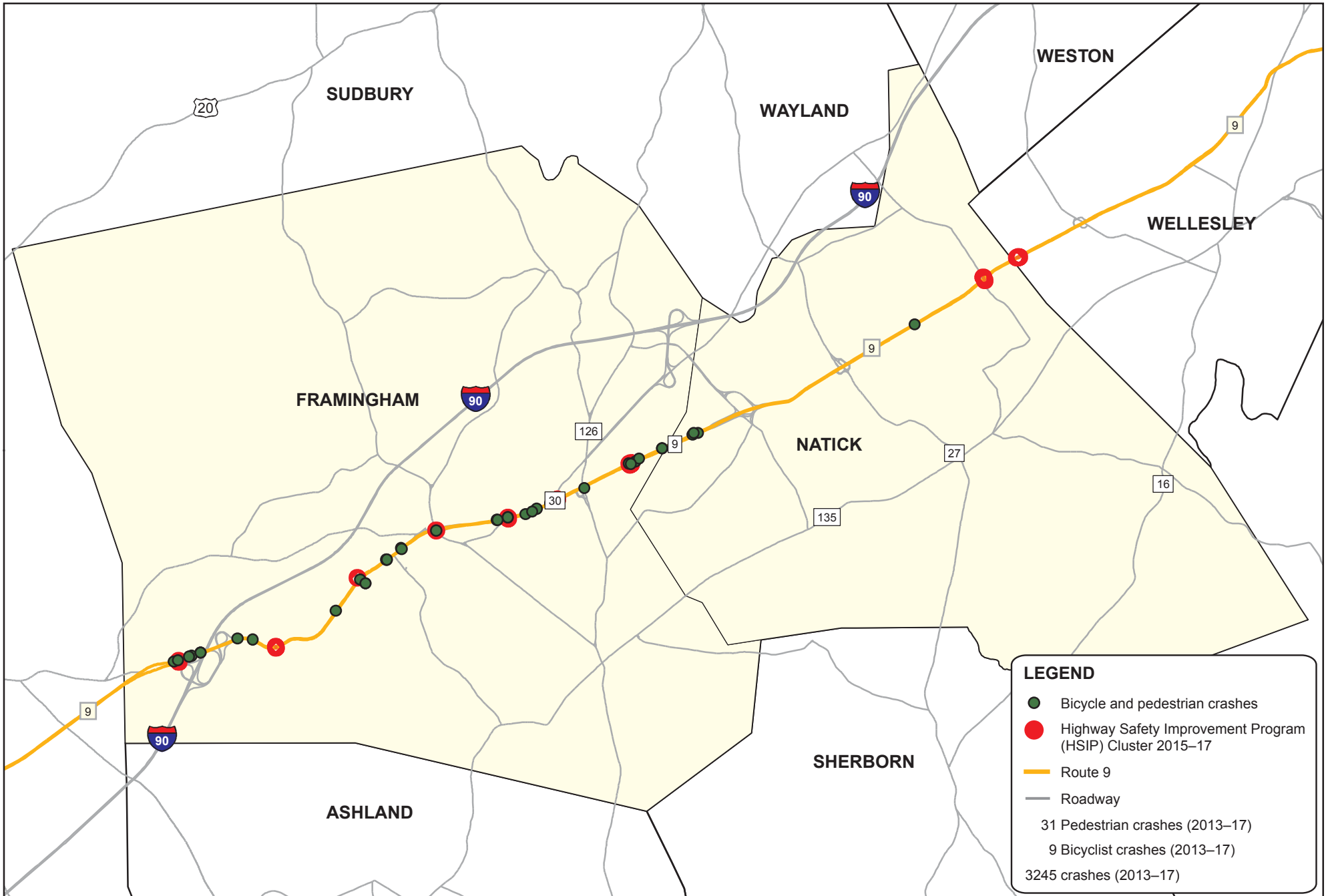
Regional Equity: Location is in a subregion that has not had a priority corridor study before, or location is in a subregion that has not had a priority corridor study in the last three years.

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. FFY = federal fiscal year. 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.

Source: Central Transportation Planning Staff.



LEGEND

- Bicycle and pedestrian crashes
- Highway Safety Improvement Program (HSIP) Cluster 2015-17
- Route 9
- Roadway

31 Pedestrian crashes (2013-17)
 9 Bicyclist crashes (2013-17)
 3245 crashes (2013-17)



FIGURE 1
Crashes 2013-17

From: [Frawley, Joseph R. \(DOT\)](#)
To: [Chen-Yuan Wang](#)
Cc: [Mark Abbott](#); [Seth Asante](#); [Kinahan, Erin \(DOT\)](#); [Sullivan, Ann E. \(DOT\)](#); [Frost, Arthur A. \(DOT\)](#)
Subject: RE: Suggestions for FFY 2021 MPO Corridor Study Locations
Date: Tuesday, August 4, 2020 8:21:00 PM
Attachments: [image001.png](#)
[image002.png](#)

Hi Chen-Yuan,

I hope all is well with you also during this time. A corridor that the District would recommend studying further is Route 9 in the City of Framingham and Town of Natick. The District has fielding inquiries about improving the safety of pedestrian and bicycles along the corridor with lower-cost fixes such as pavement marking modifications (for bikes), pedestrian signal equipment and phasing / timing changes. There are also several locations along the corridor that are high crash locations and usually on MassDOT's Top 200 Intersection Crash Cluster list, so it would help us if the study could include safety-based recommendations, particularly at the high crash locations. In addition, the District was recently asked to look closer at potential short to mid-term improvements at the Route 9 / Route 126 interchange in Framingham.

If CTPS decides to include this on the potential locations to study list, we would be happy to provide more background about efforts that are already underway and which locations along the corridor might need more focus.

Thanks,
Joe



From: Chen-Yuan Wang <cwang@ctps.org>
Sent: Monday, July 13, 2020 9:31 AM
To: 'Frawley, Joseph (DOT)' <joseph.frawley@state.ma.us>
Cc: 'Mark Abbott' <mabbott@ctps.org>; 'Seth Asante' <sasante@ctps.org>;
'erin.kinahan@state.ma.us' <erin.kinahan@state.ma.us>
Subject: Suggestions for FFY 2021 MPO Corridor Study Locations

Hi Joe,

Hope everything goes well during this usual period. We are now collecting potential locations for both of the MPO FFY 2021 Priority Corridor and Subregional Roadway studies (FFY21 MPO programs attached). As in the past years, we appreciate your suggestion of any locations that the District is interested in exploring potential improvements. If convenient, please get back to us in a couple of weeks. Meanwhile, we will discuss with you once we compile a short list of the potential locations.

Best regards. Chen-Yuan

Chen-Yuan Wang | Chief Transportation Planner
CENTRAL TRANSPORTATION PLANNING STAFF
857.702.3698 | cwang@ctps.org
www.ctps.org/bostonmpo



Please be advised that the Massachusetts Secretary of State considers e-mail to be a public record, and therefore subject to the Massachusetts Public Records Law, M.G.L. c. 66 § 10.

Part 3: Public Participation

Route 9 Priority Corridor Study in Framingham and Natick

Virtual Meeting

January 18, 2022

Name	Affiliation	Email
Ann Sullivan	MassDOT District 3	
Lori Shattuck	MassDOT District 3	
Alolade Campbell	MassDOT District 3	
Shane Leary	MassDOT District 3	
Joseph Frawley	MassDOT District 3	
Makaela Niles	MassDOT Planning	
Erica Jerram	City of Framingham	
Simon Alexandrovich	City of Framingham	
William Sedewitz	City of Framingham	
Adam Kiel	City of Framingham	
Matthew Hayes	City of Framingham	
Shane O'Brien	City of Framingham	
Amanda Loomis	Town of Natick	
Jeremy Marsette	Town of Natick	
Emily V	MetroWest Regional Transit Authority	
Jonathan Kapust	HNTB	
Alexandra Siu	HNTB	
Jason Chin	HNTB	
Mark Abbott	CTPS/Boston Region MPO	
Seth Asante	CTPS/Boston Region MPO	

Route 9 Priority Corridor Study

MEETING SUMMARY

January 18, 2022

Introduction

The meeting was held virtually and began with introductions. Mark Abbott, MPO staff, introduced the study. Mr. Abbott said that the MPO have been conducting these corridor studies to address goal areas such as safety, capacity management and mobility, system preservation, and economic vitality. Mr. Abbott added that the municipalities and MassDOT like these studies because they provide them with what would be required to address deficiencies in the corridors before committing to design and engineering.

Data Collection

Seth Asante, MPO staff, presented summaries of data collected for the Route 9 Priority Corridor study, which included volumes of vehicles and people walking and biking, spot speed data, speed regulations, crashes, and planned projects.

Existing Conditions

Mr. Asante presented the existing conditions, including the problems and corridor needs. Mr. Asante said that there were seven intersections in corridor classified as Highway Safety Improvement Program crash clusters. In addition, he mentioned lack of accommodation for people biking, poor sidewalk conditions, gaps in the sidewalk network, and lack of safe crossing opportunities for people walking and biking. Additional problems in the corridor include insufficient wayfinding signs, street lighting, and advance notifications, pavement surface friction and marking issues, traffic signal equipment and timing issues, and traffic congestion and queueing.

Improvements and Concepts

Mr. Asante presented the improvements and concepts for the corridor. Participants and stakeholders provided feedback after the presentation. The presentation was sent to participants, who were given two weeks to provide any further comments. The proposed improvements included:

- improving curb ramps at intersections and driveways to MassDOT/Americans with Disabilities Act standards
- constructing of new sidewalk-level separated bike lanes to increase safety and security for people biking.
- moving pedestrian signal phases to occur before Route 9 through traffic
- adding median refuge areas in the long crosswalks across Route 9
- installing new crosswalks across Route 9 to facilitate safe crossing opportunities
- adding pedestrian signal heads and pushbuttons on the side streets to improve safety for people walking.
- improving roadway lighting to reduce crashes under dark conditions
- retiming traffic signals to increase safety and traffic operations
- improving advance warning devices, wayfinding signs, and notification signs to reduce crashes
- upgrading emergency vehicle preemption systems

- supplementing intersection pavement markings with appropriate advance intersection lane control signs to reduce crashes.
- introducing measures to calm traffic and reduce speeding, such as uniform speed regulations and enforcement
- installing backplates with yellow retroreflective borders to increase signal visibility,
- installing overhead signals with mast-arm mounts or aligning signal heads better with their respective lanes.
- lengthening acceleration/deceleration lanes for traffic entering/exiting Route 9 at the interchange
- installing delineation to reduce crashes during dark conditions and on horizontal curves.

Follow-Up Task

Route 9 and Cochituate Road: Use the shoulder to create an auxiliary lane for traffic entering Route 9 from Cochituate Road.

Route 9 at Temple Street: Intersection needs to be reconstructed to improve safety, simplify traffic movements, and improve walking and biking accommodations

Route 9 at Edgell Road and Main Street: Consider the building the Framingham Deck Park to enhance the bond between the historical, commercial, recreational, and institutional land use of the area (*source: UMass LARP Green Infrastructure for Framingham, Massachusetts: Greenway Planning and Cultural Landscape Design*)

Walking and Biking Accommodations: Provide street-level or sidewalk-level separated bike accommodations

Safe Crossing Opportunities: Consider add new safe crossing opportunities (at-grade crossings and bridges) to improve connectivity between neighborhoods and business located north and south of Route 9

**Appendix B:
Pedestrian and Bicycle Levels of Service**



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION



Central Transportation Planning Staff (CTPS) to the Boston Region MPO:
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Pedestrian Report Card Assessment (PRCA): Roadway Segment

Roadway Segment Location

Route 9 in Framingham without improvements

Grading Categories ^[1]	Score	Rating
Safety	1.1	Poor
System Preservation	2.0	Fair
Capacity Management and Mobility	2.1	Fair
Economic Vitality	2.0	Fair

Transportation Equity^[2]

High Priority Area	Yes
Moderate Priority Area	
Low Priority Area	

[1] Poor = 0 to 1.7; Fair = 1.7 < 2.3; Good = 2.3 to 3.0

[2] Low = 0 or 1 Factor; Moderate = 2 or 3 Factors; High = 4 or 5 Factors

Grading Categories: Scoring Breakdown Roadway Segment

Capacity Management and Mobility			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Sidewalk Presence	50%	2.5	Good
Crosswalk Presence	33%	1.0	Poor
Walkway Width	17%	3.0	Good
GRADING CATEGORY TOTAL^[2] (Sidewalk Presence Score * 0.5) + (Crosswalk Presence Score * 0.33) + (Walkway Width Score * 0.17)	100%	2.1	Fair

Economic Vitality			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Pedestrian Volumes	50%	2.0	Fair
Adjacent Bicycle Accommodations	50%	2.0	Fair
GRADING CATEGORY TOTAL^[2] (Pedestrian Volumes Score * 0.5) + (Adjacent Bicycle Accommodations Score * 0.5)	100%	2.0	Fair

Safety			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Pedestrian Crashes	60%	1.0	Poor
Pedestrian-Vehicle Buffer	20%	1.5	Poor
Vehicle Travel Speed	20%	1.0	Poor
GRADING CATEGORY TOTAL^[2] (Pedestrian Crashes Score * 0.6) + (Pedestrian-Vehicle Buffer Score * 0.2) + (Vehicle Travel Speed Score * 0.2)	100%	1.1	Poor

System Preservation			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Sidewalk Condition	100%	2.0	Fair

Transportation Equity Factors ^[3]	
Area Condition	Yes/No
Low-Income Population ≥ 32.32%	No
Minority Population ≥ 28.19%	Yes
More than 6.69% of Population > 75 Years of Age	Yes
More than 16.15% of Households w/o Vehicle	Yes
Within ¼ Mile of School/College	Yes

[1] Poor = 1.0; Fair = 2.0; Good = 3.0

[2] Poor = 0 to 1.7; Fair = 1.7 < 2.3; Good = 2.3 to 3.0

[3] Use these factors to determine Transportation Equity priority level (front)



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Pedestrian Report Card Assessment (PRCA): Roadway Segment

Roadway Segment Location

Route 9 in Natick without improvements

Grading Categories ^[1]	Score	Rating
Safety	1.1	Poor
System Preservation	2.0	Fair
Capacity Management and Mobility	2.1	Fair
Economic Vitality	2.0	Fair

Transportation Equity^[2]

High Priority Area	Yes
Moderate Priority Area	
Low Priority Area	

[1] Poor = 0 to 1.7; Fair = 1.7 < 2.3; Good = 2.3 to 3.0

[2] Low = 0 or 1 Factor; Moderate = 2 or 3 Factors; High = 4 or 5 Factors

Grading Categories: Scoring Breakdown Roadway Segment

Capacity Management and Mobility			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Sidewalk Presence	50%	2.5	Fair
Crosswalk Presence	33%	1.0	Poor
Walkway Width	17%	3.0	Good
GRADING CATEGORY TOTAL^[2] <small>(Sidewalk Presence Score * 0.5) + (Crosswalk Presence Score * 0.33) + (Walkway Width Score * 0.17)</small>	100%	2.1	Good

Economic Vitality			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Pedestrian Volumes	50%	2.0	Fair
Adjacent Bicycle Accommodations	50%	2.0	Fair
GRADING CATEGORY TOTAL^[2] <small>(Pedestrian Volumes Score * 0.5) + (Adjacent Bicycle Accommodations Score * 0.5)</small>	100%	2.0	Fair

Safety			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Pedestrian Crashes	60%	1.0	Good
Pedestrian-Vehicle Buffer	20%	1.5	Fair
Vehicle Travel Speed	20%	1.0	Poor
GRADING CATEGORY TOTAL^[2] <small>(Pedestrian Crashes Score * 0.6) + (Pedestrian-Vehicle Buffer Score * 0.2) + (Vehicle Travel Speed Score * 0.2)</small>	100%	1.1	Good

System Preservation			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Sidewalk Condition	100%	2.0	Good

Transportation Equity Factors ^[3]	
Area Condition	Yes/No
Low-Income Population ≥ 32.32%	No
Minority Population ≥ 28.19%	Yes
More than 6.69% of Population > 75 Years of Age	Yes
More than 16.15% of Households w/o Vehicle	Yes
Within ¼ Mile of School/College	Yes

[1] Poor = 1.0; Fair = 2.0; Good = 3.0

[2] Poor = 0 to 1.7; Fair = 1.7 < 2.3; Good = 2.3 to 3.0

[3] Use these factors to determine Transportation Equity priority level (front)



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION



Bicycle Report Card

Roadway Segment Location

Route 9 in Framingham without Improvements

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	Yes
Moderate Priority Area	
Low Priority Area	

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

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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
Total	100%	50	F

Economic Vitality			
Performance Measure	Percentage	Points	Grade
Bike Rack Presence	50%	0	F
Land Use	50%	100	A
Total	100%	50	F

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	F
Bicyclist Operating Space	17%	0	F
Number of Travel Lanes	17%	50	F
Total	100%	8.5	F

System Preservation			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Continuity	50%	0	F
Bicycle Facility Condition	50%	0	F
Total	100%	0	A

Transportation Equity Priority	
Area Condition	Yes/No
Low Income Population => 32.32%	No
Minority Population => 28.19%	Yes
18.2%+ of Population < 16 Years Old	Yes
16.15%+ of Households w/o Vehicle	Yes
Within ¼ Mile of School/College	Yes



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Bicycle Report Card

Roadway Segment Location

Route 9 in Natick without Improvements

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	Yes
Moderate Priority Area	
Low Priority Area	

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
Total	100%	50	F

Economic Vitality			
Performance Measure	Percentage	Points	Grade
Bike Rack Presence	50%	0	F
Land Use	50%	100	A
Total	100%	50	F

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	F
Bicyclist Operating Space	17%	0	F
Number of Travel Lanes	17%	50	F
Total	100%	8.5	F

System Preservation			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Continuity	50%	0	F
Bicycle Facility Condition	50%	0	F
Total	100%	0	A

Transportation Equity Priority	
Area Condition	Yes/No
Low Income Population => 32.32%	No
Minority Population => 28.19%	Yes
18.2%+ of Population < 16 Years Old	Yes
16.15%+ of Households w/o Vehicle	Yes
Within ¼ Mile of School/College	Yes



Pedestrian Report Card Assessment (PRCA): Roadway Segment



Roadway Segment Location

Route 9 in Framingham with improvements

Grading Categories ^[1]	Score	Rating
Safety	2.4	Good
System Preservation	3.0	Good
Capacity Management and Mobility	2.3	Good
Economic Vitality	2.0	Fair

Transportation Equity ^[2]	
High Priority Area	Yes
Moderate Priority Area	
Low Priority Area	

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 [2] **Low** = 0 or 1 Factor; **Moderate** = 2 or 3 Factors; **High** = 4 or 5 Factors

Grading Categories: Scoring Breakdown Roadway Segment

Capacity Management and Mobility			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Sidewalk Presence	50%	3	Good
Crosswalk Presence	33%	1	Poor
Walkway Width	17%	3	Good
GRADING CATEGORY TOTAL^[2] <small>(Sidewalk Presence Score * 0.5) + (Crosswalk Presence Score * 0.33) + (Walkway Width Score * 0.17)</small>	100%	2.3	Good

Economic Vitality			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Pedestrian Volumes	50%	2	Fair
Adjacent Bicycle Accommodations	50%	2	Fair
GRADING CATEGORY TOTAL^[2] <small>(Pedestrian Volumes Score * 0.5) + (Adjacent Bicycle Accommodations Score * 0.5)</small>	100%	2.0	Fair

Safety			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Pedestrian Crashes	60%	3	Good
Pedestrian-Vehicle Buffer	20%	2	Fair
Vehicle Travel Speed	20%	1	Poor
GRADING CATEGORY TOTAL^[2] <small>(Pedestrian Crashes Score * 0.6) + (Pedestrian-Vehicle Buffer Score * 0.2) + (Vehicle Travel Speed Score * 0.2)</small>	100%	2.4	Good

System Preservation			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Sidewalk Condition	100%	3.0	Good

Transportation Equity Factors ^[3]	
Area Condition	Yes/No
Low-Income Population ≥ 32.32%	No
Minority Population ≥ 28.19%	Yes
More than 6.69% of Population > 75 Years of Age	Yes
More than 16.15% of Households w/o Vehicle	Yes
Within ¼ Mile of School/College	Yes

[1] Poor = 1.0; Fair = 2.0; Good = 3.0

[2] Poor = 0 to 1.7; Fair = 1.7 < 2.3; Good = 2.3 to 3.0

[3] Use these factors to determine Transportation Equity priority level (front)



Pedestrian Report Card Assessment (PRCA): Roadway Segment



Roadway Segment Location

Route 9 in Natick with improvements

Grading Categories ^[1]	Score	Rating
Safety	2.4	Good
System Preservation	3.0	Good
Capacity Management and Mobility	2.3	Good
Economic Vitality	2.0	Fair

Transportation Equity ^[2]	
High Priority Area	Yes
Moderate Priority Area	
Low Priority Area	

Central Transportation Planning Staff (CTPS) to the Boston Region MPO:
www.ctps.org | 857.702.3700 | ctps@ctps.org

Ryan Hicks, Congestion Management Process Manager:
www.ctps.org/cmp | 857.702.3661 | rhicks@ctps.org

Casey Claude, Bicycle and Pedestrian Program Manager:
www.ctps.org/bicycle-pedestrian-activities | 857.702.3707 | cclaude@ctps.org

[1] Poor = 0 to 1.7; Fair = 1.7 < 2.3; Good = 2.3 to 3.0

[2] Low = 0 or 1 Factor; Moderate = 2 or 3 Factors; High = 4 or 5 Factors

Grading Categories: Scoring Breakdown Roadway Segment

Capacity Management and Mobility			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Sidewalk Presence	50%	3	Good
Crosswalk Presence	33%	1	Poor
Walkway Width	17%	3	Good
GRADING CATEGORY TOTAL^[2] <small>(Sidewalk Presence Score * 0.5) + (Crosswalk Presence Score * 0.33) + (Walkway Width Score * 0.17)</small>	100%	2.3	Good

Economic Vitality			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Pedestrian Volumes	50%	2	Fair
Adjacent Bicycle Accommodations	50%	2	Fair
GRADING CATEGORY TOTAL^[2] <small>(Pedestrian Volumes Score * 0.5) + (Adjacent Bicycle Accommodations Score * 0.5)</small>	100%	2.0	Fair

Safety			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Pedestrian Crashes	60%	3	Good
Pedestrian-Vehicle Buffer	20%	2	Fair
Vehicle Travel Speed	20%	1	Poor
GRADING CATEGORY TOTAL^[2] <small>(Pedestrian Crashes Score * 0.6) + (Pedestrian-Vehicle Buffer Score * 0.2) + (Vehicle Travel Speed Score * 0.2)</small>	100%	2.4	Good

System Preservation			
Performance Measure ^[1]	Percentage	Score (out of 3.0)	Rating
Sidewalk Condition	100%	3.0	Good

Transportation Equity Factors ^[3]	
Area Condition	Yes/No
Low-Income Population ≥ 32.32%	No
Minority Population ≥ 28.19%	Yes
More than 6.69% of Population > 75 Years of Age	Yes
More than 16.15% of Households w/o Vehicle	Yes
Within ¼ Mile of School/College	Yes

[1] Poor = 1.0; Fair = 2.0; Good = 3.0

[2] Poor = 0 to 1.7; Fair = 1.7 < 2.3; Good = 2.3 to 3.0

[3] Use these factors to determine Transportation Equity priority level (front)



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION



Central Transportation Planning Staff (CTPS) to the Boston Region MPO:
www.ctps.org | 857.702.3700 | ctps@ctps.org

Casey Claude, Bicycle and Pedestrian Program Manager:
www.ctps.org/bicycle-pedestrian-activities | 857.702.3707 | cclaude@ctps.org

Bicycle Report Card

Roadway Segment Location

Route 9 in Framingham with Improvements

Grading Categories	Score	Grade
Safety	79	C
System Preservation	100	A
Capacity Management and Mobility	92	A
Economic Vitality	75	C

Transportation Equity

High Priority Area	Yes
Moderate Priority Area	
Low Priority Area	

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%	90	A
Proximity to Bike Network	33%	90	A
Proximity to Transit	17%	100	A
Total	100%	92	A

Economic Vitality			
Performance Measure	Percentage	Points	Grade
Bike Rack Presence	50%	50	F
Land Use	50%	100	A
Total	100%	75	C

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%	90	A
Absence of Bicycle Crashes	33%	60	D
Bicyclist Operating Space	17%	100	A
Number of Travel Lanes	17%	75	C
Total	100%	79	C

System Preservation			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Continuity	50%	75	A
Bicycle Facility Condition	50%	75	A
Total	100%	75	A

Transportation Equity Priority	
Area Condition	Yes/No
Low Income Population => 32.32%	No
Minority Population => 28.19%	Yes
18.2%+ of Population < 16 Years Old	Yes
16.15%+ of Households w/o Vehicle	Yes
Within ¼ Mile of School/College	Yes



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION



Bicycle Report Card

Roadway Segment Location

Route 9 in Natick with Improvements

Grading Categories	Score	Grade
Safety	79	C
System Preservation	100	A
Capacity Management and Mobility	92	A
Economic Vitality	75	C

Transportation Equity

High Priority Area	Yes
Moderate Priority Area	
Low Priority Area	

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

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Casey Claude, Bicycle and Pedestrian Program Manager:
www.ctps.org/bicycle-pedestrian-activities | 857.702.3707 | cclaude@ctps.org

Grading Categories: Scoring Breakdown

Capacity Management and Mobility			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Presence	50%	90	A
Proximity to Bike Network	33%	90	A
Proximity to Transit	17%	100	A
Total	100%	92	A

Economic Vitality			
Performance Measure	Percentage	Points	Grade
Bike Rack Presence	50%	50	F
Land Use	50%	100	A
Total	100%	75	C

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%	90	A
Absence of Bicycle Crashes	33%	60	D
Bicyclist Operating Space	17%	100	A
Number of Travel Lanes	17%	75	C
Total	100%	79	C

System Preservation			
Performance Measure	Percentage	Points	Grade
Bicycle Facility Continuity	50%	75	A
Bicycle Facility Condition	50%	75	A
Total	100%	75	A

Transportation Equity Priority	
Area Condition	Yes/No
Low Income Population => 32.32%	No
Minority Population => 28.19%	Yes
18.2%+ of Population < 16 Years Old	Yes
16.15%+ of Households w/o Vehicle	Yes
Within ¼ Mile of School/College	Yes

Appendix C:

Traffic and Signal Timing Data

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

Part 1: Automatic Traffic Recorder (ATR) Data

Mass Highway Department

WEEKLY SUMMARY FOR LANE 1
Starting: 5/3/2021

Page: 1

Station #: 210050000027
Site ID: 00000000103
Location: Rte.9 EB,Btwn.County Club Ln.& Temple St
Direction: EAST

STA. 1 EB

File: D0503001.prn
City: Framingham
County:

TIME	MON 3	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		82	99	102	113	99			99	396
02:00		85	68	66	65	71			71	284
03:00		40	44	38	51	43			43	173
04:00		55	51	75	57	60			60	238
05:00		154	137	139	175	151			151	605
06:00		546	511	587	567	553			553	2211
07:00		1395	1335	1466	1351	1387			1387	5547
08:00		1583	1610	1704	1742	1660			1660	6639
09:00		1628	1471	1569	1543	1553			1553	6211
10:00		1380	1295	1351		1342			1342	4026
11:00	1227	1256	1135	1220		1210			1210	4838
12:00	1209	1155	1228	1268		1215			1215	4860
13:00	1198	1218	1248	1227		1223			1223	4891
14:00	1235	1228	1217	1268		1237			1237	4948
15:00	1235	1262	1345	1336		1294			1294	5178
16:00	1347	1331	1337	1340		1339			1339	5355
17:00	1356	1349	1326	1364		1349			1349	5395
18:00	1271	1339	1334	1392		1334			1334	5336
19:00	1073	1071	1002	1203		1087			1087	4349
20:00	790	809	792	872		816			816	3263
21:00	537	585	536	700		590			590	2358
22:00	449	449	447	511		464			464	1856
23:00	332	345	342	394		353			353	1413
24:00	187	211	206	239		211			211	843
TOTALS	13446	20556	20116	21431	5664	20641			20641	81213
% AVG WKDY	65.1	99.6	97.5	103.8	27.4					
% AVG WEEK	65.1	99.6	97.5	103.8	27.4					
AM Times	11:00	09:00	08:00	08:00	08:00	08:00			08:00	
AM Peaks	1227	1628	1610	1704	1742	1660			1660	
PM Times	17:00	17:00	15:00	18:00		17:00			17:00	
PM Peaks	1356	1349	1345	1392		1349			1349	

U3

EB 20641
WB 19831

COMB AWD 40472
FAC .93(.98)
COMB ADT 36,900

Mass Highway Department

WEEKLY SUMMARY FOR LANE 1
Starting: 5/3/2021

Page: 1

Station #: 210050000061

Site ID: 00000000104

Location: Rte.9 WB,Btwn.County Club Ln.& Temple St

Direction: WEST

STA. 1 WB

File: D0503002.prn

City: Framingham

County:

TIME	MON 3	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		116	127	137	147	132			132	527
02:00		60	64	63	77	66			66	264
03:00		44	50	40	43	44			44	177
04:00		42	37	52	57	47			47	188
05:00		80	87	102	106	94			94	375
06:00		258	241	268		256			256	767
07:00		676	658	718		684			684	2052
08:00		1071	1015	1110		1065			1065	3196
09:00		1076	1079	1048		1068			1068	3203
10:00		930	945	1029		968			968	2904
11:00	972	1042	945	933		973			973	3892
12:00	983	1070	1012	1091		1039			1039	4156
13:00	1194	1198	1104	1227		1181			1181	4723
14:00	1239	1245	1258	1281		1256			1256	5023
15:00	1446	1432	1410	1535		1456			1456	5823
16:00	1578	1558	1574	1587		1574			1574	6297
17:00	1636	1696	1585	1628		1636			1636	6545
18:00	1557	1547	1549	1605		1564			1564	6258
19:00	1310	1423	1287	1459		1370			1370	5479
20:00	1119	1128	1050	1271		1142			1142	4568
21:00	855	826	800	1005		872			872	3486
22:00	516	663	640	671		622			622	2490
23:00	390	417	406	481		424			424	1694
24:00	257	308	315	310		298			298	1190
TOTALS	15052	19906	19238	20651	430	19831			19831	75277
% AVG WKDY	75.9	100.4	97.0	104.1	2.2					
% AVG WEEK	75.9	100.4	97.0	104.1	2.2					
AM Times	12:00	09:00	09:00	08:00	01:00	09:00			09:00	
AM Peaks	983	1076	1079	1110	147	1068			1068	
PM Times	17:00	17:00	17:00	17:00		17:00			17:00	
PM Peaks	1636	1696	1585	1628		1636			1636	

Mass Highway Department

WEEKLY SUMMARY FOR LANE 1
Starting: 5/3/2021

Page: 1

Station #: 210050000041
Site ID: 000000000203
Location: Rte.9 EB, Btwn. Speen St. & Rte.27
Direction: EAST

STA.2EB

File: D0503003.prn
City: Natick
County:

TIME	MON 3	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		57	63	80	98	74			74	298
02:00		46	54	51	44	49			49	195
03:00		29	31	42	43	36			36	145
04:00		51	42	43	47	46			46	183
05:00		142	135	154	158	147			147	589
06:00		572	554	611	561	574			574	2298
07:00		1501	1459	1625	1513	1524			1524	6098
08:00		1919	1976	2027	2075	1999			1999	7997
09:00		1924	1918	1957		1933			1933	5799
10:00	1282	1633	1509	1644		1517			1517	6068
11:00	1515	1477	1522	1521		1509			1509	6035
12:00	1527	1573	1650	1662		1603			1603	6412
13:00	1760	1703	1667	1729		1715			1715	6859
14:00	1699	1695	1758	1757		1727			1727	6909
15:00	1780	1709	1757	1829		1769			1769	7075
16:00	1707	1678	1750	1735		1718			1718	6870
17:00	1805	1794	1807	1879		1821			1821	7285
18:00	1694	1772	1764	1825		1764			1764	7055
19:00	1486	1370	1391	1524		1443			1443	5771
20:00	1095	989	1119	1322		1131			1131	4525
21:00	701	688	760	889		760			760	3038
22:00	476	437	470	575		490			490	1958
23:00	295	288	310	381		318			318	1274
24:00	121	150	165	170		152			152	606
TOTALS	18943	25197	25631	27032	4539	25819			25819	101342
% AVG WKDY	73.4	97.6	99.3	104.7	17.6					
% AVG WEEK	73.4	97.6	99.3	104.7	17.6					
AM Times	12:00	09:00	08:00	08:00	08:00	08:00			08:00	
AM Peaks	1527	1924	1976	2027	2075	1999			1999	
PM Times	17:00	17:00	17:00	17:00		17:00			17:00	
PM Peaks	1805	1794	1807	1879		1821			1821	

u3

EB 25819

WB 25248

Comb AWD 51067

FAC 193(.98)

Comb ADT 46,500

Mass Highway Department

WEEKLY SUMMARY FOR LANE 1
Starting: 5/3/2021

Page: 1

Station #: 210050000063
Site ID: 000000000204
Location: Rte.9 WB, Btwn. Speen St. & Rte.27
Direction: WEST

STA. 2 NB

File: D0503004.prn
City: Natick
County:

TIME	MON 3	TUE 4	WED 5	THU 6	FRI 7	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		95	120	128	144	122			122	487
02:00		49	57	67	66	60			60	239
03:00		42	34	48	52	44			44	176
04:00		26	30	53	24	33			33	133
05:00		70	83	70	83	76			76	306
06:00		288	268	295	281	283			283	1132
07:00		596	647	682	657	646			646	2582
08:00		1126	1134	1188	1151	1150			1150	4599
09:00		1375	1377	1394	1403	1387			1387	5549
10:00		1312	1274	1412		1333			1333	3998
11:00	1446	1526	1453	1550		1494			1494	5975
12:00	1608	1619	1624	1721		1643			1643	6572
13:00	1721	1745	1705	1784		1739			1739	6955
14:00	1692	1733	1830	1871		1782			1782	7126
15:00	2018	1904	1959	1960		1960			1960	7841
16:00	2172	2275	2147	2308		2226			2226	8902
17:00	2058	2177	2110	2163		2127			2127	8508
18:00	2144	2093	2113	2221		2143			2143	8571
19:00	1793	1691	1603	1977		1766			1766	7064
20:00	1254	1181	1149	1483		1267			1267	5067
21:00	871	870	795	929		866			866	3465
22:00	493	476	525	598		523			523	2092
23:00	310	308	356	394		342			342	1368
24:00	215	249	235	247		236			236	946
TOTALS	19795	24826	24628	26543	3861	25248			25248	99653
% AVG WKDY	78.4	98.3	97.5	105.1	15.3					
% AVG WEEK	78.4	98.3	97.5	105.1	15.3					
AM Times	12:00	12:00	12:00	12:00	09:00	12:00			12:00	
AM Peaks	1608	1619	1624	1721	1403	1643			1643	
PM Times	16:00	16:00	16:00	16:00		16:00			16:00	
PM Peaks	2172	2275	2147	2308		2226			2226	

Part 2: Turning Movement Count (TMC) Data

217891 (1) Route 9 @ California Avenue TMC - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833233, Location: 42.296951, -71.48348

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

Leg Direction	California Avenue Southbound						Worcester Street (Route 9) Westbound						Parking Lot Northbound						Worcester Street (Route 9) 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*	
2021-05-04 6:00AM	23	8	54	0	85	0	159	830	0	0	989	0	6	1	6	0	13	0	6	1694	127	0	1827	0	2914
7:00AM	46	5	82	0	133	0	166	1337	0	0	1503	1	10	1	6	0	17	1	10	2005	94	5	2114	0	3767
8:00AM	38	5	107	0	150	0	184	1430	0	1	1615	0	5	0	5	0	10	0	7	1729	104	0	1840	0	3615
3:00PM	137	7	182	0	326	0	121	1938	0	0	2059	0	2	1	8	0	11	0	1	1485	31	5	1522	0	3918
4:00PM	123	3	193	0	319	3	110	2086	0	3	2199	1	6	2	5	0	13	0	6	1548	47	7	1608	0	4139
5:00PM	119	4	185	0	308	0	91	1995	0	0	2086	0	2	0	7	0	9	1	3	1605	46	5	1659	1	4062
Total	486	32	803	0	1321	3	831	9616	0	4	10451	2	31	5	37	0	73	2	33	10066	449	22	10570	1	22415
% Approach	36.8%	2.4%	60.8%	0%	-	-	8.0%	92.0%	0%	0%	-	-	42.5%	6.8%	50.7%	0%	-	-	0.3%	95.2%	4.2%	0.2%	-	-	-
% Total	2.2%	0.1%	3.6%	0%	5.9%	-	3.7%	42.9%	0%	0%	46.6%	-	0.1%	0%	0.2%	0%	0.3%	-	0.1%	44.9%	2.0%	0.1%	47.2%	-	-
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%	0%	0%	0%	-	0%
Lights	439	16	764	0	1219	-	791	9351	0	4	10146	-	17	4	30	0	51	-	26	9806	409	22	10263	-	21679
% Lights	90.3%	50.0%	95.1%	0%	92.3%	-	95.2%	97.2%	0%	100%	97.1%	-	54.8%	80.0%	81.1%	0%	69.9%	-	78.8%	97.4%	91.1%	100%	97.1%	-	96.7%
Single-Unit Trucks	21	3	36	0	60	-	27	181	0	0	208	-	5	0	1	0	6	-	5	185	13	0	203	-	477
% Single-Unit Trucks	4.3%	9.4%	4.5%	0%	4.5%	-	3.2%	1.9%	0%	0%	2.0%	-	16.1%	0%	2.7%	0%	8.2%	-	15.2%	1.8%	2.9%	0%	1.9%	-	2.1%
Articulated Trucks	26	0	3	0	29	-	13	49	0	0	62	-	0	1	1	0	2	-	2	56	26	0	84	-	177
% Articulated Trucks	5.3%	0%	0.4%	0%	2.2%	-	1.6%	0.5%	0%	0%	0.6%	-	0%	20.0%	2.7%	0%	2.7%	-	6.1%	0.6%	5.8%	0%	0.8%	-	0.8%
Buses	0	13	0	0	13	-	0	35	0	0	35	-	9	0	5	0	14	-	0	17	1	0	18	-	80
% Buses	0%	40.6%	0%	0%	1.0%	-	0%	0.4%	0%	0%	0.3%	-	29.0%	0%	13.5%	0%	19.2%	-	0%	0.2%	0.2%	0%	0.2%	-	0.4%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% 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	-	-	-	-	-	3	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	1	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-

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

217891 (1) Route 9 @ California Avenue TMC - TMC

Tue May 4, 2021

AM Peak (7:15 AM - 8:15 AM)

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

All Movements

ID: 833233, Location: 42.296951, -71.48348

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

Leg Direction	California Avenue Southbound						Worcester Street (Route 9) Westbound						Parking Lot Northbound						Worcester Street (Route 9) 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*	
2021-05-04 7:15AM	6	2	21	0	29	0	42	325	0	0	367	0	2	0	3	0	5	0	2	509	23	2	536	0	937
7:30AM	6	0	15	0	21	0	33	423	0	0	456	0	3	0	1	0	4	0	2	549	30	0	581	0	1062
7:45AM	15	2	25	0	42	0	41	339	0	0	380	1	2	0	1	0	3	0	2	504	23	3	532	0	957
8:00AM	2	1	24	0	27	0	31	374	0	0	405	0	2	0	1	0	3	0	1	432	18	0	451	0	886
Total	29	5	85	0	119	0	147	1461	0	0	1608	1	9	0	6	0	15	0	7	1994	94	5	2100	0	3842
% Approach	24.4%	4.2%	71.4%	0%	-	-	9.1%	90.9%	0%	0%	-	-	60.0%	0%	40.0%	0%	-	-	0.3%	95.0%	4.5%	0.2%	-	-	-
% Total	0.8%	0.1%	2.2%	0%	3.1%	-	3.8%	38.0%	0%	0%	41.9%	-	0.2%	0%	0.2%	0%	0.4%	-	0.2%	51.9%	2.4%	0.1%	54.7%	-	-
PHF	0.483	0.625	0.850	-	0.708	-	0.875	0.863	-	-	0.882	-	0.750	-	0.500	-	0.750	-	0.875	0.908	0.783	0.417	0.904	-	0.904
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	20	2	74	0	96	-	142	1403	0	0	1545	-	5	0	5	0	10	-	6	1930	86	5	2027	-	3678
% Lights	69.0%	40.0%	87.1%	0%	80.7%	-	96.6%	96.0%	0%	0%	96.1%	-	55.6%	0%	83.3%	0%	66.7%	-	85.7%	96.8%	91.5%	100%	96.5%	-	95.7%
Single-Unit Trucks	1	1	10	0	12	-	3	46	0	0	49	-	2	0	1	0	3	-	0	51	2	0	53	-	117
% Single-Unit Trucks	3.4%	20.0%	11.8%	0%	10.1%	-	2.0%	3.1%	0%	0%	3.0%	-	22.2%	0%	16.7%	0%	20.0%	-	0%	2.6%	2.1%	0%	2.5%	-	3.0%
Articulated Trucks	8	0	1	0	9	-	2	5	0	0	7	-	0	0	0	0	0	-	1	13	6	0	20	-	36
% Articulated Trucks	27.6%	0%	1.2%	0%	7.6%	-	1.4%	0.3%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	14.3%	0.7%	6.4%	0%	1.0%	-	0.9%
Buses	0	2	0	0	2	-	0	7	0	0	7	-	2	0	0	0	2	-	0	0	0	0	0	-	11
% Buses	0%	40.0%	0%	0%	1.7%	-	0%	0.5%	0%	0%	0.4%	-	22.2%	0%	0%	0%	13.3%	-	0%	0%	0%	0%	0%	-	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	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-

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

217891 (1) Route 9 @ California Avenue TMC - TMC

Tue May 4, 2021

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

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

All Movements

ID: 833233, Location: 42.296951, -71.48348

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

Leg Direction	California Avenue Southbound						Worcester Street (Route 9) Westbound						Parking Lot Northbound						Worcester Street (Route 9) 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*	
2021-05-04 4:15PM	36	0	44	0	80	0	31	551	0	0	582	0	2	1	2	0	5	0	3	370	16	0	389	0	1056
4:30PM	30	0	44	0	74	1	25	523	0	0	548	0	2	0	2	0	4	0	3	425	9	4	441	0	1067
4:45PM	18	3	39	0	60	1	31	513	0	0	544	0	2	0	1	0	3	0	0	387	17	2	406	0	1013
5:00PM	42	0	55	0	97	0	23	482	0	0	505	0	0	0	0	0	0	0	1	424	11	0	436	0	1038
Total	126	3	182	0	311	2	110	2069	0	0	2179	0	6	1	5	0	12	0	7	1606	53	6	1672	0	4174
% Approach	40.5%	1.0%	58.5%	0%	-	-	5.0%	95.0%	0%	0%	-	-	50.0%	8.3%	41.7%	0%	-	-	0.4%	96.1%	3.2%	0.4%	-	-	-
% Total	3.0%	0.1%	4.4%	0%	7.5%	-	2.6%	49.6%	0%	0%	52.2%	-	0.1%	0%	0.1%	0%	0.3%	-	0.2%	38.5%	1.3%	0.1%	40.1%	-	-
PHF	0.750	0.250	0.827	-	0.802	-	0.887	0.939	-	-	0.936	-	0.750	0.250	0.625	-	0.600	-	0.583	0.945	0.779	0.375	0.948	-	0.978
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	1
% 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	120	1	180	0	301	-	104	2029	0	0	2133	-	4	1	4	0	9	-	7	1582	49	6	1644	-	4087
% Lights	95.2%	33.3%	98.9%	0%	96.8%	-	94.5%	98.1%	0%	0%	97.9%	-	66.7%	100%	80.0%	0%	75.0%	-	100%	98.5%	92.5%	100%	98.3%	-	97.9%
Single-Unit Trucks	2	0	1	0	3	-	4	25	0	0	29	-	0	0	0	0	0	-	0	14	0	0	14	-	46
% Single-Unit Trucks	1.6%	0%	0.5%	0%	1.0%	-	3.6%	1.2%	0%	0%	1.3%	-	0%	0%	0%	0%	0%	-	0%	0.9%	0%	0%	0.8%	-	1.1%
Articulated Trucks	4	0	1	0	5	-	2	11	0	0	13	-	0	0	0	0	0	-	0	7	4	0	11	-	29
% Articulated Trucks	3.2%	0%	0.5%	0%	1.6%	-	1.8%	0.5%	0%	0%	0.6%	-	0%	0%	0%	0%	0%	-	0%	0.4%	7.5%	0%	0.7%	-	0.7%
Buses	0	2	0	0	2	-	0	4	0	0	4	-	2	0	1	0	3	-	0	2	0	0	2	-	11
% Buses	0%	66.7%	0%	0%	0.6%	-	0%	0.2%	0%	0%	0.2%	-	33.3%	0%	20.0%	0%	25.0%	-	0%	0.1%	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	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

217891 (2) Route 9 @ Country Club Lane TMC - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833236, Location: 42.293977, -71.46724

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Worcester Road (Route 9) Westbound					Country Club Lane Northbound					Worcester Road (Route 9) Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2021-05-04 6:00AM	602	30	4	636	0	54	207	0	261	0	144	1285	20	1449	0	2346
7:00AM	1041	41	16	1098	0	90	326	0	416	0	284	1544	26	1854	0	3368
8:00AM	960	47	19	1026	0	67	275	0	342	0	388	1399	35	1822	0	3190
3:00PM	1353	92	40	1485	0	68	311	0	379	0	316	1258	34	1608	0	3472
4:00PM	1578	104	53	1735	0	87	338	0	425	0	292	1292	31	1615	0	3775
5:00PM	1412	118	59	1589	0	99	325	2	426	0	331	1268	42	1641	0	3656
Total	6946	432	191	7569	0	465	1782	2	2249	0	1755	8046	188	9989	0	19807
% Approach	91.8%	5.7%	2.5%	-	-	20.7%	79.2%	0.1%	-	-	17.6%	80.5%	1.9%	-	-	-
% Total	35.1%	2.2%	1.0%	38.2%	-	2.3%	9.0%	0%	11.4%	-	8.9%	40.6%	0.9%	50.4%	-	-
Motorcycles	0	0	0	0	-	0	1	0	1	-	0	3	0	3	-	4
% Motorcycles	0%	0%	0%	0%	-	0%	0.1%	0%	0%	-	0%	0%	0%	0%	-	0%
Lights	6752	408	190	7350	-	425	1738	2	2165	-	1719	7775	182	9676	-	19191
% Lights	97.2%	94.4%	99.5%	97.1%	-	91.4%	97.5%	100%	96.3%	-	97.9%	96.6%	96.8%	96.9%	-	96.9%
Single-Unit Trucks	133	9	1	143	-	8	31	0	39	-	25	196	4	225	-	407
% Single-Unit Trucks	1.9%	2.1%	0.5%	1.9%	-	1.7%	1.7%	0%	1.7%	-	1.4%	2.4%	2.1%	2.3%	-	2.1%
Articulated Trucks	47	0	0	47	-	0	0	0	0	-	2	53	2	57	-	104
% Articulated Trucks	0.7%	0%	0%	0.6%	-	0%	0%	0%	0%	-	0.1%	0.7%	1.1%	0.6%	-	0.5%
Buses	14	15	0	29	-	32	12	0	44	-	9	19	0	28	-	101
% Buses	0.2%	3.5%	0%	0.4%	-	6.9%	0.7%	0%	2.0%	-	0.5%	0.2%	0%	0.3%	-	0.5%
Bicycles on Road	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%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

217891 (2) Route 9 @ Country Club Lane TMC - TMC

Tue May 4, 2021

AM Peak (7:30 AM - 8:30 AM)

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

All Movements

ID: 833236, Location: 42.293977, -71.46724

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

Leg Direction	Worcester Road (Route 9) Westbound					Country Club Lane Northbound					Worcester Road (Route 9) Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
Time																
2021-05-04 7:30AM	297	5	7	309	0	26	96	0	122	0	63	424	6	493	0	924
7:45AM	251	12	2	265	0	20	84	0	104	0	104	386	5	495	0	864
8:00AM	262	14	6	282	0	14	66	0	80	0	97	318	2	417	0	779
8:15AM	260	14	8	282	0	21	66	0	87	0	70	380	6	456	0	825
Total	1070	45	23	1138	0	81	312	0	393	0	334	1508	19	1861	0	3392
% Approach	94.0%	4.0%	2.0%	-	-	20.6%	79.4%	0%	-	-	17.9%	81.0%	1.0%	-	-	-
% Total	31.5%	1.3%	0.7%	33.5%	-	2.4%	9.2%	0%	11.6%	-	9.8%	44.5%	0.6%	54.9%	-	-
PHF	0.901	0.804	0.719	0.921	-	0.779	0.813	-	0.805	-	0.803	0.889	0.792	0.940	-	0.918
Motorcycles	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%
Lights	1036	40	22	1098	-	75	304	0	379	-	329	1444	19	1792	-	3269
% Lights	96.8%	88.9%	95.7%	96.5%	-	92.6%	97.4%	0%	96.4%	-	98.5%	95.8%	100%	96.3%	-	96.4%
Single-Unit Trucks	25	1	1	27	-	0	6	0	6	-	3	52	0	55	-	88
% Single-Unit Trucks	2.3%	2.2%	4.3%	2.4%	-	0%	1.9%	0%	1.5%	-	0.9%	3.4%	0%	3.0%	-	2.6%
Articulated Trucks	3	0	0	3	-	0	0	0	0	-	0	10	0	10	-	13
% Articulated Trucks	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	-	0%	0.7%	0%	0.5%	-	0.4%
Buses	6	4	0	10	-	6	2	0	8	-	2	2	0	4	-	22
% Buses	0.6%	8.9%	0%	0.9%	-	7.4%	0.6%	0%	2.0%	-	0.6%	0.1%	0%	0.2%	-	0.6%
Bicycles on Road	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%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

217891 (2) Route 9 @ Country Club Lane TMC - TMC

Tue May 4, 2021

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

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

All Movements

ID: 833236, Location: 42.293977, -71.46724

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

Leg Direction	Worcester Road (Route 9) Westbound					Country Club Lane Northbound					Worcester Road (Route 9) Eastbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2021-05-04 4:15PM	429	24	15	468	0	17	81	0	98	0	69	324	8	401	0	967
4:30PM	411	21	12	444	0	24	70	0	94	0	95	318	5	418	0	956
4:45PM	363	29	12	404	0	23	81	0	104	0	72	347	9	428	0	936
5:00PM	362	24	14	400	0	33	90	1	124	0	82	313	10	405	0	929
Total	1565	98	53	1716	0	97	322	1	420	0	318	1302	32	1652	0	3788
% Approach	91.2%	5.7%	3.1%	-	-	23.1%	76.7%	0.2%	-	-	19.2%	78.8%	1.9%	-	-	-
% Total	41.3%	2.6%	1.4%	45.3%	-	2.6%	8.5%	0%	11.1%	-	8.4%	34.4%	0.8%	43.6%	-	-
PHF	0.912	0.845	0.883	0.917	-	0.735	0.894	0.250	0.847	-	0.837	0.938	0.800	0.965	-	0.979
Motorcycles	0	0	0	0	-	0	1	0	1	-	0	1	0	1	-	2
% Motorcycles	0%	0%	0%	0%	-	0%	0.3%	0%	0.2%	-	0%	0.1%	0%	0.1%	-	0.1%
Lights	1538	94	53	1685	-	93	311	1	405	-	311	1274	32	1617	-	3707
% Lights	98.3%	95.9%	100%	98.2%	-	95.9%	96.6%	100%	96.4%	-	97.8%	97.8%	100%	97.9%	-	97.9%
Single-Unit Trucks	18	3	0	21	-	2	8	0	10	-	4	18	0	22	-	53
% Single-Unit Trucks	1.2%	3.1%	0%	1.2%	-	2.1%	2.5%	0%	2.4%	-	1.3%	1.4%	0%	1.3%	-	1.4%
Articulated Trucks	8	0	0	8	-	0	0	0	0	-	1	7	0	8	-	16
% Articulated Trucks	0.5%	0%	0%	0.5%	-	0%	0%	0%	0%	-	0.3%	0.5%	0%	0.5%	-	0.4%
Buses	1	1	0	2	-	2	2	0	4	-	2	2	0	4	-	10
% Buses	0.1%	1.0%	0%	0.1%	-	2.1%	0.6%	0%	1.0%	-	0.6%	0.2%	0%	0.2%	-	0.3%
Bicycles on Road	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%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

217891 (3) Route 9 @ Temple Street/Old Worces... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833240, Location: 42.298112, -71.449742

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

Leg Direction	Temple Street Southbound								Old Worcester Road Southwestbound								Worcester Road (Route 9) Westbound							
	HR	R	T	L	HL	U	App	Ped*	HR	R	BR	BL	HL	U	App	Ped*	HR	R	BR	T	L	U	App	Ped*
2021-05-04 6:00AM	0	7	38	94	0	0	139	0	18	2	0	30	25	0	75	0	0	0	0	574	0	0	574	0
7:00AM	4	16	72	165	0	0	257	2	37	15	0	56	53	0	161	1	0	0	0	956	0	0	956	3
8:00AM	4	17	88	184	0	0	293	0	65	15	0	87	62	0	229	0	0	0	0	980	0	0	980	4
3:00PM	7	21	111	138	0	0	277	0	116	26	0	195	115	0	452	7	0	0	0	1426	0	0	1426	7
4:00PM	8	33	92	111	0	0	244	0	96	33	0	177	117	0	423	4	0	0	0	1549	0	0	1549	5
5:00PM	8	25	116	141	0	0	290	0	98	24	1	225	123	0	471	1	0	0	0	1436	0	0	1436	6
Total	31	119	517	833	0	0	1500	2	430	115	1	770	495	0	1811	13	0	0	0	6921	0	0	6921	25
% Approach	2.1%	7.9%	34.5%	55.5%	0%	0%	-	-	23.7%	6.4%	0.1%	42.5%	27.3%	0%	-	-	0%	0%	0%	100%	0%	0%	-	-
% Total	0.2%	0.6%	2.5%	4.0%	0%	0%	7.3%	-	2.1%	0.6%	0%	3.7%	2.4%	0%	8.8%	-	0%	0%	0%	33.5%	0%	0%	33.5%	-
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	30	119	500	823	0	0	1472	-	422	110	1	755	474	0	1762	-	0	0	0	6715	0	0	6715	-
% Lights	96.8%	100%	96.7%	98.8%	0%	0%	98.1%	-	98.1%	95.7%	100%	98.1%	95.8%	0%	97.3%	-	0%	0%	0%	97.0%	0%	0%	97.0%	-
Single-Unit Trucks	0	0	9	9	0	0	18	-	4	1	0	9	15	0	29	-	0	0	0	138	0	0	138	-
% Single-Unit Trucks	0%	0%	1.7%	1.1%	0%	0%	1.2%	-	0.9%	0.9%	0%	1.2%	3.0%	0%	1.6%	-	0%	0%	0%	2.0%	0%	0%	2.0%	-
Articulated Trucks	0	0	1	0	0	0	1	-	1	0	0	2	3	0	6	-	0	0	0	47	0	0	47	-
% Articulated Trucks	0%	0%	0.2%	0%	0%	0%	0.1%	-	0.2%	0%	0%	0.3%	0.6%	0%	0.3%	-	0%	0%	0%	0.7%	0%	0%	0.7%	-
Buses	1	0	7	1	0	0	9	-	3	3	0	4	3	0	13	-	0	0	0	21	0	0	21	-
% Buses	3.2%	0%	1.4%	0.1%	0%	0%	0.6%	-	0.7%	2.6%	0%	0.5%	0.6%	0%	0.7%	-	0%	0%	0%	0.3%	0%	0%	0.3%	-
Bicycles on Road	0	0	0	0	0	0	0	-	0	1	0	0	0	0	1	-	0	0	0	0	0	0	0	-
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	-	0%	0.9%	0%	0%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-	24
% Pedestrians	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	92.3%	-	-	-	-	-	-	-	96.0%
Bicycles on Crosswalk	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
% Bicycles on Crosswalk	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	7.7%	-	-	-	-	-	-	-	4.0%

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

217891 (3) Route 9 @ Temple Street/Old Worces... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833240, Location: 42.298112, -71.449742

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Temple Street Northbound							Worcester Road (Route 9) Eastbound							Old Worcester Road Southeastbound							Int			
	R	BR	T	BL	L	U	App	Ped*	R	T	BL	L	HL	U	App	Ped*	HR	BR	BL	L	HL		U	App	Ped*
2021-05-04 6:00AM	54	0	29	0	75	0	158	0	71	1270	0	14	3	16	1374	0	0	3	19	0	6	0	28	0	2348
7:00AM	65	0	90	2	99	0	256	0	62	1417	0	35	3	17	1534	0	1	8	27	0	12	0	48	1	3212
8:00AM	67	0	120	6	91	0	284	3	78	1335	0	34	5	20	1472	0	3	12	27	0	4	0	46	0	3304
3:00PM	66	0	130	12	123	0	331	1	88	1145	0	48	5	32	1318	0	2	9	15	0	13	0	39	0	3843
4:00PM	62	0	140	7	150	0	359	1	104	1214	0	36	8	15	1377	0	2	7	24	0	7	0	40	0	3992
5:00PM	63	0	156	11	140	0	370	2	113	1174	0	46	7	8	1348	0	1	14	17	0	4	0	36	1	3951
Total	377	0	665	38	678	0	1758	7	516	7555	0	213	31	108	8423	0	9	53	129	0	46	0	237	2	20650
% Approach	21.4%	0%	37.8%	2.2%	38.6%	0%	-	-	6.1%	89.7%	0%	2.5%	0.4%	1.3%	-	-	3.8%	22.4%	54.4%	0%	19.4%	0%	-	-	-
% Total	1.8%	0%	3.2%	0.2%	3.3%	0%	8.5%	-	2.5%	36.6%	0%	1.0%	0.2%	0.5%	40.8%	-	0%	0.3%	0.6%	0%	0.2%	0%	1.1%	-	-
Motorcycles	0	0	0	0	0	0	0	-	0	3	0	0	0	0	3	-	0	0	0	0	0	0	0	0	3
% Motorcycles	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lights	372	0	646	35	655	0	1708	-	496	7295	0	202	29	108	8130	-	7	49	129	0	43	0	228	-	20015
% Lights	98.7%	0%	97.1%	92.1%	96.6%	0%	97.2%	-	96.1%	96.6%	0%	94.8%	93.5%	100%	96.5%	-	77.8%	92.5%	100%	0%	93.5%	0%	96.2%	-	96.9%
Single-Unit Trucks	4	0	9	1	11	0	25	-	9	182	0	4	0	0	195	-	0	1	0	0	1	0	2	-	407
% Single-Unit Trucks	1.1%	0%	1.4%	2.6%	1.6%	0%	1.4%	-	1.7%	2.4%	0%	1.9%	0%	0%	2.3%	-	0%	1.9%	0%	0%	2.2%	0%	0.8%	-	2.0%
Articulated Trucks	0	0	1	0	0	0	1	-	0	45	0	0	0	0	45	-	0	0	0	0	0	0	0	-	100
% Articulated Trucks	0%	0%	0.2%	0%	0%	0%	0.1%	-	0%	0.6%	0%	0%	0%	0%	0.5%	-	0%	0%	0%	0%	0%	0%	0%	-	0.5%
Buses	1	0	9	2	12	0	24	-	11	30	0	7	2	0	50	-	2	3	0	0	1	0	6	-	123
% Buses	0.3%	0%	1.4%	5.3%	1.8%	0%	1.4%	-	2.1%	0.4%	0%	3.3%	6.5%	0%	0.6%	-	22.2%	5.7%	0%	0%	2.2%	0%	2.5%	-	0.6%
Bicycles on Road	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	-	0	0	0	0	1	0	1	-	2
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	2.2%	0%	0.4%	-	0%
Pedestrians	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	2
% Pedestrians	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%

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

217891 (3) Route 9 @ Temple Street/Old Worces... - TMC

Tue May 4, 2021

AM Peak (7:30 AM - 8:30 AM)

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

All Movements

ID: 833240, Location: 42.298112, -71.449742

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

Leg Direction	Temple Street Southbound								Old Worcester Road Southwestbound								Worcester Road (Route 9) Westbound							
	HR	R	T	L	HL	U	App	Ped*	HR	R	BR	BL	HL	U	App	Ped*	HR	R	BR	T	L	U	App	Ped*
2021-05-04 7:30AM	2	4	18	46	0	0	70	1	11	8	0	15	19	0	53	0	0	0	0	251	0	0	251	0
7:45AM	2	1	24	44	0	0	71	0	14	3	0	17	18	0	52	1	0	0	0	259	0	0	259	2
8:00AM	0	4	16	47	0	0	67	0	9	7	0	25	15	0	56	0	0	0	0	288	0	0	288	0
8:15AM	0	7	23	58	0	0	88	0	17	6	0	23	16	0	62	0	0	0	0	229	0	0	229	0
Total	4	16	81	195	0	0	296	1	51	24	0	80	68	0	223	1	0	0	0	1027	0	0	1027	2
% Approach	1.4%	5.4%	27.4%	65.9%	0%	0%	-	-	22.9%	10.8%	0%	35.9%	30.5%	0%	-	-	0%	0%	0%	100%	0%	0%	-	-
% Total	0.1%	0.5%	2.4%	5.7%	0%	0%	8.7%	-	1.5%	0.7%	0%	2.4%	2.0%	0%	6.6%	-	0%	0%	0%	30.2%	0%	0%	30.2%	-
PHF	0.500	0.571	0.844	0.841	-	-	0.841	-	0.750	0.750	-	0.800	0.895	-	0.899	-	-	-	-	0.891	-	-	0.891	-
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	3	16	79	192	0	0	290	-	50	22	0	75	61	0	208	-	0	0	0	988	0	0	988	-
% Lights	75.0%	100%	97.5%	98.5%	0%	0%	98.0%	-	98.0%	91.7%	0%	93.8%	89.7%	0%	93.3%	-	0%	0%	0%	96.2%	0%	0%	96.2%	-
Single-Unit Trucks	0	0	0	3	0	0	3	-	0	0	0	3	4	0	7	-	0	0	0	29	0	0	29	-
% Single-Unit Trucks	0%	0%	0%	1.5%	0%	0%	1.0%	-	0%	0%	0%	3.8%	5.9%	0%	3.1%	-	0%	0%	0%	2.8%	0%	0%	2.8%	-
Articulated Trucks	0	0	0	0	0	0	0	-	0	0	0	0	1	0	1	-	0	0	0	4	0	0	4	-
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	1.5%	0%	0.4%	-	0%	0%	0%	0.4%	0%	0%	0.4%	-
Buses	1	0	2	0	0	0	3	-	1	2	0	2	2	0	7	-	0	0	0	6	0	0	6	-
% Buses	25.0%	0%	2.5%	0%	0%	0%	1.0%	-	2.0%	8.3%	0%	2.5%	2.9%	0%	3.1%	-	0%	0%	0%	0.6%	0%	0%	0.6%	-
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	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2
% Pedestrians	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	0%

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

217891 (3) Route 9 @ Temple Street/Old Worces... - TMC

Tue May 4, 2021

AM Peak (7:30 AM - 8:30 AM)

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

All Movements

ID: 833240, Location: 42.298112, -71.449742

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Temple Street Northbound								Worcester Road (Route 9) Eastbound								Old Worcester Road Southeastbound								Int
	R	BR	T	BL	L	U	App	Ped*	R	T	BL	L	HL	U	App	Ped*	HR	BR	BL	L	HL	U	App	Ped*	
2021-05-04 7:30AM	16	0	20	0	35	0	71	0	15	364	0	8	3	5	395	0	0	1	7	0	2	0	10	1	850
7:45AM	24	0	34	0	16	0	74	0	17	347	0	11	0	3	378	0	1	5	9	0	5	0	20	0	854
8:00AM	14	0	19	1	20	0	54	0	21	372	0	12	0	5	410	0	1	4	4	0	1	0	10	0	885
8:15AM	19	0	23	3	25	0	70	0	20	315	0	8	2	7	352	0	2	3	9	0	0	0	14	0	815
Total	73	0	96	4	96	0	269	0	73	1398	0	39	5	20	1535	0	4	13	29	0	8	0	54	1	3404
% Approach	27.1%	0%	35.7%	1.5%	35.7%	0%	-	-	4.8%	91.1%	0%	2.5%	0.3%	1.3%	-	-	7.4%	24.1%	53.7%	0%	14.8%	0%	-	-	-
% Total	2.1%	0%	2.8%	0.1%	2.8%	0%	7.9%	-	2.1%	41.1%	0%	1.1%	0.1%	0.6%	45.1%	-	0.1%	0.4%	0.9%	0%	0.2%	0%	1.6%	-	-
PHF	0.760	-	0.706	0.333	0.686	-	0.909	-	0.869	0.940	-	0.813	0.417	0.714	0.936	-	0.500	0.650	0.806	-	0.400	-	0.675	-	0.962
Motorcycles	0	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%	-	0%
Lights	71	0	94	3	90	0	258	-	70	1337	0	37	4	20	1468	-	3	12	29	0	8	0	52	-	3264
% Lights	97.3%	0%	97.9%	75.0%	93.8%	0%	95.9%	-	95.9%	95.6%	0%	94.9%	80.0%	100%	95.6%	-	75.0%	92.3%	100%	0%	100%	0%	96.3%	-	95.9%
Single-Unit Trucks	1	0	1	1	2	0	5	-	2	49	0	1	0	0	52	-	0	0	0	0	0	0	0	-	96
% Single-Unit Trucks	1.4%	0%	1.0%	25.0%	2.1%	0%	1.9%	-	2.7%	3.5%	0%	2.6%	0%	0%	3.4%	-	0%	0%	0%	0%	0%	0%	0%	-	2.8%
Articulated Trucks	0	0	0	0	0	0	0	-	0	8	0	0	0	0	8	-	0	0	0	0	0	0	0	-	13
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	-	0%	0.6%	0%	0%	0%	0%	0.5%	-	0%	0%	0%	0%	0%	0%	0%	-	0.4%
Buses	1	0	1	0	4	0	6	-	1	4	0	1	1	0	7	-	1	1	0	0	0	0	2	-	31
% Buses	1.4%	0%	1.0%	0%	4.2%	0%	2.2%	-	1.4%	0.3%	0%	2.6%	20.0%	0%	0.5%	-	25.0%	7.7%	0%	0%	0%	0%	3.7%	-	0.9%
Bicycles on Road	0	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%	-	0%
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-

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

217891 (3) Route 9 @ Temple Street/Old Worces... - TMC

Tue May 4, 2021

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

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

All Movements

ID: 833240, Location: 42.298112, -71.449742

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

Leg Direction	Temple Street Southbound								Old Worcester Road Southwestbound								Worcester Road (Route 9) Westbound							
	HR	R	T	L	HL	U	App	Ped*	HR	R	BR	BL	HL	U	App	Ped*	HR	R	BR	T	L	U	App	Ped*
2021-05-04 4:45PM	3	7	24	35	0	0	69	0	23	8	0	37	38	0	106	0	0	0	0	390	0	0	390	1
5:00PM	2	4	30	44	0	0	80	0	25	3	1	44	32	0	105	1	0	0	0	341	0	0	341	2
5:15PM	5	4	35	33	0	0	77	0	24	7	0	70	41	0	142	0	0	0	0	363	0	0	363	0
5:30PM	0	10	31	28	0	0	69	0	28	8	0	58	23	0	117	0	0	0	0	382	0	0	382	1
Total	10	25	120	140	0	0	295	0	100	26	1	209	134	0	470	1	0	0	0	1476	0	0	1476	4
% Approach	3.4%	8.5%	40.7%	47.5%	0%	0%	-	-	21.3%	5.5%	0.2%	44.5%	28.5%	0%	-	-	0%	0%	0%	100%	0%	0%	-	-
% Total	0.2%	0.6%	3.0%	3.5%	0%	0%	7.3%	-	2.5%	0.6%	0%	5.2%	3.3%	0%	11.7%	-	0%	0%	0%	36.7%	0%	0%	36.7%	-
PHF	0.500	0.625	0.857	0.795	-	-	0.922	-	0.893	0.781	0.250	0.746	0.817	-	0.832	-	-	-	-	0.946	-	-	0.946	-
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	10	25	117	139	0	0	291	-	100	25	1	208	130	0	464	-	0	0	0	1452	0	0	1452	-
% Lights	100%	100%	97.5%	99.3%	0%	0%	98.6%	-	100%	96.2%	100%	99.5%	97.0%	0%	98.7%	-	0%	0%	0%	98.4%	0%	0%	98.4%	-
Single-Unit Trucks	0	0	2	1	0	0	3	-	0	0	0	1	3	0	4	-	0	0	0	16	0	0	16	-
% Single-Unit Trucks	0%	0%	1.7%	0.7%	0%	0%	1.0%	-	0%	0%	0%	0.5%	2.2%	0%	0.9%	-	0%	0%	0%	1.1%	0%	0%	1.1%	-
Articulated Trucks	0	0	1	0	0	0	1	-	0	0	0	0	1	0	1	-	0	0	0	7	0	0	7	-
% Articulated Trucks	0%	0%	0.8%	0%	0%	0%	0.3%	-	0%	0%	0%	0%	0.7%	0%	0.2%	-	0%	0%	0%	0.5%	0%	0%	0.5%	-
Buses	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	-	0	0	0	1	0	0	1	-
% Buses	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0.1%	0%	0%	0.1%	-
Bicycles on Road	0	0	0	0	0	0	0	-	0	1	0	0	0	0	1	-	0	0	0	0	0	0	0	-
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	-	0%	3.8%	0%	0%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	4
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	0%

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

217891 (3) Route 9 @ Temple Street/Old Worces... - TMC

Tue May 4, 2021

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

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

All Movements

ID: 833240, Location: 42.298112, -71.449742

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Temple Street Northbound								Worcester Road (Route 9) Eastbound								Old Worcester Road Southeastbound								Int
	R	BR	T	BL	L	U	App	Ped*	R	T	BL	L	HL	U	App	Ped*	HR	BR	BL	L	HL	U	App	Ped*	
2021-05-04 4:45PM	12	0	32	0	28	0	72	0	23	335	0	11	0	7	376	0	0	1	8	0	3	0	12	0	1025
5:00PM	13	0	48	3	48	0	112	0	28	262	0	13	3	4	310	0	0	2	0	0	2	0	4	1	952
5:15PM	14	0	37	2	32	0	85	1	30	314	0	11	1	1	357	0	1	2	11	0	1	0	15	0	1039
5:30PM	16	0	40	0	29	0	85	1	24	309	0	10	0	1	344	0	0	3	4	0	1	0	8	0	1005
Total	55	0	157	5	137	0	354	2	105	1220	0	45	4	13	1387	0	1	8	23	0	7	0	39	1	4021
% Approach	15.5%	0%	44.4%	1.4%	38.7%	0%	-	-	7.6%	88.0%	0%	3.2%	0.3%	0.9%	-	-	2.6%	20.5%	59.0%	0%	17.9%	0%	-	-	-
% Total	1.4%	0%	3.9%	0.1%	3.4%	0%	8.8%	-	2.6%	30.3%	0%	1.1%	0.1%	0.3%	34.5%	-	0%	0.2%	0.6%	0%	0.2%	0%	1.0%	-	-
PHF	0.859	-	0.818	0.417	0.714	-	0.790	-	0.875	0.910	-	0.865	0.333	0.464	0.922	-	0.250	0.667	0.523	-	0.583	-	0.650	-	0.968
Motorcycles	0	0	0	0	0	0	0	-	0	1	0	0	0	0	1	-	0	0	0	0	0	0	0	-	1
% Motorcycles	0%	0%	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	0%	0%	-	0%
Lights	55	0	156	5	136	0	352	-	103	1204	0	45	4	13	1369	-	1	8	23	0	7	0	39	-	3967
% Lights	100%	0%	99.4%	100%	99.3%	0%	99.4%	-	98.1%	98.7%	0%	100%	100%	100%	98.7%	-	100%	100%	100%	0%	100%	0%	100%	-	98.7%
Single-Unit Trucks	0	0	1	0	1	0	2	-	1	8	0	0	0	0	9	-	0	0	0	0	0	0	0	-	34
% Single-Unit Trucks	0%	0%	0.6%	0%	0.7%	0%	0.6%	-	1.0%	0.7%	0%	0%	0%	0%	0.6%	-	0%	0%	0%	0%	0%	0%	0%	-	0.8%
Articulated Trucks	0	0	0	0	0	0	0	-	0	4	0	0	0	0	4	-	0	0	0	0	0	0	0	-	13
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	0%	0%	-	0.3%
Buses	0	0	0	0	0	0	0	-	1	3	0	0	0	0	4	-	0	0	0	0	0	0	0	-	5
% Buses	0%	0%	0%	0%	0%	0%	0%	-	1.0%	0.2%	0%	0%	0%	0%	0.3%	-	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	-	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%	-	0%
Pedestrians	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	
Bicycles on Crosswalk	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	

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

217891 (4A) Worcester Road WB Ramps @ Edgell... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833248, Location: 42.300447, -71.434495

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

Leg Direction	Edgell Road Southbound						Worcester Road WB Offramp Westbound						
	R	T	L	U	App	Ped*	R	T	BL	L	U	App	Ped*
2021-05-04 6:00AM	33	305	0	0	338	0	24	16	29	63	0	132	0
7:00AM	44	524	0	0	568	0	42	42	82	173	0	339	1
8:00AM	37	523	0	0	560	0	73	71	90	244	0	478	0
3:00PM	40	585	0	0	625	1	111	132	121	364	0	728	0
4:00PM	43	571	0	0	614	2	84	125	124	375	0	708	0
5:00PM	32	525	0	0	557	2	70	133	124	304	0	631	1
Total	229	3033	0	0	3262	5	404	519	570	1523	0	3016	2
% Approach	7.0%	93.0%	0%	0%	-	-	13.4%	17.2%	18.9%	50.5%	0%	-	-
% Total	1.9%	25.2%	0%	0%	27.1%	-	3.4%	4.3%	4.7%	12.6%	0%	25.0%	-
Motorcycles	0	1	0	0	1	-	0	0	0	0	0	0	-
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-
Lights	209	2899	0	0	3108	-	395	505	558	1475	0	2933	-
% Lights	91.3%	95.6%	0%	0%	95.3%	-	97.8%	97.3%	97.9%	96.8%	0%	97.2%	-
Single-Unit Trucks	12	65	0	0	77	-	5	6	9	32	0	52	-
% Single-Unit Trucks	5.2%	2.1%	0%	0%	2.4%	-	1.2%	1.2%	1.6%	2.1%	0%	1.7%	-
Articulated Trucks	8	6	0	0	14	-	1	1	1	2	0	5	-
% Articulated Trucks	3.5%	0.2%	0%	0%	0.4%	-	0.2%	0.2%	0.2%	0.1%	0%	0.2%	-
Buses	0	62	0	0	62	-	3	7	2	14	0	26	-
% Buses	0%	2.0%	0%	0%	1.9%	-	0.7%	1.3%	0.4%	0.9%	0%	0.9%	-
Bicycles on Road	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%	-
Pedestrians	-	-	-	-	-	5	-	-	-	-	-	-	2
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	0%

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

217891 (4A) Worcester Road WB Ramps @ Edgell... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833248, Location: 42.300447, -71.434495

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Edgell Road Northbound						Worcester Road WB Onramp Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
Time													
2021-05-04 6:00AM	0	433	199	0	632	0	0	0	0	0	0	0	1102
7:00AM	0	677	282	0	959	0	0	0	0	0	0	0	1866
8:00AM	0	656	337	0	993	0	0	0	0	0	0	1	2031
3:00PM	0	731	372	0	1103	0	0	0	0	0	0	5	2456
4:00PM	0	670	446	0	1116	0	0	0	0	0	0	2	2438
5:00PM	0	588	373	0	961	0	0	0	0	0	0	0	2149
Total	0	3755	2009	0	5764	0	0	0	0	0	0	8	12042
% Approach	0%	65.1%	34.9%	0%	-	-	0%	0%	0%	0%	-	-	-
% Total	0%	31.2%	16.7%	0%	47.9%	-	0%	0%	0%	0%	0%	-	-
Motorcycles	0	1	0	0	1	-	0	0	0	0	0	-	2
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	-	0%
Lights	0	3588	1920	0	5508	-	0	0	0	0	0	-	11549
% Lights	0%	95.6%	95.6%	0%	95.6%	-	0%	0%	0%	0%	-	-	95.9%
Single-Unit Trucks	0	85	53	0	138	-	0	0	0	0	0	-	267
% Single-Unit Trucks	0%	2.3%	2.6%	0%	2.4%	-	0%	0%	0%	0%	-	-	2.2%
Articulated Trucks	0	12	18	0	30	-	0	0	0	0	0	-	49
% Articulated Trucks	0%	0.3%	0.9%	0%	0.5%	-	0%	0%	0%	0%	-	-	0.4%
Buses	0	69	18	0	87	-	0	0	0	0	0	-	175
% Buses	0%	1.8%	0.9%	0%	1.5%	-	0%	0%	0%	0%	-	-	1.5%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	8	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-

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

217891 (4A) Worcester Road WB Ramps @ Edgell... - TMC

Tue May 4, 2021

AM Peak (7:45 AM - 8:45 AM)

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

All Movements

ID: 833248, Location: 42.300447, -71.434495

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

Leg Direction	Edgell Road Southbound						Worcester Road WB Offramp Westbound						
	R	T	L	U	App	Ped*	R	T	BL	L	U	App	Ped*
Time													
2021-05-04 7:45AM	8	165	0	0	173	0	13	15	27	48	0	103	0
8:00AM	9	135	0	0	144	0	16	15	19	58	0	108	0
8:15AM	11	146	0	0	157	0	12	15	21	66	0	114	0
8:30AM	7	115	0	0	122	0	24	22	26	54	0	126	0
Total	35	561	0	0	596	0	65	67	93	226	0	451	0
% Approach	5.9%	94.1%	0%	0%	-	-	14.4%	14.9%	20.6%	50.1%	0%	-	-
% Total	1.7%	27.2%	0%	0%	28.9%	-	3.2%	3.2%	4.5%	11.0%	0%	21.9%	-
PHF	0.795	0.850	-	-	0.861	-	0.677	0.761	0.861	0.856	-	0.895	-
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	0	-
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-
Lights	32	531	0	0	563	-	62	64	90	218	0	434	-
% Lights	91.4%	94.7%	0%	0%	94.5%	-	95.4%	95.5%	96.8%	96.5%	0%	96.2%	-
Single-Unit Trucks	1	15	0	0	16	-	3	2	2	5	0	12	-
% Single-Unit Trucks	2.9%	2.7%	0%	0%	2.7%	-	4.6%	3.0%	2.2%	2.2%	0%	2.7%	-
Articulated Trucks	2	2	0	0	4	-	0	0	0	0	0	0	-
% Articulated Trucks	5.7%	0.4%	0%	0%	0.7%	-	0%	0%	0%	0%	0%	0%	-
Buses	0	13	0	0	13	-	0	1	1	3	0	5	-
% Buses	0%	2.3%	0%	0%	2.2%	-	0%	1.5%	1.1%	1.3%	0%	1.1%	-
Bicycles on Road	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%	-
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-

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

217891 (4A) Worcester Road WB Ramps @ Edgell... - TMC

Tue May 4, 2021

AM Peak (7:45 AM - 8:45 AM)

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

All Movements

ID: 833248, Location: 42.300447, -71.434495

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

Leg Direction	Edgell Road Northbound							Worcester Road WB Onramp Eastbound							Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*			
Time															
2021-05-04 7:45AM	0	208	83	0	291	0	0	0	0	0	0	0	0	567	
8:00AM	0	177	100	0	277	0	0	0	0	0	0	0	0	529	
8:15AM	0	144	71	0	215	0	0	0	0	0	0	0	1	486	
8:30AM	0	145	87	0	232	0	0	0	0	0	0	0	0	480	
Total	0	674	341	0	1015	0	0	0	0	0	0	0	1	2062	
% Approach	0%	66.4%	33.6%	0%	-	-	0%	0%	0%	0%	0%	-	-	-	
% Total	0%	32.7%	16.5%	0%	49.2%	-	0%	0%	0%	0%	0%	0%	-	-	
PHF	-	0.810	0.853	-	0.872	-	-	-	-	-	-	-	-	0.909	
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	0	-	0	
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	-	0%	
Lights	0	629	321	0	950	-	0	0	0	0	0	0	-	1947	
% Lights	0%	93.3%	94.1%	0%	93.6%	-	0%	0%	0%	0%	0%	-	-	94.4%	
Single-Unit Trucks	0	26	13	0	39	-	0	0	0	0	0	0	-	67	
% Single-Unit Trucks	0%	3.9%	3.8%	0%	3.8%	-	0%	0%	0%	0%	0%	-	-	3.2%	
Articulated Trucks	0	2	3	0	5	-	0	0	0	0	0	0	-	9	
% Articulated Trucks	0%	0.3%	0.9%	0%	0.5%	-	0%	0%	0%	0%	0%	-	-	0.4%	
Buses	0	17	4	0	21	-	0	0	0	0	0	0	-	39	
% Buses	0%	2.5%	1.2%	0%	2.1%	-	0%	0%	0%	0%	0%	-	-	1.9%	
Bicycles on Road	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%	
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	-	1	-	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0	-	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	

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

217891 (4A) Worcester Road WB Ramps @ Edgell... - TMC

Tue May 4, 2021

PM Peak (3:45 PM - 4:45 PM) - Overall Peak Hour

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

All Movements

ID: 833248, Location: 42.300447, -71.434495

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

Leg Direction	Edgell Road Southbound						Worcester Road WB Offramp Westbound						
	R	T	L	U	App	Ped*	R	T	BL	L	U	App	Ped*
2021-05-04 3:45PM	13	133	0	0	146	0	28	37	32	107	0	204	0
4:00PM	12	131	0	0	143	1	19	23	32	85	0	159	0
4:15PM	7	150	0	0	157	1	14	41	32	102	0	189	0
4:30PM	15	155	0	0	170	0	26	31	29	97	0	183	0
Total	47	569	0	0	616	2	87	132	125	391	0	735	0
% Approach	7.6%	92.4%	0%	0%	-	-	11.8%	18.0%	17.0%	53.2%	0%	-	-
% Total	1.9%	23.0%	0%	0%	24.9%	-	3.5%	5.3%	5.1%	15.8%	0%	29.7%	-
PHF	0.783	0.918	-	-	0.906	-	0.777	0.805	0.977	0.914	-	0.901	-
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	0	-
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-
Lights	43	536	0	0	579	-	85	131	121	382	0	719	-
% Lights	91.5%	94.2%	0%	0%	94.0%	-	97.7%	99.2%	96.8%	97.7%	0%	97.8%	-
Single-Unit Trucks	3	11	0	0	14	-	0	0	3	4	0	7	-
% Single-Unit Trucks	6.4%	1.9%	0%	0%	2.3%	-	0%	0%	2.4%	1.0%	0%	1.0%	-
Articulated Trucks	1	0	0	0	1	-	0	0	0	1	0	1	-
% Articulated Trucks	2.1%	0%	0%	0%	0.2%	-	0%	0%	0%	0.3%	0%	0.1%	-
Buses	0	22	0	0	22	-	2	1	1	4	0	8	-
% Buses	0%	3.9%	0%	0%	3.6%	-	2.3%	0.8%	0.8%	1.0%	0%	1.1%	-
Bicycles on Road	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%	-
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-

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

217891 (4A) Worcester Road WB Ramps @ Edgell... - TMC

Tue May 4, 2021

PM Peak (3:45 PM - 4:45 PM) - Overall Peak Hour

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

All Movements

ID: 833248, Location: 42.300447, -71.434495

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

Leg Direction	Edgell Road Northbound							Worcester Road WB Onramp Eastbound							Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*			
2021-05-04 3:45PM	0	181	103	0	284	0	0	0	0	0	0	3	634		
4:00PM	0	159	108	0	267	0	0	0	0	0	0	0	569		
4:15PM	0	196	116	0	312	0	0	0	0	0	0	1	658		
4:30PM	0	151	110	0	261	0	0	0	0	0	0	1	614		
Total	0	687	437	0	1124	0	0	0	0	0	0	5	2475		
% Approach	0%	61.1%	38.9%	0%	-	-	0%	0%	0%	0%	-	-	-		
% Total	0%	27.8%	17.7%	0%	45.4%	-	0%	0%	0%	0%	0%	-	-		
PHF	-	0.876	0.942	-	0.901	-	-	-	-	-	-	-	0.940		
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	-	0		
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	-	0%		
Lights	0	672	421	0	1093	-	0	0	0	0	0	-	2391		
% Lights	0%	97.8%	96.3%	0%	97.2%	-	0%	0%	0%	0%	-	-	96.6%		
Single-Unit Trucks	0	6	11	0	17	-	0	0	0	0	0	-	38		
% Single-Unit Trucks	0%	0.9%	2.5%	0%	1.5%	-	0%	0%	0%	0%	-	-	1.5%		
Articulated Trucks	0	1	3	0	4	-	0	0	0	0	0	-	6		
% Articulated Trucks	0%	0.1%	0.7%	0%	0.4%	-	0%	0%	0%	0%	-	-	0.2%		
Buses	0	8	2	0	10	-	0	0	0	0	0	-	40		
% Buses	0%	1.2%	0.5%	0%	0.9%	-	0%	0%	0%	0%	-	-	1.6%		
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0		
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	-	0%		
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	-	5		
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	100%		
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0		
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	0%		

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

217891 (4B) Worcester Road EB Onramp @ Edgel... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833252, Location: 42.299831, -71.434404

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

Leg Direction	Edgell Road Southbound						Worcester Road EB Onramp Westbound						Main Street Northbound						High Street 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*	
2021-05-04 6:00AM	63	227	78	0	368	0	0	0	0	31	31	0	10	387	4	0	401	0	224	12	238	0	474	0	1274
7:00AM	149	398	159	0	706	0	0	0	0	87	87	1	6	662	17	0	685	1	256	11	285	0	552	0	2030
8:00AM	179	456	132	0	767	0	0	0	0	94	94	0	14	689	18	1	722	1	215	26	291	0	532	1	2115
3:00PM	321	500	114	0	935	0	0	0	0	121	121	0	28	770	20	0	818	1	180	32	328	0	540	2	2414
4:00PM	302	524	116	0	942	0	0	0	0	124	124	0	29	806	28	0	863	6	223	28	274	0	525	8	2454
5:00PM	278	459	101	0	838	0	0	0	0	135	135	1	30	733	13	1	777	0	192	26	210	10	438	5	2188
Total	1292	2564	700	0	4556	0	0	0	0	592	592	2	117	4047	100	2	4266	9	1290	135	1626	10	3061	16	12475
% Approach	28.4%	56.3%	15.4%	0%	-	-	0% 0% 0%	100%	-	-	2.7%	94.9%	2.3%	0%	-	-	42.1%	4.4%	53.1%	0.3%	-	-	-		
% Total	10.4%	20.6%	5.6%	0%	36.5%	-	0% 0% 0%	4.7%	4.7%	-	0.9%	32.4%	0.8%	0%	34.2%	-	10.3%	1.1%	13.0%	0.1%	24.5%	-	-		
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	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	1257	2433	682	0	4372	-	0	0	0	578	578	-	110	3842	99	2	4053	-	1234	127	1570	10	2941	-	11944
% Lights	97.3%	94.9%	97.4%	0%	96.0%	-	0% 0% 0%	97.6%	97.6%	-	94.0%	94.9%	99.0%	100%	95.0%	-	95.7%	94.1%	96.6%	100%	96.1%	-	95.7%		
Single-Unit Trucks	22	69	11	0	102	-	0	0	0	11	11	-	2	112	0	0	114	-	40	3	26	0	69	-	296
% Single-Unit Trucks	1.7%	2.7%	1.6%	0%	2.2%	-	0% 0% 0%	1.9%	1.9%	-	1.7%	2.8%	0%	0%	2.7%	-	3.1%	2.2%	1.6%	0%	2.3%	-	2.4%		
Articulated Trucks	1	7	0	0	8	-	0	0	0	1	1	-	5	27	0	0	32	-	14	0	10	0	24	-	65
% Articulated Trucks	0.1%	0.3%	0%	0%	0.2%	-	0% 0% 0%	0.2%	0.2%	-	4.3%	0.7%	0%	0%	0.8%	-	1.1%	0%	0.6%	0%	0.8%	-	0.5%		
Buses	12	55	7	0	74	-	0	0	0	2	2	-	0	65	1	0	66	-	2	5	20	0	27	-	169
% Buses	0.9%	2.1%	1.0%	0%	1.6%	-	0% 0% 0%	0.3%	0.3%	-	0%	1.6%	1.0%	0%	1.5%	-	0.2%	3.7%	1.2%	0%	0.9%	-	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
% 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	-	-	-	-	-	2	-	-	-	-	-	9	-	-	-	-	-	-	-	15
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	-	93.8%
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	-	1
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	-	6.3%

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

217891 (4B) Worcester Road EB Onramp @ Edgel... - TMC

Tue May 4, 2021

AM Peak (7:30 AM - 8:30 AM)

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

All Movements

ID: 833252, Location: 42.299831, -71.434404

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Edgell Road Southbound						Worcester Road EB Onramp Westbound						Main Street Northbound						High Street 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
2021-05-04 7:30AM	30	90	39	0	159	0	0	0	0	31	31	0	1	169	2	0	172	0	62	3	74	0	139	0	501
7:45AM	35	128	57	0	220	0	0	0	0	32	32	0	1	213	10	0	224	1	59	3	69	0	131	0	607
8:00AM	47	108	45	0	200	0	0	0	0	20	20	0	1	199	6	1	207	0	76	7	70	0	153	0	580
8:15AM	49	127	32	0	208	0	0	0	0	22	22	0	0	145	5	0	150	1	48	7	71	0	126	1	506
Total	161	453	173	0	787	0	0	0	0	105	105	0	3	726	23	1	753	2	245	20	284	0	549	1	2194
% Approach	20.5%	57.6%	22.0%	0%	-	-	0% 0% 0%	100%	-	-	-	0.4%	96.4%	3.1%	0.1%	-	-	44.6%	3.6%	51.7%	0%	-	-	-	
% Total	7.3%	20.6%	7.9%	0%	35.9%	-	0% 0% 0%	4.8%	4.8%	-	-	0.1%	33.1%	1.0%	0%	34.3%	-	11.2%	0.9%	12.9%	0%	25.0%	-	-	
PHF	0.821	0.885	0.759	-	0.894	-	-	-	-	0.820	0.820	-	0.750	0.852	0.575	0.250	0.840	-	0.806	0.714	0.959	-	0.897	-	0.904
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	152	428	164	0	744	-	0	0	0	104	104	-	3	678	23	1	705	-	233	18	273	0	524	-	2077
% Lights	94.4%	94.5%	94.8%	0%	94.5%	-	0% 0% 0%	99.0%	99.0%	-	-	100%	93.4%	100%	100%	93.6%	-	95.1%	90.0%	96.1%	0%	95.4%	-	94.7%	
Single-Unit Trucks	5	18	4	0	27	-	0	0	0	1	1	-	0	32	0	0	32	-	8	2	6	0	16	-	76
% Single-Unit Trucks	3.1%	4.0%	2.3%	0%	3.4%	-	0% 0% 0%	1.0%	1.0%	-	-	0%	4.4%	0%	0%	4.2%	-	3.3%	10.0%	2.1%	0%	2.9%	-	3.5%	
Articulated Trucks	1	1	0	0	2	-	0	0	0	0	0	-	0	3	0	0	3	-	4	0	3	0	7	-	12
% Articulated Trucks	0.6%	0.2%	0%	0%	0.3%	-	0% 0% 0%	0%	0%	-	-	0%	0.4%	0%	0%	0.4%	-	1.6%	0%	1.1%	0%	1.3%	-	0.5%	
Buses	3	6	5	0	14	-	0	0	0	0	0	-	0	13	0	0	13	-	0	0	2	0	2	-	29
% Buses	1.9%	1.3%	2.9%	0%	1.8%	-	0% 0% 0%	0%	0%	-	-	0%	1.8%	0%	0%	1.7%	-	0%	0%	0.7%	0%	0.4%	-	1.3%	
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	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	1	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-

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

217891 (4B) Worcester Road EB Onramp @ Edgel... - TMC

Tue May 4, 2021

PM Peak (3:45 PM - 4:45 PM) - Overall Peak Hour

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

All Movements

ID: 833252, Location: 42.299831, -71.434404

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Edgell Road Southbound						Worcester Road EB Onramp Westbound						Main Street Northbound						High Street 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
2021-05-04 3:45PM	81	126	29	0	236	0	0	0	0	32	32	0	5	186	7	0	198	1	42	8	95	0	145	0	611
4:00PM	69	129	22	0	220	0	0	0	0	33	33	0	5	197	4	0	206	6	50	7	67	0	124	5	583
4:15PM	74	144	35	0	253	0	0	0	0	32	32	0	8	224	6	0	238	0	66	6	71	0	143	2	666
4:30PM	79	136	30	0	245	0	0	0	0	29	29	0	11	180	8	0	199	0	58	6	77	0	141	1	614
Total	303	535	116	0	954	0	0	0	0	126	126	0	29	787	25	0	841	7	216	27	310	0	553	8	2474
% Approach	31.8%	56.1%	12.2%	0%	-	-	0% 0% 0%	100%	-	-	-	3.4%	93.6%	3.0%	0%	-	-	39.1%	4.9%	56.1%	0%	-	-	-	
% Total	12.2%	21.6%	4.7%	0%	38.6%	-	0% 0% 0%	5.1%	5.1%	-	-	1.2%	31.8%	1.0%	0%	34.0%	-	8.7%	1.1%	12.5%	0%	22.4%	-	-	
PHF	0.935	0.929	0.829	-	0.943	-	-	-	-	0.955	0.955	-	0.659	0.878	0.781	-	0.883	-	0.818	0.844	0.816	-	0.953	-	0.929
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	300	502	114	0	916	-	0	0	0	121	121	-	28	762	25	0	815	-	201	26	301	0	528	-	2380
% Lights	99.0%	93.8%	98.3%	0%	96.0%	-	0% 0% 0%	96.0%	96.0%	-	-	96.6%	96.8%	100%	0%	96.9%	-	93.1%	96.3%	97.1%	0%	95.5%	-	96.2%	
Single-Unit Trucks	1	10	1	0	12	-	0	0	0	4	4	-	0	17	0	0	17	-	11	0	3	0	14	-	47
% Single-Unit Trucks	0.3%	1.9%	0.9%	0%	1.3%	-	0% 0% 0%	3.2%	3.2%	-	-	0%	2.2%	0%	0%	2.0%	-	5.1%	0%	1.0%	0%	2.5%	-	1.9%	
Articulated Trucks	0	2	0	0	2	-	0	0	0	0	0	-	1	4	0	0	5	-	3	0	1	0	4	-	11
% Articulated Trucks	0%	0.4%	0%	0%	0.2%	-	0% 0% 0%	0%	0%	-	-	3.4%	0.5%	0%	0%	0.6%	-	1.4%	0%	0.3%	0%	0.7%	-	0.4%	
Buses	2	21	1	0	24	-	0	0	0	1	1	-	0	4	0	0	4	-	1	1	5	0	7	-	36
% Buses	0.7%	3.9%	0.9%	0%	2.5%	-	0% 0% 0%	0.8%	0.8%	-	-	0%	0.5%	0%	0%	0.5%	-	0.5%	3.7%	1.6%	0%	1.3%	-	1.5%	
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	-	-	-	-	-	0	-	-	-	-	-	7	-	-	-	-	-	7	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	87.5%	
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	12.5%	

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

217891 (5) Route 9 @ Prospect Street TMC - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833255, Location: 42.298189, -71.422405

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

Leg Direction	Prospect Street Southbound						Worcester Road (Route 9) Westbound						Driveway Northbound						Worcester Road (Route 9) 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*	
2021-05-04 6:00AM	33	0	77	0	110	0	65	491	0	0	556	1	0	0	0	0	0	2	0	1380	71	10	1461	0	2127
7:00AM	129	0	181	0	310	0	147	999	0	0	1146	1	0	0	0	0	0	1	0	1787	170	45	2002	0	3458
8:00AM	159	0	233	0	392	0	175	1152	0	0	1327	1	0	0	0	0	0	1	0	1927	136	80	2143	0	3862
3:00PM	210	0	249	0	459	4	179	1754	0	0	1933	4	0	1	0	0	1	5	0	1436	147	127	1710	0	4103
4:00PM	189	0	201	0	390	2	126	1699	0	0	1825	6	1	1	3	0	5	9	2	1472	121	121	1716	0	3936
5:00PM	178	0	182	0	360	3	139	1692	0	0	1831	4	0	0	0	0	0	7	0	1493	180	107	1780	2	3971
Total	898	0	1123	0	2021	9	831	7787	0	0	8618	17	1	2	3	0	6	25	2	9495	825	490	10812	2	21457
% Approach	44.4%	0%	55.6%	0%	-	-	9.6%	90.4%	0%	0%	-	-	16.7%	33.3%	50.0%	0%	-	-	0%	87.8%	7.6%	4.5%	-	-	-
% Total	4.2%	0%	5.2%	0%	9.4%	-	3.9%	36.3%	0%	0%	40.2%	-	0%	0%	0%	0%	0%	-	0%	44.3%	3.8%	2.3%	50.4%	-	-
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%	0%	0%	0%	-	0%
Lights	875	0	1099	0	1974	-	818	7595	0	0	8413	-	1	2	3	0	6	-	2	9265	808	485	10560	-	20953
% Lights	97.4%	0%	97.9%	0%	97.7%	-	98.4%	97.5%	0%	0%	97.6%	-	100%	100%	100%	0%	100%	-	100%	97.6%	97.9%	99.0%	97.7%	-	97.7%
Single-Unit Trucks	15	0	15	0	30	-	10	140	0	0	150	-	0	0	0	0	0	-	0	178	8	3	189	-	369
% Single-Unit Trucks	1.7%	0%	1.3%	0%	1.5%	-	1.2%	1.8%	0%	0%	1.7%	-	0%	0%	0%	0%	0%	-	0%	1.9%	1.0%	0.6%	1.7%	-	1.7%
Articulated Trucks	1	0	1	0	2	-	0	27	0	0	27	-	0	0	0	0	0	-	0	24	0	2	26	-	55
% Articulated Trucks	0.1%	0%	0.1%	0%	0.1%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0.4%	0.2%	-	0.3%
Buses	7	0	8	0	15	-	3	25	0	0	28	-	0	0	0	0	0	-	0	25	9	0	34	-	77
% Buses	0.8%	0%	0.7%	0%	0.7%	-	0.4%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0.3%	1.1%	0%	0.3%	-	0.4%
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	-	-	-	-	-	9	-	-	-	-	-	13	-	-	-	-	-	18	-	-	-	-	-	2	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	76.5%	-	-	-	-	-	72.0%	-	-	-	-	-	100%	
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	7	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	23.5%	-	-	-	-	-	28.0%	-	-	-	-	-	0%	

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

217891 (5) Route 9 @ Prospect Street TMC - TMC

Tue May 4, 2021

AM Peak (7:45 AM - 8:45 AM)

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

All Movements

ID: 833255, Location: 42.298189, -71.422405

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Prospect Street Southbound						Worcester Road (Route 9) Westbound						Driveway Northbound						Worcester Road (Route 9) 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*	
2021-05-04 7:45AM	42	0	69	0	111	0	42	302	0	0	344	1	0	0	0	0	0	0	0	480	61	15	556	0	1011
8:00AM	34	0	67	0	101	0	38	297	0	0	335	0	0	0	0	0	0	0	0	501	32	19	552	0	988
8:15AM	45	0	50	0	95	0	47	268	0	0	315	1	0	0	0	0	0	0	0	463	30	30	523	0	933
8:30AM	42	0	57	0	99	0	44	282	0	0	326	0	0	0	0	0	0	0	0	468	34	10	512	0	937
Total	163	0	243	0	406	0	171	1149	0	0	1320	2	0	0	0	0	0	0	0	1912	157	74	2143	0	3869
% Approach	40.1%	0%	59.9%	0%	-	-	13.0%	87.0%	0%	0%	-	-	0%	0%	0%	0%	-	-	0%	89.2%	7.3%	3.5%	-	-	-
% Total	4.2%	0%	6.3%	0%	10.5%	-	4.4%	29.7%	0%	0%	34.1%	-	0%	0%	0%	0%	0%	-	0%	49.4%	4.1%	1.9%	55.4%	-	-
PHF	0.906	-	0.880	-	0.914	-	0.910	0.951	-	-	0.959	-	-	-	-	-	-	-	-	0.954	0.643	0.617	0.964	-	0.957
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%
Lights	155	0	237	0	392	-	167	1113	0	0	1280	-	0	0	0	0	0	-	0	1855	150	73	2078	-	3750
% Lights	95.1%	0%	97.5%	0%	96.6%	-	97.7%	96.9%	0%	0%	97.0%	-	0%	0%	0%	0%	-	-	0%	97.0%	95.5%	98.6%	97.0%	-	96.9%
Single-Unit Trucks	7	0	4	0	11	-	3	28	0	0	31	-	0	0	0	0	0	-	0	50	2	1	53	-	95
% Single-Unit Trucks	4.3%	0%	1.6%	0%	2.7%	-	1.8%	2.4%	0%	0%	2.3%	-	0%	0%	0%	0%	-	-	0%	2.6%	1.3%	1.4%	2.5%	-	2.5%
Articulated Trucks	0	0	1	0	1	-	0	2	0	0	2	-	0	0	0	0	0	-	0	2	0	0	2	-	5
% Articulated Trucks	0%	0%	0.4%	0%	0.2%	-	0%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	-	-	0%	0.1%	0%	0%	0.1%	-	0.1%
Buses	1	0	1	0	2	-	1	6	0	0	7	-	0	0	0	0	0	-	0	5	5	0	10	-	19
% Buses	0.6%	0%	0.4%	0%	0.5%	-	0.6%	0.5%	0%	0%	0.5%	-	0%	0%	0%	0%	-	-	0%	0.3%	3.2%	0%	0.5%	-	0.5%
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%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	-

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

217891 (5) Route 9 @ Prospect Street TMC - TMC

Tue May 4, 2021

PM Peak (3 PM - 4 PM) - Overall Peak Hour

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

All Movements

ID: 833255, Location: 42.298189, -71.422405

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Prospect Street Southbound						Worcester Road (Route 9) Westbound						Driveway Northbound						Worcester Road (Route 9) 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*	
2021-05-04 3:00PM	40	0	67	0	107	0	39	447	0	0	486	0	0	1	0	0	1	0	0	345	25	29	399	0	993
3:15PM	44	0	73	0	117	1	52	449	0	0	501	0	0	0	0	0	0	0	0	349	32	42	423	0	1041
3:30PM	55	0	53	0	108	1	48	402	0	0	450	4	0	0	0	0	0	4	0	362	44	28	434	0	992
3:45PM	71	0	56	0	127	2	40	456	0	0	496	0	0	0	0	0	0	1	0	380	46	28	454	0	1077
Total	210	0	249	0	459	4	179	1754	0	0	1933	4	0	1	0	0	1	5	0	1436	147	127	1710	0	4103
% Approach	45.8%	0%	54.2%	0%	-	-	9.3%	90.7%	0%	0%	-	-	0%	100%	0%	0%	-	-	0%	84.0%	8.6%	7.4%	-	-	-
% Total	5.1%	0%	6.1%	0%	11.2%	-	4.4%	42.7%	0%	0%	47.1%	-	0%	0%	0%	0%	0%	-	0%	35.0%	3.6%	3.1%	41.7%	-	-
PHF	0.739	-	0.853	-	0.904	-	0.861	0.962	-	-	0.965	-	-	0.250	-	-	0.250	-	-	0.945	0.799	0.756	0.942	-	0.952
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	1	-	1
% 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	204	0	245	0	449	-	177	1726	0	0	1903	-	0	1	0	0	1	-	0	1402	145	126	1673	-	4026
% Lights	97.1%	0%	98.4%	0%	97.8%	-	98.9%	98.4%	0%	0%	98.4%	-	0%	100%	0%	0%	100%	-	0%	97.6%	98.6%	99.2%	97.8%	-	98.1%
Single-Unit Trucks	3	0	1	0	4	-	1	22	0	0	23	-	0	0	0	0	0	-	0	20	1	1	22	-	49
% Single-Unit Trucks	1.4%	0%	0.4%	0%	0.9%	-	0.6%	1.3%	0%	0%	1.2%	-	0%	0%	0%	0%	0%	-	0%	1.4%	0.7%	0.8%	1.3%	-	1.2%
Articulated Trucks	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	0	5	0	0	5	-	8
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0.2%
Buses	3	0	3	0	6	-	1	3	0	0	4	-	0	0	0	0	0	-	0	8	1	0	9	-	19
% Buses	1.4%	0%	1.2%	0%	1.3%	-	0.6%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0.6%	0.7%	0%	0.5%	-	0.5%
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	-	-	-	-	-	4	-	-	-	-	-	5	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	-

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

217891 (6) Route 9 @ Cochituate Road TMC - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833256, Location: 42.298071, -71.413953

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

Leg Direction	Cochituate Road Southbound					Worcester Road (Route 9) Westbound					Worcester Road (Route 9) Eastbound					Int
	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	
2021-05-04 6:00AM	121	0	0	121	1	4	440	0	444	0	0	0	0	0	0	565
7:00AM	274	0	0	274	0	8	880	0	888	0	0	0	0	0	0	1162
8:00AM	308	0	0	308	0	11	1035	0	1046	1	0	0	0	0	0	1354
3:00PM	357	0	0	357	3	35	1454	0	1489	0	0	0	0	0	0	1846
4:00PM	348	0	0	348	1	17	1393	0	1410	0	0	0	0	0	0	1758
5:00PM	351	0	0	351	3	27	1428	0	1455	0	0	0	0	0	0	1806
Total	1759	0	0	1759	8	102	6630	0	6732	1	0	0	0	0	0	8491
% Approach	100%	0%	0%	-	-	1.5%	98.5%	0%	-	-	0%	0%	0%	-	-	-
% Total	20.7%	0%	0%	20.7%	-	1.2%	78.1%	0%	79.3%	-	0%	0%	0%	0%	-	-
Motorcycles	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%
Lights	1699	0	0	1699	-	96	6480	0	6576	-	0	0	0	0	-	8275
% Lights	96.6%	0%	0%	96.6%	-	94.1%	97.7%	0%	97.7%	-	0%	0%	0%	-	-	97.5%
Single-Unit Trucks	49	0	0	49	-	5	114	0	119	-	0	0	0	0	-	168
% Single-Unit Trucks	2.8%	0%	0%	2.8%	-	4.9%	1.7%	0%	1.8%	-	0%	0%	0%	-	-	2.0%
Articulated Trucks	8	0	0	8	-	0	16	0	16	-	0	0	0	0	-	24
% Articulated Trucks	0.5%	0%	0%	0.5%	-	0%	0.2%	0%	0.2%	-	0%	0%	0%	-	-	0.3%
Buses	3	0	0	3	-	1	20	0	21	-	0	0	0	0	-	24
% Buses	0.2%	0%	0%	0.2%	-	1.0%	0.3%	0%	0.3%	-	0%	0%	0%	-	-	0.3%
Bicycles on Road	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%
Pedestrians	-	-	-	-	8	-	-	-	-	1	-	-	-	-	-	0
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-

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

217891 (6) Route 9 @ Cochituate Road TMC - TMC

Tue May 4, 2021

AM Peak (7:45 AM - 8:45 AM)

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

All Movements

ID: 833256, Location: 42.298071, -71.413953

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

Leg Direction	Cochituate Road Southbound					Worcester Road (Route 9) Westbound					Worcester Road (Route 9) Eastbound					Int
	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	
2021-05-04 7:45AM	86	0	0	86	0	4	264	0	268	0	0	0	0	0	0	354
8:00AM	89	0	0	89	0	3	261	0	264	1	0	0	0	0	0	353
8:15AM	70	0	0	70	0	4	237	0	241	0	0	0	0	0	0	311
8:30AM	65	0	0	65	0	3	271	0	274	0	0	0	0	0	0	339
Total	310	0	0	310	0	14	1033	0	1047	1	0	0	0	0	0	1357
% Approach	100%	0%	0%	-	-	1.3%	98.7%	0%	-	-	0%	0%	0%	-	-	-
% Total	22.8%	0%	0%	22.8%	-	1.0%	76.1%	0%	77.2%	-	0%	0%	0%	0%	-	-
PHF	0.871	-	-	0.871	-	0.875	0.953	-	0.955	-	-	-	-	-	-	0.958
Motorcycles	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%
Lights	296	0	0	296	-	13	996	0	1009	-	0	0	0	0	-	1305
% Lights	95.5%	0%	0%	95.5%	-	92.9%	96.4%	0%	96.4%	-	0%	0%	0%	-	-	96.2%
Single-Unit Trucks	10	0	0	10	-	1	28	0	29	-	0	0	0	0	-	39
% Single-Unit Trucks	3.2%	0%	0%	3.2%	-	7.1%	2.7%	0%	2.8%	-	0%	0%	0%	-	-	2.9%
Articulated Trucks	1	0	0	1	-	0	2	0	2	-	0	0	0	0	-	3
% Articulated Trucks	0.3%	0%	0%	0.3%	-	0%	0.2%	0%	0.2%	-	0%	0%	0%	-	-	0.2%
Buses	3	0	0	3	-	0	7	0	7	-	0	0	0	0	-	10
% Buses	1.0%	0%	0%	1.0%	-	0%	0.7%	0%	0.7%	-	0%	0%	0%	-	-	0.7%
Bicycles on Road	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%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

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

217891 (6) Route 9 @ Cochituate Road TMC - TMC

Tue May 4, 2021

PM Peak (3 PM - 4 PM) - Overall Peak Hour

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

All Movements

ID: 833256, Location: 42.298071, -71.413953

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

Leg Direction	Cochituate Road Southbound					Worcester Road (Route 9) Westbound					Worcester Road (Route 9) Eastbound					Int	
	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*		
Time																	
2021-05-04 3:00PM	84	0	0	84	0	7	368	0	375	0	0	0	0	0	0	0	459
3:15PM	99	0	0	99	0	9	353	0	362	0	0	0	0	0	0	0	461
3:30PM	88	0	0	88	0	13	374	0	387	0	0	0	0	0	0	0	475
3:45PM	86	0	0	86	3	6	359	0	365	0	0	0	0	0	0	0	451
Total	357	0	0	357	3	35	1454	0	1489	0	0	0	0	0	0	0	1846
% Approach	100%	0%	0%	-	-	2.4%	97.6%	0%	-	-	0%	0%	0%	0%	-	-	-
% Total	19.3%	0%	0%	19.3%	-	1.9%	78.8%	0%	80.7%	-	0%	0%	0%	0%	0%	-	-
PHF	0.902	-	-	0.902	-	0.673	0.972	-	0.962	-	-	-	-	-	-	-	0.972
Motorcycles	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%
Lights	346	0	0	346	-	33	1432	0	1465	-	0	0	0	0	0	-	1811
% Lights	96.9%	0%	0%	96.9%	-	94.3%	98.5%	0%	98.4%	-	0%	0%	0%	0%	-	-	98.1%
Single-Unit Trucks	8	0	0	8	-	2	19	0	21	-	0	0	0	0	0	-	29
% Single-Unit Trucks	2.2%	0%	0%	2.2%	-	5.7%	1.3%	0%	1.4%	-	0%	0%	0%	0%	-	-	1.6%
Articulated Trucks	3	0	0	3	-	0	0	0	0	-	0	0	0	0	0	-	3
% Articulated Trucks	0.8%	0%	0%	0.8%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	-	0.2%
Buses	0	0	0	0	-	0	3	0	3	-	0	0	0	0	0	-	3
% Buses	0%	0%	0%	0%	-	0%	0.2%	0%	0.2%	-	0%	0%	0%	0%	-	-	0.2%
Bicycles on Road	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%
Pedestrians	-	-	-	-	3	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-

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

217891 (7A) Beacon Street @ Fairbanks Street... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833258, Location: 42.299433, -71.408926

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction Time	Beacon Street Southbound					Fairbanks Street Westbound					Beacon Street Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2021-05-04 6:00AM	4	73	0	77	0	28	33	0	61	0	62	9	0	71	0	209
7:00AM	19	121	0	140	2	65	56	0	121	0	121	33	0	154	0	415
8:00AM	31	120	0	151	1	103	82	0	185	0	115	18	0	133	0	469
3:00PM	33	98	0	131	0	121	86	0	207	0	230	82	0	312	0	650
4:00PM	23	102	1	126	0	166	61	0	227	0	231	100	0	331	0	684
5:00PM	26	99	0	125	2	130	58	1	189	0	263	108	0	371	0	685
Total	136	613	1	750	5	613	376	1	990	0	1022	350	0	1372	0	3112
% Approach	18.1%	81.7%	0.1%	-	-	61.9%	38.0%	0.1%	-	-	74.5%	25.5%	0%	-	-	-
% Total	4.4%	19.7%	0%	24.1%	-	19.7%	12.1%	0%	31.8%	-	32.8%	11.2%	0%	44.1%	-	-
Motorcycles	0	0	0	0	-	0	0	0	0	-	1	0	0	1	-	1
% Motorcycles	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.1%	0%	0%	0.1%	-	0%
Lights	130	587	1	718	-	589	368	1	958	-	982	343	0	1325	-	3001
% Lights	95.6%	95.8%	100%	95.7%	-	96.1%	97.9%	100%	96.8%	-	96.1%	98.0%	0%	96.6%	-	96.4%
Single-Unit Trucks	3	14	0	17	-	8	6	0	14	-	16	2	0	18	-	49
% Single-Unit Trucks	2.2%	2.3%	0%	2.3%	-	1.3%	1.6%	0%	1.4%	-	1.6%	0.6%	0%	1.3%	-	1.6%
Articulated Trucks	1	0	0	1	-	3	0	0	3	-	0	1	0	1	-	5
% Articulated Trucks	0.7%	0%	0%	0.1%	-	0.5%	0%	0%	0.3%	-	0%	0.3%	0%	0.1%	-	0.2%
Buses	2	12	0	14	-	13	2	0	15	-	23	4	0	27	-	56
% Buses	1.5%	2.0%	0%	1.9%	-	2.1%	0.5%	0%	1.5%	-	2.3%	1.1%	0%	2.0%	-	1.8%
Bicycles on Road	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%
Pedestrians	-	-	-	-	5	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-

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

217891 (7A) Beacon Street @ Fairbanks Street... - TMC

Tue May 4, 2021

AM Peak (7:30 AM - 8:30 AM)

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

All Movements

ID: 833258, Location: 42.299433, -71.408926

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Beacon Street Southbound					Fairbanks Street Westbound					Beacon Street Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2021-05-04 7:30AM	5	29	0	34	1	19	14	0	33	0	30	14	0	44	0	111
7:45AM	7	51	0	58	0	26	16	0	42	0	44	10	0	54	0	154
8:00AM	5	36	0	41	0	31	29	0	60	0	29	1	0	30	0	131
8:15AM	8	43	0	51	0	25	15	0	40	0	24	10	0	34	0	125
Total	25	159	0	184	1	101	74	0	175	0	127	35	0	162	0	521
% Approach	13.6%	86.4%	0%	-	-	57.7%	42.3%	0%	-	-	78.4%	21.6%	0%	-	-	-
% Total	4.8%	30.5%	0%	35.3%	-	19.4%	14.2%	0%	33.6%	-	24.4%	6.7%	0%	31.1%	-	-
PHF	0.781	0.779	-	0.793	-	0.815	0.638	-	0.729	-	0.722	0.625	-	0.750	-	0.846
Motorcycles	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%
Lights	25	153	0	178	-	98	71	0	169	-	121	33	0	154	-	501
% Lights	100%	96.2%	0%	96.7%	-	97.0%	95.9%	0%	96.6%	-	95.3%	94.3%	0%	95.1%	-	96.2%
Single-Unit Trucks	0	2	0	2	-	1	2	0	3	-	1	1	0	2	-	7
% Single-Unit Trucks	0%	1.3%	0%	1.1%	-	1.0%	2.7%	0%	1.7%	-	0.8%	2.9%	0%	1.2%	-	1.3%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses	0	4	0	4	-	2	1	0	3	-	5	1	0	6	-	13
% Buses	0%	2.5%	0%	2.2%	-	2.0%	1.4%	0%	1.7%	-	3.9%	2.9%	0%	3.7%	-	2.5%
Bicycles on Road	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%
Pedestrians	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-

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

217891 (7A) Beacon Street @ Fairbanks Street... - TMC

Tue May 4, 2021

PM Peak (3:30 PM - 4:30 PM) - Overall Peak Hour

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

All Movements

ID: 833258, Location: 42.299433, -71.408926

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Beacon Street Southbound					Fairbanks Street Westbound					Beacon Street Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2021-05-04 3:30PM	9	20	0	29	0	26	19	0	45	0	62	25	0	87	0	161
3:45PM	11	33	0	44	0	35	27	0	62	0	59	14	0	73	0	179
4:00PM	7	32	0	39	0	50	18	0	68	0	50	25	0	75	0	182
4:15PM	5	19	1	25	0	48	17	0	65	0	70	32	0	102	0	192
Total	32	104	1	137	0	159	81	0	240	0	241	96	0	337	0	714
% Approach	23.4%	75.9%	0.7%	-	-	66.3%	33.8%	0%	-	-	71.5%	28.5%	0%	-	-	-
% Total	4.5%	14.6%	0.1%	19.2%	-	22.3%	11.3%	0%	33.6%	-	33.8%	13.4%	0%	47.2%	-	-
PHF	0.727	0.788	0.250	0.778	-	0.795	0.750	-	0.882	-	0.861	0.750	-	0.826	-	0.930
Motorcycles	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%
Lights	31	94	1	126	-	155	81	0	236	-	230	95	0	325	-	687
% Lights	96.9%	90.4%	100%	92.0%	-	97.5%	100%	0%	98.3%	-	95.4%	99.0%	0%	96.4%	-	96.2%
Single-Unit Trucks	0	5	0	5	-	3	0	0	3	-	5	0	0	5	-	13
% Single-Unit Trucks	0%	4.8%	0%	3.6%	-	1.9%	0%	0%	1.3%	-	2.1%	0%	0%	1.5%	-	1.8%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses	1	5	0	6	-	1	0	0	1	-	6	1	0	7	-	14
% Buses	3.1%	4.8%	0%	4.4%	-	0.6%	0%	0%	0.4%	-	2.5%	1.0%	0%	2.1%	-	2.0%
Bicycles on Road	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%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

217891 (7B) Concord Street @ Fairbanks Stree... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833262, Location: 42.299526, -71.407988

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Fairbanks Street 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*	
2021-05-04 6:00AM	15	338	0	0	353	0	0	0	0	0	0	1	99	704	61	0	864	0	138	0	2	0	140	2	1357
7:00AM	31	626	0	0	657	0	0	0	0	0	0	0	151	1018	111	0	1280	0	237	0	2	0	239	0	2176
8:00AM	60	630	0	0	690	1	0	0	0	0	0	0	166	879	162	0	1207	0	261	1	6	0	268	2	2165
3:00PM	81	778	0	0	859	0	0	0	0	0	0	2	161	795	176	0	1132	0	359	1	7	0	367	11	2358
4:00PM	78	905	0	0	983	0	0	0	0	0	0	1	106	844	186	0	1136	0	346	1	7	0	354	5	2473
5:00PM	61	897	0	0	958	1	0	0	0	0	0	1	118	803	180	0	1101	0	375	0	7	0	382	5	2441
Total	326	4174	0	0	4500	2	0	0	0	0	0	5	801	5043	876	0	6720	0	1716	3	31	0	1750	25	12970
% Approach	7.2%	92.8%	0%	0%	-	-	0%	0%	0%	0%	-	-	11.9%	75.0%	13.0%	0%	-	-	98.1%	0.2%	1.8%	0%	-	-	-
% Total	2.5%	32.2%	0%	0%	34.7%	-	0%	0%	0%	0%	0%	-	6.2%	38.9%	6.8%	0%	51.8%	-	13.2%	0%	0.2%	0%	13.5%	-	-
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1	0	0	0	1	-	1
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0.1%	0%	0%	0%	0.1%	-	0%
Lights	319	4021	0	0	4340	-	0	0	0	0	0	-	774	4848	851	0	6473	-	1650	3	30	0	1683	-	12496
% Lights	97.9%	96.3%	0%	0%	96.4%	-	0%	0%	0%	0%	-	-	96.6%	96.1%	97.1%	0%	96.3%	-	96.2%	100%	96.8%	0%	96.2%	-	96.3%
Single-Unit Trucks	4	75	0	0	79	-	0	0	0	0	0	-	19	119	11	0	149	-	25	0	0	0	25	-	253
% Single-Unit Trucks	1.2%	1.8%	0%	0%	1.8%	-	0%	0%	0%	0%	-	-	2.4%	2.4%	1.3%	0%	2.2%	-	1.5%	0%	0%	0%	1.4%	-	2.0%
Articulated Trucks	1	35	0	0	36	-	0	0	0	0	0	-	5	25	2	0	32	-	1	0	0	0	1	-	69
% Articulated Trucks	0.3%	0.8%	0%	0%	0.8%	-	0%	0%	0%	0%	-	-	0.6%	0.5%	0.2%	0%	0.5%	-	0.1%	0%	0%	0%	0.1%	-	0.5%
Buses	2	43	0	0	45	-	0	0	0	0	0	-	3	49	12	0	64	-	38	0	1	0	39	-	148
% Buses	0.6%	1.0%	0%	0%	1.0%	-	0%	0%	0%	0%	-	-	0.4%	1.0%	1.4%	0%	1.0%	-	2.2%	0%	3.2%	0%	2.2%	-	1.1%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	2	0	0	2	-	1	0	0	0	1	-	3
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0.1%	0%	0%	0%	0.1%	-	0%
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	5	-	-	-	-	-	0	-	-	-	-	-	-	21
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	84.0%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	4
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	16.0%

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

217891 (7B) Concord Street @ Fairbanks Stree... - TMC

Tue May 4, 2021

AM Peak (7:15 AM - 8:15 AM)

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

All Movements

ID: 833262, Location: 42.299526, -71.407988

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Fairbanks Street 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*	
Time																									
2021-05-04 7:15AM	9	161	0	0	170	0	0	0	0	0	0	0	38	243	22	0	303	0	53	0	1	0	54	0	527
7:30AM	11	156	0	0	167	0	0	0	0	0	0	0	43	261	26	0	330	0	59	0	1	0	60	0	557
7:45AM	6	182	0	0	188	0	0	0	0	0	0	0	36	243	40	0	319	0	84	0	0	0	84	0	591
8:00AM	20	145	0	0	165	0	0	0	0	0	0	0	46	230	48	0	324	0	77	0	0	0	77	1	566
Total	46	644	0	0	690	0	0	0	0	0	0	0	163	977	136	0	1276	0	273	0	2	0	275	1	2241
% Approach	6.7%	93.3%	0%	0%	-	-	0%	0%	0%	0%	-	-	12.8%	76.6%	10.7%	0%	-	-	99.3%	0%	0.7%	0%	-	-	-
% Total	2.1%	28.7%	0%	0%	30.8%	-	0%	0%	0%	0%	0%	-	7.3%	43.6%	6.1%	0%	56.9%	-	12.2%	0%	0.1%	0%	12.3%	-	-
PHF	0.575	0.885	-	-	0.918	-	-	-	-	-	-	-	0.886	0.936	0.708	-	0.967	-	0.813	-	0.500	-	0.818	-	0.948
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%
Lights	44	608	0	0	652	-	0	0	0	0	0	-	155	919	131	0	1205	-	259	0	2	0	261	-	2118
% Lights	95.7%	94.4%	0%	0%	94.5%	-	0%	0%	0%	0%	-	-	95.1%	94.1%	96.3%	0%	94.4%	-	94.9%	0%	100%	0%	94.9%	-	94.5%
Single-Unit Trucks	1	16	0	0	17	-	0	0	0	0	0	-	6	39	3	0	48	-	5	0	0	0	5	-	70
% Single-Unit Trucks	2.2%	2.5%	0%	0%	2.5%	-	0%	0%	0%	0%	-	-	3.7%	4.0%	2.2%	0%	3.8%	-	1.8%	0%	0%	0%	1.8%	-	3.1%
Articulated Trucks	0	4	0	0	4	-	0	0	0	0	0	-	1	6	0	0	7	-	0	0	0	0	0	-	11
% Articulated Trucks	0%	0.6%	0%	0%	0.6%	-	0%	0%	0%	0%	-	-	0.6%	0.6%	0%	0%	0.5%	-	0%	0%	0%	0%	0%	-	0.5%
Buses	1	16	0	0	17	-	0	0	0	0	0	-	1	13	2	0	16	-	9	0	0	0	9	-	42
% Buses	2.2%	2.5%	0%	0%	2.5%	-	0%	0%	0%	0%	-	-	0.6%	1.3%	1.5%	0%	1.3%	-	3.3%	0%	0%	0%	3.3%	-	1.9%
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%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

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

217891 (7B) Concord Street @ Fairbanks Stree... - TMC

Tue May 4, 2021

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

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

All Movements

ID: 833262, Location: 42.299526, -71.407988

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Fairbanks Street 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*	
2021-05-04 4:15PM	19	215	0	0	234	0	0	0	0	0	0	0	26	219	53	0	298	0	83	1	0	0	84	0	616
4:30PM	20	240	0	0	260	0	0	0	0	0	0	1	29	199	38	0	266	0	85	0	1	0	86	5	612
4:45PM	15	237	0	0	252	0	0	0	0	0	0	0	18	220	45	0	283	0	93	0	3	0	96	0	631
5:00PM	14	244	0	0	258	0	0	0	0	0	0	1	41	228	47	0	316	0	84	0	4	0	88	0	662
Total	68	936	0	0	1004	0	0	0	0	0	0	2	114	866	183	0	1163	0	345	1	8	0	354	5	2521
% Approach	6.8%	93.2%	0%	0%	-	-	0%	0%	0%	0%	-	-	9.8%	74.5%	15.7%	0%	-	-	97.5%	0.3%	2.3%	0%	-	-	-
% Total	2.7%	37.1%	0%	0%	39.8%	-	0%	0%	0%	0%	0%	-	4.5%	34.4%	7.3%	0%	46.1%	-	13.7%	0%	0.3%	0%	14.0%	-	-
PHF	0.850	0.959	-	-	0.965	-	-	-	-	-	-	-	0.695	0.950	0.863	-	0.920	-	0.927	0.250	0.500	-	0.922	-	0.952
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1	0	0	0	1	-	1
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0.3%	0%	0%	0%	0.3%	-	0%
Lights	67	911	0	0	978	-	0	0	0	0	0	-	113	850	178	0	1141	-	332	1	8	0	341	-	2460
% Lights	98.5%	97.3%	0%	0%	97.4%	-	0%	0%	0%	0%	-	-	99.1%	98.2%	97.3%	0%	98.1%	-	96.2%	100%	100%	0%	96.3%	-	97.6%
Single-Unit Trucks	0	14	0	0	14	-	0	0	0	0	0	-	1	8	2	0	11	-	6	0	0	0	6	-	31
% Single-Unit Trucks	0%	1.5%	0%	0%	1.4%	-	0%	0%	0%	0%	-	-	0.9%	0.9%	1.1%	0%	0.9%	-	1.7%	0%	0%	0%	1.7%	-	1.2%
Articulated Trucks	1	7	0	0	8	-	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	11
% Articulated Trucks	1.5%	0.7%	0%	0%	0.8%	-	0%	0%	0%	0%	-	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0.4%
Buses	0	4	0	0	4	-	0	0	0	0	0	-	0	5	3	0	8	-	6	0	0	0	6	-	18
% Buses	0%	0.4%	0%	0%	0.4%	-	0%	0%	0%	0%	-	-	0%	0.6%	1.6%	0%	0.7%	-	1.7%	0%	0%	0%	1.7%	-	0.7%
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%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	5	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	0%	-

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

217891 (7C) Route 9 @ Concord Street Ramps T... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833265, Location: 42.298245, -71.408229

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

Leg Direction	Concord Street Ramp Southbound						Worcester Road (Route 9) Westbound						Concor Street Ramp Northbound						Worcester Road (Route 9) 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*	
2021-05-04 6:00AM	97	0	0	0	97	0	8	373	0	0	381	0	99	0	0	0	99	0	200	1173	0	0	1373	0	1950
7:00AM	154	0	0	0	154	0	6	831	0	0	837	0	127	0	0	0	127	0	325	1497	0	1	1823	0	2941
8:00AM	179	0	0	0	179	0	10	898	0	0	908	0	178	0	0	0	178	1	413	1618	0	0	2031	0	3296
3:00PM	165	0	0	0	165	1	23	1634	0	0	1657	0	194	0	0	0	194	0	354	1452	0	0	1806	0	3822
4:00PM	112	0	0	0	112	2	27	1563	0	0	1590	0	220	0	0	0	220	1	328	1403	0	0	1731	0	3653
5:00PM	120	0	0	0	120	2	27	1583	0	0	1610	0	205	0	1	0	206	1	305	1404	0	0	1709	0	3645
Total	827	0	0	0	827	5	101	6882	0	0	6983	0	1023	0	1	0	1024	3	1925	8547	0	1	10473	0	19307
% Approach	100%	0%	0%	0%	-	-	1.4%	98.6%	0%	0%	-	-	99.9%	0%	0.1%	0%	-	-	18.4%	81.6%	0%	0%	-	-	-
% Total	4.3%	0%	0%	0%	4.3%	-	0.5%	35.6%	0%	0%	36.2%	-	5.3%	0%	0%	0%	5.3%	-	10.0%	44.3%	0%	0%	54.2%	-	-
Motorcycles	0	0	0	0	0	-	0	1	0	0	1	-	1	0	0	0	1	-	0	1	0	0	1	-	3
% Motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%	0%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%
Lights	797	0	0	0	797	-	96	6730	0	0	6826	-	994	0	1	0	995	-	1862	8365	0	0	10227	-	18845
% Lights	96.4%	0%	0%	0%	96.4%	-	95.0%	97.8%	0%	0%	97.8%	-	97.2%	0%	100%	0%	97.2%	-	96.7%	97.9%	0%	0%	97.7%	-	97.6%
Single-Unit Trucks	18	0	0	0	18	-	3	95	0	0	98	-	18	0	0	0	18	-	50	128	0	1	179	-	313
% Single-Unit Trucks	2.2%	0%	0%	0%	2.2%	-	3.0%	1.4%	0%	0%	1.4%	-	1.8%	0%	0%	0%	1.8%	-	2.6%	1.5%	0%	100%	1.7%	-	1.6%
Articulated Trucks	8	0	0	0	8	-	1	13	0	0	14	-	2	0	0	0	2	-	9	28	0	0	37	-	61
% Articulated Trucks	1.0%	0%	0%	0%	1.0%	-	1.0%	0.2%	0%	0%	0.2%	-	0.2%	0%	0%	0%	0.2%	-	0.5%	0.3%	0%	0%	0.4%	-	0.3%
Buses	4	0	0	0	4	-	1	42	0	0	43	-	8	0	0	0	8	-	4	23	0	0	27	-	82
% Buses	0.5%	0%	0%	0%	0.5%	-	1.0%	0.6%	0%	0%	0.6%	-	0.8%	0%	0%	0%	0.8%	-	0.2%	0.3%	0%	0%	0.3%	-	0.4%
Bicycles on Road	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	2	0	0	2	-	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%
Pedestrians	-	-	-	-	-	5	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	66.7%	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	33.3%	-	-	-	-	-	-	-	-

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

217891 (7C) Route 9 @ Concord Street Ramps T... - TMC

Tue May 4, 2021

AM Peak (8 AM - 9 AM)

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

All Movements

ID: 833265, Location: 42.298245, -71.408229

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

Leg Direction	Concord Street Ramp Southbound						Worcester Road (Route 9) Westbound						Concor Street Ramp Northbound						Worceseter Road (Route 9) 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*	
2021-05-04 8:00AM	49	0	0	0	49	0	2	212	0	0	214	0	35	0	0	0	35	0	86	439	0	0	525	0	823
8:15AM	50	0	0	0	50	0	1	200	0	0	201	0	47	0	0	0	47	0	97	405	0	0	502	0	800
8:30AM	36	0	0	0	36	0	1	250	0	0	251	0	40	0	0	0	40	0	107	386	0	0	493	0	820
8:45AM	44	0	0	0	44	0	6	236	0	0	242	0	56	0	0	0	56	1	123	388	0	0	511	0	853
Total	179	0	0	0	179	0	10	898	0	0	908	0	178	0	0	0	178	1	413	1618	0	0	2031	0	3296
% Approach	100%	0%	0%	0%	-	-	1.1%	98.9%	0%	0%	-	-	100%	0%	0%	0%	-	-	20.3%	79.7%	0%	0%	-	-	-
% Total	5.4%	0%	0%	0%	5.4%	-	0.3%	27.2%	0%	0%	27.5%	-	5.4%	0%	0%	0%	5.4%	-	12.5%	49.1%	0%	0%	61.6%	-	-
PHF	0.895	-	-	-	0.895	-	0.417	0.898	-	-	0.904	-	0.795	-	-	-	0.795	-	0.839	0.921	-	-	0.967	-	0.966
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	170	0	0	0	170	-	10	858	0	0	868	-	171	0	0	0	171	-	396	1562	0	0	1958	-	3167
% Lights	95.0%	0%	0%	0%	95.0%	-	100%	95.5%	0%	0%	95.6%	-	96.1%	0%	0%	0%	96.1%	-	95.9%	96.5%	0%	0%	96.4%	-	96.1%
Single-Unit Trucks	4	0	0	0	4	-	0	26	0	0	26	-	3	0	0	0	3	-	11	42	0	0	53	-	86
% Single-Unit Trucks	2.2%	0%	0%	0%	2.2%	-	0%	2.9%	0%	0%	2.9%	-	1.7%	0%	0%	0%	1.7%	-	2.7%	2.6%	0%	0%	2.6%	-	2.6%
Articulated Trucks	2	0	0	0	2	-	0	4	0	0	4	-	2	0	0	0	2	-	3	12	0	0	15	-	23
% Articulated Trucks	1.1%	0%	0%	0%	1.1%	-	0%	0.4%	0%	0%	0.4%	-	1.1%	0%	0%	0%	1.1%	-	0.7%	0.7%	0%	0%	0.7%	-	0.7%
Buses	3	0	0	0	3	-	0	10	0	0	10	-	2	0	0	0	2	-	3	2	0	0	5	-	20
% Buses	1.7%	0%	0%	0%	1.7%	-	0%	1.1%	0%	0%	1.1%	-	1.1%	0%	0%	0%	1.1%	-	0.7%	0.1%	0%	0%	0.2%	-	0.6%
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	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

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

217891 (7C) Route 9 @ Concord Street Ramps T... - TMC

Tue May 4, 2021

PM Peak (3 PM - 4 PM) - Overall Peak Hour

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

All Movements

ID: 833265, Location: 42.298245, -71.408229

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

Leg Direction	Concord Street Ramp Southbound						Worcester Road (Route 9) Westbound						Concor Street Ramp Northbound						Worcester Road (Route 9) 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*	
2021-05-04 3:00PM	50	0	0	0	50	0	7	413	0	0	420	0	50	0	0	0	50	0	89	359	0	0	448	0	968
3:15PM	36	0	0	0	36	1	3	394	0	0	397	0	44	0	0	0	44	0	89	344	0	0	433	0	910
3:30PM	38	0	0	0	38	0	7	431	0	0	438	0	56	0	0	0	56	0	95	371	0	0	466	0	998
3:45PM	41	0	0	0	41	0	6	396	0	0	402	0	44	0	0	0	44	0	81	378	0	0	459	0	946
Total	165	0	0	0	165	1	23	1634	0	0	1657	0	194	0	0	0	194	0	354	1452	0	0	1806	0	3822
% Approach	100%	0%	0%	0%	-	-	1.4%	98.6%	0%	0%	-	-	100%	0%	0%	0%	-	-	19.6%	80.4%	0%	0%	-	-	-
% Total	4.3%	0%	0%	0%	4.3%	-	0.6%	42.8%	0%	0%	43.4%	-	5.1%	0%	0%	0%	5.1%	-	9.3%	38.0%	0%	0%	47.3%	-	-
PHF	0.825	-	-	-	0.825	-	0.821	0.948	-	-	0.946	-	0.866	-	-	-	0.866	-	0.932	0.960	-	-	0.969	-	0.957
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	160	0	0	0	160	-	22	1606	0	0	1628	-	189	0	0	0	189	-	340	1426	0	0	1766	-	3743
% Lights	97.0%	0%	0%	0%	97.0%	-	95.7%	98.3%	0%	0%	98.2%	-	97.4%	0%	0%	0%	97.4%	-	96.0%	98.2%	0%	0%	97.8%	-	97.9%
Single-Unit Trucks	4	0	0	0	4	-	1	19	0	0	20	-	4	0	0	0	4	-	13	15	0	0	28	-	56
% Single-Unit Trucks	2.4%	0%	0%	0%	2.4%	-	4.3%	1.2%	0%	0%	1.2%	-	2.1%	0%	0%	0%	2.1%	-	3.7%	1.0%	0%	0%	1.6%	-	1.5%
Articulated Trucks	1	0	0	0	1	-	0	1	0	0	1	-	0	0	0	0	0	-	1	2	0	0	3	-	5
% Articulated Trucks	0.6%	0%	0%	0%	0.6%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0.3%	0.1%	0%	0%	0.2%	-	0.1%
Buses	0	0	0	0	0	-	0	8	0	0	8	-	1	0	0	0	1	-	0	9	0	0	9	-	18
% Buses	0%	0%	0%	0%	0%	-	0%	0.5%	0%	0%	0.5%	-	0.5%	0%	0%	0%	0.5%	-	0%	0.6%	0%	0%	0.5%	-	0.5%
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	-	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-		
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-		
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

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

217891 (7D) Concord Street @ Concord Street ... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833269, Location: 42.296902, -71.409146

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Worcester Road EB Offramp 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*	
2021-05-04 6:00AM	43	433	0	0	476	0	199	0	1	0	200	0	0	674	0	0	674	0	58	0	0	0	58	3	1408
7:00AM	70	786	0	0	856	1	345	0	0	0	345	0	0	931	0	0	931	0	83	0	0	0	83	1	2215
8:00AM	85	810	0	0	895	0	409	0	0	0	409	0	0	795	0	0	795	0	116	0	0	0	116	3	2215
3:00PM	108	1036	0	0	1144	0	356	0	0	0	356	1	0	769	0	0	769	1	141	0	4	0	145	17	2414
4:00PM	109	1154	0	0	1263	0	333	0	0	0	333	0	0	781	0	0	781	0	155	0	0	0	155	10	2532
5:00PM	114	1153	0	0	1267	0	307	0	0	0	307	0	0	790	0	0	790	1	128	0	0	0	128	11	2492
Total	529	5372	0	0	5901	1	1949	0	1	0	1950	1	0	4740	0	0	4740	2	681	0	4	0	685	45	13276
% Approach	9.0%	91.0%	0%	0%	-	-	99.9%	0%	0.1%	0%	-	-	0%	100%	0%	0%	-	-	99.4%	0%	0.6%	0%	-	-	-
% Total	4.0%	40.5%	0%	0%	44.4%	-	14.7%	0%	0%	0%	14.7%	-	0%	35.7%	0%	0%	35.7%	-	5.1%	0%	0%	0%	5.2%	-	-
Motorcycles	0	1	0	0	1	-	0	0	0	0	0	-	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	521	5150	0	0	5671	-	1894	0	1	0	1895	-	0	4555	0	0	4555	-	657	0	4	0	661	-	12782
% Lights	98.5%	95.9%	0%	0%	96.1%	-	97.2%	0%	100%	0%	97.2%	-	0%	96.1%	0%	0%	96.1%	-	96.5%	0%	100%	0%	96.5%	-	96.3%
Single-Unit Trucks	5	110	0	0	115	-	33	0	0	0	33	-	0	118	0	0	118	-	17	0	0	0	17	-	283
% Single-Unit Trucks	0.9%	2.0%	0%	0%	1.9%	-	1.7%	0%	0%	0%	1.7%	-	0%	2.5%	0%	0%	2.5%	-	2.5%	0%	0%	0%	2.5%	-	2.1%
Articulated Trucks	3	32	0	0	35	-	8	0	0	0	8	-	0	20	0	0	20	-	2	0	0	0	2	-	65
% Articulated Trucks	0.6%	0.6%	0%	0%	0.6%	-	0.4%	0%	0%	0%	0.4%	-	0%	0.4%	0%	0%	0.4%	-	0.3%	0%	0%	0%	0.3%	-	0.5%
Buses	0	79	0	0	79	-	14	0	0	0	14	-	0	47	0	0	47	-	4	0	0	0	4	-	144
% Buses	0%	1.5%	0%	0%	1.3%	-	0.7%	0%	0%	0%	0.7%	-	0%	1.0%	0%	0%	1.0%	-	0.6%	0%	0%	0%	0.6%	-	1.1%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1	0	0	0	1	-	1
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%	0%	0%	0%	0.1%	-	0%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	39	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	86.7%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	6	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	13.3%	-

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

217891 (7D) Concord Street @ Concord Street ... - TMC

Tue May 4, 2021

AM Peak (7:15 AM - 8:15 AM)

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

All Movements

ID: 833269, Location: 42.296902, -71.409146

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Worcester Road EB Offramp 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*	
2021-05-04 7:15AM	13	201	0	0	214	1	72	0	0	0	72	0	0	235	0	0	235	0	19	0	0	0	19	0	540
7:30AM	17	200	0	0	217	0	99	0	0	0	99	0	0	227	0	0	227	0	22	0	0	0	22	0	565
7:45AM	21	238	0	0	259	0	82	0	0	0	82	0	0	237	0	0	237	0	25	0	0	0	25	1	603
8:00AM	20	208	0	0	228	0	87	0	0	0	87	0	0	236	0	0	236	0	32	0	0	0	32	1	583
Total	71	847	0	0	918	1	340	0	0	0	340	0	0	935	0	0	935	0	98	0	0	0	98	2	2291
% Approach	7.7%	92.3%	0%	0%	-	-	100%	0%	0%	0%	-	-	0%	100%	0%	0%	-	-	100%	0%	0%	0%	-	-	-
% Total	3.1%	37.0%	0%	0%	40.1%	-	14.8%	0%	0%	0%	14.8%	-	0%	40.8%	0%	0%	40.8%	-	4.3%	0%	0%	0%	4.3%	-	-
PHF	0.845	0.890	-	-	0.886	-	0.859	-	-	-	0.859	-	-	0.986	-	-	0.986	-	0.766	-	-	-	0.766	-	0.950
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	70	795	0	0	865	-	328	0	0	0	328	-	0	881	0	0	881	-	92	0	0	0	92	-	2166
% Lights	98.6%	93.9%	0%	0%	94.2%	-	96.5%	0%	0%	0%	96.5%	-	0%	94.2%	0%	0%	94.2%	-	93.9%	0%	0%	0%	93.9%	-	94.5%
Single-Unit Trucks	1	24	0	0	25	-	8	0	0	0	8	-	0	38	0	0	38	-	5	0	0	0	5	-	76
% Single-Unit Trucks	1.4%	2.8%	0%	0%	2.7%	-	2.4%	0%	0%	0%	2.4%	-	0%	4.1%	0%	0%	4.1%	-	5.1%	0%	0%	0%	5.1%	-	3.3%
Articulated Trucks	0	3	0	0	3	-	1	0	0	0	1	-	0	4	0	0	4	-	0	0	0	0	0	-	8
% Articulated Trucks	0%	0.4%	0%	0%	0.3%	-	0.3%	0%	0%	0%	0.3%	-	0%	0.4%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0.3%
Buses	0	25	0	0	25	-	3	0	0	0	3	-	0	12	0	0	12	-	1	0	0	0	1	-	41
% Buses	0%	3.0%	0%	0%	2.7%	-	0.9%	0%	0%	0%	0.9%	-	0%	1.3%	0%	0%	1.3%	-	1.0%	0%	0%	0%	1.0%	-	1.8%
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	-	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	1	-		
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0%	-		
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	1	-		
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0%	-		

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

217891 (7D) Concord Street @ Concord Street ... - TMC

Tue May 4, 2021

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

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

All Movements

ID: 833269, Location: 42.296902, -71.409146

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Worcester Road EB Offramp 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*	
2021-05-04 4:15PM	20	285	0	0	305	0	83	0	0	0	83	0	0	208	0	0	208	0	37	0	0	0	37	1	633
4:30PM	30	304	0	0	334	0	76	0	0	0	76	0	0	177	0	0	177	0	36	0	0	0	36	8	623
4:45PM	34	307	0	0	341	0	98	0	0	0	98	0	0	184	0	0	184	0	45	0	0	0	45	1	668
5:00PM	26	300	0	0	326	0	85	0	0	0	85	0	0	225	0	0	225	0	35	0	0	0	35	1	671
Total	110	1196	0	0	1306	0	342	0	0	0	342	0	0	794	0	0	794	0	153	0	0	0	153	11	2595
% Approach	8.4%	91.6%	0%	0%	-	-	100%	0%	0%	0%	-	-	0%	100%	0%	0%	-	-	100%	0%	0%	0%	-	-	-
% Total	4.2%	46.1%	0%	0%	50.3%	-	13.2%	0%	0%	0%	13.2%	-	0%	30.6%	0%	0%	30.6%	-	5.9%	0%	0%	0%	5.9%	-	-
PHF	0.809	0.974	-	-	0.957	-	0.872	-	-	-	0.872	-	-	0.882	-	-	0.882	-	0.850	-	-	-	0.850	-	0.967
Motorcycles	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1
% Motorcycles	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Lights	110	1155	0	0	1265	-	337	0	0	0	337	-	0	778	0	0	778	-	151	0	0	0	151	-	2531
% Lights	100%	96.6%	0%	0%	96.9%	-	98.5%	0%	0%	0%	98.5%	-	0%	98.0%	0%	0%	98.0%	-	98.7%	0%	0%	0%	98.7%	-	97.5%
Single-Unit Trucks	0	24	0	0	24	-	3	0	0	0	3	-	0	9	0	0	9	-	2	0	0	0	2	-	38
% Single-Unit Trucks	0%	2.0%	0%	0%	1.8%	-	0.9%	0%	0%	0%	0.9%	-	0%	1.1%	0%	0%	1.1%	-	1.3%	0%	0%	0%	1.3%	-	1.5%
Articulated Trucks	0	6	0	0	6	-	0	0	0	0	0	-	0	2	0	0	2	-	0	0	0	0	0	-	8
% Articulated Trucks	0%	0.5%	0%	0%	0.5%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0.3%
Buses	0	10	0	0	10	-	2	0	0	0	2	-	0	5	0	0	5	-	0	0	0	0	0	-	17
% Buses	0%	0.8%	0%	0%	0.8%	-	0.6%	0%	0%	0%	0.6%	-	0%	0.6%	0%	0%	0.6%	-	0%	0%	0%	0%	0%	-	0.7%
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	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	9	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81.8%	
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.2%	

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

217891 (7E) Concord Street @ Corregidor Road... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833270, Location: 42.295699, -71.408894

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Corregidor Road 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*	
2021-05-04 6:00AM	36	450	6	0	492	3	0	0	15	0	15	2	106	670	1	0	777	0	4	0	1	0	5	2	1289
7:00AM	113	740	8	1	862	0	0	0	22	0	22	0	128	927	2	0	1057	0	2	0	4	0	6	1	1947
8:00AM	126	791	6	0	923	0	0	3	19	0	22	0	180	792	6	0	978	0	4	0	0	0	4	2	1927
3:00PM	189	975	10	0	1174	0	0	1	12	0	13	0	217	765	2	0	984	1	6	1	1	0	8	10	2179
4:00PM	243	1049	9	0	1301	0	0	1	23	0	24	0	234	809	1	0	1044	0	1	1	1	0	3	9	2372
5:00PM	202	1034	7	0	1243	0	0	1	38	0	39	0	214	789	1	0	1004	0	1	0	0	0	1	5	2287
Total	909	5039	46	1	5995	3	0	6	129	0	135	2	1079	4752	13	0	5844	1	18	2	7	0	27	29	12001
% Approach	15.2%	84.1%	0.8%	0%	-	-	0%	4.4%	95.6%	0%	-	-	18.5%	81.3%	0.2%	0%	-	-	66.7%	7.4%	25.9%	0%	-	-	-
% Total	7.6%	42.0%	0.4%	0%	50.0%	-	0%	0%	1.1%	0%	1.1%	-	9.0%	39.6%	0.1%	0%	48.7%	-	0.1%	0%	0.1%	0%	0.2%	-	-
Motorcycles	1	0	0	0	1	-	0	0	0	0	0	-	2	0	0	0	2	-	0	0	0	0	0	-	3
% Motorcycles	0.1%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.2%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Lights	874	4834	44	1	5753	-	0	3	124	0	127	-	1045	4545	10	0	5600	-	16	2	6	0	24	-	11504
% Lights	96.1%	95.9%	95.7%	100%	96.0%	-	0%	50.0%	96.1%	0%	94.1%	-	96.8%	95.6%	76.9%	0%	95.8%	-	88.9%	100%	85.7%	0%	88.9%	-	95.9%
Single-Unit Trucks	10	116	0	0	126	-	0	1	2	0	3	-	15	137	2	0	154	-	0	0	1	0	1	-	284
% Single-Unit Trucks	1.1%	2.3%	0%	0%	2.1%	-	0%	16.7%	1.6%	0%	2.2%	-	1.4%	2.9%	15.4%	0%	2.6%	-	0%	0%	14.3%	0%	3.7%	-	2.4%
Articulated Trucks	1	32	0	0	33	-	0	0	0	0	0	-	2	20	0	0	22	-	0	0	0	0	0	-	55
% Articulated Trucks	0.1%	0.6%	0%	0%	0.6%	-	0%	0%	0%	0%	0%	-	0.2%	0.4%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0.5%
Buses	22	57	2	0	81	-	0	2	3	0	5	-	15	48	1	0	64	-	2	0	0	0	2	-	152
% Buses	2.4%	1.1%	4.3%	0%	1.4%	-	0%	33.3%	2.3%	0%	3.7%	-	1.4%	1.0%	7.7%	0%	1.1%	-	11.1%	0%	0%	0%	7.4%	-	1.3%
Bicycles on Road	1	0	0	0	1	-	0	0	0	0	0	-	0	2	0	0	2	-	0	0	0	0	0	-	3
% Bicycles on Road	0.1%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	3	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	25	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	86.2%	
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	4	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	13.8%	

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

217891 (7E) Concord Street @ Corregidor Road... - TMC

Tue May 4, 2021

AM Peak (7:15 AM - 8:15 AM)

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

All Movements

ID: 833270, Location: 42.295699, -71.408894

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Corregidor Road 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*	
2021-05-04 7:15AM	20	196	3	0	219	0	0	0	6	0	6	0	27	233	0	0	260	0	0	0	1	0	1	0	486
7:30AM	33	187	0	0	220	0	0	0	6	0	6	0	30	227	2	0	259	0	0	0	1	0	1	0	486
7:45AM	43	211	4	1	259	0	0	0	4	0	4	0	37	236	0	0	273	0	2	0	1	0	3	1	539
8:00AM	44	196	4	0	244	0	0	2	7	0	9	0	42	234	1	0	277	0	1	0	0	0	1	0	531
Total	140	790	11	1	942	0	0	2	23	0	25	0	136	930	3	0	1069	0	3	0	3	0	6	1	2042
% Approach	14.9%	83.9%	1.2%	0.1%	-	-	0%	8.0%	92.0%	0%	-	-	12.7%	87.0%	0.3%	0%	-	-	50.0%	0%	50.0%	0%	-	-	-
% Total	6.9%	38.7%	0.5%	0%	46.1%	-	0%	0.1%	1.1%	0%	1.2%	-	6.7%	45.5%	0.1%	0%	52.4%	-	0.1%	0%	0.1%	0%	0.3%	-	-
PHF	0.795	0.936	0.688	0.250	0.909	-	-	0.250	0.821	-	0.694	-	0.810	0.985	0.375	-	0.965	-	0.375	-	0.750	-	0.500	-	0.947
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	135	739	10	1	885	-	0	2	22	0	24	-	129	866	2	0	997	-	3	0	3	0	6	-	1912
% Lights	96.4%	93.5%	90.9%	100%	93.9%	-	0%	100%	95.7%	0%	96.0%	-	94.9%	93.1%	66.7%	0%	93.3%	-	100%	0%	100%	0%	100%	-	93.6%
Single-Unit Trucks	0	27	0	0	27	-	0	0	0	0	0	-	2	48	0	0	50	-	0	0	0	0	0	-	77
% Single-Unit Trucks	0%	3.4%	0%	0%	2.9%	-	0%	0%	0%	0%	0%	-	1.5%	5.2%	0%	0%	4.7%	-	0%	0%	0%	0%	0%	-	3.8%
Articulated Trucks	0	4	0	0	4	-	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	7
% Articulated Trucks	0%	0.5%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0.3%
Buses	5	20	1	0	26	-	0	0	1	0	1	-	5	13	1	0	19	-	0	0	0	0	0	-	46
% Buses	3.6%	2.5%	9.1%	0%	2.8%	-	0%	0%	4.3%	0%	4.0%	-	3.7%	1.4%	33.3%	0%	1.8%	-	0%	0%	0%	0%	0%	-	2.3%
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	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-

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

217891 (7E) Concord Street @ Corregidor Road... - TMC

Tue May 4, 2021

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

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

All Movements

ID: 833270, Location: 42.295699, -71.408894

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

Leg Direction	Concord Street (Rt 126) Southbound					Concord Street Ramp Westbound					Concor Street (Rt 126) Northbound					Corregidor Road Eastbound					Int				
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*							
2021-05-04 4:15PM	61	255	1	0	317	0	0	0	6	0	6	0	78	211	0	0	289	0	1	1	1	0	3	0	615
4:30PM	64	269	6	0	339	0	0	1	6	0	7	0	50	191	0	0	241	0	0	0	0	0	0	8	587
4:45PM	78	274	1	0	353	0	0	0	4	0	4	0	51	194	0	0	245	0	0	0	0	0	0	1	602
5:00PM	58	263	1	0	322	0	0	1	9	0	10	0	61	223	0	0	284	0	0	0	0	0	0	0	616
Total	261	1061	9	0	1331	0	0	2	25	0	27	0	240	819	0	0	1059	0	1	1	1	0	3	9	2420
% Approach	19.6%	79.7%	0.7%	0%	-	-	0%	7.4%	92.6%	0%	-	-	22.7%	77.3%	0%	0%	-	-	33.3%	33.3%	33.3%	0%	-	-	-
% Total	10.8%	43.8%	0.4%	0%	55.0%	-	0%	0.1%	1.0%	0%	1.1%	-	9.9%	33.8%	0%	0%	43.8%	-	0%	0%	0%	0%	0.1%	-	-
PHF	0.833	0.968	0.375	-	0.942	-	-	0.500	0.694	-	0.675	-	0.769	0.918	-	-	0.916	-	0.250	0.250	0.250	-	0.250	-	0.982
Motorcycles	1	0	0	0	1	-	0	0	0	0	0	-	2	0	0	0	2	-	0	0	0	0	0	-	3
% Motorcycles	0.4%	0%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0.8%	0%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.1%
Lights	250	1027	9	0	1286	-	0	1	25	0	26	-	237	802	0	0	1039	-	1	1	1	0	3	-	2354
% Lights	95.8%	96.8%	100%	0%	96.6%	-	0%	50.0%	100%	0%	96.3%	-	98.8%	97.9%	0%	0%	98.1%	-	100%	100%	100%	0%	100%	-	97.3%
Single-Unit Trucks	3	23	0	0	26	-	0	1	0	0	1	-	1	9	0	0	10	-	0	0	0	0	0	-	37
% Single-Unit Trucks	1.1%	2.2%	0%	0%	2.0%	-	0%	50.0%	0%	0%	3.7%	-	0.4%	1.1%	0%	0%	0.9%	-	0%	0%	0%	0%	0%	-	1.5%
Articulated Trucks	1	5	0	0	6	-	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	9
% Articulated Trucks	0.4%	0.5%	0%	0%	0.5%	-	0%	0%	0%	0%	0%	-	0%	0.4%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0.4%
Buses	5	6	0	0	11	-	0	0	0	0	0	-	0	5	0	0	5	-	0	0	0	0	0	-	16
% Buses	1.9%	0.6%	0%	0%	0.8%	-	0%	0%	0%	0%	0%	-	0%	0.6%	0%	0%	0.5%	-	0%	0%	0%	0%	0%	-	0.7%
Bicycles on Road	1	0	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1
% Bicycles on Road	0.4%	0%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	6
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66.7%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	3
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33.3%

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

217891 (7D) Concord Street @ Concord Street ... - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833269, Location: 42.296902, -71.409146

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Worcester Road EB Offramp 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*	
2021-05-04 6:00AM	43	433	0	0	476	0	199	0	1	0	200	0	0	674	0	0	674	0	58	0	0	0	58	3	1408
7:00AM	70	786	0	0	856	1	345	0	0	0	345	0	0	931	0	0	931	0	83	0	0	0	83	1	2215
8:00AM	85	810	0	0	895	0	409	0	0	0	409	0	0	795	0	0	795	0	116	0	0	0	116	3	2215
3:00PM	108	1036	0	0	1144	0	356	0	0	0	356	1	0	769	0	0	769	1	141	0	4	0	145	17	2414
4:00PM	109	1154	0	0	1263	0	333	0	0	0	333	0	0	781	0	0	781	0	155	0	0	0	155	10	2532
5:00PM	114	1153	0	0	1267	0	307	0	0	0	307	0	0	790	0	0	790	1	128	0	0	0	128	11	2492
Total	529	5372	0	0	5901	1	1949	0	1	0	1950	1	0	4740	0	0	4740	2	681	0	4	0	685	45	13276
% Approach	9.0%	91.0%	0%	0%	-	-	99.9%	0%	0.1%	0%	-	-	0%	100%	0%	0%	-	-	99.4%	0%	0.6%	0%	-	-	-
% Total	4.0%	40.5%	0%	0%	44.4%	-	14.7%	0%	0%	0%	14.7%	-	0%	35.7%	0%	0%	35.7%	-	5.1%	0%	0%	0%	5.2%	-	-
Motorcycles	0	1	0	0	1	-	0	0	0	0	0	-	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	521	5150	0	0	5671	-	1894	0	1	0	1895	-	0	4555	0	0	4555	-	657	0	4	0	661	-	12782
% Lights	98.5%	95.9%	0%	0%	96.1%	-	97.2%	0%	100%	0%	97.2%	-	0%	96.1%	0%	0%	96.1%	-	96.5%	0%	100%	0%	96.5%	-	96.3%
Single-Unit Trucks	5	110	0	0	115	-	33	0	0	0	33	-	0	118	0	0	118	-	17	0	0	0	17	-	283
% Single-Unit Trucks	0.9%	2.0%	0%	0%	1.9%	-	1.7%	0%	0%	0%	1.7%	-	0%	2.5%	0%	0%	2.5%	-	2.5%	0%	0%	0%	2.5%	-	2.1%
Articulated Trucks	3	32	0	0	35	-	8	0	0	0	8	-	0	20	0	0	20	-	2	0	0	0	2	-	65
% Articulated Trucks	0.6%	0.6%	0%	0%	0.6%	-	0.4%	0%	0%	0%	0.4%	-	0%	0.4%	0%	0%	0.4%	-	0.3%	0%	0%	0%	0.3%	-	0.5%
Buses	0	79	0	0	79	-	14	0	0	0	14	-	0	47	0	0	47	-	4	0	0	0	4	-	144
% Buses	0%	1.5%	0%	0%	1.3%	-	0.7%	0%	0%	0%	0.7%	-	0%	1.0%	0%	0%	1.0%	-	0.6%	0%	0%	0%	0.6%	-	1.1%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1	0	0	0	1	-	1
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%	0%	0%	0%	0.1%	-	0%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	39	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	86.7%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	6	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	13.3%	-

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

217891 (7D) Concord Street @ Concord Street ... - TMC

Tue May 4, 2021

AM Peak (7:15 AM - 8:15 AM)

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

All Movements

ID: 833269, Location: 42.296902, -71.409146

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Worcester Road EB Offramp 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*	
2021-05-04 7:15AM	13	201	0	0	214	1	72	0	0	0	72	0	0	235	0	0	235	0	19	0	0	0	19	0	540
7:30AM	17	200	0	0	217	0	99	0	0	0	99	0	0	227	0	0	227	0	22	0	0	0	22	0	565
7:45AM	21	238	0	0	259	0	82	0	0	0	82	0	0	237	0	0	237	0	25	0	0	0	25	1	603
8:00AM	20	208	0	0	228	0	87	0	0	0	87	0	0	236	0	0	236	0	32	0	0	0	32	1	583
Total	71	847	0	0	918	1	340	0	0	0	340	0	0	935	0	0	935	0	98	0	0	0	98	2	2291
% Approach	7.7%	92.3%	0%	0%	-	-	100%	0%	0%	0%	-	-	0%	100%	0%	0%	-	-	100%	0%	0%	0%	-	-	-
% Total	3.1%	37.0%	0%	0%	40.1%	-	14.8%	0%	0%	0%	14.8%	-	0%	40.8%	0%	0%	40.8%	-	4.3%	0%	0%	0%	4.3%	-	-
PHF	0.845	0.890	-	-	0.886	-	0.859	-	-	-	0.859	-	-	0.986	-	-	0.986	-	0.766	-	-	-	0.766	-	0.950
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	70	795	0	0	865	-	328	0	0	0	328	-	0	881	0	0	881	-	92	0	0	0	92	-	2166
% Lights	98.6%	93.9%	0%	0%	94.2%	-	96.5%	0%	0%	0%	96.5%	-	0%	94.2%	0%	0%	94.2%	-	93.9%	0%	0%	0%	93.9%	-	94.5%
Single-Unit Trucks	1	24	0	0	25	-	8	0	0	0	8	-	0	38	0	0	38	-	5	0	0	0	5	-	76
% Single-Unit Trucks	1.4%	2.8%	0%	0%	2.7%	-	2.4%	0%	0%	0%	2.4%	-	0%	4.1%	0%	0%	4.1%	-	5.1%	0%	0%	0%	5.1%	-	3.3%
Articulated Trucks	0	3	0	0	3	-	1	0	0	0	1	-	0	4	0	0	4	-	0	0	0	0	0	-	8
% Articulated Trucks	0%	0.4%	0%	0%	0.3%	-	0.3%	0%	0%	0%	0.3%	-	0%	0.4%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0.3%
Buses	0	25	0	0	25	-	3	0	0	0	3	-	0	12	0	0	12	-	1	0	0	0	1	-	41
% Buses	0%	3.0%	0%	0%	2.7%	-	0.9%	0%	0%	0%	0.9%	-	0%	1.3%	0%	0%	1.3%	-	1.0%	0%	0%	0%	1.0%	-	1.8%
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	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0%	-

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

217891 (7D) Concord Street @ Concord Street ... - TMC

Tue May 4, 2021

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

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

All Movements

ID: 833269, Location: 42.296902, -71.409146

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

Leg Direction	Concord Street (Rt 126) Southbound						Concord Street Ramp Westbound						Concor Street (Rt 126) Northbound						Worcester Road EB Offramp 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*	
2021-05-04 4:15PM	20	285	0	0	305	0	83	0	0	0	83	0	0	208	0	0	208	0	37	0	0	0	37	1	633
4:30PM	30	304	0	0	334	0	76	0	0	0	76	0	0	177	0	0	177	0	36	0	0	0	36	8	623
4:45PM	34	307	0	0	341	0	98	0	0	0	98	0	0	184	0	0	184	0	45	0	0	0	45	1	668
5:00PM	26	300	0	0	326	0	85	0	0	0	85	0	0	225	0	0	225	0	35	0	0	0	35	1	671
Total	110	1196	0	0	1306	0	342	0	0	0	342	0	0	794	0	0	794	0	153	0	0	0	153	11	2595
% Approach	8.4%	91.6%	0%	0%	-	-	100%	0%	0%	0%	-	-	0%	100%	0%	0%	-	-	100%	0%	0%	0%	-	-	-
% Total	4.2%	46.1%	0%	0%	50.3%	-	13.2%	0%	0%	0%	13.2%	-	0%	30.6%	0%	0%	30.6%	-	5.9%	0%	0%	0%	5.9%	-	-
PHF	0.809	0.974	-	-	0.957	-	0.872	-	-	-	0.872	-	-	0.882	-	-	0.882	-	0.850	-	-	-	0.850	-	0.967
Motorcycles	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1
% Motorcycles	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Lights	110	1155	0	0	1265	-	337	0	0	0	337	-	0	778	0	0	778	-	151	0	0	0	151	-	2531
% Lights	100%	96.6%	0%	0%	96.9%	-	98.5%	0%	0%	0%	98.5%	-	0%	98.0%	0%	0%	98.0%	-	98.7%	0%	0%	0%	98.7%	-	97.5%
Single-Unit Trucks	0	24	0	0	24	-	3	0	0	0	3	-	0	9	0	0	9	-	2	0	0	0	2	-	38
% Single-Unit Trucks	0%	2.0%	0%	0%	1.8%	-	0.9%	0%	0%	0%	0.9%	-	0%	1.1%	0%	0%	1.1%	-	1.3%	0%	0%	0%	1.3%	-	1.5%
Articulated Trucks	0	6	0	0	6	-	0	0	0	0	0	-	0	2	0	0	2	-	0	0	0	0	0	-	8
% Articulated Trucks	0%	0.5%	0%	0%	0.5%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0.3%
Buses	0	10	0	0	10	-	2	0	0	0	2	-	0	5	0	0	5	-	0	0	0	0	0	-	17
% Buses	0%	0.8%	0%	0%	0.8%	-	0.6%	0%	0%	0%	0.6%	-	0%	0.6%	0%	0%	0.6%	-	0%	0%	0%	0%	0%	-	0.7%
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	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	9	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81.8%	
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.2%	

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

217891 (8) Route 9 @ Caldor Road TMC - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833273, Location: 42.298674, -71.399752

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

Leg Direction	Caldor Road Southbound							Worcester Road (Route 9) Westbound							Parking Lot Northwestbound						
	R	T	BL	L	U	App	Ped*	R	T	L	HL	U	App	Ped*	HR	BR	BL	HL	U	App	Ped*
2021-05-04 6:00AM	32	3	0	36	0	71	0	23	355	6	0	2	386	2	1	0	1	0	0	2	0
7:00AM	60	3	0	81	1	145	0	62	746	13	0	4	825	2	0	0	0	0	0	0	2
8:00AM	73	1	0	94	0	168	0	93	795	20	0	11	919	3	0	0	0	0	0	0	2
3:00PM	158	8	3	149	0	318	1	185	1413	64	1	66	1729	9	1	0	0	0	0	1	6
4:00PM	177	3	0	148	0	328	3	174	1411	59	2	53	1699	5	4	0	0	0	0	4	1
5:00PM	170	5	0	156	0	331	1	168	1363	79	2	53	1665	13	1	0	0	0	0	1	5
Total	670	23	3	664	1	1361	5	705	6083	241	5	189	7223	34	7	0	1	0	0	8	16
% Approach	49.2%	1.7%	0.2%	48.8%	0.1%	-	-	9.8%	84.2%	3.3%	0.1%	2.6%	-	-	87.5%	0%	12.5%	0%	0%	-	-
% Total	3.6%	0.1%	0%	3.6%	0%	7.3%	-	3.8%	32.7%	1.3%	0%	1.0%	38.9%	-	0%	0%	0%	0%	0%	0%	-
Motorcycles	1	0	0	0	0	1	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-
% Motorcycles	0.1%	0%	0%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-
Lights	645	23	3	639	1	1311	-	692	5964	238	5	188	7087	-	7	0	1	0	0	8	-
% Lights	96.3%	100%	100%	96.2%	100%	96.3%	-	98.2%	98.0%	98.8%	100%	99.5%	98.1%	-	100%	0%	100%	0%	0%	100%	-
Single-Unit Trucks	10	0	0	7	0	17	-	12	82	3	0	1	98	-	0	0	0	0	0	0	-
% Single-Unit Trucks	1.5%	0%	0%	1.1%	0%	1.2%	-	1.7%	1.3%	1.2%	0%	0.5%	1.4%	-	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	0	0	0	0	0	0	-	1	18	0	0	0	19	-	0	0	0	0	0	0	-
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0.1%	0.3%	0%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	0%	-
Buses	14	0	0	18	0	32	-	0	19	0	0	0	19	-	0	0	0	0	0	0	-
% Buses	2.1%	0%	0%	2.7%	0%	2.4%	-	0%	0.3%	0%	0%	0%	0.3%	-	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	-
% Bicycles on Road	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	-	4	-	-	-	-	-	-	31	-	-	-	-	-	-	13
% Pedestrians	-	-	-	-	-	-	80.0%	-	-	-	-	-	-	91.2%	-	-	-	-	-	-	81.3%
Bicycles on Crosswalk	-	-	-	-	-	-	1	-	-	-	-	-	-	3	-	-	-	-	-	-	3
% Bicycles on Crosswalk	-	-	-	-	-	-	20.0%	-	-	-	-	-	-	8.8%	-	-	-	-	-	-	18.8%

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

217891 (8) Route 9 @ Caldor Road TMC - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833273, Location: 42.298674, -71.399752

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Underprice Way Northbound							Worcester Road (Route 9) Eastbound							Int
	HR	R	T	L	U	App	Ped*	R	BR	T	L	U	App	Ped*	
2021-05-04 6:00AM	0	20	2	20	0	42	0	7	0	1142	122	9	1280	0	1781
7:00AM	0	32	1	35	0	68	1	5	0	1368	216	20	1609	0	2647
8:00AM	0	23	1	27	0	51	2	9	1	1425	286	45	1766	0	2904
3:00PM	0	47	1	65	0	113	6	13	2	1282	271	48	1616	0	3777
4:00PM	1	34	3	64	0	102	1	12	4	1293	257	52	1618	0	3751
5:00PM	0	50	5	66	0	121	3	11	6	1293	227	60	1597	0	3715
Total	1	206	13	277	0	497	13	57	13	7803	1379	234	9486	0	18575
% Approach	0.2%	41.4%	2.6%	55.7%	0%	-	-	0.6%	0.1%	82.3%	14.5%	2.5%	-	-	-
% Total	0%	1.1%	0.1%	1.5%	0%	2.7%	-	0.3%	0.1%	42.0%	7.4%	1.3%	51.1%	-	-
Motorcycles	0	0	1	0	0	1	-	0	0	5	0	0	5	-	7
% Motorcycles	0%	0%	7.7%	0%	0%	0.2%	-	0%	0%	0.1%	0%	0%	0.1%	-	0%
Lights	1	203	12	253	0	469	-	55	12	7644	1356	234	9301	-	18176
% Lights	100%	98.5%	92.3%	91.3%	0%	94.4%	-	96.5%	92.3%	98.0%	98.3%	100%	98.0%	-	97.9%
Single-Unit Trucks	0	3	0	4	0	7	-	2	1	106	17	0	126	-	248
% Single-Unit Trucks	0%	1.5%	0%	1.4%	0%	1.4%	-	3.5%	7.7%	1.4%	1.2%	0%	1.3%	-	1.3%
Articulated Trucks	0	0	0	0	0	0	-	0	0	24	2	0	26	-	45
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0%	0.3%	0.1%	0%	0.3%	-	0.2%
Buses	0	0	0	20	0	20	-	0	0	23	4	0	27	-	98
% Buses	0%	0%	0%	7.2%	0%	4.0%	-	0%	0%	0.3%	0.3%	0%	0.3%	-	0.5%
Bicycles on Road	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%
Pedestrians	-	-	-	-	-	-	9	-	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	69.2%	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	4	-	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	30.8%	-	-	-	-	-	-	-	-

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

217891 (8) Route 9 @ Caldor Road TMC - TMC

Tue May 4, 2021

AM Peak (7:45 AM - 8:45 AM)

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

All Movements

ID: 833273, Location: 42.298674, -71.399752

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

Leg Direction	Caldor Road Southbound							Worcester Road (Route 9) Westbound							Parking Lot Northwestbound							
	R	T	BL	L	U	App	Ped*	R	T	L	HL	U	App	Ped*	HR	BR	BL	HL	U	App	Ped*	
2021-05-04 7:45AM	14	1	0	23	1	39	0	21	241	6	0	0	268	0	0	0	0	0	0	0	0	0
8:00AM	24	0	0	19	0	43	0	17	174	3	0	2	196	1	0	0	0	0	0	0	0	1
8:15AM	22	0	0	20	0	42	0	34	189	3	0	2	228	1	0	0	0	0	0	0	0	1
8:30AM	19	0	0	30	0	49	0	26	216	5	0	5	252	1	0	0	0	0	0	0	0	0
Total	79	1	0	92	1	173	0	98	820	17	0	9	944	3	0	0	0	0	0	0	0	2
% Approach	45.7%	0.6%	0%	53.2%	0.6%	-	-	10.4%	86.9%	1.8%	0%	1.0%	-	-	0%	0%	0%	0%	0%	0%	0%	-
% Total	2.7%	0%	0%	3.1%	0%	5.9%	-	3.3%	27.9%	0.6%	0%	0.3%	32.1%	-	0%	0%	0%	0%	0%	0%	0%	0%
PHF	0.823	0.250	-	0.767	0.250	0.883	-	0.721	0.851	0.708	-	0.450	0.881	-	-	-	-	-	-	-	-	-
Motorcycles	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%	-
Lights	75	1	0	84	1	161	-	96	795	16	0	9	916	-	0	0	0	0	0	0	0	-
% Lights	94.9%	100%	0%	91.3%	100%	93.1%	-	98.0%	97.0%	94.1%	0%	100%	97.0%	-	0%	0%	0%	0%	0%	0%	0%	-
Single-Unit Trucks	3	0	0	3	0	6	-	2	20	1	0	0	23	-	0	0	0	0	0	0	0	-
% Single-Unit Trucks	3.8%	0%	0%	3.3%	0%	3.5%	-	2.0%	2.4%	5.9%	0%	0%	2.4%	-	0%	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	0	0	0	0	0	0	-	0	1	0	0	0	1	-	0	0	0	0	0	0	0	-
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	0%	0%	-
Buses	1	0	0	5	0	6	-	0	4	0	0	0	4	-	0	0	0	0	0	0	0	-
% Buses	1.3%	0%	0%	5.4%	0%	3.5%	-	0%	0.5%	0%	0%	0%	0.4%	-	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	-
% Bicycles on Road	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	3	-	-	-	-	-	-	-	2
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	0%

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

217891 (8) Route 9 @ Caldor Road TMC - TMC

Tue May 4, 2021

AM Peak (7:45 AM - 8:45 AM)

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

All Movements

ID: 833273, Location: 42.298674, -71.399752

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

Leg Direction	Underprice Way								Worcester Road (Route 9)								Int
	Northbound								Eastbound								
Time	HR	R	T	L	U	App	Ped*	R	BR	T	L	U	App	Ped*			
2021-05-04 7:45AM	0	7	0	12	0	19	0	1	0	371	59	11	442	0	768		
8:00AM	0	5	0	6	0	11	1	2	0	382	80	13	477	0	727		
8:15AM	0	1	0	6	0	7	1	3	0	369	53	10	435	0	712		
8:30AM	0	8	0	7	0	15	0	1	1	327	78	13	420	0	736		
Total	0	21	0	31	0	52	2	7	1	1449	270	47	1774	0	2943		
% Approach	0%	40.4%	0%	59.6%	0%	-	-	0.4%	0.1%	81.7%	15.2%	2.6%	-	-	-		
% Total	0%	0.7%	0%	1.1%	0%	1.8%	-	0.2%	0%	49.2%	9.2%	1.6%	60.3%	-	-		
PHF	-	0.656	-	0.646	-	0.684	-	0.583	0.250	0.948	0.844	0.904	0.930	-	0.958		
Motorcycles	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%		
Lights	0	21	0	24	0	45	-	7	0	1405	267	47	1726	-	2848		
% Lights	0%	100%	0%	77.4%	0%	86.5%	-	100%	0%	97.0%	98.9%	100%	97.3%	-	96.8%		
Single-Unit Trucks	0	0	0	1	0	1	-	0	1	37	2	0	40	-	70		
% Single-Unit Trucks	0%	0%	0%	3.2%	0%	1.9%	-	0%	100%	2.6%	0.7%	0%	2.3%	-	2.4%		
Articulated Trucks	0	0	0	0	0	0	-	0	0	4	0	0	4	-	5		
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0%	0.3%	0%	0%	0.2%	-	0.2%		
Buses	0	0	0	6	0	6	-	0	0	3	1	0	4	-	20		
% Buses	0%	0%	0%	19.4%	0%	11.5%	-	0%	0%	0.2%	0.4%	0%	0.2%	-	0.7%		
Bicycles on Road	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%		
Pedestrians	-	-	-	-	-	-	2	-	-	-	-	-	-	0	-		
% Pedestrians	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Bicycles on Crosswalk	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-		

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

217891 (8) Route 9 @ Caldor Road TMC - TMC

Tue May 4, 2021

PM Peak (3:30 PM - 4:30 PM) - Overall Peak Hour

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

All Movements

ID: 833273, Location: 42.298674, -71.399752

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Caldor Road Southbound							Worcester Road (Route 9) Westbound							Parking Lot Northwestbound							
	R	T	BL	L	U	App	Ped*	R	T	L	HL	U	App	Ped*	HR	BR	BL	HL	U	App	Ped*	
2021-05-04 3:30PM	45	2	1	36	0	84	0	47	368	17	0	18	450	1	0	0	0	0	0	0	0	1
3:45PM	36	3	0	47	0	86	0	44	345	14	0	12	415	5	1	0	0	0	0	0	1	3
4:00PM	42	1	0	29	0	72	2	58	388	12	0	13	471	1	1	0	0	0	0	0	1	0
4:15PM	50	1	0	43	0	94	0	37	332	10	2	13	394	0	1	0	0	0	0	0	1	0
Total	173	7	1	155	0	336	2	186	1433	53	2	56	1730	7	3	0	0	0	0	0	3	4
% Approach	51.5%	2.1%	0.3%	46.1%	0%	-	-	10.8%	82.8%	3.1%	0.1%	3.2%	-	-	100%	0%	0%	0%	0%	0%	-	-
% Total	4.5%	0.2%	0%	4.1%	0%	8.8%	-	4.9%	37.5%	1.4%	0.1%	1.5%	45.3%	-	0.1%	0%	0%	0%	0%	0%	0.1%	-
PHF	0.865	0.583	0.250	0.824	-	0.894	-	0.802	0.923	0.779	0.250	0.778	0.918	-	0.750	-	-	-	-	-	0.750	-
Motorcycles	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%	-
Lights	166	7	1	146	0	320	-	182	1407	53	2	56	1700	-	3	0	0	0	0	0	3	-
% Lights	96.0%	100%	100%	94.2%	0%	95.2%	-	97.8%	98.2%	100%	100%	100%	98.3%	-	100%	0%	0%	0%	0%	0%	100%	-
Single-Unit Trucks	2	0	0	2	0	4	-	4	19	0	0	0	23	-	0	0	0	0	0	0	0	-
% Single-Unit Trucks	1.2%	0%	0%	1.3%	0%	1.2%	-	2.2%	1.3%	0%	0%	0%	1.3%	-	0%	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	0	0	0	0	0	0	-	0	3	0	0	0	3	-	0	0	0	0	0	0	0	-
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0.2%	0%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	0%	0%	-
Buses	5	0	0	7	0	12	-	0	4	0	0	0	4	-	0	0	0	0	0	0	0	-
% Buses	2.9%	0%	0%	4.5%	0%	3.6%	-	0%	0.3%	0%	0%	0%	0.2%	-	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	-
% Bicycles on Road	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	-	2	-	-	-	-	-	-	6	-	-	-	-	-	-	-	4
% Pedestrians	-	-	-	-	-	-	100%	-	-	-	-	-	-	85.7%	-	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	0%	-	-	-	-	-	-	14.3%	-	-	-	-	-	-	-	0%

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

217891 (8) Route 9 @ Caldor Road TMC - TMC

Tue May 4, 2021

PM Peak (3:30 PM - 4:30 PM) - Overall Peak Hour

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

All Movements

ID: 833273, Location: 42.298674, -71.399752

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Underprice Way Northbound							Worcester Road (Route 9) Eastbound							Int
	HR	R	T	L	U	App	Ped*	R	BR	T	L	U	App	Ped*	
2021-05-04 3:30PM	0	12	0	13	0	25	1	1	0	333	70	13	417	0	976
3:45PM	0	19	0	19	0	38	2	5	0	323	59	11	398	0	938
4:00PM	1	5	0	20	0	26	0	2	0	331	75	13	421	0	991
4:15PM	0	9	0	15	0	24	0	4	0	314	73	12	403	0	916
Total	1	45	0	67	0	113	3	12	0	1301	277	49	1639	0	3821
% Approach	0.9%	39.8%	0%	59.3%	0%	-	-	0.7%	0%	79.4%	16.9%	3.0%	-	-	-
% Total	0%	1.2%	0%	1.8%	0%	3.0%	-	0.3%	0%	34.0%	7.2%	1.3%	42.9%	-	-
PHF	0.250	0.592	-	0.838	-	0.743	-	0.600	-	0.977	0.923	0.942	0.973	-	0.964
Motorcycles	0	0	0	0	0	0	-	0	0	1	0	0	1	-	1
% Motorcycles	0%	0%	0%	0%	0%	0%	-	0%	0%	0.1%	0%	0%	0.1%	-	0%
Lights	1	45	0	59	0	105	-	12	0	1284	273	49	1618	-	3746
% Lights	100%	100%	0%	88.1%	0%	92.9%	-	100%	0%	98.7%	98.6%	100%	98.7%	-	98.0%
Single-Unit Trucks	0	0	0	2	0	2	-	0	0	10	2	0	12	-	41
% Single-Unit Trucks	0%	0%	0%	3.0%	0%	1.8%	-	0%	0%	0.8%	0.7%	0%	0.7%	-	1.1%
Articulated Trucks	0	0	0	0	0	0	-	0	0	2	0	0	2	-	5
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0%	0.2%	0%	0%	0.1%	-	0.1%
Buses	0	0	0	6	0	6	-	0	0	4	2	0	6	-	28
% Buses	0%	0%	0%	9.0%	0%	5.3%	-	0%	0%	0.3%	0.7%	0%	0.4%	-	0.7%
Bicycles on Road	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%
Pedestrians	-	-	-	-	-	-	3	-	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-

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

217891 (9) Route 9 @ Oak Street TMC - TMC

Tue May 4, 2021

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

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

All Movements

ID: 833275, Location: 42.303551, -71.332012

Provided by: Precision Data Industries, LLC (PDI)

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

Leg Direction	Worcester Road (Route 9) Southbound						Oak Street Westbound						Worcester Road (Route 9) Northbound						Oak Street 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*	
2021-05-04 6:00AM	36	36	125	0	197	0	47	517	29	8	601	0	34	61	32	0	127	0	44	1171	56	1	1272	0	2197
7:00AM	85	94	210	0	389	0	119	821	77	5	1022	0	57	126	114	0	297	0	64	1342	93	2	1501	3	3209
8:00AM	112	167	221	0	500	0	187	1033	83	9	1312	0	68	176	135	0	379	1	54	1260	123	8	1445	0	3636
3:00PM	163	183	162	0	508	0	161	1551	135	15	1862	0	67	137	154	0	358	0	118	1208	109	17	1452	0	4180
4:00PM	134	183	166	0	483	1	151	1304	115	12	1582	1	73	137	163	0	373	0	115	1183	127	27	1452	0	3890
5:00PM	147	183	168	0	498	3	152	1133	121	11	1417	0	48	153	147	0	348	0	131	1195	101	24	1451	2	3714
Total	677	846	1052	0	2575	4	817	6359	560	60	7796	1	347	790	745	0	1882	1	526	7359	609	79	8573	5	20826
% Approach	26.3%	32.9%	40.9%	0%	-	-	10.5%	81.6%	7.2%	0.8%	-	-	18.4%	42.0%	39.6%	0%	-	-	6.1%	85.8%	7.1%	0.9%	-	-	-
% Total	3.3%	4.1%	5.1%	0%	12.4%	-	3.9%	30.5%	2.7%	0.3%	37.4%	-	1.7%	3.8%	3.6%	0%	9.0%	-	2.5%	35.3%	2.9%	0.4%	41.2%	-	-
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	655	828	1025	0	2508	-	796	6211	539	59	7605	-	336	766	724	0	1826	-	512	7170	592	79	8353	-	20292
% Lights	96.8%	97.9%	97.4%	0%	97.4%	-	97.4%	97.7%	96.3%	98.3%	97.6%	-	96.8%	97.0%	97.2%	0%	97.0%	-	97.3%	97.4%	97.2%	100%	97.4%	-	97.4%
Single-Unit Trucks	16	12	20	0	48	-	14	115	16	1	146	-	9	19	16	0	44	-	10	147	11	0	168	-	406
% Single-Unit Trucks	2.4%	1.4%	1.9%	0%	1.9%	-	1.7%	1.8%	2.9%	1.7%	1.9%	-	2.6%	2.4%	2.1%	0%	2.3%	-	1.9%	2.0%	1.8%	0%	2.0%	-	1.9%
Articulated Trucks	1	1	4	0	6	-	6	25	1	0	32	-	2	1	0	0	3	-	2	32	2	0	36	-	77
% Articulated Trucks	0.1%	0.1%	0.4%	0%	0.2%	-	0.7%	0.4%	0.2%	0%	0.4%	-	0.6%	0.1%	0%	0%	0.2%	-	0.4%	0.4%	0.3%	0%	0.4%	-	0.4%
Buses	5	5	3	0	13	-	1	8	4	0	13	-	0	3	5	0	8	-	2	10	4	0	16	-	50
% Buses	0.7%	0.6%	0.3%	0%	0.5%	-	0.1%	0.1%	0.7%	0%	0.2%	-	0%	0.4%	0.7%	0%	0.4%	-	0.4%	0.1%	0.7%	0%	0.2%	-	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%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	3	
% Pedestrians	-	-	-	-	-	25.0%	-	-	-	-	-	100%	-	-	-	-	-	0%	-	-	-	-	-	60.0%	
Bicycles on Crosswalk	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	75.0%	-	-	-	-	-	0%	-	-	-	-	-	100%	-	-	-	-	-	40.0%	

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

217891 (9) Route 9 @ Oak Street TMC - TMC

Tue May 4, 2021

AM Peak (8 AM - 9 AM)

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

All Movements

ID: 833275, Location: 42.303551, -71.332012

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

Leg Direction	Worcester Road (Route 9) Southbound						Oak Street Westbound						Worcester Road (Route 9) Northbound						Oak Street 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*	
2021-05-04 8:00AM	23	26	52	0	101	0	47	225	23	2	297	0	10	39	27	0	76	1	22	332	34	2	390	0	864
8:15AM	25	58	53	0	136	0	50	233	20	2	305	0	17	49	42	0	108	0	10	312	29	5	356	0	905
8:30AM	32	42	64	0	138	0	49	304	16	3	372	0	23	42	26	0	91	0	12	314	31	1	358	0	959
8:45AM	32	41	52	0	125	0	41	271	24	2	338	0	18	46	40	0	104	0	10	302	29	0	341	0	908
Total	112	167	221	0	500	0	187	1033	83	9	1312	0	68	176	135	0	379	1	54	1260	123	8	1445	0	3636
% Approach	22.4%	33.4%	44.2%	0%	-	-	14.3%	78.7%	6.3%	0.7%	-	-	17.9%	46.4%	35.6%	0%	-	-	3.7%	87.2%	8.5%	0.6%	-	-	-
% Total	3.1%	4.6%	6.1%	0%	13.8%	-	5.1%	28.4%	2.3%	0.2%	36.1%	-	1.9%	4.8%	3.7%	0%	10.4%	-	1.5%	34.7%	3.4%	0.2%	39.7%	-	-
PHF	0.875	0.720	0.863	-	0.906	-	0.935	0.850	0.865	0.750	0.882	-	0.739	0.898	0.804	-	0.877	-	0.614	0.949	0.904	0.400	0.926	-	0.948
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	104	161	215	0	480	-	184	1005	75	8	1272	-	65	168	130	0	363	-	49	1192	116	8	1365	-	3480
% Lights	92.9%	96.4%	97.3%	0%	96.0%	-	98.4%	97.3%	90.4%	88.9%	97.0%	-	95.6%	95.5%	96.3%	0%	95.8%	-	90.7%	94.6%	94.3%	100%	94.5%	-	95.7%
Single-Unit Trucks	7	3	5	0	15	-	1	23	7	1	32	-	2	8	3	0	13	-	3	55	5	0	63	-	123
% Single-Unit Trucks	6.3%	1.8%	2.3%	0%	3.0%	-	0.5%	2.2%	8.4%	11.1%	2.4%	-	2.9%	4.5%	2.2%	0%	3.4%	-	5.6%	4.4%	4.1%	0%	4.4%	-	3.4%
Articulated Trucks	0	1	0	0	1	-	2	4	0	0	6	-	1	0	0	0	1	-	2	12	1	0	15	-	23
% Articulated Trucks	0%	0.6%	0%	0%	0.2%	-	1.1%	0.4%	0%	0%	0.5%	-	1.5%	0%	0%	0%	0.3%	-	3.7%	1.0%	0.8%	0%	1.0%	-	0.6%
Buses	1	2	1	0	4	-	0	1	1	0	2	-	0	0	2	0	2	-	0	1	1	0	2	-	10
% Buses	0.9%	1.2%	0.5%	0%	0.8%	-	0%	0.1%	1.2%	0%	0.2%	-	0%	0%	1.5%	0%	0.5%	-	0%	0.1%	0.8%	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	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-

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

217891 (9) Route 9 @ Oak Street TMC - TMC

Tue May 4, 2021

PM Peak (3 PM - 4 PM) - Overall Peak Hour

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

All Movements

ID: 833275, Location: 42.303551, -71.332012

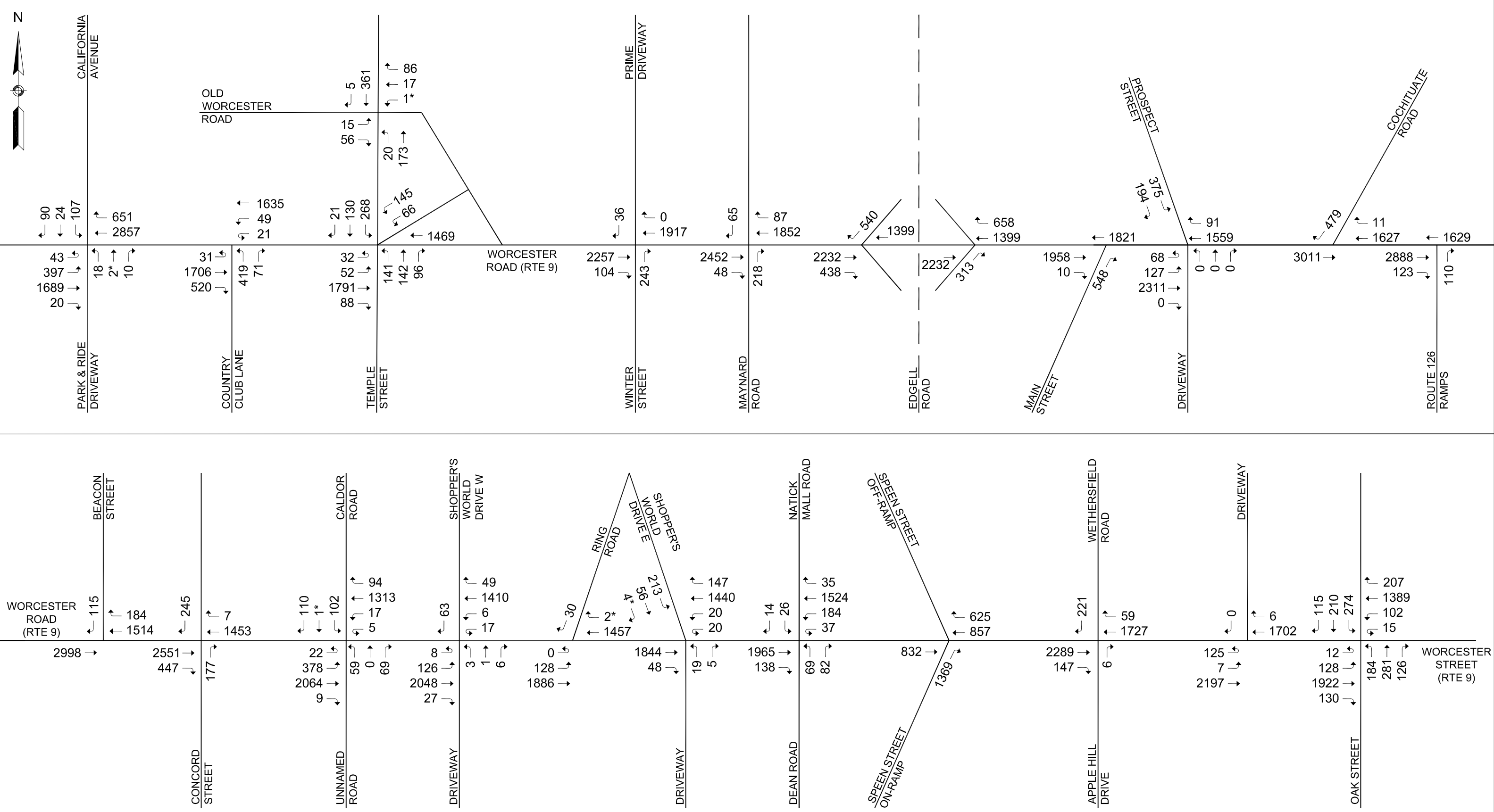
Provided by: Precision Data Industries, LLC
(PDI)
46 Morton Street,
Framingham, MA, MA, 01702, US

Leg Direction	Worcester Road (Route 9) Southbound						Oak Street Westbound						Worcester Road (Route 9) Northbound						Oak Street 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*	
2021-05-04 3:00PM	30	41	44	0	115	0	44	390	27	3	464	0	16	43	38	0	97	0	25	341	31	5	402	0	1078
3:15PM	50	44	42	0	136	0	30	409	33	1	473	0	15	23	23	0	61	0	29	272	29	2	332	0	1002
3:30PM	48	57	44	0	149	0	34	371	36	6	447	0	22	29	52	0	103	0	34	295	21	6	356	0	1055
3:45PM	35	41	32	0	108	0	53	381	39	5	478	0	14	42	41	0	97	0	30	300	28	4	362	0	1045
Total	163	183	162	0	508	0	161	1551	135	15	1862	0	67	137	154	0	358	0	118	1208	109	17	1452	0	4180
% Approach	32.1%	36.0%	31.9%	0%	-	-	8.6%	83.3%	7.3%	0.8%	-	-	18.7%	38.3%	43.0%	0%	-	-	8.1%	83.2%	7.5%	1.2%	-	-	-
% Total	3.9%	4.4%	3.9%	0%	12.2%	-	3.9%	37.1%	3.2%	0.4%	44.5%	-	1.6%	3.3%	3.7%	0%	8.6%	-	2.8%	28.9%	2.6%	0.4%	34.7%	-	-
PHF	0.815	0.803	0.920	-	0.852	-	0.759	0.948	0.865	0.625	0.974	-	0.761	0.797	0.740	-	0.869	-	0.868	0.886	0.879	0.708	0.903	-	0.969
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	161	178	159	0	498	-	158	1515	131	15	1819	-	64	134	152	0	350	-	116	1182	107	17	1422	-	4089
% Lights	98.8%	97.3%	98.1%	0%	98.0%	-	98.1%	97.7%	97.0%	100%	97.7%	-	95.5%	97.8%	98.7%	0%	97.8%	-	98.3%	97.8%	98.2%	100%	97.9%	-	97.8%
Single-Unit Trucks	1	3	1	0	5	-	3	34	2	0	39	-	3	2	2	0	7	-	1	20	1	0	22	-	73
% Single-Unit Trucks	0.6%	1.6%	0.6%	0%	1.0%	-	1.9%	2.2%	1.5%	0%	2.1%	-	4.5%	1.5%	1.3%	0%	2.0%	-	0.8%	1.7%	0.9%	0%	1.5%	-	1.7%
Articulated Trucks	1	0	1	0	2	-	0	1	0	0	1	-	0	0	0	0	0	-	0	4	1	0	5	-	8
% Articulated Trucks	0.6%	0%	0.6%	0%	0.4%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0.9%	0%	0.3%	-	0.2%
Buses	0	2	1	0	3	-	0	1	2	0	3	-	0	1	0	0	1	-	1	2	0	0	3	-	10
% Buses	0%	1.1%	0.6%	0%	0.6%	-	0%	0.1%	1.5%	0%	0.2%	-	0%	0.7%	0%	0%	0.3%	-	0.8%	0.2%	0%	0%	0.2%	-	0.2%
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	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

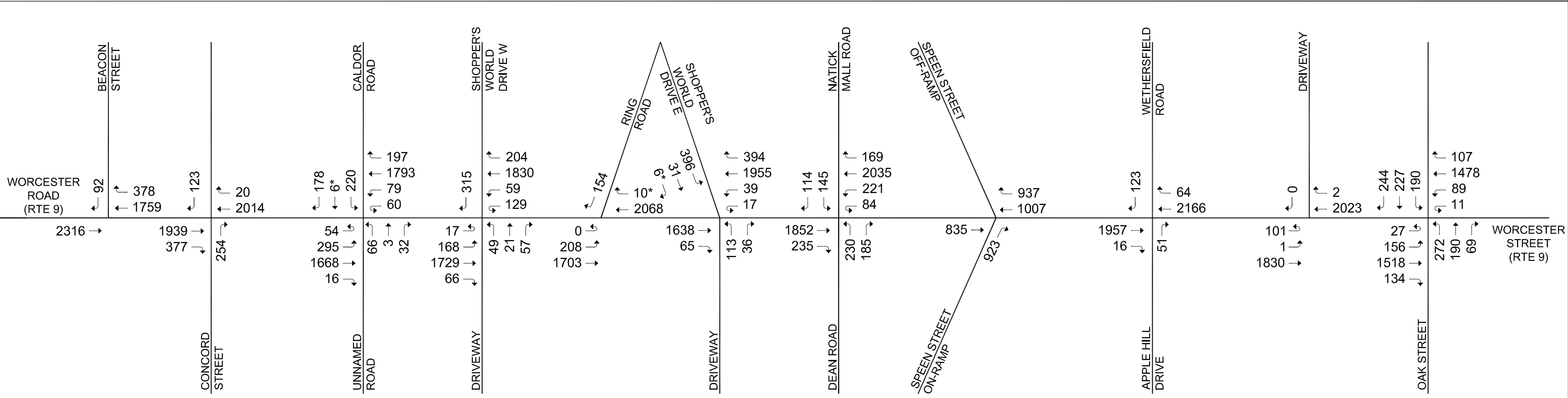
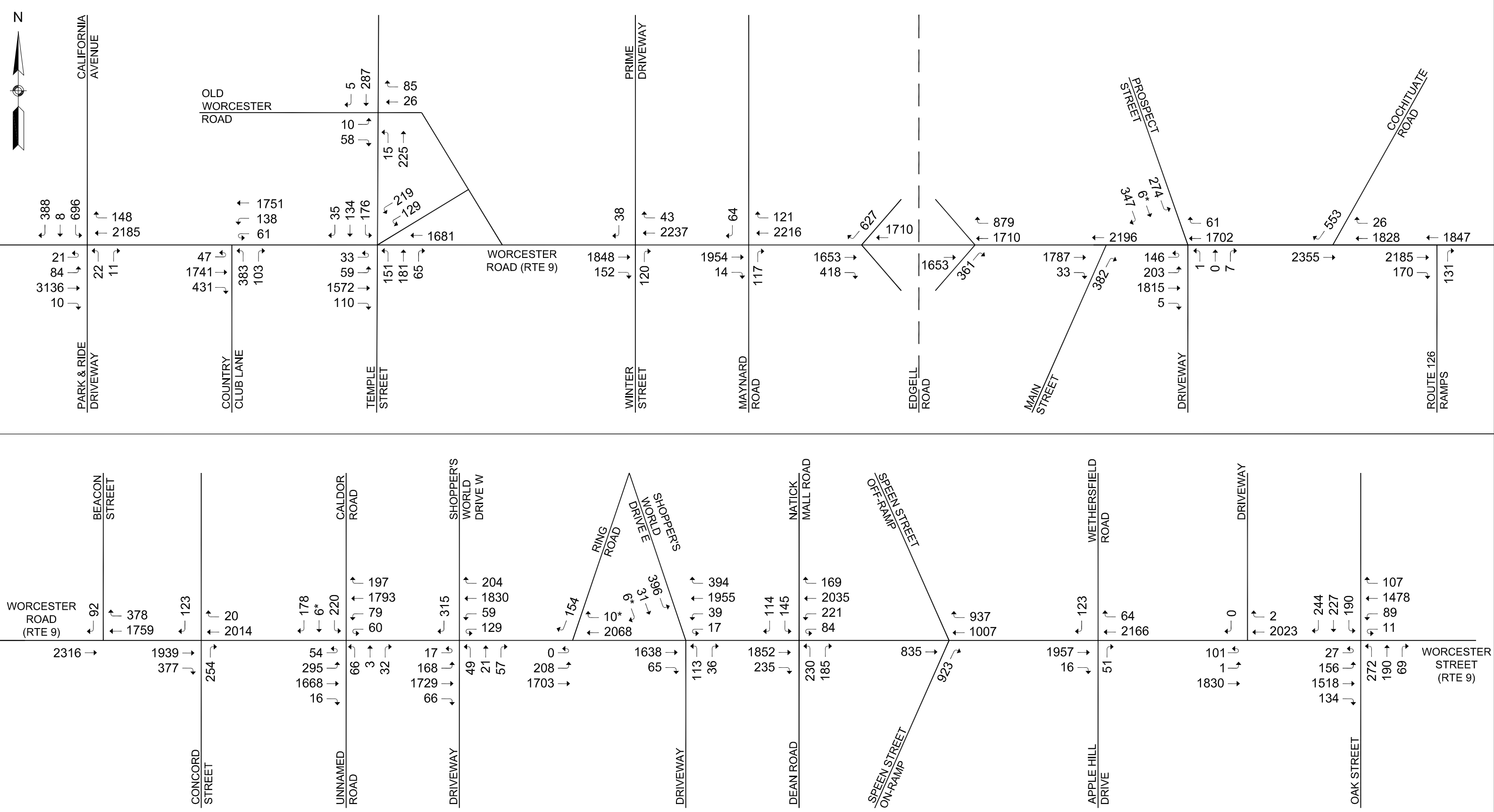
Part 3: HNTB 2019 Traffic Counts

DRAFT - 2019 Existing Year Counts - Weekday AM Peak Hour
Worcester Road / Worcester Street (Route 9) from California
Avenue to Oak Street, Framingham/Natick, MA



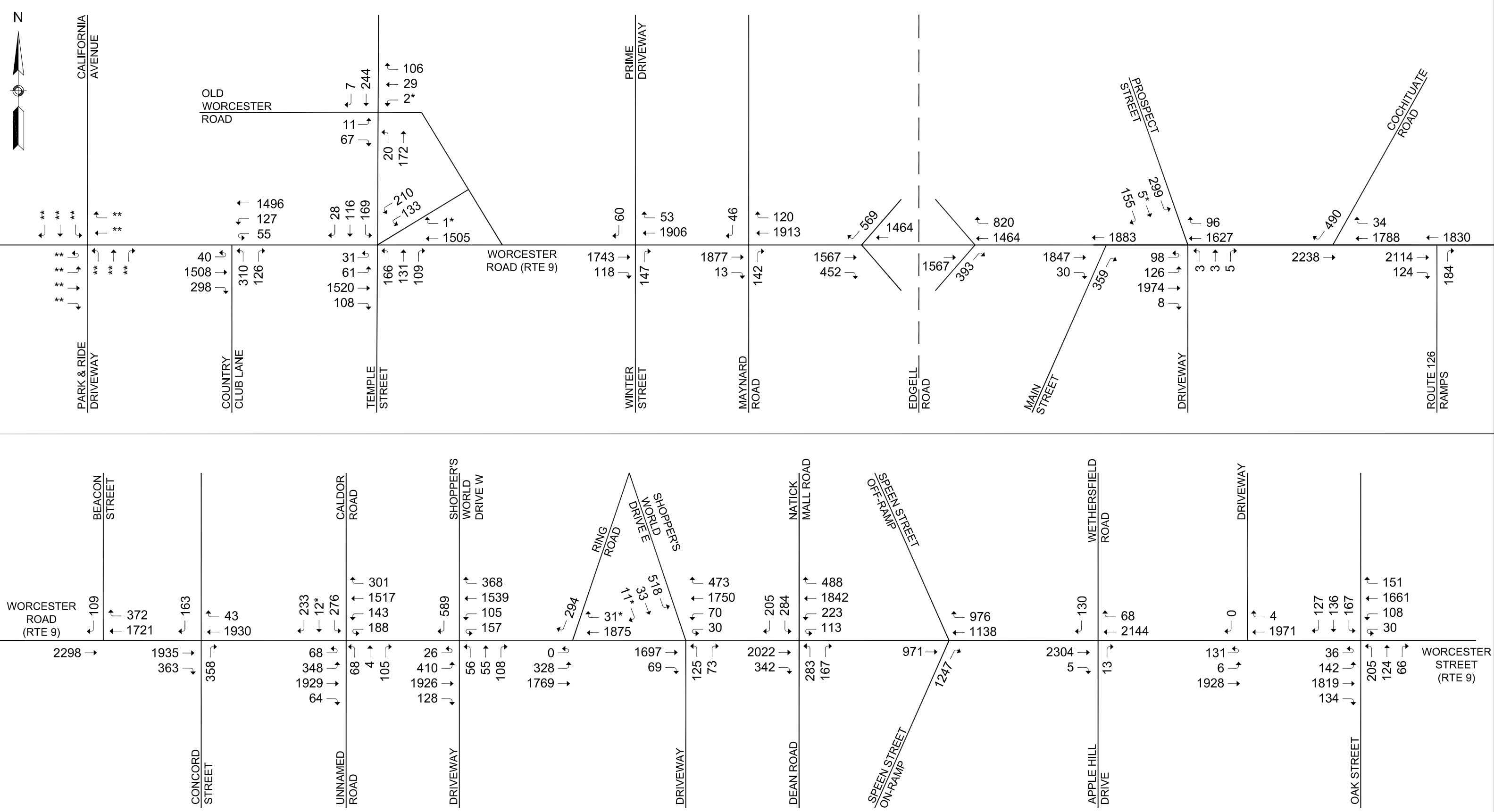
*Movement is prohibited

DRAFT - 2019 Existing Year Counts - Weekday PM Peak Hour
Worcester Road / Worcester Street (Route 9) from California
Avenue to Oak Street, Framingham/Natick, MA



*Movement is prohibited

DRAFT - 2019 Existing Year Counts - Weekend SAT Peak Hour
Worcester Road / Worcester Street (Route 9) from California
Avenue to Oak Street, Framingham/Natick, MA



*Movement is prohibited
 ** No Saturday data available at Route 9 / California Avenue

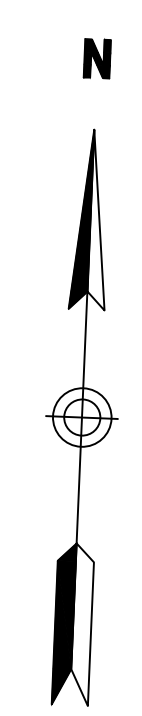
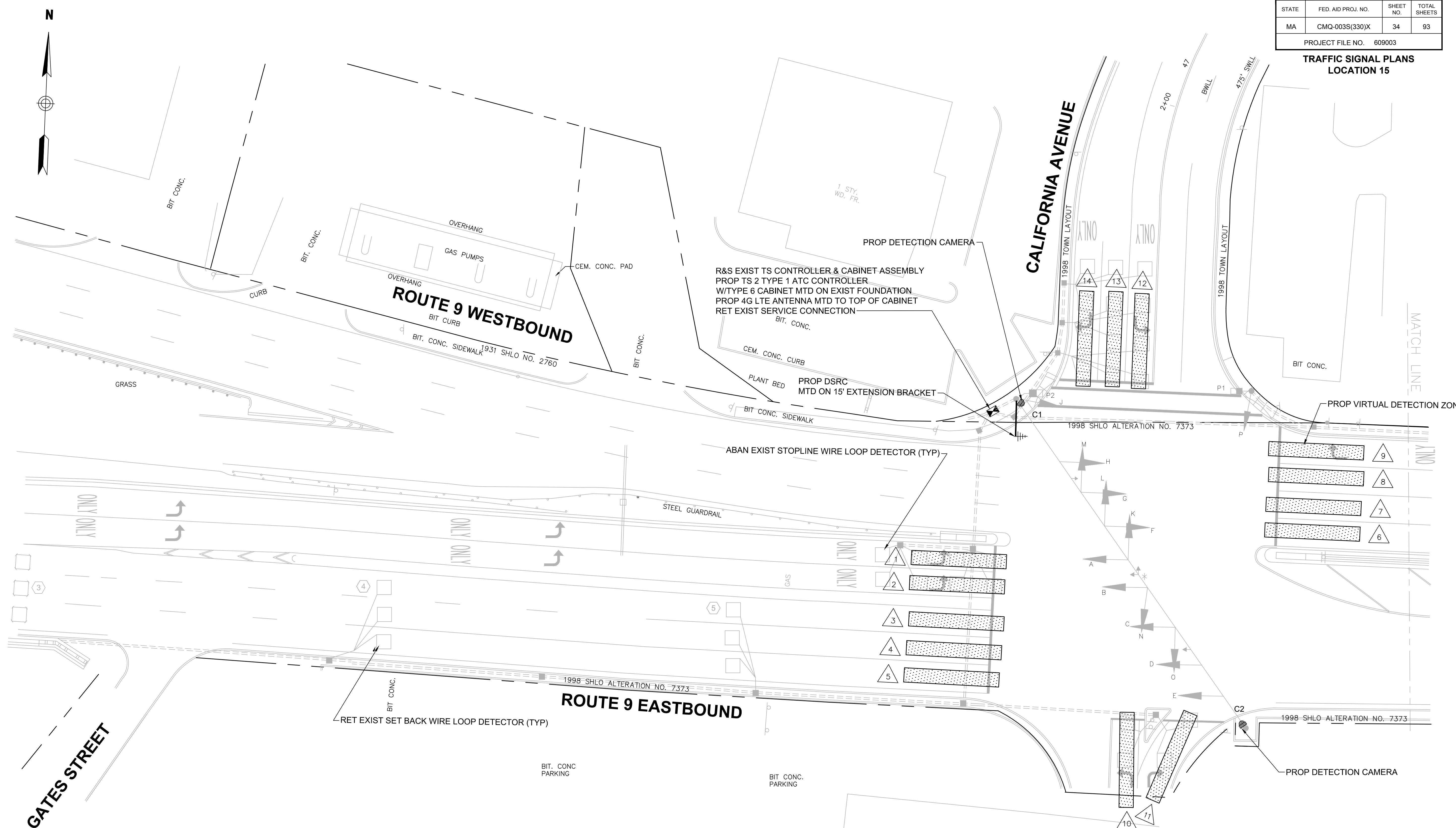
Part 3: Traffic Signal Data

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	34	93

PROJECT FILE NO. 609003

**TRAFFIC SIGNAL PLANS
LOCATION 15**



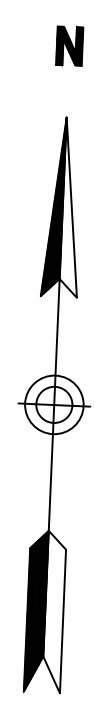
- CONSTRUCTION NOTES**
- SEE SHEET 36 FOR TRAFFIC SIGNAL DATA.
 - RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
 - RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
 - EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.



**SPAT CHALLENGE
ROUTE 9**

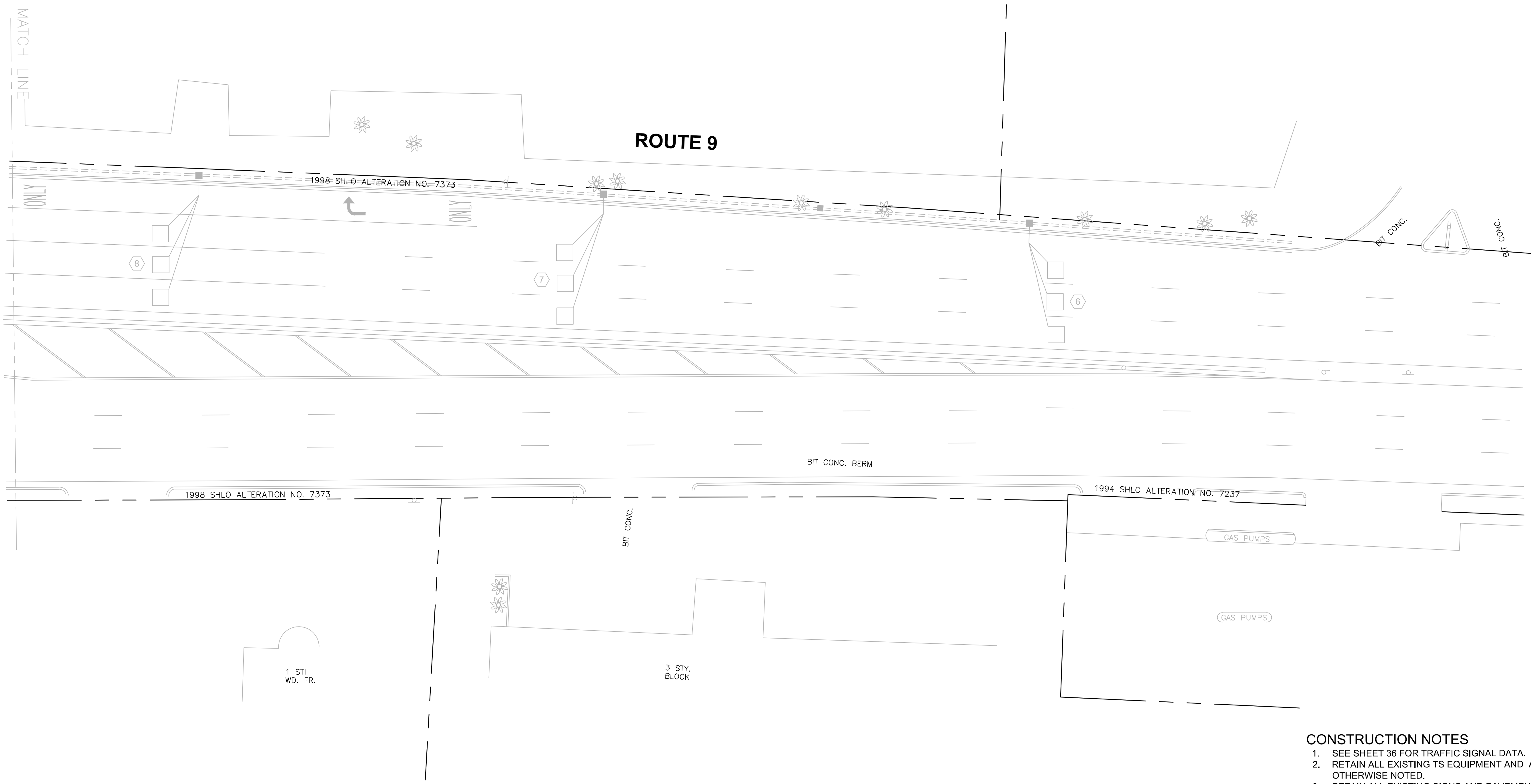
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	35	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 15**



4 STY.
BRICK

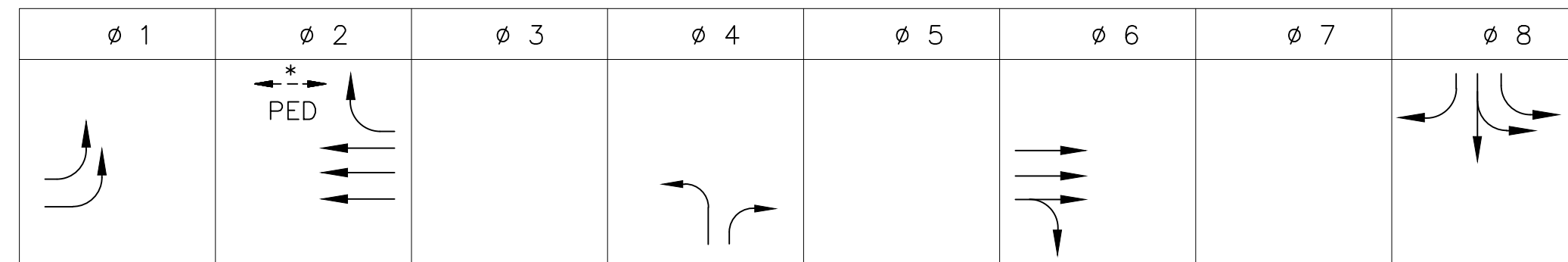
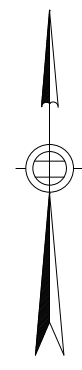
NOTE:
LOOPS ARE SHOWN AS DEPICTED ON THE DESIGN PLANS. THE ACTUAL LOCATION OF THE LOOPS WAS NOT VISIBLE DURING FIELD INVENTORY.



- CONSTRUCTION NOTES**
1. SEE SHEET 36 FOR TRAFFIC SIGNAL DATA.
 2. RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
 3. RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
 4. EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

20 0 20 40
SCALE IN FEET
APPROXIMATE, PLAN ORIGINALLY METRIC

APPROX. NORTH



PROPOSED SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

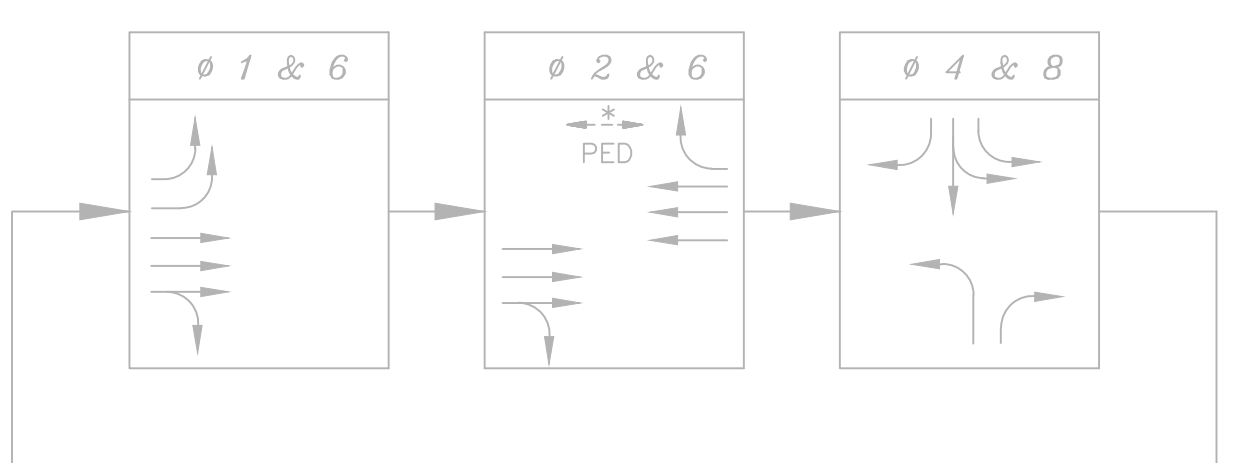
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH OPER.
WORCESTER ROAD (ROUTE 9)	EB	A,B	GL	YL	RL	RL	RL	RL				RL	RL	RL				RL	RL	RL			RL	RL	RL	FR	
WORCESTER ROAD (ROUTE 9)	EB	C	R	R	R	R	R	R				R	R	R				GVA	Y	R			R	R	R	FY	
WORCESTER ROAD (ROUTE 9)	EB	D,E	R	R	R	R	R	R				R	R	R				G	Y	R			R	R	R	FY	
WORCESTER ROAD (ROUTE 9)	WB	F	R	R	R	GVA	Y	R				R	R	R				R	R	R			R	R	R	FY	
WORCESTER ROAD (ROUTE 9)	WB	G,H,J	R	R	R	R	G	Y	R			R	R	R				R	R	R			R	R	R	FY	
BUS PARKING LOT	NB	N,O,P	R	R	R	R	R	R				G	Y	R				R	R	R			R	R	R	FR	
CALIFORNIA AVENUE	SB	K,L,M	R	R	R	R	R	R				R	R	R				R	R	R			G	Y	R	FR	
PEDESTRIAN		ALL	DW	DW	DW	W/FDW	DW	DW				DW	DW	DW				DW	DW	DW			DW	DW	DW	OFF	

TIMING IN SECONDS		
MINIMUM GREEN (INITIAL)	5	5
PASSAGE TIME (VEHICLE)	2	2
MAXIMUM 1	30	60
MAXIMUM 2	30	60
YELLOW CLEARANCE		3
RED CLEARANCE		2
WALK (W)		7
PEDESTRIAN CLEARANCE		20

RECALL	OFF	MIN	OFF	MIN	OFF
MEMORY	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK

- NOTES:
- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
 - *UPON PEDESTRIAN PUSH BUTTON ACTUATION
 - ø4 & ø8 DUAL ENTRY
 - MAXIMUM 1 = NORMAL OPERATION
 - MAXIMUM 2 = MON-FRI 0700-0900
 - STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
 - DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL NOT BE IN EFFECT.

EXISTING PREFERENTIAL PHASING SEQUENCE



EXISTING PRE-EMPTION PHASING & PRIORITY			
DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1	→	ø2
D2	2	→	ø1&ø6
D3	3	↓	ø4

EXISTING SIGNAL HEAD DATA					
M,N,R	A,B	C,F	D,E,G,H,J	K,L,M,N,O,P	P1-P2

ALL 12" LENS

- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
- PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1, D2 OR D3 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D3 LOWEST)
- IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2, #3) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 1 SECOND: ALL RED) AND SERVICE SUNSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
- MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
- OPTICOM STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.

- SEQUENCE & TIMING NOTES:
- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
 - THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
 - IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
 - IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

SPAT CHALLENGE ROUTE 9			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	36	93
PROJECT FILE NO. 609003			
TRAFFIC SIGNAL PLANS LOCATION 15			

LIST OF MAJOR ITEMS REQUIRED		
ROUTE 9 AT CALIFORNIA AVENUE		
PAY ITEM	QUANTITY	DESCRIPTION
	1	TS 2 TYPE 1 ATC CONTROLLER IN A 32/48 ATC CABINET INSTALLED ON EXIST FOUNDATION
	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET
	1	ETHERNET SWITCH
	1	VEHICLE DETECTION SYSTEM (DIGITAL IP CAMERAS, VDP & CABLES)
	1	CABINET MONITOR UNIT
	1	VIDEO INTERFACE/ EXTENSION VIDEO UNIT
	1	15' EXTENSION BRACKET
	6	LOOP DETECTOR AMPLIFIER
	1	PROP PRE-EMPTION PHASE SELECTOR
	1	CONNECTED VEHICLE SYSTEM W/RSU

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

PROPOSED VIDEO DETECTION DATA

EXISTING DETECTOR DATA						
DETECTOR NO.	NO. SECTION/ SIZE	NO. OF TURNS	OPERATIONS	DELAY /EXT	CALL PHASE	LOOP CONNECTION
1	4-6'x6'	3	PRESENCE	0	ø1	SERIES/PARALLEL
2	4-6'x6'	3	PRESENCE	0	ø1	SERIES/PARALLEL
3	3-6'x6'	3	PRESENCE	0	ø6	SERIES
4	3-6'x6'	3	PRESENCE	0	ø6	SERIES
5	3-6'x6'	3	PRESENCE	EXT 1 SEC	ø6	SERIES
6	3-6'x6'	3	PRESENCE	0	ø2	SERIES
7	3-6'x6'	3	PRESENCE	0	ø2	SERIES
8	3-6'x6'	3	PRESENCE	EXT 1 SEC	ø2	SERIES
9	4-6'x6'	3	PRESENCE	0	ø4	SERIES/PARALLEL
10	4-6'x6'	3	PRESENCE	0	ø4	SERIES/PARALLEL
11	4-6'x6'	3	PRESENCE	DELAY 10 SEC	ø4	SERIES/PARALLEL
12	2-6'x6'	3	PRESENCE	0	ø8	SERIES
13	2-6'x6'	3	PRESENCE	DELAY 10 SEC	ø8	SERIES

DETECTION ZONE	APPROACH/LANE	CAMERA	DELAY /EXT	CALL PHASE
1	ROUTE 9 EB LEFT-TURN LANE	C1	0	ø1
2	ROUTE 9 EB LEFT-TURN LANE	C1	0	ø1
3	ROUTE 9 EB THRU LANE	C2	0	ø6
4	ROUTE 9 EB THRU LANE	C2	0	ø6
5	ROUTE 9 EB THRU-RIGHT LANE	C2	0	ø6
6	ROUTE 9 WB THRU LANE	C1	0	ø2
7	ROUTE 9 WB THRU LANE	C1	0	ø2
8	ROUTE 9 WB THRU LANE	C1	0	ø2
9	ROUTE 9 WB RIGHT-TURN LANE	C1	0	ø2
10	CALIFORNIA AVENUE NB LEFT-TURN LANE	C1	0	ø4
11	CALIFORNIA AVENUE NB RIGHT-TURN LANE	C1	0	ø4
12	CALIFORNIA AVENUE SB LEFT-TURN LANE	C2	0	ø8
13	CALIFORNIA AVENUE SB LEFT-THRU LANE	C2	0	ø8
14	CALIFORNIA AVENUE SB RIGHT-TURN LANE	C2	0	ø8

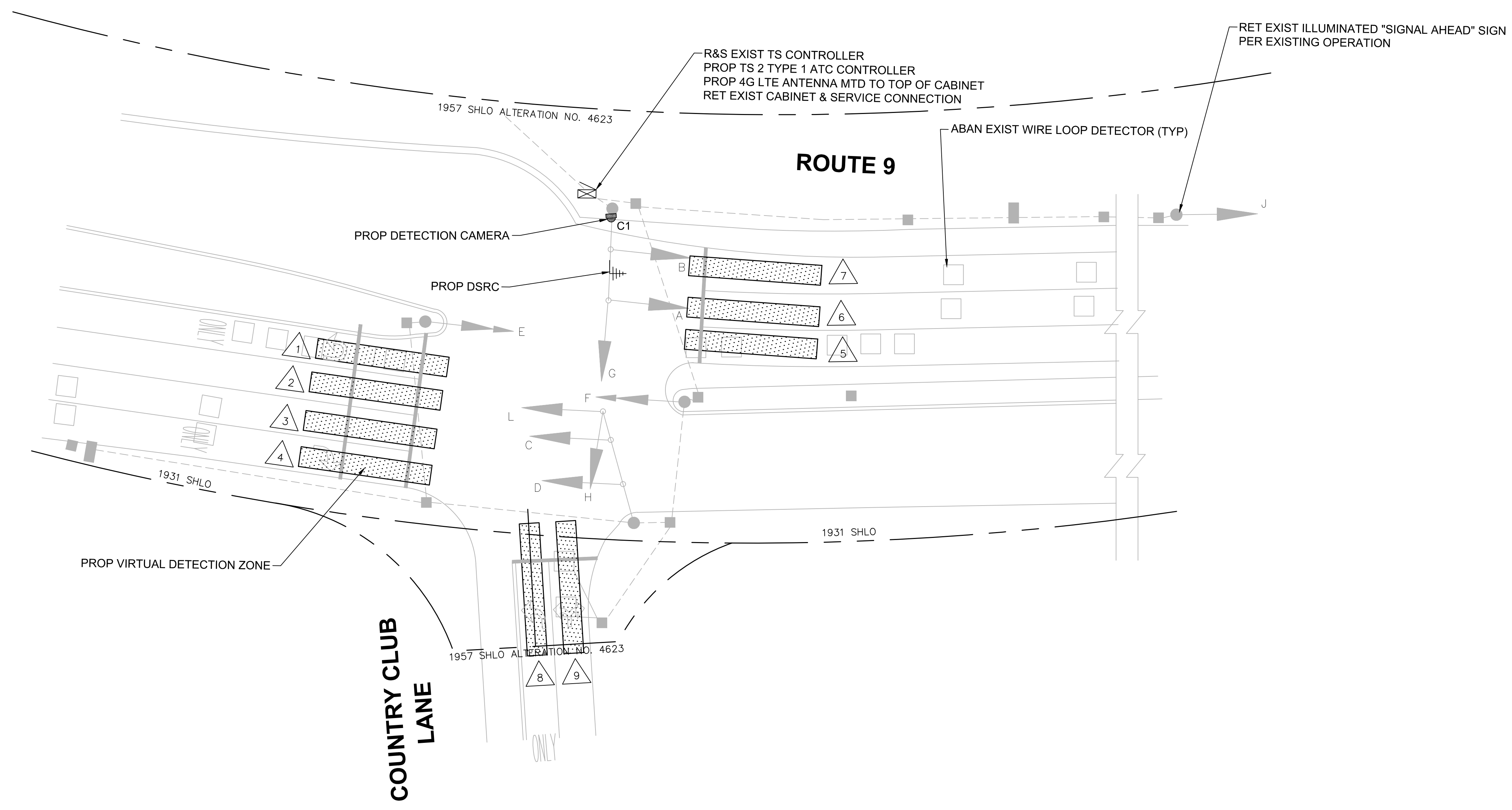
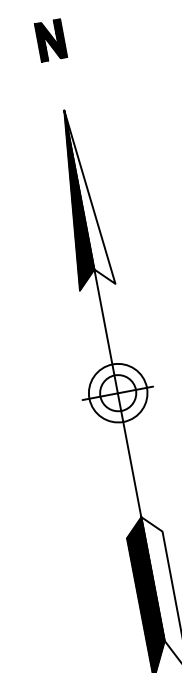
NOTE: DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	37	93

PROJECT FILE NO. 609003

**TRAFFIC SIGNAL PLANS
LOCATION 16**



CONSTRUCTION NOTES

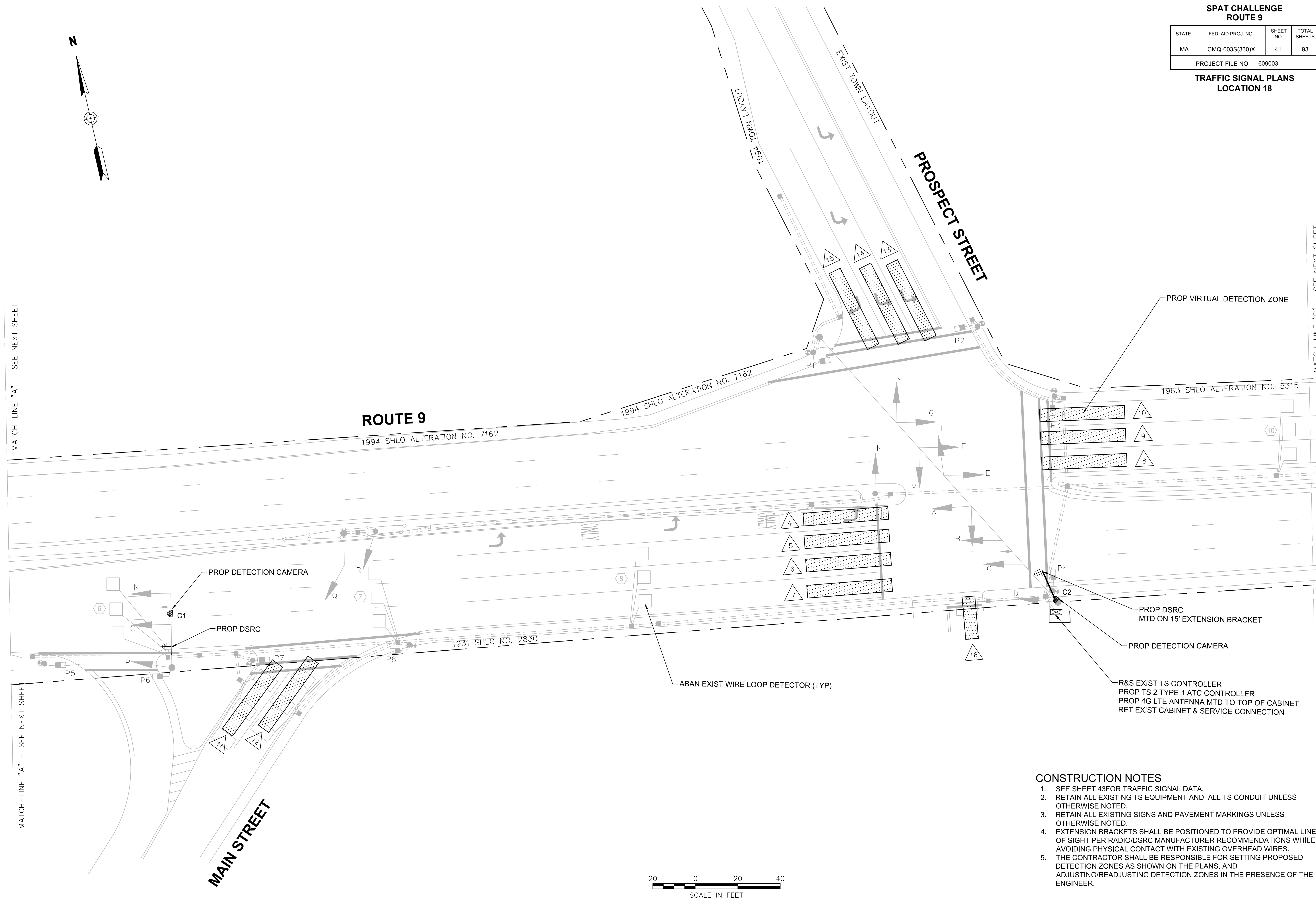
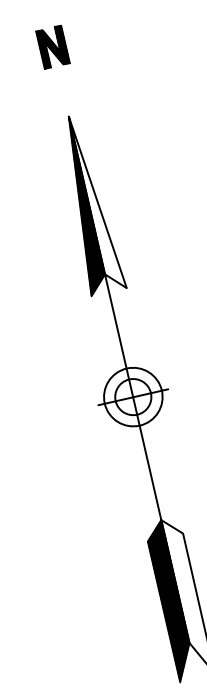
1. SEE SHEET 38 FOR TRAFFIC SIGNAL DATA.
2. RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
4. EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.



**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	41	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 18**



MATCH-LINE "A" - SEE NEXT SHEET

MATCH-LINE "B" - SEE NEXT SHEET

MATCH-LINE "A" - SEE NEXT SHEET

MATCH-LINE "B" - SEE NEXT SHEET

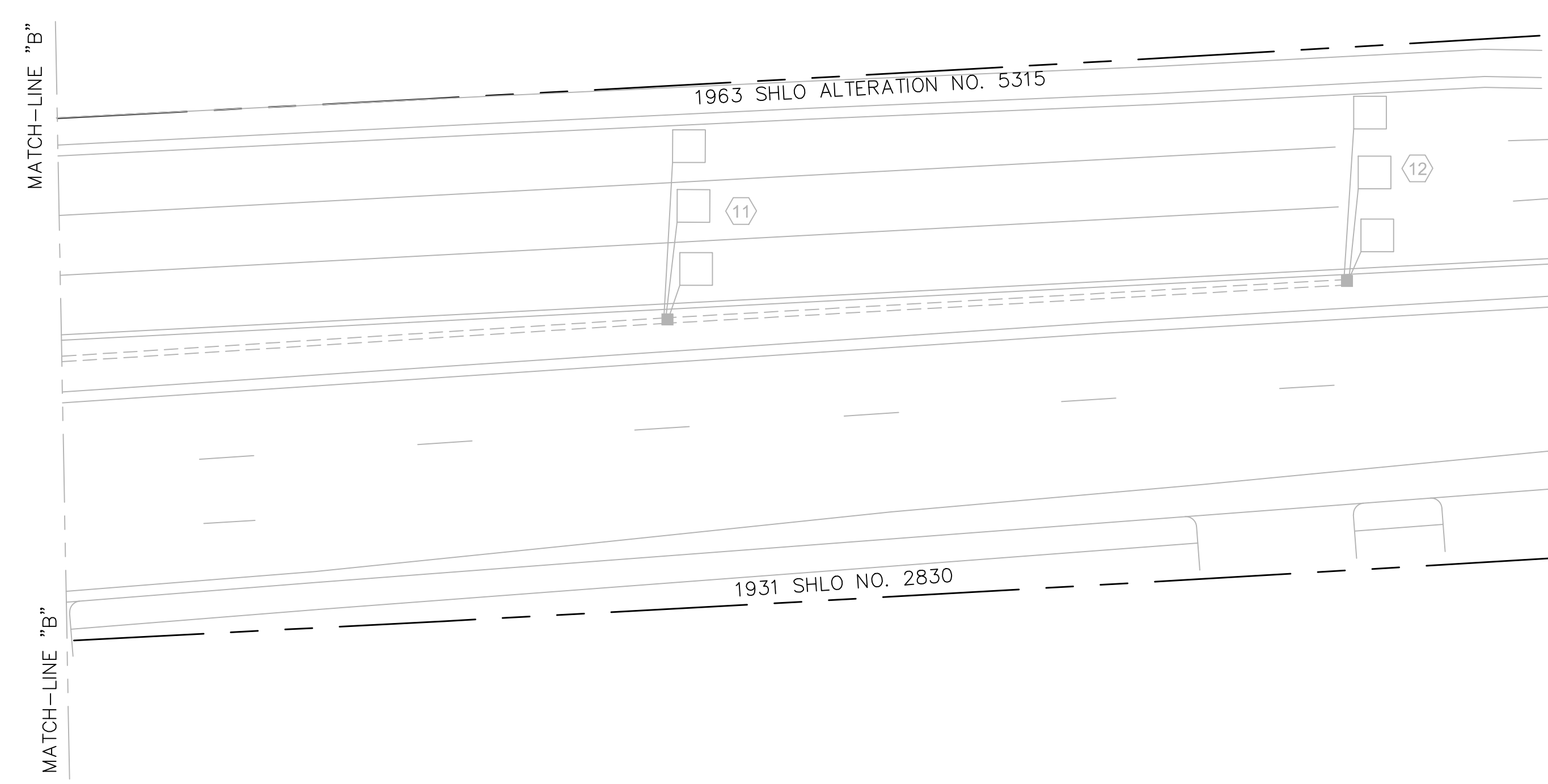
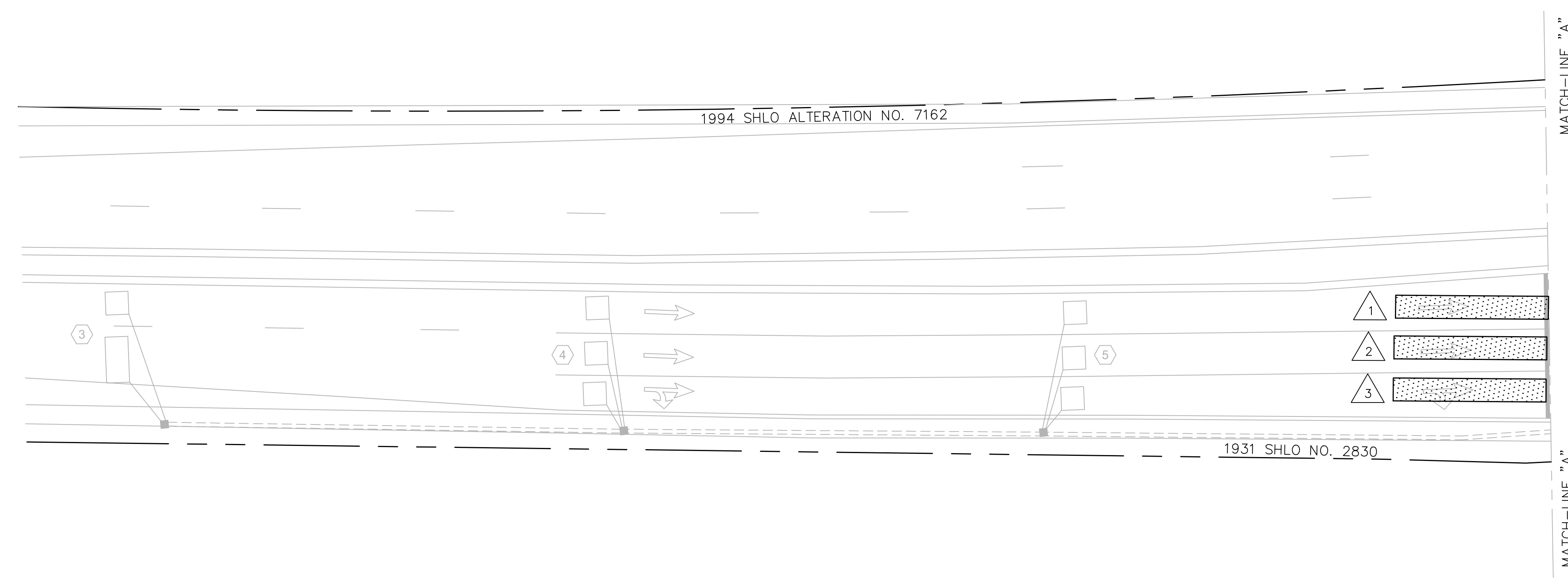
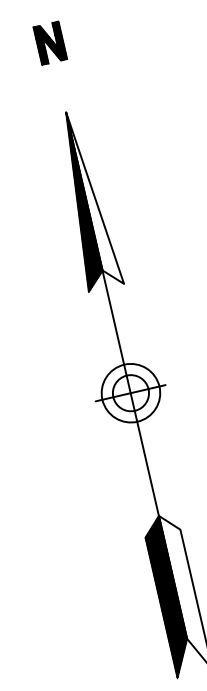


- CONSTRUCTION NOTES**
- SEE SHEET 43 FOR TRAFFIC SIGNAL DATA.
 - RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
 - RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
 - EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	42	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 18**

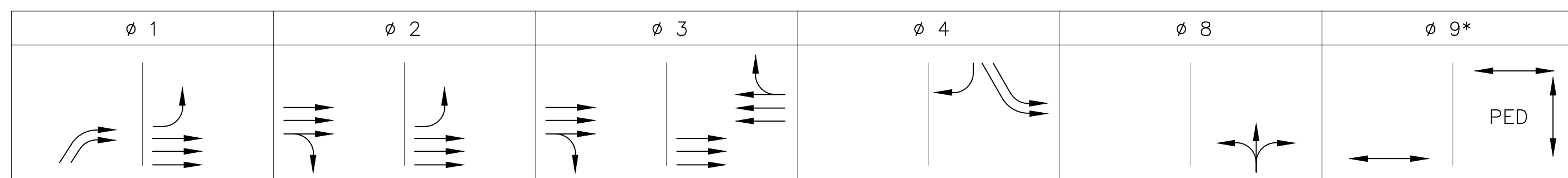
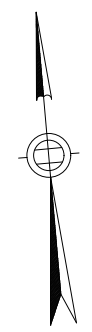


CONSTRUCTION NOTES

1. SEE SHEET 43 FOR TRAFFIC SIGNAL DATA.
2. RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
4. EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.



APPROX. NORTH



PROPOSED SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

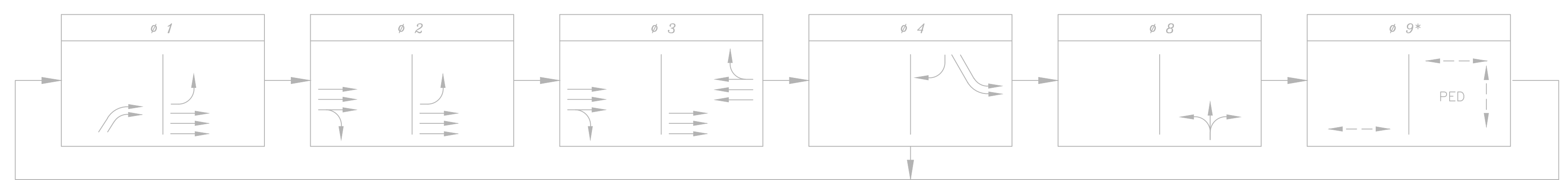
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	FLASH OPER. FRL	
WORCESTER ROAD (ROUTE 9)	EB	A	GL	GL	GL				RL	RL	RL				RL	RL	RL					
WORCESTER ROAD (ROUTE 9)	EB	B,C	GV	GV	GV				GV	Y	R				R	R	R					FY
WORCESTER ROAD (ROUTE 9)	EB	D	G	G	G				G	Y	R				R	R	R					FY
WORCESTER ROAD (ROUTE 9)	EB	N,O	R	R	R				GV	GV	GV				R	R	R					FY
WORCESTER ROAD (ROUTE 9)	EB	P	R	R	R				G	Y	R				R	R	R					FY
WORCESTER ROAD (ROUTE 9)	WB	E,F	R	R	R				R	R	R				R	R	R					FY
WORCESTER ROAD (ROUTE 9)	WB	G	R	R	R				R	R	R				R	R	R					FY
MAIN STREET	NB	Q,R	GR	YR	RR				RR	RR	RR				RR	RR	RR					FRR
PROSPECT STREET	SB	H	RL	RL	RL				RL	RL	RL				RL	RL	RL					FRL
PROSPECT STREET	SB	J,K	R	R	R				R	R	R				R	R	R					FR
DRIVEWAY	NB	L,M	R	R	R				R	R	R				R	R	R					FR
PEDESTRIAN		P1-P2	DW	DW	DW				DW	DW	DW				DW	DW	DW					OFF
PEDESTRIAN		P3-P4	DW	DW	DW				DW	DW	DW				DW	DW	DW					OFF
PEDESTRIAN		P5-P8	DW	DW	DW				DW	DW	DW				DW	DW	DW					OFF

TIMING IN SECONDS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	EMERGENCY ONLY
MINIMUM GREEN (INITIAL)	5			5			5			5			5						
PASSAGE TIME (VEHICLE)	2			2			2			2			2						
MAXIMUM 1	20			15			70			15			20						
MAXIMUM 2	15			20			110			15			15						
YELLOW CLEARANCE		3			3			3			4			4					
RED CLEARANCE WALK (W)			1			1			4			2			2			7	4
PEDESTRIAN CLEARANCE																		22	
RECALL MEMORY		OFF		OFF		MIN LOCKING		OFF		OFF		OFF		OFF					

- NOTES:
1. AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
 2. * UPON PEDESTRIAN PUSH BUTTON ACTUATION
 3. MAXIMUM 1 = NORMAL OPERATION
 4. MAXIMUM 2 = NOT USED
 5. STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.

EXISTING PREFERENTIAL PHASING SEQUENCE

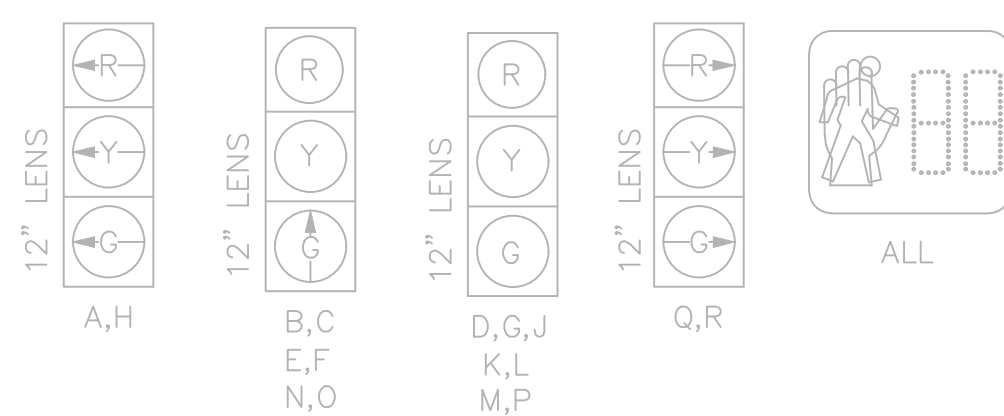


EXISTING EMERGENCY PRE-EMPTION DATA

APPROACH	PHASE	TIME (SEC)
ROUTE 9 EB	Ø2	25

EMERGENCY PRE-EMPTION DATA NOTES:
ACTIVATION OF FIRE PRE-EMPTION RESULTS IN IMMEDIATE CLEARANCE OF ANY CONFLICTING MOVEMENTS IN PROGRESS, FOLLOWED BY FIRE PRE-EMPTION PHASE, FOLLOWED BY RETURN TO THE BEGINNING OF THE CYCLE.

EXISTING SIGNAL IDENTIFICATION



SEQUENCE & TIMING NOTES:

1. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
2. THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
3. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
4. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

LIST OF MAJOR ITEMS REQUIRED

PAY ITEM	QUANTITY	DESCRIPTION
	1	TS 2 TYPE 1 ATC CONTROLLER INSTALLED IN EXIST CABINET
	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET
	1	ADDITIONAL OVERHEAD DSRC
	1	ETHERNET SWITCH
	1	VEHICLE DETECTION SYSTEM (DIGITAL IP CAMERAS, VDP & CABLES)
	1	CABINET MONITOR UNIT
	1	VIDEO INTERFACE/ EXTENSION VIDEO UNIT
	1	15' EXTENSION BRACKET
	1	CONNECTED VEHICLE SYSTEM W/RSU

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

PROPOSED VIDEO DETECTION DATA

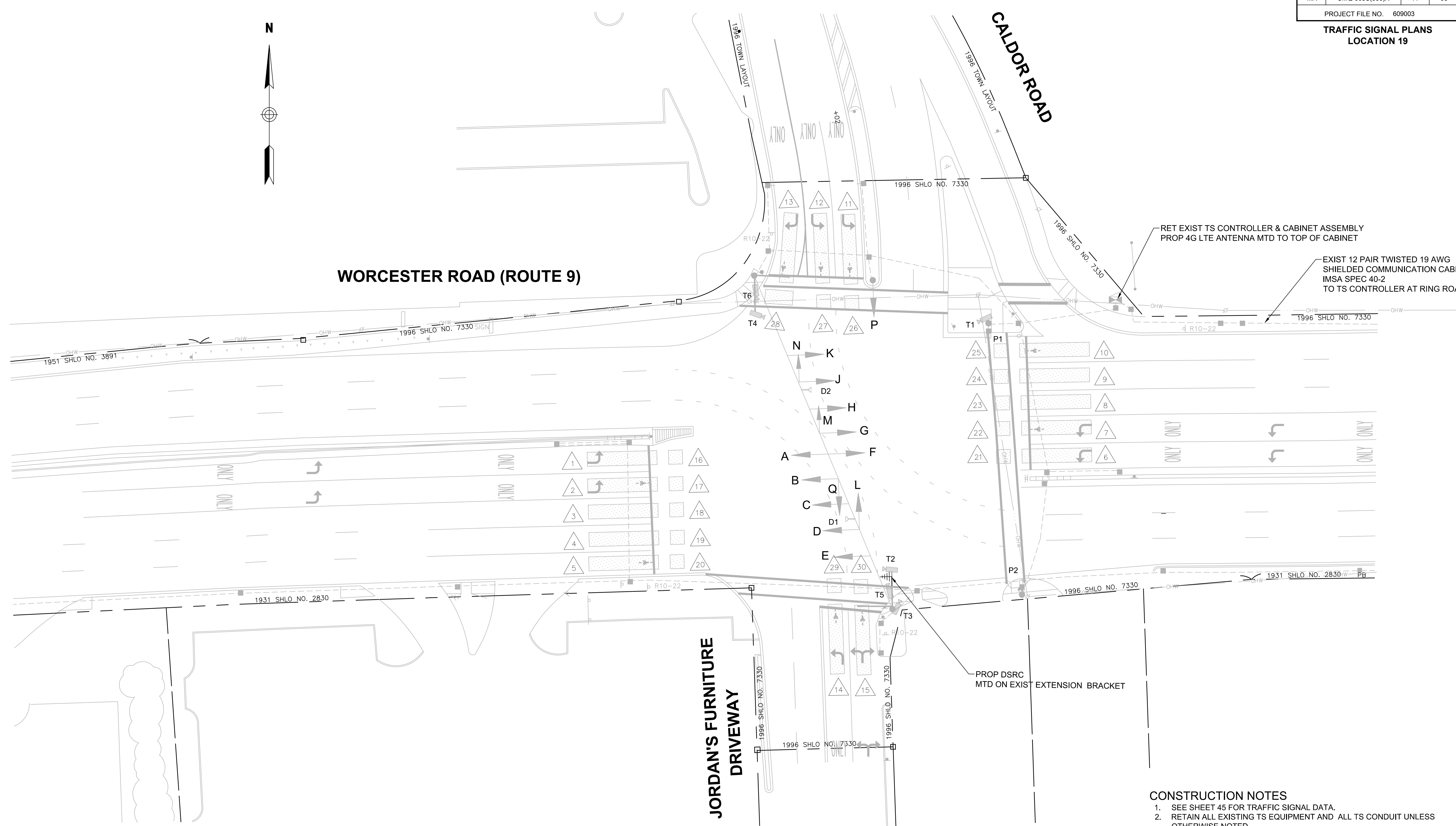
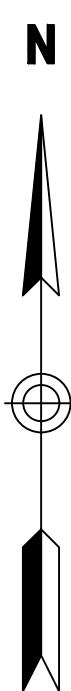
DETECTION ZONE	APPROACH/LANE	CAMERA	DELAY /EXT	CALL PHASE
1	ROUTE 9 EB THRU LANE	C1	0	Ø3
2	ROUTE 9 EB THRU LANE	C1	0	Ø3
3	ROUTE 9 EB THRU-RIGHT LANE	C1	0	Ø3
4	ROUTE 9 EB LEFT-TURN LANE	C2	0	Ø2
5	ROUTE 9 EB THRU LANE	C2	0	Ø3
6	ROUTE 9 EB THRU LANE	C2	0	Ø3
7	ROUTE 9 EB THRU LANE	C2	0	Ø3
8	ROUTE 9 WB THRU LANE	C2	0	Ø3
9	ROUTE 9 WB THRU LANE	C2	0	Ø3
10	ROUTE 9 WB THRU LANE	C2	0	Ø3
11	MAIN STREET NB RIGHT-TURN LANE	C1	0	Ø1
12	MAIN STREET NB RIGHT-TURN LANE	C1	0	Ø1
13	PROSPECT STREET SB LEFT-TURN LANE	C2	0	Ø4
14	PROSPECT STREET SB LEFT-TURN LANE	C2	0	Ø4
15	PROSPECT STREET SB RIGHT-TURN LANE	C2	0	Ø4
16	DRIVEWAY NB	C2	0	Ø8

NOTE: DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	44	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 19**



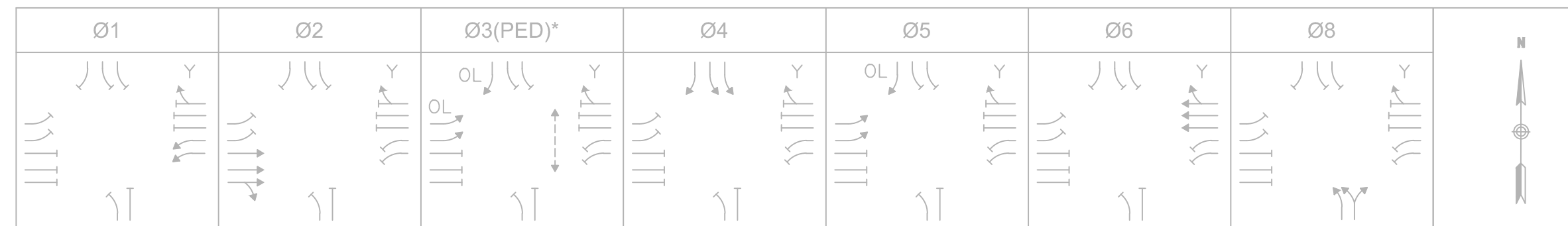
RET EXIST TS CONTROLLER & CABINET ASSEMBLY
PROP 4G LTE ANTENNA MTD TO TOP OF CABINET

EXIST 12 PAIR TWISTED 19 AWG
SHIELDED COMMUNICATION CABLE
IMSA SPEC 40-2
TO TS CONTROLLER AT RING ROAD

PROP DSRC
MTD ON EXIS EXTENSION BRACKET

- CONSTRUCTION NOTES**
1. SEE SHEET 45 FOR TRAFFIC SIGNAL DATA.
 2. RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
 3. RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
 4. EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.





EXISTING SEQUENCE AND TIMING FOR FULLY ACTUATED CONTROL (COORDINATED)

APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	FLASH
WORCESTER RD (RTE 9)	EB	A,B	←R-	←R-	←R-	←R-	←R-	←G-	←Y-	←R-	←R-	←R-	←R-	←G-	←Y-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←FR-
WORCESTER RD (RTE 9)	EB	C,D	R	R	R	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
WORCESTER RD (RTE 9)	EB	E	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
WORCESTER RD (RTE 9)	WB	F,G	←G-	←Y-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←FR-
WORCESTER RD (RTE 9)	WB	H,J,K	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
JORDAN'S FURNITURE	NB	Q	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←FR-
JORDAN'S FURNITURE	NB	P	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
CALDOR ROAD	SB	L,M	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←G-	←Y-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←FR-
CALDOR ROAD	SB	N	←R-	←R-	←R-	←R-	←R-	←R-	←G-	←Y-	←R-	←G-	←Y-	←R-	←G-	←Y-	←R-	←R-	←R-	←R-	←R-	←R-	←R-	←FR-
PEDESTRIAN	N-S	P1-P2	DW	DW	DW	DW	DW	DW	W/FDW	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF

TIMING IN SECONDS

MINIMUM GREEN (INITIAL)	6			10								6			6							10			6		
PASSAGE TIME (VEHICLE)	2			2								2			2							2			2		
MAXIMUM 1	10			30								20			10							30			20		
MAXIMUM 2																											
YELLOW CLEARANCE			3.5		4					4			4												4		
RED CLEARANCE					4			2				4.5			2										4.5		2
PEDESTRIAN WALK									7/22																		
PEDESTRIAN CLEARANCE																											

CONFLICT FLASH OPERATION ONLY

DETECTOR MEMORY	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK
RECALL	OFF	MIN	OFF	OFF	OFF	MIN	OFF

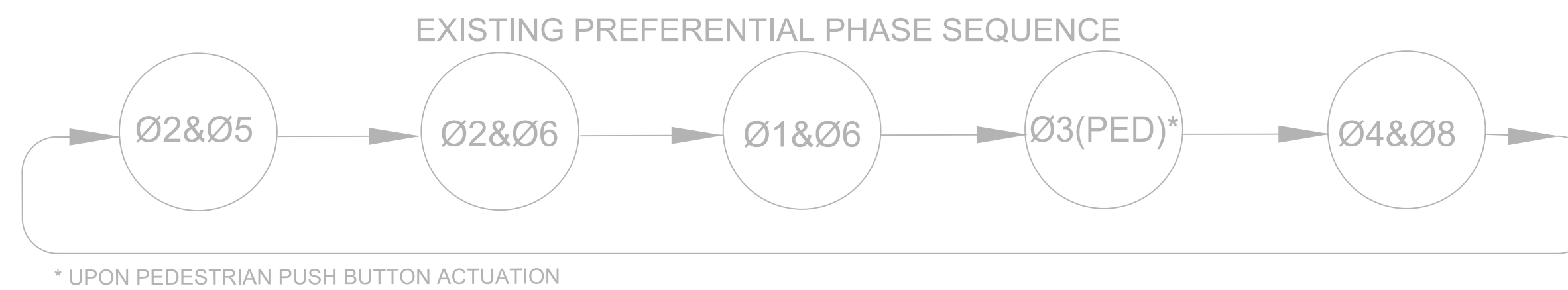
COORDINATION DATA			PHASE SPLIT TIMES							
TIMING PLAN	CYCLE	OFFSET	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø8	
TIME BASED COORDINATION BACK-UP PROGRAM										
1/1/1 M-F 6AM-9AM	85	16	14(14)	53(20)	0(37)	18(14)	25(14)	42(20)	18(14)	
2/1/1 M-F 11AM-2PM	90	14	15(15)	52(23)	0(37)	23(15)	23(15)	44(23)	23(15)	
3/1/1 M-F 3PM-7PM	90	17	16(14)	52(25)	0(37)	22(14)	18(15)	50(24)	22(14)	
4/1/1 SAT&SUN 9AM-7PM	100	31	20(14)	54(35)	0(37)	26(14)	22(15)	52(34)	26(14)	
5/1/1 M-F 11AM-2PM	110	11	20(15)	60(43)	0(37)	30(15)	30(15)	50(43)	30(15)	
6/1/1 M-F 3PM-7PM	120	52	20(15)	70(43)	0(37)	30(25)	22(15)	68(43)	30(25)	
7/1/1 SAT&SUN 9AM-7PM	130	92	22(20)	73(48)	0(37)	35(25)	27(20)	68(48)	35(25)	
ADAPTIVE TRAFFIC CONTROL PROGRAM										
21/1/1 M-F 5AM-10AM SAT&SUN 8AM-10AM	60	26	14	34	37	12	18	30	12	
22/1/1 M-F 10AM-10PM SAT&SUN 10AM-10PM	80	17	15	44	37	21	22	37	21	
MODE			COORD Ø				COORD Ø			

- NOTES:**
- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
 - * UPON PEDESTRIAN PUSH BUTTON ACTUATION
 - Y = YIELD CONTROL
 - OL = OVERLAP
 - Ø4 & Ø8 DUAL ENTRY
 - MAXIMUM 1 = NORMAL OPERATION
 - MAXIMUM 2 = NOT USED
 - STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
 - DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL BE IN EFFECT.
 - INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.
 - Ø2&Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
 - OFFSET: BEGINNING OF Ø2&Ø6 GREEN.
 - PLAN FORCE OFF SHALL BE IN EFFECT.
 - SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
 - (X) SPLIT TIME WITH PEDESTRIAN PHASE ACTUATED.
 - YIELD MODE COORDINATION SHALL BE IN EFFECT.
 - PLANS 5 THRU 7 SHALL BE PROGRAMMED FOR USE NOVEMBER 15 THRU JANUARY 1.

EXISTING PRE-EMPTION PHASING & PRIORITY

DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2&Ø5
D2	2		Ø1&Ø6

- EXISTING EMERGENCY VEHICLE PRE-EMPTION OPERATION**
- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
 - PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1 OR D2 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D2 LOWEST)
 - IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCES FOR THE ASSOCIATED PHASE(S) AS SHOWN IN THE SEQUENCE AND TIMING CHART AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
 - MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
 - PRE-EMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.
 - EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.
 - EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE ADAPTIVE PROGRAMMING.



EXISTING SIGNAL HEAD DATA

A,B,F,G,L,M,Q	C,D,H,J,K	E	P	N	P1-P2

ALL 12" LENS

- NOTE:**
- SIGNAL HEAD E IS EQUIPPED WITH A 2" WIDE YELLOW REFLECTIVE BORDER.

SEQUENCE & TIMING NOTES:

- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
- THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
- IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
- IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

LIST OF MAJOR ITEMS REQUIRED

ROUTE 9 AT CALDOR ROAD		
PAY ITEM	QUANTITY	DESCRIPTION
	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET
816.19	1	CONNECTED VEHICLE SYSTEM W/RSU

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

EXISTING ADAPTIVE TRAFFIC CONTROL SETTINGS			
INTERSECTION SETTINGS (ALL ENTRIES IN SECONDS)			
MIN CYCLE	MAX CYCLE	MAX CYCLE RATE OF CHANGE	MAX SPLIT RATE OF CHANGE
60	140	10	5

SPAT CHALLENGE ROUTE 9

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	45	93

PROJECT FILE NO. 609003

TRAFFIC SIGNAL PLANS LOCATION 19

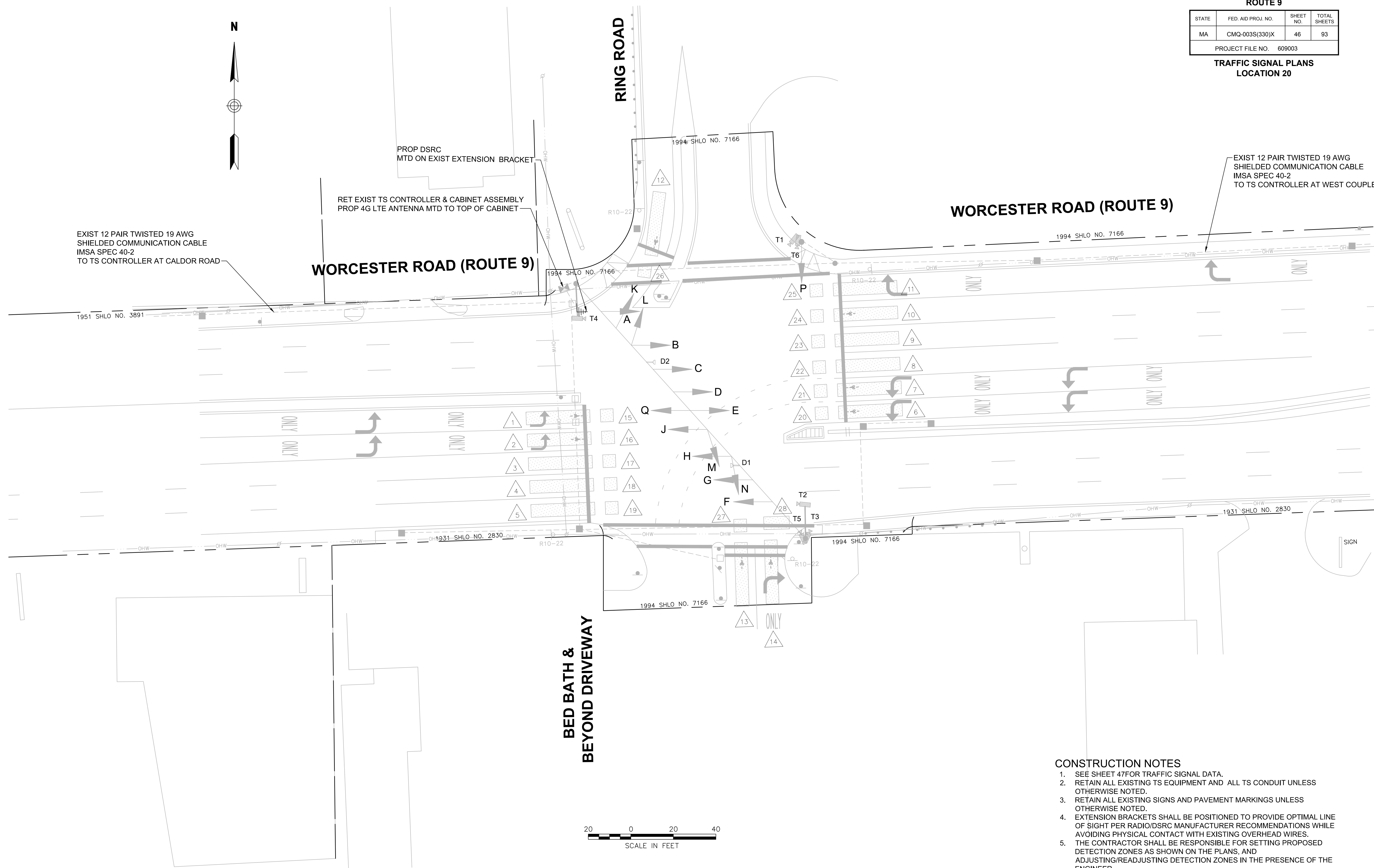
EXISTING DETECTOR DATA					
DETECTOR NO.	ZONE SIZE	VEHICLE SENSOR	DELAY /EXT	CALL PHASE	UTILIZATION PHASE
1	TO BE FIELD ADJUSTED	T1	0	Ø5	-
2	TO BE FIELD ADJUSTED	T1	0	Ø5	-
3	TO BE FIELD ADJUSTED	T2	0	Ø2	-
4	TO BE FIELD ADJUSTED	T2	0	Ø2	-
5	TO BE FIELD ADJUSTED	T2	0	Ø2	-
6	TO BE FIELD ADJUSTED	T3	0	Ø1	-
7	TO BE FIELD ADJUSTED	T3	0	Ø1	-
8	TO BE FIELD ADJUSTED	T4	0	Ø6	-
9	TO BE FIELD ADJUSTED	T4	0	Ø6	-
10	TO BE FIELD ADJUSTED	T4	0	Ø6	-
11	TO BE FIELD ADJUSTED	T5	0	Ø4	-
12	TO BE FIELD ADJUSTED	T5	0	Ø4	-
13	TO BE FIELD ADJUSTED	T5	5 SEC DELAY	Ø4	-
14	TO BE FIELD ADJUSTED	T6	0	Ø8	-
15	TO BE FIELD ADJUSTED	T6	0	Ø8	-
16	TO BE FIELD ADJUSTED	T1	0	-	Ø5
17	TO BE FIELD ADJUSTED	T1	0	-	Ø5
18	TO BE FIELD ADJUSTED	T2	0	-	Ø2
19	TO BE FIELD ADJUSTED	T2	0	-	Ø2
20	TO BE FIELD ADJUSTED	T2	0	-	Ø2
21	TO BE FIELD ADJUSTED	T3	0	-	Ø1
22	TO BE FIELD ADJUSTED	T3	0	-	Ø1
23	TO BE FIELD ADJUSTED	T4	0	-	Ø6
24	TO BE FIELD ADJUSTED	T4	0	-	Ø6
25	TO BE FIELD ADJUSTED	T4	0	-	Ø6
26	TO BE FIELD ADJUSTED	T5	0	-	Ø4
27	TO BE FIELD ADJUSTED	T5	0	-	Ø4
28	TO BE FIELD ADJUSTED	T5	0	-	Ø4
29	TO BE FIELD ADJUSTED	T6	0	-	Ø8
30	TO BE FIELD ADJUSTED	T6	0	-	Ø8

- NOTES:**
- DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	46	93

PROJECT FILE NO. 609003
**TRAFFIC SIGNAL PLANS
LOCATION 20**



EXIST 12 PAIR TWISTED 19 AWG SHIELDED COMMUNICATION CABLE IMSA SPEC 40-2 TO TS CONTROLLER AT CALDOR ROAD

RET EXIST TS CONTROLLER & CABINET ASSEMBLY PROP 4G LTE ANTENNA MTD TO TOP OF CABINET

PROP DSRC MTD ON EXIST EXTENSION BRACKET

EXIST 12 PAIR TWISTED 19 AWG SHIELDED COMMUNICATION CABLE IMSA SPEC 40-2 TO TS CONTROLLER AT WEST COUPLET

**BED BATH &
BEYOND DRIVEWAY**



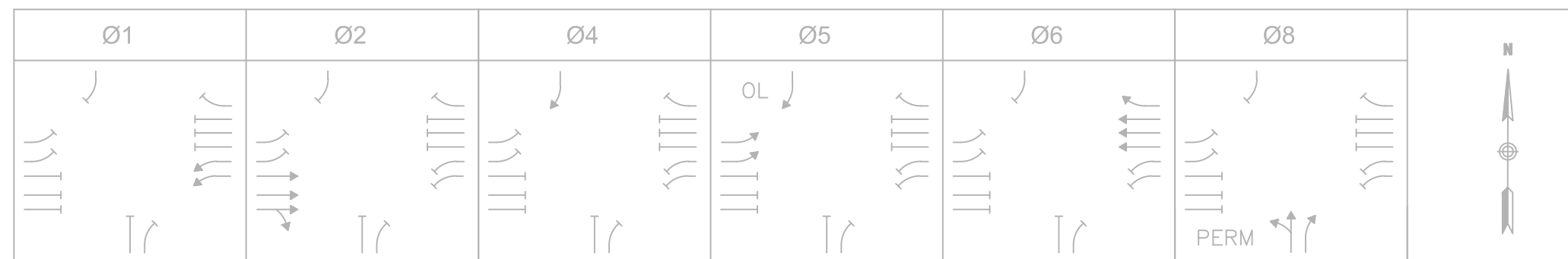
CONSTRUCTION NOTES

1. SEE SHEET 47 FOR TRAFFIC SIGNAL DATA.
2. RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
4. EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	47	93

PROJECT FILE NO. 609003
**TRAFFIC SIGNAL PLANS
LOCATION 20**



SEQUENCE & TIMING NOTES:

- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
- THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
- IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
- IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

EXISTING SEQUENCE AND TIMING FOR FULLY ACTUATED CONTROL (COORDINATED)

APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	FLASH	
WORCESTER RD (RTE 9)	WB	A	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FY
WORCESTER RD (RTE 9)	WB	B,C	R	R	R	R	R	R	R	R	R	R	R	R	R	OL	Y	R	R	R	R	FY
WORCESTER RD (RTE 9)	WB	D,E	<G	<Y	<R	<R	<R	<R	<R	<R	<R	<R	<R	<R	<R	<R	<R	<R	<R	<R	<R	<FR
WORCESTER RD (RTE 9)	EB	F	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
WORCESTER RD (RTE 9)	EB	G,H	R	R	R	OL	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
WORCESTER RD (RTE 9)	EB	J,Q	<R	<R	<R	<R	<R	<R	<R	<R	<R	<G	<Y	<R	<R	<R	<R	<R	<R	<R	<R	<FR
DRIVEWAY	NB	M,N,P	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
RING ROAD	SB	K,L	R	R	R	R	R	R	R	G	Y	R	G	Y	R	R	R	R	R	R	R	FR

TIMING IN SECONDS

	Ø1	Ø2	Ø4	Ø5	Ø6	Ø8
MINIMUM GREEN (INITIAL)	6		10		6	
PASSAGE TIME (VEHICLE)	2		2		2	
MAXIMUM 1	10		30		20	
MAXIMUM 2	X		X		X	
YELLOW CLEARANCE		3.5		4		4
RED CLEARANCE			3.5		1.5	
PEDESTRIAN WALK				1		
PEDESTRIAN CLEARANCE						

CONFLICT FLASH OPERATION ONLY

DETECTOR MEMORY	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK
RECALL	OFF	MIN	OFF	OFF	MIN	OFF

COORDINATION DATA

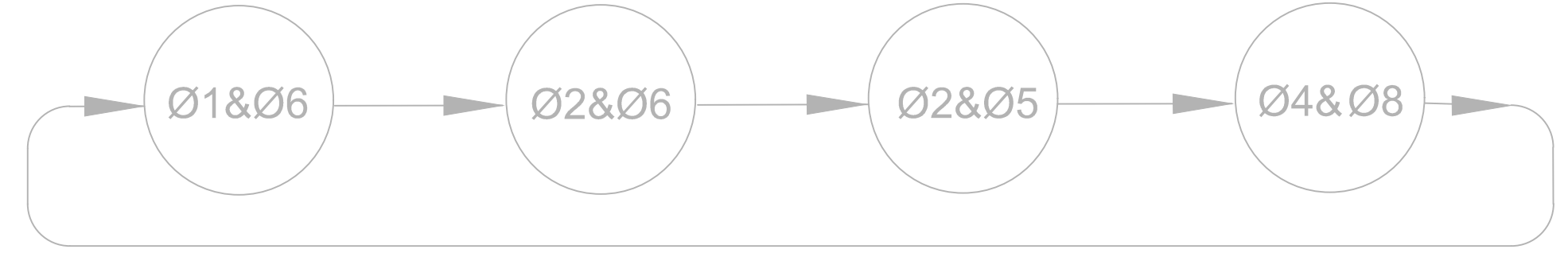
TIMING PLAN	CYCLE	OFFSET	Ø1	Ø2	Ø4	Ø5	Ø6	Ø8
1/1/1 M-F 6AM-9AM	85	5	14	57	14	14	57	14
2/1/1 M-F 11AM-2PM	90	17	17	49	24	19	47	24
3/1/1 M-F 3PM-7PM	90	17	16	51	23	16	51	23
4/1/1 SAT&SUN 9AM-7PM	100	40	17	54	29	25	46	29
5/1/1 M-F 11AM-2PM	110	106	18	65	27	24	59	27
6/1/1 M-F 3PM-7PM	120	52	18	74	28	18	74	28
7/1/1 SAT&SUN 9AM-7PM	130	102	20	74	36	30	64	36

ADAPTIVE TRAFFIC CONTROL PROGRAM

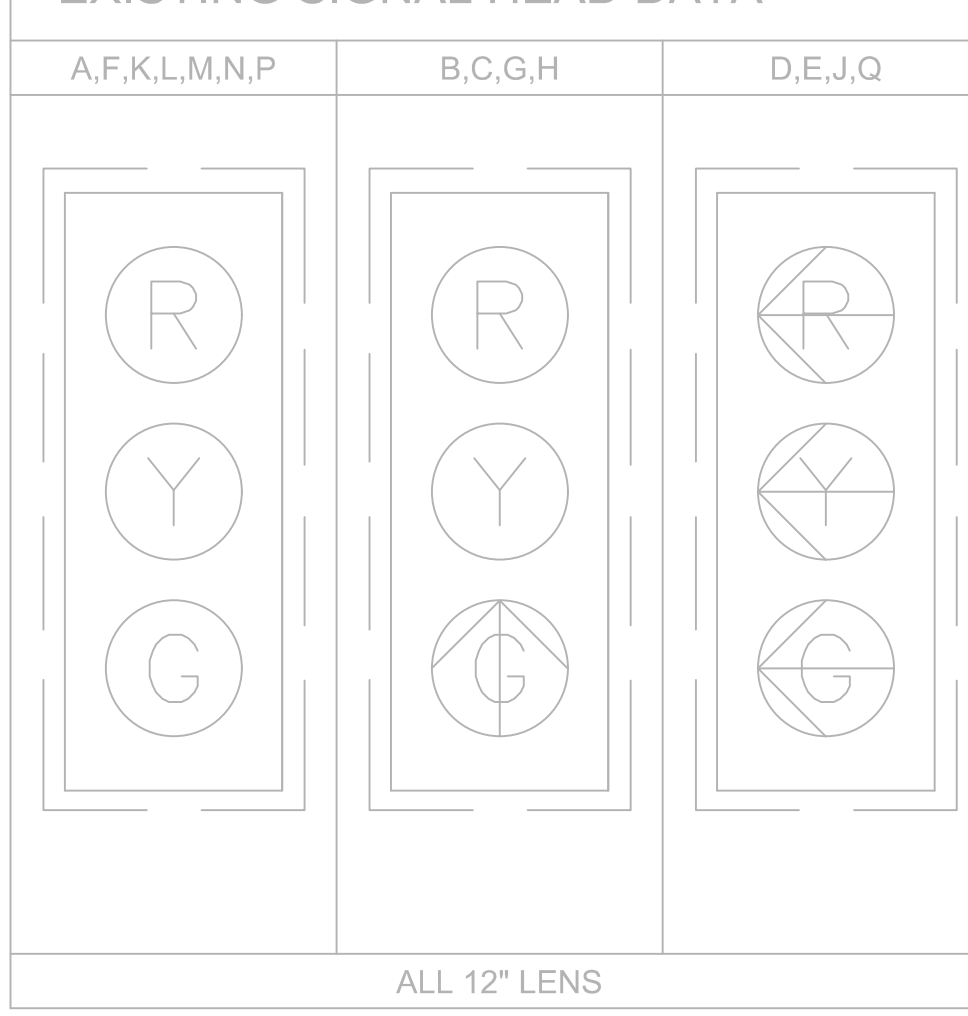
MODE	PHASE SPLIT TIMES	Ø1	Ø2	Ø4	Ø5	Ø6	Ø8
21/1/1 M-F 5AM-10AM SAT&SUN 8AM-10AM		60	24	14	32	14	14
22/1/1 M-F 10AM-10PM SAT&SUN 10AM-10PM		80	12	15	45	20	18
MODE			COORD Ø			COORD Ø	

- NOTES:**
- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
 - OL = OVERLAP
 - PERM = PERMISSIVE
 - Ø4 & Ø8 DUAL ENTRY
 - MAXIMUM 1 = NORMAL OPERATION
 - MAXIMUM 2 = NOT USED
 - STOP AND GO OPERATION FOR 24 HOURS PER DAY, FLASHING OPERATION FOR EMERGENCY ONLY.
 - INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.
 - Ø2&Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
 - OFFSET: BEGINNING OF Ø2&Ø6 GREEN.
 - PLAN FORCE OFF SHALL BE IN EFFECT.
 - SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
 - YIELD MODE COORDINATION SHALL BE IN EFFECT.
 - PLANS 5 THRU 7 SHALL BE PROGRAMMED FOR USE NOVEMBER 15 THRU JANUARY 1.

EXISTING PREFERENTIAL PHASE SEQUENCE



EXISTING SIGNAL HEAD DATA



- NOTES:**
- SIGNAL HEADS K,M & P DO NOT HAVE BACKPLATES.
 - SIGNAL HEADS A & F ARE EQUIPPED WITH A 2" WIDE YELLOW REFLECTIVE BORDER.

LIST OF MAJOR ITEMS REQUIRED

ROUTE 9 AT RING ROAD

PAY ITEM	QUANTITY	DESCRIPTION
816.20	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET
	1	CONNECTED VEHICLE SYSTEM W/RSU

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

EXISTING ADAPTIVE TRAFFIC CONTROL SETTINGS

INTERSECTION SETTINGS (ALL ENTRIES IN SECONDS)

MIN CYCLE	MAX CYCLE	MAX CYCLE RATE OF CHANGE	MAX SPLIT RATE OF CHANGE
60	140	10	5

EXISTING DETECTOR DATA

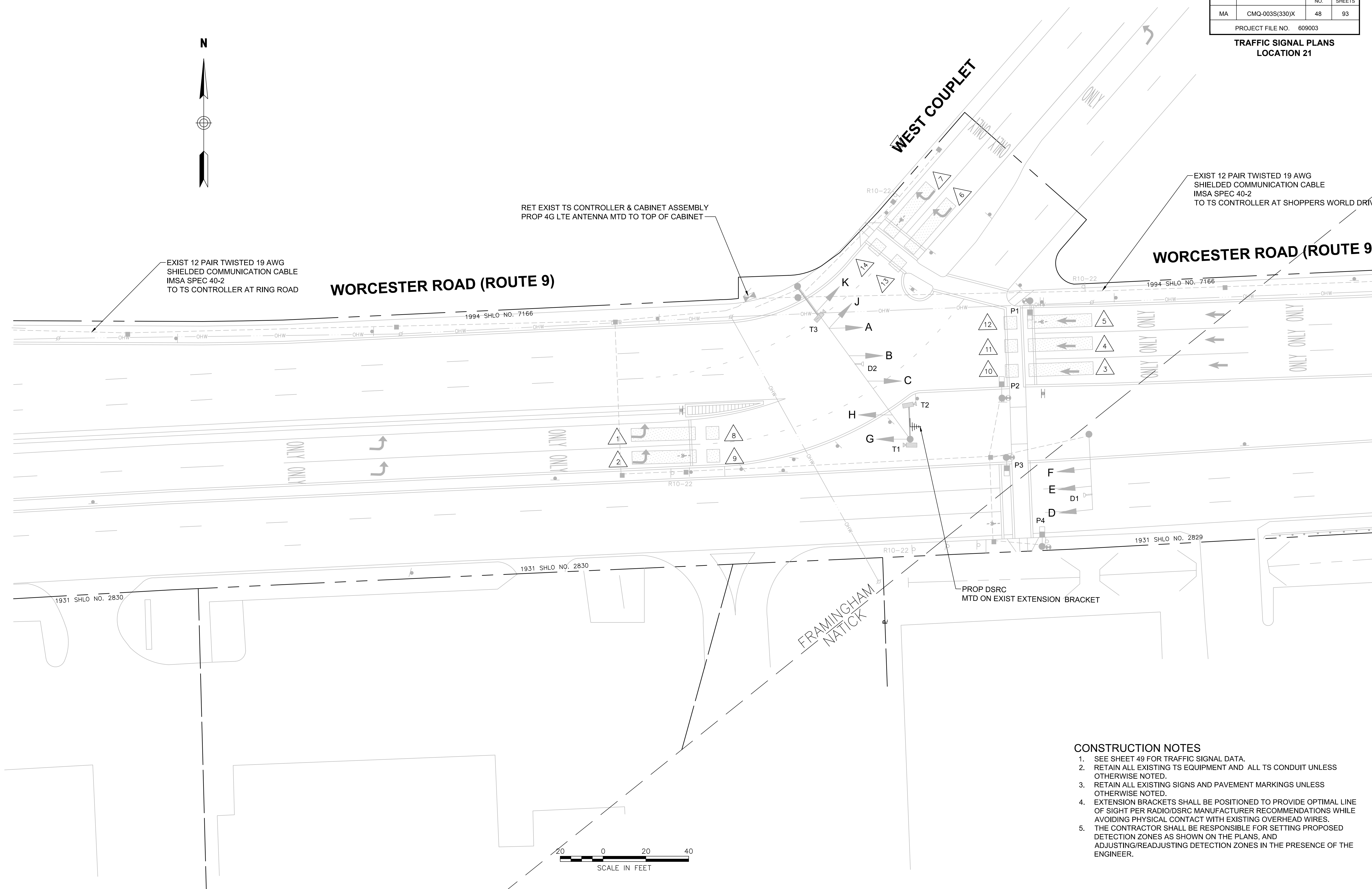
DETECTOR NO.	ZONE SIZE	VEHICLE SENSOR	DELAY /EXT	CALL PHASE	UTILIZATION PHASE
1	TO BE FIELD ADJUSTED	T1	0	Ø5	-
2	TO BE FIELD ADJUSTED	T1	0	Ø5	-
3	TO BE FIELD ADJUSTED	T2	0	Ø2	-
4	TO BE FIELD ADJUSTED	T2	0	Ø2	-
5	TO BE FIELD ADJUSTED	T2	0	Ø2	-
6	TO BE FIELD ADJUSTED	T3	0	Ø1	-
7	TO BE FIELD ADJUSTED	T3	0	Ø1	-
8	TO BE FIELD ADJUSTED	T4	0	Ø6	-
9	TO BE FIELD ADJUSTED	T4	0	Ø6	-
10	TO BE FIELD ADJUSTED	T4	0	Ø6	-
11	TO BE FIELD ADJUSTED	T4	0	Ø6	-
12	TO BE FIELD ADJUSTED	T5	5 SEC DELAY	Ø4	-
13	TO BE FIELD ADJUSTED	T6	0	Ø8	-
14	TO BE FIELD ADJUSTED	T6	0	Ø8	-
15	TO BE FIELD ADJUSTED	T1	0	-	Ø5
16	TO BE FIELD ADJUSTED	T1	0	-	Ø5
17	TO BE FIELD ADJUSTED	T2	0	-	Ø2
18	TO BE FIELD ADJUSTED	T2	0	-	Ø2
19	TO BE FIELD ADJUSTED	T2	0	-	Ø2
20	TO BE FIELD ADJUSTED	T3	0	-	Ø1
21	TO BE FIELD ADJUSTED	T3	0	-	Ø1
22	TO BE FIELD ADJUSTED	T4	0	-	Ø6
23	TO BE FIELD ADJUSTED	T4	0	-	Ø6
24	TO BE FIELD ADJUSTED	T4	0	-	Ø6
25	TO BE FIELD ADJUSTED	T4	0	-	Ø6
26	TO BE FIELD ADJUSTED	T5	0	-	Ø4
27	TO BE FIELD ADJUSTED	T6	0	-	Ø8
28	TO BE FIELD ADJUSTED	T6	0	-	Ø8

- NOTES:**
- DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	48	93

PROJECT FILE NO. 609003
**TRAFFIC SIGNAL PLANS
LOCATION 21**



EXIST 12 PAIR TWISTED 19 AWG SHIELDED COMMUNICATION CABLE IMSA SPEC 40-2 TO TS CONTROLLER AT RING ROAD

RET EXIST TS CONTROLLER & CABINET ASSEMBLY PROP 4G LTE ANTENNA MTD TO TOP OF CABINET

EXIST 12 PAIR TWISTED 19 AWG SHIELDED COMMUNICATION CABLE IMSA SPEC 40-2 TO TS CONTROLLER AT SHOPPERS WORLD DRIVE

PROP DSRC MTD ON EXIST EXTENSION BRACKET

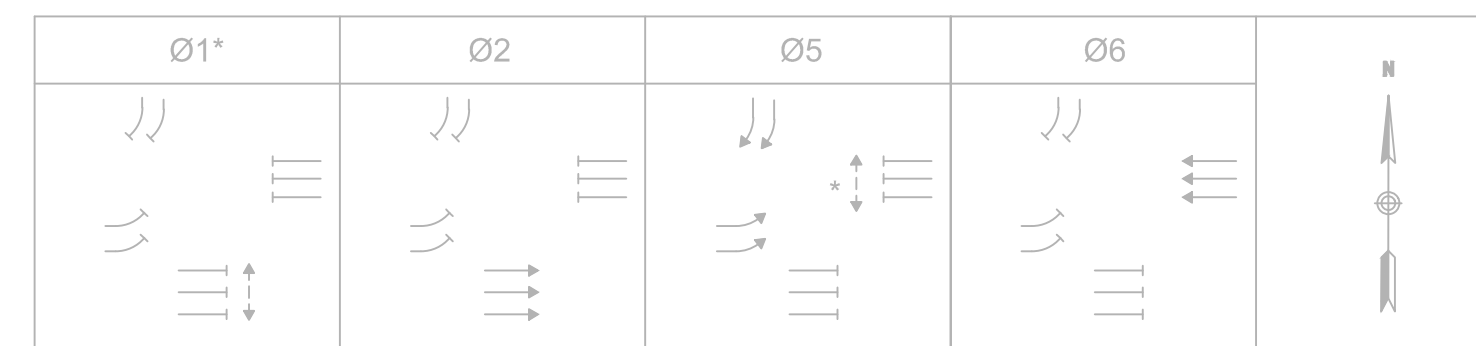
- CONSTRUCTION NOTES**
- SEE SHEET 49 FOR TRAFFIC SIGNAL DATA.
 - RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
 - RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
 - EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.



**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	49	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 21**



EXISTING SEQUENCE AND TIMING FOR FULLY ACTUATED CONTROL (COORDINATED)

APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	FLASH
WORCESTER RD (RTE 9)	WB	A,B,C	R	R	R	R	R	R	R	R	R	Y	Y	R	FY
WORCESTER RD (RTE 9)	EB	D,E,F	R	R	R	Y	Y	R	R	R	R	R	R	R	FY
WORCESTER RD (RTE 9)	EB	G,H	(R)	(R)	(R)	(R)	(R)	(R)	(G)	(Y)	(R)	(R)	(R)	(R)	(FR)
WEST COUplet	SB	J,K	(R)	(R)	(R)	(R)	(R)	(R)	(G)	(Y)	(R)	(R)	(R)	(R)	(FR)
PEDESTRIAN	N-S	P1-P2	DW	DW	DW	DW	DW	DW	W/FDW	FDW	DW	DW	DW	DW	OFF
PEDESTRIAN	N-S	P3-P4	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF

TIMING IN SECONDS

MINIMUM GREEN (INITIAL)					10			6				10			
PASSAGE TIME (VEHICLE)					-			2				2			
MAXIMUM 1					10			30				40			
MAXIMUM 2					X			X				X			
YELLOW CLEARANCE							4			4				4	
RED CLEARANCE					3			1				3			1
PEDESTRIAN WALK			7						7/4						
PEDESTRIAN CLEARANCE			7												

CONFLICT FLASH OPERATION ONLY

DETECTOR MEMORY		NON-LOCK		-	NON-LOCK	NON-LOCK
RECALL		OFF		MIN	OFF	MIN

COORDINATION DATA			PHASE SPLIT TIMES			
TIMING PLAN	CYCLE	OFFSET	Ø1	Ø2	Ø5	Ø6
TIME BASED COORDINATION BACK-UP PROGRAM						
1/1/1 M-F 6AM-9AM	85	0	0(17)	85(68)	21(21)	64(64)
2/1/1 M-F 11AM-2PM	90	0	0(17)	90(73)	23(23)	67(67)
3/1/1 M-F 3PM-7PM	90	0	0(17)	90(73)	21(21)	69(69)
4/1/1 SAT&SUN 9AM-7PM	100	0	0(17)	100(83)	30(30)	70(70)
5/1/1 M-F 11AM-2PM	110	0	0(17)	110(93)	25(25)	85(85)
6/1/1 M-F 3PM-7PM	120	0	0(17)	120(103)	25(25)	95(95)
7/1/1 SAT&SUN 9AM-7PM	130	0	0(17)	130(113)	37(37)	93(93)
ADAPTIVE TRAFFIC CONTROL PROGRAM						
21/1/1 M-F 5AM-10AM SAT&SUN 8AM-10AM	60	0	0(17)	60(47)	19(19)	41(41)
22/1/1 M-F 10AM-10PM SAT&SUN 10AM-10PM	80	0	0(17)	80(63)	21(21)	59(59)
			COORD Ø			COORD Ø

NOTES:

- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
- * UPON PEDESTRIAN PUSH BUTTON ACTUATION
- MAXIMUM 1 = NORMAL OPERATION
- MAXIMUM 2 = NOT USED
- STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
- DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL BE IN EFFECT.
- INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.
- Ø2&Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
- OFFSET: BEGINNING OF Ø2&Ø6 GREEN.
- PLAN FORCE OFF SHALL BE IN EFFECT.
- SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
- (X) SPLIT TIME WITH PEDESTRIAN PHASE ACTUATED.
- YIELD MODE COORDINATION SHALL BE IN EFFECT.
- PLANS 5 THRU 7 SHALL BE PROGRAMMED FOR USE NOVEMBER 15 THRU JANUARY 1.

SEQUENCE & TIMING NOTES:

- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
- THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
- IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
- IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

EXISTING ADAPTIVE TRAFFIC CONTROL SETTINGS			
INTERSECTION SETTINGS (ALL ENTRIES IN SECONDS)			
MIN CYCLE	MAX CYCLE	MAX CYCLE RATE OF CHANGE	MAX SPLIT RATE OF CHANGE
60	140	10	5

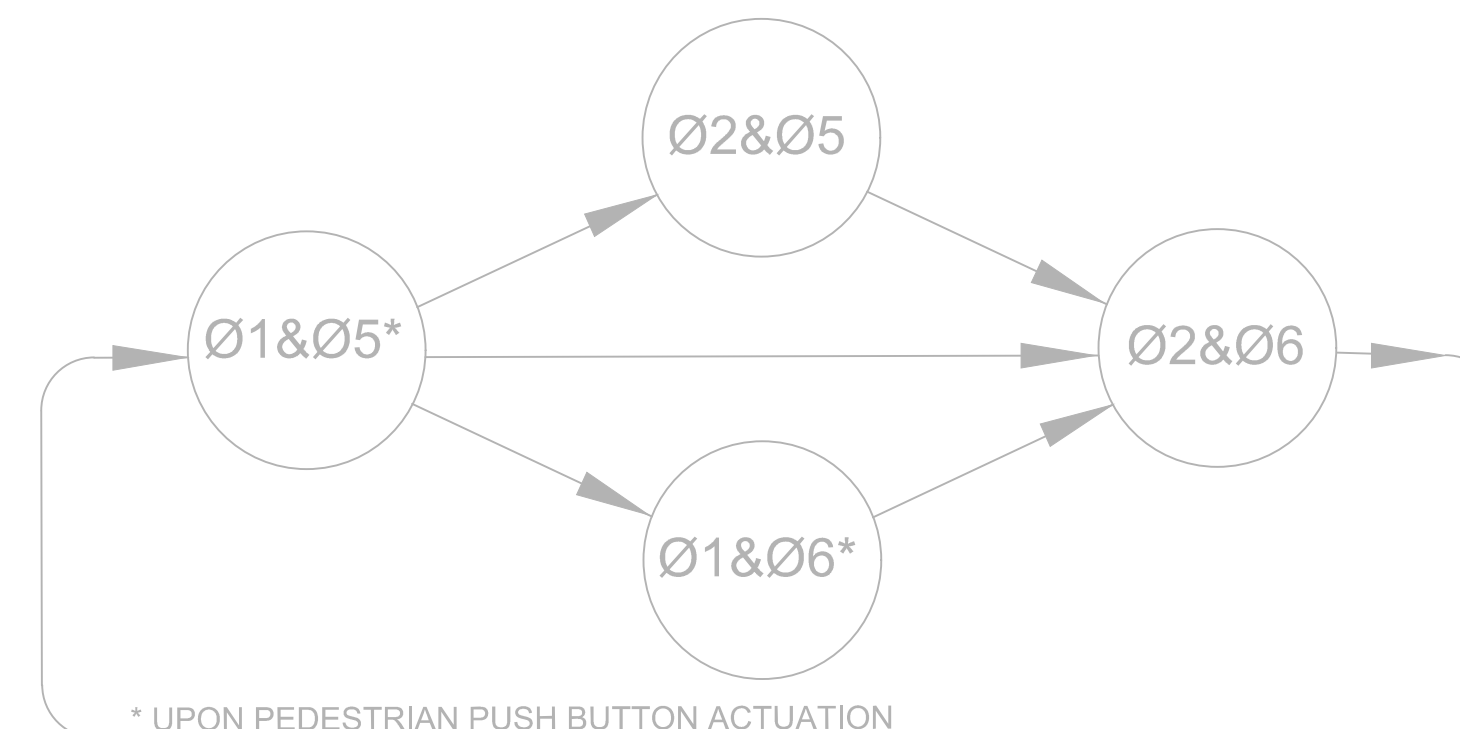
LIST OF MAJOR ITEMS REQUIRED

ROUTE 9 AT WEST COUplet

PAY ITEM	QUANTITY	DESCRIPTION
816.21	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET
	1	CONNECTED VEHICLE SYSTEM W/RSU

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

EXISTING PREFERENTIAL PHASE SEQUENCE



EXISTING SIGNAL HEAD DATA

A,B,C,D,E,F	G,H	J,K	P1-P4
ALL 12" LENS			

EMERGENCY VEHICLE PRE-EMPTION OPERATION

- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
- PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1 OR D2 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D2 LOWEST)
- IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCES FOR THE ASSOCIATED PHASE(S) AS SHOWN IN THE SEQUENCE AND TIMING CHART AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
- MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
- PRE-EMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.
- EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.
- EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE ADAPTIVE PROGRAMMING.

EXISTING PRE-EMPTION PHASING & PRIORITY

DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2&Ø5
D2	2		Ø6

EXISTING DETECTOR DATA					
DETECTOR NO.	ZONE SIZE	VEHICLE SENSOR	DELAY /EXT	CALL PHASE	UTILIZATION PHASE
1	TO BE FIELD ADJUSTED	T1	0	Ø5	-
2	TO BE FIELD ADJUSTED	T1	0	Ø5	-
3	TO BE FIELD ADJUSTED	T2	0	Ø6	-
4	TO BE FIELD ADJUSTED	T2	0	Ø6	-
5	TO BE FIELD ADJUSTED	T2	0	Ø6	-
6	TO BE FIELD ADJUSTED	T3	0	Ø5	-
7	TO BE FIELD ADJUSTED	T3	0	Ø5	-
8	TO BE FIELD ADJUSTED	T1	0	-	Ø5
9	TO BE FIELD ADJUSTED	T1	0	-	Ø5
10	TO BE FIELD ADJUSTED	T2	0	-	Ø6
11	TO BE FIELD ADJUSTED	T2	0	-	Ø6
12	TO BE FIELD ADJUSTED	T2	0	-	Ø6
13	TO BE FIELD ADJUSTED	T3	0	-	Ø5
14	TO BE FIELD ADJUSTED	T3	0	-	Ø5

NOTES:

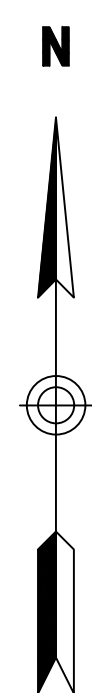
- DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	50	93

PROJECT FILE NO. 609003

**TRAFFIC SIGNAL PLANS
LOCATION 22**



FRAMINGHAM
NATICK

SHOPPERS WORLD DRIVE

WORCESTER ROAD (ROUTE 9)

WORCESTER ROAD (ROUTE 9)

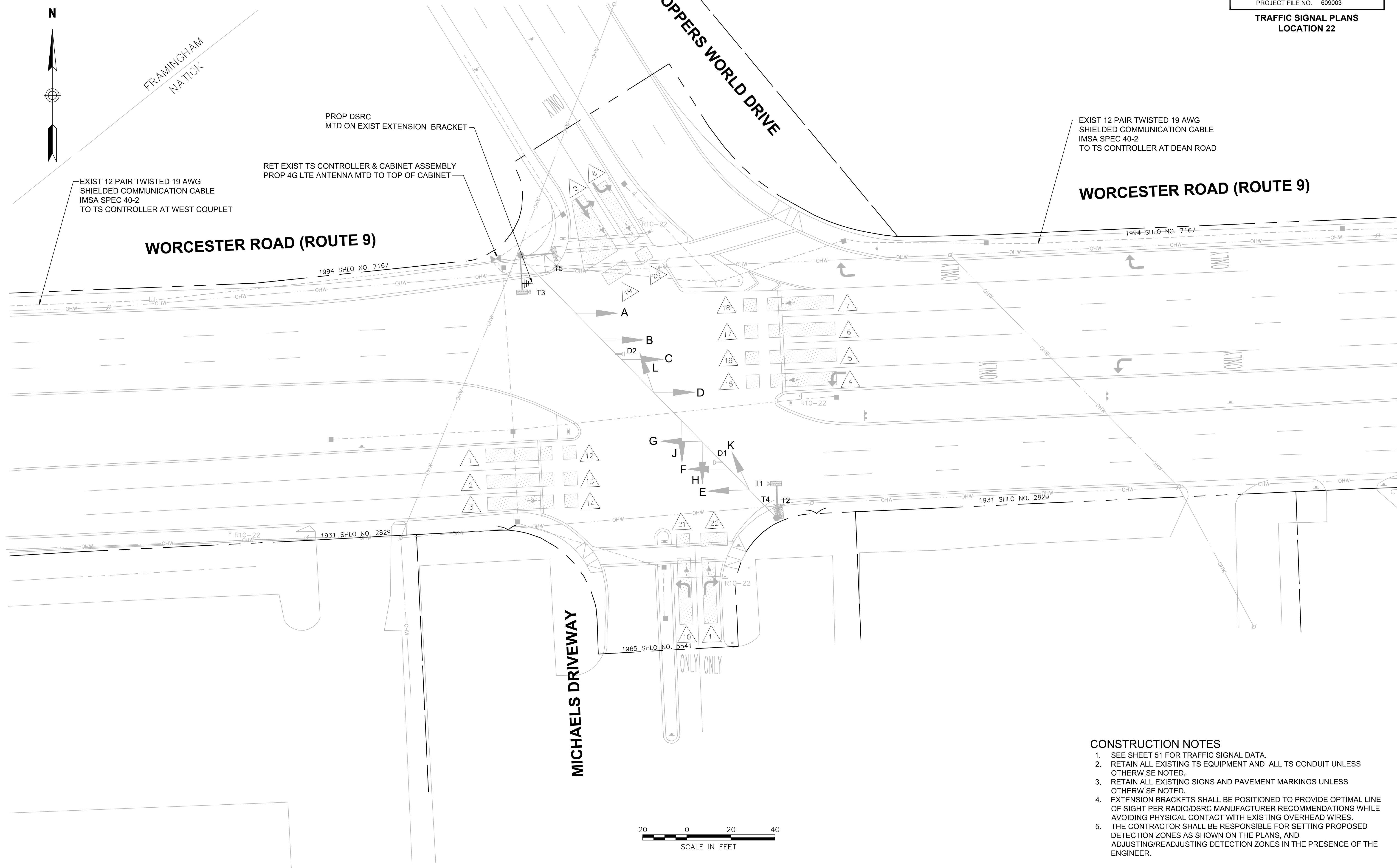
MICHAELS DRIVEWAY

PROP DSRC
MTD ON EXIST EXTENSION BRACKET

RET EXIST TS CONTROLLER & CABINET ASSEMBLY
PROP 4G LTE ANTENNA MTD TO TOP OF CABINET

EXIST 12 PAIR TWISTED 19 AWG
SHIELDED COMMUNICATION CABLE
IMSA SPEC 40-2
TO TS CONTROLLER AT WEST COUPLET

EXIST 12 PAIR TWISTED 19 AWG
SHIELDED COMMUNICATION CABLE
IMSA SPEC 40-2
TO TS CONTROLLER AT DEAN ROAD



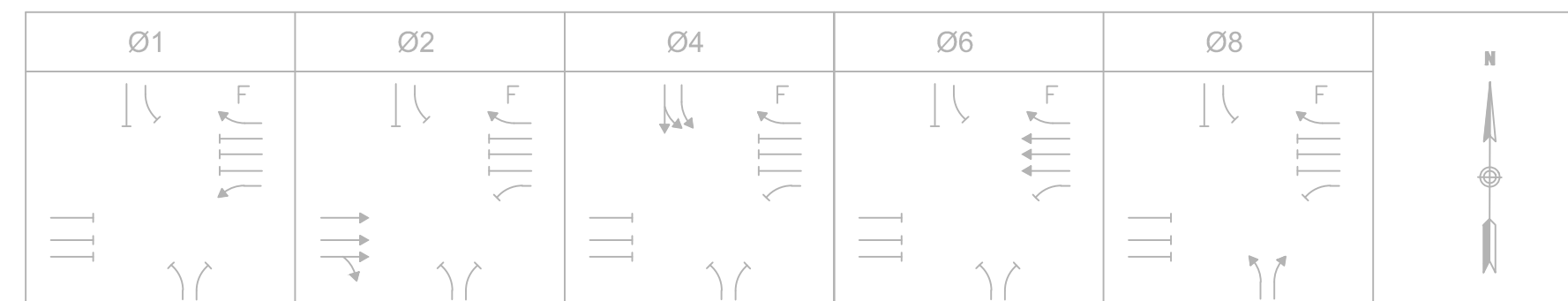
CONSTRUCTION NOTES

1. SEE SHEET 51 FOR TRAFFIC SIGNAL DATA.
2. RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
4. EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	51	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 22**



EXISTING SEQUENCE AND TIMING FOR FULLY ACTUATED CONTROL (COORDINATED)

APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	4	5	6	7	8	9	FLASH
WORCESTER RD (RTE 9)	WB	A,B,C	R	R	R	R	R	R	R	R	R	Y	R	R	R	R	R	FY
WORCESTER RD (RTE 9)	WB	D	←G←	←Y←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←R←	←FR←
WORCESTER RD (RTE 9)	EB	E	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	FY
WORCESTER RD (RTE 9)	EB	F,G	R	R	R	←G←	Y	R	R	R	R	R	R	R	R	R	R	FY
MICHAELS DRIVEWAY	NB	H,J	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	FR
SHOPPERS WORLD DR	SB	K,L	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FR

TIMING IN SECONDS																		
MINIMUM GREEN (INITIAL)	6			10			6			10			6					
PASSAGE TIME (VEHICLE)	2			2			2			2			2					
MAXIMUM 1	10			30			20			40			20					
MAXIMUM 2	X			X			X			X			X					
YELLOW CLEARANCE		3.5			4			4			4			4				
RED CLEARANCE			3			1			1.5			1			1.5			
PEDESTRIAN WALK																		
PEDESTRIAN CLEARANCE																		

DETECTOR MEMORY		NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK
RECALL		OFF	MIN	OFF	MIN	OFF

COORDINATION DATA			COORDINATION PHASE SPLIT TIMES				
TIMING PLAN	CYCLE	OFFSET	Ø1	Ø2	Ø4	Ø6	Ø8
TIME BASED COORDINATION BACK-UP PROGRAM							
1/1/1 M-F 6AM-9AM	85	44	16	49	20	65	20
2/1/1 M-F 11AM-2PM	90	52	20	43	27	63	27
3/1/1 M-F 3PM-7PM	90	56	22	41	27	63	27
4/1/1 SAT&SUN 9AM-7PM	100	85	19	45	36	64	36
5/1/1 M-F 11AM-2PM	110	40	23	52	35	75	35
6/1/1 M-F 3PM-7PM	120	18	25	58	37	83	37
7/1/1 SAT&SUN 9AM-7PM	130	22	20	60	50	80	50
ADAPTIVE TRAFFIC CONTROL PROGRAM							
21/1/1 M-F 5AM-10AM SAT&SUN 8AM-10AM	60	57	13	33	14	46	14
22/1/1 M-F 10AM-10PM SAT&SUN 10AM-10PM	80	43	18	37	25	55	25
MODE				COORD Ø		COORD Ø	

SEQUENCE & TIMING NOTES:

- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
- THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
- IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
- IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

LIST OF MAJOR ITEMS REQUIRED

PAY ITEM	QUANTITY	DESCRIPTION
	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET
	3	ONBOARD UNIT
	1	CONNECTED VEHICLE SYSTEM W/RSU
	1	TS 2 TYPE 1 ATC CONTROLLER IN A 32/48 ATC CABINET (SPARE)
	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET (SPARE)
	2	CONNECTED VEHICLE SYSTEM W/RSU (SPARE)
	1	ETHERNET SWITCH (SPARE)
	1	VEHICLE DETECTION SYSTEM (DIGITAL IP CAMERAS, VDP & CABLES) (SPARE)
	1	VIDEO INTERFACE/ EXTENSION VIDEO UNIT (SPARE)
	1	WIRELESS COMMUNICATIONS SYSTEM (W/2 ANTENNAS, 1 ETHERNET RADIO UNIT INTERFACE & CABLES) (SPARE)
	1	CABINET MONITOR UNIT (SPARE)

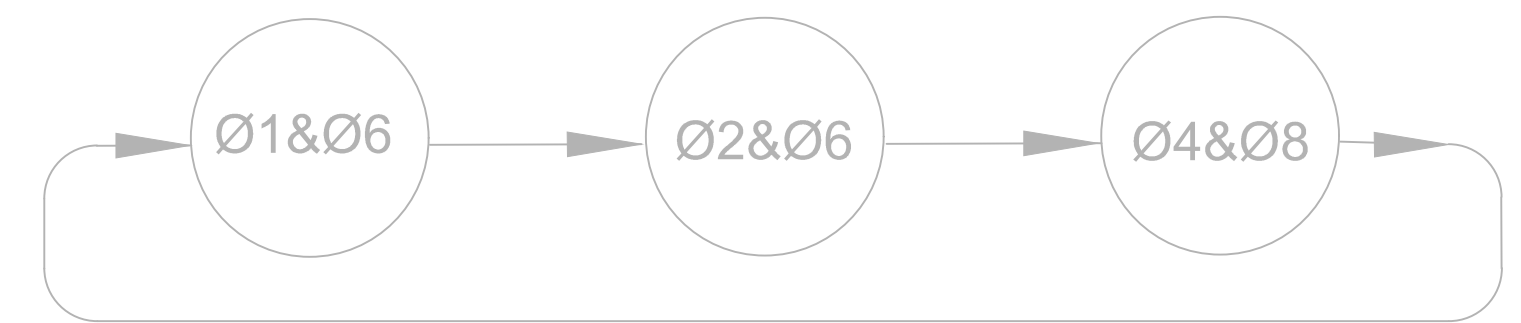
PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

EXISTING DETECTOR DATA

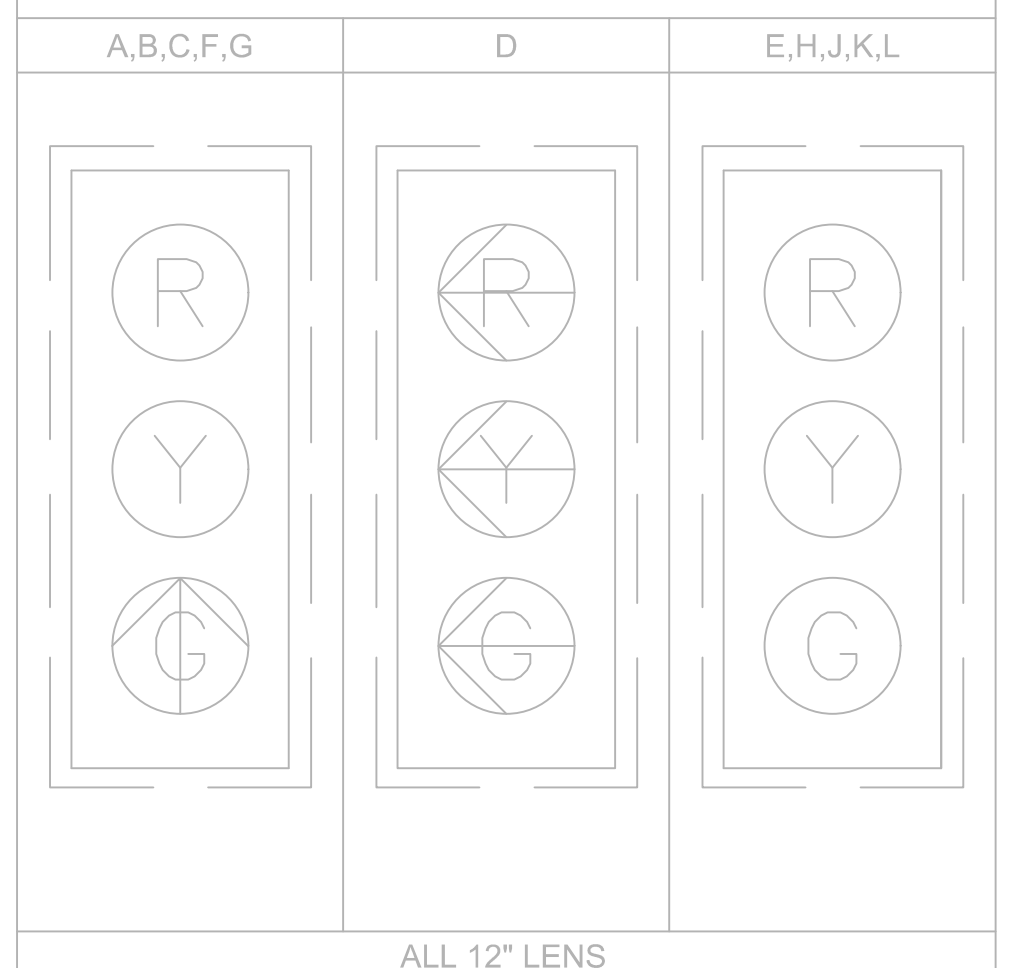
DETECTOR NO.	ZONE SIZE	VEHICLE SENSOR	DELAY /EXT	CALL PHASE	UTILIZATION PHASE
1	TO BE FIELD ADJUSTED	T1	0	Ø2	-
2	TO BE FIELD ADJUSTED	T1	0	Ø2	-
3	TO BE FIELD ADJUSTED	T1	0	Ø2	-
4	TO BE FIELD ADJUSTED	T2	0	Ø1	-
5	TO BE FIELD ADJUSTED	T3	0	Ø6	-
6	TO BE FIELD ADJUSTED	T3	0	Ø6	-
7	TO BE FIELD ADJUSTED	T3	0	Ø6	-
8	TO BE FIELD ADJUSTED	T4	0	Ø4	-
9	TO BE FIELD ADJUSTED	T4	0	Ø4	-
10	TO BE FIELD ADJUSTED	T5	0	Ø8	-
11	TO BE FIELD ADJUSTED	T5	5 SEC DELAY	Ø8	-
12	TO BE FIELD ADJUSTED	T1	0	-	Ø2
13	TO BE FIELD ADJUSTED	T1	0	-	Ø2
14	TO BE FIELD ADJUSTED	T1	0	-	Ø2
15	TO BE FIELD ADJUSTED	T2	0	-	Ø1
16	TO BE FIELD ADJUSTED	T3	0	-	Ø6
17	TO BE FIELD ADJUSTED	T3	0	-	Ø6
18	TO BE FIELD ADJUSTED	T3	0	-	Ø6
19	TO BE FIELD ADJUSTED	T4	0	-	Ø4
20	TO BE FIELD ADJUSTED	T4	0	-	Ø4
21	TO BE FIELD ADJUSTED	T5	0	-	Ø8
22	TO BE FIELD ADJUSTED	T5	0	-	Ø8

- NOTES:**
- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
 - F = FREE
 - Ø4 & Ø8 DUAL ENTRY
 - MAXIMUM 1 = NORMAL OPERATION
 - MAXIMUM 2 = NOT USED
 - STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
 - INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.
 - Ø2&Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
 - OFFSET: BEGINNING OF Ø2&Ø6 GREEN.
 - PLAN FORCE OFF SHALL BE IN EFFECT.
 - SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
 - YIELD MODE COORDINATION SHALL BE IN EFFECT.
 - PLANS 5 THRU 7 SHALL BE PROGRAMMED FOR USE NOVEMBER 15 THRU JANUARY 1.

EXISTING PREFERENTIAL PHASE SEQUENCE



EXISTING SIGNAL HEAD DATA



- NOTE:**
- SIGNAL HEAD E IS EQUIPPED WITH A 2" WIDE YELLOW REFLECTIVE BORDER.

EXISTING EMERGENCY VEHICLE PRE-EMPTION OPERATION

- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
- PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1 OR D2 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D2 LOWEST)
- IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCES FOR THE ASSOCIATED PHASE(S) AS SHOWN IN THE SEQUENCE AND TIMING CHART AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
- MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
- PRE-EMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.
- EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.
- EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE ADAPTIVE PROGRAMMING.

EXISTING PRE-EMPTION PHASING & PRIORITY

DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2
D2	2		Ø1&Ø6

EXISTING ADAPTIVE TRAFFIC CONTROL SETTINGS

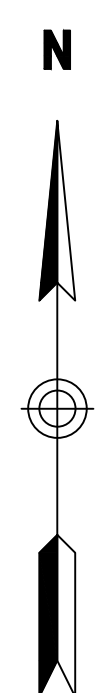
INTERSECTION SETTINGS (ALL ENTRIES IN SECONDS)			
MIN CYCLE	MAX CYCLE	MAX CYCLE RATE OF CHANGE	MAX SPLIT RATE OF CHANGE
60	140	10	5

- NOTES:**
- DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	52	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 23**



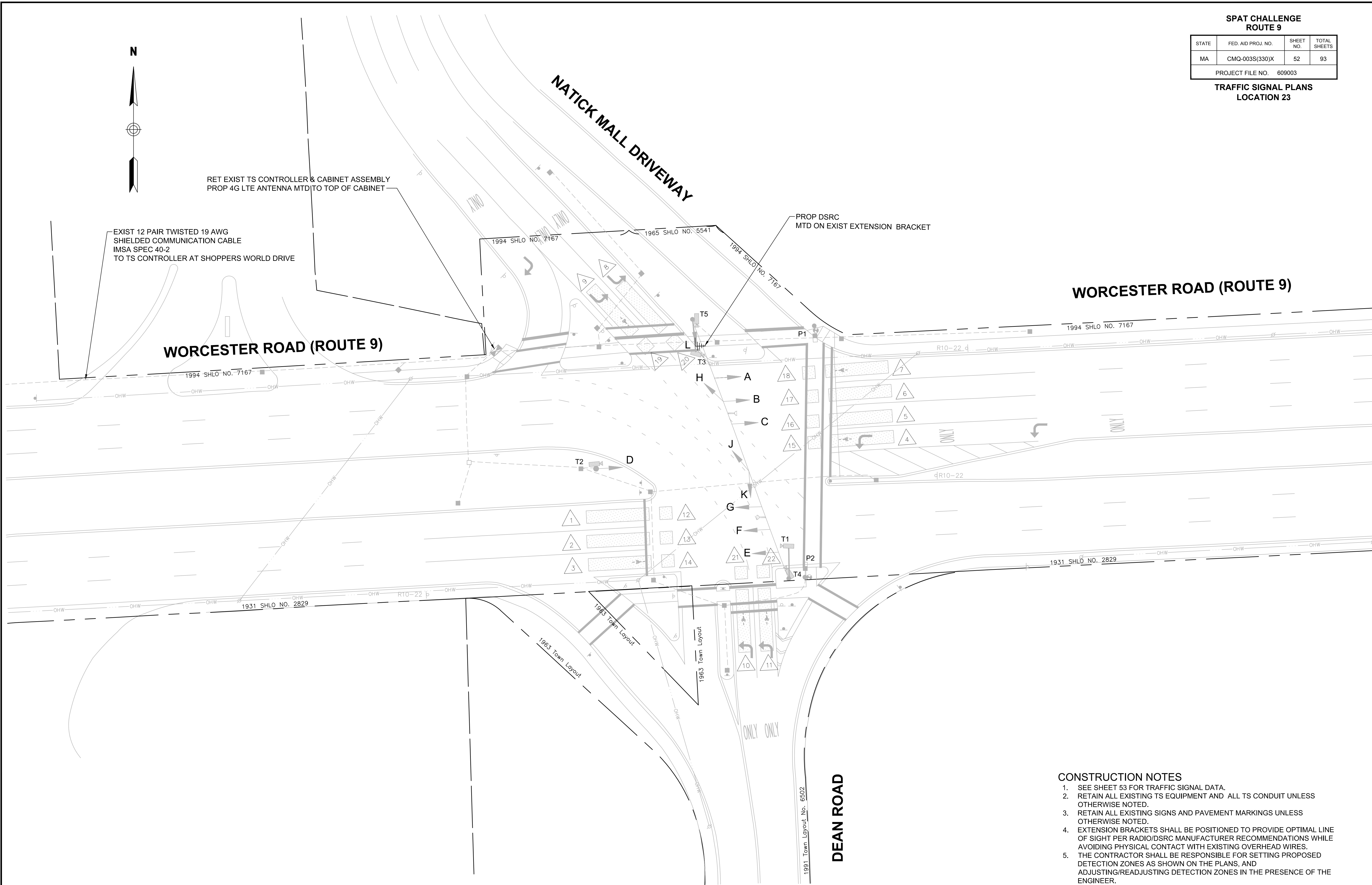
RET EXIST TS CONTROLLER & CABINET ASSEMBLY
PROP 4G LTE ANTENNA MTD TO TOP OF CABINET

EXIST 12 PAIR TWISTED 19 AWG
SHIELDED COMMUNICATION CABLE
IMSA SPEC 40-2
TO TS CONTROLLER AT SHOPPERS WORLD DRIVE

PROP DSRC
MTD ON EXIST EXTENSION BRACKET

WORCESTER ROAD (ROUTE 9)

WORCESTER ROAD (ROUTE 9)



1931 SHLO NO. 2829

1963 Town Layout

1963 Town Layout

1963 Town Layout

1991 Town Layout No. 6502

DEAN ROAD



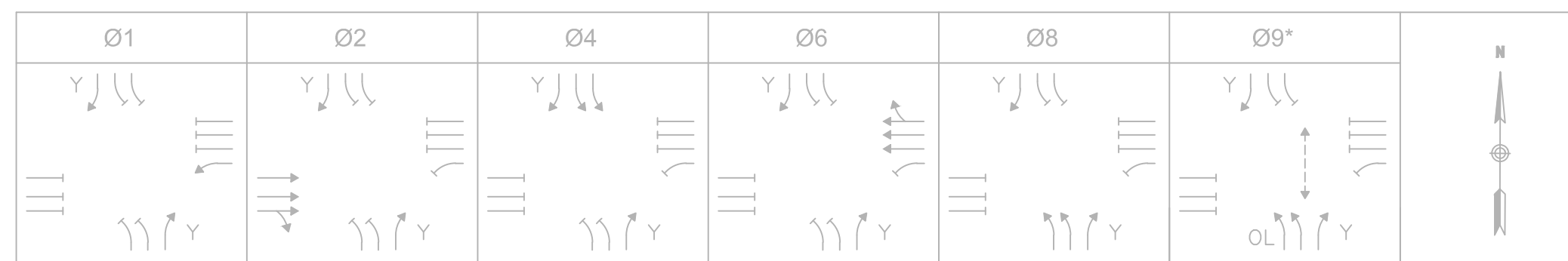
CONSTRUCTION NOTES

1. SEE SHEET 53 FOR TRAFFIC SIGNAL DATA.
2. RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
4. EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	53	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 23**



SEQUENCE & TIMING NOTES:

- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
- THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
- IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
- IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

EXISTING SEQUENCE AND TIMING FOR FULLY ACTUATED CONTROL (COORDINATED)

APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	FLASH	
WORCESTER RD (RTE 9)	WB	A	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	FY
WORCESTER RD (RTE 9)	WB	B,C	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	FY
WORCESTER RD (RTE 9)	WB	D	(G)	(Y)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(FR)
WORCESTER RD (RTE 9)	EB	E,F,G	R	R	R	(G)	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
DEAN ROAD	NB	K,L	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(G)	(Y)	(R)	(R)	(R)	(R)	(R)	(FR)
NATICK MALL DRIVEWAY	SB	H,J	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(G)	(Y)	(R)	(R)	(R)	(R)	(R)	(FR)
PEDESTRIAN		ALL	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	FDW	DW	DW	OFF

TIMING IN SECONDS

MINIMUM GREEN (INITIAL)	6		10		6		10		6													
PASSAGE TIME (VEHICLE)	2		2		2		2		2													
MAXIMUM 1	10		30		20		40		20													
MAXIMUM 2																						
YELLOW CLEARANCE		3.5		4		4		4		4				4						4		
RED CLEARANCE			3		1		2		1					2						3		
PEDESTRIAN WALK																				7/24		
PEDESTRIAN CLEARANCE																						

CONFLICT FLASH OPERATION ONLY

DETECTOR MEMORY		NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK	NON-LOCK																
RECALL		OFF	MIN	OFF	MIN	OFF																

COORDINATION DATA			PHASE SPLIT TIMES					
TIMING PLAN	CYCLE	OFFSET	Ø1	Ø2	Ø4	Ø6	Ø8	Ø9*

TIME BASED COORDINATION BACK-UP PROGRAM								
1/1/1 M-F 6AM-9AM	85	63	22(14)	51(21)	12(12)	73(35)	12(12)	0(38)
2/1/1 M-F 11AM-2PM	90	69	28(14)	46(22)	16(16)	74(36)	16(16)	0(38)
3/1/1 M-F 3PM-7PM	90	70	26(14)	51(25)	13(13)	77(39)	13(13)	0(38)
4/1/1 SAT&SUN 9AM-7PM	100	95	28(14)	57(35)	15(13)	85(49)	15(13)	0(38)
5/1/1 M-F 11AM-2PM	110	51	28(14)	59(42)	23(16)	87(56)	23(16)	0(38)
6/1/1 M-F 3PM-7PM	120	27	33(14)	71(55)	16(13)	104(69)	16(13)	0(38)
7/1/1 SAT&SUN 9AM-7PM	130	25	34(20)	75(57)	21(15)	109(77)	21(15)	0(38)

ADAPTIVE TRAFFIC CONTROL PROGRAM								
21/1/1 M-F 5AM-10AM SAT&SUN 8AM-10AM	60	20	14	34	12	48	12	38
22/1/1 M-F 10AM-10PM SAT&SUN 10AM-10PM	80	61	25	41	14	66	14	38
MODE			COORD Ø				COORD Ø	

NOTES:

- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
- * UPON PEDESTRIAN PUSH BUTTON ACTUATION
- Y = YIELD CONTROL
- OL = OVERLAP
- Ø4 & Ø8 DUAL ENTRY
- MAXIMUM 1 = NORMAL OPERATION
- MAXIMUM 2 = NOT USED
- STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
- DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL BE IN EFFECT.
- INHIBIT MAX TERMINATION SHALL BE IN EFFECT DURING COORDINATION.
- Ø2&Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
- OFFSET: BEGINNING OF Ø2&Ø6 GREEN.
- PLAN FORCE OFF SHALL BE IN EFFECT.
- SPLIT TIMES EQUAL GREEN PLUS CLEARANCES.
- (X) SPLIT TIME WITH PEDESTRIAN PHASE ACTUATED.
- YIELD MODE COORDINATION SHALL BE IN EFFECT.
- PLANS 5 THRU 7 SHALL BE PROGRAMMED FOR USE NOVEMBER 15 THRU JANUARY 1.

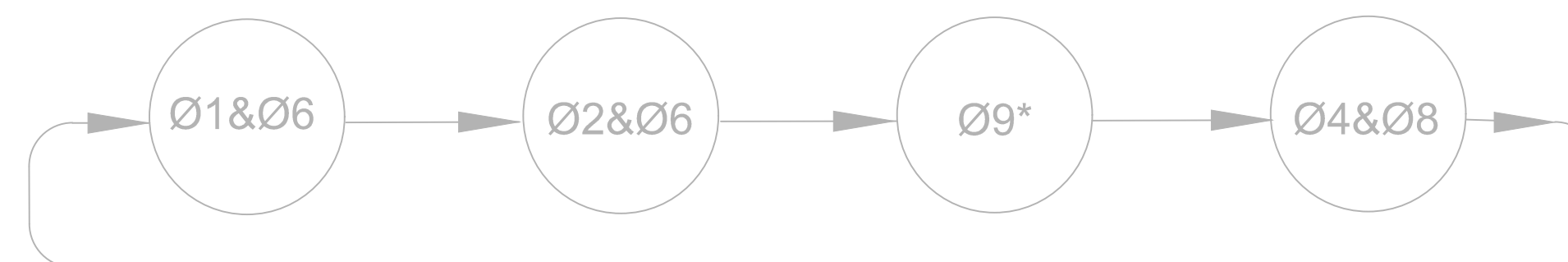
EXISTING PRE-EMPTION PHASING & PRIORITY

DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2
D2	2		Ø1&Ø6

EXISTING EMERGENCY VEHICLE PRE-EMPTION OPERATION

- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
- PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1 OR D2 ASSIGNED PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D2 LOWEST)
- IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCES FOR THE ASSOCIATED PHASE(S) AS SHOWN IN THE SEQUENCE AND TIMING CHART AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
- MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
- PRE-EMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.
- EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.

EXISTING PREFERENTIAL PHASE SEQUENCE



* UPON PEDESTRIAN PUSH BUTTON ACTUATION

EXISTING SIGNAL HEAD DATA

A	B,C,E,F,G	D,H,J,K,L	P1-P2

ALL 12" LENS

NOTE:

- SIGNAL HEAD A IS EQUIPPED WITH A 2" WIDE YELLOW REFLECTIVE BORDER.

LIST OF MAJOR ITEMS REQUIRED

ROUTE 9 AT DEAN ROAD

PAY ITEM	QUANTITY	DESCRIPTION
816.23	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET
	1	CONNECTED VEHICLE SYSTEM W/RSU

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

EXISTING DETECTOR DATA

DETECTOR NO.	ZONE SIZE	VEHICLE SENSOR	DELAY /EXT	CALL PHASE	UTILIZATION PHASE
1	TO BE FIELD ADJUSTED	T1	0	Ø2	-
2	TO BE FIELD ADJUSTED	T1	0	Ø2	-
3	TO BE FIELD ADJUSTED	T1	0	Ø2	-
4	TO BE FIELD ADJUSTED	T2	0	Ø1	-
5	TO BE FIELD ADJUSTED	T3	0	Ø6	-
6	TO BE FIELD ADJUSTED	T3	0	Ø6	-
7	TO BE FIELD ADJUSTED	T3	0	Ø6	-
8	TO BE FIELD ADJUSTED	T4	0	Ø4	-
9	TO BE FIELD ADJUSTED	T4	0	Ø4	-
10	TO BE FIELD ADJUSTED	T5	0	Ø8	-
11	TO BE FIELD ADJUSTED	T5	0	Ø8	-
12	TO BE FIELD ADJUSTED	T1	0	-	Ø2
13	TO BE FIELD ADJUSTED	T1	0	-	Ø2
14	TO BE FIELD ADJUSTED	T1	0	-	Ø2
15	TO BE FIELD ADJUSTED	T2	0	-	Ø1
16	TO BE FIELD ADJUSTED	T3	0	-	Ø6
17	TO BE FIELD ADJUSTED	T3	0	-	Ø6
18	TO BE FIELD ADJUSTED	T3	0	-	Ø6
19	TO BE FIELD ADJUSTED	T4	0	-	Ø4
20	TO BE FIELD ADJUSTED	T4	0	-	Ø4
21	TO BE FIELD ADJUSTED	T5	0	-	Ø8
22	TO BE FIELD ADJUSTED	T5	0	-	Ø8

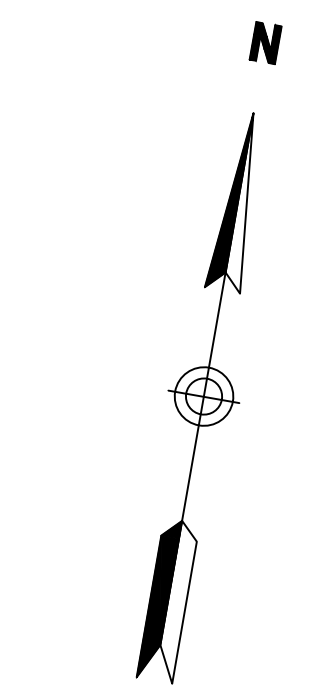
NOTES:

- DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

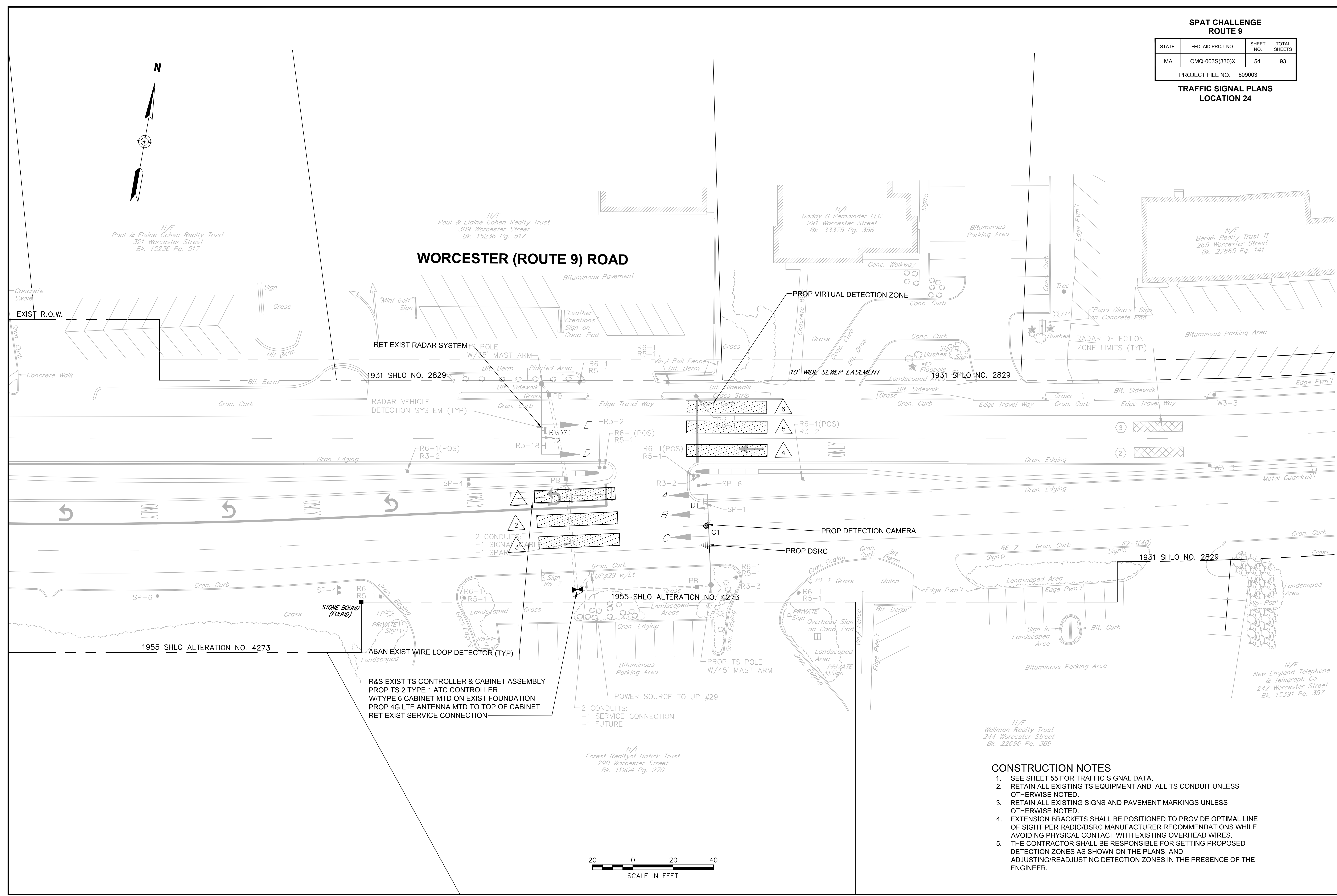
**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	54	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 24**



WORCESTER (ROUTE 9) ROAD



R&S EXIST TS CONTROLLER & CABINET ASSEMBLY
PROP TS 2 TYPE 1 ATC CONTROLLER
W/TYPE 6 CABINET MTD ON EXIST FOUNDATION
PROP 4G LTE ANTENNA MTD TO TOP OF CABINET
RET EXIST SERVICE CONNECTION

2 CONDUITS:
-1 SERVICE CONNECTION
-1 FUTURE



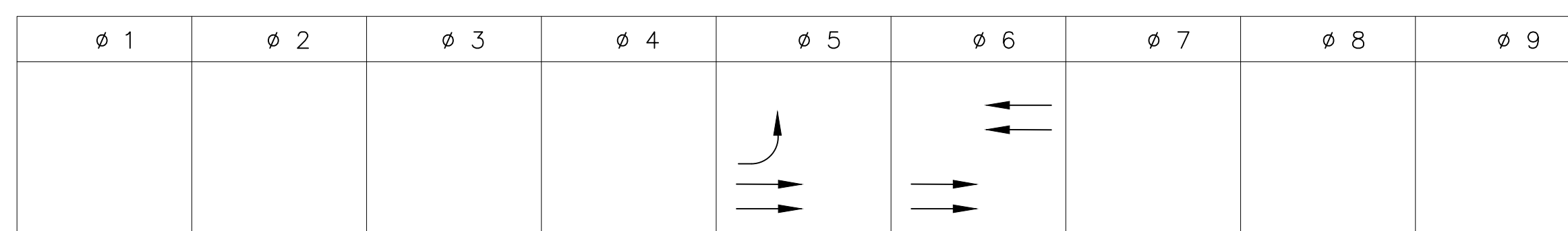
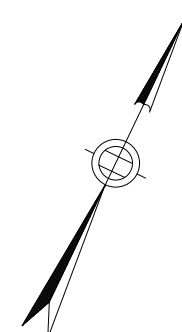
- CONSTRUCTION NOTES**
- SEE SHEET 55 FOR TRAFFIC SIGNAL DATA.
 - RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
 - RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
 - EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	55	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLANS
LOCATION 24**

APPROX. NORTH



PROPOSED SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	FLASH OPER.	
WORCESTER ROAD (ROUTE 9)	EB	A													GL	YL	RL	RL	RL												FRL
WORCESTER ROAD (ROUTE 9)	EB	B,C													GV	Y	R	GV	Y	R											FY
WORCESTER ROAD (ROUTE 9)	WB	D													R	R	R	GV	Y	R										FY	
WORCESTER ROAD (ROUTE 9)	WB	E													R	R	R	G	Y	R										FY	
<i>TIMING IN SECONDS</i>																															
MINIMUM GREEN (INITIAL)															5			5													
PASSAGE TIME (VEHICLE)															2			2													
MAXIMUM 1															25			75													
MAXIMUM 2															25			75													
YELLOW CLEARANCE																4			3												
RED CLEARANCE																	2			2											
WALK (W)																															
PEDESTRIAN CLEARANCE																															
RECALL																	OFF		MAX												
MEMORY																	NON-LOCKING		-												

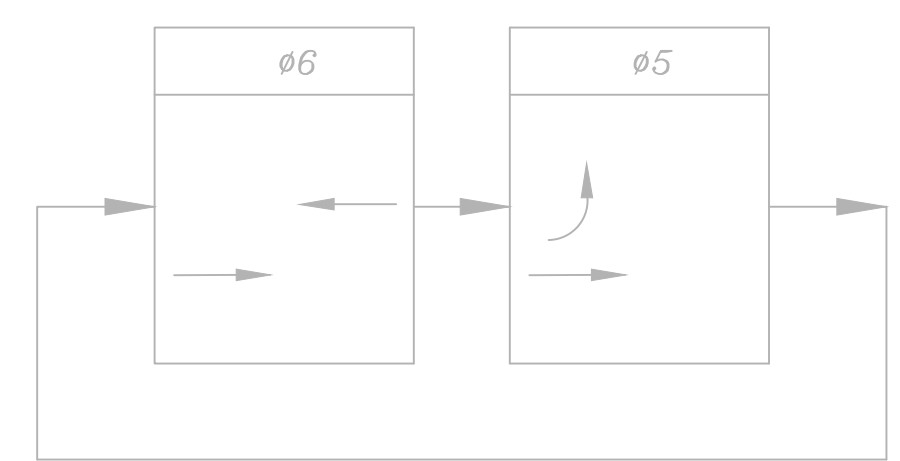
EMERGENCY ONLY

- NOTES:**
- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
 - MAXIMUM 1 = NORMAL OPERATION
 - MAXIMUM 2 = NOT USED
 - STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.

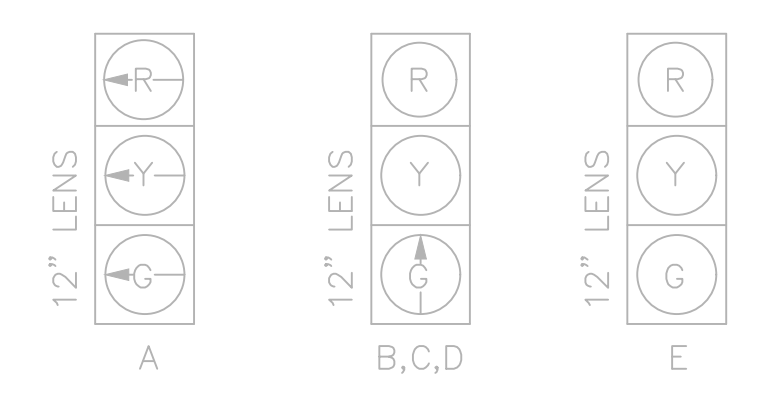
EXISTING PRE-EMPTION PHASING & PRIORITY

DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1	↗	05
D2	2	↔	06

EXISTING PREFERENTIAL PHASING SEQUENCE



EXISTING SIGNAL IDENTIFICATION



- SIGNAL IDENTIFICATION NOTES:**
- ALL SIGNAL HEADS HAVE 5" LOUVERED BACKPLATES.
 - ALL SIGNAL LENSES ARE 12" DIA.
 - ALL SIGNAL HEADS ARE FIXED-MOUNTED.

- EXISTING EMERGENCY VEHICLE PRE-EMPTION OPERATION.**
- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
 - PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1 OR D2 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D2 LOWEST)
 - IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCES FOR THE ASSOCIATED PHASE(S) AS SHOWN IN THE SEQUENCE AND TIMING CHART AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
 - MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
 - PRE-EMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.

- SEQUENCE & TIMING NOTES:**
- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
 - THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
 - IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
 - IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

LIST OF MAJOR ITEMS REQUIRED

ROUTE 9 AT U-TURN		
PAY ITEM	QUANTITY	DESCRIPTION
816.24	1	TS 2 TYPE 1 ATC CONTROLLER IN A 32/48 ATC CABINET INSTALLED ON EXIST FOUNDATION
	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET
	1	ETHERNET SWITCH
	1	VEHICLE DETECTION SYSTEM (DIGITAL IP CAMERA, VDP & CABLES)
	1	R&S EXIST VEHICLE DETECTION RADAR
	1	CABINET MONITOR UNIT
	1	VIDEO INTERFACE/EXTENSION VIDEO UNIT
	1	PROP PRE-EMPTION PHASE SELECTOR
	1	CONNECTED VEHICLE SYSTEM W/RSU

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

PROPOSED VIDEO DETECTION DATA

DETECTION ZONE	APPROACH/LANE	CAMERA	DELAY /EXT	CALL PHASE
1	ROUTE 9 EB U-TURN LANE	C1	0	05
2	ROUTE 9 EB THRU LANE	C1	0	06
3	ROUTE 9 EB THRU LANE	C1	0	06
4	ROUTE 9 WB THRU LANE	C1	0	06
5	ROUTE 9 WB THRU LANE	C1	0	06
6	ROUTE 9 WB THRU LANE	C1	0	06

NOTE: DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY

EXISTING RADAR DETECTOR DATA

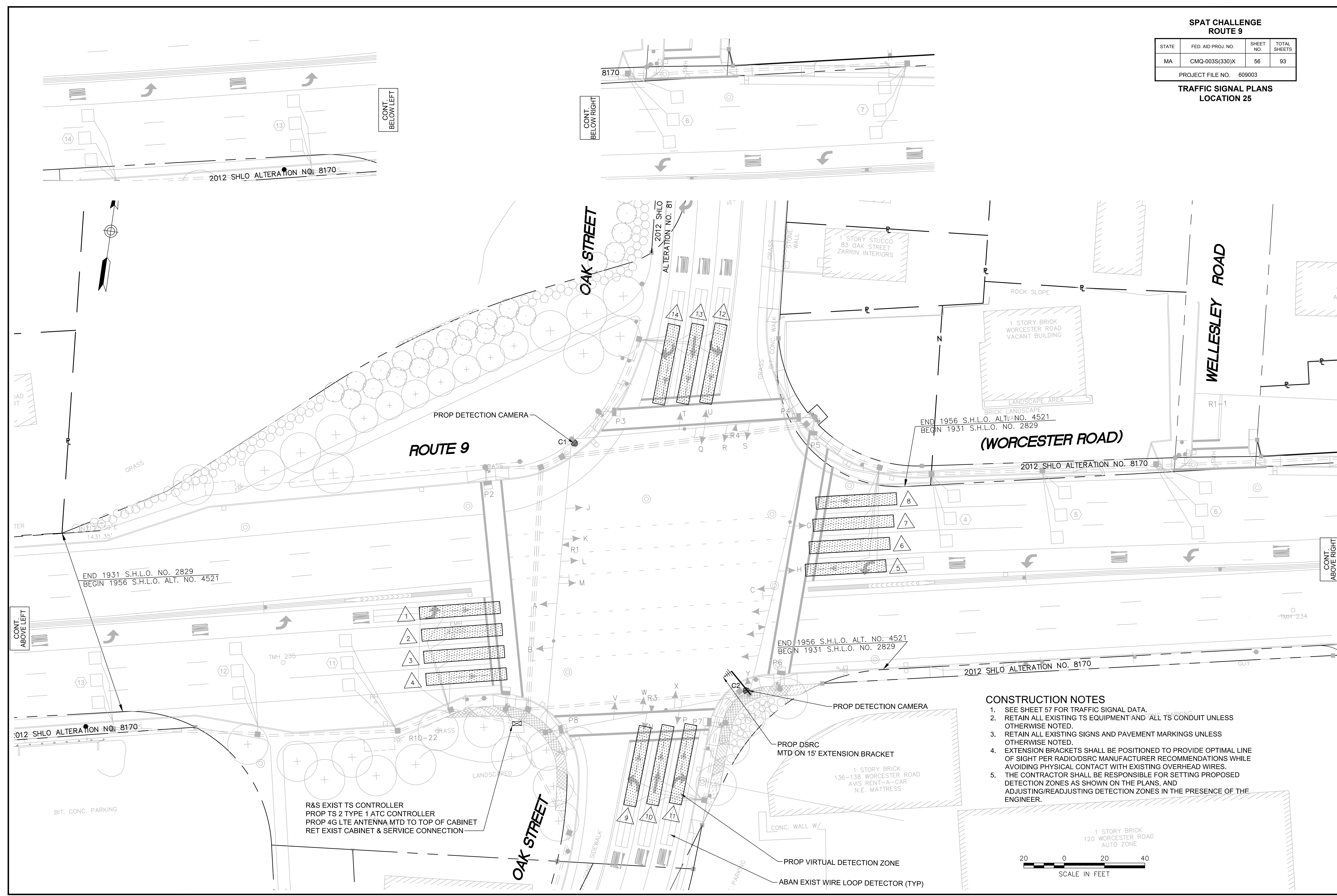
DETECTOR ZONE	BEGIN ZONE	END ZONE	RADAR	DELAY /EXT	CALL PHASE
2	100' FROM WB SL	400' FROM WB SL	RVDS #1	0	06
3	100' FROM WB SL	400' FROM WB SL	RVDS #1	0	06

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	56	93

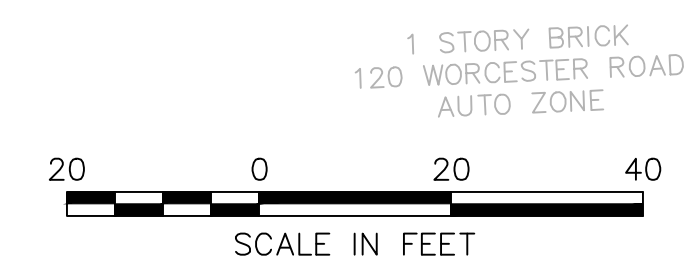
PROJECT FILE NO. 609003
**TRAFFIC SIGNAL SIGNALS
LOCATION 25**

Plotted on: 25-Sep-2019 10:04 AM
24-28-37 NATICK.DWG



CONSTRUCTION NOTES

1. SEE SHEET 57 FOR TRAFFIC SIGNAL DATA.
2. RETAIN ALL EXISTING TS EQUIPMENT AND ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. RETAIN ALL EXISTING SIGNS AND PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
4. EXTENSION BRACKETS SHALL BE POSITIONED TO PROVIDE OPTIMAL LINE OF SIGHT PER RADIO/DSRC MANUFACTURER RECOMMENDATIONS WHILE AVOIDING PHYSICAL CONTACT WITH EXISTING OVERHEAD WIRES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING PROPOSED DETECTION ZONES AS SHOWN ON THE PLANS, AND ADJUSTING/READJUSTING DETECTION ZONES IN THE PRESENCE OF THE ENGINEER.



CONT. BELOW LEFT

CONT. BELOW RIGHT

CONT. ABOVE LEFT

CONT. ABOVE RIGHT

2012 SHLO ALTERATION NO. 8170

8170

OAK STREET

WELLESLEY ROAD

ROUTE 9

(WORCESTER ROAD)

2012 SHLO ALTERATION NO. 8170

2012 SHLO ALTERATION NO. 8170

2012 SHLO ALTERATION NO. 8170

R&S EXIST TS CONTROLLER
PROP TS 2 TYPE 1 ATC CONTROLLER
PROP 4G LTE ANTENNA MTD TO TOP OF CABINET
RET EXIST CABINET & SERVICE CONNECTION

1 STORY BRICK
136-138 WORCESTER ROAD
AVIS RENT-A-CAR
N.E. MATTRESS

1 STORY BRICK
120 WORCESTER ROAD
AUTO ZONE

1 STORY STUCCO
83 OAK STREET
ZARRIN INTERIORS

1 STORY BRICK
WORCESTER ROAD
VACANT BUILDING

END 1956 S.H.L.O. ALT. NO. 4521
BEGIN 1931 S.H.L.O. NO. 2829

END 1931 S.H.L.O. NO. 2829
BEGIN 1956 S.H.L.O. ALT. NO. 4521

END 1956 S.H.L.O. ALT. NO. 4521
BEGIN 1931 S.H.L.O. NO. 2829

BIT. CONC. PARKING

CONC. WALL W/

PROP VIRTUAL DETECTION ZONE

ABAN EXIST WIRE LOOP DETECTOR (TYP)

PROP DSRC
MTD ON 15' EXTENSION BRACKET

PROP DETECTION CAMERA

PROP DETECTION CAMERA

1431.35°

TMH 234

CONT. BELOW LEFT

CONT. BELOW RIGHT

CONT. ABOVE LEFT

CONT. ABOVE RIGHT

2012 SHLO ALTERATION NO. 8170

8170

OAK STREET

WELLESLEY ROAD

ROUTE 9

(WORCESTER ROAD)

2012 SHLO ALTERATION NO. 8170

2012 SHLO ALTERATION NO. 8170

2012 SHLO ALTERATION NO. 8170

R&S EXIST TS CONTROLLER
PROP TS 2 TYPE 1 ATC CONTROLLER
PROP 4G LTE ANTENNA MTD TO TOP OF CABINET
RET EXIST CABINET & SERVICE CONNECTION

1 STORY BRICK
136-138 WORCESTER ROAD
AVIS RENT-A-CAR
N.E. MATTRESS

1 STORY BRICK
120 WORCESTER ROAD
AUTO ZONE

1 STORY STUCCO
83 OAK STREET
ZARRIN INTERIORS

1 STORY BRICK
WORCESTER ROAD
VACANT BUILDING

END 1956 S.H.L.O. ALT. NO. 4521
BEGIN 1931 S.H.L.O. NO. 2829

END 1931 S.H.L.O. NO. 2829
BEGIN 1956 S.H.L.O. ALT. NO. 4521

END 1956 S.H.L.O. ALT. NO. 4521
BEGIN 1931 S.H.L.O. NO. 2829

BIT. CONC. PARKING

CONC. WALL W/

PROP VIRTUAL DETECTION ZONE

ABAN EXIST WIRE LOOP DETECTOR (TYP)

PROP DSRC
MTD ON 15' EXTENSION BRACKET

PROP DETECTION CAMERA

PROP DETECTION CAMERA

1431.35°

TMH 234

**SPAT CHALLENGE
ROUTE 9**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ-003S(330)X	57	93
PROJECT FILE NO. 609003			

**TRAFFIC SIGNAL PLAN
LOCATION 25**

SEQUENCE & TIMING NOTES:

- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
- THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
- IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
- IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

PROPOSED SEQUENCE & TIMING FOR FULLY ACTUATED CONTROL ROUTE 9 (WORCESTER ROAD) & OAK STREET LOCATION 1			INTERVALS																											OPERATION		
APPROACH	DIRECT.	FACES																												FLASHING	OPERATION	
ROUTE 9 (WORCESTER ROAD)	EB	A,C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27			
ROUTE 9 (WORCESTER ROAD)	WB	B,D,E,F G,J,K,L	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		Y
OAK STREET	NB	H,M N,Q	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		R
OAK STREET	SB	P,R,S U,X,Y T,W,V	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		R
PEDESTRIAN	N-S	P1,P2,P5,P6	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW		OFF	
	E-W	P3,P4,P7,P8	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW		OFF	
			TIMING IN SECONDS																											EMERGENCY ONLY		
MINIMUM GREEN			5			5			5			5			5			5			5			5			5					
MAX GREEN 1 (FREE)			15			90			15			30			15			90			15			30			15					
MAX GREEN 2			15			90			15			30			15			90			15			30			15					
VEHICLE EXTENSION			2			2			2			2			2			2			2			2			2					
PED INTERVALS																																
YELLOW CLEARANCE				4			4			3			3			4			4			3			4			7	30			
RED CLEARANCE					2			2			3			3			2			2			3			2			4			
DETECTION (MEMORY)			NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK					
RECALL			OFF		MIN		OFF		OFF		OFF		OFF		MIN		OFF		OFF		OFF		OFF		OFF		OFF					

NOTES:

- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
- UPON PEDESTRIAN PUSH BUTTON ACTUATION
- Ø4 & Ø8 DUAL ENTRY
- MAXIMUM 1 = NORMAL OPERATION
- MAXIMUM 2 = NOT USED
- STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
- DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL NOT BE IN EFFECT.

- ⊙ ←G IF FOLLOWED BY Ø1 + Ø6.
- ⊙ ←G IF FOLLOWED BY Ø2 + Ø5.
- ⊙ R←G IF FOLLOWED BY Ø3 + Ø8.
- ⊙ R←G IF FOLLOWED BY Ø4 + Ø7.

EXISTING LOOP DETECTORS								
NUMBER	NUMBER SECTION	SIZE	NUMBER TURNS	OPERATION	CALL Ø	CALL DELAY (SECONDS)	EXTEND Ø	LOOP CONNECTION
5	3	6'x6'	3	PRESENCE	6	-	6	SERIES
6	3	6'x6'	3	PRESENCE	6	-	6	SERIES
7	3	6'x6'	3	PRESENCE	6	-	6	SERIES
11	3	6'x6'	3	PRESENCE	2	-	2	SERIES
12	3	6'x6'	3	PRESENCE	2	-	2	SERIES
13	3	6'x6'	3	PRESENCE	2	-	2	SERIES
14	3	6'x6'	3	PRESENCE	2	-	2	SERIES

LIST OF MAJOR ITEMS REQUIRED

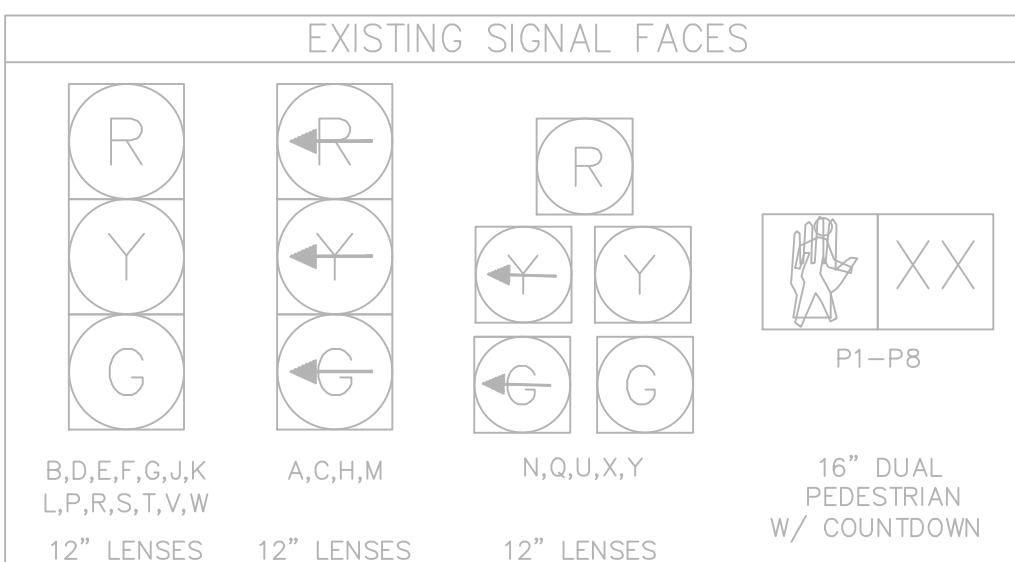
ROUTE 9 AT OAK STREET		
PAY ITEM	QUANTITY	DESCRIPTION
	1	TS 2 TYPE 1 ATC CONTROLLER INSTALLED IN EXISTING TS CABINET
	1	OVERHEAD DSRC UNIT W/ 4G LTE ANTENNA MTD TO CABINET
	1	ETHERNET SWITCH
	1	VEHICLE DETECTION SYSTEM (DIGITAL IP CAMERAS, VDP & CABLES)
	1	CABINET MONITOR UNIT
	1	VIDEO INTERFACE/ EXTENSION VIDEO UNIT
	1	15' EXTENSION BRACKET
816.25	1	CONNECTED VEHICLE SYSTEM WRSU

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

PROPOSED VIDEO DETECTION DATA

DETECTION ZONE	APPROACH/LANE	CAMERA	DELAY /EXT	CALL PHASE
1	ROUTE 9 EB LEFT-TURN LANE	C1	0	Ø5
2	ROUTE 9 EB THRU LANE	C1	0	Ø2
3	ROUTE 9 EB THRU LANE	C1	0	Ø2
4	ROUTE 9 EB THRU-RIGHT LANE	C2	0	Ø2
5	ROUTE 9 WB LEFT-TURN LANE	C2	0	Ø1
6	ROUTE 9 WB THRU LANE	C2	0	Ø6
7	ROUTE 9 WB THRU LANE	C3	0	Ø6
8	ROUTE 9 WB THRU-RIGHT LANE	C3	0	Ø6
9	OAK STREET NB LEFT-TURN LANE	C3	0	Ø3
10	OAK STREET NB THRU LANE	C2	0	Ø8
11	OAK STREET NB RIGHT-TURN LANE	C3	0	Ø8
12	OAK STREET SB LEFT-TURN LANE	C3	0	Ø7
13	OAK STREET SB THRU LANE	C3	0	Ø4
14	OAK STREET SB RIGHT-TURN LANE	C3	0	Ø4

NOTE: DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY



NOTES:

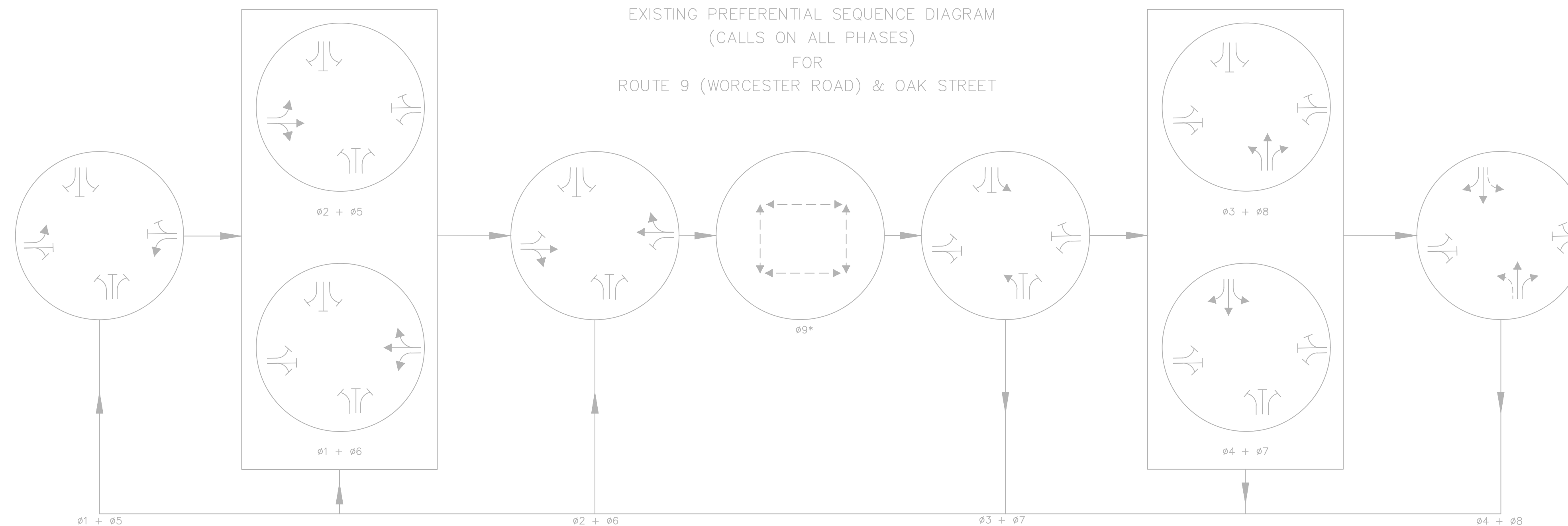
- ALL VEHICLE AND PEDESTRIAN LENSES SHALL BE LED TYPE.
- ALL HOUSINGS TO BE PROVIDED WITH TUNNEL VISORS AND 5" BACKPLATES.
- ALL HOUSINGS TO BE FIXED MOUNTED.

EXISTING PRE-EMPTION PHASING & PRIORITY			
RECEIVER AND PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
R4	1	←	NB Ø3+Ø8
R2	2	←	EB Ø2+Ø5
R1	3	←	WB Ø1+Ø6
R3	4	←	SB Ø4+Ø7

NOTES:

- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL RECEIVERS LOCATED AT THE INTERSECTION.
- PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH RECEIVERS ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (R4, R2, R1, THEN R3)
- IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL RECEIVER R4 (OR OTHERS AS PROVIDED) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY PRE-EMPTION THE ASSOCIATED GREEN PHASE FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN PROVIDE PRE-EMPTION PHASE CLEARANCE SERVICE THEN RESUME NORMAL OPERATION.
- MINIMUM GREEN, NORMAL VEHICLE AND PEDESTRIAN CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
- EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.
- ONCE PRE-EMPTION TERMINATES THE SIGNAL WILL RETURN TO PHASES 2+6 TO RESUME NORMAL OPERATION.

EXISTING PREFERENTIAL SEQUENCE DIAGRAM (CALLS ON ALL PHASES) FOR ROUTE 9 (WORCESTER ROAD) & OAK STREET



Appendix D:

Intersection Level of Service Analysis

Part 1: AM Existing Conditions

Part 2: PM Existing Conditions

Part 3: 2030 AM Conditions

Part 4: 2030 PM Conditions

Part 1: AM Existing Conditions

1: Driveway/California Ave & Worcester Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗			↖↗	↖	↖		↖	↖	↖	↖
Traffic Volume (vph)	440	1690	20	0	2860	650	20	0	10	110	25	90
Future Volume (vph)	440	1690	20	0	2860	650	20	0	10	110	25	90
Satd. Flow (prot)	3255	4812	0	0	4821	1501	1678	0	1501	1594	1626	1501
Flt Permitted	0.950						0.708			0.950	0.969	
Satd. Flow (perm)	3255	4812	0	0	4821	1501	1250	0	1501	1594	1626	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	458	1781	0	0	2979	677	21	0	10	70	71	94
Turn Type	Prot	NA			NA	Prot	Perm		Perm	Perm	NA	Perm
Protected Phases	1	6			2	2						8
Permitted Phases							4		4	8		8
Total Split (s)	35.0	101.0			66.0	66.0	30.0		30.0	30.0	30.0	30.0
Total Lost Time (s)	5.0	6.0			6.0	6.0	5.0		5.0	5.0	5.0	5.0
Act Effct Green (s)	20.5	85.8			60.3	60.3	11.0		11.0	12.2	12.2	12.2
Actuated g/C Ratio	0.19	0.79			0.55	0.55	0.10		0.10	0.11	0.11	0.11
v/c Ratio	0.75	0.47			1.12	0.82	0.17		0.07	0.39	0.39	0.56
Control Delay	50.5	4.7			84.2	31.6	47.9		45.1	52.4	52.2	59.8
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	50.5	4.7			84.2	31.6	47.9		45.1	52.4	52.2	59.8
LOS	D	A			F	C	D		D	D	D	E
Approach Delay		14.0			74.5			47.0				55.3
Approach LOS		B			E			D				E
Queue Length 50th (ft)	156	123			-876	365	13		6	48	49	63
Queue Length 95th (ft)	225	192			#1156	#733	40		24	102	101	124
Internal Link Dist (ft)		1018			585			187				263
Turn Bay Length (ft)	400											
Base Capacity (vph)	899	4212			2665	829	287		345	367	374	345
Starvation Cap Reductn	0	0			0	0	0		0	0	0	0
Spillback Cap Reductn	0	0			0	0	0		0	0	0	0
Storage Cap Reductn	0	0			0	0	0		0	0	0	0
Reduced v/c Ratio	0.51	0.42			1.12	0.82	0.07		0.03	0.19	0.19	0.27

Intersection Summary

Cycle Length: 131

Actuated Cycle Length: 109.1

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.12

Intersection Signal Delay: 51.6

Intersection LOS: D

Intersection Capacity Utilization 91.5%

ICU Level of Service F

Analysis Period (min) 15

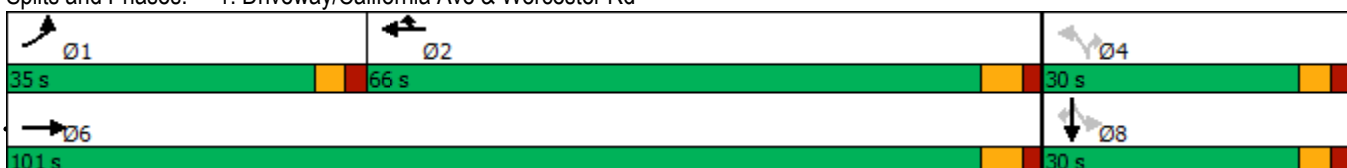
~ Volume exceeds capacity, queue is theoretically infinite.

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: 1: Driveway/California Ave & Worcester Rd



2: Country Club Ln & Worcester Rd



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗	↖	↑↑	↖↗	
Traffic Volume (vph)	30	1710	520	70	1640	420	70
Future Volume (vph)	30	1710	520	70	1640	420	70
Satd. Flow (prot)	1678	3355	1501	1678	3355	3217	0
Flt Permitted	0.950			0.950		0.959	
Satd. Flow (perm)	1678	3355	1501	1678	3355	3217	0
Satd. Flow (RTOR)			*200				
Lane Group Flow (vph)	31	1781	542	73	1708	511	0
Turn Type	Prot	NA	Prot	Prot	NA	Prot	
Protected Phases	1	6	6	5	2	4	
Permitted Phases							
Total Split (s)	20.0	60.0	60.0	20.0	60.0	25.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	5.0	
Act Effct Green (s)	7.3	54.5	54.5	9.6	58.8	18.5	
Actuated g/C Ratio	0.08	0.57	0.57	0.10	0.61	0.19	
v/c Ratio	0.24	0.94	0.58	0.44	0.83	0.82	
Control Delay	48.5	32.2	12.2	50.6	21.3	50.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.5	32.2	12.2	50.6	21.3	50.4	
LOS	D	C	B	D	C	D	
Approach Delay		27.8			22.5	50.4	
Approach LOS		C			C	D	
Queue Length 50th (ft)	19	551	134	45	473	160	
Queue Length 95th (ft)	49	#800	261	89	#655	#247	
Internal Link Dist (ft)		1378			1287	306	
Turn Bay Length (ft)	400		400	300			
Base Capacity (vph)	264	1902	937	264	2054	675	
Starvation Cap Reductn	0	0	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	0.12	0.94	0.58	0.28	0.83	0.76	

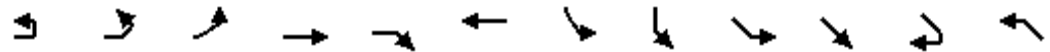
Intersection Summary

Cycle Length: 105
 Actuated Cycle Length: 96.1
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 28.3
 Intersection LOS: C
 Intersection Capacity Utilization 78.9%
 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: 2: Country Club Ln & Worcester Rd



3: Temple St & Worcester Rd & Jug Handle

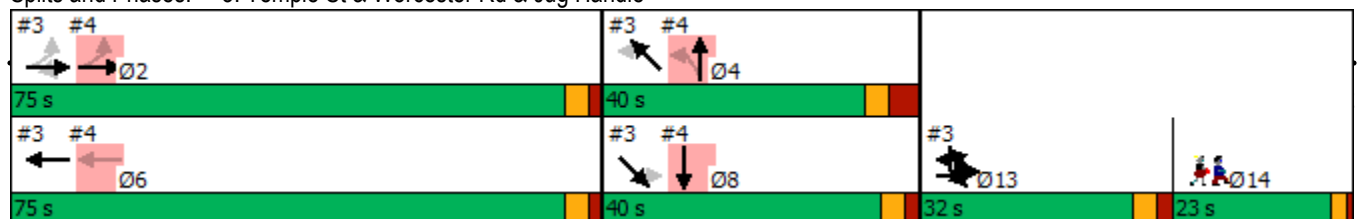


Lane Group	EBU	EBL2	EBL	EBT	EBR	WBT	SBL2	SBL	SEL	SET	SER	NWL
Lane Configurations			↔	↑↑	↗	↑↑↑	↖	↖		↔		↖
Traffic Volume (vph)	30	50	0	1790	90	1470	65	145	270	130	25	140
Future Volume (vph)	30	50	0	1790	90	1470	65	145	270	130	25	140
Satd. Flow (prot)	0	0	1678	3355	1501	4821	1678	1678	0	1698	0	1678
Flt Permitted		*0.950	*0.950				0.950	0.950				
Satd. Flow (perm)	0	0	1678	3355	1501	4821	1678	1678	0	1752	0	1766
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	0	83	1865	94	1531	68	151	0	442	0	146
Turn Type	Prot	Prot	Perm	NA	Perm	NA	Prot	Prot	Perm	NA		Perm
Protected Phases	13	13		2		6	13	13		8		
Permitted Phases			2		2				8			4
Total Split (s)	32.0	32.0	75.0	75.0	75.0	75.0	32.0	32.0	40.0	40.0		40.0
Total Lost Time (s)			5.0	5.0	5.0	5.0	5.0	5.0		5.0		7.0
Act Effct Green (s)			70.5	70.5	70.5	70.5	18.0	18.0		35.3		33.3
Actuated g/C Ratio			0.49	0.49	0.49	0.49	0.13	0.13		0.25		0.23
v/c Ratio			0.10	1.12	0.13	0.64	0.32	0.72		1.02		0.35
Control Delay			22.3	98.2	22.7	29.7	61.7	79.3		58.3		51.1
Queue Delay			0.1	0.0	0.0	0.0	0.0	0.0		0.7		0.0
Total Delay			22.4	98.2	22.7	29.7	61.7	79.3		59.0		51.1
LOS			C	F	C	C	E	E		E		D
Approach Delay				91.7		29.7		73.8		59.0		
Approach LOS				F		C		E		E		
Queue Length 50th (ft)			37	~988	43	352	56	131		58		109
Queue Length 95th (ft)			95	#1530	107	584	119	239		m#706		218
Internal Link Dist (ft)				646		691		163		96		
Turn Bay Length (ft)			400		400							300
Base Capacity (vph)			830	1660	743	2386	320	320		433		412
Starvation Cap Reductn			0	0	0	0	0	0		1		0
Spillback Cap Reductn			210	0	0	0	0	0		0		0
Storage Cap Reductn			0	0	0	0	0	0		0		0
Reduced v/c Ratio			0.13	1.12	0.13	0.64	0.21	0.47		1.02		0.35

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 142.5
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 64.3
 Intersection LOS: E
 Intersection Capacity Utilization 112.6%
 ICU Level of Service H
 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: Temple St & Worcester Rd & Jug Handle



3: Temple St & Worcester Rd & Jug Handle



Lane Group	NWT	NWR2	Ø14
Lane Configurations			
Traffic Volume (vph)	140	100	
Future Volume (vph)	140	100	
Satd. Flow (prot)	1657	0	
Flt Permitted			
Satd. Flow (perm)	1657	0	
Satd. Flow (RTOR)			
Lane Group Flow (vph)	250	0	
Turn Type	NA		
Protected Phases	4		14
Permitted Phases			
Total Split (s)	40.0		23.0
Total Lost Time (s)	7.0		
Act Effct Green (s)	33.3		
Actuated g/C Ratio	0.23		
v/c Ratio	0.65		
Control Delay	60.1		
Queue Delay	0.6		
Total Delay	60.6		
LOS	E		
Approach Delay	57.1		
Approach LOS	E		
Queue Length 50th (ft)	201		
Queue Length 95th (ft)	#388		
Internal Link Dist (ft)	704		
Turn Bay Length (ft)			
Base Capacity (vph)	386		
Starvation Cap Reductn	0		
Spillback Cap Reductn	20		
Storage Cap Reductn	0		
Reduced v/c Ratio	0.68		
Intersection Summary			

4: Temple St & Old Worcester Rd

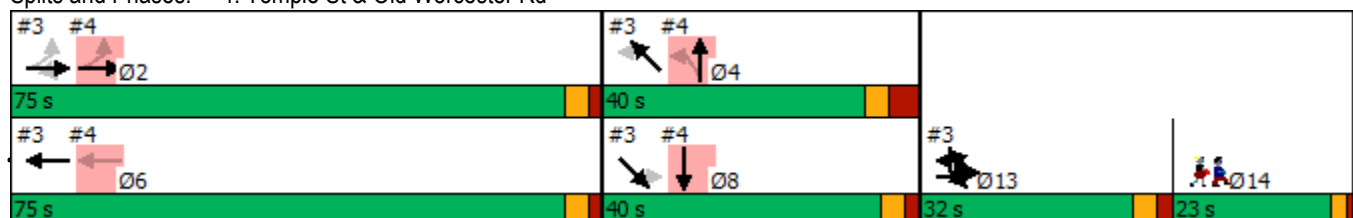


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	10	0	55	0	20	90	20	175	0	0	360	5
Future Volume (vph)	10	0	55	0	20	90	20	175	0	0	360	5
Satd. Flow (prot)	0	1552	0	0	1572	0	0	1757	0	0	1762	0
Flt Permitted		0.965						*0.800				
Satd. Flow (perm)	0	1508	0	0	1572	0	0	1413	0	0	1762	0
Satd. Flow (RTOR)		77			94							
Lane Group Flow (vph)	0	67	0	0	115	0	0	203	0	0	380	0
Turn Type	Perm	NA			NA		Perm	NA			NA	
Protected Phases		2						4			8	
Permitted Phases	2				6		4					
Total Split (s)	75.0	75.0			75.0		40.0	40.0			40.0	
Total Lost Time (s)		5.0			5.0			7.0			5.0	
Act Effct Green (s)		70.5			70.5			33.3			35.3	
Actuated g/C Ratio		0.49			0.49			0.23			0.25	
v/c Ratio		0.09			0.14			0.62			0.87	
Control Delay		4.3			7.1			29.4			73.0	
Queue Delay		0.1			0.0			5.0			2.3	
Total Delay		4.4			7.1			34.4			75.3	
LOS		A			A			C			E	
Approach Delay		4.4			7.1			34.4			75.3	
Approach LOS		A			A			C			E	
Queue Length 50th (ft)		0			9			58			325	
Queue Length 95th (ft)		26			56			#192			#664	
Internal Link Dist (ft)		1206			164			96			221	
Turn Bay Length (ft)												
Base Capacity (vph)		785			825			329			436	
Starvation Cap Reductn		0			0			74			0	
Spillback Cap Reductn		215			0			0			15	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			0.14			0.80			0.90	

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 142.5
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 48.0
 Intersection LOS: D
 Intersection Capacity Utilization 46.5%
 ICU Level of Service A
 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: 4: Temple St & Old Worcester Rd



5: Main St/Edgell Rd & High St /High St

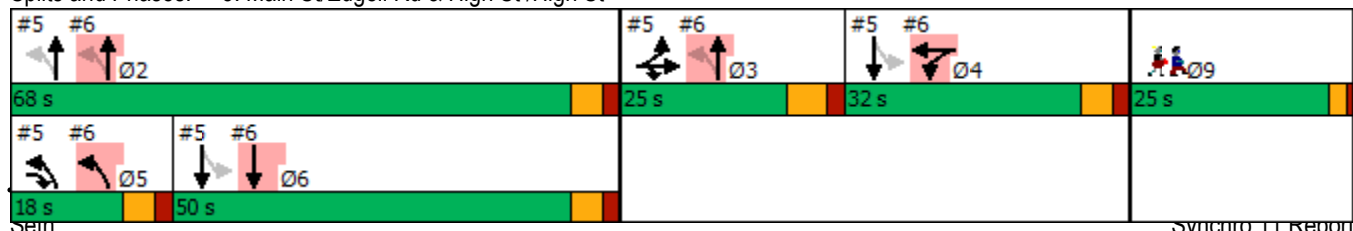


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	329	23	284	0	0	0	28	842	3	201	525	187
Future Volume (vph)	329	23	284	0	0	0	28	842	3	201	525	187
Satd. Flow (prot)	1594	1607	1501	0	0	0	0	3349	0	0	3216	0
Flt Permitted	0.950	0.958						0.896			0.609	
Satd. Flow (perm)	1594	1607	1501	0	0	0	0	3006	0	0	1980	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	182	185	296	0	0	0	0	909	0	0	951	0
Turn Type	Split	NA	pt+ov					pm+pt	NA		Perm	NA
Protected Phases	3	3	3 5					5	2			6 4
Permitted Phases								2			6 4	
Total Split (s)	25.0	25.0						18.0	68.0			
Total Lost Time (s)	6.5	6.5						5.5				
Act Effct Green (s)	18.5	18.5	30.0					62.5			71.0	
Actuated g/C Ratio	0.15	0.15	0.24					0.50			0.57	
v/c Ratio	0.77	0.78	0.82					0.59			0.85	
Control Delay	73.6	74.0	43.8					23.6			12.9	
Queue Delay	1.0	1.1	0.0					0.1			0.0	
Total Delay	74.6	75.1	43.8					23.7			12.9	
LOS	E	E	D					C			B	
Approach Delay		61.0						23.7			12.9	
Approach LOS		E						C			B	
Queue Length 50th (ft)	150	153	129					257			77	
Queue Length 95th (ft)	#270	#275	#253					319			78	
Internal Link Dist (ft)		457			497			605			150	
Turn Bay Length (ft)	300		250									
Base Capacity (vph)	235	237	360					1537			1124	
Starvation Cap Reductn	0	0	0					0			0	
Spillback Cap Reductn	6	6	0					45			0	
Storage Cap Reductn	0	0	0					0			0	
Reduced v/c Ratio	0.79	0.80	0.82					0.61			0.85	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 125
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 29.4
 Intersection LOS: C
 Intersection Capacity Utilization 74.8%
 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: 5: Main St/Edgell Rd & High St /High St



6: Edgell Rd & Pleasant St

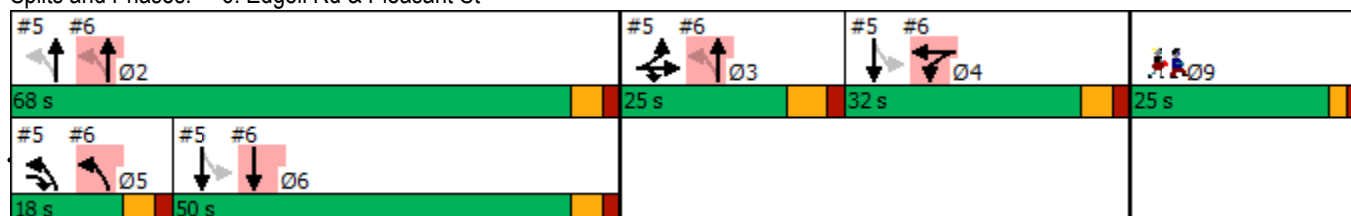


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔	↔		↔	↑			↕↕	
Traffic Volume (vph)	0	0	0	370	78	75	396	782	0	0	651	41
Future Volume (vph)	0	0	0	370	78	75	396	782	0	0	651	41
Satd. Flow (prot)	0	0	0	3255	1635	0	1678	1766	0	0	3325	0
Flt Permitted				0.950			0.268					
Satd. Flow (perm)	0	0	0	3255	1635	0	473	1766	0	0	3325	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	0	0	385	159	0	413	815	0	0	721	0
Turn Type				Split	NA		pm+pt	NA			NA	
Protected Phases				4	4		5	2 3			6	
Permitted Phases							2 3					
Total Split (s)				32.0	32.0		18.0				50.0	
Total Lost Time (s)				5.5	5.5		5.5				5.5	
Act Effct Green (s)				26.5	26.5		87.5	87.5			44.5	
Actuated g/C Ratio				0.21	0.21		0.70	0.70			0.36	
v/c Ratio				0.56	0.46		0.92	0.66			0.61	
Control Delay				47.6	48.0		38.8	5.5			35.8	
Queue Delay				0.0	0.0		5.8	0.3			0.1	
Total Delay				47.6	48.0		44.6	5.7			35.9	
LOS				D	D		D	A			D	
Approach Delay					47.7			18.8			35.9	
Approach LOS					D			B			D	
Queue Length 50th (ft)				144	113		65	25			250	
Queue Length 95th (ft)				196	183		m#140	60			316	
Internal Link Dist (ft)		271			808			150			421	
Turn Bay Length (ft)				500								
Base Capacity (vph)				690	346		451	1236			1183	
Starvation Cap Reductn				0	0		21	82			0	
Spillback Cap Reductn				0	0		0	0			40	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.56	0.46		0.96	0.71			0.63	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 125
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 30.1
 Intersection LOS: C
 Intersection Capacity Utilization 65.5%
 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: 6: Edgell Rd & Pleasant St



7: Main St & Worcester Rd

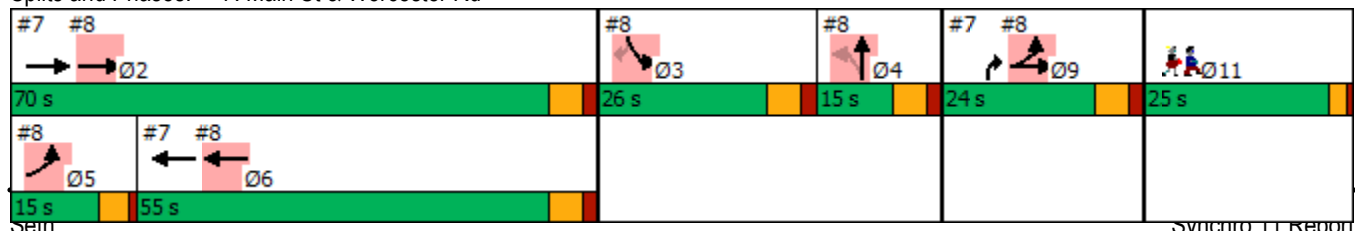


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	Ø4	Ø5	Ø11
Lane Configurations	↑↑↑			↑↑↑		↑↑				
Traffic Volume (vph)	1960	10	0	1522	0	550				
Future Volume (vph)	1960	10	0	1522	0	550				
Satd. Flow (prot)	4816	0	0	4821	0	2642				
Flt Permitted										
Satd. Flow (perm)	4816	0	0	4821	0	2642				
Satd. Flow (RTOR)	1					887				
Lane Group Flow (vph)	2052	0	0	1585	0	573				
Turn Type	NA			NA		Prot				
Protected Phases	2			6		9	3	4	5	11
Permitted Phases										
Total Split (s)	70.0			55.0		24.0	26.0	15.0	15.0	25.0
Total Lost Time (s)	6.0			6.0		6.0				
Act Effct Green (s)	64.7			53.3		18.2				
Actuated g/C Ratio	0.51			0.42		0.14				
v/c Ratio	0.84			0.78		0.50				
Control Delay	31.8			16.1		1.6				
Queue Delay	0.1			1.2		0.2				
Total Delay	31.9			17.3		1.8				
LOS	C			B		A				
Approach Delay	31.9			17.3	1.8					
Approach LOS	C			B	A					
Queue Length 50th (ft)	454			81		0				
Queue Length 95th (ft)	#916			#709		0				
Internal Link Dist (ft)	422			244	416					
Turn Bay Length (ft)										
Base Capacity (vph)	2450			2021		1138				
Starvation Cap Reductn	0			222		0				
Spillback Cap Reductn	24			0		111				
Storage Cap Reductn	0			0		0				
Reduced v/c Ratio	0.85			0.88		0.56				

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 127.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 22.3
 Intersection LOS: C
 Intersection Capacity Utilization 67.3%
 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.

Splits and Phases: 7: Main St & Worcester Rd



8: Worcester Rd & Prospect St

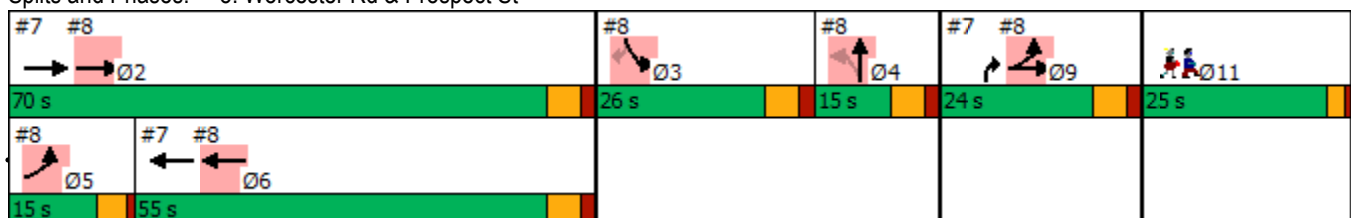


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	2310	0	0	1560	90	0	1	0	375	0	200
Future Volume (vph)	200	2310	0	0	1560	90	0	1	0	375	0	200
Satd. Flow (prot)	1678	4821	0	0	4783	0	0	1766	0	3255	0	1678
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1678	4821	0	0	4783	0	0	1766	0	3255	0	1678
Satd. Flow (RTOR)												
Lane Group Flow (vph)	208	2406	0	0	1719	0	0	1	0	391	0	208
Turn Type	Prot	NA			NA			NA		Prot		Perm
Protected Phases	5.9	2.9			6			4		3		
Permitted Phases							4					3
Total Split (s)					55.0		15.0	15.0		26.0		26.0
Total Lost Time (s)					6.0			6.0		6.0		6.0
Act Effct Green (s)	30.4	88.0			53.3			5.7		20.2		20.2
Actuated g/C Ratio	0.24	0.69			0.42			0.04		0.16		0.16
v/c Ratio	0.52	0.72			0.86			0.01		0.76		0.78
Control Delay	68.9	7.3			39.5			65.0		62.1		72.7
Queue Delay	1.0	0.1			0.6			0.0		0.0		0.0
Total Delay	69.9	7.4			40.1			65.0		62.1		72.7
LOS	E	A			D			E		E		E
Approach Delay		12.4			40.1			65.0			65.8	
Approach LOS		B			D			E			E	
Queue Length 50th (ft)	167	79			413			1		149		155
Queue Length 95th (ft)	m250	246			#844			8		#308		#386
Internal Link Dist (ft)		244			273			196			695	
Turn Bay Length (ft)												200
Base Capacity (vph)	450	3334			2005			126		517		266
Starvation Cap Reductn	92	202			0			0		0		0
Spillback Cap Reductn	0	0			77			0		0		0
Storage Cap Reductn	0	0			0			0		0		0
Reduced v/c Ratio	0.58	0.77			0.89			0.01		0.76		0.78

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 127.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 28.6
 Intersection LOS: C
 Intersection Capacity Utilization 72.7%
 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: 8: Worcester Rd & Prospect St



12: Caldor Rd/Worcester Rd

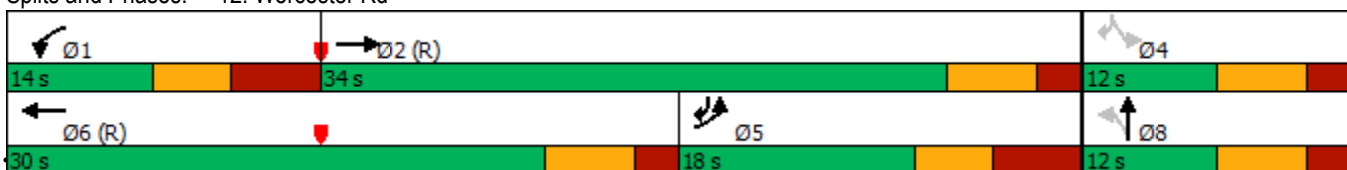


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕		↔↔	↕↕↕		↔	↕		↔↔		↔
Traffic Volume (vph)	400	2050	10	30	1310	110	60	0	70	110	0	100
Future Volume (vph)	400	2050	10	30	1310	110	60	0	70	110	0	100
Satd. Flow (prot)	3255	4816	0	3255	4763	0	1594	1439	0	3255	0	1501
Flt Permitted	0.950			0.950			0.950	0.996		0.833		
Satd. Flow (perm)	3255	4816	0	3255	4763	0	1594	1439	0	2854	0	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	417	2145	0	31	1480	0	57	79	0	115	0	104
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm		pm+ov
Protected Phases	5	2		1	6			8				5
Permitted Phases							8			4		4
Total Split (s)	18.0	34.0		14.0	30.0		12.0	12.0		12.0		18.0
Total Lost Time (s)	7.5	6.0		7.5	6.0		6.0	6.0		6.0		7.5
Act Effct Green (s)	11.4	40.0		6.2	25.5		6.0	6.0		6.0		21.0
Actuated g/C Ratio	0.19	0.67		0.10	0.42		0.10	0.10		0.10		0.35
v/c Ratio	0.68	0.67		0.09	0.73		0.36	0.55		0.40		0.20
Control Delay	30.1	12.1		25.0	17.5		32.0	42.8		29.9		13.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay	30.1	12.1		25.0	17.5		32.0	42.8		29.9		13.9
LOS	C	B		C	B		C	D		C		B
Approach Delay		15.0			17.7			38.3				22.3
Approach LOS		B			B			D				C
Queue Length 50th (ft)	74	118		5	164		21	29		20		24
Queue Length 95th (ft)	#129	#381		15	215		52	#83		42		54
Internal Link Dist (ft)		865			3810			474				672
Turn Bay Length (ft)	500			300			250			300		
Base Capacity (vph)	616	3212		352	2027		159	143		285		524
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	0.68	0.67		0.09	0.73		0.36	0.55		0.40		0.20

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 12 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 17.0
 Intersection LOS: B
 Intersection Capacity Utilization 71.6%
 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.

Splits and Phases: 12: Worcester Rd



13: Oak Street & Worcester St

AM Peak Hour

Existing Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕↕↕		↖	↕↕↕		↖	↕	↖	↖	↕	↖
Traffic Volume (vph)	150	1920	130	115	1390	220	180	281	130	275	210	120
Future Volume (vph)	150	1920	130	115	1390	220	180	281	130	275	210	120
Satd. Flow (prot)	1678	4778	0	1678	4725	0	1678	1766	1501	1678	1766	1501
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1678	4778	0	1678	4725	0	1678	1766	1501	1678	1766	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	156	2135	0	120	1677	0	188	293	135	286	219	125
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	17.0	35.0		17.0	35.0		18.0	20.0	20.0	18.0	20.0	20.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Act Effct Green (s)	10.6	30.0		10.0	29.4		11.8	14.0	14.0	12.0	14.2	14.2
Actuated g/C Ratio	0.12	0.33		0.11	0.33		0.13	0.16	0.16	0.13	0.16	0.16
v/c Ratio	0.79	1.34		0.65	1.09		0.86	1.07	0.58	1.28	0.79	0.53
Control Delay	66.6	185.8		54.5	81.3		72.8	112.6	46.2	191.5	58.0	44.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	185.8		54.5	81.3		72.8	112.6	46.2	191.5	58.0	44.0
LOS	E	F		D	F		E	F	D	F	E	D
Approach Delay		177.7			79.5			85.9			115.8	
Approach LOS		F			E			F			F	
Queue Length 50th (ft)	87	~597		65	~400		106	~186	72	~208	122	66
Queue Length 95th (ft)	#185	#693		#130	#495		#222	#343	132	#364	#237	123
Internal Link Dist (ft)		351			574			601			628	
Turn Bay Length (ft)	400			400			300		300	300		300
Base Capacity (vph)	205	1592		205	1542		223	274	233	223	278	236
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.76	1.34		0.59	1.09		0.84	1.07	0.58	1.28	0.79	0.53

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.34

Intersection Signal Delay: 126.7

Intersection LOS: F

Intersection Capacity Utilization 96.4%

ICU Level of Service F

Analysis Period (min) 15

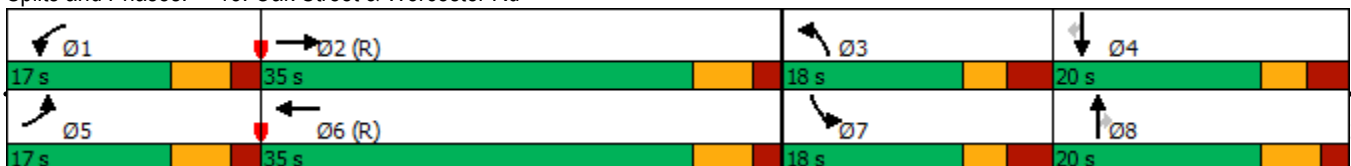
~ Volume exceeds capacity, queue is theoretically infinite.

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: 13: Oak Street & Worcester Rd



Part 2: PM Existing Conditions

2: Country Club Ln & Worcester Rd



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗↘	
Traffic Volume (vph)	50	1740	430	200	1750	380	100
Future Volume (vph)	50	1740	430	200	1750	380	100
Satd. Flow (prot)	1678	3355	1501	1678	3355	3194	0
Flt Permitted	0.950			0.950		0.962	
Satd. Flow (perm)	1678	3355	1501	1678	3355	3194	0
Satd. Flow (RTOR)			*200				
Lane Group Flow (vph)	52	1813	448	208	1823	500	0
Turn Type	Prot	NA	pt+ov	Prot	NA	Prot	
Protected Phases	5	2	2 7	1	6	7	
Permitted Phases							
Total Split (s)	20.0	60.0		20.0	60.0	25.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0	5.0	
Act Effct Green (s)	8.6	54.0	78.2	14.6	62.2	19.2	
Actuated g/C Ratio	0.08	0.52	0.75	0.14	0.60	0.18	
v/c Ratio	0.37	1.04	0.38	0.89	0.91	0.85	
Control Delay	52.4	58.2	3.2	80.1	28.1	55.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	52.4	58.2	3.2	80.1	28.1	55.6	
LOS	D	E	A	F	C	E	
Approach Delay		47.4			33.4	55.6	
Approach LOS		D			C	E	
Queue Length 50th (ft)	34	~702	41	139	564	167	
Queue Length 95th (ft)	71	#841	75	#270	#811	#245	
Internal Link Dist (ft)		1378			1287	306	
Turn Bay Length (ft)	400		400	300			
Base Capacity (vph)	242	1746	1190	242	2010	615	
Starvation Cap Reductn	0	0	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	0.21	1.04	0.38	0.86	0.91	0.81	

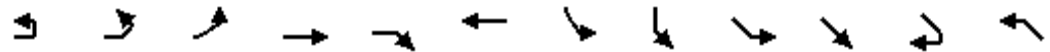
Intersection Summary

Cycle Length: 105
 Actuated Cycle Length: 103.8
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 42.4
 Intersection LOS: D
 Intersection Capacity Utilization 86.5%
 ICU Level of Service E
 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: 2: Country Club Ln & Worcester Rd



3: Temple St & Worcester Rd & Jug Handle

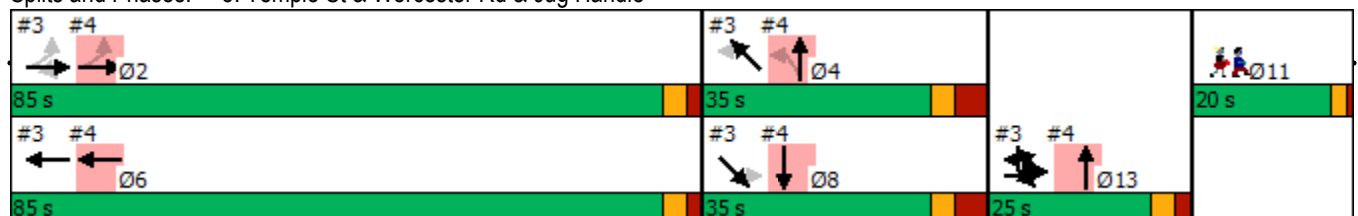


Lane Group	EBU	EBL2	EBL	EBT	EBR	WBT	SBL2	SBL	SEL	SET	SER	NWL
Lane Configurations												
Traffic Volume (vph)	35	60	0	1570	110	2035	130	220	180	135	35	160
Future Volume (vph)	35	60	0	1570	110	2035	130	220	180	135	35	160
Satd. Flow (prot)	0	0	1678	3355	1501	4821	1678	1678	0	1699	0	1678
Flt Permitted		*0.950	*0.950				0.950	0.950				
Satd. Flow (perm)	0	0	1678	3355	1501	4821	1678	1678	0	1743	0	1766
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	0	99	1635	115	2120	135	229	0	365	0	167
Turn Type	Prot	Prot	Perm	NA	Perm	NA	Prot	Prot	Perm	NA		Perm
Protected Phases	13	13		2		6	13	13		8		
Permitted Phases			2		2				8			4
Total Split (s)	25.0	25.0	85.0	85.0	85.0	85.0	25.0	25.0	35.0	35.0		35.0
Total Lost Time (s)			5.0	5.0	5.0	5.0	5.0	5.0		7.0		7.0
Act Effct Green (s)			80.2	80.2	80.2	80.2	20.1	20.1		28.1		28.1
Actuated g/C Ratio			0.54	0.54	0.54	0.54	0.13	0.13		0.19		0.19
v/c Ratio			0.11	0.91	0.14	0.82	0.60	1.02		1.11		0.50
Control Delay			18.5	39.7	19.0	32.4	73.9	126.3		95.7		61.4
Queue Delay			0.0	0.0	0.0	0.0	0.0	0.0		0.2		0.0
Total Delay			18.5	39.7	19.0	32.4	73.9	126.3		95.9		61.4
LOS			B	D	B	C	E	F		F		E
Approach Delay				37.2		32.4		106.8		95.9		
Approach LOS				D		C		F		F		
Queue Length 50th (ft)			43	687	51	568	121	219		~351		142
Queue Length 95th (ft)			96	#1103	110	831	222	#468		m#528		252
Internal Link Dist (ft)				646		691		163		96		
Turn Bay Length (ft)			400		400							300
Base Capacity (vph)			903	1806	808	2595	225	225		328		333
Starvation Cap Reductn			0	0	0	0	0	0		6		0
Spillback Cap Reductn			136	0	0	0	0	0		0		0
Storage Cap Reductn			0	0	0	0	0	0		0		0
Reduced v/c Ratio			0.13	0.91	0.14	0.82	0.60	1.02		1.13		0.50

Intersection Summary

Cycle Length: 165
 Actuated Cycle Length: 149
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 47.6
 Intersection LOS: D
 Intersection Capacity Utilization 113.9%
 ICU Level of Service H
 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: Temple St & Worcester Rd & Jug Handle



3: Temple St & Worcester Rd & Jug Handle



Lane Group	NWT	NWR2	Ø11
Lane Configurations			
Traffic Volume (vph)	180	70	
Future Volume (vph)	180	70	
Satd. Flow (prot)	1692	0	
Flt Permitted			
Satd. Flow (perm)	1692	0	
Satd. Flow (RTOR)			
Lane Group Flow (vph)	261	0	
Turn Type	NA		
Protected Phases	4		11
Permitted Phases			
Total Split (s)	35.0		20.0
Total Lost Time (s)	7.0		
Act Effct Green (s)	28.1		
Actuated g/C Ratio	0.19		
v/c Ratio	0.82		
Control Delay	79.1		
Queue Delay	6.2		
Total Delay	85.3		
LOS	F		
Approach Delay	75.9		
Approach LOS	E		
Queue Length 50th (ft)	238		
Queue Length 95th (ft)	#455		
Internal Link Dist (ft)	704		
Turn Bay Length (ft)			
Base Capacity (vph)	318		
Starvation Cap Reductn	0		
Spillback Cap Reductn	29		
Storage Cap Reductn	0		
Reduced v/c Ratio	0.90		
Intersection Summary			

4: Temple St & Old Worcester Rd

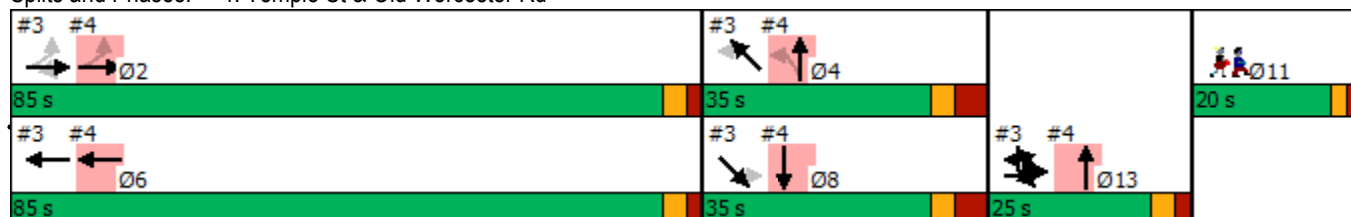


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	10	0	60	0	25	85	15	225	0	0	290	10
Future Volume (vph)	10	0	60	0	25	85	15	225	0	0	290	10
Satd. Flow (prot)	0	1548	0	0	1582	0	0	1761	0	0	1759	0
Flt Permitted		0.967						*0.800				
Satd. Flow (perm)	0	1508	0	0	1582	0	0	1413	0	0	1759	0
Satd. Flow (RTOR)		79			89						1	
Lane Group Flow (vph)	0	73	0	0	115	0	0	250	0	0	312	0
Turn Type	Perm	NA			NA		custom	NA			NA	
Protected Phases		2			6			4 13			8	
Permitted Phases	2						4					
Total Split (s)	85.0	85.0			85.0		35.0				35.0	
Total Lost Time (s)		8.0			5.0						7.0	
Act Effct Green (s)		77.2			80.2			53.1			28.1	
Actuated g/C Ratio		0.52			0.54			0.36			0.19	
v/c Ratio		0.09			0.13			0.50			0.94	
Control Delay		3.9			6.1			20.3			95.3	
Queue Delay		0.1			0.0			13.1			15.4	
Total Delay		4.0			6.1			33.3			110.6	
LOS		A			A			C			F	
Approach Delay		4.0			6.1			33.3			110.6	
Approach LOS		A			A			C			F	
Queue Length 50th (ft)		0			11			64			291	
Queue Length 95th (ft)		27			51			m90			#569	
Internal Link Dist (ft)		1206			164			96			221	
Turn Bay Length (ft)												
Base Capacity (vph)		819			892			503			332	
Starvation Cap Reductn		0			0			227			0	
Spillback Cap Reductn		241			0			0			24	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.13			0.13			0.91			1.01	

Intersection Summary

Cycle Length: 165
 Actuated Cycle Length: 149
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 58.5
 Intersection LOS: E
 Intersection Capacity Utilization 47.6%
 ICU Level of Service A
 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: 4: Temple St & Old Worcester Rd



5: Main St/Edgell Rd & High St /High St

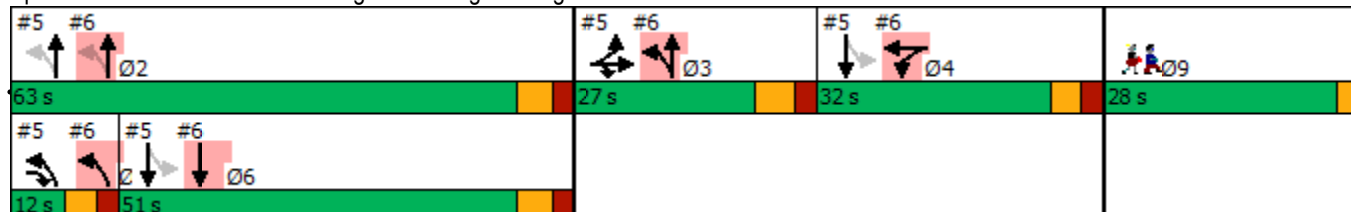


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	31	251	0	0	0	29	913	34	135	621	351
Future Volume (vph)	360	31	251	0	0	0	29	913	34	135	621	351
Satd. Flow (prot)	1594	1611	1501	0	0	0	0	3335	0	0	3175	0
Flt Permitted	0.950	0.960						0.750			0.600	
Satd. Flow (perm)	1594	1611	1501	0	0	0	0	2504	0	0	1917	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	202	205	261	0	0	0	0	1016	0	0	1154	0
Turn Type	Split	NA	pt+ov				pm+pt	NA		Perm	NA	
Protected Phases	3	3	3 5				5	2			6 4	
Permitted Phases							2			6 4		
Total Split (s)	27.0	27.0					12.0	63.0				
Total Lost Time (s)	7.0	7.0						6.5				
Act Effct Green (s)	20.2	20.2	25.3					57.1			70.7	
Actuated g/C Ratio	0.15	0.15	0.19					0.43			0.53	
v/c Ratio	0.84	0.84	0.92					0.92			1.13	
Control Delay	84.1	84.2	77.4					49.7			85.9	
Queue Delay	41.7	43.0	0.0					28.9			0.0	
Total Delay	125.7	127.2	77.4					78.6			85.9	
LOS	F	F	E					E			F	
Approach Delay		107.3						78.6			85.9	
Approach LOS		F						E			F	
Queue Length 50th (ft)	162	165	144					317			~397	
Queue Length 95th (ft)	#382	#385	#399					#703			m#647	
Internal Link Dist (ft)		457			497			605			150	
Turn Bay Length (ft)	300		250									
Base Capacity (vph)	241	244	284					1107			1017	
Starvation Cap Reductn	0	0	0					0			0	
Spillback Cap Reductn	50	51	0					146			0	
Storage Cap Reductn	0	0	0					0			0	
Reduced v/c Ratio	1.06	1.06	0.92					1.06			1.13	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 133.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 88.3
 Intersection LOS: F
 Intersection Capacity Utilization 86.9%
 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: 5: Main St/Edgell Rd & High St /High St



6: Edgell Rd & Pleasant St

PM Peak Hour

Existing Conditions



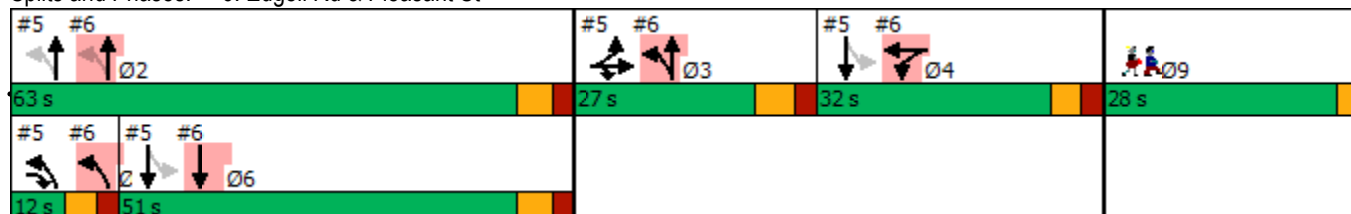
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	600	153	101	505	797	0	0	660	55
Future Volume (vph)	0	0	0	600	153	101	505	797	0	0	660	55
Satd. Flow (prot)	0	0	0	3255	1660	0	1678	1766	0	0	3319	0
Flt Permitted				0.950			0.193					
Satd. Flow (perm)	0	0	0	3255	1660	0	341	1766	0	0	3319	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	0	0	625	264	0	526	830	0	0	745	0
Turn Type				Split	NA		custom	NA			NA	
Protected Phases				4	4		5 3	2 3			6	
Permitted Phases							2					
Total Split (s)				32.0	32.0						51.0	
Total Lost Time (s)				6.0	6.0						6.5	
Act Effct Green (s)				26.3	26.3		78.8	84.4			45.0	
Actuated g/C Ratio				0.20	0.20		0.59	0.63			0.34	
v/c Ratio				0.98	0.81		1.11	0.74			0.67	
Control Delay				82.9	71.9		88.6	7.2			43.0	
Queue Delay				19.3	0.0		0.7	4.2			16.8	
Total Delay				102.2	71.9		89.3	11.4			59.8	
LOS				F	E		F	B			E	
Approach Delay					93.2			41.6			59.8	
Approach LOS					F			D			E	
Queue Length 50th (ft)				249	196		~323	14			251	
Queue Length 95th (ft)				#481	#430		m#559	m88			428	
Internal Link Dist (ft)		271			808			150			421	
Turn Bay Length (ft)				500								
Base Capacity (vph)				641	327		475	1118			1120	
Starvation Cap Reductn				0	0		34	211			0	
Spillback Cap Reductn				44	0		0	0			374	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				1.05	0.81		1.19	0.92			1.00	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 133.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 61.5
 Intersection LOS: E
 Intersection Capacity Utilization 80.5%
 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: 6: Edgell Rd & Pleasant St



7: Main St & Worcester Rd



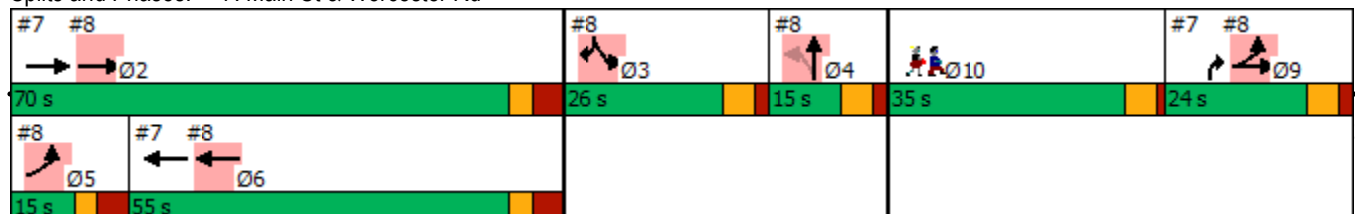
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	Ø4	Ø5	Ø10
Lane Configurations	↑↑↑			↑↑↑		↑↑				
Traffic Volume (vph)	1750	35	0	2385	0	380				
Future Volume (vph)	1750	35	0	2385	0	380				
Satd. Flow (prot)	4807	0	0	4821	0	2642				
Flt Permitted										
Satd. Flow (perm)	4807	0	0	4821	0	2642				
Satd. Flow (RTOR)	2					986				
Lane Group Flow (vph)	1859	0	0	2484	0	396				
Turn Type	NA			NA		Prot				
Protected Phases	2			6		9	3	4	5	10
Permitted Phases										
Total Split (s)	70.0			55.0		24.0	26.0	15.0	15.0	35.0
Total Lost Time (s)	7.0			7.0		6.0				
Act Effct Green (s)	64.1			48.8		18.3				
Actuated g/C Ratio	0.50			0.38		0.14				
v/c Ratio	0.78			1.36		0.32				
Control Delay	31.3			187.7		0.7				
Queue Delay	0.6			0.2		0.1				
Total Delay	32.0			187.8		0.8				
LOS	C			F		A				
Approach Delay	32.0			187.8	0.8					
Approach LOS	C			F	A					
Queue Length 50th (ft)	393			~875		0				
Queue Length 95th (ft)	#873			m#928		0				
Internal Link Dist (ft)	422			244	416					
Turn Bay Length (ft)										
Base Capacity (vph)	2384			1821		1220				
Starvation Cap Reductn	0			108		0				
Spillback Cap Reductn	206			0		185				
Storage Cap Reductn	0			0		0				
Reduced v/c Ratio	0.85			1.45		0.38				

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 129.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.38
 Intersection Signal Delay: 111.1
 Intersection LOS: F
 Intersection Capacity Utilization 58.7%
 ICU Level of Service B
 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: 7: Main St & Worcester Rd



8: Worcester Rd & Prospect St

PM Peak Hour

Existing Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	350	1815	0	0	2035	210	0	1	0	275	0	350
Future Volume (vph)	350	1815	0	0	2035	210	0	1	0	275	0	350
Satd. Flow (prot)	1678	4821	0	0	4754	0	0	1766	0	3255	0	1678
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1678	4821	0	0	4754	0	0	1766	0	3255	0	1678
Satd. Flow (RTOR)												
Lane Group Flow (vph)	365	1891	0	0	2339	0	0	1	0	286	0	365
Turn Type	Prot	NA			NA			NA		Prot		Prot
Protected Phases	5.9	2.9			6			4		3		3
Permitted Phases							4					
Total Split (s)					55.0		15.0	15.0		26.0		26.0
Total Lost Time (s)					7.0			6.0		6.0		6.0
Act Effct Green (s)	32.5	88.5			48.8			5.7		20.3		20.3
Actuated g/C Ratio	0.25	0.68			0.38			0.04		0.16		0.16
v/c Ratio	0.86	0.57			1.30			0.01		0.56		1.38
Control Delay	90.0	6.1			174.4			68.0		57.3		234.9
Queue Delay	53.3	0.2			0.8			0.0		0.0		1.7
Total Delay	143.3	6.2			175.1			68.0		57.3		236.6
LOS	F	A			F			E		E		F
Approach Delay		28.4			175.1			68.0			157.8	
Approach LOS		C			F			E			F	
Queue Length 50th (ft)	295	58			~819			1		105		~363
Queue Length 95th (ft)	#685	164			#1444			9		211		#808
Internal Link Dist (ft)		244			273			196			695	
Turn Bay Length (ft)												200
Base Capacity (vph)	422	3301			1795			125		512		264
Starvation Cap Reductn	139	461			0			0		0		0
Spillback Cap Reductn	0	0			388			0		0		31
Storage Cap Reductn	0	0			0			0		0		0
Reduced v/c Ratio	1.29	0.67			1.66			0.01		0.56		1.57

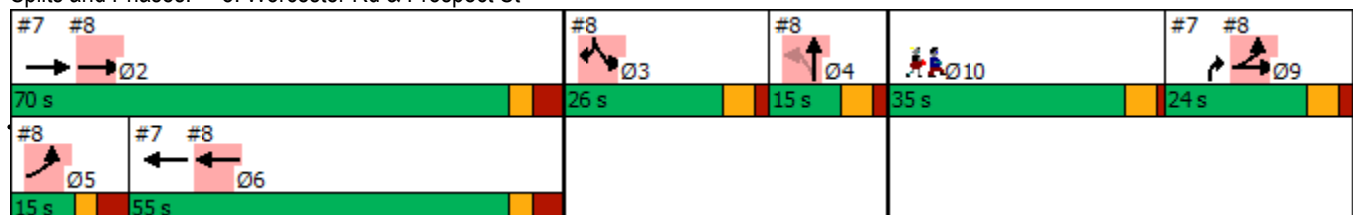
Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 129.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.38
 Intersection Signal Delay: 109.9
 Intersection LOS: F
 Intersection Capacity Utilization 92.9%
 ICU Level of Service F
 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: 8: Worcester Rd & Prospect St



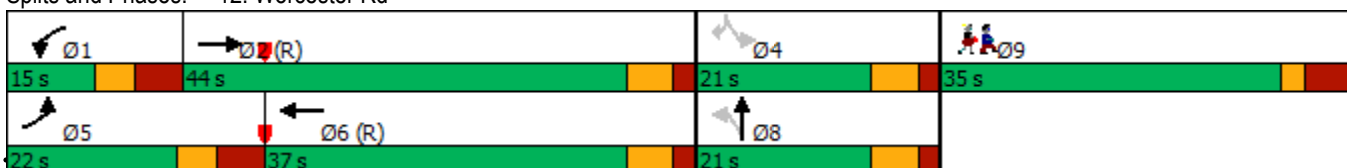
12: Caldor Rd/Worcester Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	1670	15	140	1790	215	80	0	45	220	0	185
Future Volume (vph)	380	1670	15	140	1790	215	80	0	45	220	0	185
Satd. Flow (prot)	3255	4816	0	3255	4744	0	1594	1469	0	3255	0	1501
Flt Permitted	0.950			0.950			0.950	0.988		0.714		
Satd. Flow (perm)	3255	4816	0	3255	4744	0	1594	1469	0	2446	0	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	396	1756	0	146	2089	0	68	62	0	229	0	193
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm		Perm
Protected Phases	5	2		1	6			8				
Permitted Phases							8			4		4
Total Split (s)	22.0	44.0		15.0	37.0		21.0	21.0		21.0		21.0
Total Lost Time (s)	7.5	6.0		7.5	6.0		6.0	6.0		6.0		6.0
Act Effct Green (s)	18.9	64.0		9.5	54.6		15.0	15.0		15.0		15.0
Actuated g/C Ratio	0.16	0.56		0.08	0.47		0.13	0.13		0.13		0.13
v/c Ratio	0.74	0.65		0.55	0.93		0.33	0.32		0.72		0.99
Control Delay	55.3	21.7		58.9	37.4		50.3	50.6		61.6		112.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay	55.3	21.7		58.9	37.4		50.3	50.6		61.6		112.6
LOS	E	C		E	D		D	D		E		F
Approach Delay		27.9			38.8			50.5				84.9
Approach LOS		C			D			D				F
Queue Length 50th (ft)	142	275		53	469		48	44		85		145
Queue Length 95th (ft)	#251	#639		#99	#915		96	90		#136		#295
Internal Link Dist (ft)		865			3810			474				672
Turn Bay Length (ft)	500			300			250			300		
Base Capacity (vph)	534	2681		267	2252		207	191		319		195
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	0.74	0.65		0.55	0.93		0.33	0.32		0.72		0.99

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 38.3
 Intersection LOS: D
 Intersection Capacity Utilization 77.7%
 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: 12: Worcester Rd



13: Oak Street & Worcester St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↕↕↕		↖	↕↕↕		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	185	1520	135	160	1800	190	270	190	80	190	230	245
Future Volume (vph)	185	1520	135	160	1800	190	270	190	80	190	230	245
Satd. Flow (prot)	1678	4763	0	1678	4754	0	1678	1766	1501	1678	1766	1501
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1678	4763	0	1678	4754	0	1678	1766	1501	1678	1766	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	193	1724	0	167	2073	0	281	198	83	198	240	255
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	15.0	39.0		15.0	39.0		18.0	18.0	18.0	18.0	18.0	18.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Act Effct Green (s)	9.0	33.0		9.0	33.0		12.0	12.0	12.0	12.0	12.0	12.0
Actuated g/C Ratio	0.10	0.37		0.10	0.37		0.13	0.13	0.13	0.13	0.13	0.13
v/c Ratio	1.16	0.99		1.00	1.19		1.26	0.84	0.41	0.89	1.02	1.27
Control Delay	156.6	48.0		113.2	119.5		183.1	69.1	42.8	77.5	105.3	191.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	156.6	48.0		113.2	119.5		183.1	69.1	42.8	77.5	105.3	191.6
LOS	F	D		F	F		F	E	D	E	F	F
Approach Delay		58.9			119.0			122.2				129.1
Approach LOS		E			F			F				F
Queue Length 50th (ft)	~130	350		97	~526		~202	112	44	112	~142	~185
Queue Length 95th (ft)	#263	#467		#224	#621		#356	#230	90	#237	#291	#333
Internal Link Dist (ft)		351			574			601			628	
Turn Bay Length (ft)	400			400			300		300	300		300
Base Capacity (vph)	167	1746		167	1743		223	235	200	223	235	200
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.16	0.99		1.00	1.19		1.26	0.84	0.41	0.89	1.02	1.27

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.27

Intersection Signal Delay: 99.4

Intersection LOS: F

Intersection Capacity Utilization 96.3%

ICU Level of Service F

Analysis Period (min) 15

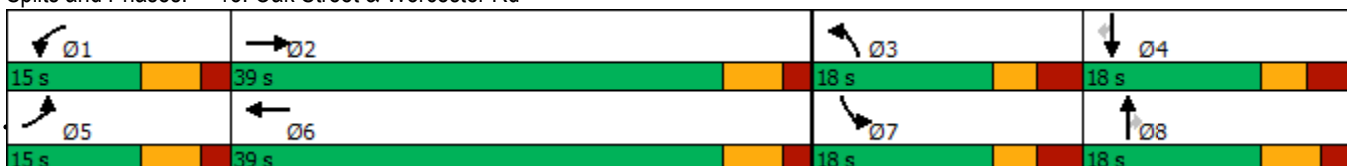
~ Volume exceeds capacity, queue is theoretically infinite.

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: 13: Oak Street & Worcester Rd



Part 3: 2030 AM Conditions

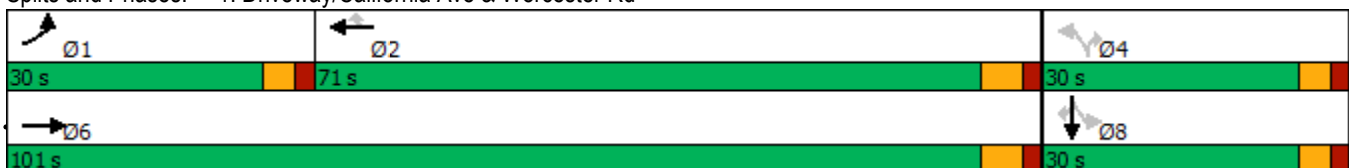
1: Driveway/California Ave & Worcester Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	440	1690	20	0	2860	650	20	0	10	110	25	90
Future Volume (vph)	440	1690	20	0	2860	650	20	0	10	110	25	90
Satd. Flow (prot)	3255	4812	0	0	4821	1501	1678	0	1501	1594	1626	1501
Flt Permitted	0.950						0.707			0.950	0.969	
Satd. Flow (perm)	3255	4812	0	0	4821	1501	1249	0	1501	1594	1626	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	472	1834	0	0	3069	697	21	0	11	72	73	97
Turn Type	Prot	NA			NA	Perm	Perm		Perm	Perm	NA	Perm
Protected Phases	1	6			2							8
Permitted Phases						2	4		4	8		8
Total Split (s)	30.0	101.0			71.0	71.0	30.0		30.0	30.0	30.0	30.0
Total Lost Time (s)	5.0	6.0			6.0	6.0	5.0		5.0	5.0	5.0	5.0
Act Effct Green (s)	21.1	91.4			65.2	65.2	11.4		11.4	12.8	12.8	12.8
Actuated g/C Ratio	0.18	0.79			0.57	0.57	0.10		0.10	0.11	0.11	0.11
v/c Ratio	0.79	0.48			1.12	0.82	0.17		0.07	0.41	0.41	0.58
Control Delay	55.8	4.7			87.2	31.7	50.1		47.3	55.2	55.0	63.5
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	55.8	4.7			87.2	31.7	50.1		47.3	55.2	55.0	63.5
LOS	E	A			F	C	D		D	E	E	E
Approach Delay		15.2			76.9			49.2				58.5
Approach LOS		B			E			D				E
Queue Length 50th (ft)	173	135			~975	404	14		7	53	53	70
Queue Length 95th (ft)	245	205			#1195	#748	41		26	105	107	130
Internal Link Dist (ft)		1018			585			187				263
Turn Bay Length (ft)	400											
Base Capacity (vph)	709	3983			2730	850	272		326	347	354	326
Starvation Cap Reductn	0	0			0	0	0		0	0	0	0
Spillback Cap Reductn	0	0			0	0	0		0	0	0	0
Storage Cap Reductn	0	0			0	0	0		0	0	0	0
Reduced v/c Ratio	0.67	0.46			1.12	0.82	0.08		0.03	0.21	0.21	0.30

Intersection Summary

Cycle Length: 131
 Actuated Cycle Length: 115.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 53.7
 Intersection LOS: D
 Intersection Capacity Utilization 93.7%
 ICU Level of Service F
 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: 1: Driveway/California Ave & Worcester Rd



2: Country Club Ln & Worcester Rd



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⬇	↑↑	↗	↖	↑↑	↘↙	
Traffic Volume (vph)	30	1710	520	70	1640	420	70
Future Volume (vph)	30	1710	520	70	1640	420	70
Satd. Flow (prot)	1678	3355	1501	1678	3355	3217	0
Flt Permitted	0.950			0.950		0.959	
Satd. Flow (perm)	1678	3355	1501	1678	3355	3217	0
Satd. Flow (RTOR)			*200				
Lane Group Flow (vph)	32	1835	558	75	1760	526	0
Turn Type	Prot	NA	Prot	Prot	NA	Prot	
Protected Phases	1	6	6	5	2	4	
Permitted Phases							
Total Split (s)	10.0	70.0	70.0	11.0	71.0	24.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	5.0	
Act Effect Green (s)	5.0	64.0	64.0	6.0	69.0	18.8	
Actuated g/C Ratio	0.05	0.61	0.61	0.06	0.66	0.18	
v/c Ratio	0.41	0.90	0.56	0.79	0.80	0.91	
Control Delay	63.8	24.9	9.8	97.6	17.5	64.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.8	24.9	9.8	97.6	17.5	64.0	
LOS	E	C	A	F	B	E	
Approach Delay		22.0			20.7	64.0	
Approach LOS		C			C	E	
Queue Length 50th (ft)	21	518	125	51	460	179	
Queue Length 95th (ft)	53	651	217	#132	577	#275	
Internal Link Dist (ft)		1378			1287	306	
Turn Bay Length (ft)	400		400	300			
Base Capacity (vph)	79	2048	994	95	2209	583	
Starvation Cap Reductn	0	0	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	0.41	0.90	0.56	0.79	0.80	0.90	

Intersection Summary

Cycle Length: 105
 Actuated Cycle Length: 104.8
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 26.1
 Intersection LOS: C
 Intersection Capacity Utilization 80.8%
 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: 2: Country Club Ln & Worcester Rd



3: Temple St & Worcester Rd & Jug Handle



Lane Group	NWT	NWR2	Ø14
Lane Configurations			
Traffic Volume (vph)	140	100	
Future Volume (vph)	140	100	
Satd. Flow (prot)	1657	0	
Flt Permitted			
Satd. Flow (perm)	1657	0	
Satd. Flow (RTOR)			
Lane Group Flow (vph)	257	0	
Turn Type	NA		
Protected Phases	4		14
Permitted Phases			
Total Split (s)	40.0		23.0
Total Lost Time (s)	7.0		
Act Effct Green (s)	33.3		
Actuated g/C Ratio	0.23		
v/c Ratio	0.67		
Control Delay	61.0		
Queue Delay	0.7		
Total Delay	61.7		
LOS	E		
Approach Delay	57.9		
Approach LOS	E		
Queue Length 50th (ft)	209		
Queue Length 95th (ft)	#406		
Internal Link Dist (ft)	704		
Turn Bay Length (ft)			
Base Capacity (vph)	385		
Starvation Cap Reductn	0		
Spillback Cap Reductn	22		
Storage Cap Reductn	0		
Reduced v/c Ratio	0.71		
Intersection Summary			

4: Temple St & Old Worcester Rd

AM Peak Hour
2030 AM Conditions

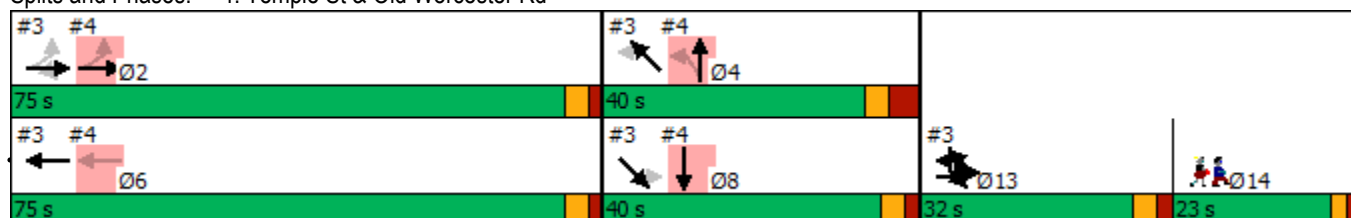


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	10	0	55	0	20	90	20	175	0	0	360	5
Future Volume (vph)	10	0	55	0	20	90	20	175	0	0	360	5
Satd. Flow (prot)	0	1552	0	0	1570	0	0	1757	0	0	1762	0
Flt Permitted		0.962						*0.800				
Satd. Flow (perm)	0	1505	0	0	1570	0	0	1413	0	0	1762	0
Satd. Flow (RTOR)		77			97							
Lane Group Flow (vph)	0	70	0	0	118	0	0	209	0	0	391	0
Turn Type	Perm	NA			NA		Perm	NA			NA	
Protected Phases		2						4			8	
Permitted Phases	2				6		4					
Total Split (s)	75.0	75.0			75.0		40.0	40.0			40.0	
Total Lost Time (s)		5.0			5.0			7.0			5.0	
Act Effct Green (s)		70.5			70.5			33.3			35.3	
Actuated g/C Ratio		0.49			0.49			0.23			0.25	
v/c Ratio		0.09			0.14			0.64			0.90	
Control Delay		4.7			7.0			30.1			76.7	
Queue Delay		0.1			0.0			6.1			3.8	
Total Delay		4.8			7.0			36.2			80.5	
LOS		A			A			D			F	
Approach Delay		4.8			7.0			36.2			80.5	
Approach LOS		A			A			D			F	
Queue Length 50th (ft)		0			9			60			338	
Queue Length 95th (ft)		29			57			#244			#694	
Internal Link Dist (ft)		1206			164			96			221	
Turn Bay Length (ft)												
Base Capacity (vph)		782			824			329			435	
Starvation Cap Reductn		0			0			75			0	
Spillback Cap Reductn		215			0			0			17	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			0.14			0.82			0.94	

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 142.8
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 51.0
 Intersection LOS: D
 Intersection Capacity Utilization 47.4%
 ICU Level of Service A
 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: 4: Temple St & Old Worcester Rd



5: Main St/Edgell Rd & High St /High St

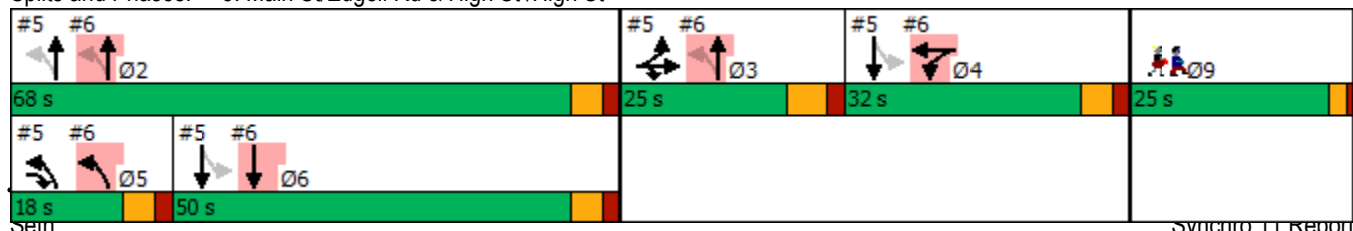
AM Peak Hour
2030 AM Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	329	23	284	0	0	0	28	842	3	201	525	187
Future Volume (vph)	329	23	284	0	0	0	28	842	3	201	525	187
Satd. Flow (prot)	1594	1607	1501	0	0	0	0	3349	0	0	3216	0
Flt Permitted	0.950	0.958						0.881			0.603	
Satd. Flow (perm)	1594	1607	1501	0	0	0	0	2956	0	0	1961	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	187	191	305	0	0	0	0	936	0	0	980	0
Turn Type	Split	NA	pt+ov				pm+pt	NA		Perm	NA	
Protected Phases	3	3	3 5				5	2			6 4	
Permitted Phases							2			6 4		
Total Split (s)	25.0	25.0					18.0	68.0				
Total Lost Time (s)	6.5	6.5						5.5				
Act Effct Green (s)	18.5	18.5	30.0					62.5			71.0	
Actuated g/C Ratio	0.15	0.15	0.24					0.50			0.57	
v/c Ratio	0.80	0.81	0.85					0.62			0.88	
Control Delay	75.8	76.7	46.8					24.2			15.4	
Queue Delay	2.2	2.3	0.0					0.1			0.0	
Total Delay	78.0	79.1	46.8					24.3			15.4	
LOS	E	E	D					C			B	
Approach Delay		64.3						24.3			15.4	
Approach LOS		E						C			B	
Queue Length 50th (ft)	155	158	134					268			84	
Queue Length 95th (ft)	#281	#288	#270					331			#355	
Internal Link Dist (ft)		457			497			605			150	
Turn Bay Length (ft)	300		250									
Base Capacity (vph)	235	237	360					1517			1113	
Starvation Cap Reductn	0	0	0					0			0	
Spillback Cap Reductn	10	10	0					59			0	
Storage Cap Reductn	0	0	0					0			0	
Reduced v/c Ratio	0.83	0.84	0.85					0.64			0.88	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 125
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 31.5
 Intersection LOS: C
 Intersection Capacity Utilization 76.6%
 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: 5: Main St/Edgell Rd & High St /High St



6: Edgell Rd & Pleasant St

AM Peak Hour
2030 AM Conditions

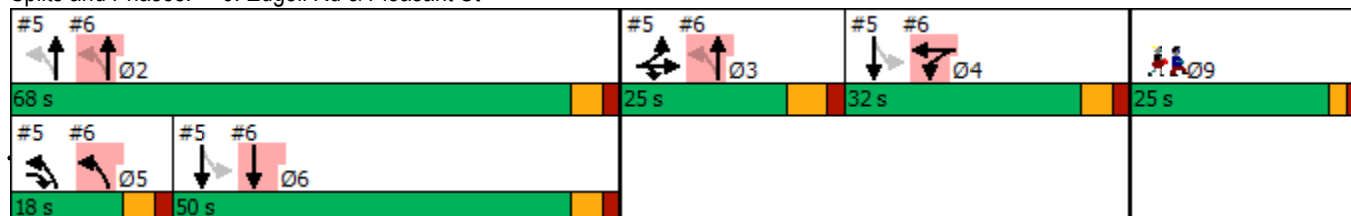


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	370	78	75	396	782	0	0	651	41
Future Volume (vph)	0	0	0	370	78	75	396	782	0	0	651	41
Satd. Flow (prot)	0	0	0	3255	1637	0	1678	1766	0	0	3325	0
Flt Permitted				0.950			0.258					
Satd. Flow (perm)	0	0	0	3255	1637	0	456	1766	0	0	3325	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	0	0	397	164	0	425	839	0	0	742	0
Turn Type				Split	NA		pm+pt	NA			NA	
Protected Phases				4	4		5	2 3			6	
Permitted Phases							2 3					
Total Split (s)				32.0	32.0		18.0				50.0	
Total Lost Time (s)				5.5	5.5		5.5				5.5	
Act Effct Green (s)				26.5	26.5		87.5	87.5			44.5	
Actuated g/C Ratio				0.21	0.21		0.70	0.70			0.36	
v/c Ratio				0.58	0.47		0.96	0.68			0.63	
Control Delay				48.0	48.4		48.8	5.9			36.3	
Queue Delay				0.0	0.0		10.1	0.3			0.1	
Total Delay				48.0	48.4		58.9	6.2			36.4	
LOS				D	D		E	A			D	
Approach Delay					48.1			23.9			36.4	
Approach LOS					D			C			D	
Queue Length 50th (ft)				150	117		77	30			260	
Queue Length 95th (ft)				203	189		m#171	67			327	
Internal Link Dist (ft)		271			808			150			421	
Turn Bay Length (ft)				500								
Base Capacity (vph)				690	347		441	1236			1183	
Starvation Cap Reductn				0	0		20	81			0	
Spillback Cap Reductn				0	0		0	0			48	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.58	0.47		1.01	0.73			0.65	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 125
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 32.8
 Intersection LOS: C
 Intersection Capacity Utilization 67.1%
 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: 6: Edgell Rd & Pleasant St



7: Main St & Worcester Rd

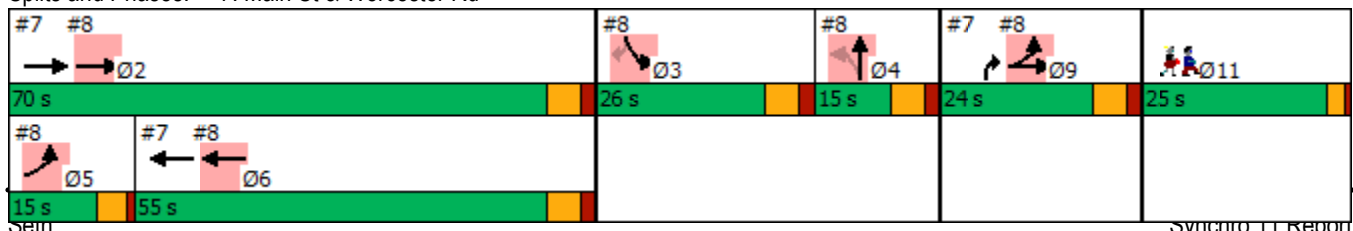


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	Ø4	Ø5	Ø11
Lane Configurations	↑↑↑			↑↑↑		↑↑				
Traffic Volume (vph)	1960	10	0	1522	0	550				
Future Volume (vph)	1960	10	0	1522	0	550				
Satd. Flow (prot)	4816	0	0	4821	0	2642				
Flt Permitted										
Satd. Flow (perm)	4816	0	0	4821	0	2642				
Satd. Flow (RTOR)	1					887				
Lane Group Flow (vph)	2114	0	0	1633	0	590				
Turn Type	NA			NA		Prot				
Protected Phases	2			6		9	3	4	5	11
Permitted Phases										
Total Split (s)	70.0			55.0		24.0	26.0	15.0	15.0	25.0
Total Lost Time (s)	6.0			6.0		6.0				
Act Effct Green (s)	64.7			53.3		18.2				
Actuated g/C Ratio	0.51			0.42		0.14				
v/c Ratio	0.86			0.81		0.52				
Control Delay	32.9			16.4		1.7				
Queue Delay	0.1			1.7		0.2				
Total Delay	33.1			18.0		1.9				
LOS	C			B		A				
Approach Delay	33.1			18.0	1.9					
Approach LOS	C			B	A					
Queue Length 50th (ft)	479			84		0				
Queue Length 95th (ft)	#963			#745		0				
Internal Link Dist (ft)	422			244	416					
Turn Bay Length (ft)										
Base Capacity (vph)	2450			2021		1138				
Starvation Cap Reductn	0			222		0				
Spillback Cap Reductn	28			0		118				
Storage Cap Reductn	0			0		0				
Reduced v/c Ratio	0.87			0.91		0.58				

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 127.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 23.2
 Intersection LOS: C
 Intersection Capacity Utilization 69.1%
 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.

Splits and Phases: 7: Main St & Worcester Rd



8: Worcester Rd & Prospect St

AM Peak Hour
2030 AM Conditions

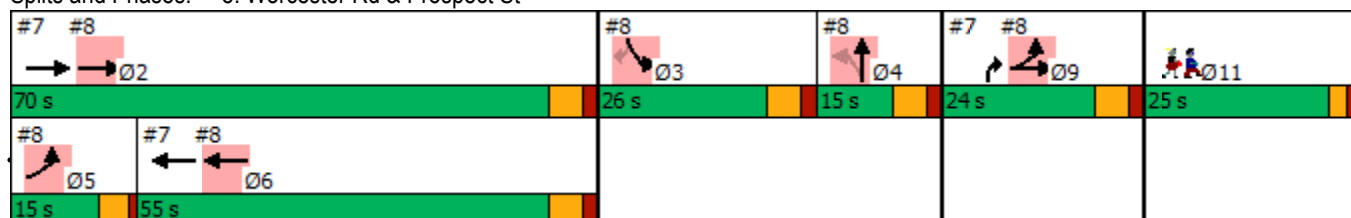


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	2310	0	0	1560	90	0	1	0	375	0	200
Future Volume (vph)	200	2310	0	0	1560	90	0	1	0	375	0	200
Satd. Flow (prot)	1678	4821	0	0	4783	0	0	1766	0	3255	0	1678
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1678	4821	0	0	4783	0	0	1766	0	3255	0	1678
Satd. Flow (RTOR)												
Lane Group Flow (vph)	215	2478	0	0	1771	0	0	1	0	402	0	215
Turn Type	Prot	NA			NA			NA		Prot		Perm
Protected Phases	5 9	2 9			6			4		3		
Permitted Phases							4					3
Total Split (s)					55.0		15.0	15.0		26.0		26.0
Total Lost Time (s)					6.0			6.0		6.0		6.0
Act Effct Green (s)	30.4	88.0			53.3			5.7		20.2		20.2
Actuated g/C Ratio	0.24	0.69			0.42			0.04		0.16		0.16
v/c Ratio	0.54	0.74			0.88			0.01		0.78		0.81
Control Delay	69.1	7.7			41.0			65.0		63.2		75.3
Queue Delay	1.1	0.2			1.1			0.0		0.0		0.0
Total Delay	70.2	7.8			42.0			65.0		63.2		75.3
LOS	E	A			D			E		E		E
Approach Delay		12.8			42.0			65.0			67.4	
Approach LOS		B			D			E			E	
Queue Length 50th (ft)	172	81			433			1		154		161
Queue Length 95th (ft)	m251	#298			#884			8		#321		#403
Internal Link Dist (ft)		244			273			196			695	
Turn Bay Length (ft)												200
Base Capacity (vph)	450	3334			2005			126		517		266
Starvation Cap Reductn	92	202			0			0		0		0
Spillback Cap Reductn	0	0			83			0		0		0
Storage Cap Reductn	0	0			0			0		0		0
Reduced v/c Ratio	0.60	0.79			0.92			0.01		0.78		0.81

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 127.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 29.6 Intersection LOS: C
 Intersection Capacity Utilization 74.3% 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Worcester Rd & Prospect St



12: Worcester Rd

AM Peak Hour
2030 AM Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	2050	10	30	1310	110	60	0	70	110	0	100
Future Volume (vph)	400	2050	10	30	1310	110	60	0	70	110	0	100
Satd. Flow (prot)	3255	4816	0	3255	4763	0	1594	1439	0	3255	0	1501
Flt Permitted	0.950			0.950			0.950	0.996		0.833		
Satd. Flow (perm)	3255	4816	0	3255	4763	0	1594	1439	0	2854	0	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	429	2210	0	32	1524	0	58	81	0	118	0	107
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm		pm+ov
Protected Phases	5	2		1	6			8				5
Permitted Phases							8			4		4
Total Split (s)	18.0	34.0		14.0	30.0		12.0	12.0		12.0		18.0
Total Lost Time (s)	7.5	6.0		7.5	6.0		6.0	6.0		6.0		7.5
Act Effct Green (s)	11.3	40.0		6.2	25.6		6.0	6.0		6.0		20.9
Actuated g/C Ratio	0.19	0.67		0.10	0.43		0.10	0.10		0.10		0.35
v/c Ratio	0.70	0.69		0.10	0.75		0.36	0.57		0.41		0.20
Control Delay	31.0	12.7		25.0	18.0		32.2	43.8		30.2		14.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay	31.0	12.7		25.0	18.0		32.2	43.8		30.2		14.0
LOS	C	B		C	B		C	D		C		B
Approach Delay		15.7			18.2			39.0				22.5
Approach LOS		B			B			D				C
Queue Length 50th (ft)	76	125		5	171		21	30		21		25
Queue Length 95th (ft)	#136	#400		16	225		53	#85		42		55
Internal Link Dist (ft)		865			3810			474				672
Turn Bay Length (ft)	500			300			250			300		
Base Capacity (vph)	614	3212		352	2030		159	143		285		523
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	0.70	0.69		0.09	0.75		0.36	0.57		0.41		0.20

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 12 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 17.6

Intersection LOS: B

Intersection Capacity Utilization 72.9%

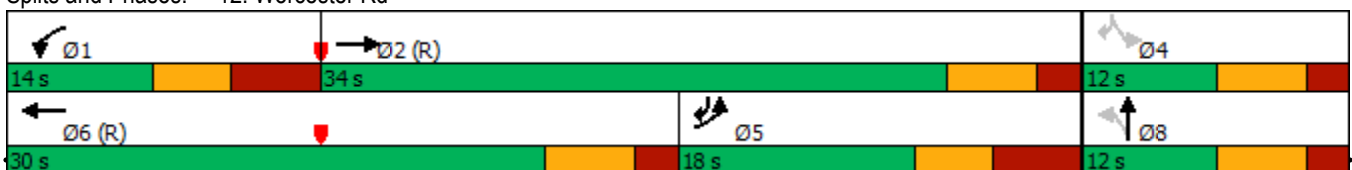
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Worcester Rd



Seth

13: Oak Street & Worcester Rd

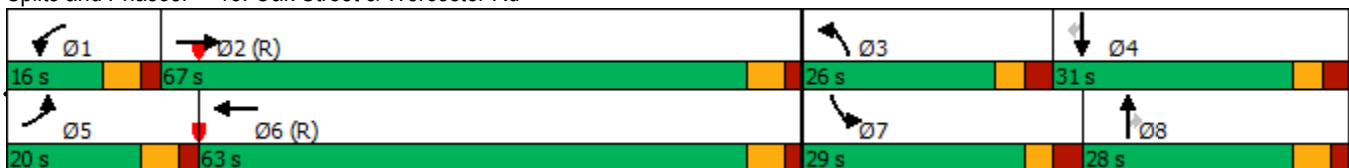
AM Peak Hour
2030 AM Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	1920	130	115	1390	220	180	281	130	275	210	120
Future Volume (vph)	150	1920	130	115	1390	220	180	281	130	275	210	120
Satd. Flow (prot)	1678	4778	0	1678	4725	0	1678	1766	1501	1678	1766	1501
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1678	4778	0	1678	4725	0	1678	1766	1501	1678	1766	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	161	2199	0	123	1727	0	193	301	139	295	225	129
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	20.0	67.0		16.0	63.0		26.0	28.0	28.0	29.0	31.0	31.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Act Effct Green (s)	14.0	61.0		10.0	57.0		18.8	22.0	22.0	23.0	26.2	26.2
Actuated g/C Ratio	0.10	0.44		0.07	0.41		0.13	0.16	0.16	0.16	0.19	0.19
v/c Ratio	0.96	1.06		1.03	0.90		0.86	1.09	0.59	1.07	0.68	0.46
Control Delay	122.7	75.0		153.4	46.2		91.2	133.0	66.2	129.0	65.1	57.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.7	75.0		153.4	46.2		91.2	133.0	66.2	129.0	65.1	57.3
LOS	F	E		F	D		F	F	E	F	E	E
Approach Delay		78.3			53.3			105.6			92.6	
Approach LOS		E			D			F			F	
Queue Length 50th (ft)	148	~801		~119	533		173	~307	119	~297	195	107
Queue Length 95th (ft)	#295	#893		#253	604		#299	#496	193	#484	290	177
Internal Link Dist (ft)		351			574			601			628	
Turn Bay Length (ft)	400			400			300		300	300		300
Base Capacity (vph)	167	2081		119	1923		239	277	235	275	330	280
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.06		1.03	0.90		0.81	1.09	0.59	1.07	0.68	0.46

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: 1.09
 Intersection Signal Delay: 74.7
 Intersection LOS: E
 Intersection Capacity Utilization 98.7%
 ICU Level of Service F
 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: 13: Oak Street & Worcester Rd



Part 4: 2030 PM Conditions

2: Country Club Ln & Worcester Rd



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗↗	
Traffic Volume (vph)	50	1740	430	200	1750	380	100
Future Volume (vph)	50	1740	430	200	1750	380	100
Satd. Flow (prot)	1678	3355	1501	1678	3355	3194	0
Flt Permitted	0.950			0.950		0.962	
Satd. Flow (perm)	1678	3355	1501	1678	3355	3194	0
Satd. Flow (RTOR)			*200				
Lane Group Flow (vph)	54	1867	461	215	1878	515	0
Turn Type	Prot	NA	pt+ov	Prot	NA	Prot	
Protected Phases	5	2	2 7	1	6	7	
Permitted Phases							
Total Split (s)	20.0	60.0		20.0	60.0	25.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0	5.0	
Act Effct Green (s)	8.7	54.0	78.4	14.8	62.3	19.3	
Actuated g/C Ratio	0.08	0.52	0.75	0.14	0.60	0.19	
v/c Ratio	0.39	1.07	0.39	0.90	0.94	0.87	
Control Delay	52.7	70.4	3.4	83.0	31.3	57.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	52.7	70.4	3.4	83.0	31.3	57.7	
LOS	D	E	A	F	C	E	
Approach Delay		57.0			36.6	57.7	
Approach LOS		E			D	E	
Queue Length 50th (ft)	35	~742	44	144	603	173	
Queue Length 95th (ft)	73	#880	79	#281	#854	#258	
Internal Link Dist (ft)		1378			1287	306	
Turn Bay Length (ft)	400		400	300			
Base Capacity (vph)	241	1739	1186	241	2006	613	
Starvation Cap Reductn	0	0	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	0.22	1.07	0.39	0.89	0.94	0.84	

Intersection Summary

Cycle Length: 105
 Actuated Cycle Length: 104.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 48.5
 Intersection LOS: D
 Intersection Capacity Utilization 88.7%
 ICU Level of Service E
 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: 2: Country Club Ln & Worcester Rd



3: Temple St & Worcester Rd & Jug Handle

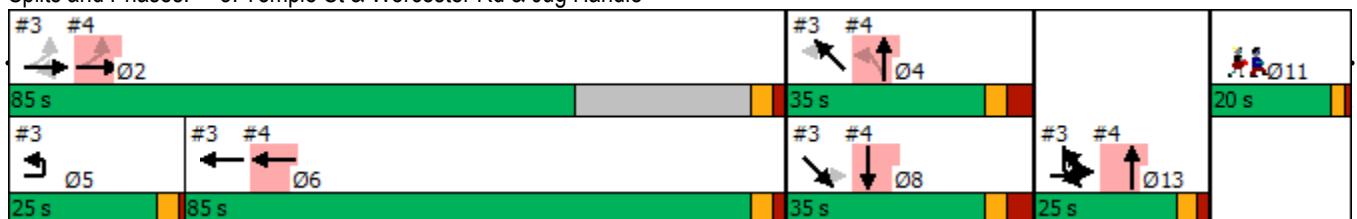


Lane Group	EBU	EBL2	EBL	EBT	EBR	WBT	SBL2	SBL	SEL	SET	SER	NWL
Lane Configurations			↔	↑↑	↗	↑↑↑	↖	↖		↔		↖
Traffic Volume (vph)	35	60	0	1570	110	2035	130	220	180	135	35	160
Future Volume (vph)	35	60	0	1570	110	2035	130	220	180	135	35	160
Satd. Flow (prot)	0	0	1678	3355	1501	4821	1678	1678	0	1698	0	1678
Flt Permitted		*0.950	*0.950				0.950	0.950				
Satd. Flow (perm)	0	0	1678	3355	1501	4821	1678	1678	0	1741	0	1766
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	0	102	1684	118	2183	139	236	0	376	0	172
Turn Type	Prot	Prot	Perm	NA	Perm	NA	Prot	Prot	Perm	NA		Perm
Protected Phases	5	13		2		6	13	13		8		
Permitted Phases			2		2				8			4
Total Split (s)	25.0	25.0	85.0	85.0	85.0	85.0	25.0	25.0	35.0	35.0		35.0
Total Lost Time (s)			5.0	5.0	5.0	5.0	5.0	5.0		7.0		7.0
Act Effct Green (s)			80.2	80.2	80.2	80.2	20.1	20.1		28.1		28.1
Actuated g/C Ratio			0.54	0.54	0.54	0.54	0.13	0.13		0.19		0.19
v/c Ratio			0.11	0.93	0.15	0.84	0.62	1.05		1.15		0.52
Control Delay			18.5	42.6	19.0	33.5	74.6	133.1		107.7		61.9
Queue Delay			0.0	0.0	0.0	0.0	0.0	0.0		0.2		0.0
Total Delay			18.6	42.6	19.0	33.5	74.6	133.1		107.9		61.9
LOS			B	D	B	C	E	F		F		E
Approach Delay				39.9		33.5		111.4		107.9		
Approach LOS				D		C		F		F		
Queue Length 50th (ft)			45	729	52	598	125	~236		~372		147
Queue Length 95th (ft)			98	#1160	113	875	#236	#486		m#531		260
Internal Link Dist (ft)				646		691		163		96		
Turn Bay Length (ft)			400		400							300
Base Capacity (vph)			1185	2370	1060	2595	225	225		328		333
Starvation Cap Reductn			0	0	0	0	0	0		6		0
Spillback Cap Reductn			189	0	0	0	0	0		0		0
Storage Cap Reductn			0	0	0	0	0	0		0		0
Reduced v/c Ratio			0.10	0.71	0.11	0.84	0.62	1.05		1.17		0.52

Intersection Summary

Cycle Length: 190
 Actuated Cycle Length: 149
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 50.4
 Intersection LOS: D
 Intersection Capacity Utilization 116.6%
 ICU Level of Service H
 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: Temple St & Worcester Rd & Jug Handle



3: Temple St & Worcester Rd & Jug Handle



Lane Group	NWT	NWR2	Ø11
Lane Configurations			
Traffic Volume (vph)	180	70	
Future Volume (vph)	180	70	
Satd. Flow (prot)	1692	0	
Flt Permitted			
Satd. Flow (perm)	1692	0	
Satd. Flow (RTOR)			
Lane Group Flow (vph)	268	0	
Turn Type	NA		
Protected Phases	4		11
Permitted Phases			
Total Split (s)	35.0		20.0
Total Lost Time (s)	7.0		
Act Effct Green (s)	28.1		
Actuated g/C Ratio	0.19		
v/c Ratio	0.84		
Control Delay	81.5		
Queue Delay	8.3		
Total Delay	89.8		
LOS	F		
Approach Delay	78.9		
Approach LOS	E		
Queue Length 50th (ft)	246		
Queue Length 95th (ft)	#473		
Internal Link Dist (ft)	704		
Turn Bay Length (ft)			
Base Capacity (vph)	318		
Starvation Cap Reductn	0		
Spillback Cap Reductn	30		
Storage Cap Reductn	0		
Reduced v/c Ratio	0.93		
Intersection Summary			

4: Temple St & Old Worcester Rd

PM Peak Hour
2030 PM Conditions

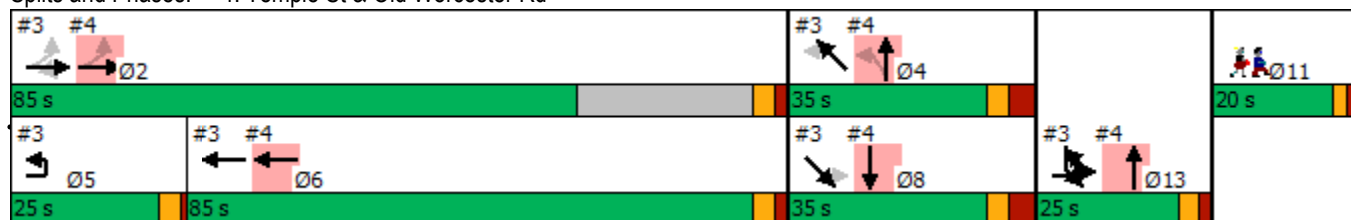


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	10	0	60	0	25	85	15	225	0	0	290	10
Future Volume (vph)	10	0	60	0	25	85	15	225	0	0	290	10
Satd. Flow (prot)	0	1552	0	0	1582	0	0	1761	0	0	1757	0
Flt Permitted		0.963						*0.800				
Satd. Flow (perm)	0	1505	0	0	1582	0	0	1413	0	0	1757	0
Satd. Flow (RTOR)		69			91						1	
Lane Group Flow (vph)	0	75	0	0	118	0	0	257	0	0	322	0
Turn Type	Perm	NA			NA		custom	NA			NA	
Protected Phases		2			6			4 13			8	
Permitted Phases	2						4					
Total Split (s)	85.0	85.0			85.0		35.0				35.0	
Total Lost Time (s)		8.0			5.0						7.0	
Act Effct Green (s)		77.2			80.2			53.1			28.1	
Actuated g/C Ratio		0.52			0.54			0.36			0.19	
v/c Ratio		0.09			0.13			0.51			0.97	
Control Delay		5.6			6.1			20.4			101.7	
Queue Delay		0.1			0.0			15.9			21.1	
Total Delay		5.7			6.1			36.4			122.8	
LOS		A			A			D			F	
Approach Delay		5.7			6.1			36.4			122.8	
Approach LOS		A			A			D			F	
Queue Length 50th (ft)		3			11			65			303	
Queue Length 95th (ft)		35			52			m90			#594	
Internal Link Dist (ft)		1206			164			96			221	
Turn Bay Length (ft)												
Base Capacity (vph)		1054			893			503			332	
Starvation Cap Reductn		0			0			227			0	
Spillback Cap Reductn		442			0			0			25	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			0.13			0.93			1.05	

Intersection Summary

Cycle Length: 190
 Actuated Cycle Length: 149
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 64.8
 Intersection LOS: E
 Intersection Capacity Utilization 48.4%
 ICU Level of Service A
 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: 4: Temple St & Old Worcester Rd



5: Main St/Edgell Rd & High St /High St

PM Peak Hour
2030 PM Conditions



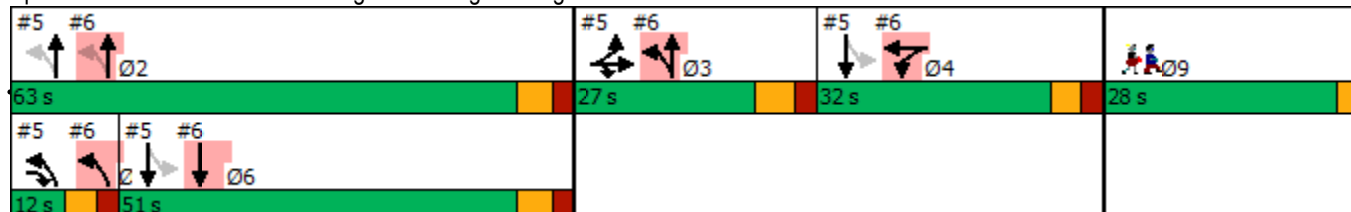
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	31	251	0	0	0	29	913	34	135	621	351
Future Volume (vph)	360	31	251	0	0	0	29	913	34	135	621	351
Satd. Flow (prot)	1594	1611	1501	0	0	0	0	3335	0	0	3175	0
Flt Permitted	0.950	0.960						0.732			0.590	
Satd. Flow (perm)	1594	1611	1501	0	0	0	0	2444	0	0	1885	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	208	211	269	0	0	0	0	1047	0	0	1188	0
Turn Type	Split	NA	pt+ov				pm+pt	NA		Perm	NA	
Protected Phases	3	3	3 5				5	2			6 4	
Permitted Phases							2			6 4		
Total Split (s)	27.0	27.0					12.0	63.0				
Total Lost Time (s)	7.0	7.0						6.5				
Act Effct Green (s)	20.2	20.2	25.3					57.1			70.7	
Actuated g/C Ratio	0.15	0.15	0.19					0.43			0.53	
v/c Ratio	0.86	0.86	0.95					0.97			1.19	
Control Delay	87.3	87.5	83.0					57.3			108.5	
Queue Delay	52.5	51.8	0.0					41.8			0.0	
Total Delay	139.8	139.2	83.0					99.1			108.5	
LOS	F	F	F					F			F	
Approach Delay		117.4						99.1			108.5	
Approach LOS		F						F			F	
Queue Length 50th (ft)	168	170	151					332			~393	
Queue Length 95th (ft)	#396	#401	#417					#747			m#855	
Internal Link Dist (ft)		457			497			605			150	
Turn Bay Length (ft)	300		250									
Base Capacity (vph)	241	244	284					1084			1000	
Starvation Cap Reductn	0	0	0					0			0	
Spillback Cap Reductn	51	51	0					162			0	
Storage Cap Reductn	0	0	0					0			0	
Reduced v/c Ratio	1.09	1.09	0.95					1.14			1.19	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 133.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.19
 Intersection Signal Delay: 107.2
 Intersection LOS: F
 Intersection Capacity Utilization 89.0%
 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: 5: Main St/Edgell Rd & High St /High St



7: Main St & Worcester Rd

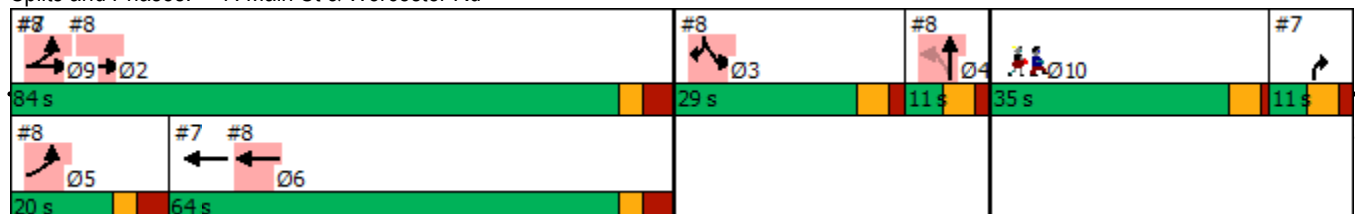


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	Ø4	Ø5	Ø10
Lane Configurations	↑↑↑			↑↑↑		↑↑				
Traffic Volume (vph)	1750	35	0	2385	0	380				
Future Volume (vph)	1750	35	0	2385	0	380				
Satd. Flow (prot)	4807	0	0	4821	0	2642				
Flt Permitted										
Satd. Flow (perm)	4807	0	0	4821	0	2642				
Satd. Flow (RTOR)	2					873				
Lane Group Flow (vph)	1916	0	0	2559	0	408				
Turn Type	NA			NA		Prot				
Protected Phases	2			6		9	3	4	5	10
Permitted Phases										
Total Split (s)	84.0			64.0		11.0	29.0	11.0	20.0	35.0
Total Lost Time (s)	7.0			7.0		6.0				
Act Effct Green (s)	78.2			57.9		5.1				
Actuated g/C Ratio	0.59			0.44		0.04				
v/c Ratio	0.68			1.22		0.43				
Control Delay	22.9			120.6		1.5				
Queue Delay	0.2			0.2		0.3				
Total Delay	23.1			120.8		1.7				
LOS	C			F		A				
Approach Delay	23.1			120.8	1.7					
Approach LOS	C			F	A					
Queue Length 50th (ft)	331			~867		0				
Queue Length 95th (ft)	763			m#1084		0				
Internal Link Dist (ft)	422			244	416					
Turn Bay Length (ft)										
Base Capacity (vph)	2826			2098		940				
Starvation Cap Reductn	0			138		0				
Spillback Cap Reductn	203			0		147				
Storage Cap Reductn	0			0		0				
Reduced v/c Ratio	0.73			1.31		0.51				

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 133
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 72.5
 Intersection LOS: E
 Intersection Capacity Utilization 60.2%
 ICU Level of Service B
 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: 7: Main St & Worcester Rd



8: Worcester Rd & Prospect St

PM Peak Hour
2030 PM Conditions

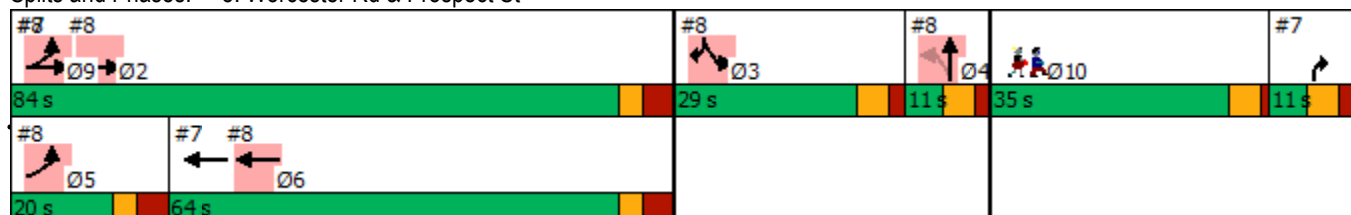


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	350	1815	0	0	2035	210	0	1	0	275	0	350
Future Volume (vph)	350	1815	0	0	2035	210	0	1	0	275	0	350
Satd. Flow (prot)	1678	4821	0	0	4754	0	0	1766	0	3255	0	1678
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1678	4821	0	0	4754	0	0	1766	0	3255	0	1678
Satd. Flow (RTOR)												
Lane Group Flow (vph)	376	1947	0	0	2408	0	0	1	0	295	0	376
Turn Type	Prot	NA			NA			NA		Prot		Prot
Protected Phases	5.9	2.9			6			4		3		3
Permitted Phases							4					
Total Split (s)					64.0		11.0	11.0		29.0		29.0
Total Lost Time (s)					7.0			6.0		6.0		6.0
Act Effct Green (s)	24.4	89.4			57.9			5.1		23.4		23.4
Actuated g/C Ratio	0.18	0.67			0.44			0.04		0.18		0.18
v/c Ratio	1.22	0.60			1.16			0.01		0.52		1.28
Control Delay	180.1	5.2			114.0			71.0		55.6		191.7
Queue Delay	1.1	0.0			0.5			0.0		0.0		1.3
Total Delay	181.2	5.3			114.6			71.0		55.6		193.0
LOS	F	A			F			E		E		F
Approach Delay		33.7			114.6			71.0			132.6	
Approach LOS		C			F			E			F	
Queue Length 50th (ft)	~345	63			~803			1		110		~367
Queue Length 95th (ft)	#799	151			#1428			9		217		#818
Internal Link Dist (ft)		244			273			196			695	
Turn Bay Length (ft)												200
Base Capacity (vph)	307	3239			2069			67		571		294
Starvation Cap Reductn	26	112			0			0		0		0
Spillback Cap Reductn	0	0			362			0		0		29
Storage Cap Reductn	0	0			0			0		0		0
Reduced v/c Ratio	1.34	0.62			1.41			0.01		0.52		1.42

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 133
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 82.0
 Intersection LOS: F
 Intersection Capacity Utilization 95.0%
 ICU Level of Service F
 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: 8: Worcester Rd & Prospect St



12: Caldor Rd/Worcester Rd

PM Peak Hour
2030 PM Conditions

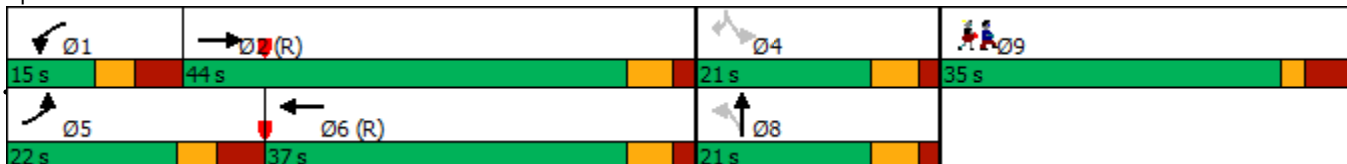


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	1670	15	140	1790	215	80	0	45	220	0	185
Future Volume (vph)	380	1670	15	140	1790	215	80	0	45	220	0	185
Satd. Flow (prot)	3255	4816	0	3255	4744	0	1594	1470	0	3255	0	1501
Flt Permitted	0.950			0.950			0.950	0.988		0.713		
Satd. Flow (perm)	3255	4816	0	3255	4744	0	1594	1470	0	2443	0	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	408	1808	0	150	2152	0	70	64	0	236	0	198
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm		Perm
Protected Phases	5	2		1	6			8				
Permitted Phases							8			4		4
Total Split (s)	22.0	44.0		15.0	37.0		21.0	21.0		21.0		21.0
Total Lost Time (s)	7.5	6.0		7.5	6.0		6.0	6.0		6.0		6.0
Act Effct Green (s)	19.8	63.9		9.6	53.7		15.0	15.0		15.0		15.0
Actuated g/C Ratio	0.17	0.56		0.08	0.47		0.13	0.13		0.13		0.13
v/c Ratio	0.73	0.68		0.56	0.97		0.34	0.34		0.74		1.02
Control Delay	53.9	22.1		59.1	43.9		50.6	50.9		63.2		118.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay	53.9	22.1		59.1	43.9		50.6	50.9		63.2		118.6
LOS	D	C		E	D		D	D		E		F
Approach Delay		28.0			44.9			50.7				88.5
Approach LOS		C			D			D				F
Queue Length 50th (ft)	145	289		55	503		50	46		88		~151
Queue Length 95th (ft)	#262	#668		#104	#950		98	93		#142		#304
Internal Link Dist (ft)		865			3810			474				672
Turn Bay Length (ft)	500			300			250			300		
Base Capacity (vph)	560	2677		270	2215		207	191		318		195
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	0.73	0.68		0.56	0.97		0.34	0.34		0.74		1.02

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 41.4
 Intersection LOS: D
 Intersection Capacity Utilization 79.4%
 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: 12: Worcester Rd



13: Oak Street & Worcester St

PM Peak Hour
2030 PM Conditions

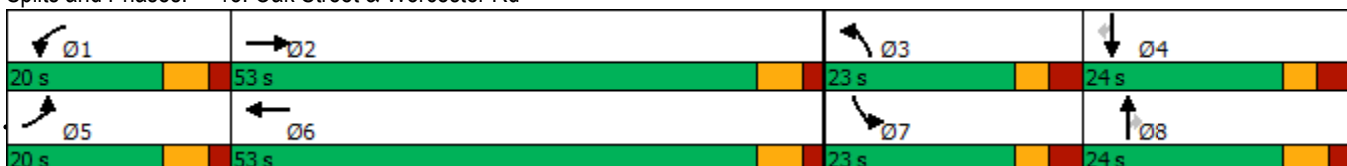


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑		↖	↑	↖	↖	↑	↖
Traffic Volume (vph)	185	1520	135	160	1800	190	270	190	80	190	230	245
Future Volume (vph)	185	1520	135	160	1800	190	270	190	80	190	230	245
Satd. Flow (prot)	1678	4763	0	1678	4754	0	1678	1766	1501	1678	1766	1501
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1678	4763	0	1678	4754	0	1678	1766	1501	1678	1766	1501
Satd. Flow (RTOR)												
Lane Group Flow (vph)	198	1776	0	172	2135	0	290	204	86	204	247	263
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	20.0	53.0		20.0	53.0		23.0	24.0	24.0	23.0	24.0	24.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Act Effct Green (s)	14.0	47.2		13.8	47.0		17.0	18.5	18.5	16.5	18.0	18.0
Actuated g/C Ratio	0.12	0.39		0.12	0.39		0.14	0.15	0.15	0.14	0.15	0.15
v/c Ratio	1.02	0.95		0.89	1.15		1.22	0.75	0.37	0.89	0.94	1.17
Control Delay	121.2	47.4		94.5	107.5		175.7	66.9	51.2	87.2	92.0	158.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.2	47.4		94.5	107.5		175.7	66.9	51.2	87.2	92.0	158.1
LOS	F	D		F	F		F	E	D	F	F	F
Approach Delay		54.8			106.5			119.0			115.0	
Approach LOS		D			F			F			F	
Queue Length 50th (ft)	~158	483		133	~710		~276	154	61	157	191	~243
Queue Length 95th (ft)	#314	#594		#263	#805		#452	#270	114	#292	#351	#412
Internal Link Dist (ft)		351			574			601			628	
Turn Bay Length (ft)	400			400			300		300	300		300
Base Capacity (vph)	195	1871		195	1861		237	271	231	237	264	225
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.95		0.88	1.15		1.22	0.75	0.37	0.86	0.94	1.17

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.22
 Intersection Signal Delay: 90.6
 Intersection LOS: F
 Intersection Capacity Utilization 98.6%
 ICU Level of Service F
 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.

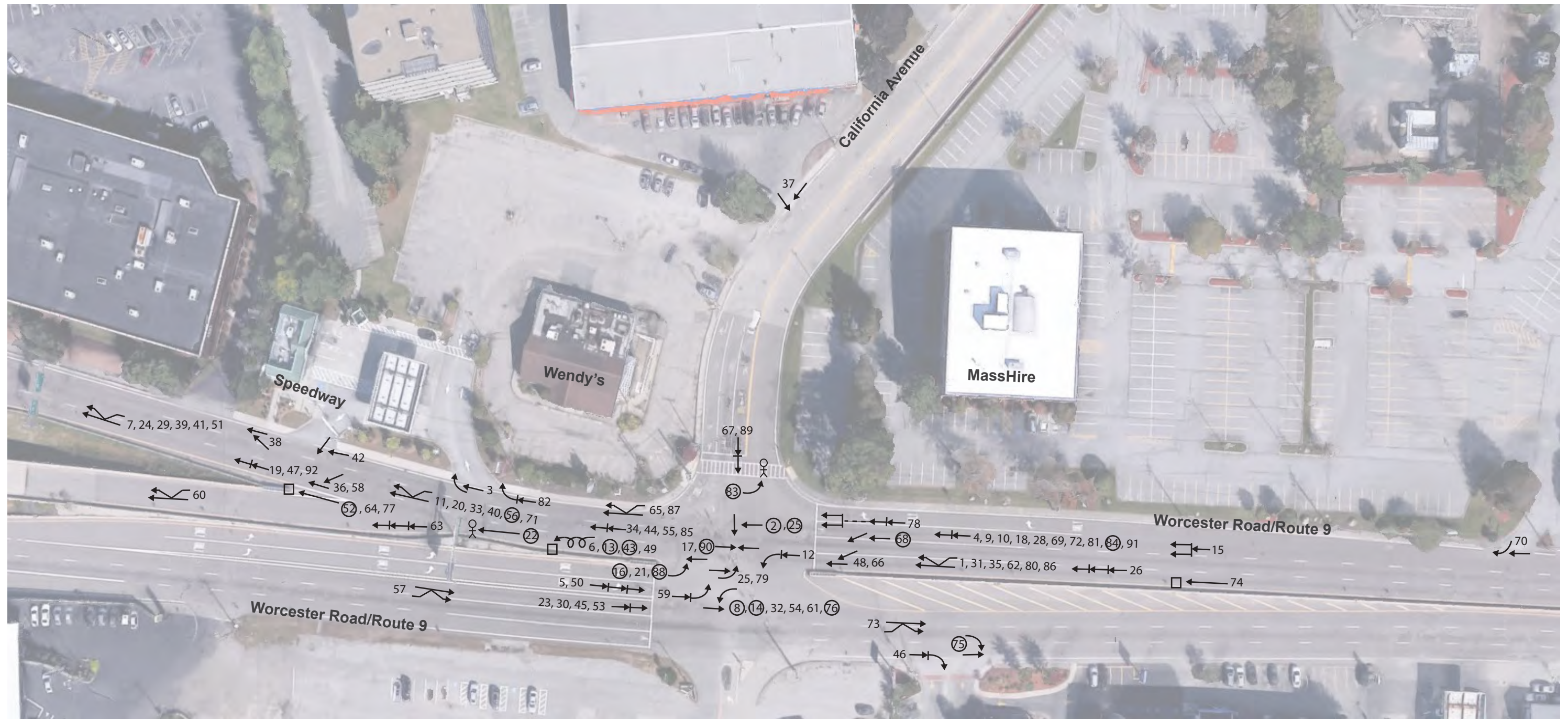
Splits and Phases: 13: Oak Street & Worcester Rd



Appendix E: Traffic Safety Data

1. Collision Diagrams

Part 1: Collision Diagrams



SYMBOLS

- | | | | | |
|----|----------------------|---|---|----------------|
| → | Moving Vehicle | → | ▭ | Parked Vehicle |
| ↔ | Backing Vehicle | → | □ | Fixed Object |
| ⋯→ | Non-Involved Vehicle | → | ⊗ | Bicycle |
| → | ⊗ | → | 🐾 | Animal |
| | | | | |

TYPES OF CRASH

- | | | | |
|-----|----------|----|----------------|
| ↔↔↔ | Head On | ↔↔ | Sideswipe |
| →↓ | Angle | ↪↪ | Out of Control |
| →↔ | Rear End | | |

CRASH INDEX AND SEVERITY

- #, #, #
- # Property Damage Only Crash Index Number
 - # Injury Crash Index Number
 - # Fatal Crash Index Number



Figure 1
Collision Diagram 2015–19
Route 9 and California Avenue

Table 1
Crash Lookup: California Avenue at Route 9
MassDOT Crash Data 2015-2019

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	01/18/2015	Sun	5:53 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain	Travelling straight ahead / Overtaking/passing	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
2	01/22/2015	Thu	11:42 PM	Off-peak	2	2	Incapacitating	Angle	Dry	Dark - lighted roadway	Clear / Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner / No improper driving
3	02/20/2015	Fri	7:21 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving / Other improper action
4	02/21/2015	Sat	2:54 PM	Off-peak	2	0	Property damage only	Rear-end	Snow	Daylight	Snow	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
5	02/22/2015	Sun	10:00 AM	Off-peak	3	0	Property damage only	Rear-end	Wet	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with ditch / Collision with motor vehicle in traffic	Inattention / Distracted / No improper driving
6	03/05/2015	Thu	3:15 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Sand, mud, dirt, oil, gravel	Dark - unlit roadway	Rain / Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
7	03/17/2015	Tue	12:43 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving
8	03/18/2015	Wed	7:53 AM	Peak	2	2	Non-incapacitating	Angle	Dry	Daylight	Clear	Making U-turn / Travelling straight ahead	Collision with motor vehicle in traffic	Made an improper turn / No improper driving
9	04/15/2015	Wed	1:17 PM	Off-peak	2	1	Possible	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
10	04/18/2015	Sat	11:21 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
11	06/06/2015	Sat	7:40 PM	Off-peak	1	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
12	06/21/2015	Sun	12:20 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain / Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / Disregarded traffic signs, signals, road markings / Made an improper turn
13	07/05/2015	Sun	1:49 AM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with guardrail	Fatigued/asleep / Failure to keep in proper lane or running off road
14	07/13/2015	Mon	8:47 AM	Peak	2	4	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings / Made an improper turn
15	07/23/2015	Thu	10:26 PM	Off-peak	3	1	Possible	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with parked motor vehicle / Collision with motor vehicle in traffic	No improper driving / Driving too fast for conditions
16	07/29/2015	Wed	1:20 AM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner / No improper driving
17	08/17/2015	Mon	12:00 AM	Off-peak	2	0	Property damage only	Head-on	Dry	Daylight	Clear	Travelling straight ahead	Reported but invalid / Collision with motor vehicle in traffic	No improper driving
18	10/23/2015	Fri	8:24 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
19	10/29/2015	Thu	5:26 PM	Peak	2	1	Possible	Rear-end	Dry	Dusk	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Distracted / No improper driving
20	11/13/2015	Fri	6:25 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Inattention
21	12/01/2015	Tue	4:22 AM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / No improper driving

Table 1
Crash Lookup: California Avenue at Route 9
MassDOT Crash Data 2015-2019

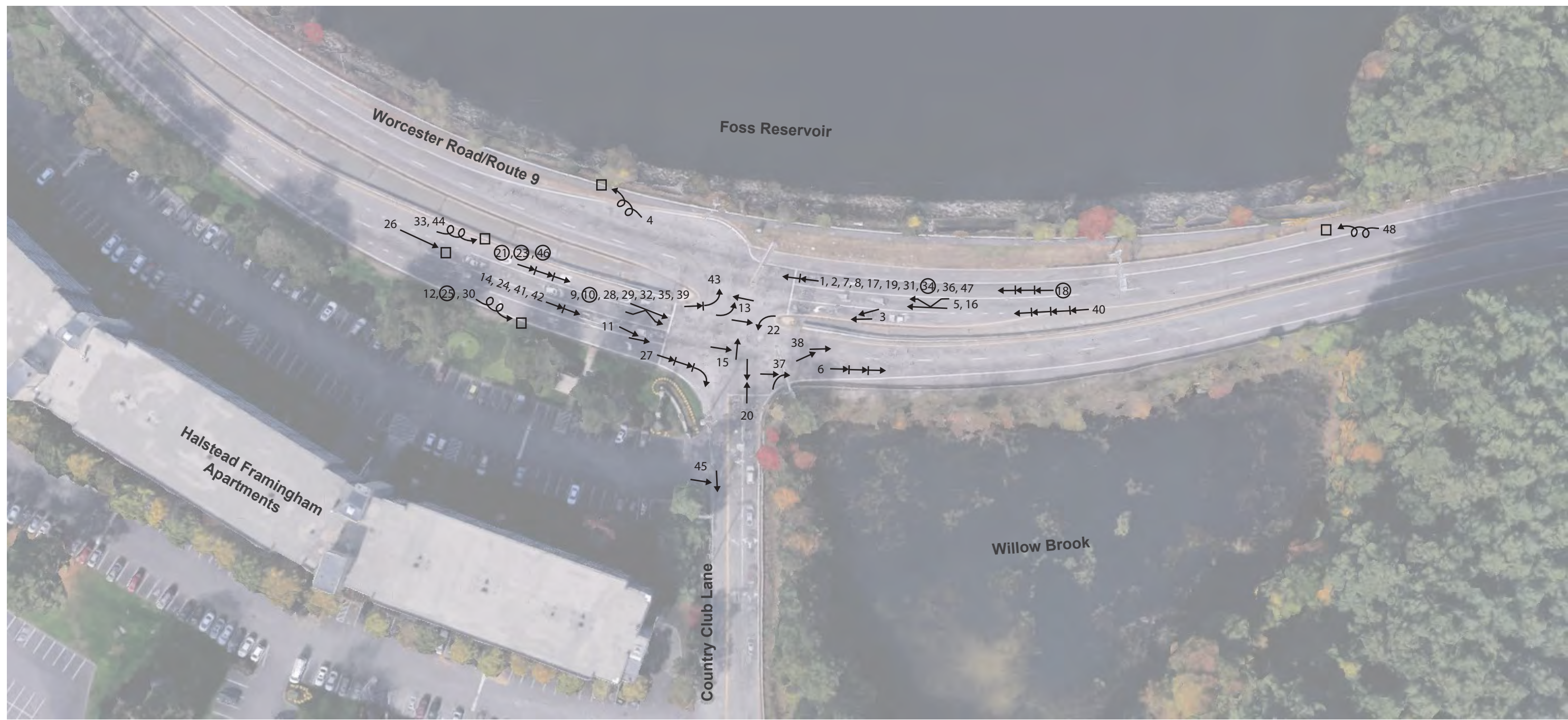
22	01/04/2016	Mon	5:08 PM	Peak	1	2	Incapacitating	Unknown	Dry	Dusk	Clear	Travelling straight ahead	Collision with pedestrian	Unknown
23	01/13/2016	Wed	5:26 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
24	02/22/2016	Mon	4:40 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
25	03/04/2016	Fri	1:01 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Turning left	Collision with motor vehicle in traffic	Unknown
26	03/12/2016	Sat	6:25 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
27	03/13/2016	Sun	3:55 PM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
28	04/14/2016	Thu	5:50 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention / Glare
29	04/19/2016	Tue	12:38 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Unknown
30	05/01/2016	Sun	2:29 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
31	05/13/2016	Fri	3:58 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
32	05/19/2016	Thu	6:53 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
33	05/22/2016	Sun	7:19 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Other improper action
34	05/30/2016	Mon	8:09 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dusk	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
35	06/02/2016	Thu	3:28 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
36	06/14/2016	Tue	7:18 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Exceeded authorized speed limit / Failed to yield right of way
37	07/09/2016	Sat	2:31 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
38	07/19/2016	Tue	5:57 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
39	07/23/2016	Sat	1:01 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Unknown
40	08/06/2016	Sat	4:55 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Unknown / Travelling straight ahead	Collision with motor vehicle in traffic / Unknown	Unknown
41	08/24/2016	Wed	12:45 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Changing lanes / Unknown	Collision with motor vehicle in traffic	Unknown
42	11/05/2016	Sat	6:44 AM	Off-peak	2	0	Property damage only	Angle	Dry	Dawn	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic / Collision with median barrier	Disregarded traffic signs, signals, road markings / Failed to yield right of way / No improper driving
43	11/27/2016	Sun	12:50 AM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with median barrier	Unknown
44	12/11/2016	Sun	10:30 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with parked motor vehicle / Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / Unknown
45	12/12/2016	Mon	6:10 PM	Peak	2	0	Property damage only	Rear-end	Wet	Dark - lighted roadway	Cloudy	Travelling straight ahead	Collision with utility pole / Collision with motor vehicle in traffic	No improper driving / Followed too closely
46	01/06/2017	Fri	8:55 AM	Peak	2	0	Property damage only	Rear-end	Wet	Daylight	Snow	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Driving too fast for conditions / Followed too closely

Table 1
Crash Lookup: California Avenue at Route 9
MassDOT Crash Data 2015-2019

47	01/09/2017	Mon	9:20 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
48	02/04/2017	Sat	1:38 PM	Off-peak	2	1	Possible	Angle	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Unknown
49	02/09/2017	Thu	2:30 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
50	02/14/2017	Tue	2:00 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
51	02/17/2017	Fri	8:16 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Sand, mud, dirt, oil, gravel	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
52	02/19/2017	Sun	7:08 PM	Off-peak	1	1	Incapacitating	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with median barrier	Unknown
53	03/01/2017	Wed	5:42 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Dawn	Rain	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
54	06/08/2017	Thu	9:41 PM	Off-peak	2	1	Possible	Angle	Dry	Dark - lighted roadway	Clear	Making U-turn / Travelling straight ahead	Collision with motor vehicle in traffic	Made an improper turn / Failed to yield right of way
55	06/17/2017	Sat	10:57 AM	Off-peak	2	0	Property damage only	Rear-end	Water (standing, moving)	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
56	07/02/2017	Sun	8:47 PM	Off-peak	2	1	Non-incapacitating	Sideswipe, same direction	Dry	Dusk	Cloudy / Unknown	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / Other improper action
57	07/12/2017	Wed	8:38 PM	Off-peak	3	3	Non-incapacitating	Sideswipe, same direction	Wet	Dark - lighted roadway	Cloudy / Rain	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
58	07/30/2017	Sun	1:55 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
59	09/29/2017	Fri	7:22 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
60	10/03/2017	Tue	9:05 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Other improper action
61	10/04/2017	Wed	6:44 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / No improper driving
62	10/06/2017	Fri	8:32 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Unknown / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
63	10/31/2017	Tue	7:49 AM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving / Followed too closely
64	01/04/2018	Thu	4:13 PM	Peak	1	0	Property damage only	Single vehicle crash	Snow	Dusk	Rain / Snow	Travelling straight ahead	Collision with median barrier	Unknown
65	01/12/2018	Fri	6:49 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain / Fog, smog, smoke	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / No improper driving
66	01/19/2018	Fri	11:23 PM	Off-peak	2	0	Property damage only	Angle	Sand, mud, dirt, oil, gravel	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / Over-correcting/over-steering) / No improper driving
67	01/27/2018	Sat	9:04 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
68	03/02/2018	Fri	9:28 AM	Peak	2	1	Non-incapacitating	Angle	Wet	Daylight	Rain	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
69	03/06/2018	Tue	8:40 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
70	04/05/2018	Thu	11:39 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving

**Table 1
Crash Lookup: California Avenue at Route 9
MassDOT Crash Data 2015-2019**

71	04/06/2018	Fri	7:33 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Followed too closely
72	04/08/2018	Sun	10:15 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
73	04/15/2018	Sun	10:47 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
74	05/08/2018	Tue	3:50 PM	Peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with unknown movable object	Unknown
75	05/10/2018	Thu	12:25 PM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
76	07/12/2018	Thu	1:38 PM	Off-peak	2	2	Non-incapacitating	Angle	Dry	Daylight	Clear	Making U-turn / Travelling straight ahead	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / No improper driving
77	07/22/2018	Sun	3:03 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with median barrier	Unknown
78	08/16/2018	Thu	11:55 AM	Off-peak	4	0	Property damage only	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic / Changing lanes	Collision with motor vehicle in traffic	Inattention / No improper driving / No improper driving
79	09/11/2018	Tue	8:42 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
80	12/10/2018	Mon	9:23 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Unknown
81	02/01/2019	Fri	11:09 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
82	02/06/2019	Wed	2:36 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Unknown
83	05/12/2019	Sun	12:41 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Wet	Daylight	Rain	Turning left	Collision with pedestrian	No improper driving
84	05/21/2019	Tue	12:14 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
85	05/31/2019	Fri	3:12 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
86	06/07/2019	Fri	1:44 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Making U-turn / Travelling straight ahead	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Failure to keep in proper lane or running off road / No improper driving
87	07/03/2019	Wed	8:14 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Unknown	Daylight	Clear	Travelling straight ahead / Changing lanes	Other / Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
88	08/20/2019	Tue	8:05 PM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Turning left	Collision with motor vehicle in traffic	Operating defective equipment / No improper driving
89	08/26/2019	Mon	1:25 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	No improper driving
90	09/21/2019	Sat	12:00 AM	Off-peak	2	4	Incapacitating	Head-on	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Exceeded authorized speed limit / No improper driving
91	11/08/2019	Fri	2:47 AM	Off-peak	3	0	Property damage only	Rear-end	Wet	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic / Collision with unknown movable object	No improper driving / Followed too closely / Exceeded authorized speed limit
92	12/30/2019	Mon	4:47 PM	Peak	2	0	Property damage only	Rear-end	Wet	Dark - lighted roadway	Rain	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving



SYMBOLS

- | | | | |
|-----|----------------------|-----|----------------|
| → | Moving Vehicle | → □ | Parked Vehicle |
| ←←← | Backing Vehicle | → □ | Fixed Object |
| ⋯→ | Non-Involved Vehicle | → ⚙ | Bicycle |
| → ⤴ | Pedestrian | → 🐕 | Animal |

TYPES OF CRASH

- | | | | |
|-------|----------|-----|----------------|
| ↔↔↔ | Head On | ↘↗ | Sideswipe |
| → ↓ ↙ | Angle | → 〰 | Out of Control |
| → | Rear End | | |

CRASH INDEX AND SEVERITY

- #, #, #
- # Property Damage Only Crash Index Number
 - # Injury Crash Index Number
 - # Fatal Crash Index Number



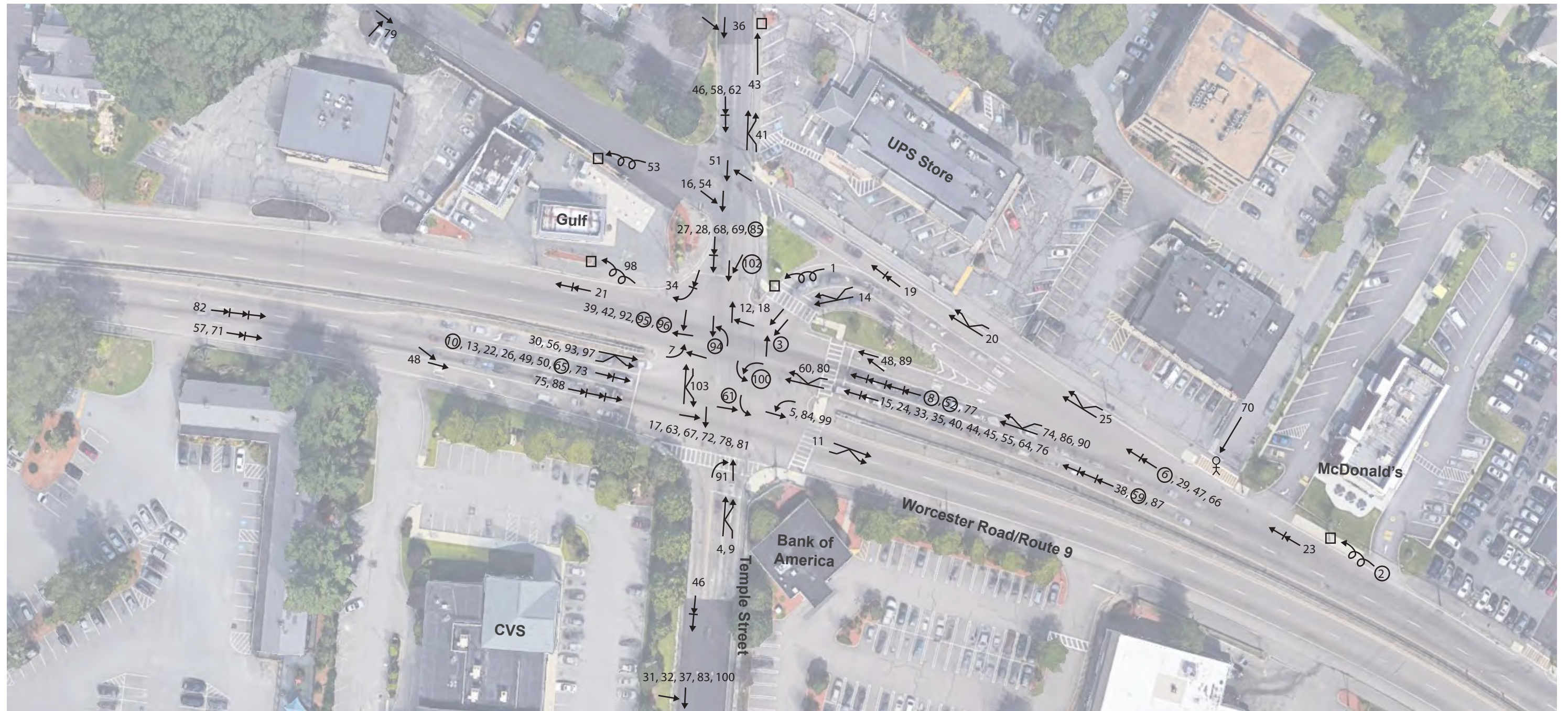
Figure 2
Collision Diagram 2015–19
Route 9 and Country Club Lane

Table 2
Crash Lookup: Country Club Lane at Route 9
MassDOT Crash Data 2015-2019

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Condition	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	02/06/2015	Fri	9:35 PM	Off-peak	1	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with parked motor vehicle	Followed too closely
2	03/25/2015	Wed	8:44 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
3	04/28/2015	Tue	10:20 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic / Turning left	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
4	05/18/2015	Mon	6:12 PM	Peak	1	0	Property damage only	Single vehicle crash	Sand, mud, dirt, oil, gravel	Daylight	Clear	Making U-turn	Collision with guardrail	Unknown
5	06/12/2015	Fri	7:00 PM	Off-peak	2	1	Non-incapacitating	Sideswipe, same direction	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Turning right	Collision with motor vehicle in traffic	No improper driving / Inattention
6	07/10/2015	Fri	6:00 PM	Peak	3	1	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely
7	08/06/2015	Thu	9:17 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
8	11/11/2015	Wed	9:30 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention / Distracted
9	11/12/2015	Thu	12:27 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain / Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving
10	02/05/2016	Fri	8:20 AM	Peak	2	1	Non-incapacitating	Sideswipe, same direction	Slush	Daylight	Cloudy / Snow	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Other improper action / No improper driving
11	02/06/2016	Sat	3:20 AM	Off-peak	2	1	Non-incapacitating	Angle	Ice	Dark - lighted roadway	Clear	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
12	02/15/2016	Mon	8:41 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Snow	Dark - lighted roadway	Snow / Blowing sand, snow	Slowing or stopped in traffic	Collision with tree	Driving too fast for conditions
13	04/12/2016	Tue	1:59 PM	Off-peak	2	1	Possible	Angle	Wet	Daylight	Rain	Making U-turn / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
14	05/03/2016	Tue	10:29 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
15	05/21/2016	Sat	9:59 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
16	07/29/2016	Fri	6:38 AM	Off-peak	3	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain / Cloudy	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
17	08/08/2016	Mon	8:41 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
18	08/26/2016	Fri	6:46 PM	Off-peak	3	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
19	11/14/2016	Mon	11:00 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
20	12/20/2016	Tue	6:04 PM	Peak	2	0	Property damage only	Head-on	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
21	01/09/2017	Mon	8:05 AM	Peak	3	2	Non-incapacitating	Rear-end	Wet	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
22	02/07/2017	Tue	7:42 PM	Off-peak	2	0	Property damage only	Angle	Ice	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Failed to yield right of way
23	02/17/2017	Fri	7:15 PM	Off-peak	3	1	Non-incapacitating	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Changing lanes	Collision with motor vehicle in traffic	Unknown
24	04/05/2017	Wed	9:49 AM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear / Cloudy	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown

Table 2
Crash Lookup: Country Club Lane at Route 9
MassDOT Crash Data 2015-2019

25	05/29/2017	Mon	2:25 AM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with guardrail	Unknown
26	07/21/2017	Fri	4:53 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dawn	Clear	Travelling straight ahead	Collision with light pole or other post/support	No improper driving
27	08/09/2017	Wed	4:36 PM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Turning right / Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
28	10/01/2017	Sun	1:46 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Other improper action / No improper driving
29	11/12/2017	Sun	6:45 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - unknown	Clear	Travelling straight ahead / Unknown	Collision with motor vehicle in traffic	No improper driving / Followed too closely
30	11/18/2017	Sat	3:36 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with other fixed object (wall, building, tunnel, etc.)	Failure to keep in proper lane or running off road / Fatigued/asleep
31	11/22/2017	Wed	12:00 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain / Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Inattention / Followed too closely / No improper driving
32	02/10/2018	Sat	1:08 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain / Cloudy	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Other improper action / No improper driving
33	07/07/2018	Sat	2:45 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with guardrail	No improper driving
34	07/31/2018	Tue	6:35 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
35	09/14/2018	Fri	6:00 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dusk	Clear	Turning right	Collision with motor vehicle in traffic	No improper driving
36	09/17/2018	Mon	2:53 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
37	10/02/2018	Tue	6:54 PM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
38	12/22/2018	Sat	2:22 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
39	01/01/2019	Tue	4:22 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
40	01/10/2019	Thu	5:20 PM	Peak	4	0	Property damage only	Rear-end	Dry	Dark - unlit roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
41	03/26/2019	Tue	4:31 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
42	03/27/2019	Wed	10:46 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
43	06/28/2019	Fri	6:54 PM	Off-peak	2	0	Property damage only	Rear-end	Unknown	Daylight	Clear	Making U-turn	Collision with motor vehicle in traffic	No improper driving / Unknown
44	07/07/2019	Sun	2:10 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Unknown	Daylight	Clear	Travelling straight ahead	Collision with light pole or other post/support	Other improper action
45	08/22/2019	Thu	8:00 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy / Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
46	10/24/2019	Thu	5:25 PM	Peak	3	1	Non-incapacitating	Rear-end	Dry	Dusk	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
47	12/11/2019	Wed	4:51 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
48	12/13/2019	Fri	7:20 AM	Peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with guardrail	Unknown



SYMBOLS

- | | | | |
|-----|----------------------|-----|----------------|
| → | Moving Vehicle | → □ | Parked Vehicle |
| ↔ | Backing Vehicle | → □ | Fixed Object |
| ⋯→ | Non-Involved Vehicle | → 🚲 | Bicycle |
| → 🚶 | Pedestrian | → 🐾 | Animal |

TYPES OF CRASH

- | | | | |
|-----|----------|----|----------------|
| ↔↔↔ | Head On | ↔↔ | Sideswipe |
| → ↓ | Angle | ↪↪ | Out of Control |
| → | Rear End | | |

CRASH INDEX AND SEVERITY

- #, #, #
- # Property Damage Only Crash Index Number
 - # Injury Crash Index Number
 - # Fatal Crash Index Number



Figure 3
Collision Diagram 2015–19
Route 9 and Temple Street

**Table 3
Crash Lookup: Temple Street at Route 9
MassDOT Crash Data 2015-2019**

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	01/01/2015	Thu	12:40 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Turning left	Collision with utility pole	Unknown
2	01/02/2015	Fri	3:53 PM	Peak	1	1	Incapacitating	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with utility pole	Fatigued/asleep
3	02/25/2015	Wed	8:00 PM	Off-peak	3	1	Non-incapacitating	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
4	04/08/2015	Wed	12:00 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
5	04/21/2015	Tue	3:00 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Made an improper turn / Disregarded traffic signs, signals, road markings
6	04/25/2015	Sat	2:00 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
7	04/26/2015	Sun	1:34 AM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings / Other improper action
8	05/05/2015	Tue	3:30 PM	Peak	4	2	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
9	05/05/2015	Tue	8:05 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
10	05/21/2015	Thu	4:00 PM	Peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
11	07/19/2015	Sun	4:45 PM	Off-peak	1	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	No improper driving
12	08/03/2015	Mon	9:06 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with ditch	Disregarded traffic signs, signals, road markings / Unknown
13	08/16/2015	Sun	8:46 PM	Off-peak	1	0	Property damage only	Rear-end	Wet	Dark - lighted roadway	Rain	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
14	09/21/2015	Mon	12:10 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
15	10/13/2015	Tue	11:57 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
16	11/04/2015	Wed	7:29 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
17	11/14/2015	Sat	12:18 PM	Off-peak	2	1	Possible	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
18	12/08/2015	Tue	9:43 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - unlit roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
19	01/09/2016	Sat	11:25 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
20	01/11/2016	Mon	3:21 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Unknown
21	02/04/2016	Thu	10:32 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
22	02/10/2016	Wed	6:36 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Cloudy / Snow	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Unknown
23	02/13/2016	Sat	11:02 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear / Other	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown

**Table 3
Crash Lookup: Temple Street at Route 9
MassDOT Crash Data 2015-2019**

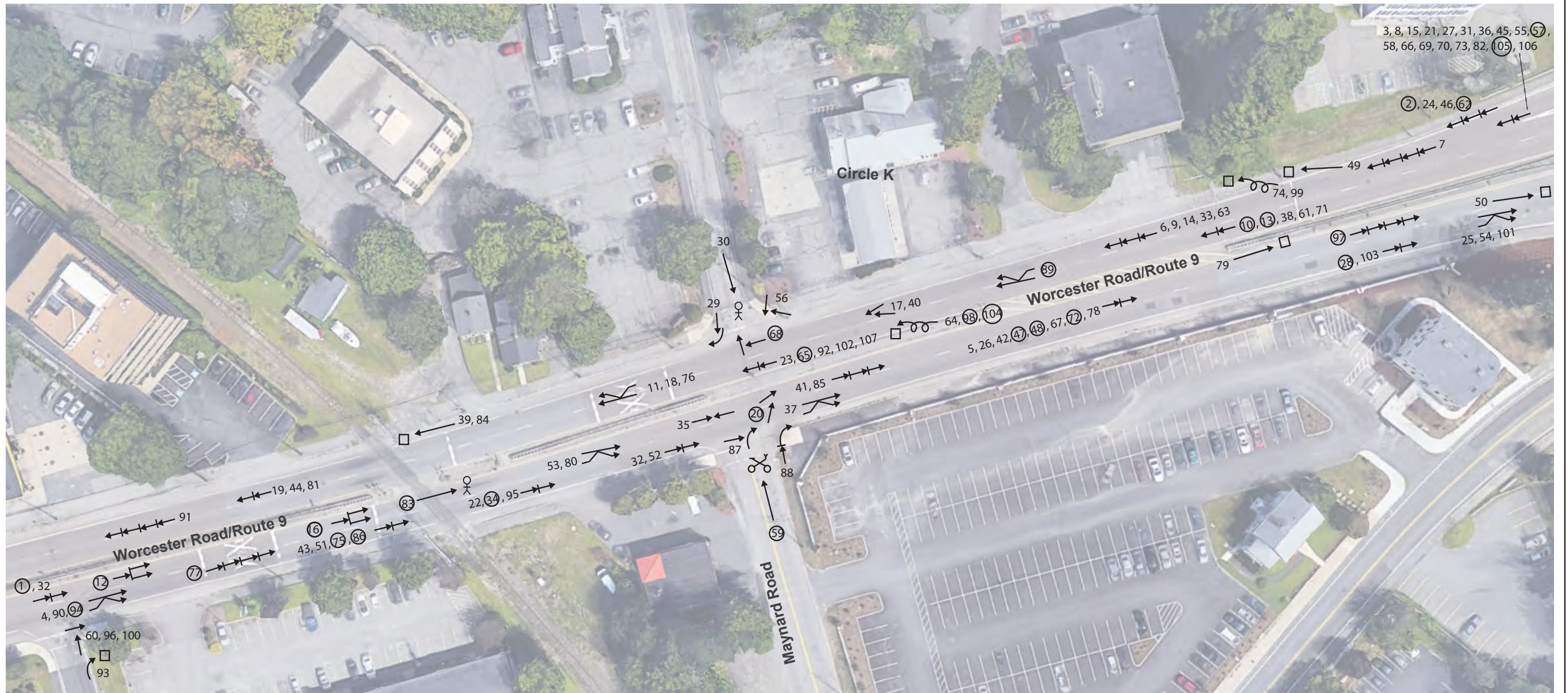
24	03/01/2016	Tue	3:32 PM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
25	03/15/2016	Tue	4:07 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain	Overtaking/passing / Turning right	Collision with motor vehicle in traffic	Unknown
26	04/13/2016	Wed	6:34 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
27	06/13/2016	Mon	8:30 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dusk	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
28	06/17/2016	Fri	1:02 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Emotional / Unknown
29	06/20/2016	Mon	4:29 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Unknown / Travelling straight ahead	Unknown / Collision with motor vehicle in traffic	Unknown
30	07/28/2016	Thu	7:49 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Other improper action
31	08/15/2016	Mon	3:50 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Unknown
32	08/17/2016	Wed	7:41 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / Glare
33	11/03/2016	Thu	4:13 PM	Peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
34	11/19/2016	Sat	10:27 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving
35	12/02/2016	Fri	12:13 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
36	12/08/2016	Thu	5:01 PM	Peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
37	01/17/2017	Tue	5:51 PM	Peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Rain	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
38	01/18/2017	Wed	4:08 PM	Peak	3	0	Property damage only	Rear-end	Wet	Daylight	Rain / Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
39	02/02/2017	Thu	12:00 AM	Off-peak	2	2	Possible	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
40	02/07/2017	Tue	7:50 PM	Off-peak	2	0	Property damage only	Rear-end	Ice	Dark - lighted roadway	Sleet, hail	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
41	02/17/2017	Fri	12:00 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Ice	Dark - lighted roadway	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Unknown
42	02/24/2017	Fri	9:33 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
43	02/27/2017	Mon	12:12 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
44	04/27/2017	Thu	6:30 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
45	05/20/2017	Sat	7:12 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
46	05/31/2017	Wed	5:57 PM	Peak	2	1	Possible	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
47	07/01/2017	Sat	9:09 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
48	07/19/2017	Wed	10:51 PM	Off-peak	2	1	Possible	Angle	Dry	Dark - lighted roadway	Clear	Leaving traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Made an improper turn / No improper driving
49	07/21/2017	Fri	4:20 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Unknown / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
50	07/27/2017	Thu	10:01 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
51	08/29/2017	Tue	2:51 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
52	08/30/2017	Wed	5:51 PM	Peak	4	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Driving too fast for conditions / Other improper action / No improper driving
53	09/04/2017	Mon	6:41 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Wet	Daylight	Rain	Travelling straight ahead	Collision with utility pole	Driving too fast for conditions

**Table 3
Crash Lookup: Temple Street at Route 9
MassDOT Crash Data 2015-2019**

54	09/05/2017	Tue	5:46 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
55	10/05/2017	Thu	1:31 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
56	10/13/2017	Fri	7:43 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
57	12/04/2017	Mon	2:26 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
58	12/09/2017	Sat	9:31 PM	Off-peak	2	0	Property damage only	Rear-end	Ice	Dark - lighted roadway	Snow	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
59	12/30/2017	Sat	11:57 PM	Off-peak	3	1	Non-incapacitating	Rear-end	Dry	Dark - lighted roadway	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Physical impairment / Disregarded traffic signs, signals, road markings / No improper driving
60	12/30/2017	Sat	10:37 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
61	03/18/2018	Sun	9:02 PM	Off-peak	2	4	Non-incapacitating	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
62	04/17/2018	Tue	7:55 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dusk	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Followed too closely
63	05/17/2018	Thu	8:20 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy / Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
64	07/07/2018	Sat	3:26 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Driving too fast for conditions / Followed too closely / No improper driving
65	08/04/2018	Sat	5:25 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear / Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
66	08/23/2018	Thu	10:39 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Unknown / Slowing or stopped in traffic	Collision with motor vehicle in traffic / Other	No improper driving
67	08/24/2018	Fri	9:25 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
68	09/15/2018	Sat	3:25 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
69	10/10/2018	Wed	4:43 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
70	11/09/2018	Fri	12:07 PM	Off-peak	1	1	Possible	Single vehicle crash	Dry	Daylight	Clear	Turning right	Collision with pedestrian	Failed to yield right of way
71	11/20/2018	Tue	10:34 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Dark - unlit roadway	Clear / Sleet, hail	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Driving too fast for conditions
72	12/02/2018	Sun	7:45 PM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
73	12/08/2018	Sat	10:15 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention / Followed too closely
74	01/03/2019	Thu	9:18 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Cloudy	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
75	01/06/2019	Sun	8:10 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
76	01/14/2019	Mon	8:45 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
77	03/11/2019	Mon	12:54 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
78	03/31/2019	Sun	8:20 PM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
79	04/02/2019	Tue	6:55 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way / Inattention

**Table 3
Crash Lookup: Temple Street at Route 9
MassDOT Crash Data 2015-2019**

80	04/06/2019	Sat	11:32 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Unknown
81	04/06/2019	Sat	5:07 AM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Cloudy / Rain	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
82	05/25/2019	Sat	1:15 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
83	07/09/2019	Tue	6:00 PM	Peak	2	0	Property damage only	Angle	Unknown	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
84	07/13/2019	Sat	9:50 PM	Off-peak	2	0	Property damage only	Angle	Unknown	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
85	07/28/2019	Sun	1:17 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Unknown	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / Followed too closely
86	08/08/2019	Thu	2:44 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Leaving traffic lane / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
87	08/09/2019	Fri	7:39 AM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
88	08/12/2019	Mon	9:15 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
89	08/16/2019	Fri	12:35 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
90	08/24/2019	Sat	3:26 PM	Off-peak	3	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Unknown
91	09/05/2019	Thu	12:49 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings / Made an improper turn
92	09/05/2019	Thu	3:01 AM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
93	09/17/2019	Tue	5:11 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dawn	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road
94	10/03/2019	Thu	9:04 PM	Off-peak	2	1	Non-incapacitating	Angle	Wet	Dark - lighted roadway	Rain	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
95	10/21/2019	Mon	1:01 AM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
96	10/24/2019	Thu	4:54 PM	Peak	2	1	Incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
97	11/02/2019	Sat	11:00 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
98	11/17/2019	Sun	4:00 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Turning left	Collision with utility pole	Unknown
99	11/21/2019	Thu	7:15 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
100	11/21/2019	Thu	8:26 PM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Dark - lighted roadway	Clear	Turning left	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
101	12/04/2019	Wed	11:00 PM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Other improper action
102	12/11/2019	Wed	10:13 PM	Off-peak	2	2	Non-incapacitating	Angle	Wet	Dark - lighted roadway	Rain	Entering traffic lane / Turning left	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
103	12/18/2019	Wed	7:25 PM	Off-peak	2	0	Property damage only	Sideswipe, opposite direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving



SYMBOLS

- | | | | | |
|----|----------------------|---|---|----------------|
| → | Moving Vehicle | → | ▭ | Parked Vehicle |
| ↔ | Backing Vehicle | → | □ | Fixed Object |
| ⋯→ | Non-Involved Vehicle | → | ⊗ | Bicycle |
| → | ⊗ | → | 🐾 | Animal |
| | Pedestrian | | | |

TYPES OF CRASH

- | | | | |
|-----|----------|----|----------------|
| ↔↔↔ | Head On | ↔↔ | Sideswipe |
| →↓ | Angle | ↪↪ | Out of Control |
| →↔ | Rear End | | |

CRASH INDEX AND SEVERITY

- #, #, #
- # Property Damage Only Crash Index Number
 - # Injury Crash Index Number
 - # Fatal Crash Index Number



Figure 4
Collision Diagram 2015–19
Route 9 and Maynard Road

**Table 4
Crash Lookup: Maynard Road at Route 9
MassDOT Crash Data 2015-2019**

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	02/06/2015	Fri	3:12 PM	Off-peak	2	1	Possible injury	Rear end	Wet	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in transport	
2	02/07/2015	Sat	2:35 PM	Off-peak	3	1	Non-incapacitating	Rear end	Slush	Daylight	Snow	Slowing or stopped in traffic	Collision with motor vehicle in transport	Inattention / No improper driving
3	02/10/2015	Tue	7:16 AM	Peak	2	0	Property damage only	Rear end	Slush	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
4	03/03/2015	Tue	7:11 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Unknown
5	03/07/2015	Sat	1:53 PM	Off-peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Unknown
6	04/09/2015	Thu	4:10 PM	Peak	3	0	Property damage only	Rear end	Wet	Daylight	Rain	Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
7	04/29/2015	Wed	4:35 PM	Peak	4	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
8	05/13/2015	Wed	1:58 PM	Off-peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Merging	Collision with motor vehicle in transport	No improper driving / Followed too closely
9	05/13/2015	Wed	3:32 PM	Peak	3	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Followed too closely
10	06/12/2015	Fri	7:26 PM	Off-peak	2	1	Non-incapacitating	Rear end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	Inattention / No improper driving
11	07/02/2015	Thu	3:06 PM	Off-peak	1	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving
12	07/16/2015	Thu	4:28 PM	Peak	3	1	Possible injury	Rear end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
13	07/24/2015	Fri	7:36 AM	Peak	2	1	Possible injury	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Unknown
14	08/25/2015	Tue	4:08 PM	Peak	3	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	Unknown
15	09/01/2015	Tue	4:32 PM	Peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
16	09/25/2015	Fri	12:41 PM	Off-peak	3	1	Possible injury	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
17	10/07/2015	Wed	1:23 AM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Turning right / Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Made an improper turn / Failure to keep in proper lane or running off road
18	11/03/2015	Tue	2:51 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving
19	11/08/2015	Sun	6:45 PM	Off-peak	2	0	Property damage only	Rear end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
20	11/11/2015	Wed	9:18 PM	Off-peak	2	1	Non-incapacitating	Angle	Wet	Dark - lighted roadway	Rain	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Disregarded traffic signs, signals, road markings / Failed to yield right of way
21	12/15/2015	Tue	6:25 PM	Peak	2	0	Property damage only	Rear end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
22	01/13/2016	Wed	2:51 PM	Off-peak	2	0	Possible injury	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
23	01/18/2016	Mon	5:07 PM	Peak	2	0	Property damage only	Rear end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
24	01/19/2016	Tue	10:28 PM	Off-peak	3	0	Property damage only	Rear end	Dry	Dark - roadway not lighted	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
25	02/11/2016	Thu	6:43 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Unknown
26	02/20/2016	Sat	12:45 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Disregarded traffic signs, signals, road markings
27	02/29/2016	Mon	4:24 PM	Peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
28	03/02/2016	Wed	11:11 AM	Off-peak	2	1	Non-incapacitating	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
29	04/07/2016	Thu	11:26 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning right / Travelling straight ahead	Collision with motor vehicle in transport	No improper driving

**Table 4
Crash Lookup: Maynard Road at Route 9
MassDOT Crash Data 2015-2019**

30	06/17/2016	Fri	8:31 AM	Peak	1	0	Property damage only	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with pedestrian	No improper driving
31	06/26/2016	Sun	4:16 PM	Off-peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Entering traffic lane	Collision with motor vehicle in transport	No improper driving / Followed too closely
32	07/03/2016	Sun	12:00 AM	Off-peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
33	09/01/2016	Thu	7:14 AM	Peak	3	0	Property damage only	Rear end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
34	11/05/2016	Sat	12:46 PM	Off-peak	2	2	Possible injury	Rear end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
35	11/12/2016	Sat	2:38 AM	Off-peak	2	0	Possible injury	Head on	Dry	Dark - unknown roadway lighting	Clear	Travelling straight ahead	Collision with motor vehicle in transport	Wrong side or wrong way / No improper driving
36	11/15/2016	Tue	4:39 PM	Peak	2	0	Property damage only	Rear end	Wet	Dusk	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
37	11/22/2016	Tue	5:40 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Turning right	Collision with motor vehicle in transport	No improper driving / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner / Other improper action
38	11/25/2016	Fri	10:50 AM	Off-peak	2	0	Property damage only	Rear end	Wet	Daylight	Rain	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
39	12/17/2016	Sat	1:16 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Snow	Other	Snow	Other	Collision with light pole or other post/support	Other improper action
40	12/23/2016	Fri	4:46 PM	Peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in transport	Unknown
41	01/10/2017	Tue	8:04 AM	Peak	3	0	Property damage only	Rear end	Ice	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Unknown
42	02/10/2017	Fri	5:25 PM	Peak	2	0	Property damage only	Rear end	Slush	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
43	02/17/2017	Fri	7:20 AM	Peak	2	0	Property damage only	Rear end	Unknown	Unknown	Unknown	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely / Other improper action
44	02/27/2017	Mon	8:14 AM	Peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Followed too closely
45	03/10/2017	Fri	11:06 AM	Off-peak	2	0	Property damage only	Rear end	Snow	Daylight	Snow	Entering traffic lane	Collision with motor vehicle in transport	No improper driving / Followed too closely
46	04/03/2017	Mon	3:29 PM	Off-peak	3	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
47	04/12/2017	Wed	8:22 AM	Peak	2	1	Possible injury	Rear end	Dry	Daylight	Clear	Travelling straight ahead		No improper driving / Followed too closely
48	04/12/2017	Wed	8:33 AM	Peak	2	1	Non-incapacitating	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
49	05/17/2017	Wed	4:14 PM	Peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Entering traffic lane	Collision with light pole or other post/support	Unknown
50	06/02/2017	Fri	5:39 PM	Peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear		Collision with other movable object	No improper driving
51	07/06/2017	Thu	6:50 AM	Off-peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
52	07/28/2017	Fri	2:57 PM	Off-peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
53	08/10/2017	Thu	1:10 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Parked	Collision with parked motor vehicle	Fatigued/asleep
54	08/17/2017	Thu	2:28 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	Unknown
55	08/27/2017	Sun	6:38 PM	Off-peak	3	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
56	09/05/2017	Tue	4:43 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning right / Travelling straight ahead	Collision with motor vehicle in transport	Unknown
57	09/29/2017	Fri	7:21 PM	Off-peak	2	1	Possible injury	Rear end	Dry	Dark - lighted roadway	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in transport	No improper driving / Followed too closely

**Table 4
Crash Lookup: Maynard Road at Route 9
MassDOT Crash Data 2015-2019**

58	10/18/2017	Wed	8:44 AM	Peak	2	0	Possible injury	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
59	10/25/2017	Wed	4:08 PM	Peak	1	1	Non-incapacitating	Angle	Wet	Daylight	Rain	Slowing or stopped in traffic	Collision with cyclist	No improper driving
60	10/28/2017	Sat	10:33 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Turning right	Collision with motor vehicle in transport	No improper driving / Other improper action
61	10/29/2017	Sun	1:36 PM	Off-peak	2	0	Property damage only	Rear end	Wet	Daylight	Rain		Collision with motor vehicle in transport	
62	11/06/2017	Mon	5:09 PM	Peak	3	1	Non-incapacitating	Rear end	Wet	Dark - lighted roadway	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	Inattention / No improper driving
63	11/27/2017	Mon	12:34 PM	Off-peak	3	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in transport	Unknown
64	12/25/2017	Mon	8:34 AM	Peak	1	0	Property damage only	Single vehicle crash	Snow	Daylight	Snow	Travelling straight ahead	Collision with guardrail	No improper driving
65	01/07/2018	Sun	5:05 PM	Off-peak	2	1	Non-incapacitating	Rear end	Wet	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Changing lanes	Collision with motor vehicle in transport	No improper driving / Followed too closely
66	01/11/2018	Thu	11:03 AM	Off-peak	2	0	Property damage only	Rear end	Wet	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	Unknown
67	01/26/2018	Fri	11:20 AM	Off-peak	2	0	Property damage only	Rear end	Dry	Dark - roadway not lighted	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
68	02/03/2018	Sat	5:32 AM	Off-peak	2	2	Non-incapacitating	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in transport	Failure to keep in proper lane or running off road / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner / No improper driving
69	02/08/2018	Thu	5:46 PM	Peak	2	0	Property damage only	Rear end	Ice	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
70	03/19/2018	Mon	4:24 PM	Peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
71	05/03/2018	Thu	10:19 PM	Off-peak	2	0	Property damage only	Rear end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving
72	05/08/2018	Tue	9:45 AM	Peak	2	1	Non-incapacitating	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
73	05/24/2018	Thu	6:43 AM	Off-peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Entering traffic lane	Collision with motor vehicle in transport	Followed too closely
74	07/01/2018	Sun	8:56 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Changing lanes / Travelling straight ahead	Collision with guardrail	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner / No improper driving
75	08/07/2018	Tue	9:15 AM	Peak	2	1	Non-incapacitating	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
76	09/06/2018	Thu	6:07 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain	Travelling straight ahead	Collision with motor vehicle in transport	No improper driving
77	09/10/2018	Mon	3:43 PM	Peak	4	1	Possible injury	Rear end	Wet	Daylight	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving / Followed too closely
78	10/04/2018	Thu	5:04 PM	Peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	No improper driving
79	10/06/2018	Sat	7:21 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Changing lanes	Collision with median barrier	Failure to keep in proper lane or running off road
80	10/13/2018	Sat	1:54 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in transport	Inattention / No improper driving
81	10/18/2018	Thu	6:34 PM	Off-peak	2	0	Property damage only	Rear end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in transport	
82	11/13/2018	Tue	8:47 AM	Peak	2	0	Property damage only	Rear end	Wet	Daylight	Cloudy	Entering traffic lane	Collision with motor vehicle in transport	Distracted / No improper driving
83	12/11/2018	Tue	5:59 PM	Peak	1	1	Incapacitating	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with pedestrian	No improper driving
84	12/31/2018	Mon	2:30 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Unknown	Unknown	Unknown
85	01/07/2019	Mon	7:43 AM	Peak	3	0	Property damage only	Rear end	Sand, mud, dirt, oil, gravel	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
86	01/07/2019	Mon	9:38 AM	Peak	2	1	Possible injury	Rear end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
87	01/08/2019	Tue	5:22 PM	Peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Rain	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / Unknown

**Table 4
Crash Lookup: Maynard Road at Route 9
MassDOT Crash Data 2015-2019**

88	01/21/2019	Mon	6:55 PM	Off-peak	2	0	Unknown	Rear end	Ice	Dark - lighted roadway	Clear	Turning right / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
89	02/18/2019	Mon	11:00 PM	Off-peak	2	2	Possible injury	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
90	03/19/2019	Tue	2:02 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Entering traffic lane	Collision with motor vehicle in traffic	No improper driving
91	03/22/2019	Fri	3:13 PM	Off-peak	4	0	Property damage only	Rear end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / Driving too fast for conditions / No improper driving
92	04/19/2019	Fri	9:10 AM	Peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
93	04/19/2019	Fri	6:05 PM	Peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Cloudy	Turning right	Collision with motor vehicle in traffic	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc
94	04/24/2019	Wed	10:03 AM	Off-peak	2	2	Non-incapacitating	Sideswipe, same direction	Dry	Daylight	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Failure to keep in proper lane or running off road / No improper driving
95	06/21/2019	Fri	1:21 PM	Off-peak	2	0	Property damage only	Rear end	Unknown	Daylight	Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
96	06/28/2019	Fri	7:54 AM	Peak	2	0	Property damage only	Angle	Unknown	Daylight	Clear	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
97	07/22/2019	Mon	7:49 AM	Peak	4	2	Non-incapacitating	Rear end	Unknown	Daylight	Clear / Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Driving too fast for conditions
98	08/13/2019	Tue	7:17 PM	Off-peak	1	1	Possible injury	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with guardrail	Failure to keep in proper lane or running off road
99	08/28/2019	Wed	2:21 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Wet	Daylight	Cloudy / Rain	Travelling straight ahead	Collision with utility pole	Followed too closely
100	09/03/2019	Tue	4:28 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
101	09/24/2019	Tue	9:43 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Other improper action / No improper driving
102	10/04/2019	Fri	2:44 PM	Off-peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Distracted / No improper driving
103	10/11/2019	Fri	2:03 PM	Off-peak	2	0	Property damage only	Rear end	Wet	Daylight	Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
104	10/30/2019	Wed	3:28 PM	Off-peak	1	2	Possible injury	Single vehicle crash	Wet	Daylight	Cloudy / Rain	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
105	10/30/2019	Wed	7:20 PM	Off-peak	2	3	Possible injury	Rear end	Wet	Dark - lighted roadway	Cloudy	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
106	11/17/2019	Sun	5:12 PM	Off-peak	2	0	Property damage only	Rear end	Wet	Dark - roadway not lighted	Snow	Entering traffic lane	Collision with motor vehicle in traffic	No improper driving / Followed too closely
107	12/12/2019	Thu	3:20 PM	Off-peak	2	0	Property damage only	Rear end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving

Table 5
Crash Lookup: Edgell Road/Main Street at Route 9
MassDOT Crash Data 2015-2019

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Condition	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	01/03/2015	Sat	6:33 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Snow	Dark - lighted roadway	Snow / Sleet, hail	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Driving too fast for conditions
2	01/15/2015	Thu	11:00 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Cloudy	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	Inattention / Unknown
3	01/19/2015	Mon	5:12 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
4	01/25/2015	Sun	12:00 PM	Off-peak	3	0	Property damage only	Rear-end	Wet	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
5	02/06/2015	Fri	5:52 PM	Peak	2	0	Property damage only	Angle	Dry	Dark - unknown	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
6	02/17/2015	Tue	5:50 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Dawn	Clear	Turning right	Collision with motor vehicle in traffic	Inattention / Followed too closely / No improper driving
7	02/25/2015	Wed	3:13 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
8	04/22/2015	Wed	4:02 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
9	05/05/2015	Tue	5:06 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
10	05/06/2015	Wed	6:35 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	No improper driving
11	05/16/2015	Sat	2:27 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear / Cloudy	Travelling straight ahead	Collision with ditch	No improper driving / Failed to yield right of way
12	06/16/2015	Tue	5:20 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
13	06/29/2015	Mon	1:08 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
14	08/28/2015	Fri	3:18 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
15	09/15/2015	Tue	5:30 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dusk	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
16	09/24/2015	Thu	4:15 PM	Peak	3	0	Property damage only	Angle	Dry	Daylight	Clear	Changing lanes / Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
17	11/07/2015	Sat	7:23 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
18	11/15/2015	Sun	8:39 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
19	11/25/2015	Wed	2:55 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Unknown	Daylight	Unknown	Slowing or stopped in traffic / Turning left	Collision with motor vehicle in traffic	Unknown
20	01/14/2016	Thu	12:00 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
21	01/21/2016	Thu	3:55 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
22	01/22/2016	Fri	1:08 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
23	01/28/2016	Thu	8:03 AM	Peak	5	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
24	02/09/2016	Tue	6:31 AM	Off-peak	2	0	Property damage only	Rear-end	Snow	Dusk	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Unknown
25	03/16/2016	Wed	1:59 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
26	03/21/2016	Mon	1:21 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
27	03/24/2016	Thu	7:12 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Unknown	Dusk	Rain	Turning right	Collision with pedestrian	Unknown

Table 5
Crash Lookup: Edgell Road/Main Street at Route 9
MassDOT Crash Data 2015-2019

28	04/15/2016	Fri	8:20 AM	Peak	2	0	Property damage only	Head-on	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Failed to yield right of way / Made an improper turn
29	05/14/2016	Sat	5:46 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
30	06/05/2016	Sun	1:01 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Cloudy / Rain	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
31	06/12/2016	Sun	3:14 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Changing lanes	Collision with motor vehicle in traffic	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner / Failure to keep in proper lane or running off road
32	06/16/2016	Thu	6:19 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
33	07/06/2016	Wed	9:58 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
34	08/05/2016	Fri	1:54 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
35	08/12/2016	Fri	9:58 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
36	08/27/2016	Sat	3:29 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
37	12/10/2016	Sat	8:00 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
38	12/13/2016	Tue	12:46 AM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / No improper driving
39	12/28/2016	Wed	8:15 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
40	12/28/2016	Wed	3:15 PM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
41	01/19/2017	Thu	12:00 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
42	01/27/2017	Fri	4:25 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dusk	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
43	03/02/2017	Thu	6:15 PM	Peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
44	03/16/2017	Thu	10:10 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Unknown / Turning left	Collision with motor vehicle in traffic	Unknown
45	03/31/2017	Fri	2:28 PM	Off-peak	2	1	Non-incapacitating	Angle	Wet	Daylight	Rain	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
46	04/08/2017	Sat	12:20 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Turning left	Collision with motor vehicle in traffic	Unknown
47	04/11/2017	Tue	3:40 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
48	04/16/2017	Sun	7:32 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Overtaking/passing	Collision with motor vehicle in traffic	Unknown
49	04/24/2017	Mon	7:00 AM	Peak	2	1	Non-incapacitating	Sideswipe, same direction	Dry	Daylight	Clear	Turning right / Turning left	Collision with motor vehicle in traffic	Unknown
50	05/06/2017	Sat	1:31 PM	Off-peak	2	1	Possible	Angle	Wet	Daylight	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
51	06/01/2017	Thu	4:10 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Failed to yield right of way
52	06/08/2017	Thu	7:04 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
53	06/09/2017	Fri	3:49 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Unknown
54	06/23/2017	Fri	4:31 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Failure to keep in proper lane or running off road
55	06/26/2017	Mon	3:38 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
56	07/10/2017	Mon	12:25 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Turning left	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving

Table 5
Crash Lookup: Edgell Road/Main Street at Route 9
MassDOT Crash Data 2015-2019

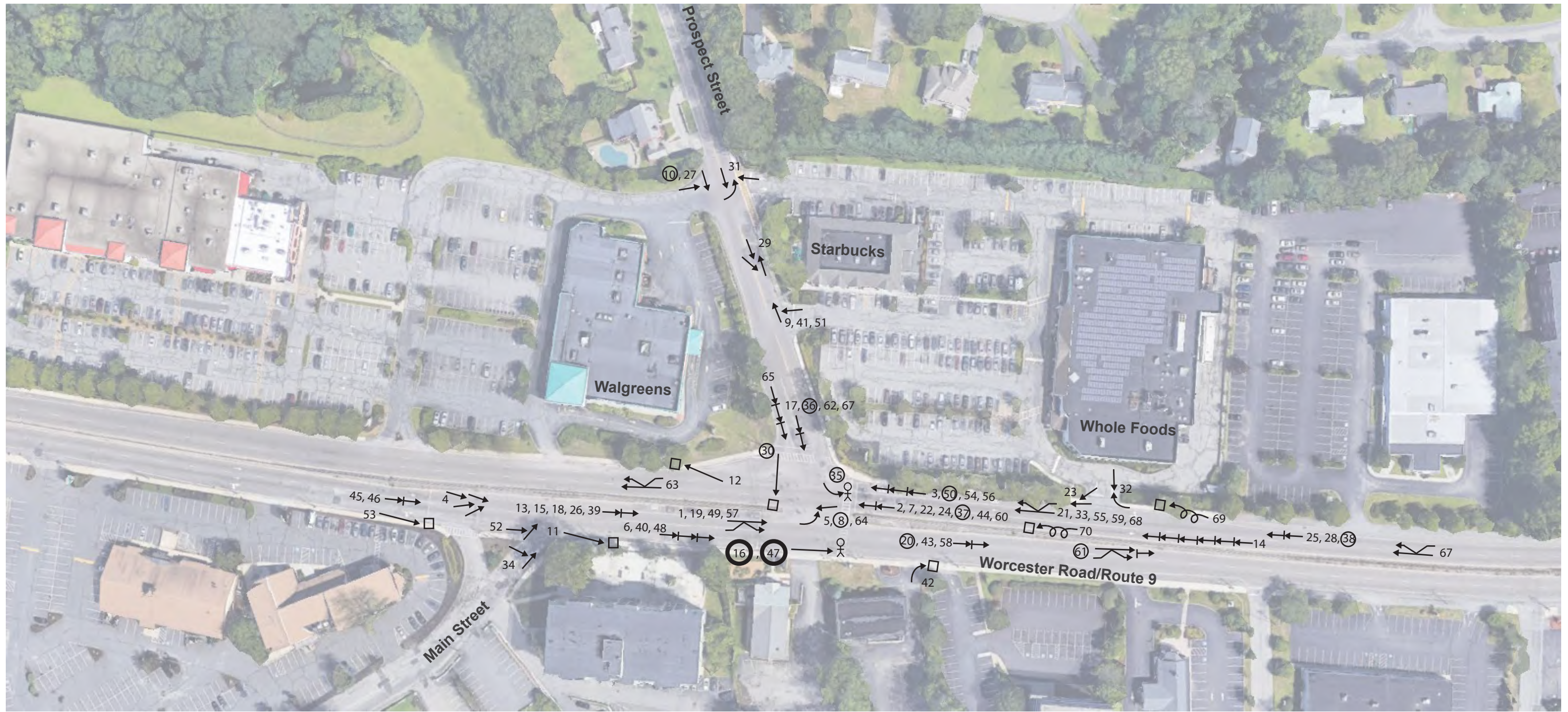
57	08/11/2017	Fri	1:06 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Unknown	Collision with motor vehicle in traffic	Unknown
58	08/17/2017	Thu	8:46 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
59	08/20/2017	Sun	7:22 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with guardrail	Unknown
60	08/27/2017	Sun	12:36 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Changing lanes	Collision with motor vehicle in traffic	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner / Over-correcting/over-steering
61	08/28/2017	Mon	5:34 PM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Unknown
62	09/11/2017	Mon	3:55 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Entering traffic lane	Collision with motor vehicle in traffic	No improper driving / Followed too closely
63	10/02/2017	Mon	8:24 AM	Peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Turning right	Collision with motor vehicle in traffic	No improper driving
64	10/03/2017	Tue	12:59 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / Unknown
65	10/20/2017	Fri	10:59 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
66	10/27/2017	Fri	2:32 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving
67	11/05/2017	Sun	1:44 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
68	12/08/2017	Fri	6:26 PM	Peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear / Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
69	01/10/2018	Wed	8:12 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Inattention / No improper driving
70	01/12/2018	Fri	6:01 PM	Peak	1	1	Incapacitating	Angle	Wet	Dark - lighted roadway	Rain / Fog, smog, smoke	Travelling straight ahead	Collision with pedestrian	No improper driving
71	01/18/2018	Thu	3:39 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
72	01/20/2018	Sat	3:30 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
73	02/08/2018	Thu	4:28 PM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Driving too fast for conditions
74	02/11/2018	Sun	4:05 PM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
75	03/21/2018	Wed	8:51 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
76	03/23/2018	Fri	12:05 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Travelling straight ahead / Entering traffic lane	Collision with motor vehicle in traffic	No improper driving
77	04/02/2018	Mon	4:25 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Inattention / No improper driving
78	04/17/2018	Tue	12:44 PM	Off-peak	2	2	Non-incapacitating	Angle	Dry	Daylight	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
79	04/24/2018	Tue	10:34 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Unknown	Collision with motor vehicle in traffic / Unknown	No improper driving / Unknown
80	04/24/2018	Tue	3:13 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
81	05/04/2018	Fri	1:56 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
82	05/07/2018	Mon	8:30 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Unknown
83	05/21/2018	Mon	3:10 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Overtaking/passing / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Made an improper turn / No improper driving
84	05/23/2018	Wed	1:57 PM	Off-peak	2	1	Non-incapacitating	Sideswipe, same direction	Dry	Daylight	Clear	Slowing or stopped in traffic / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Unknown
85	05/27/2018	Sun	1:22 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain	Turning left	Collision with motor vehicle in traffic	No improper driving / Inattention / Failure to keep in proper lane or running off road

Table 5
Crash Lookup: Edgell Road/Main Street at Route 9
MassDOT Crash Data 2015-2019

86	06/01/2018	Fri	3:57 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
87	06/11/2018	Mon	11:45 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with parked motor vehicle / Collision with motor vehicle in traffic	No improper driving
88	06/19/2018	Tue	1:58 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
89	08/05/2018	Sun	11:31 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
90	08/28/2018	Tue	4:01 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
91	09/09/2018	Sun	6:19 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dawn	Clear	Leaving traffic lane	Collision with motor vehicle in traffic	Inattention
92	09/14/2018	Fri	4:38 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
93	09/28/2018	Fri	1:14 PM	Off-peak	2	1	Non-incapacitating	Angle	Wet	Daylight	Cloudy / Rain	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
94	10/16/2018	Tue	8:50 AM	Peak	4	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
95	10/16/2018	Tue	1:41 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
96	10/23/2018	Tue	10:57 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Turning right	Collision with motor vehicle in traffic	No improper driving
97	11/13/2018	Tue	8:56 AM	Peak	2	1	Non-incapacitating	Rear-end	Wet	Daylight	Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
98	11/27/2018	Tue	4:35 PM	Peak	2	0	Property damage only	Angle	Dry	Dusk	Clear	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / No improper driving
99	12/05/2018	Wed	8:50 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
100	12/11/2018	Tue	8:00 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dawn	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving
101	01/01/2019	Tue	1:56 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Dark - lighted roadway	Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
102	01/03/2019	Thu	10:05 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
103	01/08/2019	Tue	7:31 AM	Peak	2	0	Property damage only	Angle	Wet	Daylight	Cloudy / Snow	Slowing or stopped in traffic / Turning left	Collision with parked motor vehicle / Collision with motor vehicle in traffic	Made an improper turn / No improper driving
104	02/11/2019	Mon	4:51 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
105	04/05/2019	Fri	9:03 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving
106	05/20/2019	Mon	7:21 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy / Clear	Turning left	Collision with motor vehicle in traffic	Unknown
107	05/31/2019	Fri	6:24 PM	Peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
108	06/05/2019	Wed	11:35 AM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
109	06/19/2019	Wed	8:57 PM	Off-peak	2	0	Property damage only	Rear-end	Unknown	Dark - lighted roadway	Cloudy	Slowing or stopped in traffic / Unknown	Collision with motor vehicle in traffic	No improper driving
110	06/28/2019	Fri	2:58 PM	Off-peak	2	1	Non-incapacitating	Sideswipe, same direction	Unknown	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
111	07/09/2019	Tue	11:24 AM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Unknown	Daylight	Clear	Turning left	Collision with pedestrian	Unknown
112	07/13/2019	Sat	2:13 AM	Off-peak	2	1	Possible	Rear-end	Unknown	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Exceeded authorized speed limit
113	07/16/2019	Tue	8:22 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Unknown	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving
114	07/25/2019	Thu	9:41 AM	Peak	2	1	Incapacitating	Angle	Unknown	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
115	07/28/2019	Sun	9:30 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - unlit roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way

**Table 5
Crash Lookup: Edgell Road/Main Street at Route 9
MassDOT Crash Data 2015-2019**

116	08/07/2019	Wed	3:36 PM	Peak	2	3	Non-incapacitating	Angle	Dry	Daylight	Cloudy	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Failed to yield right of way / Other improper action
117	08/20/2019	Tue	5:38 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
118	08/26/2019	Mon	3:25 PM	Off-peak	4	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
119	08/29/2019	Thu	7:28 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
120	09/06/2019	Fri	8:02 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear / Cloudy	Slowing or stopped in traffic / Turning left	Collision with motor vehicle in traffic	No improper driving / Unknown
121	09/07/2019	Sat	10:26 AM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Inattention / No improper driving
122	09/09/2019	Mon	4:13 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
123	09/10/2019	Tue	8:01 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Turning left	Collision with motor vehicle in traffic	Unknown
124	09/21/2019	Sat	6:31 PM	Off-peak	2	2	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / No improper driving
125	10/01/2019	Tue	6:50 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
126	10/02/2019	Wed	8:03 PM	Off-peak	2	2	Possible	Rear-end	Wet	Dark - lighted roadway	Rain	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Followed too closely
127	10/03/2019	Thu	6:40 AM	Off-peak	2	2	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
128	10/04/2019	Fri	9:32 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Inattention / No improper driving
129	10/15/2019	Tue	1:33 PM	Off-peak	2	1	Possible	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
130	10/17/2019	Thu	1:05 PM	Off-peak	2	0	Property damage only	Angle	Wet	Daylight	Cloudy / Rain	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
131	11/06/2019	Wed	2:46 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
132	11/23/2019	Sat	10:25 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	No improper driving
133	11/26/2019	Tue	6:02 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Turning right	Collision with motor vehicle in traffic	Failed to yield right of way
134	12/09/2019	Mon	8:54 PM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - unlit roadway	Rain	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
135	12/18/2019	Wed	4:00 PM	Peak	3	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Distracted / No improper driving



SYMBOLS

- | | | | | |
|----|----------------------|---|---|----------------|
| → | Moving Vehicle | → | ▭ | Parked Vehicle |
| ↔ | Backing Vehicle | → | □ | Fixed Object |
| ⋯→ | Non-Involved Vehicle | → | ⊗ | Bicycle |
| → | ⊗ | → | 🐾 | Animal |
| → | ⊗ | → | 👤 | Pedestrian |

TYPES OF CRASH

- | | | | |
|-----|----------|----|----------------|
| ↔↔↔ | Head On | ↔↔ | Sideswipe |
| →↘ | Angle | ↪↪ | Out of Control |
| →↔ | Rear End | | |

CRASH INDEX AND SEVERITY

- #, #, #
- # Property Damage Only Crash Index Number
 - # Injury Crash Index Number
 - # Fatal Crash Index Number



Figure 6
Collision Diagram 2015–19
Route 9 and Prospect Street

**Table 6
Crash Lookup: Prospect Street at Route 9
MassDOT Crash Data 2015-2019**

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	01/10/2015	Sat	2:05 PM	Off-peak	2	3	Possible	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Making U-turn	Collision with motor vehicle in traffic	No improper driving / Made an improper turn
2	02/14/2015	Sat	10:00 PM	Off-peak	2	0	Property damage only	Rear-end	Snow	Dark - unknown	Snow	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
3	02/22/2015	Sun	3:50 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
4	02/25/2015	Wed	2:48 PM	Off-peak	4	1	Unknown	Angle	Wet	Daylight	Clear	Entering traffic lane / Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Failed to yield right of way / Made an improper turn / No improper driving
5	04/27/2015	Mon	3:23 PM	Off-peak	2	2	Possible	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic / Turning left	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
6	05/31/2015	Sun	8:00 AM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / No improper driving
7	07/28/2015	Tue	9:12 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
8	09/01/2015	Tue	12:00 AM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Turning left / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
9	09/17/2015	Thu	12:33 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Unknown	Collision with motor vehicle in traffic	No improper driving
10	09/22/2015	Tue	8:55 AM	Peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
11	10/05/2015	Mon	9:30 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Wet	Dark - lighted roadway	Rain	Travelling straight ahead	Collision with other fixed object (wall, building, tunnel, etc.)	Failure to keep in proper lane or running off road
12	11/06/2015	Fri	1:14 AM	Off-peak	1	1	Possible	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with tree	Disregarded traffic signs, signals, road markings
13	11/16/2015	Mon	10:49 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Distracted
14	01/10/2016	Sun	11:13 PM	Off-peak	6	0	Property damage only	Rear-end	Wet	Dark - lighted roadway	Rain	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
15	01/15/2016	Fri	5:50 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / No improper driving
16	01/20/2016	Wed	7:48 PM	Off-peak	1	1	Fatal injury	Single vehicle crash	Sand, mud, dirt, oil, gravel	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with pedestrian	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
17	04/13/2016	Wed	10:10 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
18	05/06/2016	Fri	7:03 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
19	06/08/2016	Wed	5:29 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Cloudy	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
20	08/23/2016	Tue	2:03 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / Other improper action / No improper driving
21	08/29/2016	Mon	4:29 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely

**Table 6
Crash Lookup: Prospect Street at Route 9
MassDOT Crash Data 2015-2019**

22	08/30/2016	Tue	2:20 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Distracted
23	11/03/2016	Thu	5:42 PM	Peak	2	0	Property damage only	Angle	Wet	Dusk	Rain / Cloudy	Changing lanes / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
24	11/06/2016	Sun	7:25 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic / Collision with parked motor vehicle	Other improper action / No improper driving
25	11/26/2016	Sat	10:08 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
26	12/02/2016	Fri	6:28 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / No improper driving
27	12/10/2016	Sat	2:03 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
28	12/14/2016	Wed	9:26 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
29	12/15/2016	Thu	2:41 PM	Off-peak	3	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
30	01/05/2017	Thu	7:16 AM	Peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with other fixed object (wall, building, tunnel, etc.)	Unknown
31	01/07/2017	Sat	12:41 PM	Off-peak	3	0	Property damage only	Angle	Snow	Daylight	Snow	Turning left / Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
32	01/10/2017	Tue	9:27 AM	Peak	2	0	Property damage only	Head-on	Wet	Daylight	Cloudy	Turning right / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
33	03/25/2017	Sat	9:03 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Cloudy/Rain	Changing lanes	Collision with motor vehicle in traffic	Unknown
34	04/26/2017	Wed	10:13 AM	Off-peak	3	1	Non-incapacitating	Angle	Wet	Daylight	Rain	Turning right / Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic / Collision with ditch	Unknown
35	06/05/2017	Mon	3:49 PM	Peak	1	2	Incapacitating	Single vehicle crash	Wet	Daylight	Rain / Cloudy	Turning left	Collision with pedestrian	Unknown
36	06/09/2017	Fri	11:32 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
37	06/17/2017	Sat	10:46 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
38	08/05/2017	Sat	11:22 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Wet	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Distracted
39	10/03/2017	Tue	7:38 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
40	10/10/2017	Tue	4:01 PM	Peak	3	0	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
41	10/17/2017	Tue	11:38 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
42	10/20/2017	Fri	3:50 PM	Peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Turning right	Collision with motor vehicle in traffic	No improper driving
43	10/23/2017	Mon	4:09 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
44	10/29/2017	Sun	3:15 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain / Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely

**Table 6
Crash Lookup: Prospect Street at Route 9
MassDOT Crash Data 2015-2019**

45	12/02/2017	Sat	2:03 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
46	01/03/2018	Wed	10:35 AM	Off-peak	2	0	Property damage only	Rear-end	Ice	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
47	02/15/2018	Thu	7:18 PM	Off-peak	1	0	Fatal injury	Single vehicle crash	Wet	Dark - lighted roadway	Fog, smog, smoke	Changing lanes	Collision with pedestrian	Unknown
48	03/06/2018	Tue	4:19 PM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Inattention
49	03/11/2018	Sun	7:45 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
50	05/04/2018	Fri	8:46 PM	Off-peak	3	2	Non-incapacitating	Rear-end	Dry	Dark - unlit roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
51	06/03/2018	Sun	3:15 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
52	08/09/2018	Thu	1:31 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
53	09/23/2018	Sun	6:00 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dawn	Clear	Travelling straight ahead	Collision with utility pole	Visibility obstructed
54	09/27/2018	Thu	8:34 AM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
55	09/27/2018	Thu	9:00 AM	Peak	2	0	Property damage only	Sideswipe, opposite direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
56	10/15/2018	Mon	3:42 PM	Peak	3	3	Possible	Rear-end	Dry	Daylight	Clear / Cloudy	Making U-turn / Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Made an improper turn / No improper driving / Followed too closely
57	10/24/2018	Wed	4:52 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left / Making U-turn	Collision with motor vehicle in traffic	No improper driving / Unknown
58	11/02/2018	Fri	9:48 AM	Peak	2	0	Property damage only	Rear-end	Wet	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
59	11/02/2018	Fri	10:27 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic / Collision with light pole or other post/support	Inattention / No improper driving
60	11/28/2018	Wed	1:21 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / Distracted / No improper driving
61	12/30/2018	Sun	10:30 PM	Off-peak	3	2	Incapacitating	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Changing lanes / Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / Failure to keep in proper lane or running off road / No improper driving
62	02/19/2019	Tue	7:55 AM	Peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
63	04/08/2019	Mon	9:07 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
64	05/21/2019	Tue	8:28 AM	Peak	2	0	Property damage only	Head-on	Dry	Daylight	Clear	Turning left / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
65	06/13/2019	Thu	11:29 AM	Off-peak	3	0	Property damage only	Rear-end	Unknown	Daylight	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving

**Table 6
Crash Lookup: Prospect Street at Route 9
MassDOT Crash Data 2015-2019**

66	09/06/2019	Fri	9:06 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear / Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Unknown
67	09/18/2019	Wed	6:15 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning right	Collision with motor vehicle in traffic	No improper driving / Made an improper turn
68	11/20/2019	Wed	9:56 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
69	11/28/2019	Thu	1:49 AM	Off-peak	1	1	Possible	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with guardrail	Unknown
70	12/30/2019	Mon	12:58 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Slush	Daylight	Snow / Sleet, hail	Slowing or stopped in traffic	Collision with median barrier	Driving too fast for conditions



SYMBOLS		TYPES OF CRASH		CRASH INDEX AND SEVERITY
Moving Vehicle	Parked Vehicle	Head On	Sideswipe	#, #, #
Backing Vehicle	Fixed Object	Angle	Out of Control	# Property Damage Only Crash Index Number
Non-Involved Vehicle	Bicycle	Rear End		# Injury Crash Index Number
Pedestrian	Animal			# Fatal Crash Index Number



Figure 10
Collision Diagram 2015–19
Route 9 and Cochituate Road

Table 10
Crash Lookup: Cochituate Road at Route 9
MassDOT Crash Data 2015-2019

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	01/20/2015	Tue	10:30 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
2	01/26/2015	Mon	1:08 PM	Off-peak	2	1	Incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
3	03/03/2015	Tue	8:34 AM	Peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
4	03/14/2015	Sat	12:24 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
5	03/23/2015	Mon	7:42 PM	Off-peak	2	1	Possible	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
6	03/24/2015	Tue	2:07 PM	Off-peak	2	1	Possible	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
7	03/30/2015	Mon	1:31 AM	Off-peak	2	2	Possible	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
8	04/07/2015	Tue	5:25 PM	Peak	3	1	Non-incapacitating	Rear-end	Wet	Daylight	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
9	04/20/2015	Mon	12:58 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain / Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
10	04/24/2015	Fri	9:53 AM	Peak	2	1	Possible	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
11	05/07/2015	Thu	8:28 PM	Off-peak	2	1	Incapacitating	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
12	05/09/2015	Sat	3:30 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
13	05/25/2015	Mon	3:21 PM	Off-peak	2	4	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
14	06/16/2015	Tue	7:26 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
15	07/09/2015	Thu	11:30 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy / Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
16	07/24/2015	Fri	4:30 PM	Peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Cloudy / Rain	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
17	08/08/2015	Sat	11:04 AM	Off-peak	2	1	Possible	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
18	08/17/2015	Mon	10:59 AM	Off-peak	2	4	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
19	08/29/2015	Sat	2:00 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
20	09/05/2015	Sat	4:06 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
21	09/06/2015	Sun	1:08 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
22	09/21/2015	Mon	2:47 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Entering traffic lane	Collision with motor vehicle in traffic	Followed too closely / No improper driving
23	11/17/2015	Tue	8:54 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
24	01/15/2016	Fri	9:22 AM	Peak	2	1	Possible	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
25	02/02/2016	Tue	6:16 PM	Peak	3	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving

Table 10
Crash Lookup: Cochituate Road at Route 9
MassDOT Crash Data 2015-2019

26	04/20/2016	Wed	9:20 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Other improper action
27	05/13/2016	Fri	12:10 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Entering traffic lane	Collision with motor vehicle in traffic	Unknown
28	05/22/2016	Sun	9:15 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
29	06/03/2016	Fri	6:04 PM	Peak	2	2	Unknown	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
30	06/15/2016	Wed	2:07 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
31	06/20/2016	Mon	5:21 PM	Peak	2	1	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
32	08/13/2016	Sat	1:10 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Turning right / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
33	11/03/2016	Thu	10:41 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Distracted
34	11/08/2016	Tue	9:00 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
35	11/08/2016	Tue	12:48 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
36	11/20/2016	Sun	12:00 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
37	12/06/2016	Tue	11:04 AM	Off-peak	2	0	Property damage only	Rear-end	Slush	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
38	12/09/2016	Fri	12:40 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
39	12/23/2016	Fri	9:55 AM	Peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
40	02/12/2017	Sun	4:44 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Snow	Dark - lighted roadway	Snow	Turning left	Collision with curb	No improper driving
41	02/20/2017	Mon	3:35 PM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
42	02/27/2017	Mon	3:00 PM	Off-peak	2	1	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
43	04/17/2017	Mon	4:32 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
44	06/20/2017	Tue	3:24 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
45	08/03/2017	Thu	8:20 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
46	08/07/2017	Mon	3:10 PM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Cloudy	Entering traffic lane / Travelling straight ahead	Collision with utility pole / Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
47	08/12/2017	Sat	5:13 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
48	09/21/2017	Thu	2:21 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Entering traffic lane	Collision with motor vehicle in traffic	Followed too closely / No improper driving
49	11/22/2017	Wed	2:00 PM	Off-peak	3	3	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention

Table 10
Crash Lookup: Cochituate Road at Route 9
MassDOT Crash Data 2015-2019

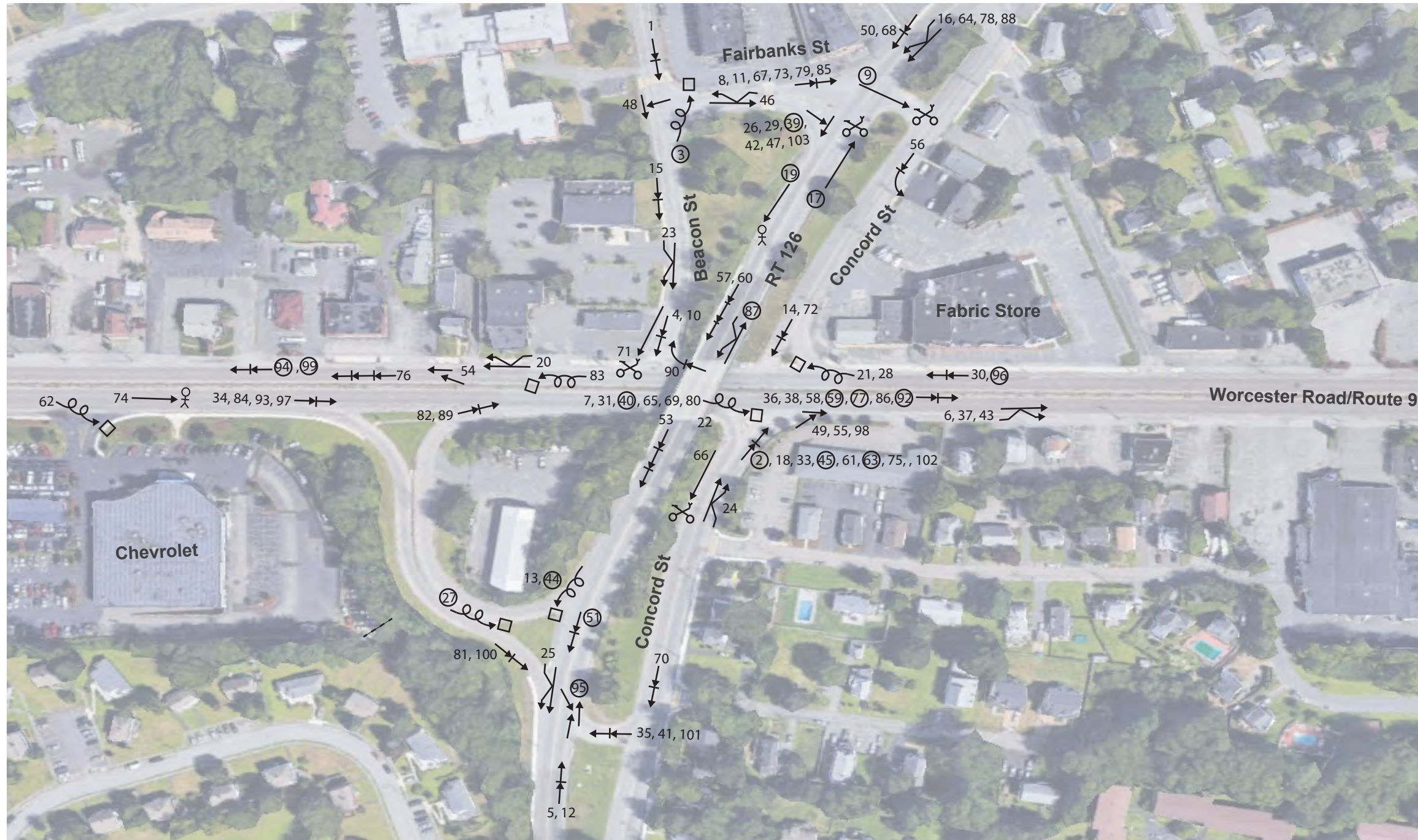
50	01/12/2018	Fri	12:07 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Wet	Dark - lighted roadway	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
51	02/03/2018	Sat	11:06 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
52	03/16/2018	Fri	11:31 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Unknown	Collision with motor vehicle in traffic / Unknown	Unknown / No improper driving
53	04/17/2018	Tue	2:17 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
54	04/28/2018	Sat	3:39 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Unknown	Collision with highway traffic sign post	Unknown
55	06/11/2018	Mon	6:15 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Fatigued/asleep / No improper driving
56	08/05/2018	Sun	7:49 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / Physical impairment / No improper driving
57	09/23/2018	Sun	12:04 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Entering traffic lane	Collision with motor vehicle in traffic	Unknown / No improper driving
58	09/29/2018	Sat	1:35 PM	Off-peak	6	0	Property damage only	Rear-end	Dry	Daylight	Clear / Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
59	10/03/2018	Wed	8:25 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
60	10/08/2018	Mon	9:10 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy / Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Inattention / Visibility obstructed
61	10/11/2018	Thu	2:00 PM	Off-peak	4	1	Possible	Rear-end	Wet	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
62	10/11/2018	Thu	11:00 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
63	10/16/2018	Tue	4:00 PM	Peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
64	10/22/2018	Mon	7:38 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Entering traffic lane	Collision with motor vehicle in traffic	No improper driving / Inattention
65	12/04/2018	Tue	10:13 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
66	12/30/2018	Sun	3:50 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
67	01/04/2019	Fri	8:14 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / Distracted / No improper driving
68	02/07/2019	Thu	11:15 AM	Off-peak	2	1	Possible	Rear-end	Wet	Daylight	Rain	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
69	02/27/2019	Wed	7:01 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Dark - lighted roadway	Clear	Entering traffic lane	Collision with motor vehicle in traffic	Followed too closely / No improper driving
70	03/05/2019	Tue	10:26 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
71	03/20/2019	Wed	12:50 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear / Cloudy	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
72	04/20/2019	Sat	10:19 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain / Cloudy	Entering traffic lane	Collision with motor vehicle in traffic	Followed too closely / No improper driving
73	04/22/2019	Mon	8:45 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear / Cloudy	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving

**Table 10
Crash Lookup: Cochituate Road at Route 9
MassDOT Crash Data 2015-2019**

74	06/10/2019	Mon	7:45 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dusk	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Made an improper turn
75	07/13/2019	Sat	12:51 PM	Off-peak	2	0	Property damage only	Rear-end	Unknown	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
76	07/13/2019	Sat	12:59 PM	Off-peak	2	0	Property damage only	Rear-end	Unknown	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / Inattention / No improper driving
77	07/14/2019	Sun	12:57 PM	Off-peak	2	0	Property damage only	Rear-end	Unknown	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
78	07/16/2019	Tue	7:15 PM	Off-peak	3	0	Property damage only	Rear-end	Unknown	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Distracted
79	08/05/2019	Mon	12:54 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
80	08/17/2019	Sat	4:45 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
81	08/23/2019	Fri	10:05 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
82	08/28/2019	Wed	4:00 PM	Peak	3	1	Non-incapacitating	Rear-end	Wet	Daylight	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
83	09/08/2019	Sun	5:08 PM	Off-peak	2	1	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
84	09/10/2019	Tue	10:50 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
85	09/11/2019	Wed	7:50 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
86	09/20/2019	Fri	5:00 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
87	09/21/2019	Sat	1:20 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
88	09/22/2019	Sun	4:30 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Distracted
89	10/07/2019	Mon	7:00 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Cloudy	Slowing or stopped in traffic / Unknown	Collision with motor vehicle in traffic	No improper driving
90	10/08/2019	Tue	10:35 AM	Off-peak	2	1	Possible	Rear-end	Wet	Daylight	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
91	10/24/2019	Thu	12:17 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
92	10/25/2019	Fri	12:11 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
93	11/01/2019	Fri	9:00 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
94	11/04/2019	Mon	11:35 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / No improper driving
95	12/08/2019	Sun	12:54 PM	Off-peak	3	1	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving

Table 10
Crash Lookup: Cochituate Road at Route 9
MassDOT Crash Data 2015-2019

96	12/18/2019	Wed	8:22 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
97	12/30/2019	Mon	9:12 AM	Peak	2	1	Possible	Rear-end	Wet	Daylight	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving



SYMBOLS

→	Moving Vehicle	→ □	Parked Vehicle
→ ←←	Backing Vehicle	→ □	Fixed Object
→ ·····	Non-Involved Vehicle	→ ⚙	Bicycle
→ ⤴	Pedestrian	→ 🐾	Animal

TYPES OF CRASH

→ ←→	Head On	→ ↘	Sideswipe
→ ↓ ↙	Angle	→ ⚙	Out of Control
→ →	Rear End		

CRASH INDEX AND SEVERITY

#, #, #

#	Property Damage Only Crash Index Number
#	Injury Crash Index Number
#	Fatal Crash Index Number



Figure 7
Collision Diagram 2015–19
Route 9 and Route 126

**Table 7
Crash Lookup: RT 126 at Route 9
MassDOT Crash Data 2015-2019**

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Condition	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	02/04/2015	Wed	9:30 PM	Off-peak	2	0	Property damage only	Rear-end	Snow	Dark - lighted roadway	Snow	Turning left / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
2	02/28/2015	Sat	12:47 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic / Collision with ditch	Followed too closely / No improper driving
3	03/21/2015	Sat	12:33 AM	Off-peak	1	1	Incapacitating	Single vehicle crash	Wet	Dark - lighted roadway	Sleet, hail	Turning left	Collision with curb	Driving too fast for conditions / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
4	04/11/2015	Sat	12:53 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Turning right	Collision with motor vehicle in traffic	Followed too closely / No improper driving
5	05/15/2015	Fri	9:00 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / Inattention / No improper driving
6	06/14/2015	Sun	1:15 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
7	06/14/2015	Sun	2:19 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with light pole or other post/support	Unknown
8	06/15/2015	Mon	9:10 PM	Off-peak	2	1	Possible	Rear-end	Wet	Daylight	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / No improper driving
9	07/02/2015	Thu	7:30 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Daylight	Clear	Travelling straight ahead	Collision with cyclist (bicycle, tricycle, unicycle, pedal car)	No improper driving
10	07/31/2015	Fri	7:14 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Entering traffic lane	Collision with motor vehicle in traffic	Followed too closely / No improper driving
11	08/25/2015	Tue	10:00 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
12	10/23/2015	Fri	2:57 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Other improper action
13	10/25/2015	Sun	4:38 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - unlit roadway	Cloudy / Rain	Travelling straight ahead	Collision with utility pole	Failure to keep in proper lane or running off road / Fatigued/asleep
14	11/03/2015	Tue	4:48 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dusk	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
15	11/08/2015	Sun	12:51 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Backing / Parked	Collision with parked motor vehicle	No improper driving
16	12/04/2015	Fri	7:30 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving / Made an improper turn
17	12/26/2015	Sat	9:12 AM	Off-peak	1	1	Incapacitating	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with cyclist (bicycle, tricycle, unicycle, pedal car)	No improper driving
18	12/31/2015	Thu	11:09 AM	Peak	2	0	Property damage only	Rear-end	Wet	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
19	03/05/2016	Sat	9:34 PM	Off-peak	1	2	Non-incapacitating	Single vehicle crash	Dry	Dark - unlit roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
20	03/17/2016	Thu	12:50 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - lighted roadway	Cloudy	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Failure to keep in proper lane or running off road / No improper driving
21	03/25/2016	Fri	12:16 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Wet	Dark - lighted roadway	Rain	Turning right	Collision with curb	Driving too fast for conditions / Failure to keep in proper lane or running off road
22	04/16/2016	Sat	5:56 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic / Turning right	Collision with motor vehicle in traffic	No improper driving / Other improper action

**Table 7
Crash Lookup: RT 126 at Route 9
MassDOT Crash Data 2015-2019**

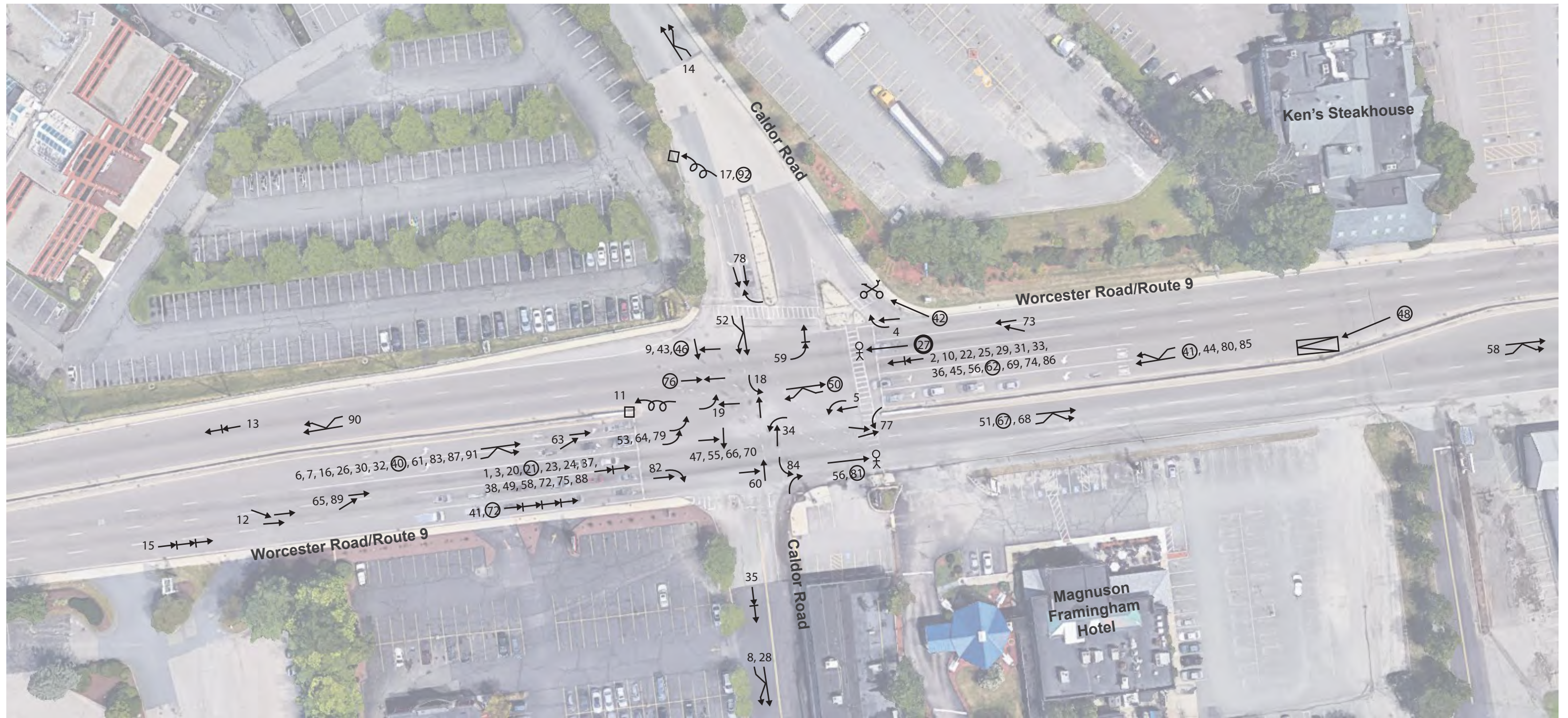
23	05/01/2016	Sun	9:50 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning right	Collision with motor vehicle in traffic	No improper driving / Made an improper turn / Failure to keep in proper lane or running off road
24	05/21/2016	Sat	7:01 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Overtaking/passing / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
25	05/28/2016	Sat	8:29 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Visibility obstructed / Unknown
26	06/20/2016	Mon	1:55 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
27	06/30/2016	Thu	7:16 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Dusk	Clear	Leaving traffic lane	Collision with guardrail	Driving too fast for conditions
28	07/06/2016	Wed	9:31 AM	Peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Turning right	Collision with curb	No improper driving
29	07/08/2016	Fri	2:10 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Travelling straight ahead / Turning right	Collision with light pole or other post/support / Collision with motor vehicle in traffic	Failed to yield right of way
30	07/14/2016	Thu	7:20 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Unknown
31	08/11/2016	Thu	2:17 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Wet	Daylight	Rain	Turning right	Collision with highway traffic sign post	Driving too fast for conditions
32	08/27/2016	Sat	10:53 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
33	11/14/2016	Mon	9:00 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear / Cloudy	Turning right	Collision with motor vehicle in traffic	No improper driving / Distracted
34	12/15/2016	Thu	3:07 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Followed too closely / No improper driving
35	12/16/2016	Fri	7:46 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Turning right	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Failure to keep in proper lane or running off road
36	01/11/2017	Wed	11:51 AM	Off-peak	2	1	Possible	Rear-end	Wet	Daylight	Clear	Slowing or stopped in traffic / Turning right	Collision with motor vehicle in traffic	Unknown / No improper driving
37	01/11/2017	Wed	9:30 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
38	01/13/2017	Fri	2:30 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
39	02/02/2017	Thu	5:31 AM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Other improper action / Unknown
40	02/07/2017	Tue	7:57 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Ice	Dark - lighted roadway	Sleet, hail / Rain	Turning right	Collision with other fixed object (wall, building, tunnel, etc.)	Driving too fast for conditions
41	04/01/2017	Sat	5:12 PM	Off-peak	2	0	Possible	Rear-end	Wet	Daylight	Rain / Snow	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Other improper action
42	05/15/2017	Mon	5:00 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Backing	Collision with motor vehicle in traffic	No improper driving
43	06/05/2017	Mon	5:52 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
44	07/11/2017	Tue	8:35 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Wet	Dark - lighted roadway	Rain	Leaving traffic lane	Collision with utility pole	Failure to keep in proper lane or running off road
45	07/11/2017	Tue	1:22 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
46	07/25/2017	Tue	12:20 AM	Off-peak	2	0	Property damage only	Sideswipe, opposite direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Reported but invalid / Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
47	08/03/2017	Thu	6:15 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
48	08/27/2017	Sun	1:40 PM	Off-peak	2	1	Property damage only	Angle	Dry	Daylight	Clear	Turning left / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way

**Table 7
Crash Lookup: RT 126 at Route 9
MassDOT Crash Data 2015-2019**

49	09/02/2017	Sat	6:44 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic / Turning right	Collision with motor vehicle in traffic	Unknown
50	09/03/2017	Sun	6:52 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Dusk	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / Followed too closely
51	10/02/2017	Mon	10:10 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
52	10/13/2017	Fri	7:27 PM	Off-peak	2	1	Possible	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
53	10/23/2017	Mon	7:06 PM	Off-peak	3	1	Possible	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
54	11/21/2017	Tue	6:45 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - unlit roadway	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
55	12/06/2017	Wed	12:50 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
56	12/17/2017	Sun	10:49 AM	Off-peak	2	1	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / No improper driving
57	12/28/2017	Thu	7:46 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Dark - unlit roadway	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
58	01/03/2018	Wed	3:22 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
59	02/08/2018	Thu	10:43 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
60	02/14/2018	Wed	6:07 PM	Peak	3	0	Property damage only	Rear-end	Dry	Dark - unlit roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
61	02/25/2018	Sun	4:37 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic / Unknown	Unknown / No improper driving
62	02/28/2018	Wed	1:42 AM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with curb	Exceeded authorized speed limit / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
63	03/30/2018	Fri	4:53 PM	Peak	2	0	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Entering traffic lane	Collision with motor vehicle in traffic	Unknown
64	05/15/2018	Tue	2:19 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
65	05/16/2018	Wed	7:26 AM	Peak	1	0	Property damage only	Single vehicle crash	Sand, mud, dirt, oil, gravel	Daylight	Cloudy / Clear	Turning right	Other	Unknown
66	06/16/2018	Sat	2:26 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Wet	Daylight	Rain	Entering traffic lane	Collision with cyclist (bicycle, tricycle, unicycle, pedal car)	Unknown
67	06/19/2018	Tue	8:40 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
68	06/20/2018	Wed	2:18 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Turning right	Collision with motor vehicle in traffic	Followed too closely / Inattention / No improper driving
69	09/03/2018	Mon	6:00 PM	Peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Turning right	Collision with other fixed object (wall, building, tunnel, etc.)	Failure to keep in proper lane or running off road
70	09/06/2018	Thu	5:47 PM	Peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
71	09/17/2018	Mon	2:37 PM	Off-peak	1	1	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with cyclist (bicycle, tricycle, unicycle, pedal car)	No improper driving
72	09/19/2018	Wed	2:27 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain / Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / Distracted / No improper driving
73	09/21/2018	Fri	4:42 PM	Peak	2	1	Possible	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
74	10/08/2018	Mon	7:29 PM	Off-peak	1	1	Possible	Single vehicle crash	Wet	Dark - lighted roadway	Rain	Travelling straight ahead	Collision with pedestrian	No improper driving
75	11/02/2018	Fri	4:45 PM	Peak	2	0	Property damage only	Rear-end	Wet	Daylight	Cloudy	Slowing or stopped in traffic / Turning right	Collision with motor vehicle in traffic	Followed too closely / No improper driving
76	11/12/2018	Mon	3:59 PM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving

**Table 7
Crash Lookup: RT 126 at Route 9
MassDOT Crash Data 2015-2019**

77	11/15/2018	Thu	8:36 AM	Peak	2	1	Non-incapacitating	Rear-end	Dry	Daylight	Cloudy / Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
78	11/16/2018	Fri	2:54 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Snow	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
79	12/03/2018	Mon	1:13 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings / Followed too closely
80	12/14/2018	Fri	8:05 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Clear	Changing lanes	Collision with curb	Unknown
81	03/05/2019	Tue	2:18 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
82	03/13/2019	Wed	4:00 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
83	03/16/2019	Sat	11:06 AM	Off-peak	1	1	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with guardrail	No improper driving
84	04/01/2019	Mon	3:33 PM	Peak	2	1	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
85	04/14/2019	Sun	11:05 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Dark - lighted roadway	Rain	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown / No improper driving
86	04/15/2019	Mon	2:44 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Travelling straight ahead	Collision with motor vehicle in traffic	Exceeded authorized speed limit / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner / No improper driving
87	05/17/2019	Fri	7:36 AM	Peak	2	2	Non-incapacitating	Sideswipe, opposite direction	Wet	Daylight	Rain	Travelling straight ahead	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Failure to keep in proper lane or running off road / No improper driving
88	06/12/2019	Wed	4:09 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / No improper driving
89	06/13/2019	Thu	8:12 AM	Peak	2	0	Property damage only	Rear-end	Unknown	Daylight	Rain	Entering traffic lane / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / No improper driving
90	06/14/2019	Fri	7:39 AM	Peak	1	0	Property damage only	Rear-end	Unknown	Daylight	Cloudy	Turning right	Collision with motor vehicle in traffic	No improper driving
91	06/17/2019	Mon	3:20 PM	Off-peak	2	0	Property damage only	Rear-end	Unknown	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
92	06/30/2019	Sun	10:01 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Unknown	Daylight	Cloudy	Turning right	Collision with motor vehicle in traffic	Unknown / Followed too closely
93	07/16/2019	Tue	7:24 AM	Peak	2	0	Property damage only	Rear-end	Unknown	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Inattention / No improper driving
94	07/17/2019	Wed	1:36 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Unknown	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
95	07/18/2019	Thu	9:14 AM	Peak	3	2	Non-incapacitating	Angle	Unknown	Daylight	Rain	Making U-turn / Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Failed to yield right of way / Disregarded traffic signs, signals, road markings / No improper driving
96	07/18/2019	Thu	5:30 PM	Peak	2	1	Non-incapacitating	Rear-end	Unknown	Daylight	Cloudy	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
97	09/17/2019	Tue	9:40 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
98	09/29/2019	Sun	11:00 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	No improper driving
99	10/10/2019	Thu	10:29 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Wet	Daylight	Cloudy / Rain	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
100	11/06/2019	Wed	2:10 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
101	11/06/2019	Wed	5:15 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Turning right	Collision with motor vehicle in traffic	Followed too closely / No improper driving
102	11/13/2019	Wed	1:25 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Followed too closely / No improper driving
103	12/21/2019	Sat	12:00 AM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Turning left / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving



SYMBOLS

- | | | | | |
|----|----------------------|---|---|----------------|
| → | Moving Vehicle | → | ▭ | Parked Vehicle |
| ↔ | Backing Vehicle | → | □ | Fixed Object |
| ⋯→ | Non-Involved Vehicle | → | ⊗ | Bicycle |
| → | ⊗ | → | 🐾 | Animal |
| | Pedestrian | | | |

TYPES OF CRASH

- | | | | |
|-----|----------|----|----------------|
| ↔↔↔ | Head On | ↔↔ | Sideswipe |
| →↓ | Angle | ↪↪ | Out of Control |
| →↔ | Rear End | | |

CRASH INDEX AND SEVERITY

- #, #, #
- # Property Damage Only Crash Index Number
 - # Injury Crash Index Number
 - # Fatal Crash Index Number



Figure 8
Collision Diagram 2015–19
Route 9 and Caldor Road

**Table 8
Crash Lookup: Caldor Road at Route 9
MassDOT Crash Data 2015-2019**

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Conditions	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	01/01/2015	Thu	5:27 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
2	01/06/2015	Tue	9:19 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
3	01/16/2015	Fri	6:59 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
4	01/30/2015	Fri	2:30 PM	Off-peak	2	0	Property damage only	Angle	Wet	Daylight	Clear / Other	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / Other improper action
5	01/31/2015	Sat	3:55 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
6	05/20/2015	Wed	4:13 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dusk	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
7	06/10/2015	Wed	9:10 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
8	06/29/2015	Mon	7:02 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Unknown	Collision with motor vehicle in traffic	No improper driving
9	08/09/2015	Sun	8:20 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
10	09/01/2015	Tue	9:08 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
11	10/18/2015	Sun	12:09 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Daylight	Cloudy	Travelling straight ahead	Collision with median barrier	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
12	12/11/2015	Fri	12:00 AM	Off-peak	3	0	Property damage only	Angle	Wet	Dawn	Fog, smog, smoke / Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
13	01/14/2016	Thu	5:52 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
14	01/29/2016	Fri	10:14 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - unlit roadway	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
15	02/15/2016	Mon	2:52 PM	Off-peak	3	3	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
16	02/27/2016	Sat	10:22 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
17	03/04/2016	Fri	2:53 AM	Off-peak	1	1	Unknown	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Turning right	Collision with tree	Failure to keep in proper lane or running off road / Unknown
18	03/11/2016	Fri	6:50 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
19	05/01/2016	Sun	8:35 AM	Off-peak	2	2	Unknown	Head-on	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
20	05/31/2016	Tue	8:04 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Turning left / Making U-turn	Collision with motor vehicle in traffic	No improper driving / Followed too closely
21	06/04/2016	Sat	9:13 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
22	06/21/2016	Tue	6:23 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / Inattention
23	07/05/2016	Tue	10:56 PM	Off-peak	2	1	Possible	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Failed to yield right of way / No improper driving

**Table 8
Crash Lookup: Caldor Road at Route 9
MassDOT Crash Data 2015-2019**

24	07/06/2016	Wed	3:46 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	Unknown
25	07/14/2016	Thu	5:26 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
26	07/23/2016	Sat	10:41 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	No improper driving
27	08/09/2016	Tue	9:02 PM	Off-peak	1	2	Fatal	Single vehicle crash	Dry	Dark - unlit roadway	Clear	Travelling straight ahead	Collision with pedestrian	No improper driving
28	08/26/2016	Fri	8:14 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Turning right	Collision with motor vehicle in traffic	No improper driving
29	08/30/2016	Tue	6:00 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Inattention / Distracted / No improper driving
30	11/11/2016	Fri	1:35 PM	Off-peak	2	1	Non-incapacitating	Sideswipe, same direction	Dry	Daylight	Clear	Turning left / Making U-turn	Collision with motor vehicle in traffic	Inattention / No improper driving
31	01/25/2017	Wed	5:32 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
32	01/28/2017	Sat	9:57 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
33	03/26/2017	Sun	2:14 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Cloudy / Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
34	04/01/2017	Sat	1:38 PM	Off-peak	2	0	Property damage only	Angle	Slush	Daylight	Sleet, hail / Snow	Turning left / Making U-turn	Collision with motor vehicle in traffic	Unknown
35	05/03/2017	Wed	7:53 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
36	05/05/2017	Fri	5:33 PM	Peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain	Slowing or stopped in traffic / Unknown	Collision with motor vehicle in traffic / Unknown	Unknown
37	05/10/2017	Wed	11:54 PM	Off-peak	2	1	Possible	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / Inattention
38	05/13/2017	Sat	2:12 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear / Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
39	07/20/2017	Thu	4:50 PM	Peak	4	3	Possible	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
40	08/14/2017	Mon	10:35 PM	Off-peak	3	2	Incapacitating	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Inattention / No improper driving
41	09/14/2017	Thu	9:20 PM	Off-peak	2	1	Non-incapacitating	Sideswipe, same direction	Wet	Dark - unlit roadway	Rain	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
42	09/25/2017	Mon	3:25 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with cyclist (bicycle, tricycle, unicycle, pedal car)	Unknown
43	10/07/2017	Sat	9:30 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
44	10/18/2017	Wed	8:00 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Unknown / No improper driving
45	11/03/2017	Fri	11:32 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear / Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Followed too closely / Inattention / No improper driving
46	11/04/2017	Sat	7:35 AM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown / Other improper action
47	11/13/2017	Mon	9:50 PM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Cloudy / Rain	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings

**Table 8
Crash Lookup: Caldor Road at Route 9
MassDOT Crash Data 2015-2019**

48	11/17/2017	Fri	4:09 AM	Off-peak	3	2	Non-incapacitating	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Parked	Collision with parked motor vehicle	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner / Failure to keep in proper lane or running off road / No improper driving
49	11/20/2017	Mon	7:27 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
50	12/02/2017	Sat	12:37 PM	Off-peak	2	1	Non-incapacitating	Sideswipe, opposite direction	Dry	Daylight	Clear	Slowing or stopped in traffic / Backing	Collision with motor vehicle in traffic	Inattention / No improper driving
51	12/12/2017	Tue	9:57 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - unlit roadway	Rain	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
52	01/12/2018	Fri	10:41 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain / Fog, smog, smoke	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
53	02/16/2018	Fri	1:55 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown / No improper driving
54	02/20/2018	Tue	1:02 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Turning right / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Followed too closely
55	03/02/2018	Fri	12:00 AM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Rain / Severe crosswinds	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
56	03/04/2018	Sun	7:53 PM	Off-peak	1	1	Possible	Single vehicle crash	Wet	Dark - lighted roadway	Rain	Unknown	Unknown	Unknown
57	03/31/2018	Sat	3:28 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
58	04/15/2018	Sun	6:42 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
59	04/18/2018	Wed	1:47 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with parked motor vehicle / Collision with motor vehicle in traffic	Unknown / No improper driving
60	05/08/2018	Tue	9:40 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Entering traffic lane / Travelling straight ahead	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Failed to yield right of way / No improper driving
61	05/15/2018	Tue	11:01 AM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
62	06/13/2018	Wed	9:48 PM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with parked motor vehicle / Collision with motor vehicle in traffic	No improper driving / Followed too closely
63	06/27/2018	Wed	12:28 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Unknown
64	08/15/2018	Wed	3:48 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Making U-turn	Collision with motor vehicle in traffic	No improper driving / Failure to keep in proper lane or running off road / Made an improper turn
65	08/20/2018	Mon	9:33 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
66	09/18/2018	Tue	11:11 AM	Off-peak	2	0	Property damage only	Angle	Wet	Daylight	Rain / Cloudy	Travelling straight ahead	Collision with motor vehicle in traffic	Inattention / No improper driving
67	10/22/2018	Mon	11:56 AM	Off-peak	2	1	Non-incapacitating	Sideswipe, same direction	Dry	Daylight	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving

**Table 8
Crash Lookup: Caldor Road at Route 9
MassDOT Crash Data 2015-2019**

68	11/07/2018	Wed	8:40 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
69	11/14/2018	Wed	11:35 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Backing	Collision with motor vehicle in traffic	Other improper action / No improper driving
70	11/18/2018	Sun	5:01 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - unlit roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
71	11/29/2018	Thu	5:11 PM	Peak	4	1	Non-incapacitating	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
72	11/29/2018	Thu	7:53 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
73	12/21/2018	Fri	1:33 PM	Off-peak	2	0	Property damage only	Angle	Wet	Daylight	Rain	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
74	12/21/2018	Fri	5:30 PM	Peak	3	0	Property damage only	Rear-end	Wet	Dusk	Rain	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
75	01/30/2019	Wed	5:00 PM	Peak	2	0	Property damage only	Rear-end	Dry	Dusk	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
76	04/01/2019	Mon	7:40 AM	Peak	2	2	Non-incapacitating	Head-on	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown
77	04/17/2019	Wed	6:20 PM	Peak	3	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Unknown / No improper driving
78	07/22/2019	Mon	4:14 PM	Peak	3	1	Possible	Head-on	Dry	Daylight	Clear	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	Made an improper turn / Failure to keep in proper lane or running off road / No improper driving
79	08/01/2019	Thu	8:19 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Turning left	Collision with motor vehicle in traffic	Unknown
80	08/17/2019	Sat	7:40 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - unlit roadway	Rain	Turning left / Making U-turn	Collision with motor vehicle in traffic	Unknown / Failed to yield right of way
81	09/03/2019	Tue	8:34 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with pedestrian	No improper driving
82	09/15/2019	Sun	6:40 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning right / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
83	10/05/2019	Sat	4:15 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Made an improper turn / No improper driving
84	10/14/2019	Mon	12:15 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Turning left / Turning right	Collision with motor vehicle in traffic	No improper driving
85	10/23/2019	Wed	9:00 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning right / Slowing or stopped in traffic	Collision with motor vehicle in traffic	Made an improper turn / No improper driving
86	10/31/2019	Thu	6:18 PM	Peak	4	0	Property damage only	Rear-end	Wet	Dark - lighted roadway	Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
87	11/04/2019	Mon	11:30 AM	Off-peak	2	2	Possible	Sideswipe, same direction	Dry	Daylight	Clear	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Failed to yield right of way / Disregarded traffic signs, signals, road markings / No improper driving
88	11/06/2019	Wed	7:21 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely / Failure to keep in proper lane or running off road
89	11/24/2019	Sun	6:43 PM	Off-peak	2	0	Property damage only	Angle	Wet	Dark - lighted roadway	Rain	Changing lanes / Travelling straight ahead	Collision with motor vehicle in traffic	Inattention / No improper driving

**Table 8
Crash Lookup: Caldor Road at Route 9
MassDOT Crash Data 2015-2019**

90	11/29/2019	Fri	6:20 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Overtaking/passing	Collision with motor vehicle in traffic	No improper driving / Failed to yield right of way
91	12/27/2019	Fri	1:53 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Turning left	Collision with motor vehicle in traffic	Unknown
92	12/28/2019	Sat	5:14 PM	Off-peak	1	1	Non-incapacitating	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Turning left	Collision with tree	Illness



SYMBOLS

- | | |
|------------------------|-------------------|
| → Moving Vehicle | → Parked Vehicle |
| ↔ Backing Vehicle | → Fixed Object |
| ⋯ Non-Involved Vehicle | → Bicycle |
| → Pedestrian | → Animal |

TYPES OF CRASH

- | | |
|-------------|-------------------|
| ↔↔↔ Head On | ↔↔ Sideswipe |
| →↓↔ Angle | ↪↪ Out of Control |
| →↔ Rear End | |

CRASH INDEX AND SEVERITY

- #, #, #
- # Property Damage Only Crash Index Number
- # Injury Crash Index Number
- # Fatal Crash Index Number



Figure 9
Collision Diagram 2015–19
Route 9 and Oak Street

**Table 9
Crash Lookup: Oak Street at Route 9
MassDOT Crash Data 2015-2019**

Index	Crash Date	Day	Time	Peak Hour	# Veh	# Injured	Crash Severity	Manner of Collision	Road Surface Condition	Ambient Light Conditions	Weather Conditions	Vehicle Actions Prior to Crash	Most Harmful Event	Driver Contributing Code
1	01/20/2015	Tue	8:38 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
2	02/20/2015	Fri	12:00 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Other improper action
3	03/04/2015	Wed	8:54 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Wet	Dark - lighted roadway	Clear	Other	Collision with highway traffic sign post	Other improper action
4	03/05/2015	Thu	1:26 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
5	03/06/2015	Fri	5:11 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Inattention
6	03/19/2015	Thu	8:29 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Other improper action
7	03/23/2015	Mon	4:51 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Cloudy	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Other improper action
8	04/01/2015	Wed	9:26 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving
9	04/10/2015	Fri	2:23 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
10	05/11/2015	Mon	5:40 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Backing	Collision with motor vehicle in traffic	No improper driving
11	05/13/2015	Wed	2:10 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
12	05/22/2015	Fri	7:41 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
13	05/28/2015	Thu	10:31 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
14	06/02/2015	Tue	9:40 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
15	06/04/2015	Thu	6:57 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
16	06/04/2015	Thu	2:28 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
17	06/24/2015	Wed	7:26 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
18	07/12/2015	Sun	12:31 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Entering traffic lane	Collision with motor vehicle in traffic	No improper driving / Followed too closely
19	07/18/2015	Sat	12:19 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Physical impairment / No improper driving
20	07/20/2015	Mon	6:45 PM	Off-peak	4	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Fatigued/asleep / No improper driving
21	08/04/2015	Tue	6:42 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Clear	Backing / Travelling straight ahead	Collision with motor vehicle in traffic	Wrong side or wrong way / Failed to yield right of way / No improper driving
22	08/17/2015	Mon	3:15 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Other improper action

**Table 9
Crash Lookup: Oak Street at Route 9
MassDOT Crash Data 2015-2019**

23	08/21/2015	Fri	1:26 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Turning left	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
24	08/21/2015	Fri	7:34 AM	Peak	2	0	Property damage only	Angle	Wet	Daylight	Cloudy / Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Other improper action
25	08/24/2015	Mon	12:25 PM	Off-peak	3	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Cloudy	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown
26	08/27/2015	Thu	7:08 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
27	08/31/2015	Mon	12:24 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
28	09/02/2015	Wed	7:49 AM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
29	09/08/2015	Tue	8:46 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
30	09/08/2015	Tue	1:27 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Made an improper turn / No improper driving
31	09/11/2015	Fri	10:56 AM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
32	09/27/2015	Sun	8:58 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Inattention
33	10/06/2015	Tue	4:19 PM	Peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Overtaking/passing / Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
34	10/07/2015	Wed	10:00 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
35	10/23/2015	Fri	10:59 AM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings / Failure to keep in proper lane or running off road
36	11/03/2015	Tue	10:17 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
37	11/15/2015	Sun	8:28 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
38	01/25/2016	Mon	6:37 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dawn	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
39	02/02/2016	Tue	2:03 AM	Off-peak	2	1	Non-incapacitating	Rear-end	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Fatigued/asleep / No improper driving
40	02/06/2016	Sat	3:07 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
41	03/13/2016	Sun	6:19 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
42	03/15/2016	Tue	9:47 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Dark - unlit roadway	Rain / Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
43	03/18/2016	Fri	8:45 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Inattention
44	04/11/2016	Mon	1:21 PM	Off-peak	1	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving

**Table 9
Crash Lookup: Oak Street at Route 9
MassDOT Crash Data 2015-2019**

45	05/04/2016	Wed	2:16 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
46	06/09/2016	Thu	4:52 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Dawn	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Other improper action
47	06/30/2016	Thu	11:52 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Other improper action
48	07/12/2016	Tue	9:30 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
49	07/13/2016	Wed	8:07 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
50	08/04/2016	Thu	12:38 PM	Off-peak	2	3	Possible	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
51	08/07/2016	Sun	6:20 AM	Off-peak	2	1	Fatal injury	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings / Failed to yield right of way
52	08/21/2016	Sun	12:56 PM	Off-peak	3	1	Incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
53	09/01/2016	Thu	4:15 PM	Peak	1	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning right	Collision with motor vehicle in traffic	No improper driving
54	09/22/2016	Thu	8:31 AM	Peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
55	09/23/2016	Fri	10:33 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
56	10/24/2016	Mon	9:06 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Other improper action
57	10/27/2016	Thu	7:42 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Dark - unlit roadway	Rain / Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
58	12/02/2016	Fri	5:39 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Inattention
59	01/13/2017	Fri	12:25 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
60	03/26/2017	Sun	8:47 AM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	No improper driving / Other improper action
61	05/09/2017	Tue	2:43 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
62	05/11/2017	Thu	5:07 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning right	Collision with motor vehicle in traffic	Made an improper turn / No improper driving
63	05/20/2017	Sat	10:09 PM	Off-peak	2	1	Non-incapacitating	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	Unknown / No improper driving
64	05/30/2017	Tue	7:03 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
65	06/06/2017	Tue	1:49 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Rain	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
66	07/06/2017	Thu	4:38 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
67	08/11/2017	Fri	1:01 PM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Other improper action

**Table 9
Crash Lookup: Oak Street at Route 9
MassDOT Crash Data 2015-2019**

68	10/19/2017	Thu	9:59 AM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Other improper action
69	10/22/2017	Sun	3:31 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
70	11/27/2017	Mon	10:39 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
71	12/13/2017	Wed	6:42 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Cloudy	Turning left / Making U-turn	Collision with motor vehicle in traffic	No improper driving
72	12/14/2017	Thu	1:50 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
73	02/12/2018	Mon	8:21 PM	Off-peak	2	0	Property damage only	Angle	Dry	Dark - lighted roadway	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
74	03/22/2018	Thu	1:49 PM	Off-peak	2	0	Property damage only	Rear-end	Wet	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
75	03/29/2018	Thu	5:29 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Backing	Collision with motor vehicle in traffic	No improper driving / Inattention
76	05/03/2018	Thu	6:44 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
77	05/21/2018	Mon	3:51 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
78	06/05/2018	Tue	4:58 PM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving
79	09/06/2018	Thu	4:54 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Wet	Daylight	Rain / Cloudy	Travelling straight ahead / Turning right	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
80	09/13/2018	Thu	9:04 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
81	09/23/2018	Sun	1:53 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Distracted
82	10/09/2018	Tue	10:09 AM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
83	10/10/2018	Wed	1:08 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Turning left	Collision with motor vehicle in traffic	No improper driving
84	10/14/2018	Sun	7:27 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Dark - lighted roadway	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
85	10/26/2018	Fri	6:05 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Dusk	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving / Inattention
86	11/21/2018	Wed	2:42 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
87	11/27/2018	Tue	5:04 PM	Peak	2	0	Property damage only	Angle	Dry	Dusk	Clear	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Failed to yield right of way / No improper driving
88	12/10/2018	Mon	1:40 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
89	01/06/2019	Sun	12:57 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Other improper action
90	02/05/2019	Tue	3:22 PM	Off-peak	2	0	Property damage only	Sideswipe, opposite direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	Failure to keep in proper lane or running off road / No improper driving
91	02/23/2019	Sat	2:54 PM	Off-peak	3	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Inattention
92	03/02/2019	Sat	2:23 PM	Off-peak	2	0	Property damage only	Rear-end	Snow	Daylight	Snow	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Inattention
93	03/18/2019	Mon	4:15 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead / Changing lanes	Collision with motor vehicle in traffic	No improper driving

**Table 9
Crash Lookup: Oak Street at Route 9
MassDOT Crash Data 2015-2019**

94	03/25/2019	Mon	2:48 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Other improper action
95	04/07/2019	Sun	8:42 AM	Off-peak	2	0	Property damage only	Angle	Dry	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
96	05/17/2019	Fri	4:45 PM	Peak	2	1	Non-incapacitating	Rear-end	Wet	Daylight	Clear	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving
97	06/11/2019	Tue	1:12 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Followed too closely
98	06/17/2019	Mon	8:18 AM	Peak	3	2	Non-incapacitating	Rear-end	Dry	Daylight	Clear	Slowing or stopped in traffic / Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
99	08/08/2019	Thu	8:00 AM	Peak	2	0	Property damage only	Rear-end	Dry	Daylight	Clear / Other	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Other improper action
100	08/09/2019	Fri	3:25 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	No improper driving / Disregarded traffic signs, signals, road markings
101	08/19/2019	Mon	12:47 PM	Off-peak	2	1	Non-incapacitating	Angle	Dry	Daylight	Clear / Other	Travelling straight ahead / Turning left	Collision with motor vehicle in traffic	Disregarded traffic signs, signals, road markings / Other improper action / No improper driving
102	08/31/2019	Sat	11:42 PM	Off-peak	1	0	Property damage only	Single vehicle crash	Dry	Dark - unlit roadway	Clear	Travelling straight ahead	Collision with median barrier	Fatigued/asleep / Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
103	10/01/2019	Tue	2:14 PM	Off-peak	2	0	Property damage only	Rear-end	Dry	Daylight	Cloudy	Slowing or stopped in traffic	Collision with motor vehicle in traffic	No improper driving / Other improper action
104	10/07/2019	Mon	4:06 PM	Peak	4	0	Property damage only	Angle	Dry	Daylight	Cloudy	Making U-turn / Turning left	Collision with motor vehicle in traffic	No improper driving
105	11/06/2019	Wed	2:49 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Clear	Travelling straight ahead	Collision with motor vehicle in traffic	Inattention
106	11/18/2019	Mon	4:58 PM	Peak	2	0	Property damage only	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain	Making U-turn / Entering traffic lane	Collision with motor vehicle in traffic	No improper driving
107	12/16/2019	Mon	12:51 PM	Off-peak	2	0	Property damage only	Sideswipe, same direction	Dry	Daylight	Cloudy / Other	Travelling straight ahead	Collision with motor vehicle in traffic	Unknown

**Appendix F:
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>Step I: Problem/Need/Opportunity Identification 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>Step II: Planning 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>Step III: Project Initiation 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>Step IV: Design, Environmental, and Right of Way 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>Step V: Programming 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>Step VI: Procurement 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>Step VII: Construction 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>Step VIII: Project Assessment 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