

Route 138 Priority Corridor Study Milton, MA



Addressing Priority
Corridors from
the Long-Range
Transportation Plan
Needs Assessment

Route 138 Priority Corridor Study

Milton, Massachusetts

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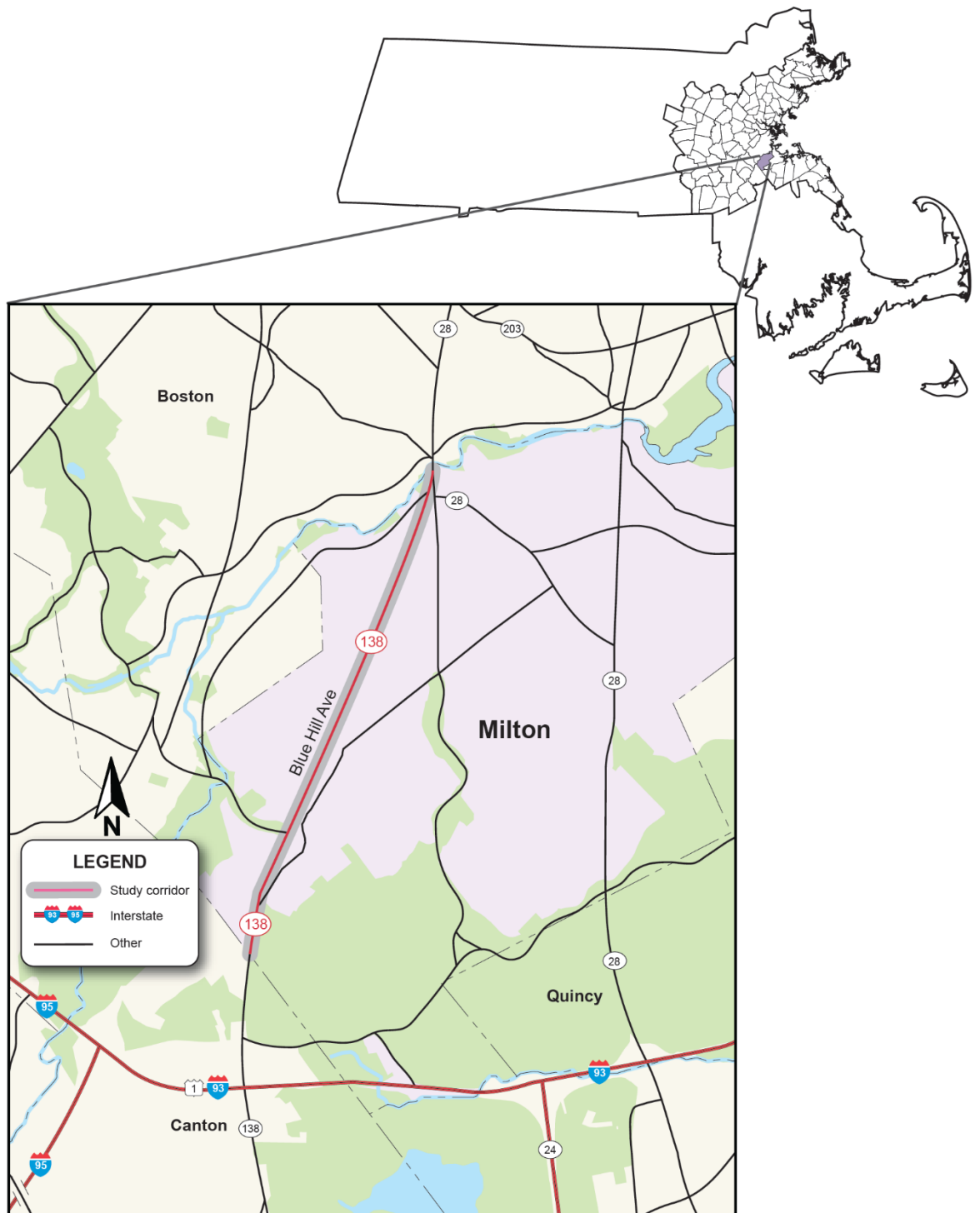
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Abstract

The Boston Region Metropolitan Planning Organization (MPO) selected Route 138 in the Town of Milton as the subject of a corridor study in federal fiscal year (FFY) 2018. The *Route 138 Priority Corridor Study* focuses on one of the locations identified in a regional needs assessment—conducted as part of the MPO’s Long-Range Transportation Plan, *Charting Progress to 2040*—used to guide investment decisions regarding transportation infrastructure improvements in the Boston region. The MPO prioritized this location for study after considering a number of factors: the need to address poor safety conditions and traffic congestion; the desire to enhance multimodal transportation; the need to maintain regional travel capacity; the interest in ensuring that, over time, corridor studies are funded in all subregions of the MPO’s planning area; and the potential for recommendations from the study to be implemented. This report details the analyses of the existing conditions and assessments of safety and operational problems in the corridor, discusses options for roadway improvements, and makes recommendations for implementing improvements.

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Executive Summary

ES.1 BACKGROUND

The Boston Region Metropolitan Planning Organization (MPO) selected Route 138 in the Town of Milton as the subject of a corridor study in federal fiscal year (FFY) 2018. The *Route 138 Priority Corridor Study* focuses on one of the locations identified in a regional needs assessment—conducted as part of the MPO’s Long-Range Transportation Plan (LRTP), *Charting Progress to 2040*—used to guide investment decisions regarding transportation infrastructure improvements in the Boston region.

The MPO prioritized this location for study after considering a number of factors, including the need to address poor safety conditions and traffic congestion; desire to enhance multimodal transportation; need to maintain regional travel capacity; and the potential to implement the study recommendations. The report analyzes the existing conditions, assesses safety and operational problems in the corridor, and discusses concepts for roadway improvements.

ES.2 EXISTING CONDITIONS

Route 138 in Milton is a two-way, two-lane principal arterial under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). The Town of Milton has jurisdiction of the majority of the crossing streets. The Department of Conservation and Recreation (DCR) has jurisdiction of Green Street and Neponset Valley Parkway; DCR also oversees the Blue Hills Recreational area.

The MassDOT Highway Division, Town of Milton, and Boston Region MPO collected and assembled the data used to assess the existing conditions and identify problems in the corridor, which included vehicular, pedestrian, and bicycle volumes, traffic speeds, crashes, zoning and land uses, and community input data (community survey).

Our analysis rates the corridor as *poor* based on the quality of vehicular, pedestrian, and bicycle travel it provides. Many locations in the study area experienced a greater-than-expected number of crashes; and two intersections are on the list of Highway Safety Improvement Program (HSIP) crash clusters.¹ The roadway is considered unfriendly for pedestrians and bicyclists because of

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 5), or a fatality (weighted by 10).

- A lack of connected and continuous bicycle lanes
- Gaps in the sidewalk network
- Narrow and substandard sidewalks
- A lack of crosswalks at midblock locations
- Obstructions in sidewalks
- Poor street lighting
- High vehicle speeds
- Roadway configurations that create inequity by placing too much emphasis on vehicular use

The traffic safety and operational problems facing roadway users include, but are not limited to

- High vehicular speeds
- High-crash locations
- High volumes of traffic
- Inadequate capacity at some of the signalized intersections
- A lack of left-turn lanes
- Outdated signal-timing plans
- Outdated signal equipment
- Drainage problems and pavement conditions
- Motorists' difficulty in turning left or pulling out of side streets and business driveways

ES.3 PROPOSED IMPROVEMENTS

MPO staff, working with an advisory task force (representatives from MassDOT and Town of Milton), developed Complete Streets concepts for the corridor. Presently, MassDOT project #608484: Canton-Milton Roadway Improvements on Route 138, which had already been programmed in the 2020 Transportation Improvement Program (TIP), addresses roadway and related work on Route 138 in Canton and Milton. For the purposes of this study, staff divided the corridor into three segments—southern, middle, and northern—and developed improvement concepts for each segment.

Blue Hills Reservation Area (Southern Segment)

- Alternative 1 consists of a three-lane cross-section—one southbound lane and two northbound lanes and a multi-use path on the east side of the roadway. Figure ES 1 shows the improvements in Alternative 1. The two northbound lanes would eliminate the merging from two lanes to one at

the Canton Park-and-Ride lot, and continue as a right-turn-only lane onto the Canton Avenue branch.

- Alternative 2 maintains the existing roadway cross-section—one travel lane in each direction and a bicycle lane and sidewalk on either side of the roadway. Figure ES 1 shows the improvements in Alternative 2.
- Both Alternatives 1 and 2 provide a pedestrian- and bicyclist-friendly environment. However, Alternative 1, improves safety and traffic flow by eliminating the merging of the two northbound lanes into one lane just north of the intersection of Route 138 and Royall Street/Blue Hill River Road; and avoids relocating utility poles on the west side of the roadway, which could impact the project schedule because of right-of-way concerns. Alternative 2, on the other hand increases access and connectivity to places for pedestrian and bicyclists and reduces pedestrian and bicycle crossings on Route 138.

Brush Hill Area (Middle Segment)

- Alternative 1 maintains the two-lane cross-section, and builds a multi-use path on the east side of the roadway. Figure ES 1 shows the improvement concepts in Alternative 1.
- Alternative 2 maintains the existing two-way roadway cross-section and builds a bicycle lane and sidewalk on either side of the roadway. Figure ES 1 shows the improvements in Alternative 2.

Both Alternatives 1 and 2 provide a pedestrian- and bicyclist-friendly environment. However, Alternative 1 avoids relocating utility poles on the west side of the roadway, which could impact the project schedule because of right-of-way concerns. Alternative 1 also fits the character of the neighborhood and would encourage more people to bicycle and walk. Alternative 2 has better connectivity and reduces pedestrian and bicycle crossings.

Additional improvement concepts that could be incorporated into either alternative include:

- Considering installation of a northbound left-turn lane on Route 138 at Brush Hill Road to reduce the impact of weaving traffic on the westbound approach of Brush Hill Road
- Optimizing traffic signal timings and adjusting clearance intervals of traffic signals
- Upgrading traffic signal equipment including, signal controller, signal poles, pedestrian signals, detection, emergency vehicle preemption system, and retro reflective backplates

- Aligning signal heads to improve visibility
- Improving street lighting to increase safety and security for users
- Trimming vegetation on the approaches to improve visibility of the signal heads
- Installing a Route 138 northbound left-turn lane at the intersections with Neponset Valley Parkway and Milton Street
- Installing “(RED) SIGNAL AHEAD” advance warning signs on Route 138 to warn drivers of upcoming traffic lights at Milton Street/Dollar Lane and Atherton Street/Bradlee Road
- Widening the southbound receiving approach on Route 138 at Brush Hill Road to two lanes
- Installing crosswalk and curb ramps to MassDOT standards
- Adding do-not-block-intersection crosshatch pavement markings at the intersections of Route 138 at Brush Hill Road, Neponset Valley Parkway, and Milton Street/Dollar Lane to prevent queues from blocking the intersection
- Opening the island in front of the fire station to provide emergency vehicles with direct access to the intersection
- Reducing width of the driveways to the fire station and adding signage/pavement markings to limit access to fire/rescue equipment only, and prevent vehicles traveling between the Bradlee Road and Atherton Street approaches to the west of the intersection from cutting through the fire station

Tucker Neighborhood (Northern Segment)

- Alternative 1 maintains the two-lane cross-section and sidewalks on either side of the roadway and convert one of the 10-foot shoulders into a two-way bike lane or a multi-use path. The other shoulder would continue to provide designated on-street parking for residents. Figure ES 1 shows the improvements in Alternative 1.
- Alternative 2 also maintains the existing two-way roadway cross-section and sidewalks on either side of the roadway, and converts the existing shoulders into buffered bicycle lanes. Figure ES 1 shows the improvement concepts in Alternative 2.

In this segment, both Alternatives 1 and 2 provide a pedestrian- and bicyclist-friendly environment. However, Alternative 1 addresses parking needs of the residents and Alternative 2 does not.

- Additional improvement concepts that could be incorporated into either alternative include
 - Optimizing traffic signal timings and adjusting clearance intervals of traffic signals

- Upgrading signal equipment including signal controller, poles, pedestrian signals, detection, emergency vehicle preemption system, and retro reflective backplates
- Installing a pedestrian-activated midblock crossing signal at Oak Street to provide safer crossing for students or moving the pedestrian crossing signal at Aberdeen Road to Tucker Street to serve both students and church goers
- Installing bump-outs or curb extensions to reduce crossing distance and improve visibility at the intersections
- Improving street lighting to increase safety and security for users
- Installing curb ramps to MassDOT standards

ES.4 CONCLUSION

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

Chapter 7 describes in detail short-, medium-, and long-term improvements, as well as cost estimates for each improvement, categorized as *low* (less than \$10,000), *medium* (\$10,000 to \$500,000), and *high* (\$500,000 or more). The short-term improvements, usually low cost, are relatively uncomplicated and inexpensive to implement, and require minimal design efforts. They include installing signs; pavement markings; in-pavement detection for bicyclists; countdown timers for pedestrians; high-visibility crosswalks; traffic signal retiming; and upgrades to signal-head backplates.

The medium-term improvements, usually low-to-medium cost, are more complicated than their short-term counterparts and require more funding resources and design and engineering efforts. Medium-term improvements include installing pedestrian-activated midblock crosswalks; reconfiguring existing roadway shoulders into bicycle lanes; improving drainage; upgrading signal equipment to include an Opticom system for emergency preemption; reconstructing substandard sidewalks; modifying geometry; and managing driveway access.

The long-term improvements, usually high-cost, typically require more design and engineering efforts, environmental permitting, and more funding resources. They include improving street lights; installing new sidewalks; reconstructing intersections to improve safety; managing capacity and mobility; and installing new traffic signals.

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

Chapter 1—Introduction

1.1 ORIGIN OF STUDY

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

MPO staff identified a number of arterial roadway segments that should be prioritized because they require maintenance, modernization, and safety and mobility improvements; these roadway segments are listed in the LRTP. To address the problems that exist in some of these arterial segments, a study was included in the federal fiscal year (FFY) 2018 Unified Planning Work Program (UPWP).³ Through this study, MPO staff recommended conceptual improvements for one or more corridors, or several small sections within a corridor. MPO staff selects locations for study—considering municipal, Subregional, and other public feedback—and collect data, conduct technical analysis, and recommend improvements. Recommendations from the study are sent to implementing agencies, which may choose to fund improvements through various federal, state, and local sources, separately or in combination. By focusing on arterial segments rather than intersections, planners can evaluate multimodal transportation needs comprehensively with the goal of creating Complete Streets.

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

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

Chapter 2—Study Location, Goals, and Public Participation

2.1 SELECTION PROCESS

On January 18, 2018, the Boston Region MPO gave approval to its staff to study Route 138 in Milton, 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} The map in Figure 1 shows the arterial roadway segments in the study area. (All figures are included at the end of the report.)

The study location was selected from a list of 44 arterial segments in 33 municipalities in the MPO region.¹⁰ A copy of the technical memorandum describing the selection process is included in Appendix A. MassDOT Highway Division District 6, the MassDOT Office of Transportation Planning, and the Town of Milton supported the study of Route 138. They participated 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 Highway Safety Improvement Program (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 pedestrians and bicyclists 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 Unified Planning Work Program planning studies, during each funding cycle MPO staff select no more than one location per subregion to study, and choose a location in a different subregion from the location studied in the preceding cycle.

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 Technical Memorandum, dated May 18, 2017, to the Boston Region Metropolitan Planning Organization, *Federal Fiscal Year (FFY) 2017 Priority Corridors for Long-Range Transportation Plan (LRTP) Needs Assessment: Selection of Study Locations*.

2.2 STUDY VISION AND GOALS

The Town of Milton and MassDOT have shown a commitment to supporting alternative transportation options through the Healthy Transportation Compact. Transforming Route 138 into a Complete Streets format that balances the needs of motorists with the needs of pedestrians and bicyclists by increasing the quantity and quality of infrastructure for walking, biking, and bus transit would make the road more efficient by ¹¹

- Reducing congestion
- Increasing safety for motorists, pedestrians, and bicyclists
- Improving connectivity by closing gaps in the sidewalk and bicycle networks
- Connecting people to places to support livable communities

Toward that end, the objectives of this study were to

- Document existing problems
- Examine traffic flow and capacity
- Analyze safety for pedestrians, bicyclists, motorists, and bus riders
- Determine the needs of pedestrians, bicyclists, motorists, and bus riders
- Develop Complete Streets concepts to improve existing conditions

2.3 PUBLIC PARTICIPATION

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

¹¹ This vision aligns with the aims of the Healthy Transportation Compact, a key requirement of the landmark transportation reform legislation, signed into law in June 2009, which aims to facilitate transportation decisions that balance the needs of all transportation users, expand mobility, improve public health, support a cleaner environment, and create stronger communities.

Chapter 3—Characteristics of the Corridor

3.1 ROADWAY

Route 138 is a state highway in Massachusetts that runs from Milton south to Fall River. This roadway serves regional and local traffic traveling to Boston to the north and Canton, Stoughton, and Easton to the south. Figure 2 shows the roadway jurisdiction, which identifies the authority and obligation of agencies to administer, control, construct, maintain, and operate a highway subject to the provisions of the Commonwealth of Massachusetts. It is a two-lane, two-way roadway classified as a principal arterial, state designated truck route, and part of the National Highway System (NHS) program.

Figure 3 shows the right-of-way and shoulder widths along roadway. In Milton, the roadway's right-of-way width varies between 50 and 65 feet and it has six feet or more paved shoulder on either side for the majority of the corridor.¹²

Figure 4 shows the sidewalk network on Route 138. Approximately, 70 percent of the corridor either lacks sidewalks or has sidewalks that do not meet MassDOT's standards; thus, a significant portion of the roadway could be retrofitted to include sidewalks and the existing substandard sidewalks could be reconstructed.¹³

Providing facilities to keep pedestrians and bicyclists separated from vehicular traffic in this corridor is a high priority because of the high volumes of traffic, high vehicle speeds, high volumes of truck traffic, and mixed land uses (residential, educational, and recreational). The utility poles in the corridor are mostly located on the west side of the roadway and many of the properties along the corridor have stone walls marking the boundaries.

3.2 SIGNALIZED INTERSECTIONS

Several cross streets and driveways intersect Route 138, which create safety and operations problems not only for motorists but to also for pedestrians and bicyclists. Figure 5, shows the intersections selected for study. There are six signalized intersections in corridor:

- Brush Hill Road
- Milton Street/Dollar Lane
- Atherton Street/Bradlee Road

¹² Right-of-way is defined as the land, or interest therein, acquired for or devoted to a highway.

¹³ The minimum width for a sidewalk is five feet excluding the width of the curb. The measurement of a sidewalk sometimes includes the width of the curb. If this method of measurement is used, the minimum width of a sidewalk is 5.5 feet. In addition, sidewalks must have the necessary access features to comply with the federal Americans with Disabilities Act.

- Robbins Street
- Cheever Street/Blue Hill Terrace Street
- Brook Road

All of the traffic signals are equipped with fully actuated traffic-control systems; however, they are very old and lack Opticom systems for emergency preemption. The equipment, along with the existing signal timings and phasing plans, needs to be upgraded. The traffic-signal heads are mounted on mixture of mast-arm and post mounts and they lack backplates. Over-grown vegetation and tree branches obscure some of the signal heads, especially in spring and summer. There are no pedestrian facilities such as sidewalks, crosswalks, and push-button pedestrian-activated signals at two signalized intersections: Brush Hill Road and Milton Street/Dollar Street. MassDOT has jurisdiction over the signalized intersections and is responsible for implementing improvements to the intersections.

3.2.1 Route 138 and Brush Hill Road Intersection

Brush Hill Road is a town-owned collector street that intersects Route 138 at an oblique angle to form a four-leg signalized intersection. It is one of the critical intersections in the corridor as there are high traffic volumes on both Route 138 and Brush Hill Road during peak periods. Route 138 has one lane on each approach and Brush Hill Road has two lanes on the westbound approach (an exclusive left-turn lane and a through- right-turn lane) and one travel lane on the eastbound approach. Northbound left turns are prohibited at the intersection; northbound drivers are required to proceed to Brush Hill Road via Canton Avenue. The Thatcher Montessori School is in the southwestern corner of the intersection.

3.2.2 Route 138 and Milton Street/Dollar Lane Intersection

Milton Street and Dollar Lane are town-owned collector roads that intersect Route 138 to form a four-leg signalized intersection. Each of the approaches at the intersection has one travel lane. The intersection curb radii are adequate for trucks and buses. The land uses adjacent to the intersection are primarily residential.

3.2.3 Route 138 and Atherton Street/Bradlee Road Intersection

Atherton Street and Bradlee Road are town-owned collector roads. They intersect with Route 138 at an oblique angle to form a four-leg signalized intersection. Route 138, Atherton Street, and Bradlee Road have one lane on each approach. There are sidewalks only on the north side of Atherton Street/Bradlee Road and crosswalks with curb ramps and detectable warning

plates and pedestrian signals are present at the intersection. The intersection curb radii are adequate for trucks and buses servicing business activities; however, trucks are prohibited on Atherton Street and Bradlee Road. The land uses in the area are residential, and the Milton Fire Department, which experiences cut-through traffic, is located at the intersection.

3.2.4 Route 138 and Robbins Street Intersection

Robbins Street is a town-owned local roadway; it intersects Route 138 at an oblique angle to form a four-leg signalized intersection. Each approach at the intersection has one lane serving all traffic movements. South of the intersection, there is a sidewalk on the west side of Route 138, which continues on the east side of Route 138, north of the intersection. A crosswalk connects both sidewalks diagonally across Route 138, and the curb ramps are constructed to MassDOT standards. On Robbins Street, the sidewalks are on north side of the roadway east of the intersection, and on the south side west of the roadway. There are functioning push-button pedestrian signals for crossing Route 138. Sight distance at the intersection is poor because Robbins Street intersects Route 138 at an oblique angle and has a slope. The intersection curb radii are adequate for trucks and buses; and the land uses in the area are mostly residential.

3.2.5 Route 138 and Cheever Street/Blue Hill Terrace Street Intersection

Cheever Street and Blue Hill Terrace Street are town-owned, local streets that intersect Route 138 at an oblique angle to form two closely spaced three-leg signalized intersections. The offset between the two intersections is about 100 feet long. Each approach at the intersection has one lane serving all traffic movements. There are sidewalks on either side of the roadways and crosswalks with curb ramps, but the curb ramps lack warning plates. The intersection curb radii are not adequate for trucks and buses. The land use near the intersection is residential.

3.2.6 Route 138 and Brook Road Intersection

Brook Road is a town-owned local roadway; it intersects Route 138 at an oblique angle to form a four-leg signalized intersection. The west segment of Brook Road is a two-way, two-lane roadway, and the east segment is a one-way, one lane roadway, that moves traffic away from the intersection (eastbound only). Each approach at the intersection has one lane serving all traffic movements. There are sidewalks along either sides of both roadways, and crosswalks have been installed on all four approaches. The crosswalks have curb ramps but they lack detection-warning plates. Sight distance at the intersection is poor because

Brook Road intersects Route 138 at an oblique angle. The intersection curb radii are adequate for trucks and buses. The land use in the area is mostly residential.

3.3 UNSIGNALIZED INTERSECTIONS

All of the selected unsignalized intersections are two-way stop-controlled intersections with one travel lane on each approach. Route 138 is the major street at the all of the intersections and its traffic is not controlled. The minor streets have stop signs. The intersection curb radii are adequate for trucks and buses and the land uses surrounding the intersections are primarily residential.

3.3.1 Route 138 and Neponset Valley Parkway Intersection

Neponset Valley Parkway is a principal arterial roadway under the jurisdiction of the Department of Conservation and Recreation (DCR). It intersects Route 138 to form a three-leg unsignalized intersection. A high volume of left-turns off of Route 138 and right turns off of Neponset Valley Parkway occur at the intersection during peak travel periods. There are no pedestrian facilities at the intersection, except for a sidewalk on the north side of Neponset Valley Parkway that terminates at the intersection.

3.3.2 Route 138 and Blue Jay Way Intersection

Blue Jay Way is a privately owned local street—the main entrance to Curry College. It intersects Route 138 to form a T-type unsignalized intersection, under the jurisdiction of MassDOT. There is no pedestrian facility at the intersection. The intersection curb radii are adequate for trucks and buses that serve businesses and institutions in the area.

3.3.3 Route 138 and Aberdeen Road Intersection

Aberdeen Road is a town-owned roadway that intersects Route 138 to form a T-type unsignalized intersection. Aberdeen Road is stop controlled. There are sidewalks on either side of Route 138 and Aberdeen Road. In addition, there are crosswalks with curb ramps at the intersection; the crosswalk across Route 138 has pedestrian signals with pedestrian-activated pushbuttons. The intersection curb radii are adequate for trucks and buses. The Concord Baptist Church is located on the east side of Route 138 across from Aberdeen Road.

3.3.4 Route 138 and Oak Street Intersection

Oak Street is a town-owned roadway that intersects Route 138 to form a four-leg unsignalized intersection. The north and south legs of Oak Street are offset about 40 feet apart. There are sidewalks along either side of Route 138 and Oak Street; and crosswalks have been installed on both roadways; however, the curb ramps lack detection warning plates. Many of the Tucker Elementary School

students cross Route 138 at Oak Street, and a school crossing guard is posted at the intersection during school openings and closings. The Tucker Elementary School is located on the east side of Route 138 on Oak Street.

3.4 LAND USE

The map in Figure 6 shows the general land-use designations for the area surrounding Route 138. The area is generally zoned residential except for the park and open space of the Blue Hills Reservation. The southern and middle portions of the area surrounding the corridor is lightly settled with one-family detached dwellings, and the northern portion is densely settled with one-family dwellings.

Other land uses in the area include

- Curry College—a 4,000-student liberal-arts-based institution located on a 131-acre campus near the Blue Hills Reservation in Milton
- Fuller Village—an independent senior-living facility
- Tucker Elementary School—houses 440 students Pre-Kindergarten to Grade 5
- Concord Baptist Church—a vibrant community church
- Thacher Montessori School—houses students Pre-Kindergarten to Grade 8
- Massachusetts Audubon's Blue Hills Trailside Museum—an interpretive center for the state-owned Blue Hills Reservation, featuring a natural history museum and outdoor wildlife exhibits
- Eustis Estate Museum and Study Center—operated by Historic New England, which sits on 80 acres of picturesque landscape at the base of the Blue Hills

3.5 PLANNED PROJECTS AND STUDIES

Transportation projects planned for the Route 138 corridor and previous studies that addressed the study area or its surroundings are described below. The conceptual improvements developed in this study considered and incorporated recommendations from the previous studies.

3.5.1 Roadway Improvements on Route 138 in Canton and Milton

MassDOT's project number 608484 will resurface and make Complete Streets improvements on Route 138 in Canton and Milton. Funding for the project is planned to be programmed in the Boston Region MPO's federal fiscal year (FFY) 2020 Transportation Improvement Program (TIP). As of August, 2018, the project

was in the preliminary design stage.¹⁴ Some of the recommendations in this study would be incorporated and implemented as part of that project.

3.5.2 Road Safety Audit, Route 138 at Atherton Street/Bradlee Road and Milton Street/Dollar Lane

In 2015, the Town of Milton, in collaboration with MassDOT, conducted a road safety audit (RSA) for two intersections of Route 138 at Atherton Street/Bradlee Road and Milton Street/Dollar Lane.¹⁵ The RSA was conducted because the intersection was identified as a high-crash location based on the 2012 Highway Safety Improvement Program (HSIP) crash cluster data.¹⁶ The MassDOT Highway Division's *Traffic and Safety Engineering 25% Design Submission Guidelines* require an RSA for all project-related high-crash locations to identify safety enhancements that may be implemented in conjunction with an off-site mitigation project, and other measures that could be programmed for implementation by other agencies or municipalities. The RSA recommended several short-, medium-, and long-term improvements to address safety and operations problems at the intersections. They included provisions for left-turn lanes on Route 138, modifying the signal phasing and timing plans, upgrading signal equipment, geometric enhancements, pavement markings, and new signage.

¹⁴ Data queried on MassDOT Highway Division's Project Information Database on December 26, 2017. <https://www.mass.gov/service-details/massdot-project-info>.

¹⁵ Road Safety Audit, Blue Hill Avenue (Route 138) at Atherton Street/Bradlee Road and Blue Hill Avenue (Route 138) at Milton Street/Dollar Lane, MassDOT Project #607763, prepared for Massachusetts Department of Transportation, July 7, 2015.

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

Chapter 4—Existing Conditions

4.1 DATA COLLECTION

MassDOT Highway Division's Traffic Data Collection section conducted automatic traffic recorder (ATR) counts during a six-day period from Tuesday, March 27, 2018 to Sunday, April 1, 2018. The ATR machines count vehicles continuously during the collection period and are used to determine the volume of traffic on a roadway. MassDOT planned counts at 21 sites initially, although equipment issues at five sites (mostly in the northern third of the corridor) prevented data collection at those sites.

MassDOT Highway Division's Traffic Data Collection Section also collected turning-movement counts (TMCs) in the study area on Thursday, March 29, 2018. MassDOT performed TMCs at 17 locations on the Route 138 corridor, conducting the counts during the weekday AM peak travel period (6:00 AM to 9:00 AM) and weekday PM peak travel period (3:00 PM to 6:00 PM). MassDOT performed a second count on Saturday, March 31 at seven of those locations, and at an additional eighth location on a Sunday (in order to capture volumes of churchgoers near the Concord Baptist Church). In all cases, MassDOT recorded heavy vehicles, pedestrians, and bicycles separately.

4.2 DAILY TRAFFIC VOLUMES

Figure 7 shows a summary of the Average Daily Traffic (ADT) data recorded using the MassDOT counts. Figure 8 shows the amount of daily traffic variation at four locations along Route 138. The counts on Route 138 show that traffic gradually diminishes toward the north end of the corridor as drivers turn off of Route 138 to access various Boston destinations; this occurs mainly on side streets at Canton Avenue, Brush Hill Road, Neponset Valley Parkway, and Milton Street. Notably, the counts indicate that there is little difference between weekday and weekend volumes, based, in part, on the recreational attractions present in the corridor. Appendix B contains full records of the ATR counts.

4.3 TURNING MOVEMENT VOLUMES

Figure 9 shows the turning movement volumes at the major intersections during the weekday AM and PM peak hours. Peak hours in the corridor were recorded as 7:30 AM to 8:30 AM in the morning and 3:00 PM to 4:00 PM in the afternoon peak. The afternoon volumes were remarkably consistent and stayed within four percent of the highest peak volumes throughout the entire afternoon collection period. This kind of "peak spreading" is a common characteristic of urban roadways where demand exceeds available capacity.

Figure 10 shows the turning movement volumes at the eight intersections where an additional weekend count was requested. As with the weekday counts, the weekend counts were conducted during a morning period (8:00 AM–11:00 AM) and an evening period (2:00 PM–5:00 PM). The highest volumes were observed between 3:00 PM and 4:00 PM hour, during which time the total intersection volumes were five percent higher than during the weekday PM peak hour, and only two percent lower than during the weekday AM peak hour. Appendix B contains the turning movement data.

4.4 PEDESTRIAN AND BICYCLE VOLUMES

The TMC data were also used to provide staff with information about pedestrian and bicyclist activity during the three-hour collection periods. Figure 11 cites the observed pedestrian volumes; and Figure 12 cites the observed bicyclist volumes. Table 1 also distinguishes the number of pedestrians that crossed Route 138 from those that crossed an adjacent side street.

**Table 1
Pedestrian Crossing by Type**

Count Period	Weekday			Weekend		
	Route 138	Side Streets	Total	Route 138	Side Streets	Total
South Parking Lot Entrance	0	0	0	21	9	30
South Parking Lot Exit	0	1	1	2	6	8
North Parking Lot Entrance	0	0	0	0	3	3
Green Street	0	12	12	5	46	51
Canton Avenue	0	1	1	0	17	17
Thacher Montessori School	0	2	2	0	1	1
Brush Hill Road	0	1	1	1	1	2
Neponset Valley Parkway	0	2	2	1	2	3
Milton Street / Dollar Lane	1	2	3	7	2	9
Blue Jay Way	3	19	22	--	--	--
Atherton Street / Bradlee Road	1	6	7	--	--	--
Robbins Street	2	7	9	--	--	--
Cheever Street / Blue Hill Terrace	13	29	42	--	--	--
Aberdeen Road	19	51	70	94	143	237
Oak Street	102	166	268	--	--	--
Brook Road	22	46	68	--	--	--

Source: Central Transportation Planning Staff.

The counts show that pedestrian activity is highest in the north section of the corridor where there are dense residential neighborhoods, an elementary school, and a church. The rest of the corridor does not see a lot of pedestrian traffic, although pedestrian traffic increased on Saturday near the Blue Hills Reservation. Bicycle counts were similarly low except near Blue Hills on the weekend. MPO staff attributes the low pedestrian and cyclist volumes primarily to

the absence of appropriate facilities in the corridor. Other contributing factors might include cold April weather, high vehicle speeds, and high traffic volumes during peak periods. Bicycle volumes in particular were found to be at their lowest during peak commuting hours.

4.5 PEDESTRIAN LEVEL OF SERVICE

The quality of pedestrian travel is largely affected by the roadway infrastructure, such as whether there are sidewalks or traffic signals that allow pedestrians time to cross an intersection before vehicles get a green light. To reflect the complex relationship between pedestrians and their travel environments, MPO staff developed a Pedestrian Report Card Assessment tool, which grades a given roadway on its quality of pedestrian travel; and whether it reflects the MPO's goals for safe pedestrian facilities, expands pedestrian infrastructure, improves connectivity of the transportation network, and enhances economic vitality in the region.¹⁷ The ratings in this pedestrian assessment tool (displayed in Appendix F) correlate with the goals emphasized in the MPO's Long-Range Transportation Plan (LRTP): safety, system preservation, capacity management and mobility, and economic vitality. Based on the tool, Route 138 in Milton was rated *good* in terms of safety (although vehicle speeds remain an issue), *fair* in terms of system preservation, and *poor* in terms of economic vitality and capacity management and mobility. Overall, the assessment indicates that the roadway needs improvements to accommodate pedestrians.

4.6 SPOT SPEEDS

Staff collected vehicle travel speeds and volumes at four of the ATR sites on Route 138. Figure 13 summarizes the speed data and compares it with the posted speed regulations present in the study area. MassDOT data show that several locations had 85th-percentile speeds well above the posted limit. In particular, there were two locations on Route 138 southbound where 85th-percentile speeds of 51 mph and 43 mph were observed in zones with a 35 mph speed limit. Appendix B contains more information on about speed data.

4.7 SIGNAL TIMING AND LAYOUT INFORMATION

MassDOT provided MPO staff with existing signal timings, as-built traffic signal plans, and signal-phase sequences of the signalized intersections (included in Appendix C). MPO staff used Google Maps and field visits to identify recent modifications to the intersection layouts and signal plans in order to analyze the condition of existing traffic operations.

¹⁷ Ryan Hicks and Casey-Marie Claude, *Pedestrian Level-of-Service Memorandum*, Technical Memorandum to the Boston Region Metropolitan Planning Organization, January 19, 2017.

4.8 TRANSIT SERVICES

The Massachusetts Bay Transportation Authority (MBTA) bus Route 716—Cobbs Corner to Mattapan Station—operates throughout the length of the Route 138 corridor in Milton. It provides bus service to Cobbs Corner in Canton, Canton Center Station on the MBTA's Providence/Stoughton commuter rail line, Royall Street and the nearby business park, Curry College, and the Mattapan Red Line station. Buses run Monday through Friday every 90 minutes from 5:50 AM to 7:20 PM, and hourly on Saturdays from 8:00 AM to 5:55 PM. There is no service on Sundays. Appendix D contains the Route 716 schedule and a map showing the 14 stops in Milton.

A&A Metro Transportation, under contract with the MBTA, operates this bus service. The 716 line has a flexible-stop policy, which allows riders to signal the driver if they wish to board or alight at a location other than a designated stop. However, poor lighting along the corridor can make it difficult for drivers to see those users. The Route 138 corridor also is accessed easily via the red line Mattapan Station, which is just one-quarter mile north of the corridor and is also the terminus of the 716 bus line. From Mattapan, riders can use the Mattapan Trolley and transfer at Ashmont Station for service to downtown Boston.

Chapter 5—Existing Conditions Analyses

5.1 SAFETY ANALYSIS

To evaluate safety for motorists, pedestrians, and bicyclists in the study area, MPO staff used crash data from MassDOT's Registry of Motor Vehicles database and from the Milton Police Department from January 2011 through December 2015. The following sections describe the analyses and results of this safety assessment.

5.1.1 Summary of Crash Data

Two hundred sixty-two (262) crashes were recorded in the MassDOT database during the five-year analysis period. Figure 14 shows the spatial distribution of these crashes within the study area.

Some features of the dataset include

- No fatal crashes, but injury rate was very high: 42 percent of crashes (110 of 262) resulted in injury to at least one of the involved parties.
- 61 percent of all crashes were rear-ends. However, this figure rises to 74 percent when considering just the crashes south of Milton Street; those north of Milton Street were only 11 percent rear-ends. This suggests many of the rear-end crashes may be caused by congestion, which is much worse in the southern portion of the corridor.
- 41 percent of crashes took place during peak hours (defined as 7:00 AM–10:00 AM and 3:00 PM–6:00 PM).
- Two crashes involved cyclists, although one of those was the result of a cyclist hitting a stopped vehicle.
- Three crashes involved a pedestrian. All three took place in the dense residential neighborhood north of Cheever Street.
- 62 percent of crashes took place at an intersection; 38 percent of crashes took place along an open roadway segment.
- 11 percent of crashes were single-vehicle, 67 percent involved two vehicles, and 22 percent involved three or more vehicles.

Appendix E contains figures and tables that break down the crash data.

5.1.2 HSM Methodology: Expected Crashes

MPO staff used methods from the 2010 edition of the *Highway Safety Manual* (HSM) to analyze safety. The techniques in the HSM combine roadway geometry, traffic volumes, crash history, and regional factors into a unified metric—"expected crashes"—that estimates the intrinsic safety conditions at a site by compensating for the random fluctuations typically associated with

samples of collision data. Expected crashes may be broken down in several ways such as by manner of collision or degree of injury; and also may be converted into dollar values based on agreed-upon societal cost figures for different types of crashes. They may be used to identify high-risk sites with potential for improvement, and to compare the relative merits of different intervention strategies.¹⁸

The HSM methodology had previously been the subject of research by MassDOT in cooperation with faculty from University of Massachusetts Lowell. The result of this study was to refine the formulas and coefficients of the HSM methodology for intersections to match Massachusetts traffic data better. MPO staff used these regionalized versions of the HSM methods for its analysis of intersections.¹⁹

Figure 15 summarizes results of the existing-conditions safety analysis. The HSM procedure requires that a corridor is broken down into segments and intersections as each type of facility is analyzed with a distinct method. Figure 15 shows the 10 intersections and 11 segments into which MPO staff divided the corridor. For each intersection and each segment, the number of expected crashes during a five-year period is shown along with number of crashes that MassDOT recorded between 2011 and 2015. This comparison provides insight into the responsiveness of a particular location to potential safety interventions. If the predicted number of crashes (crashes per year under idealized circumstances) is significantly less than the expected number of crashes it suggests that correctable factors are elevating the crash rate. The difference between these two terms is referred to as the Potential for Safety Improvement (PSI).

Figure 15 cites locations in green with PSI less than 0; yellow for PSI between 0 and 1; and red for PSI greater than 1. Table 2 shows the numerical values of the PSI for the different intersections (shaded green) and segments (shaded white) within the corridor. It also shows the “high risk” site designation, which is a statistical comparison with other Massachusetts intersections developed as part of the MassDOT and UMass research. The last row in Table 2 shows that 15 of 21 sites showed potential for improvement and eight of 10 intersections qualify as high-risk.

¹⁸ *Highway Safety Manual 2010*, American Association of State Highway and Transportation Officials, Washington, DC, December 2010.
¹⁹ Yuanchang Xie and Chen (Julian) Chen, *Calibration of Safety Performance Functions for Massachusetts Urban and Suburban Intersections*. Report prepared for Massachusetts Department of Transportation Office of Transportation Planning, March 2016.

**Table 2
Potential for Safety Improvement**

Analysis Location	Predicted Crashes	Expected Crashes	PSI (Potential for Safety Improvement)	High-Risk Site?
Segment from Parking Lot to Green Street	1.72	1.40	-0.32	-
Intersection at Green Street	2.39	1.13	-1.26	No
Segment from Green Street to Brush Hill Road	3.03	4.97	1.94	-
Intersection at Brush Hill Road	7.57	7.09	-0.48	No
Segment from Brush Hill Road to Neponset Valley Parkway	3.00	2.24	-0.76	-
Intersection at Neponset Valley Parkway	3.04	4.24	1.19	Yes
Segment from Neponset Valley Parkway to Milton Street	0.80	1.13	0.33	-
Intersection at Milton Street/Dollar Lane	4.46	6.19	1.74	Yes
Segment from Milton Street to Blue Jay Way	1.27	1.25	-0.02	-
Intersection at Blue Jay Way	1.00	1.36	0.36	Yes
Segment from Blue Jay Way to Atherton Street	1.25	0.93	-0.32	-
Intersection at Bradley Road/Atherton Street	2.50	3.07	0.58	Yes
Segment from Atherton Street to Robbins Street	2.23	2.52	0.28	-
Intersection at Robbins Street	1.02	1.11	0.09	Yes
Segment from Robbins Street to Cheever Street	2.14	2.38	0.25	-
Intersection at Blue Hill Terrace/Cheever Street	1.79	1.99	0.20	Yes
Segment from Cheever Street to Oak Street	0.98	2.25	1.27	-
Intersection at Oak Street	0.41	0.44	0.04	Yes
Segment from Oak Street to Brook Road	0.46	0.54	0.08	-
Intersection at Brook Road	1.67	2.23	0.56	Yes
Segment from Brook Road past Austin Street	0.55	1.42	0.87	-
Entire Route 138 Corridor	43.28	49.89	15 of 21	8 of 10

Green shading denotes intersections and white shading denotes segments within the corridor.
Source: Central Transportation Planning Staff.

Staff also used the HSM analysis results to assign a monetary value to the societal burden of traffic collisions. The Federal Highway Administration (FHWA) provides “comprehensive cost” values that take into account both economic costs (lost wages, property damage) and costs from monetizing changes in quality-adjusted life years. These equivalencies are broken down by type and severity of accident. For the purposes of this study, MPO staff used two values: \$15,600 per property damage only (PDO) crash, and \$260,800 per crash involving a non-capacitating injury. Both values are adjusted to reflect the 2016 Massachusetts cost of living.²⁰

²⁰ Technical Memorandum, dated January 1, 2018, to the Massachusetts Department of Transportation, *MassDOT Average Comprehensive Crash Costs*.

Table 3 shows the total estimated comprehensive societal cost per year that resulted from collisions within the corridor. Estimated costs based on expected crashes and observed crashes are well above \$4 million per year, which demonstrates that investing in safety improvements inside the corridor can yield large returns when taking the comprehensive societal cost into consideration. Appendix E presents further detail about the input data, computational steps, and HSM formula outputs.

**Table 3
Comprehensive Costs of Crashes**

Crash Severity	Crashes Per Year (Observed)	Estimated Cost (Observed)	Crashes Per Year (Expected)	Estimated Cost (Expected)
Property Damage Only	30.4	\$470,000	34.2	\$530,000
Fatal and Injury	22.0	\$5,700,000	15.7	\$4,100,000
Total	52.4	\$6,200,000	49.9	\$4,600,000

Source: Central Transportation Planning Staff.

5.1.3 Collision Diagrams

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

- **High Priority: Neponset Valley Parkway and Milton Street intersections.** Each of these intersections has both large numbers of observed crashes and great potential for safety improvement, making them clear targets for intervention. At Neponset Valley Parkway, the lack of a traffic signal causes angle crashes and associated high rates of injury. At Milton Street, the primary culprit is the huge number of rear-end crashes (26 rear-ends out of 33 total crashes). An important contributing factor in this case is the undeveloped stretch of Route 138 leading up to the Milton Street intersection, which causes drivers to travel at high speeds and then get taken by surprise by queues at the signal. Figures 3 and Figure 4 in Appendix E show collision diagrams for these intersections.
- **High Priority: Atherton Street and Cheever Street Intersections.** These lower-volume intersections have a high number of reported collisions, and both have great potential for improvement. The main problem at these intersections is their unconventional geometry, which causes angle collisions and rear-ends that occur inside the intersection.

Figure 6 and Figure 10 in Appendix E, show collision diagrams for these intersections.

- **High Priority: Route 138 North of Cheever Street.** All of the facilities to the north of Cheever Street showed significant potential for safety improvement. The neighborhoods here are dense with side streets and driveways and most of the collisions were caused by vehicles joining or leaving Route 138 unexpectedly. Several vehicles struck cars parked on Route 138, and there were a number of other collisions where poor visibility because of parked cars was cited as a contributing factor. Three pedestrians and a bicycle were struck by vehicles in this region. Figures 10 through 12 in Appendix E show the collision diagrams in this area.
- **Moderate Priority: Central Portions of Route 138.** Between Neponset Valley Parkway and Cheever Street, the HSM analysis shows greater-than-expected collision rates and good potential for improvement. This area has high travel speeds, and vehicles turning into side streets or driveways are at risk of getting rear-ended. Figures 5 through 9 in Appendix E show collision diagrams for this area.
- **Moderate Priority: Blue Jay Way (Curry College Entrance).** Despite only nine recorded crashes, this unsignalized intersection shows positive potential for improvement. Although signalization may not be appropriate because of the small volume of traffic, adding sidewalks and lighting and marking a designated bus stop zone should calm speeds and allow vehicles to turn into or out of Curry College more safely. Figure 5 in Appendix E shows the collision diagram at Blue Jay Way.
- **Moderate Priority: Intersection at Brush Hill Road.** Although this intersection recorded 32 crashes, the HSM analysis showed the intersection as having low potential for improvement because of the massive daily volume of traffic (34,000 vehicles per day) handled by the intersection. Despite this, the estimated cost of the collisions at the intersection (\$680,000 per year) was still higher than anywhere else in the corridor so even incremental improvements in safety could have a significant net effect. Figure 2 in Appendix E shows the collision diagram for Brush Hill Road.
- **High Priority: Collisions Caused by Endemic Congestion.** Slow-moving, congested conditions contributed to many of the collisions in the corridor, especially toward the border with Canton where rear-end collisions were particularly prevalent. These types of collisions are the main reason that the Route 138 segment between Green Street and Brush Hill Road has very high potential for improvement. (Collisions at

Canton Avenue were included in this segment because of the limitations of the HSM, although only two were caused by that intersection.) Intense traffic is common because daily traffic—much of which is non-local—is highest in this area, though capacity remains the same as in the rest of the corridor. The resulting conditions lead to distracted, aggressive, and impatient drivers, and producing interventions short of increasing capacity that would target this behavior may be difficult. Figure 1 in Appendix E shows the collision diagrams for this area.

5.1.4 Road Safety Audit

As mentioned in section 3.5.2, a Road Safety Audit (RSA) was previously performed in the study area in 2015. MPO staff included the findings of the report in their analysis and recommendations—such as “(Red) Signal Ahead” signs and protected left-turn lanes—into the design proposals discussed in Chapter 7. Chapter 7 also contains further discussions of the safety issues for specific locations, along with their proposed alternatives for improvement.

5.2 TRAFFIC OPERATIONS ANALYSIS

5.2.1 Intersection Level-of-Service Analysis

Staff conducted traffic operations analyses consistent with the Highway Capacity Manual (HCM) methodologies.²¹ HCM methodology is used to assess traffic conditions at signalized and unsignalized intersections and to rate the level of service (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 4 presents the control delays (standards for comparison) associated with each LOS for signalized and unsignalized intersections.

**Table 4
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.

²¹ *Highway Capacity Manual 2010*, Transportation Research Board of the National Academies, Washington, DC, December 2010.

Using the traffic and signal data collected, MPO staff built traffic analysis networks for the weekday AM, weekday PM, and weekend PM peak hours. Synchro traffic analysis software was used to assess the capacity and quality of traffic flow.²² Figures 16 and 18 show the analysis results for the weekday AM, weekday PM, and weekend PM peak periods, respectively. Appendix F presents the existing conditions LOS analysis worksheets.

Aside from the intersection at Brush Hill Road, which operates at LOS F and LOS E during the AM and PM peak hours, the capacity analyses show mostly acceptable conditions throughout the corridor. Even the unsignalized side streets in the study area generally experience acceptable levels of delay. The main exception is at Neponset Valley Parkway, which operates at LOS E during the AM peak hour and LOS F during the PM peak hour.

The results of the Synchro model may seem overly optimistic, as congestion is a known issue in this region. But the discrepancy is partially attributed to peak spreading: The HCM uses an analysis period of 15 minutes to calculate delay, whereas the queues in Milton continue building for hours across the lengthy morning and evening peak travel periods. The traffic volumes are also necessarily based on counts at the intersections, which show the entry volume for each intersection. This number may be much smaller than the demand volume during peak hours.

5.2.2 Traffic Signal Warrant Analysis

Traffic signals are valuable devices for controlling vehicular and pedestrian traffic. Signals that are properly designed, located, operated, and maintained will provide orderly movement of traffic, reduce congestion, and reduce the frequency and severity of certain types of crashes (especially right-angle collisions). However, traffic control signals are not solutions to all problems at intersections. Poorly designed and maintained, ineffectively placed, improperly operated, or unjustified traffic control signals can result in excessive delays, a significant increase in crashes (especially the rear-end type), and diversion of traffic to less adequate routes as road users attempt to avoid delay produced by signals.

The process of evaluating the suitability of a traffic signal for a given intersection is called “signal warrant analysis.” The *Manual on Uniform Traffic and Control Devices* (MUTCD) provides a procedure for performing signal warrant analysis

²² Trafficware Inc., Synchro Studio 9, Synchro plus SimTraffic, Build 914, Sugar Land, Texas.

based on nine different criteria, referred to as warrants.²³ MPO staff selected five warrants based on available data and relevance to the study, and evaluated each at eight of the intersections within the study area. In some cases, performing the warrant analysis was dependent on turning movement data and was therefore limited to peak hours. Table 5 presents results of the traffic signal warrant analyses. Appendix C contains more detailed worksheets.

The signal warrant analysis confirms that the existing signals at Brush Hill Road, Milton Street, Cheever Street, and Brook Road are appropriate because each location satisfies at least one signal warrant. It also shows that Neponset Valley Parkway is an excellent candidate for receiving a signal because it satisfies Warrants 1 through 3. Oak Street was of interest primarily as a pedestrian crossing location. Because vehicular traffic is relatively low, it does not meet traffic signal criteria. However, it does satisfy MUTCD criteria for pedestrian hybrid beacons.²⁴ Chapter 7 discusses this conclusion and incorporates it into the design recommendations.

**Table 5
Summary of Signal Warrant Analysis**

Intersection	Has Signal?	Warrant 1 8-hour volume	Warrant 2 4-hour volume	Warrant 3 Peak hour volume	Warrant 4 Pedestrian Volume	Warrant 7 Crash Experience
Brush Hill Road	Yes	Satisfied	Satisfied	Satisfied	Not Satisfied	Not Satisfied
Neponset Valley Parkway	No	Satisfied	Satisfied	Satisfied	Not Satisfied	Not Satisfied
Milton Street / Dollar Lane	Yes	Not Satisfied	Satisfied	Satisfied	Not Satisfied	Not Satisfied
Atherton Street / Bradlee Road	Yes	Not Satisfied	Not Satisfied	Not Satisfied	Not Satisfied	Not Satisfied
Robbins Street	Yes	Satisfied	Not Satisfied	Satisfied	Not Satisfied	Satisfied
Cheever Street / Blue Hill Terrace	Yes	Satisfied	Satisfied	Satisfied	Not Satisfied	Not Satisfied
Oak Street	No	Not Satisfied	Satisfied	Satisfied	Not Satisfied	Satisfied
Brook Road	Yes	Satisfied	Satisfied	Satisfied	Not Satisfied	Satisfied

Note: Warrants 1–3 at Brook Road, Warrant 3A (peak hour delay) at all intersections, and Warrant 4 at all intersections were evaluated during peak hours only (6:00 AM–9:00 AM and 3:00 PM–6:00 PM).
Source: Central Transportation Planning Staff.

The existing signals at Atherton Street and Robbins Street do not satisfy any of the five warrants used during this study. However, they each have other factors that justify the presence of a signal. The signal at Atherton Street helps reduce

²³ Chapter 4C: Traffic Control Signal Needs Studies, *Manual on Uniform Traffic Control Devices*, 2009 Edition with Revisions 1 and 2, Federal Highway Administration, US Department of Transportation, May 2012.

²⁴ Chapter 4F: Pedestrian Hybrid Beacons, *Manual on Uniform Traffic Control Devices*.

confusion caused by the complex five-leg intersection geometry. It also allows safe and rapid access to Route 138 from the fire station immediately adjacent to the intersection. Robbins Street meets Route 138 at an oblique angle, resulting in a very wide intersection with poor visibility. The signal at that intersection helps to mitigate the problems caused by its geometry. A signal is also needed to allow pedestrians to cross from the sidewalk north of Robbins Street, which is only present on the east side of the road, to the sidewalk south of Robbins Street, which is only present on the west side of the road. Therefore, maintaining a signal at both of these locations was deemed appropriate based on engineering judgment.

Chapter 6—Community Engagement

Stakeholder participation is a crucial part of any project, and the residents who use the Route 138 corridor are among the most important stakeholders. Hence, MPO staff used a number of methods to engage the community in planning for improvements to the study area.

6.1 TOWN SURVEY

MPO staff developed a survey to help determine the public's opinion about the problems on Route 138 in Milton and to learn their ideas for resolving them. The online survey that was posted on the Town of Milton website received 740 responses between March 22, 2018 and April 29, 2018. The fact that 45 percent of responses came within the first two days of the posting speaks to strong community engagement in Milton. Figure 19 presents the questions contained in the survey, along with the answers received. More than one-third of respondents left significant free-response feedback for one or more questions; those comments are included in Appendix G.

Some notable conclusions drawn from the survey are

- The vast majority of respondents (89 percent) drive on the corridor. However, nearly a one-quarter (24 percent) of respondents also said that they walk or jog (despite low observed pedestrian volumes).
- High vehicle speeds were the most commonly cited problem for pedestrians and cyclists, both in the survey answers and in free responses.
- Many respondents expressed shock that anyone would consider walking, and especially biking, in the corridor because of the dangerous conditions.
- Many people wrote that they had interest in biking or walking on Route 138 but were concerned for their safety. The fact that Question 5 (“Please indicate any problems that keep you from bicycling or walking on Route 138.”) received more responses than Question 4 (“While bicycling or walking along Route 138, what particular problems do you regularly encounter?”) also points to this trend.
- Many participants complained about intersections being blocked during peak hours, both for its effects on traffic (preventing turning movements) as well as concern for pedestrian safety (obstructing crosswalks).
- Despite being a population of mostly drivers, the respondents seemed extremely receptive to the idea of improving facilities for other modes. Eighty percent of residents indicated they would like to see Complete Streets solutions in at least part of the corridor. The written comments were overwhelmingly centered on ideas for improving the bicycle and

pedestrian experience; only a couple addressed congestion at all. Some participants, recognizing that much of the traffic is from out-of-town, even went so far as to say they were opposed to added lanes or left-turn bays, since these would only get filled with new traffic.

- On the other hand, improving public transit did not seem to be a priority for respondents. Only 16 percent indicated that they would like to see improved bus service

Feedback from the survey was very helpful both to gauge community sentiment and to solicit ideas for solutions to the existing problems. Some of the ideas presented in the comments section were used while developing the design alternatives discussed in Chapter 7.

6.2 MILTON WIKIMAP FEEDBACK

The Town of Milton has set up a map-based community survey for the Milton Complete Streets Prioritization Plan at wikimapping.com. This website allows users to encode a written comment onto a map at a specific location.²⁵ MPO staff examined a sample of these comments in addition to the responses to the town website survey.

Figures 1 through 3 in Appendix G show some of the common comments encountered in the wikimapping data. Overall the responses mirrored many of the themes from the town website survey:

- Significant concern for high speed traffic
- Requests for more pedestrian crossing locations, particularly near the Blue Hills Recreational Area and in the northern portion of the corridor
- Some complaints about cut-through traffic contributing to congestion or unsafe conditions on side streets
- Missing or deteriorating sidewalks in several locations

²⁵ *Milton Complete Streets Prioritization Plan*. Retrieved March 1, 2018. <http://wikimapping.com/wikimap/Milton.html>.

Chapter 7—Improvement Concepts

MPO staff, working with the study’s advisory task force, developed improvement concepts that could transform Route 138 in Milton into a pedestrian-and-bicyclist-friendly transportation corridor that serves all modes of transportation safely and maintains regional travel capacity by connecting people and their destinations. Many of the concepts for improvements that staff developed would be carried out within the existing roadway’s right-of-way and would account for the needs of abutters and roadway users. Most of the improvements could be completed in the short-term as funding for the project had already been allocated and programmed in the 2020 Transportation Improvement Program (TIP).

The corridor was divided into three segments based on land use and traffic volume:

- Blue Hills Reservation Area (southern segment): from Canton-Milton town line to the Canton Avenue branch
- Brush Hill Area (middle segment): From Brush Hill Road to Atherton Street/Bradlee Road
- Tucker Neighborhood (northern segment): from Robbins Street to the end of Route 138

7.1 ROUTE 138 SEGMENT IN THE BLUE HILLS RESERVATION AREA

This segment extends is in the southern part of corridor. It is surrounded primarily by the park and open spaces of Blue Hills Reservation, and a low-density residential neighborhood of detached one-family dwellings. This segment has the highest levels of traffic and congestion in the study area, and carries about 37,000 vehicles per day. Here, the strategy was to evaluate different roadway cross-sections to improve safety and, operations, and make the roadway more pedestrian-and-bicyclist friendly. MPO staff developed two alternatives for consideration based on discussions with the task force.

7.2.1 Alternative 1: Three-Lane Cross-Section with a Multi-Use Path on the East Side of the Roadway

Alternative 1 (shown in Figures 20 and 21) consists of a three-lane cross-section—one southbound lane and two northbound lanes and a multi-use path on the east side of the roadway.

Advantages

- Provides a pedestrian- and bicyclist-friendly environment.
- Encourages more people to walk and bicycle together.
- Fits the character of the neighborhood.

- Improves traffic flow and operations. It allows the two northbound lanes that currently end at the Canton Park-and-Ride lot to be extended onto Canton Avenue, where it will continue as a right-turn-only lane onto the Canton Avenue branch.
- Improves safety by eliminating merging of the two northbound lanes into one just north of the intersection of Route 138 and Royall Street/Blue Hill River Road.
- Avoids relocating utility poles on the west side of the roadway, which could affect the project schedule because of right-of-way impacts.

Disadvantages

- Limited access for pedestrians and bicyclists to the west side of the roadway.
- Leads to more pedestrian and bicycle crossings.

7.2.2 Alternative 2: Two-Lane Cross-Section with Dual Bicycle Lanes and Sidewalks

Alternative 2 (shown in Figures 22 and 23) maintains the existing roadway cross-section—one travel lane each direction, a bicycle lane and sidewalk on either side of the roadway, and a midblock crosswalk in the vicinity of the south parking facility.

Advantages

- Provides a pedestrian- and bicyclist-friendly environment for nonmotorized transportation modes.
- Increases access and connectivity to places for pedestrians and bicyclists.
- Reduces pedestrian and bicycle crossings on Route 138.

Disadvantages

- Prevents the two northbound lanes that currently end at the Canton park-and-ride lot to be extended onto Canton Avenue.
- Offers minimal improvements to congestion, and queuing in the segment, especially the intersections of Route 138 at Royall Street/Blue Hill River Road and Brush Hill Road.
- Utility poles on the west side of roadway could impact sidewalk installation on that side.

7.2.2 Redesign of the Canton Avenue and Blue Hill Avenue Intersection

Figure 23 shows the improvement concept for the redesign of Route 138 and Canton Avenue. The concept would improve safety for pedestrians and bicyclists by

1. Reducing speeds of vehicles continuing on Canton Avenue

- 2. Consolidating openings at the intersection to reduce crossing distance
- 3. Aligning Summit Road to approach Canton Avenue more perpendicularly

7.3 ROUTE 138 SEGMENT IN THE BRUSH HILL AREA

This segment is the middle part of the corridor. The area surrounding the roadway is primarily low-density residential neighborhoods of detached one-family dwellings. This segment has medium- to-high traffic volumes (between 15,000 and 25,000 vehicles per day); and congestion and queuing occur primarily during the PM peak period. For this segment, the strategy is similar to that of the Blue Hill Reservation area—to evaluate different roadway cross-sections to improve safety, operations, and make the roadway more pedestrian- and-bicyclist friendly. MPO staff developed two alternatives for consideration based on discussions with the task force.

7.3.1 Alternative 1: Two-Lane Cross-Section with a Multi-Use Path on the East Side of the Roadway

Alternative 1 (shown in Figures 24 through 29) maintains the two-lane cross-section, installs northbound left-turn lanes at the Neponset Valley Parkway and Milton Street intersections, and builds a multi-use path on the east side of the roadway. Additional improvement concepts include signaling the intersection of Route 138 and Neponset Valley Parkway.

Advantages

- Provides a pedestrian- and bicyclist-friendly environment.
- Encourages more people to walk and bicycle together.
- Fits the character of the neighborhood.
- Improves traffic flow at the intersections of Route 138 at Brush Hill Road, Neponset Valley Parkway, Milton Street/Dollar Lane, and Atherton Street/Bradlee Road.
- Avoids relocations of utility poles on the west side of the roadway, which could affect the project schedule and right-of-way impacts.

Disadvantages

- Limited access for pedestrians and bicyclists to the west side of the roadway.
- Leads to more pedestrian and bicycle crossings.

7.3.2 Alternative 2: Two-Lane Cross-Section with Dual Bicycle Lanes and Sidewalks

Alternative 2 (shown in Figures 30 through 35) maintains the existing two-way roadway cross-section, installs left-turn lanes at selected intersections, and a

bicycle lane and sidewalk on either side of the roadway. Additional improvement concepts include signaling the intersection of Route 138 and Neponset Valley Parkway.

Advantages

- Provides a pedestrian- and bicyclist-friendly environment.
- Improves traffic flow at the intersections of Route 138 at Brush Hill Road, Neponset Valley Parkway, Milton Street/Dollar Lane, and Atherton Street/Bradlee Road.
- Increase access and connectivity to places for pedestrian and bicyclists.
- Reduces pedestrian and bicycle crossings on Route 138.

Disadvantages

- Would require more space at the intersections where a northbound left-turn lane is recommended (Neponset Valley Parkway and Milton Street).
- Utility poles on the west side of roadway would impact sidewalk installation on that side.

7.3.3 Additional Improvements at Selected Intersections

Tables 6 through 9 show additional improvement concepts for the intersections that could be incorporated into either alternative. The time frame categorized as *short-term* is typically less than three years. Short-term improvements are relatively uncomplicated and inexpensive to implement, and require minimal design efforts. *Medium-term* is typically between three and five years. Medium-term improvements are more complicated than their short-term counterparts and require more funding resources and design and engineering efforts. *Long-term* improvements typically require five or more years to plan and implement. They require more design and engineering efforts, environmental permitting, and larger funding resources. Cost estimates for each improvement were categorized as *low* (less than \$10,000), *medium* (\$10,000 to \$500,000), and *high* (\$500,000 or more). Because there is a funded project for this corridor, some of the medium- or long-term improvements might be incorporated into that project.

Route 138 at Brush Hill Road: Allow Northbound Left Turns

As a result of feedback from the town engineer, MPO staff investigated the effects of permitting left turns from Route 138 northbound onto Brush Hill Road westbound. Currently, this turning movement is prohibited and vehicles are instead required to use Canton Avenue to access Brush Hill Road. The suggestion from the town would restore this movement and add a protected left-turn bay to the northbound approach.

From a safety standpoint, adding a left turn bay would have advantages and disadvantages. The primary benefit, and the main concern as voiced by the town, would be a reduction in weaving maneuvers on the short segment of Brush Hill Road between Canton Avenue and Route 138. Under the existing configuration, most of the left turns from Brush Hill Road westbound come from southbound traffic on Canton Avenue, while most of the through-traffic comes from Route 138 northbound via Canton Avenue. These two traffic streams, which exceed 100 vehicles per hour during the peak periods, must weave past each other within about 200 feet to reach the appropriate lane. Permitting left turns from Route 138 northbound would remove most of the through traffic off Brush Hill Road and eliminate the need for a weave.

The primary safety drawback of using the proposed configuration is that it would come at the cost of adding a second receiving lane on the Route 138 northbound approach. This recommendation, which is illustrated in Figure 24, improves safety at the intersection by removing the need for westbound left turns and eastbound right turns to merge into a single lane during their shared signal phase. The existing right-of-way in the vicinity of Brush Hill Road is 50 feet and would not provide enough space for two southbound lanes and two northbound lanes (one through-lane and one left-turn bay) without land takings. The collision data obtained by CTPS did not show any crashes resulting from either the weave or the merge maneuvers, so it is not clear which of the two issues presents the greater safety risk.

From an operations standpoint, Synchro level-of-service analysis showed slightly increased intersection delay for the PM and weekend peak hours. The increased delay is primarily experienced by southbound traffic that must yield some effective green time to the northbound left-turn traffic. During the AM peak hour, when southbound traffic is lower, the analysis showed slightly decreased delay after the addition of a left-turn bay. These results suggest that the town's suggestion should be viable operationally, even if it does not represent the optimal traffic configuration. Table F-2 in Appendix F summarizes the level-of-service analysis for this design option.

**Table 6
Route 138 at Brush Hill Road**

Issue	Improvement	Time Frame	Cost	Jurisdiction
Congestion	Consider adding a northbound left-turn lane on Route 138 at Brush Hill to reduce weaving on the westbound approach	Medium	Medium	MassDOT
Congestion	Optimize traffic signal timings	Short-term	Low	MassDOT
Safety and congestion	Upgrade signal equipment	Medium-term	Medium	MassDOT
Safety and congestion	Widen the southbound receiving approach to two lanes.	Short-term	Medium	MassDOT
Safety	Align signal heads to improve visibility at each approach.	Short-term	Low	MassDOT
Safety	Trim vegetation on the approaches to improve visibility of the signal heads.	Short-term	Low	MassDOT
Safety	Install crosswalk with ADA curb ramps.	Medium-term	Medium	MassDOT
Safety and congestion	Add do not block intersection crosshatch pavement markings to prevent queues from blocking the intersection.	Short-term	Low	MassDOT
Safety	Install additional street lighting to improve safety and security for users.	Medium-term	Medium	MassDOT

Source: Central Transportation Planning Staff.

**Table 7
Route 138 at Neponset Valley Parkway**

Issue	Improvement	Time Frame	Cost	Jurisdiction
Congestion	Install new traffic signal	Medium-term	High	MassDOT
Safety and congestion	Add a Route 138 northbound left-turn lane	Medium-term	Medium	MassDOT
Safety	Trim vegetation on the approaches to improve visibility of the signal heads.	Short-term	Low	MassDOT
Safety	Install crosswalk with ADA curb ramps.	Short-term	Low	MassDOT
Safety and congestion	Add do not block intersection crosshatch pavement markings to prevent queues from blocking the intersection.	Short-term	Low	MassDOT
Safety	Install additional street lighting to improve safety and security for users.	Medium-term	Medium	MassDOT

Source: Central Transportation Planning Staff.

**Table 8
Route 138 at Milton Street/Dollar Lane Intersection**

Issue	Improvement	Time Frame	Cost	Jurisdiction
Congestion	Optimize traffic signal timings	Short-term	Low	MassDOT
Safety and congestion	Upgrade signal equipment	Medium-term	Medium	MassDOT
Safety and congestion	Add a Route 138 northbound left-turn lane	Medium-term	Medium	MassDOT
Safety	Install “(RED) SIGNAL AHEAD” advance warning signs to warn road users of upcoming traffic lights	Short-term	Medium	MassDOT
Safety	Align signal heads to improve visibility at each approach.	Short-term	Low	MassDOT
Safety	Trim vegetation on the approaches to improve visibility of the signal heads.	Short-term	Low	MassDOT
Safety	Install crosswalk with ADA curb ramps.	Medium-term	Medium	MassDOT
Safety and congestion	Add do not block intersection crosshatch pavement markings to prevent queues from blocking the intersection.	Short-term	Low	MassDOT
Safety	Install additional street lighting to improve safety and security for users.	Medium-term	Medium	MassDOT

Source: Central Transportation Planning Staff.

**Table 9
Route 138 at Atherton Street/Bradlee Road Intersection**

Issue	Improvement	Time Frame	Cost	Jurisdiction
Congestion	Optimize traffic signal timings	Short-term	Low	MassDOT
Safety and congestion	Upgrade signal equipment	Medium-term	Medium	MassDOT
Safety and congestion	Install additional signal heads on Bradlee Road to stop vehicles for emergency preemption.	Medium-term	Medium	MassDOT
Safety	Install “(RED) SIGNAL AHEAD” advance warning signs to warn road users of upcoming traffic lights	Short-term	Medium	MassDOT
Safety and access management	Open the island in front of the Fire Station to provide emergency vehicles direct access to the intersection when queued vehicles are present on either the Atherton Street or Bradlee Road eastbound approaches.	Medium-term	Medium	MassDOT
Safety and access management	Reduce width of the driveways to the Fire Station and add signage/pavement markings to limit access only to fire/rescue equipment.	Medium-term	Medium	MassDOT
Safety	Align signal heads to improve visibility at each approach.	Short-term	Low	MassDOT
Safety	Trim vegetation on the approaches to improve visibility of the signal heads.	Short-term	Low	MassDOT
Safety	Install crosswalk with ADA curb ramps.	Medium-term	Medium	MassDOT
Safety and congestion	Add “No Turn on Red” signs to the approaches of Atherton Street and Bradlee Road.	Short-term	Low	MassDOT
Safety	Install additional street lighting to improve safety and security for users.	Medium-term	Medium	MassDOT

Source: Central Transportation Planning Staff.

7.4 ROUTE 138 SEGMENT IN THE TUCKER NEIGHBORHOOD

This is the northern segment of the corridor. The land uses surrounding the roadway consist of high-density residential neighborhoods of one- and two-family dwellings. This segment has the lowest levels of traffic in the corridor (between 10,000 and 12,000 vehicles per day); and has sidewalks and 10-foot wide shoulders on either side of the roadway. The 10-foot wide shoulders are primarily used as on-street parking, but are not authorized. The strategy is to enhance safety for pedestrians and bicycles and make the roadway more pedestrian-and-bicyclist friendly.

7.4.1 Alternative 1: Two-Lane Cross-Section with a Two-Way Bike Lane or Multi-use Path on the East Side of the Roadway

Figure 36-38 show the improvements in Alternative 1. Staff developed Alternative 1 (shown in Figures 36 through 38) to address concerns about residential parking. Alternative 1 maintains the two-lane cross-section and sidewalks on either side of the roadway and converts one of the 10-foot shoulders into a two-way bike lane or multi-use path. The other shoulder would provide authorized on-street parking for residents.

Advantages

- Provides a pedestrian- and bicyclist-friendly environment.
- Encourages more people to walk and bicycle together.
- Fits the character of the neighborhood.
- Addresses parking needs of the residents.
- Avoids relocating utility poles on the west side of the roadway, which could affect the project schedule and right of way impacts.

Disadvantages

- Limited access for bicyclists to one side of the roadway.
- Leads to more crossings for bicyclists.

7.4.2 Alternative 2: Two-Lane Cross-Section with Dual Bicycle Lanes and Sidewalks

Alternative 2 (shown in Figures 39 through 41) maintains the existing two-way roadway cross-section and sidewalks on either side of the roadway, and converts the shoulders into buffered bicycle lanes.

Advantages

- Provides a pedestrian- and bicyclist-friendly environment.
- Increases access and connectivity to places for pedestrian and bicyclists.
- Reduces pedestrian and bicycle crossings on Route 138.

- Fits into the roadway’s right-of-way

Disadvantages

- Residents would lose on-street parking in the vicinity.
- Low volume of bicycles in the segment does not justify dual bicycle lanes, and residents lose on-street parking.

7.4.3 Additional Improvements at Selected Intersections

One

Tables 10 through 13 present additional improvement concepts for the intersections that could be incorporated into either alternative.

**Table 10
Route 138 at Robbins Street**

Issue	Improvement	Time Frame	Cost	Jurisdiction
Congestion	Optimize traffic signal timings	Short-term	Low	MassDOT
Safety and congestion	Upgrade signal equipment	Medium-term	Medium	MassDOT
Safety and congestion	Add “No Turn on Red” signs to the approaches of Atherton Street and Bradlee Road.	Short-term	Low	MassDOT
Safety	Align signal heads to improve visibility at each approach.	Short-term	Low	MassDOT
Safety	Trim vegetation on the approaches to improve visibility of the signal heads.	Short-term	Low	MassDOT
Safety	Install crosswalk with ADA curb ramps.	Medium-term	Medium	MassDOT
Safety	Install additional street lighting to improve safety and security for users.	Medium-term	Medium	MassDOT

Source: Central Transportation Planning Staff.

**Table 11
Route 138 at Cheever Street/Blue Hill Terrace Street**

Issue	Improvement	Time Frame	Cost	Jurisdiction
Congestion	Optimize traffic signal timings	Short-term	Low	MassDOT
Safety and congestion	Upgrade signal equipment	Medium-term	Medium	MassDOT
Safety and congestion	Add “No Turn on Red” signs to the approaches of Cheever Street and Blue Hill Terrace Street.	Short-term	Low	MassDOT
Safety	Align signal heads to improve visibility at each approach.	Short-term	Low	MassDOT
Safety	Trim vegetation on the approaches to improve visibility of the signal heads.	Short-term	Low	MassDOT
Safety	Upgrade sidewalks and curb ramps	Medium-term	Medium	MassDOT
Safety	Add curb bump-outs or extensions to shorten crosswalks and improve visibility at intersections	Medium-term	Low	MassDOT
Safety	Install additional street lighting to improve safety and security for users.	Medium-term	Medium	MassDOT

Source: Central Transportation Planning Staff.

**Table 12
Route 138 at Aberdeen Road and Oak Street**

Issue	Improvement	Time Frame	Cost	Jurisdiction
Safety and pedestrian accommodation	Install a pedestrian-activated crossing signal at Oak Street to provide safer crossing for students or	Medium-term	Medium	MassDOT
	Move the pedestrian-activated crossing signal at Aberdeen Road to Tucker Street to serve both students and church activities			
Pedestrian accommodation	Upgrade sidewalks, crosswalks, and curb ramps to MassDOT standards.	Medium-term	Medium	MassDOT
Safety	Add street curb bump-outs or extensions to shorten crosswalks and improve visibility at intersections	Medium-term	Low	MassDOT

Source: Central Transportation Planning Staff.

**Table 13
Route 138 at Brook Road**

Issue	Improvement	Time Frame	Cost	Jurisdiction
Congestion	Optimize traffic signal timings	Short-term	Low	MassDOT
Safety and congestion	Upgrade signal equipment	Medium-term	Medium	MassDOT
Safety and congestion	Add "No Turn on Red" signs to the approaches of Cheever Street and Blue Hill Terrace Street.	Short-term	Low	MassDOT
	Align signal heads to improve visibility at each approach.			
Safety	Trim vegetation on the approaches to improve visibility of the signal heads.	Short-term	Low	MassDOT
Safety	Upgrade sidewalks and curb ramps	Medium-term	Medium	MassDOT
Safety	Install additional street lighting to improve safety and security for users.	Medium-term	Medium	MassDOT
	Add street curb bump-outs to shorten crosswalks and improve visibility			

Source: Central Transportation Planning Staff.

Chapter 8—Performance of Future Conditions

8.1 INTERSECTION LEVEL-OF-SERVICE (LOS) PERFORMANCE

Planners typically use models to forecast future traffic volumes systematically based on changes in the transportation network or land use. For this study, MPO staff used the statewide travel demand model set. Using this model, staff projected that between now and 2040, traffic volume on Route 138 in Milton would remain at current levels because of congestion and repurposing developments in the corridor.

To test the impact of future traffic conditions that would result from proposed improvements, MPO staff used the projected peak-hour turning movement volumes. Figures 42 through 44 show the expected performance of the signalized and unsignalized intersections after implementing the proposed improvements. The analyses indicate that the intersections would operate satisfactorily during the peak hours. Appendix F contains LOS results for the future conditions.

8.2 PEDESTRIAN LEVEL-OF-SERVICE PERFORMANCE WITH IMPROVEMENTS

MPO staff evaluated what would be the future LOS of Route 138 in Milton if the recommendations from this study were implemented. Appendix F contains results of the pedestrian LOS score card analyses, and the ratings, as related to the four goals areas emphasized in the MPO's Long-Range Transportation Plan (LRTP). Based on the assessment, Route 138 was rated *good* in terms of meeting the MPO's goals for capacity management and mobility and economic vitality because of prioritizing safe accommodations for pedestrians and bicyclists, improving connectivity of the pedestrian network, and providing infrastructure for people with disabilities.

8.3 SAFETY IMPACTS OF PROPOSED IMPROVEMENTS

Each of the proposed improvements discussed in Chapter 7 was chosen to target specific safety deficiencies present in the study area. The *Highway Safety Manual* (HSM) cost-benefit analysis is performed on the basis of reduced collisions; in the case of the existing conditions these were mostly vehicular crashes because of the absence of pedestrian and bicycle facilities on a significant portion of the corridor. However, the improvement concepts primarily target pedestrians and bicyclists, as they are Complete Streets solutions. The HSM analysis will show multimodal improvements as having a negative safety impact because increased participation in these modes exposes a larger number

of users to risk. Nonetheless, several concepts proposed in the study do have high-quality data to justify their safety benefits.

- **Corridor and Intersection Lighting Upgrades.** Existing lighting along the Route 138 corridor is inadequate. MPO staff recommends upgrading or replacing these facilities as part of any future project. MassDOT crash data show a total collision reduction of about eight percent when street lights are added to unlit intersections or roadway segments. Providing intersection and highway lighting could reduce nighttime crashes by approximately 18-to-38 percent²⁶.
- **Pedestrian Crossing Safety.** Improving the ability of pedestrians to cross Route 138 safely was a major priority in this study. The recommendations include fitting all signalized intersections with high-visibility crosswalks and installing midblock pedestrian-activated crossing signals at selected locations. Upgrading crossings has been shown to reduce vehicle-pedestrian collisions by about 40 percent.²⁷ Providing pedestrian-activated crossing signals such as pedestrian hybrid beacons could reduce vehicle-pedestrian crashes by as much as 55 percent²⁶.
- **Traffic Signal at Neponset Valley Parkway.** Complaints about safety at the intersection of Route 138 and Neponset Valley Parkway were confirmed by the HSM analysis, which showed that this is a high-risk intersection. The proposed traffic signal at this intersection will improve safety by providing all movements with a protected phase. The HSM formulas predict these changes will reduce expected annual crashes by about 27 percent.
- **Bicycle Safety.** The survey responses showed that Route 138 is generally considered to be a very dangerous place in which to bicycle. The proposals in this study seek to remedy this problem by providing bicyclists with separated facilities, either through street-level buffered bike lanes or a multi-use path. A 2017 analysis of similar roadways in Florida showed a 14 percent reduction in vehicle/bicycle collision totals after installing designated bike lanes.²⁸ However, other studies show an

²⁶ Crash Modification Factors Clearinghouse, US Department of Transportation Federal Highway Administration, website, <http://www.cmfclearinghouse.org/>, August 14, 2018

²⁷ Chen, L., C. Chen, and R. Ewing. "The Relative Effectiveness of Pedestrian Safety Countermeasures at Urban Intersections - Lessons from a New York City Experience." Presented at the 91st Annual Meeting of the Transportation Research Board, January 22-26, Washington, DC, 2012.

²⁸ Alluri et al. "Statewide Analysis of Bicycle Crashes." Florida Department of Transportation (May 2017).

increase in the total number of bicycle accidents as more riders choose to use the new facilities.

- **Reduced Speed.** High travel speeds were cited in the survey as contributing to unsafe conditions for users of all modes. Spot speed data confirmed that traffic often travels well above the posted limit. A ten percent reduction in mean travel speeds has been shown to correlate with a 10 percent reduction in crashes.²⁹ Speeds could also be directly targeted by reducing the official speed limit in the corridor. In particular, the five locations where the speed limit switches between 35 mph and 45 mph is confusing and could be converted to a uniform 35 mph zone. This would require the approval of state legislature.
- **“Red Signal Ahead” Signs.** These actuated warning signs, which are proposed in advance of the Milton Street and Atherton Street intersections, have been shown to bring about an eight percent reduction in collisions at the intersections where they are used.³⁰
- **Repaving and Restriping.** A corridor project like this will necessarily include some degree of pavement resurfacing or replacement. This change in itself can 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.

²⁹ Elvik, R., Christensen, P., and Amundsen, A., “Speed and Road Accidents An Evaluation of the Power Model.” Oslo, Norway, Transportøkonomisk Institutt, (2004)

³⁰ Appiah et al. “Safety Effect of Dilemma-Zone Protection Using Actuated Advance Warning Systems.” Transportation Research Record: Journal of the Transportation Research Board, No. 2250, Transportation Research Board of the National Academies, Washington, D.C., 2011, pp. 19-24. DOI: 10.3141/2250-03.

Chapter 9—Conclusion and Next Steps

9.1 TIME FRAME AND COSTS FOR THE IMPROVEMENTS

MPO staff worked with the study's advisory task force members to develop solutions for addressing the pedestrian and bicyclist issues, and traffic safety and operations problems identified in the corridor. The concepts include short-, medium-, and long-term improvements. Short-term improvements usually are low-cost improvements and long-term improvements usually are high-cost improvements. MPO staff qualitatively assigned each improvement concept to one of the following cost categories: *low cost*, less than \$10,000; *medium cost*, \$10,000 to \$500,000; and *high cost*, greater than \$500,000. These are preliminary cost estimates that do not include the costs of acquiring lands adjacent to the roadway, which may be required for some of the improvements.

The short-term improvements are relatively uncomplicated and inexpensive to implement, and require minimal design efforts. They include sign installation; pavement markings; in-pavement detection for bicycles; countdown timers for pedestrians; high-visibility crosswalks; traffic signal retiming; and upgrades to signal-head backplates.

The medium-term improvements are more complicated and require more funding resources and design and engineering efforts. Medium-term improvements include installing pedestrian-activated midblock crosswalks; reconfiguring existing roadway shoulders into bicycle lanes; drainage improvements; upgrading signal equipment to include an Opticom system for emergency preemption; reconstructing substandard sidewalks; geometric modifications; and managing access to driveways.

The long-term improvements typically require more design and engineering efforts, environmental permitting, and larger funding resources. They include improving street lighting; installing new sidewalks; reconstructing intersections to improve safety; capacity management and mobility; and installing new traffic signals.

9.2 BENEFITS OF THE STUDY

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

- Modernize the corridor into a more pedestrian- and bicyclist-friendly roadway
- Close the gap in the sidewalk network

- Transform Route 138 to support the rich recreational activities of the Blue Hills Reservation and the vision of connecting the neighborhoods to places such as schools, recreational areas, and local businesses
- Improve safety at Highway Safety Improvement Program (HSIP) crash cluster locations and other high-crash locations in the corridor
- Improve traffic flow and operations in the corridor, especially at very congested intersections
- Promote multimodal transportation

9.3 PROJECT IMPLEMENTATION

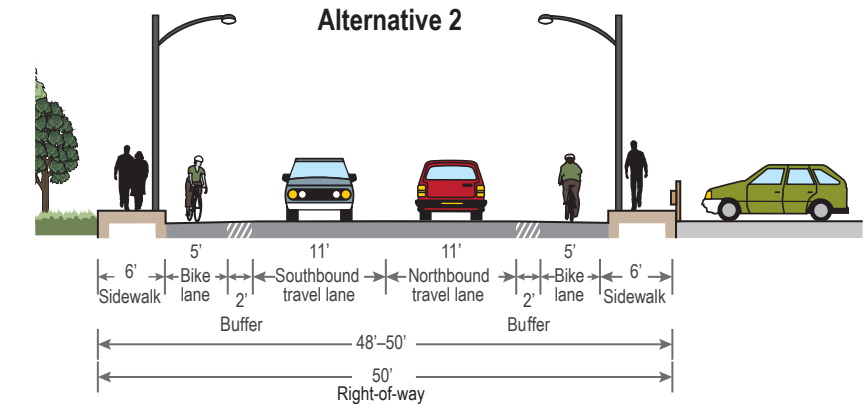
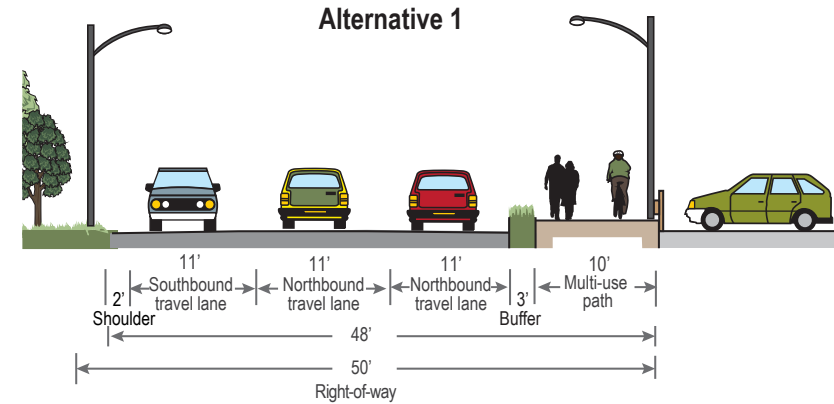
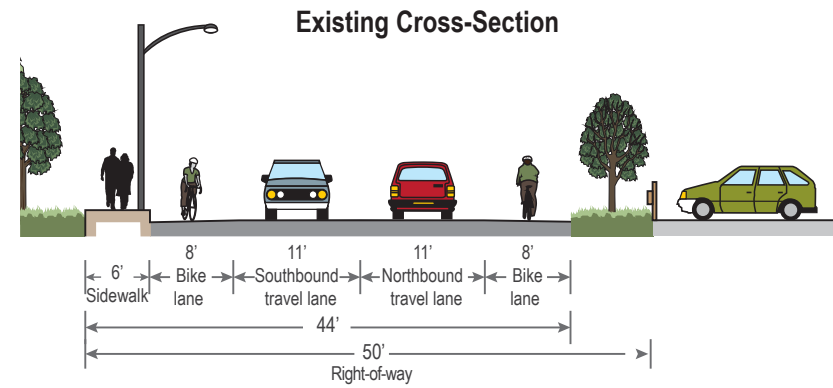
The federal fiscal year (FFY) 2019–23 Transportation Improvement Program (TIP) includes a project (Resurfacing and Related Work on Route 138) programmed in FFY 2020, to address some of the problems identified in this study. Currently, the emphasis is on providing Complete Streets solutions for the corridor and successful implementation would require cooperation between MassDOT Highway Division and the Town of Milton to ensure that sidewalks, bicycle lanes, or multi-use paths are continuous and connected; and to ensure that MassDOT’s standards guide the design of roadway elements. It is important for stakeholders to examine the concepts with all road users in mind. MassDOT owns Route 138 and would be responsible for implementing renovations to the roadway and intersections. The Town of Milton owns the majority of the side streets and would be responsible for implementing renovations on those streets. The Department of Conservation and Recreation (DCR) owns some of the roadways (Neponset Valley Parkway and Green Street) and facilities in the Blue Hills Reservation and would be responsible for implementing improvements for those facilities.

9.4 PROJECT DEVELOPMENT

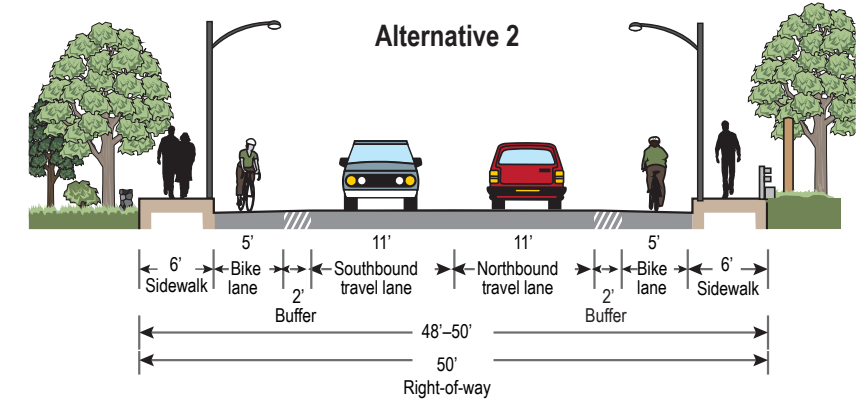
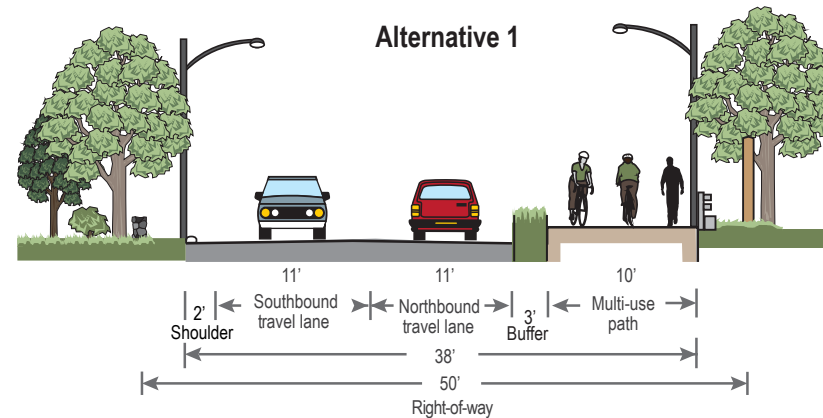
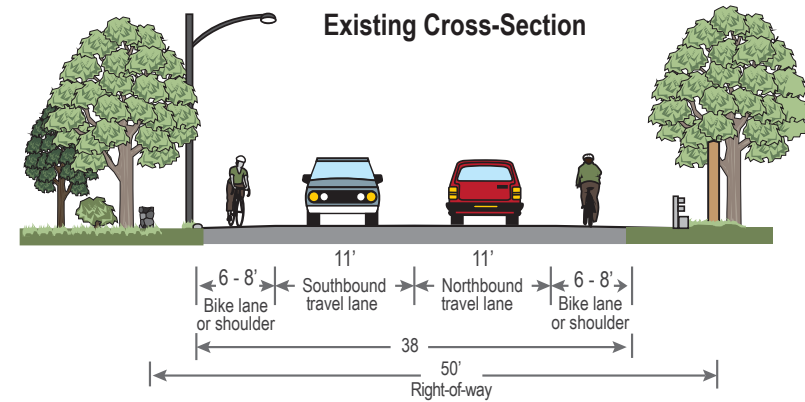
Transportation decision making is complex and is influenced by factors such as financial limitations and agencies’ programmatic commitments. Project development is the process that takes transportation improvements from concept to construction. This process will depend upon cooperation between MassDOT, the Town of Milton, and the Boston Region MPO. This planning study provides the necessary information for the project proponents to initiate the project notification and review process. After completing these initial steps, the proponents can start preliminary design and engineering and begin working with the MPO to program funding for the project in the TIP. Appendix H contains an overview of the project development process.

SA/sa

Blue Hills Reservation Area (Southern Segment)
 (From Canton-Milton Town Line to Canton Avenue Branch)



Brush Hill Area (Middle Segment)
 (From Brush Hill Road to Atherton Street/Bradlee Road)



Tucker Neighborhood (Northern Segment)
 (From Robbins Street to the End of Route 138)

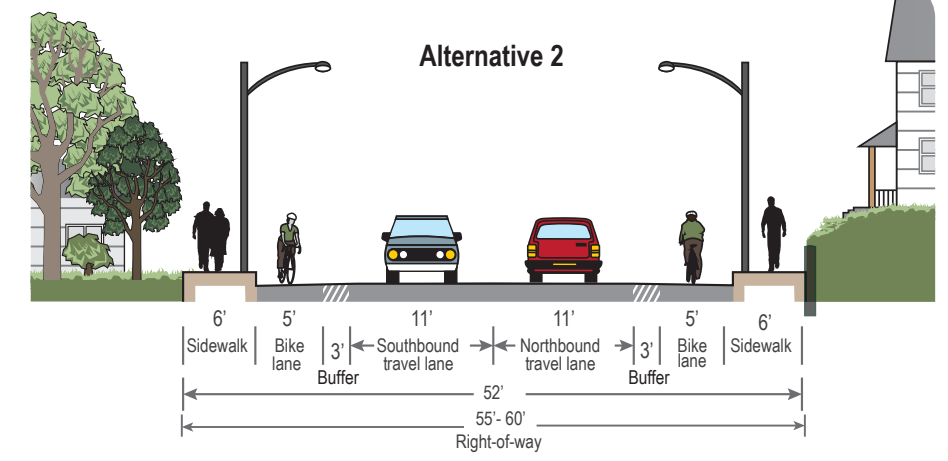
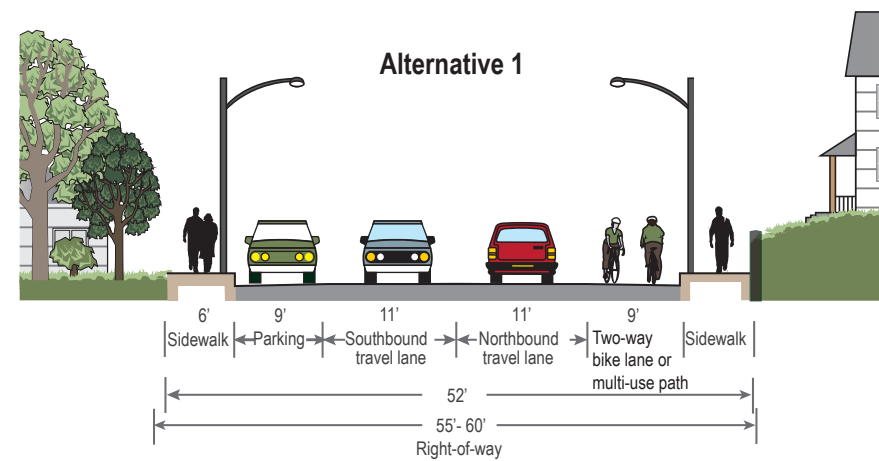
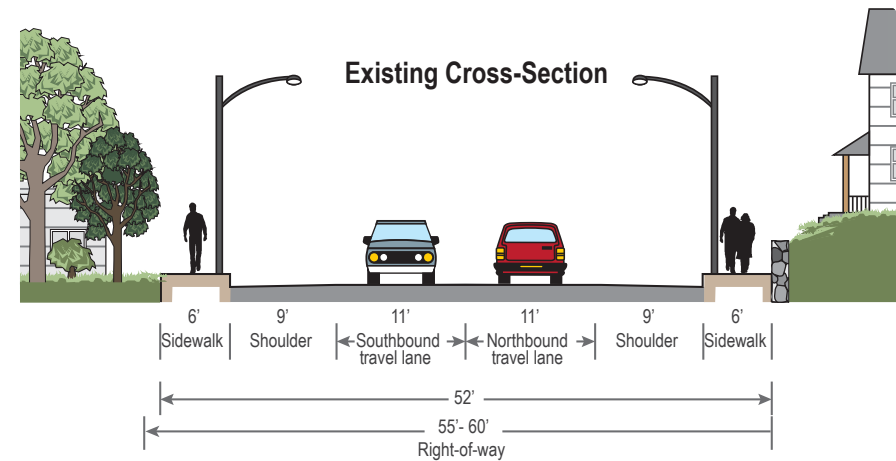


Figure ES 1
 Summary of Alternatives



Figure 2
Jurisdiction of Roadway in the Route 138 Study Area

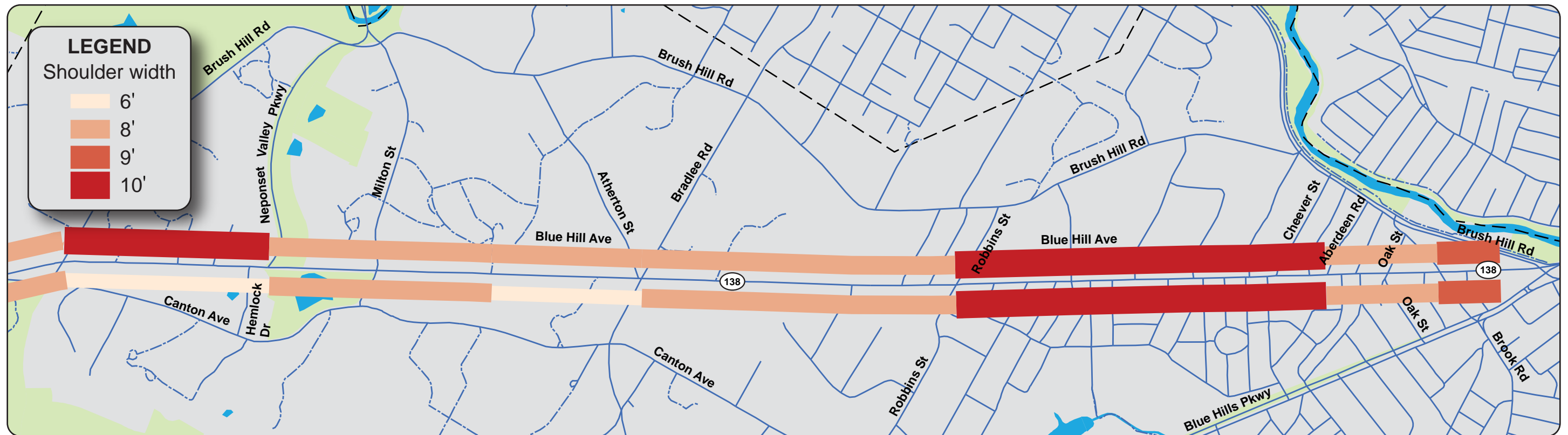


Figure 3
Width of Right of Way and Shoulders on Route 138 in Milton



Figure 4
Locations of Sidewalks on Route 138 in Milton

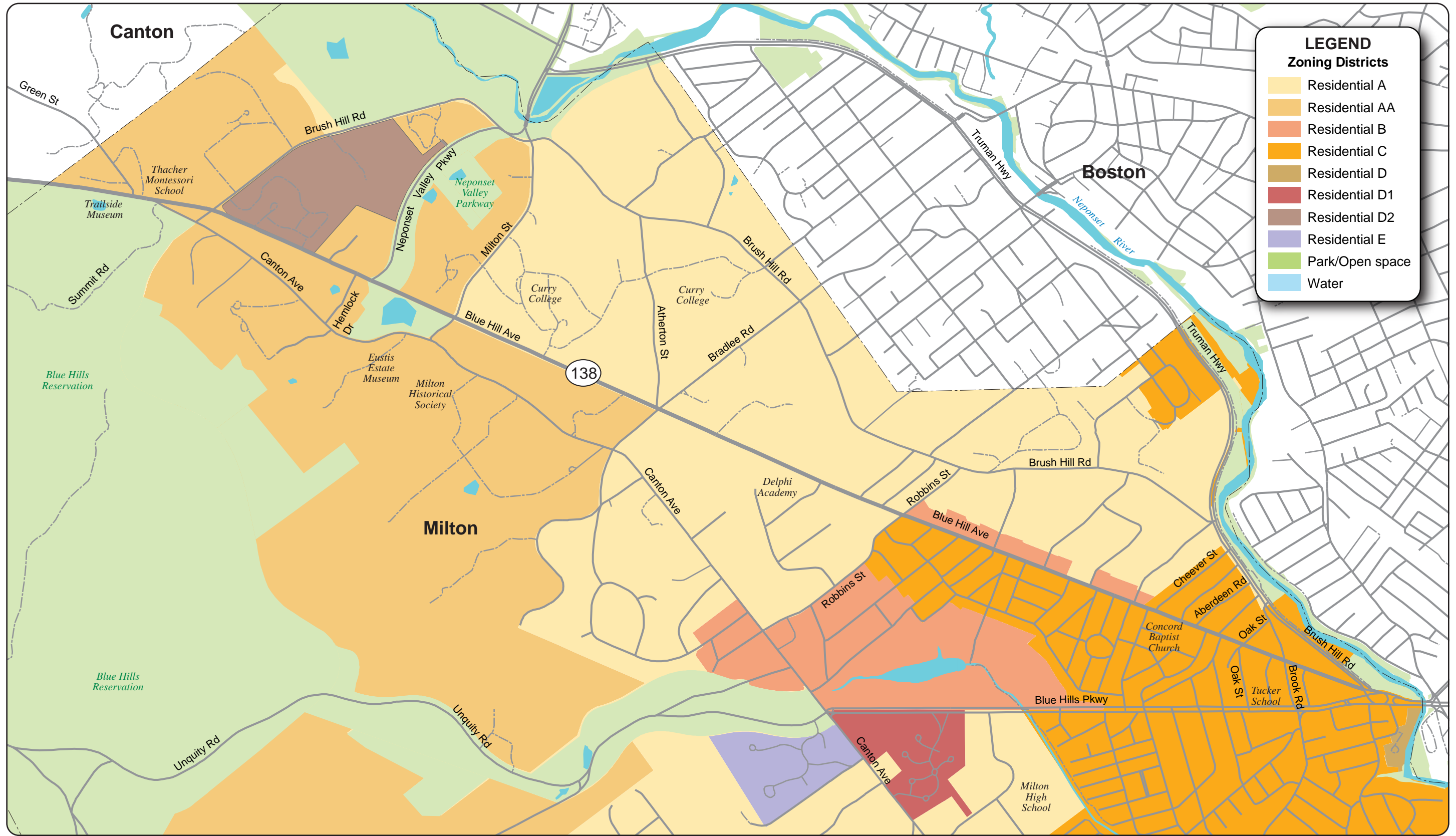


Figure 6
Land Use and Zoning Map along Route 138 in Milton

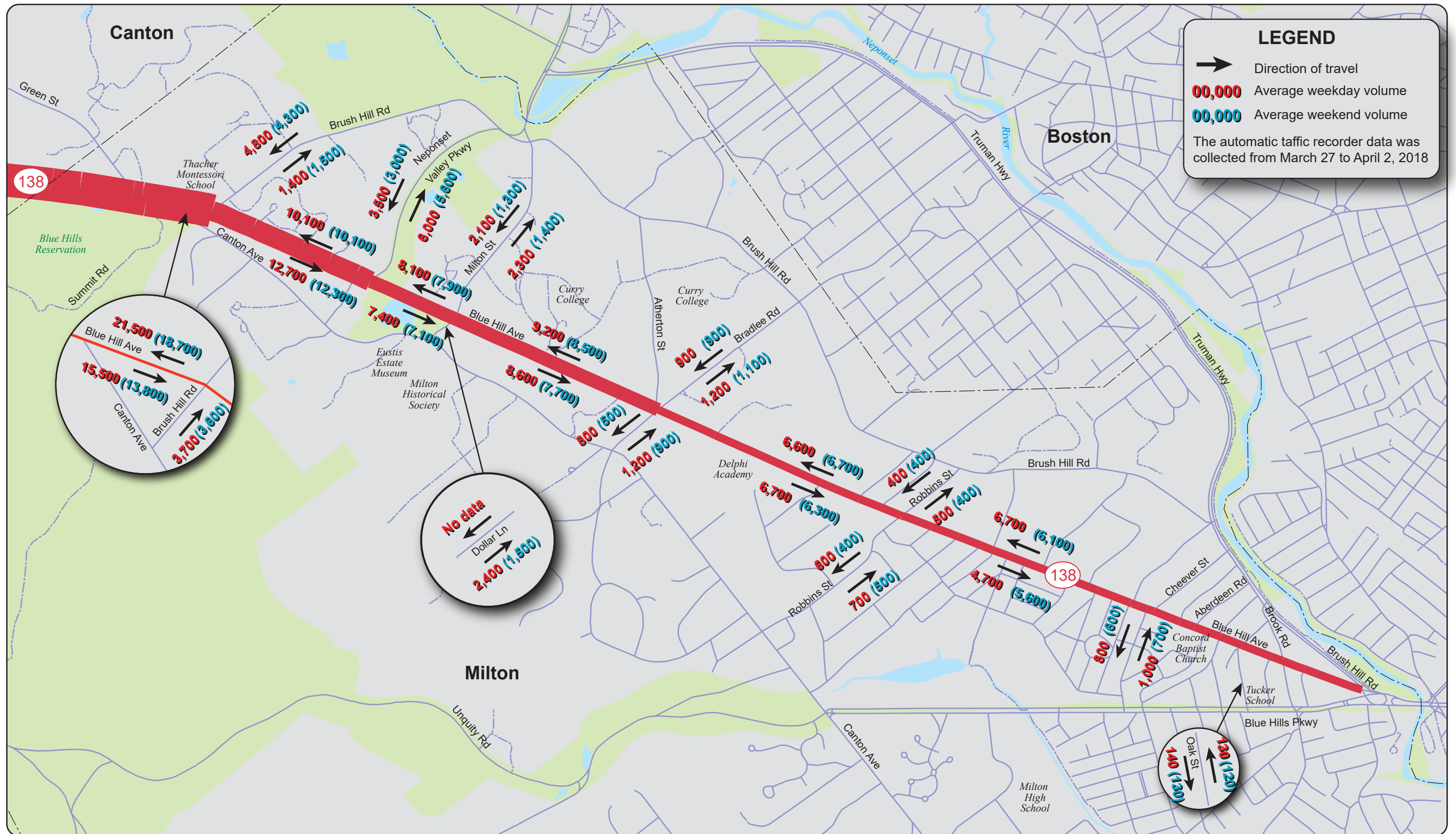


Figure 7
Weekday and Weekend Average Traffic Volumes on Route 138 in Milton

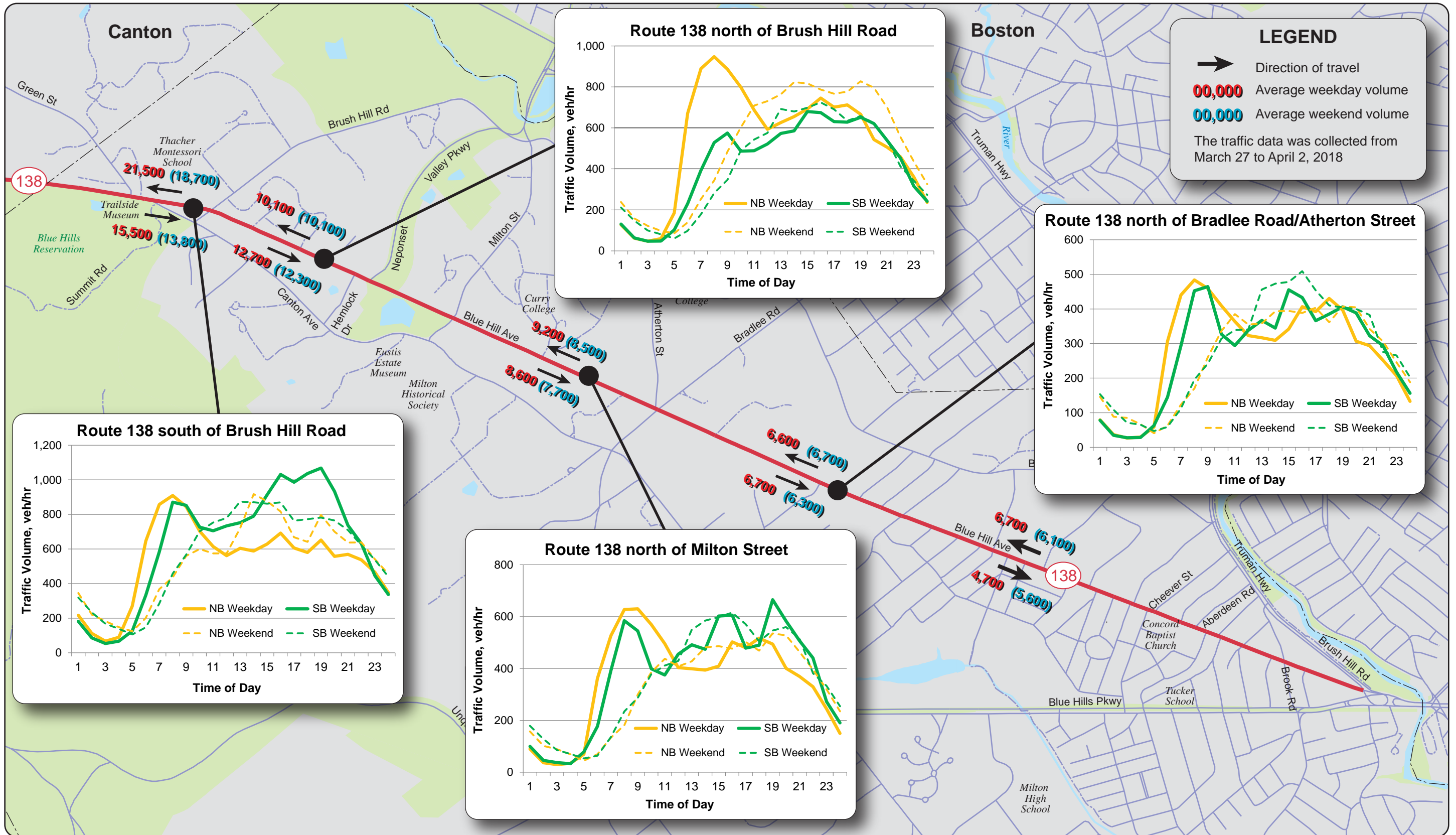


Figure 8
Weekday and Weekend Hourly Traffic-Volume Distribution on Route 138 in Milton

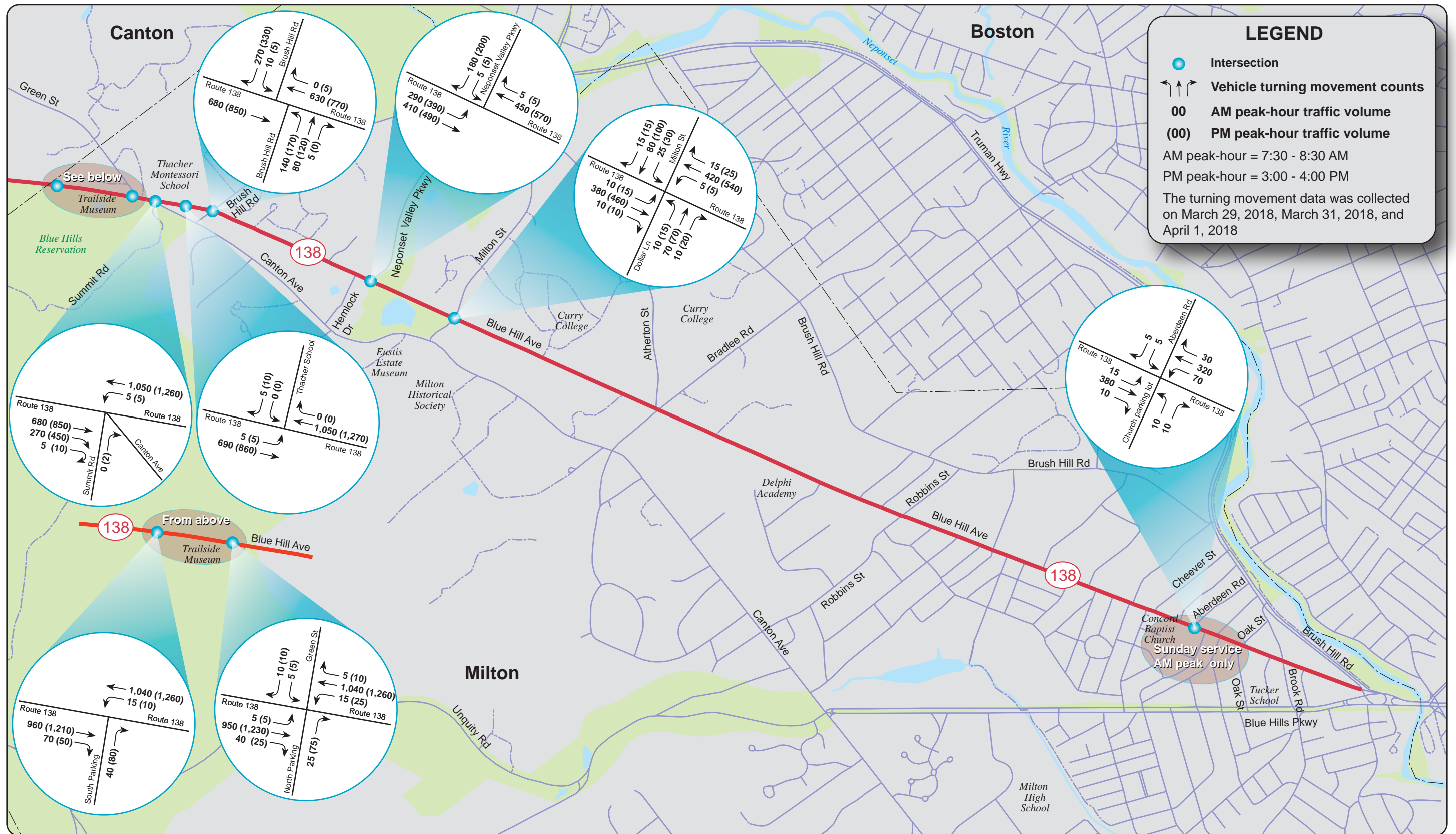
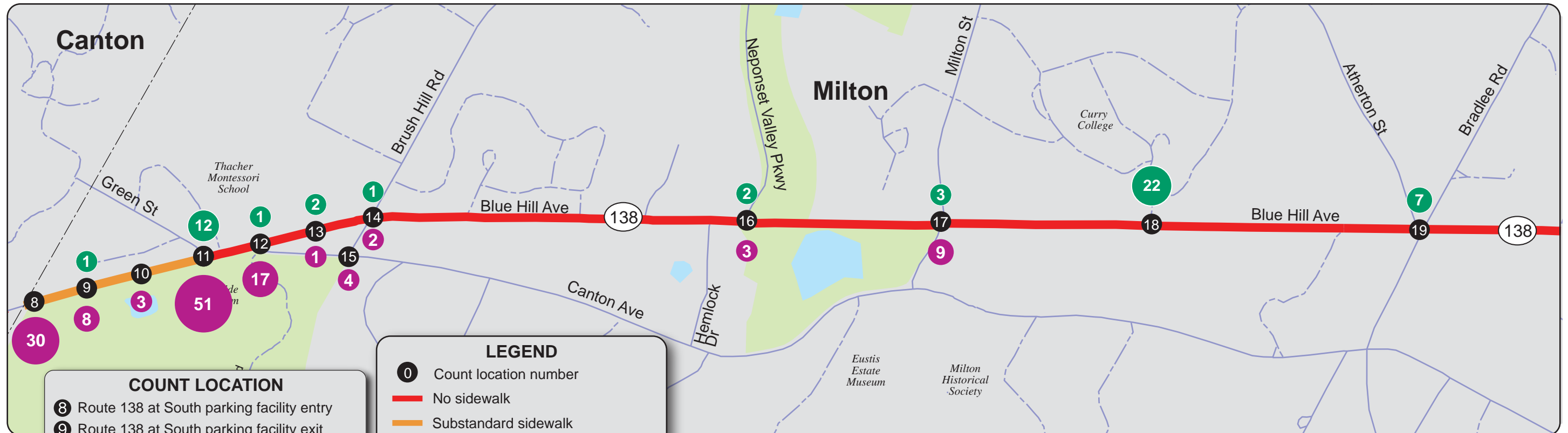


Figure 10
 Turning Movement Volumes on Route 138 in Milton
 Weekend AM and PM Peak Hour

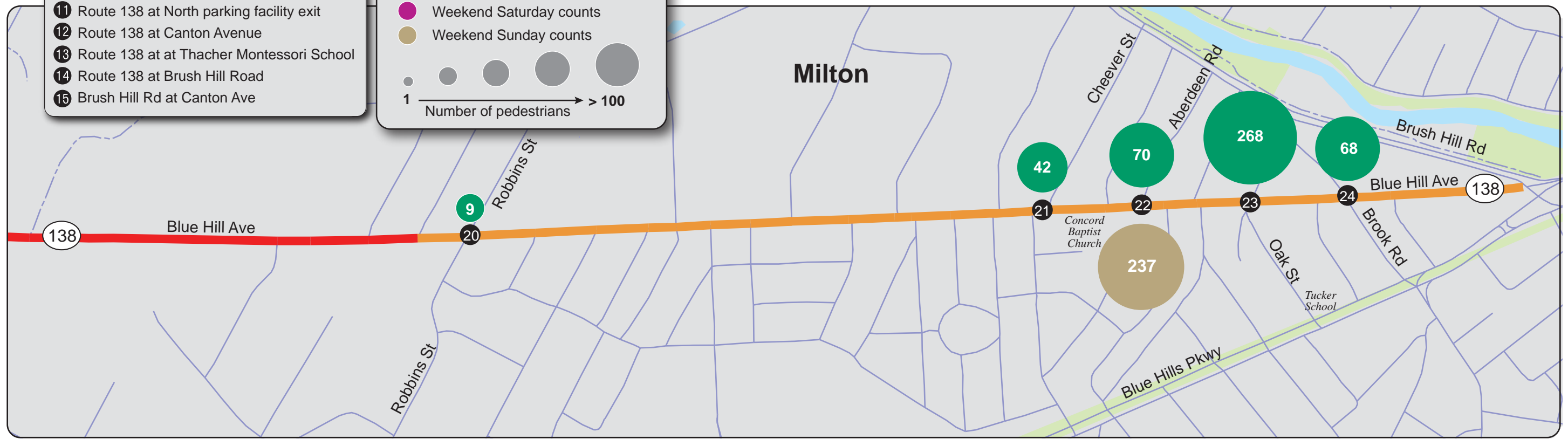


- COUNT LOCATION**
- ⑧ Route 138 at South parking facility entry
 - ⑨ Route 138 at South parking facility exit
 - ⑩ Route 138 at North parking facility entry
 - ⑪ Route 138 at North parking facility exit
 - ⑫ Route 138 at Canton Avenue
 - ⑬ Route 138 at at Thacher Montessori School
 - ⑭ Route 138 at Brush Hill Road
 - ⑮ Brush Hill Rd at Canton Ave

LEGEND

- ① Count location number
- No sidewalk
- Substandard sidewalk
- Weekday counts
- Weekend Saturday counts
- Weekend Sunday counts

1 ————— > 100
Number of pedestrians



BOSTON REGION MPO

Figure 11
Peak Period Pedestrian Volumes
 (Weekday: 6:00 - 9:00 AM and 3:00 - 6:00 PM)
 Weekend: 8:00 - 11:00 AM and 2:00 - 5:00 PM)

Addressing Priority Corridors from the L RTP Needs Assessment: Route 138 in Milton

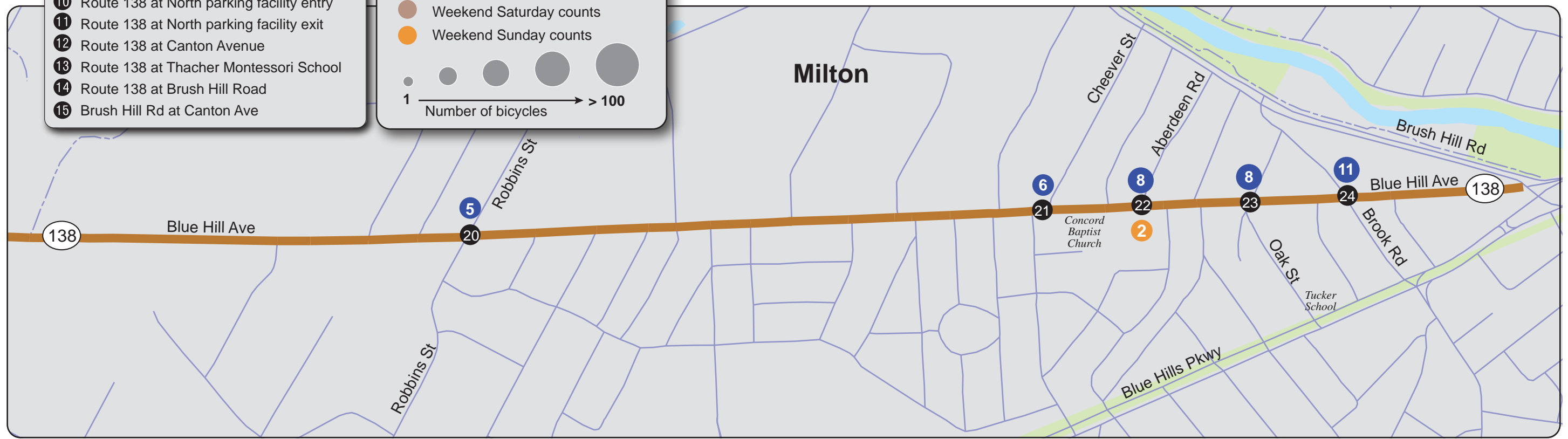


Figure 12
Peak Period Bicycle Volumes
 (Weekday: 6:00 - 9:00 AM and 3:00 - 6:00 PM)
 Weekend: 8:00 - 11:00 AM and 2:00 - 5:00 PM)



Figure 13
Observed Spot Speeds and Posted Speed Limits on Route 138 in Milton

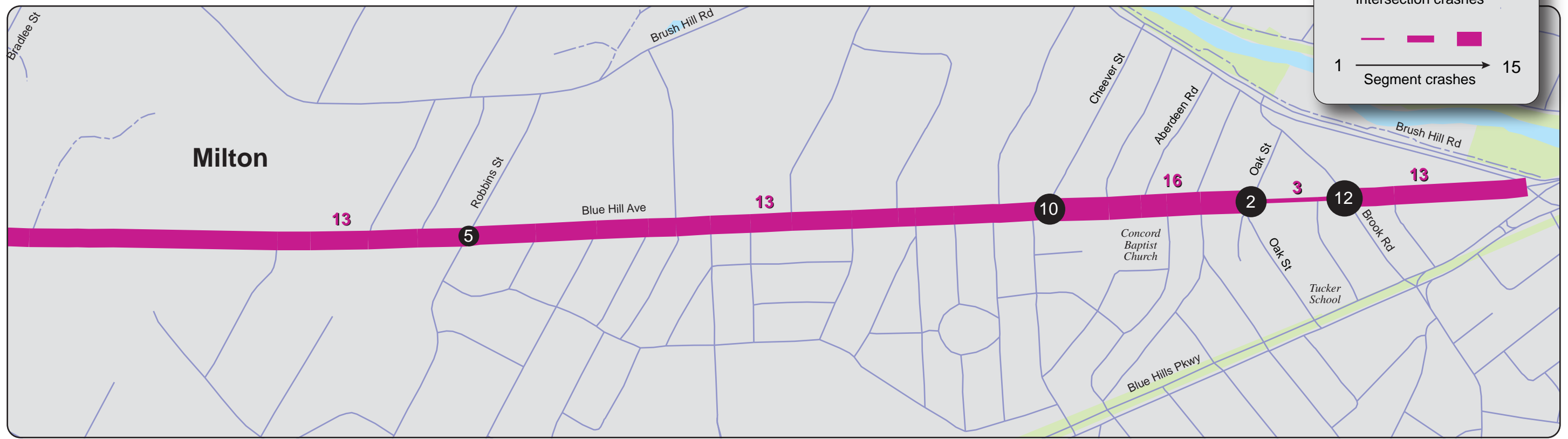
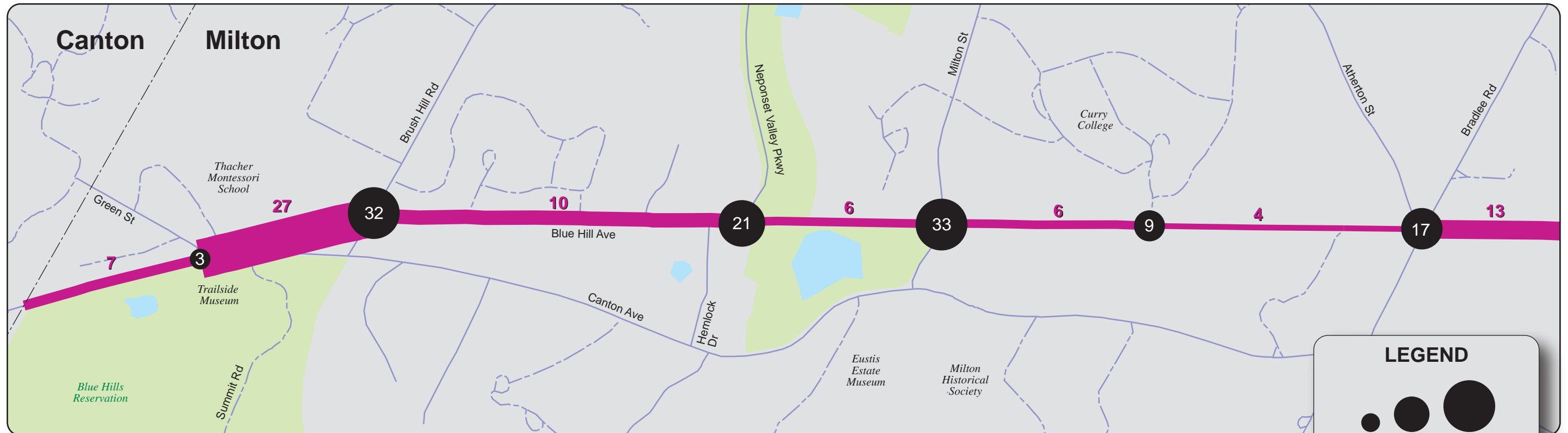


Figure 14
Crashes by Intersection and Segment (2011 - 2015)

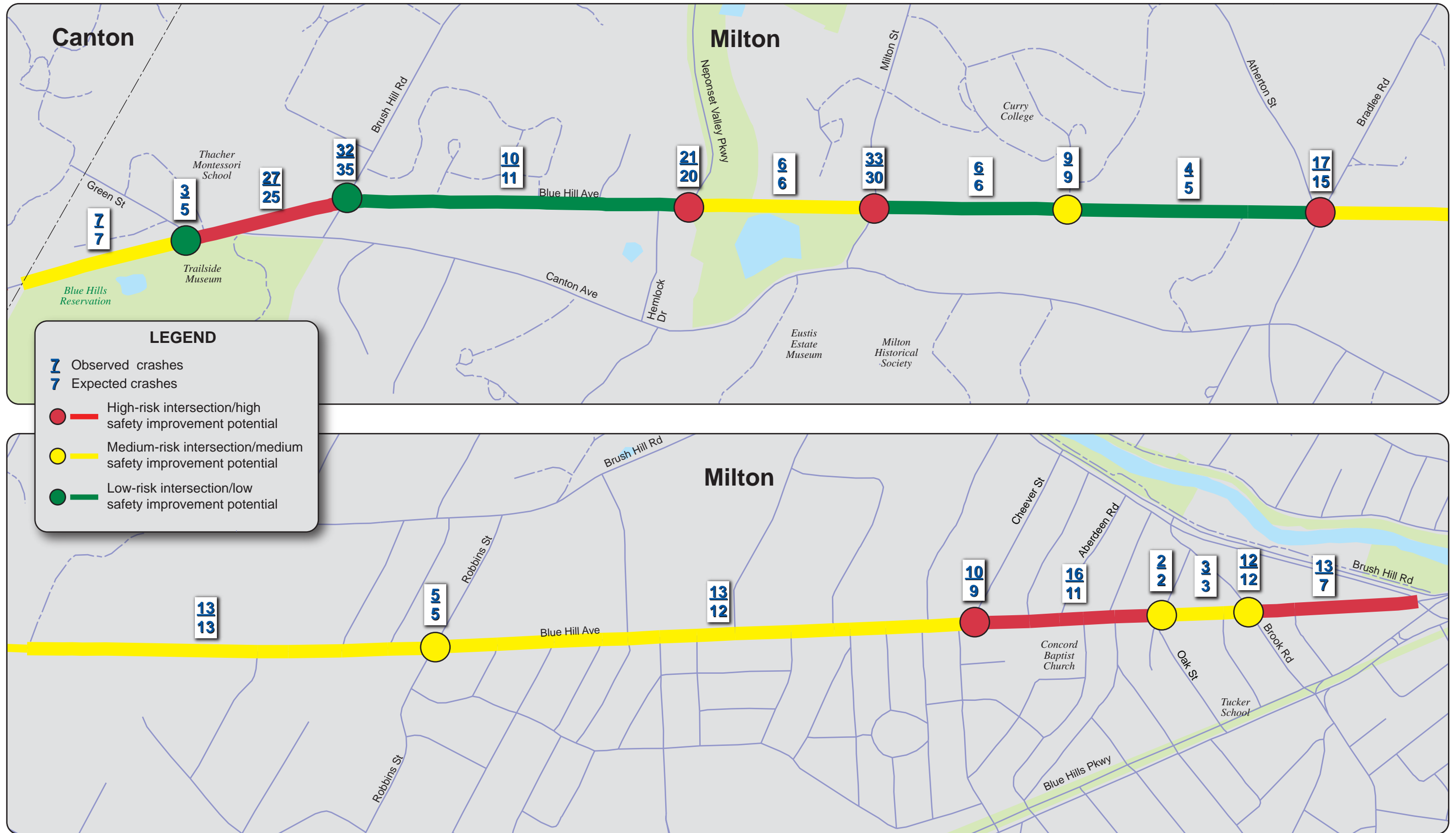


Figure 15
Observed and Expected Crashes by Intersection and Segment

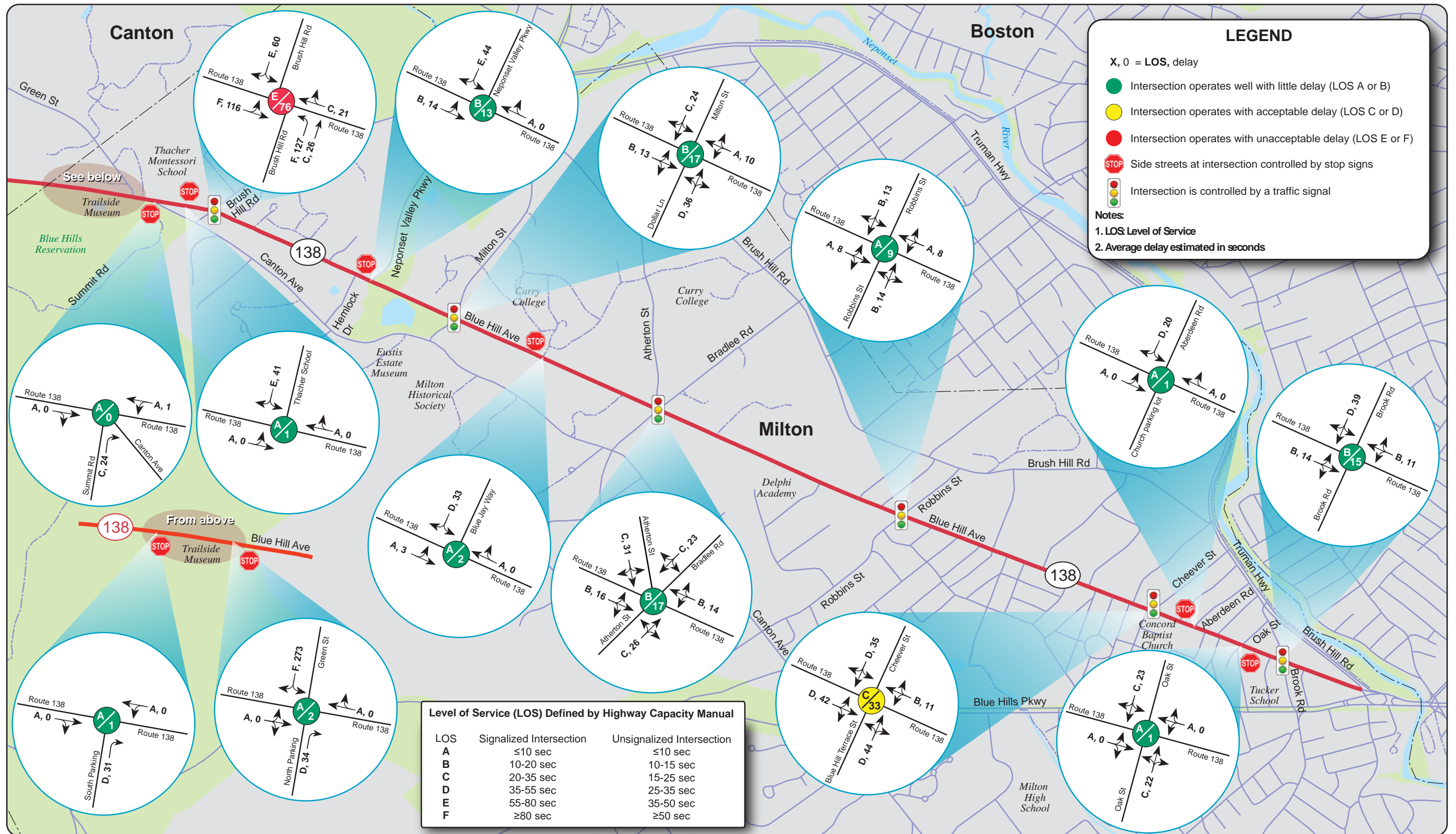


Figure 16
Existing Conditions
Weekday AM Peak Hour Intersection Level of Service

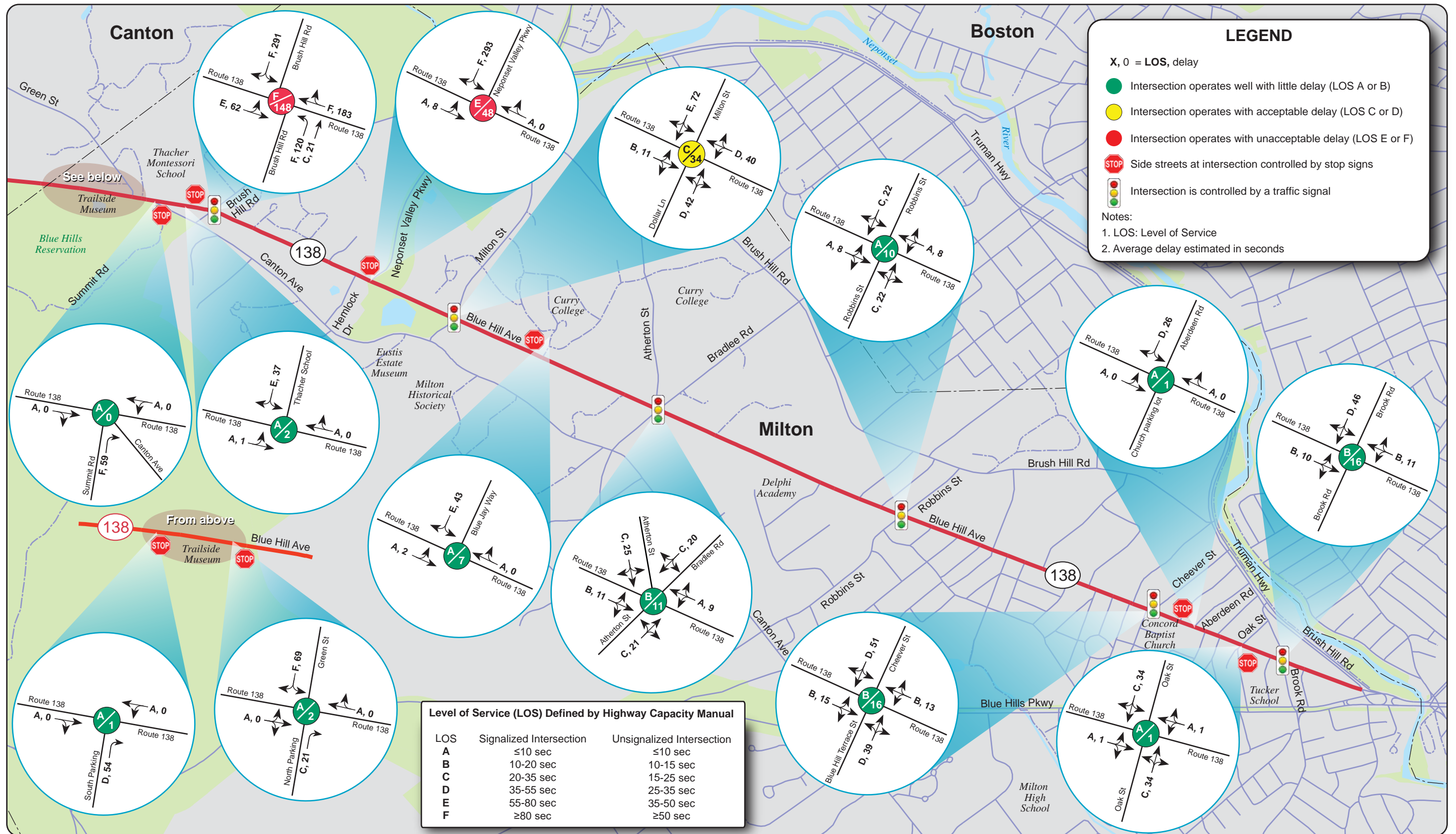


Figure 17
Existing Conditions
Weekday PM Peak Hour Intersection Level of Service

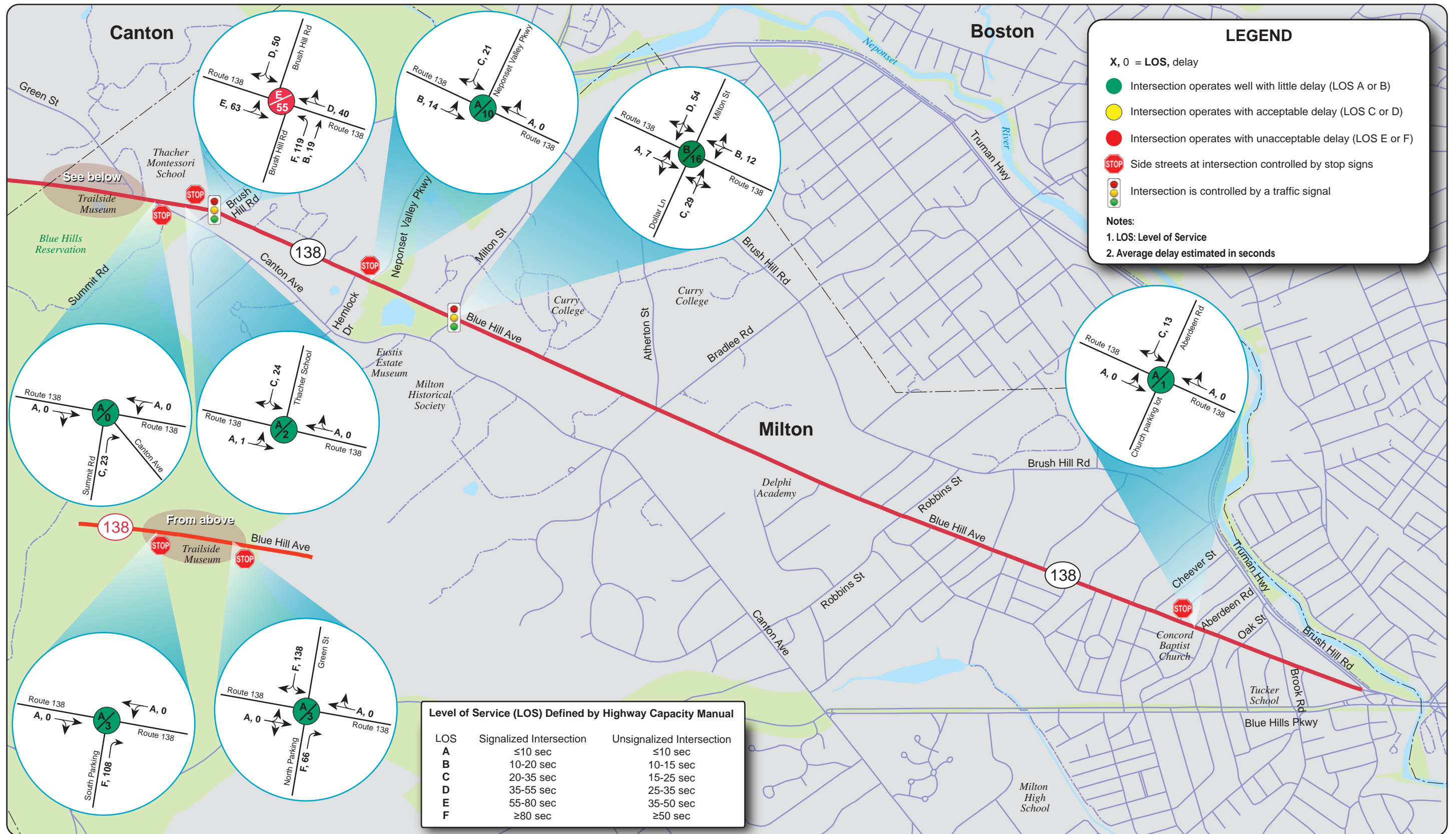
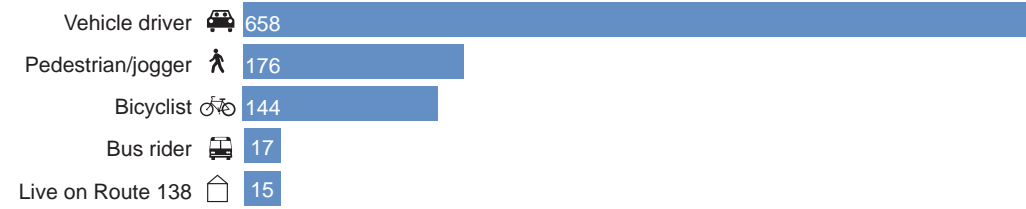
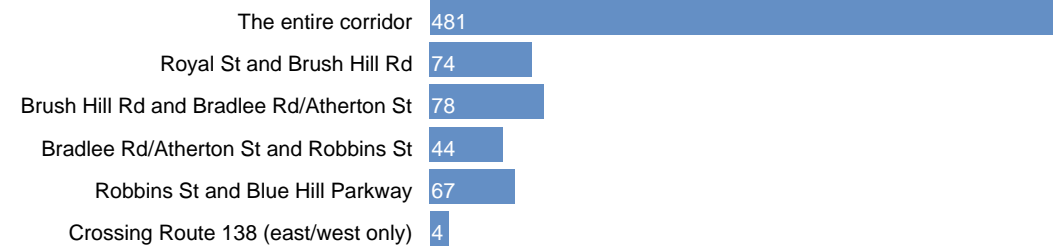


Figure 18
Existing Conditions
Weekend PM Peak Hour Intersection Level of Service

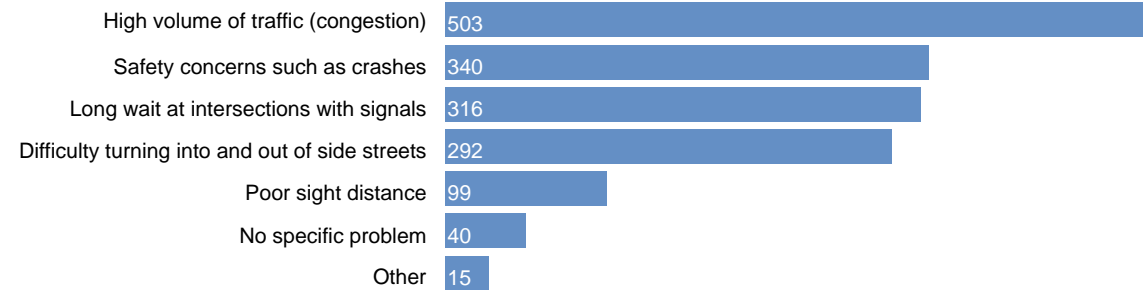
1. How do you typically use Route 138? Are you a:



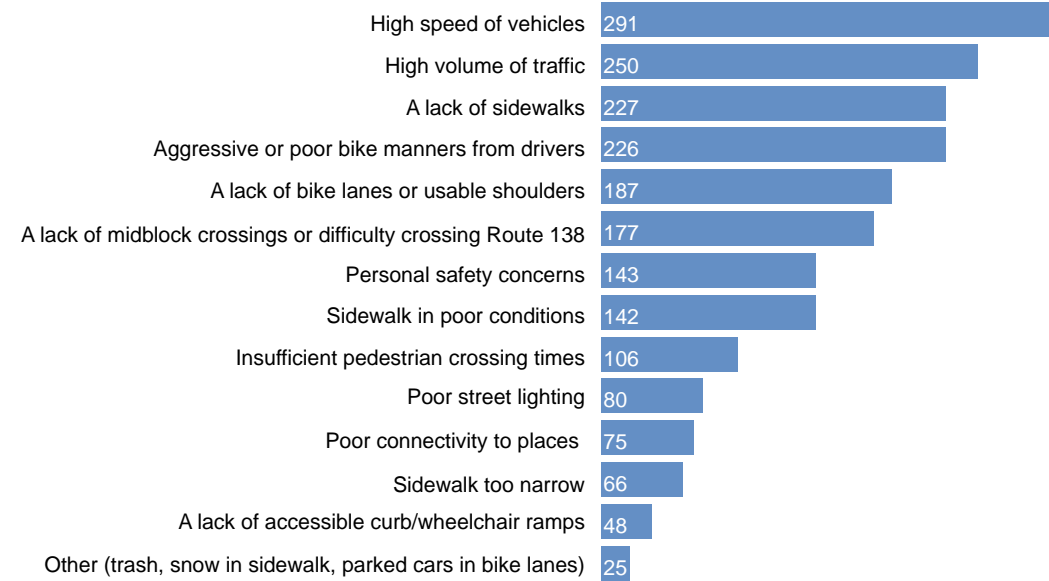
2. Please indicate which section(s) of Route 138 in Canton that you typically use.



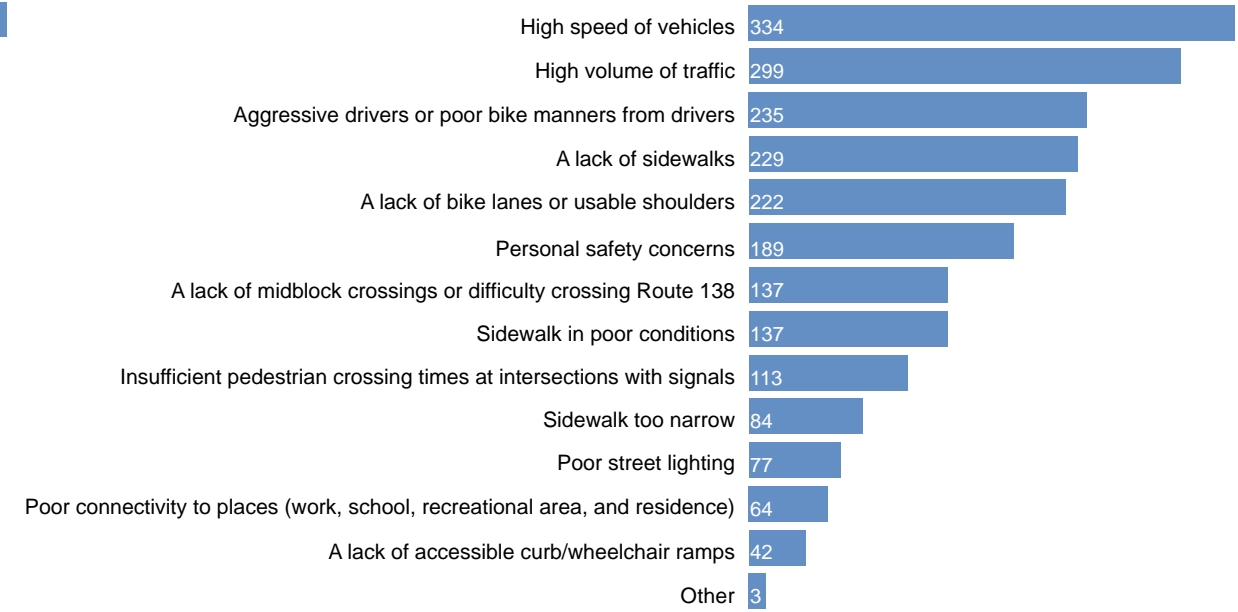
3. While driving on Route 138, what are the problems you encounter?



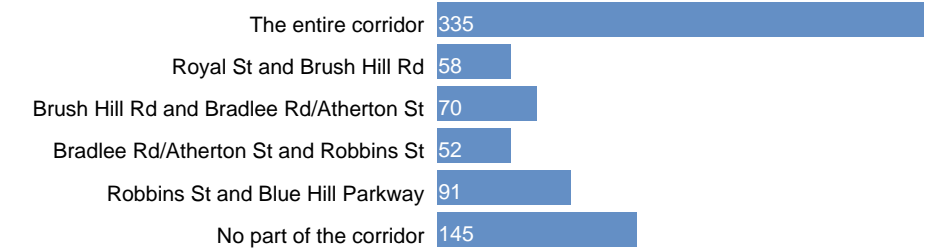
4. While bicycling or walking along Route 138, what particular problems do you regularly encounter?



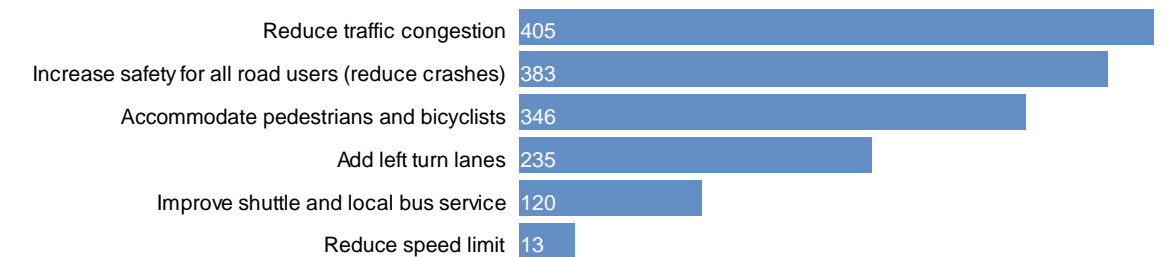
5. Please indicate any problems that keep you from bicycling or walking on Route 138.



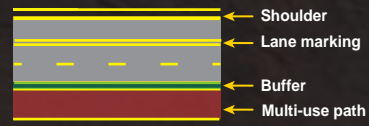
6. Please indicate which section(s) of Route 138 in Canton that you feel are most in need of Complete Street (bicycle and pedestrian accommodations) solutions.



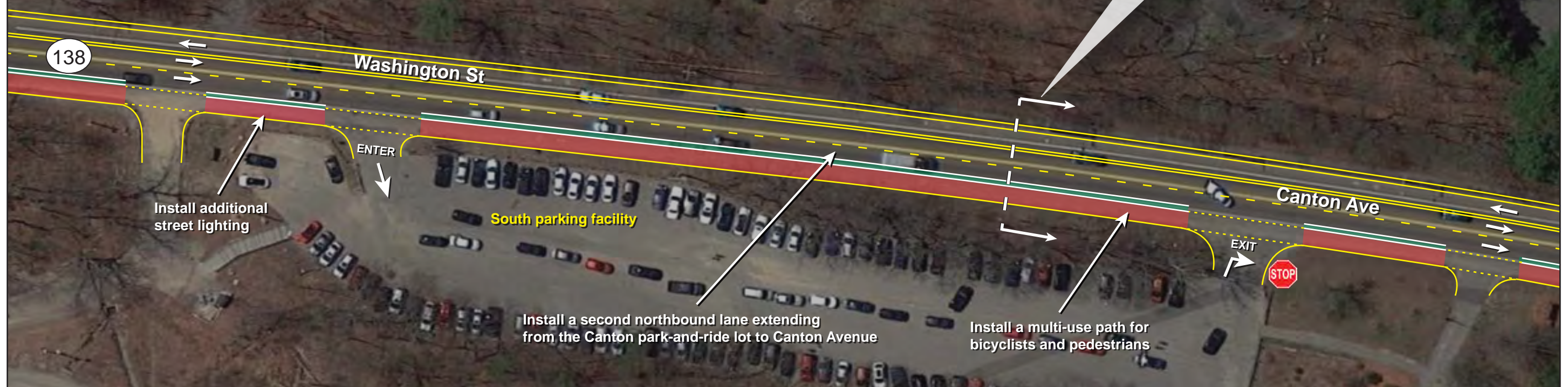
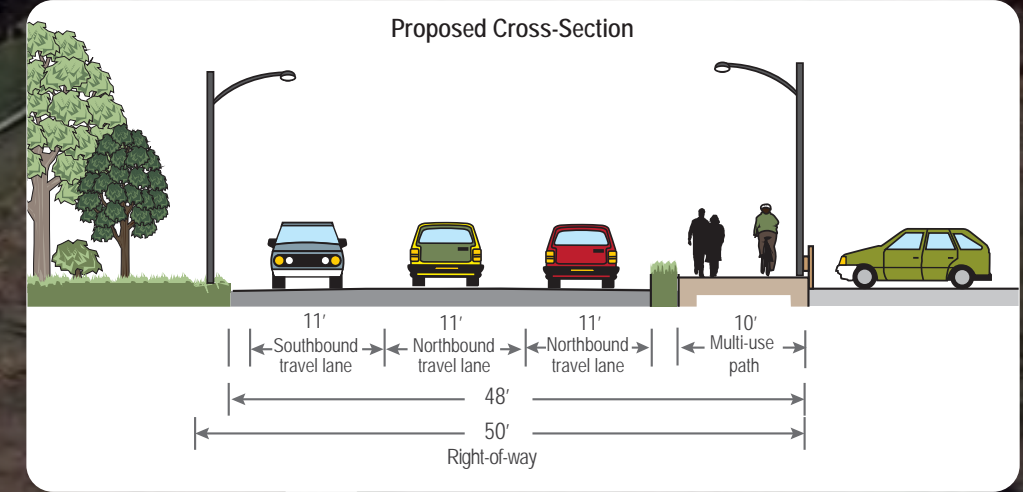
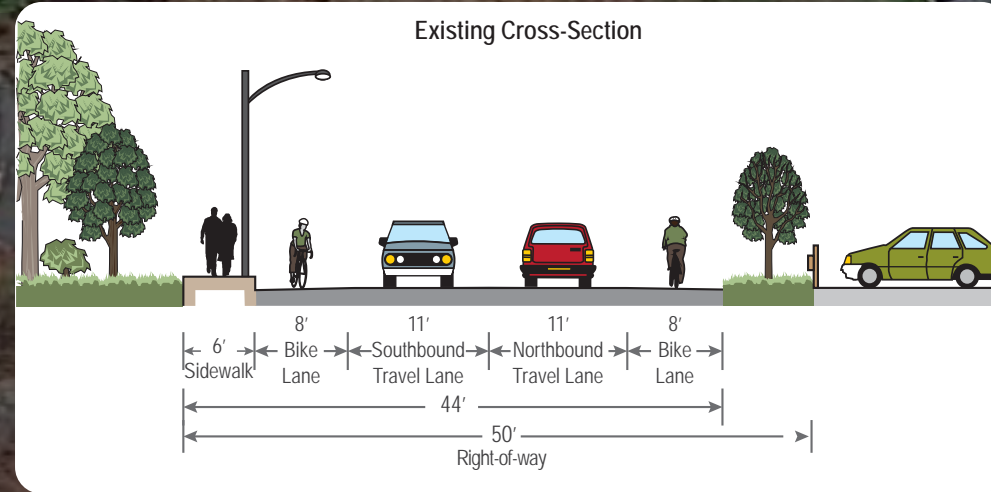
7. Please indicate any traffic operational improvements you would like to see implemented in the Route 138 corridor.



LEGEND



Not to scale: for illustration purposes



A picture of the existing roadway



Examples of multi-use path



Figure 20
Improvement Concept: Alternative 1- Multi-Use Path on East Side of Roadway Only
Route 138 at the Blue Hill Reservation South Parking Facility Area

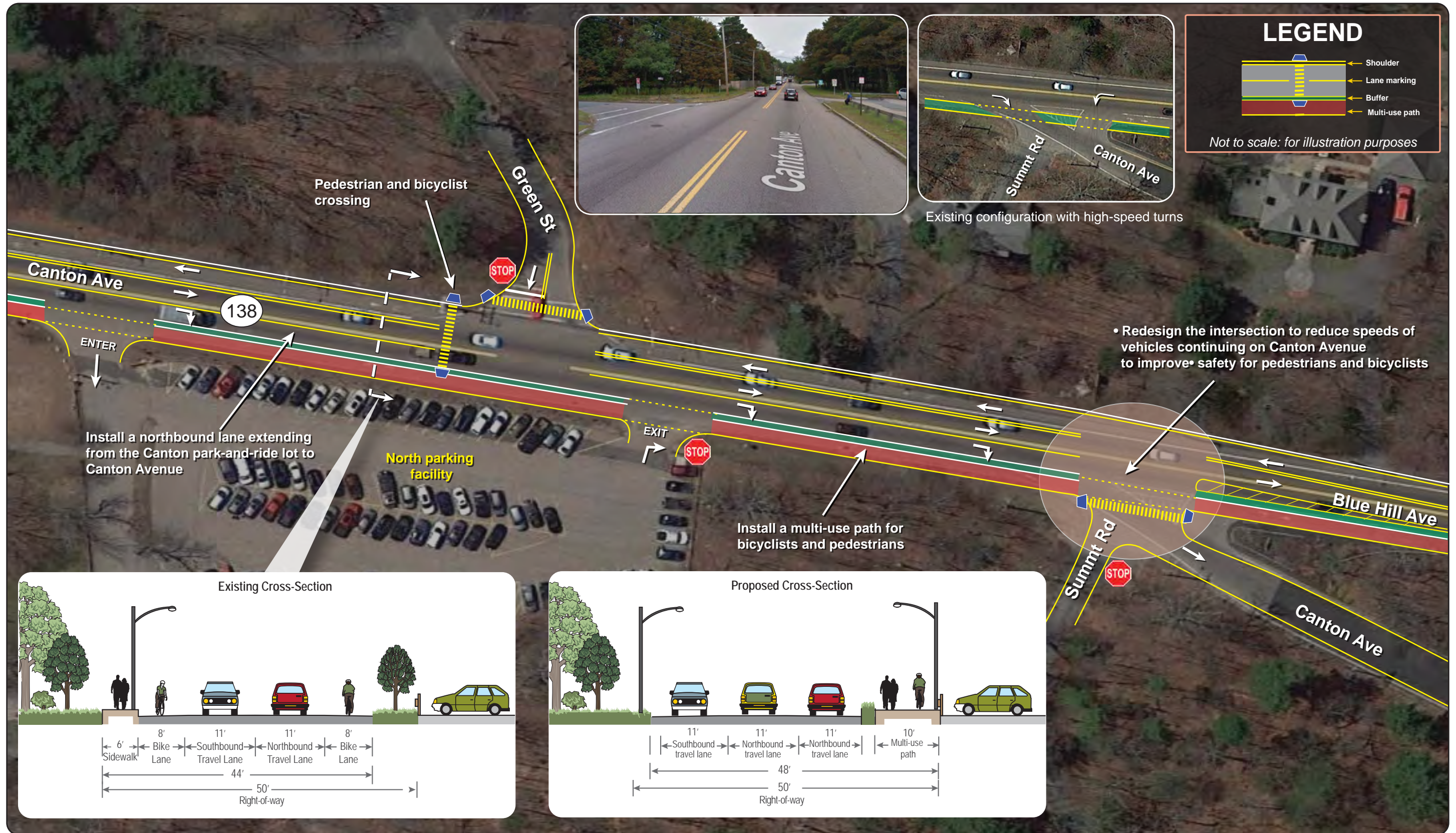


Figure 21
Improvement Concept: Alternative 1 - Multi-Use Path on East Side of Roadway
Route 138 at Green Street and Canton Avenue

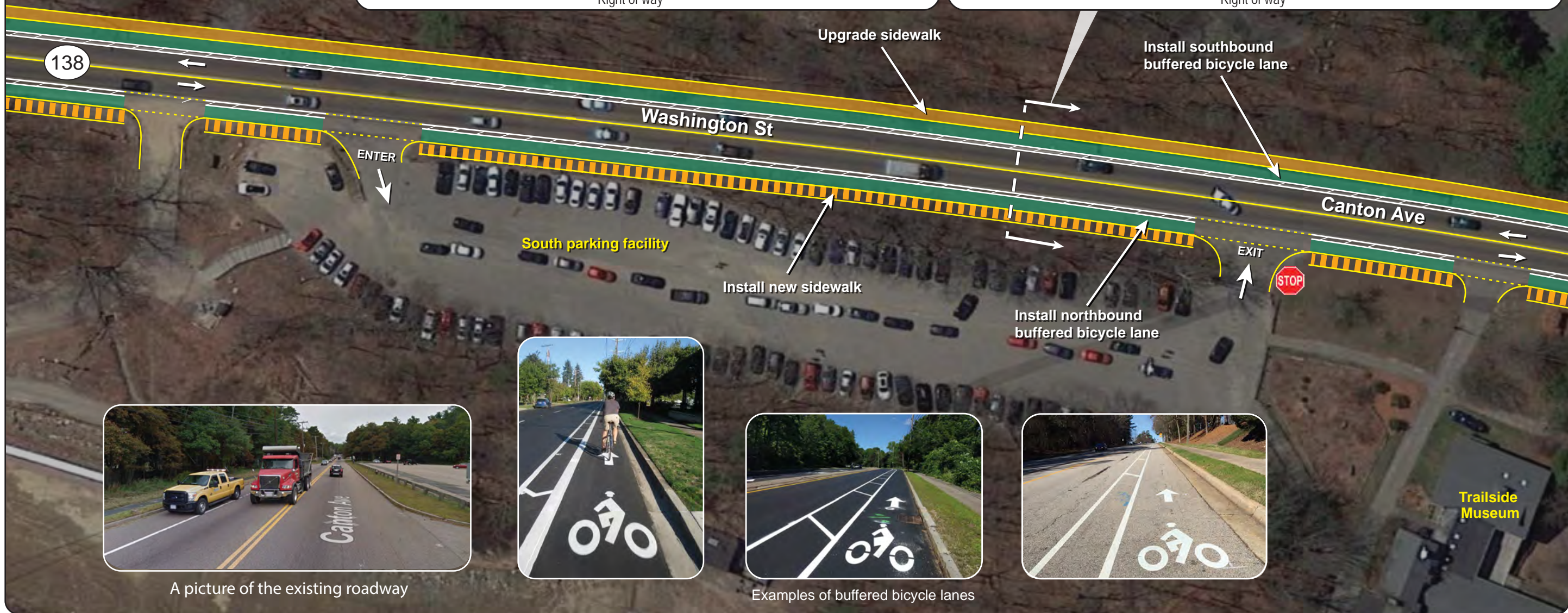
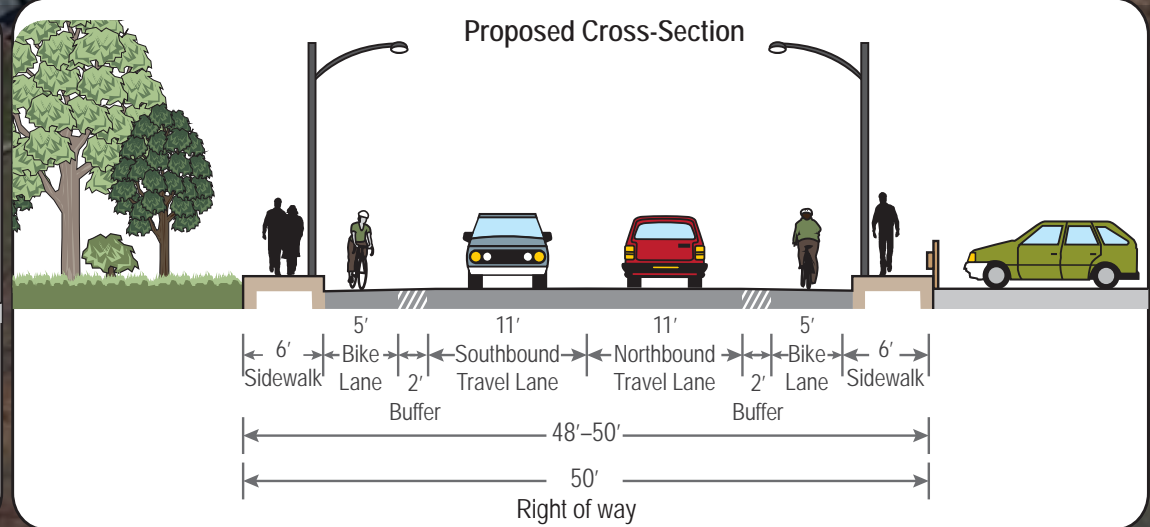
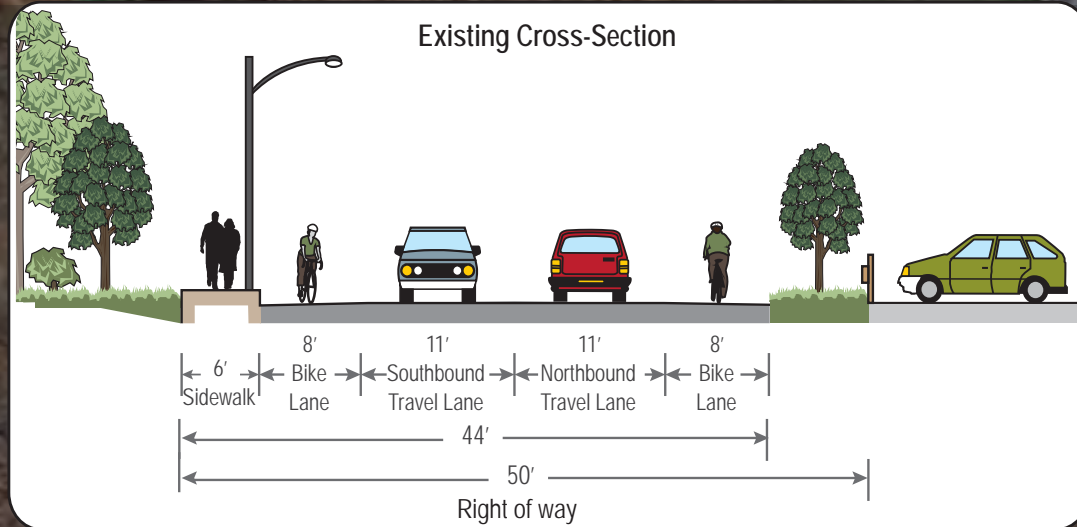
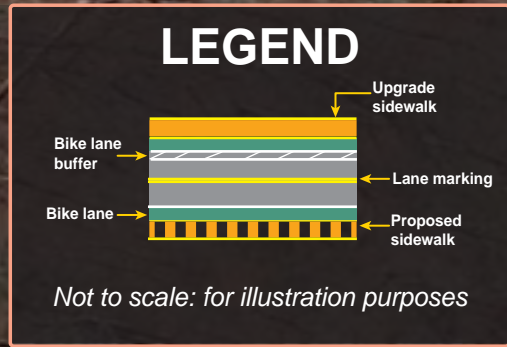


Figure 22
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at the Blue Hill Reservation South Parking Facility Area

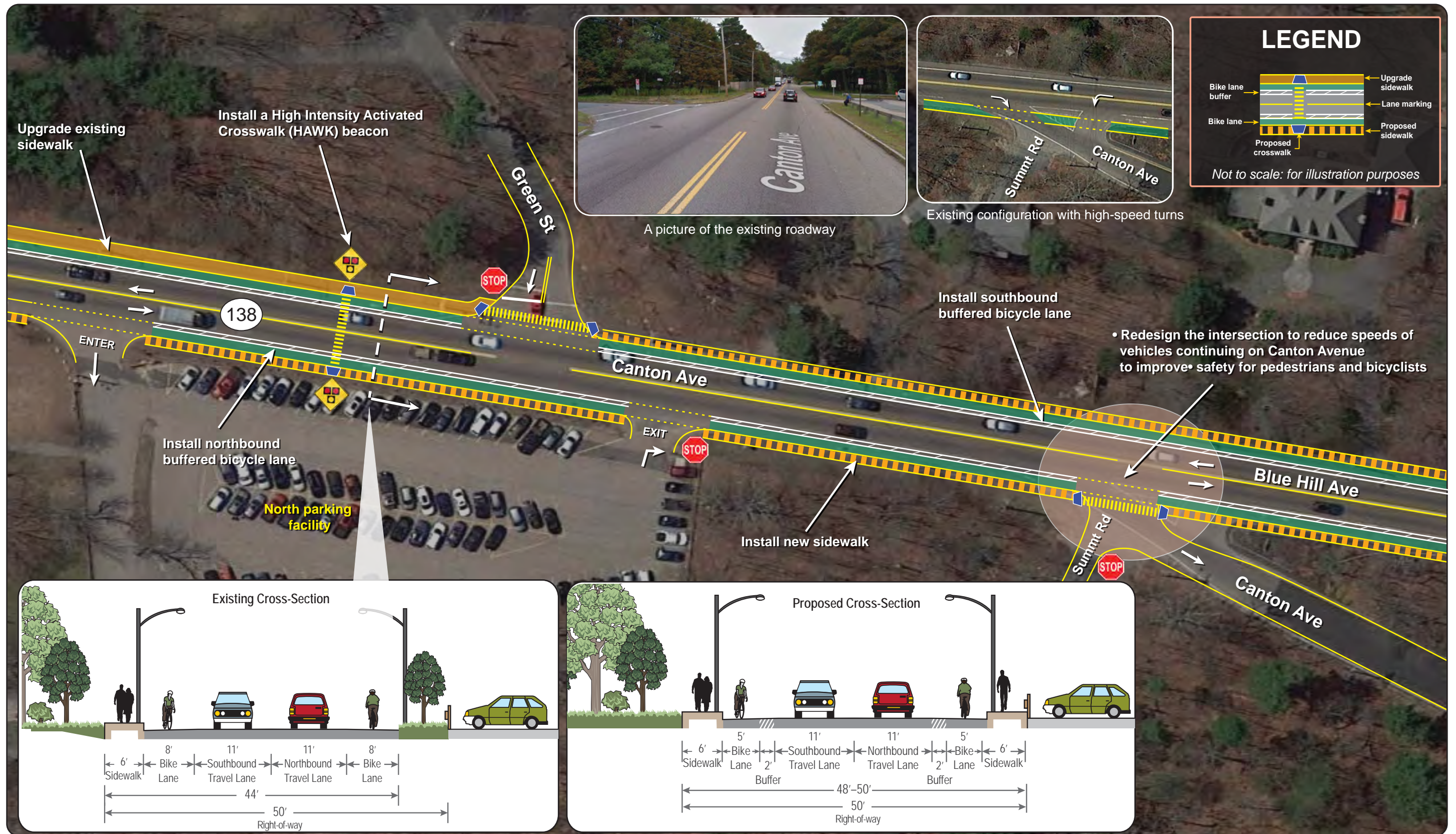
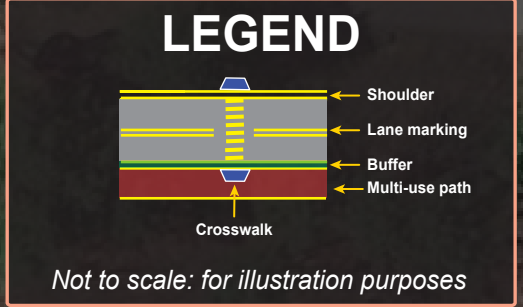


Figure 23
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at Green Street and Canton Avenue



A picture of the existing roadway

- Upgrade traffic signal equipment to include pedestrian signals, detection for bicycles, and emergency vehicle preemption system
- Install new mast arm poles, add retro reflective backplates, and align signal heads to improve visibility at each approach
- Optimize traffic signal timings and adjust clearance intervals to be consistent with MassDOT standard
- Trim vegetation on the approaches to improve visibility of the signal heads



Consider adding a northbound left-turn lane on Route 138 to reduce weaving on Brush Hill Road westbound approach

Install do not block intersection crosshatch pavement markings

Thacher Montessori School

Widen receiving approach to two lanes

EXIT
ENTER

Blue Hill Ave

Blue Hill Ave

138

Brush Hill Rd

Install multi-use path on east side of the roadway

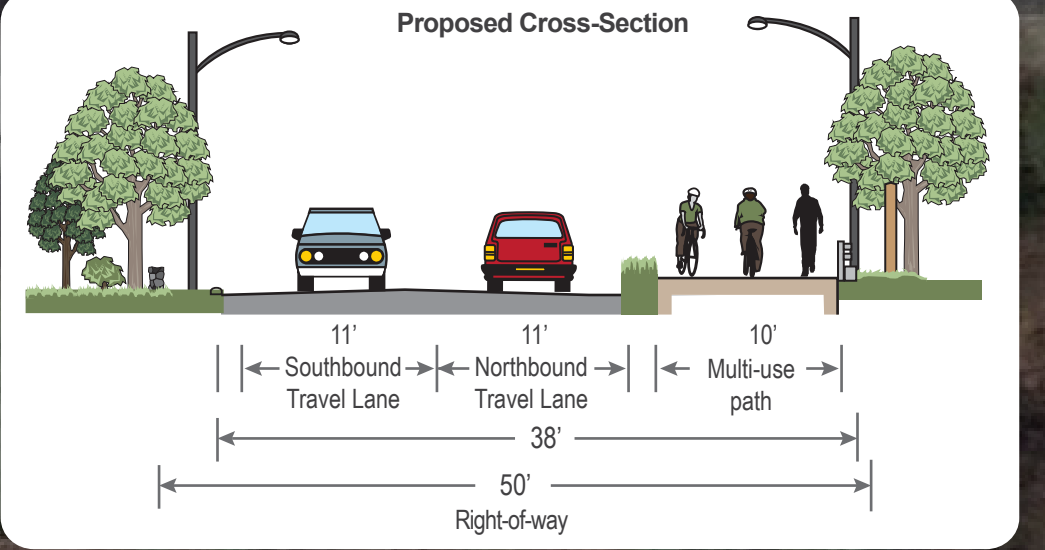
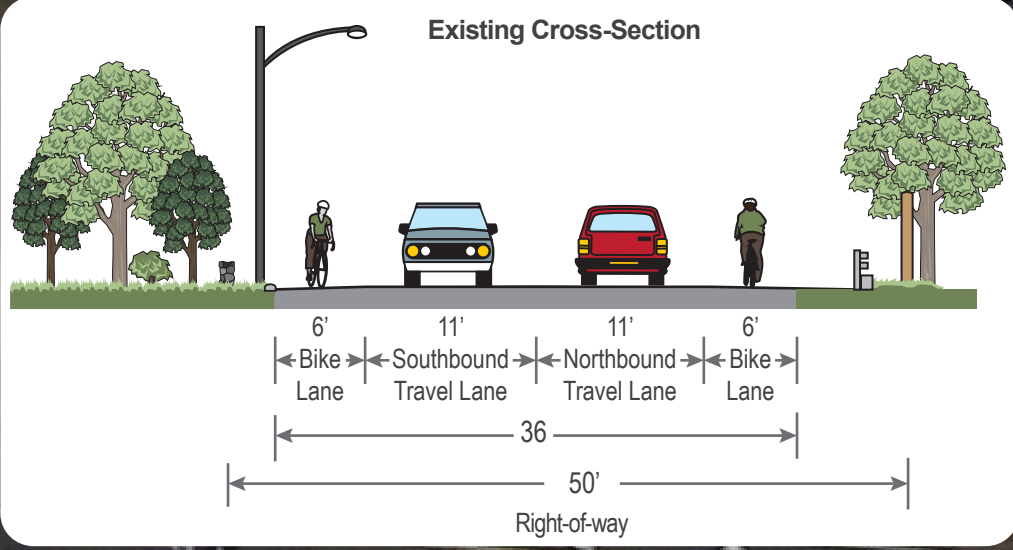


Figure 24
Improvement Concept: Alternative 1 - Multi-Use Path on East Side of Roadway
Route 138 at Brush Hill Road

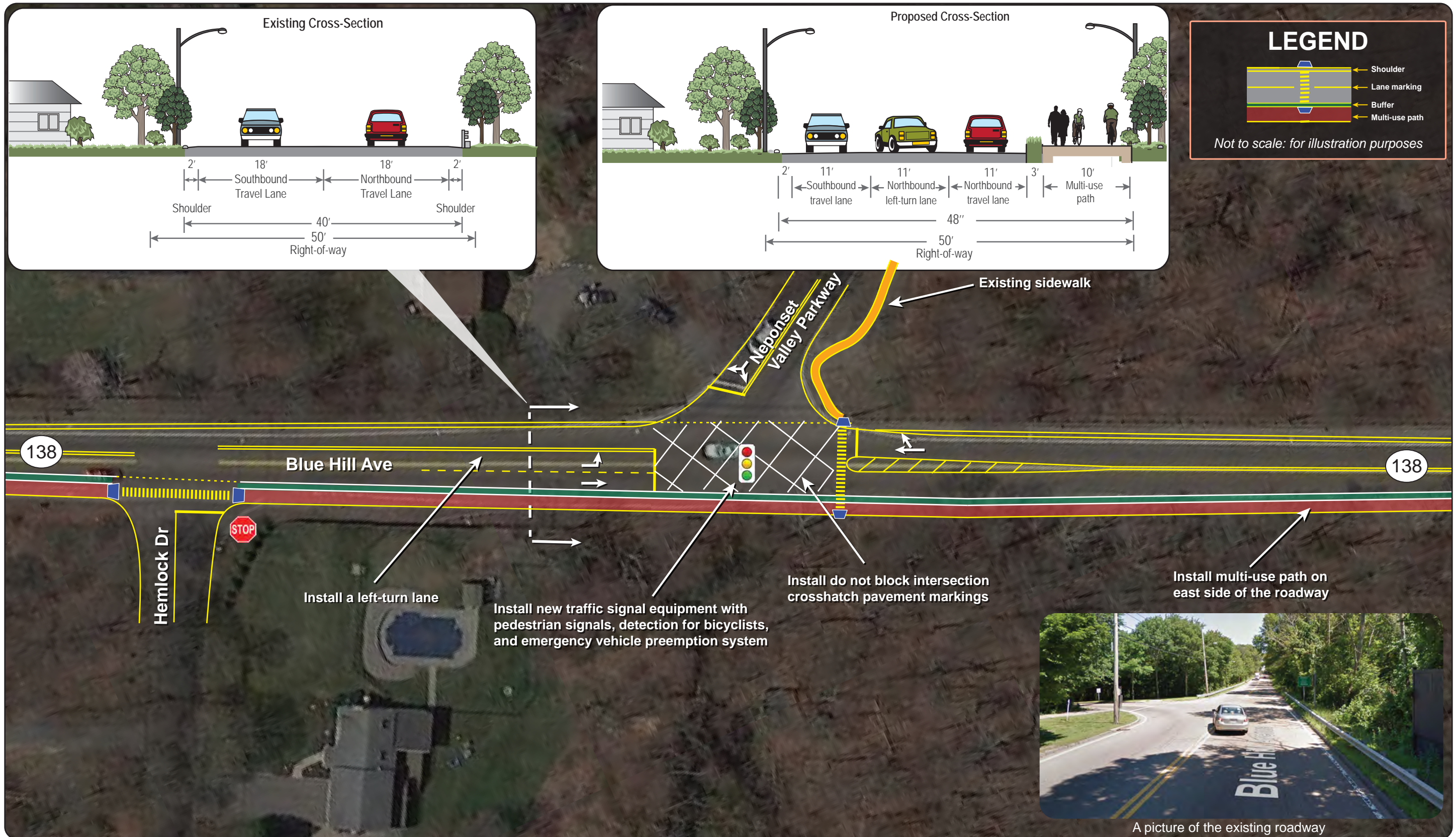


Figure 25
Improvement Concept: Alternative 1- Multi-Use Path on East Side of Roadway
Route 138 at Neponset Valley Parkway

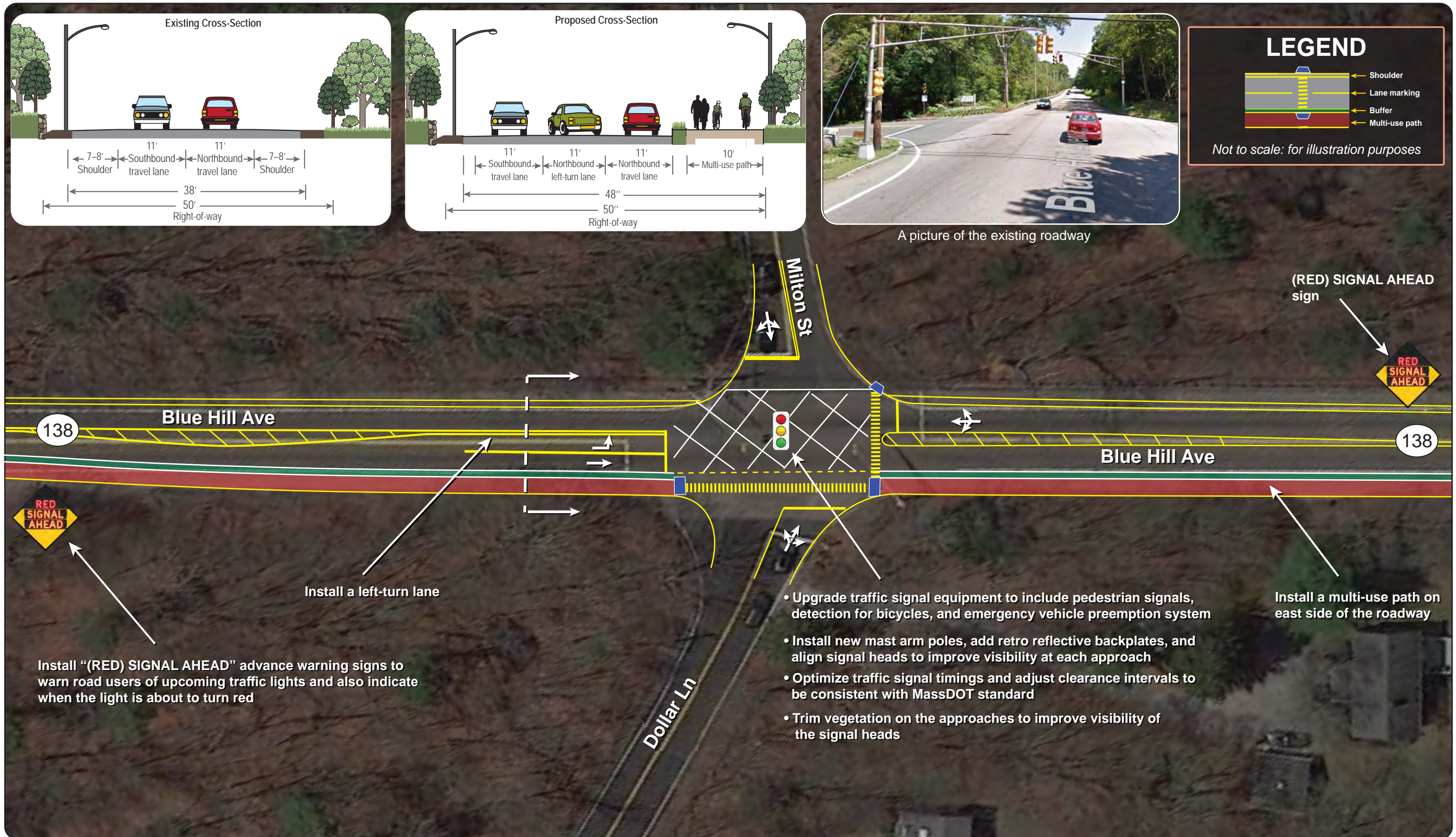
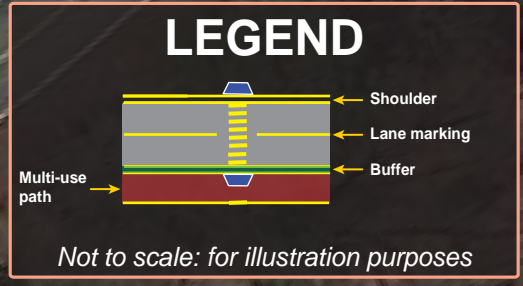
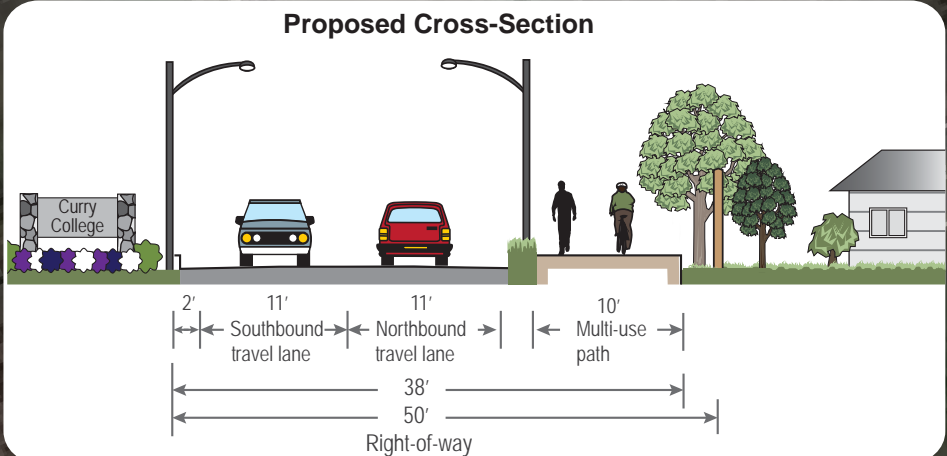
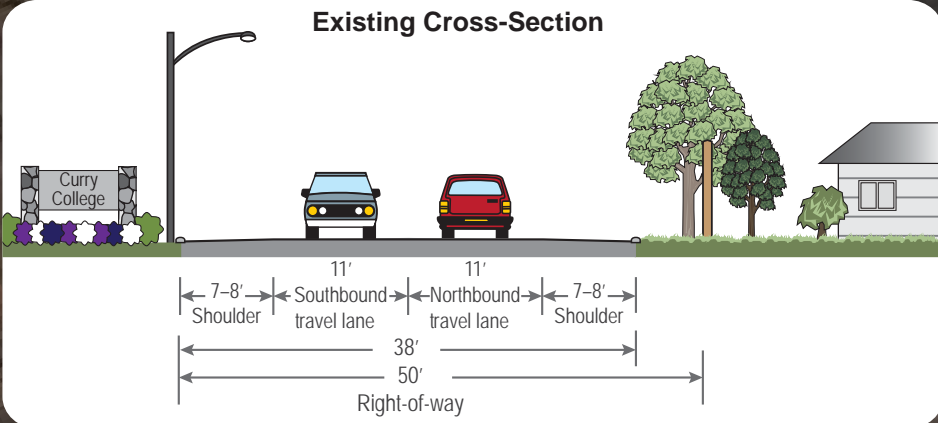
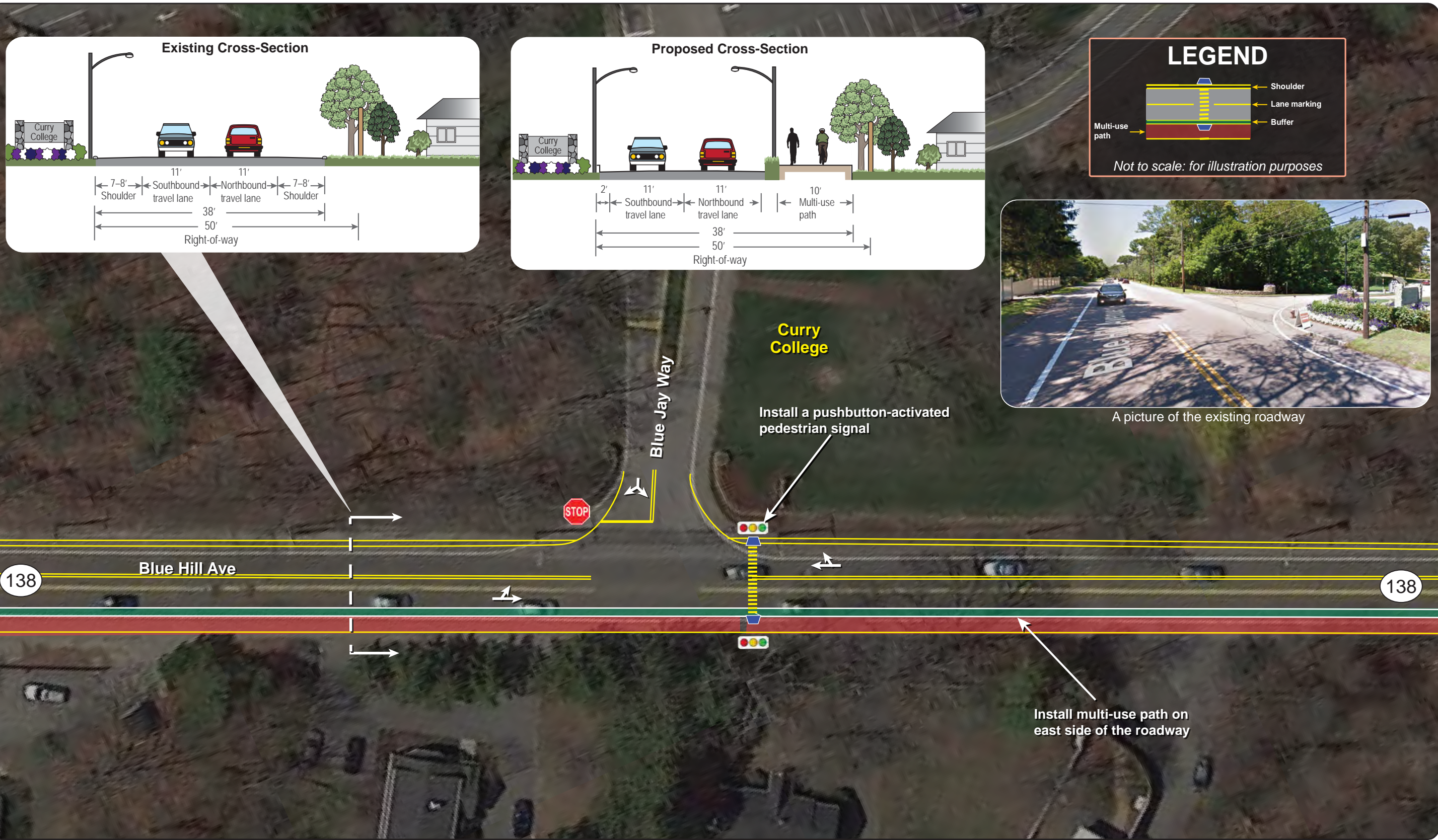


Figure 26
Improvement Concept: Alternative 1- Multi-Use Path on East Side of Roadway
Route 138 at Milton Street and Dollar Lane



A picture of the existing roadway



Figure 27
Improvement Concept: Alternative 1- Multi-Use Path on East Side of Roadway Only
Route 138 at the Blue Jay Way (Curry College)

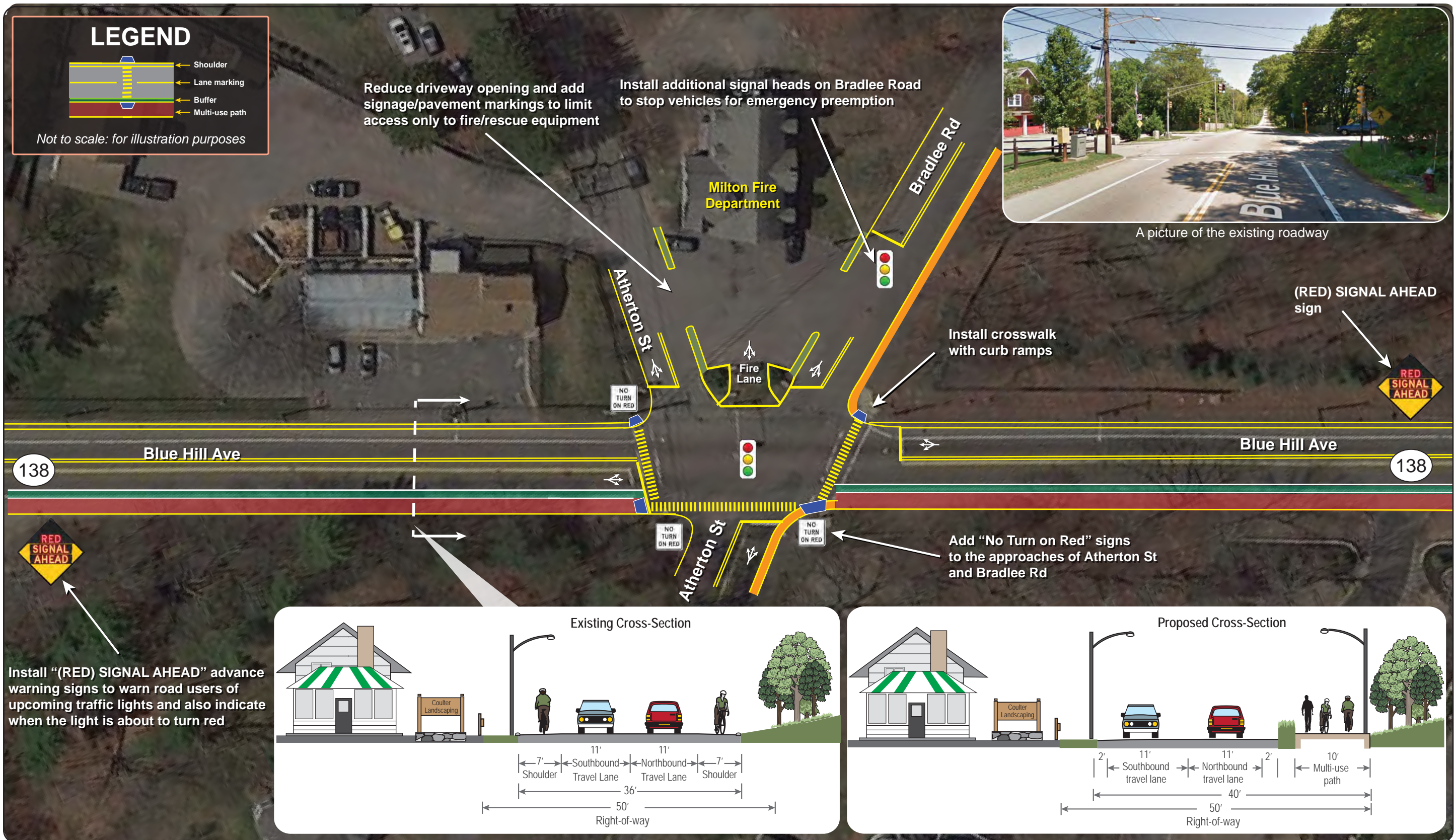


Figure 28
Improvement Concept: Alternative 1- Multi-Use Path on East Side of Roadway Only
Route 138 at Bradlee Road and Atherton Street

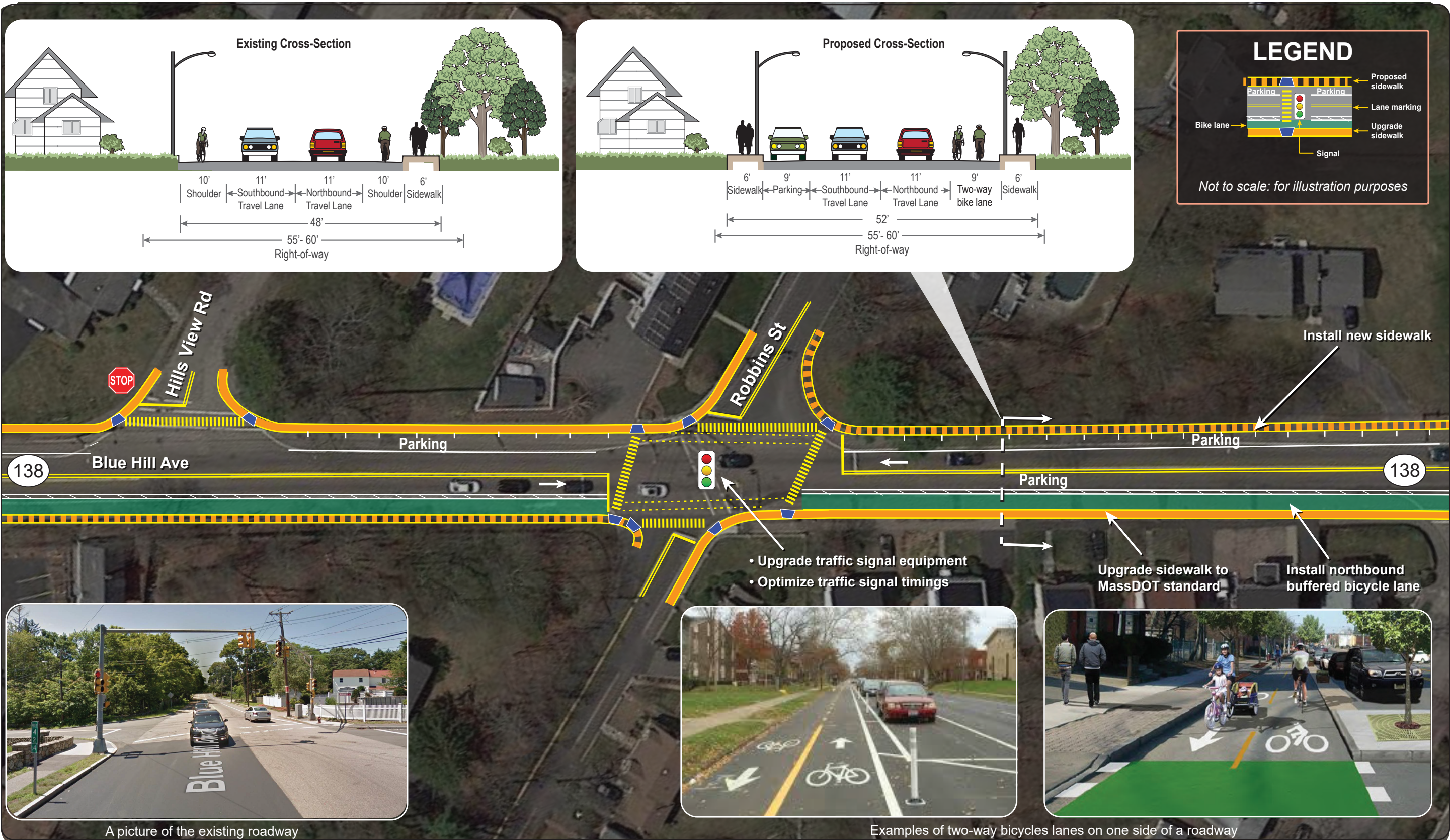


Figure 29
Improvement Concept: Alternative 1 - Two-Way Bicycle Lane or Multi-Use Path on East Side of Roadway
Route 138 at Robbins Street



A picture of the existing roadway

- Upgrade traffic signal equipment to include pedestrian signals, detection for bicycles, and emergency vehicle preemption system
- Install new mast arm poles, add retro reflective backplates, and align signal heads to improve visibility at each approach
- Optimize traffic signal timings and adjust clearance intervals to be consistent with MassDOT standard
- Trim vegetation on the approaches to improve visibility of the signal heads

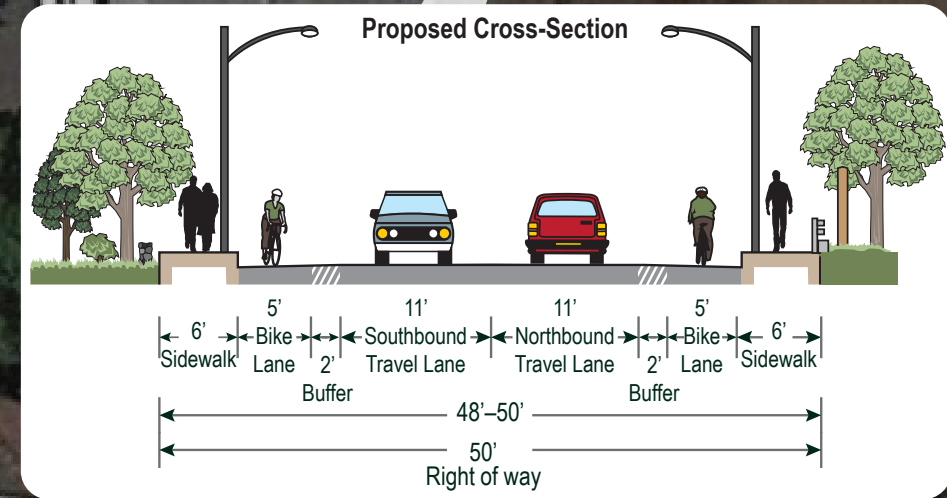
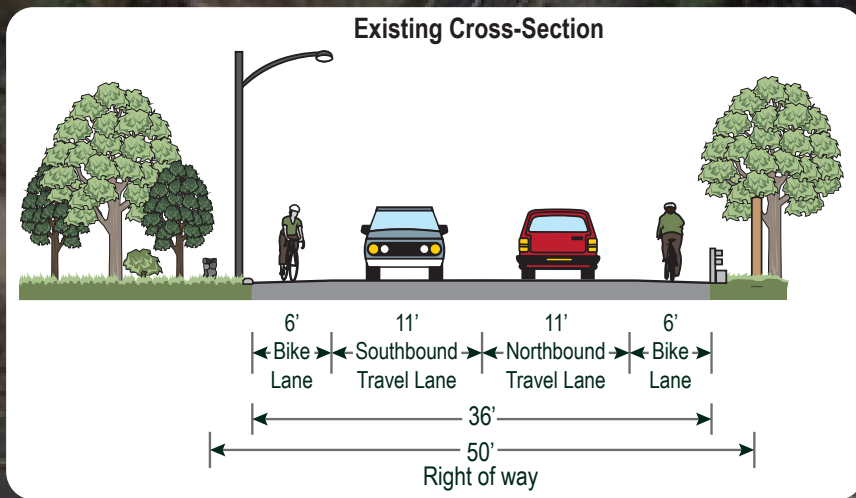
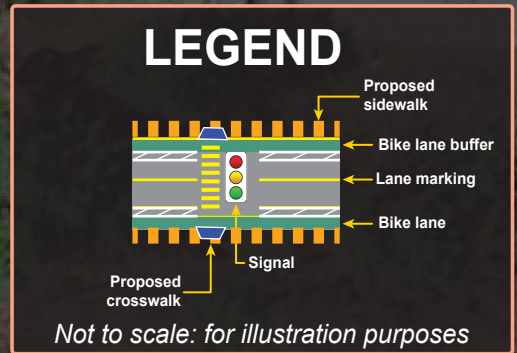


Figure 30
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at Brush Hill Road

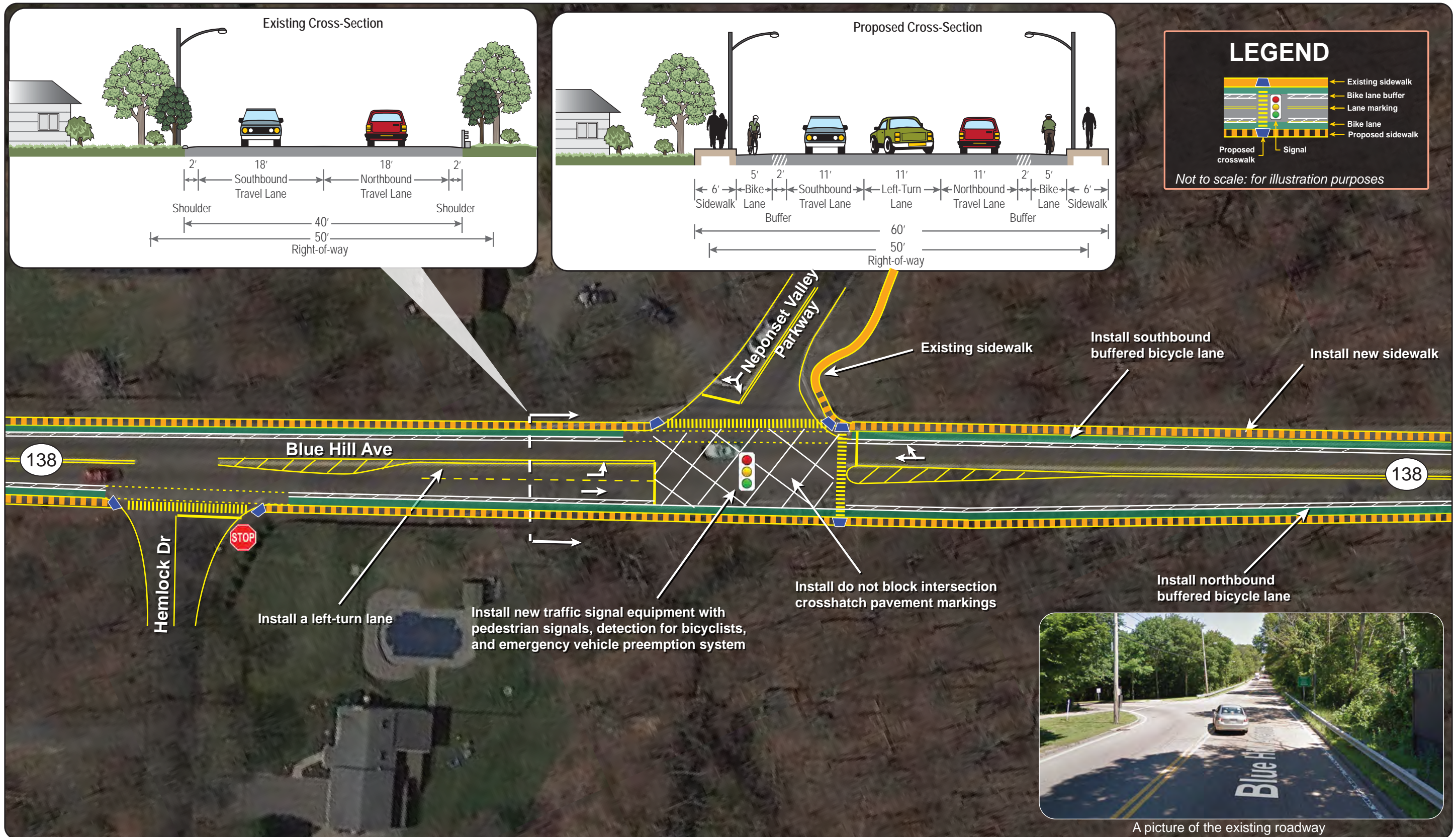
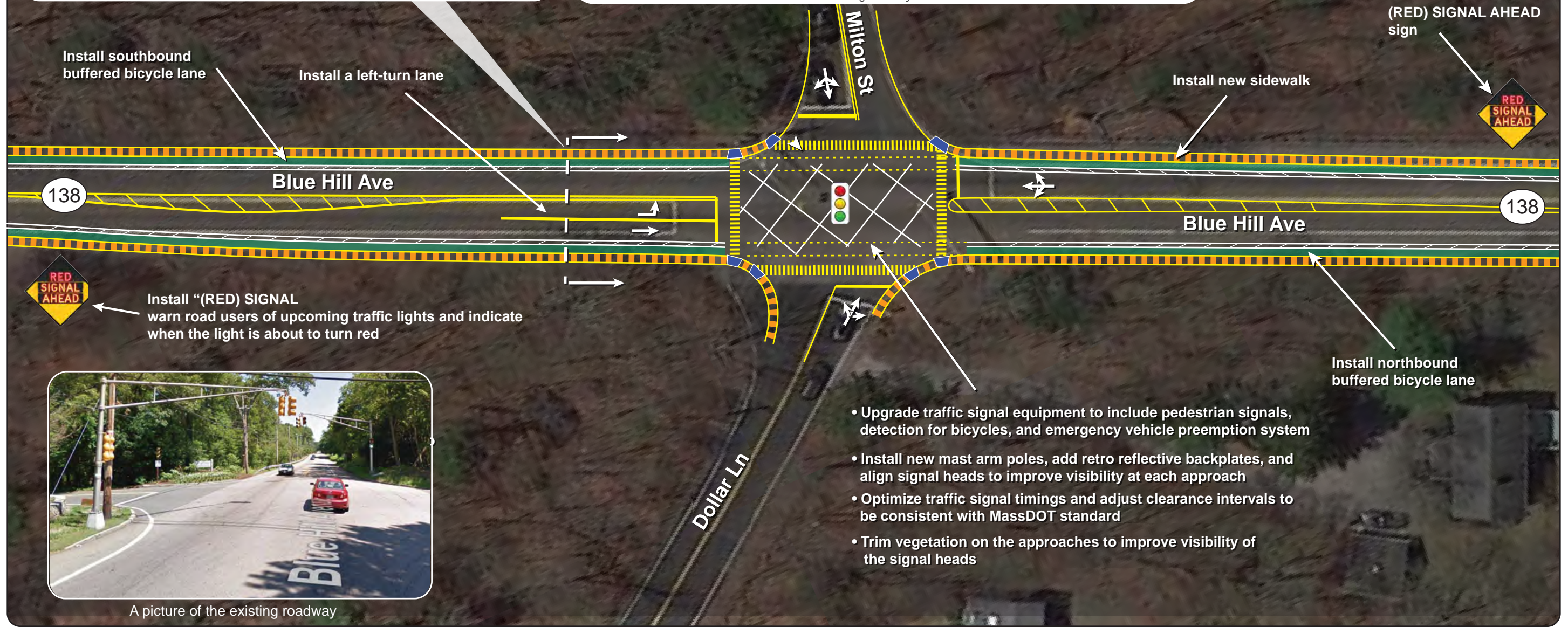
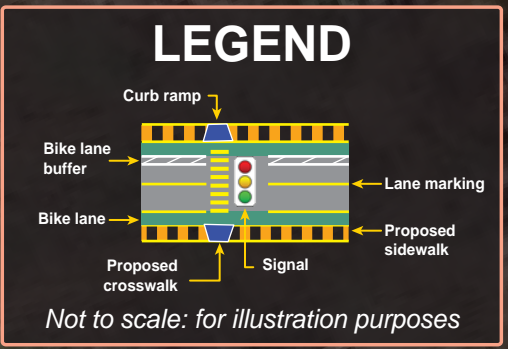
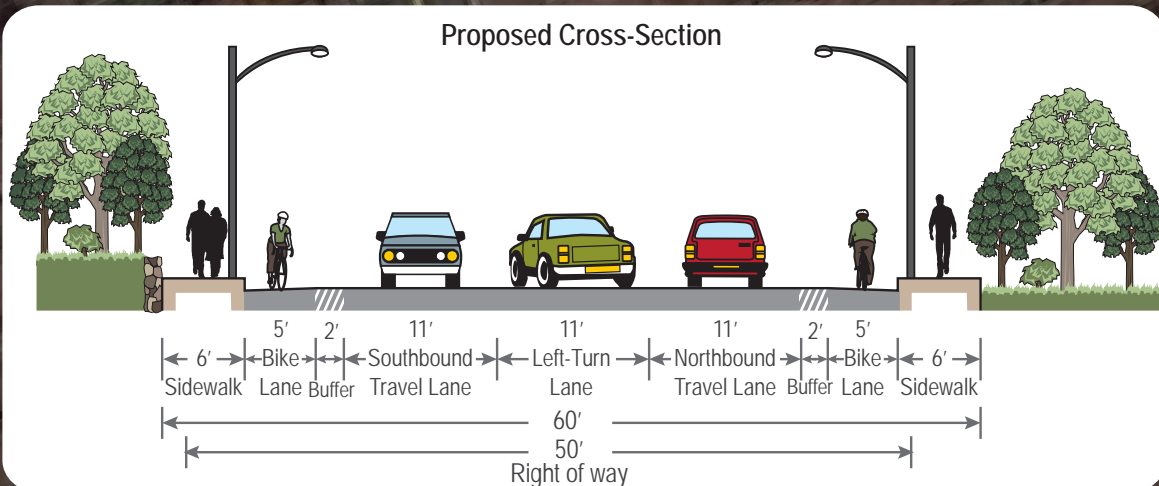
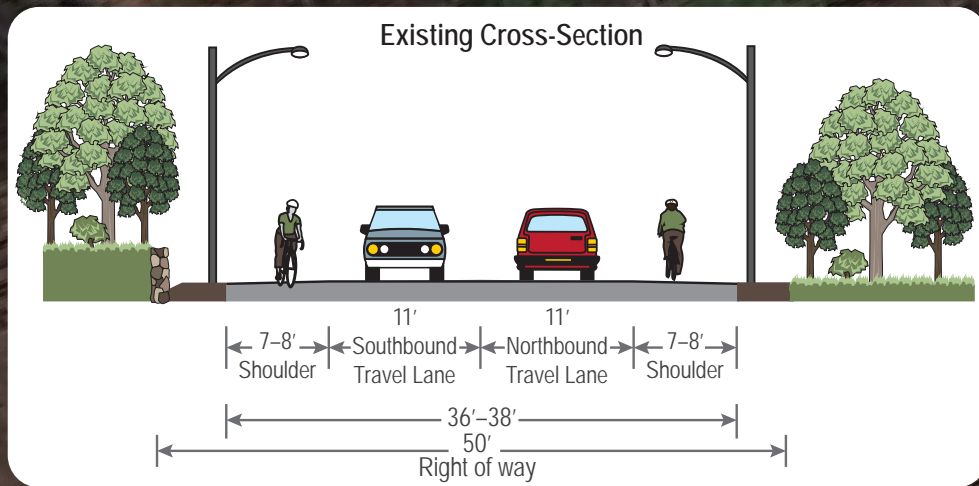


Figure 31
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at Neponset Valley Parkway



- Upgrade traffic signal equipment to include pedestrian signals, detection for bicycles, and emergency vehicle preemption system
- Install new mast arm poles, add retro reflective backplates, and align signal heads to improve visibility at each approach
- Optimize traffic signal timings and adjust clearance intervals to be consistent with MassDOT standard
- Trim vegetation on the approaches to improve visibility of the signal heads



Figure 32
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at Milton Street and Dollar Lane

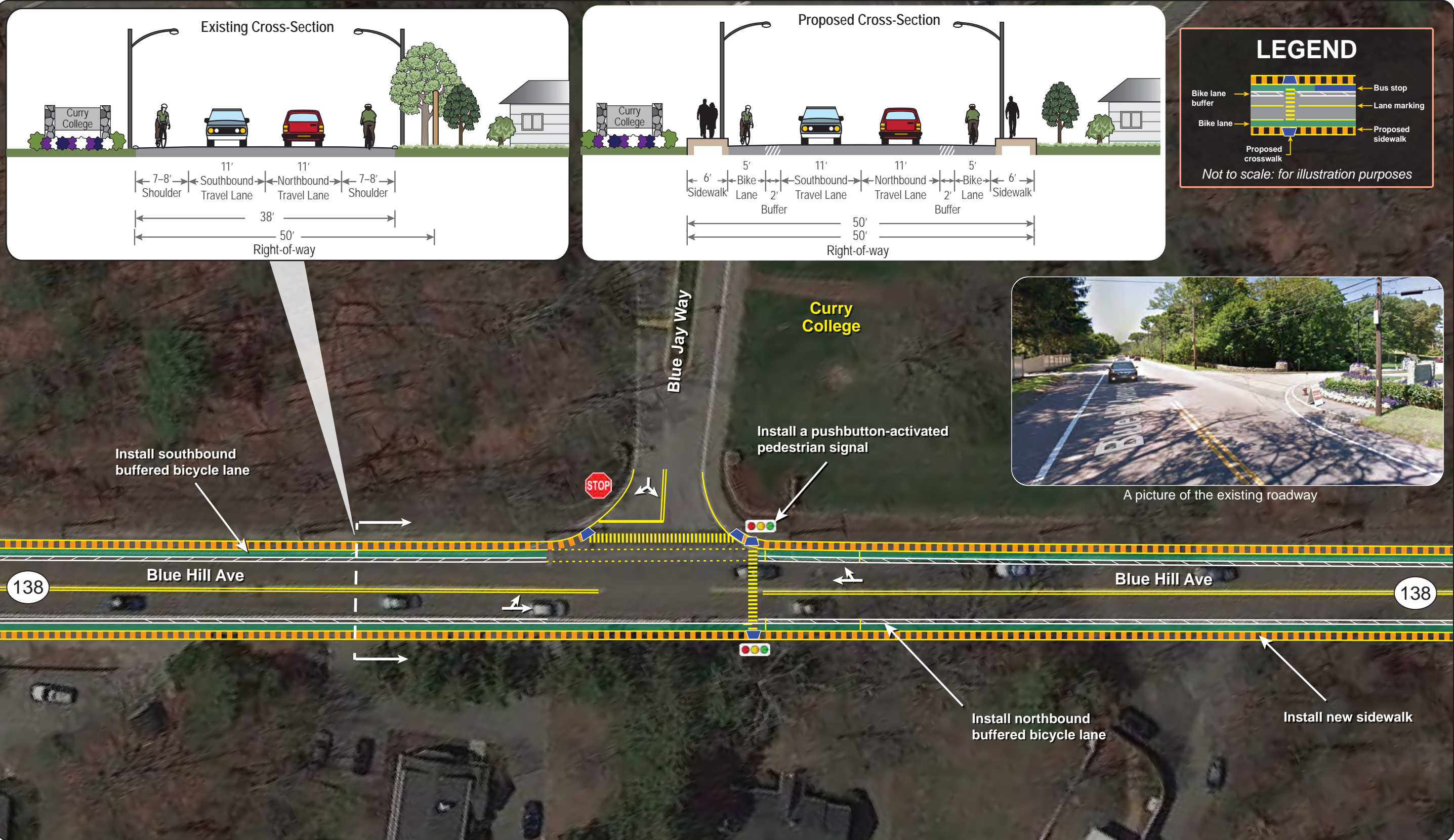


Figure 33
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at the Blue Jay Way (Curry College)

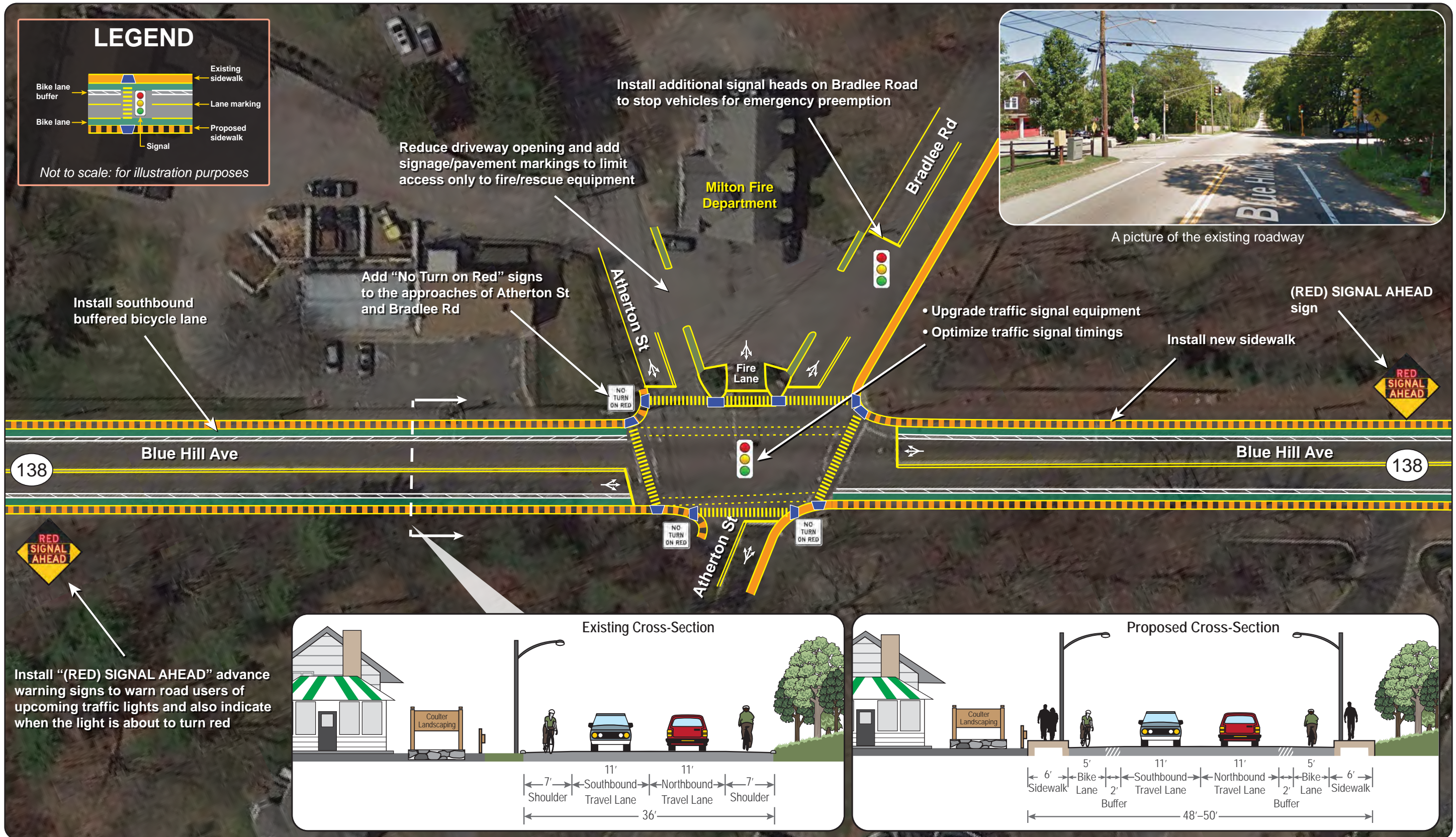


Figure 34
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at Bradlee Road and Atherton Street

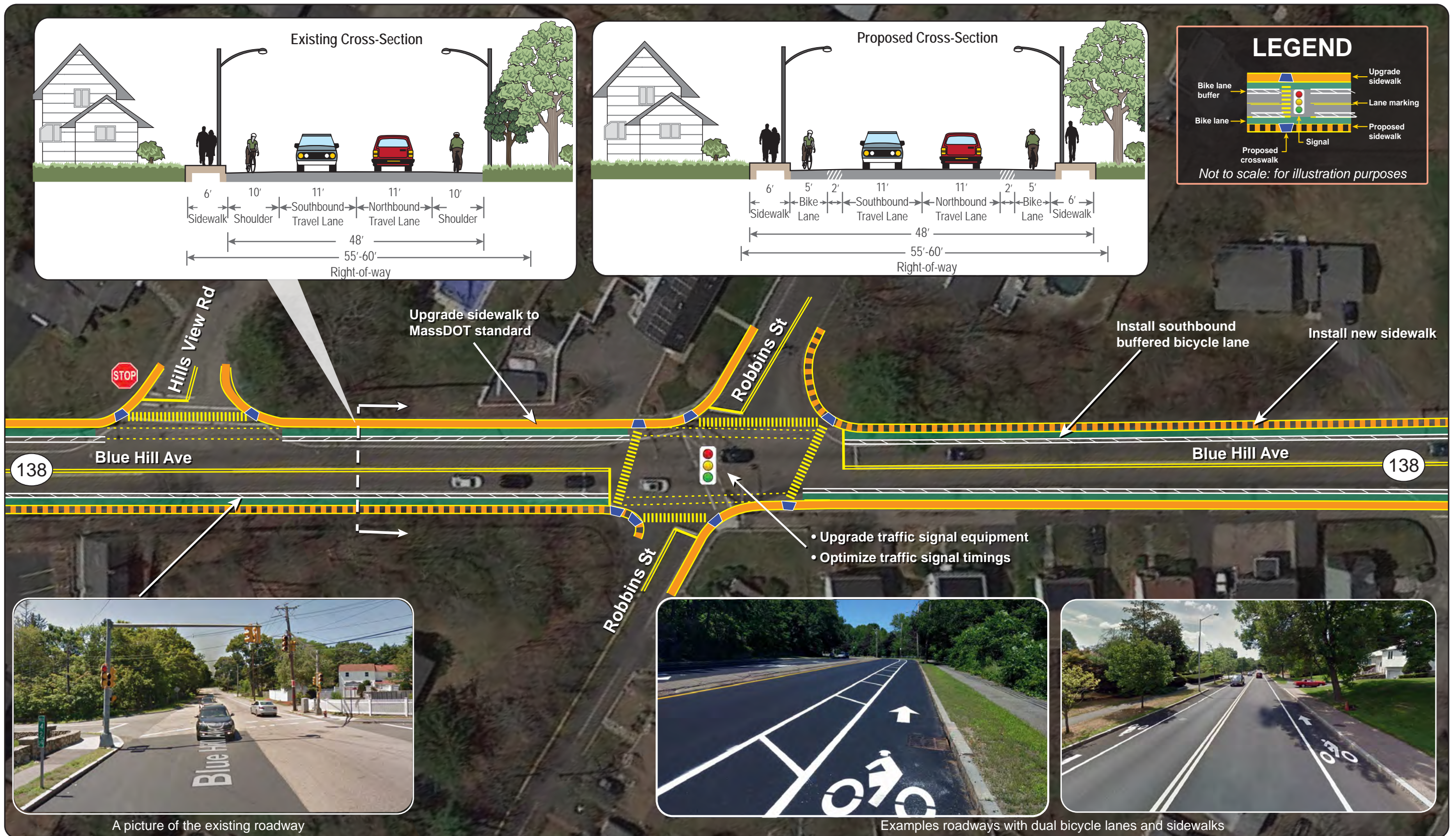


Figure 35
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at Robbins Street

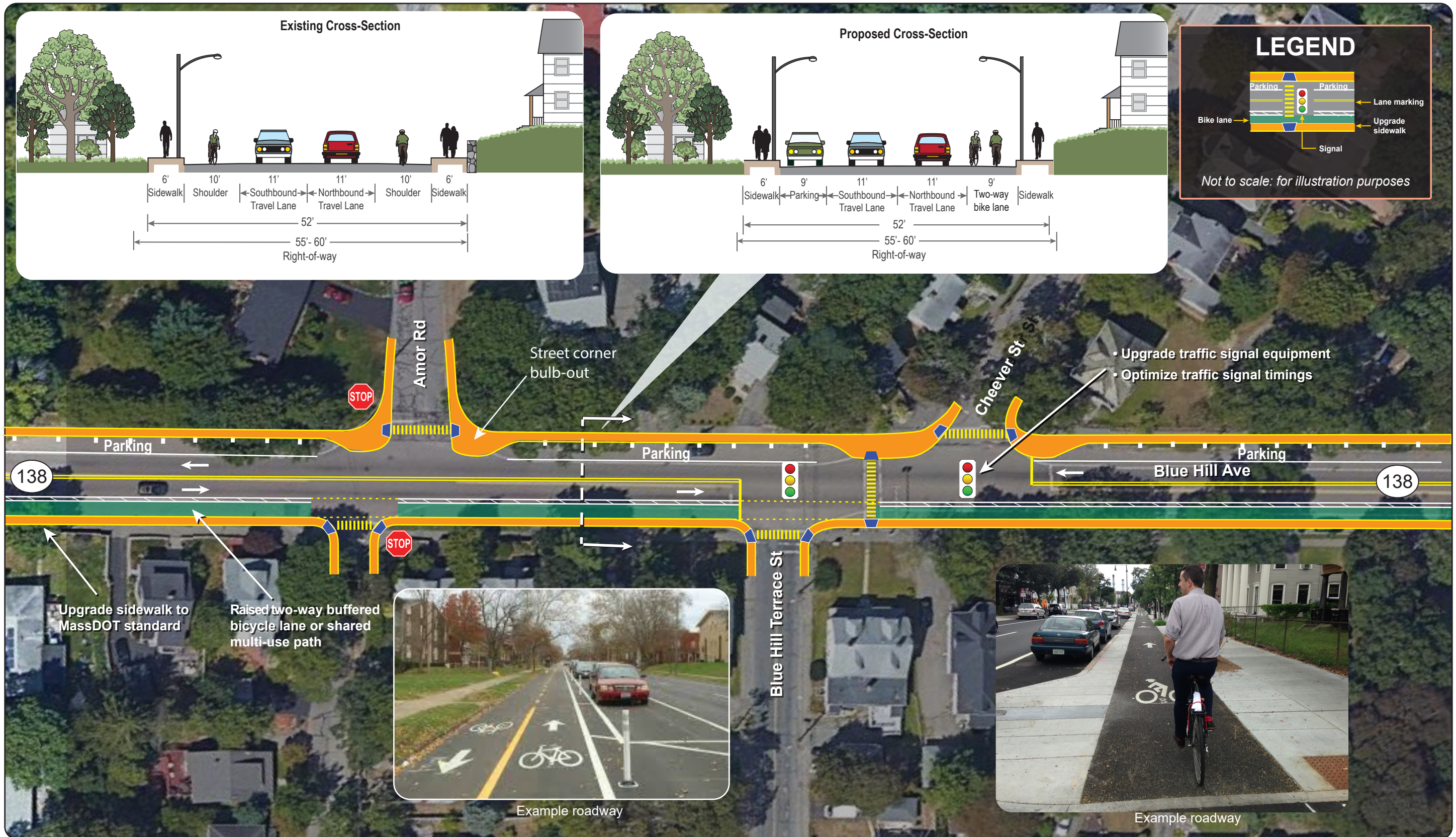
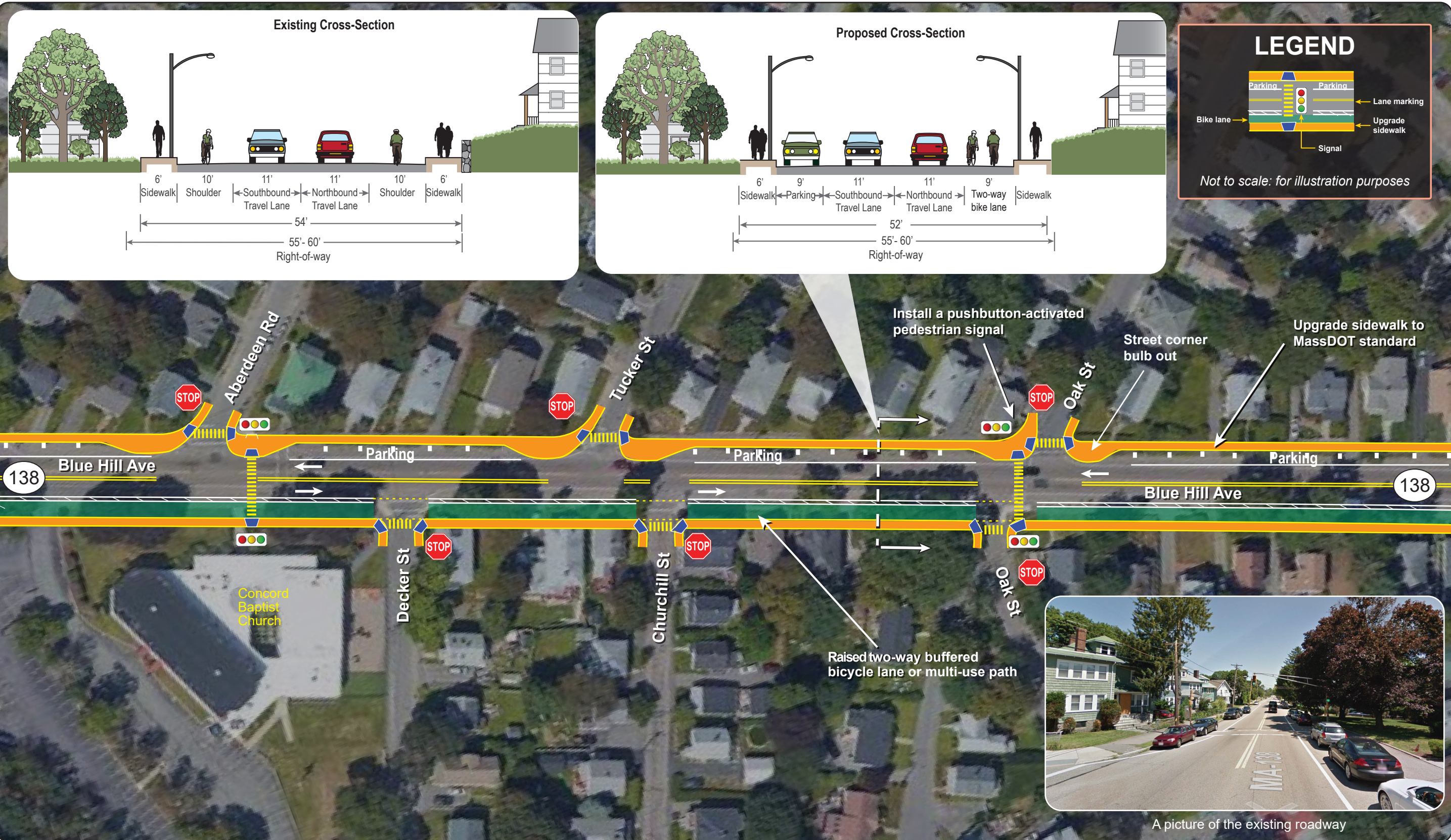


Figure 36
Improvement Concept: Alternative 1- Raised Two-Way Bike Lane or Multi-use Path on the East Side of the Roadway
Route 138 at Cheever Street and Blue Hill Terrace Street



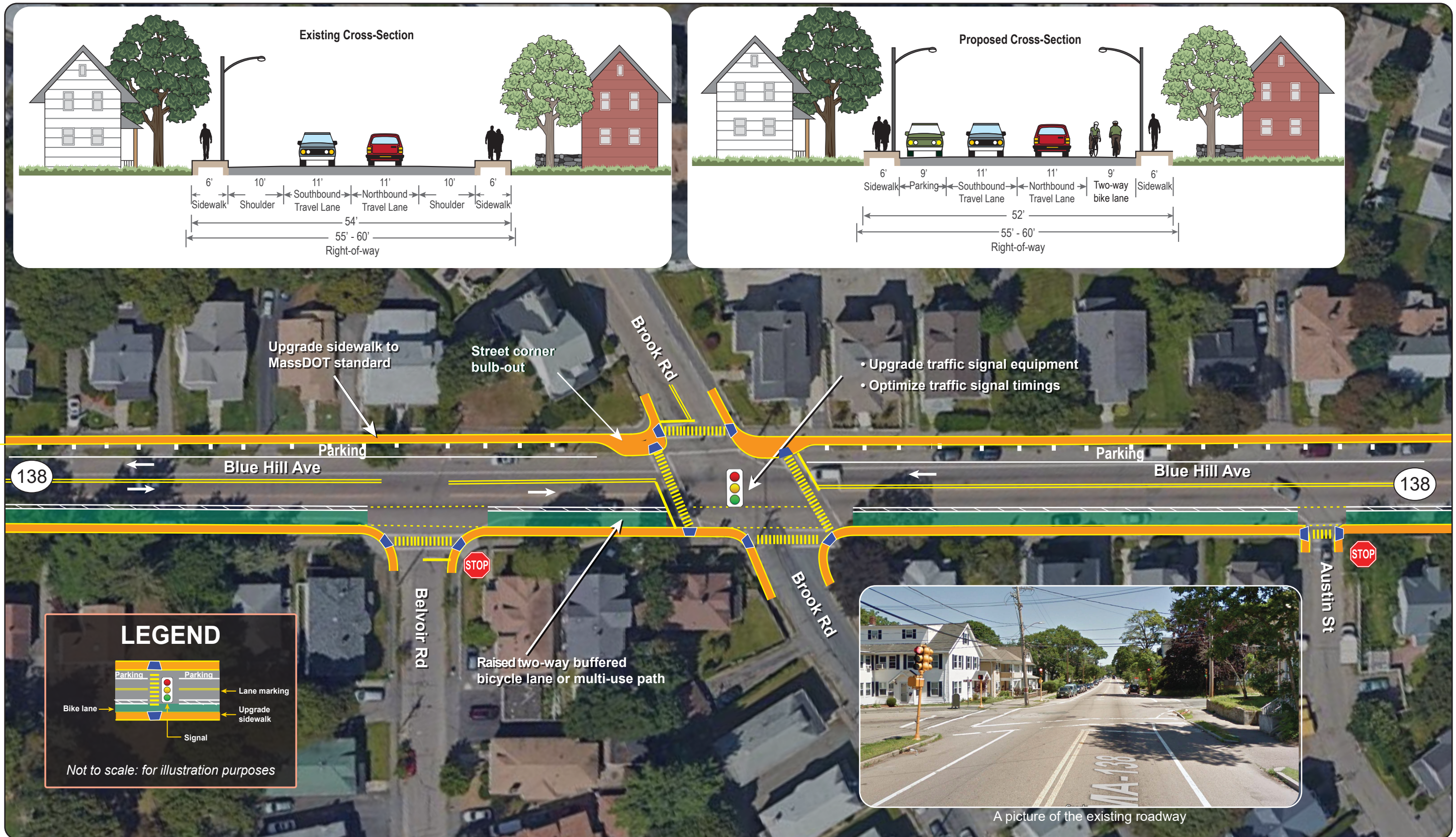


Figure 38
Improvement Concept: Alternative 1: Raised Two-Way Bicycle Lane or Multi-use Path on East Side of Roadway
Route 138 at Brook Road

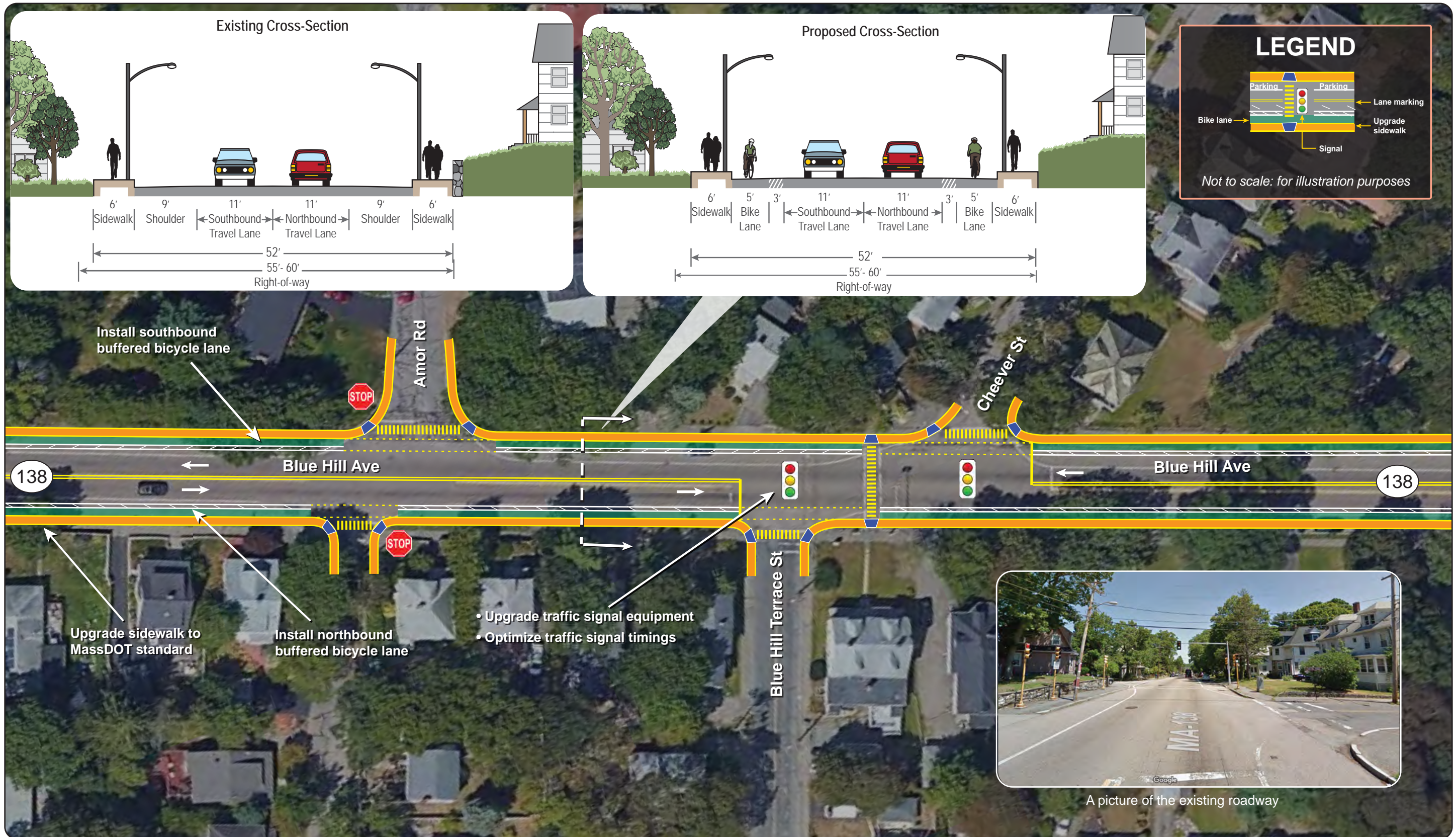


Figure 39
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at Cheever Street and Blue Hill Terrace Street

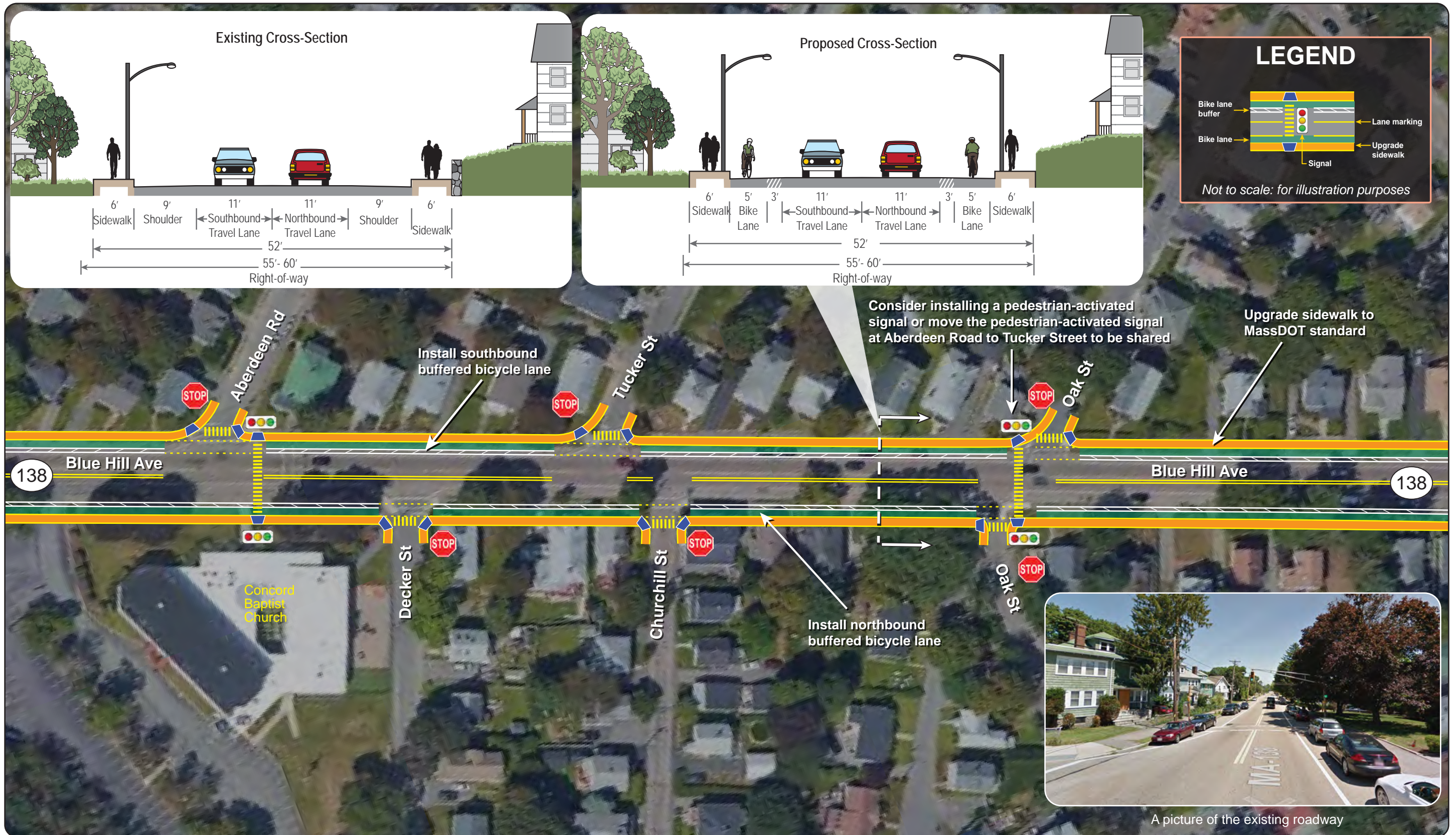
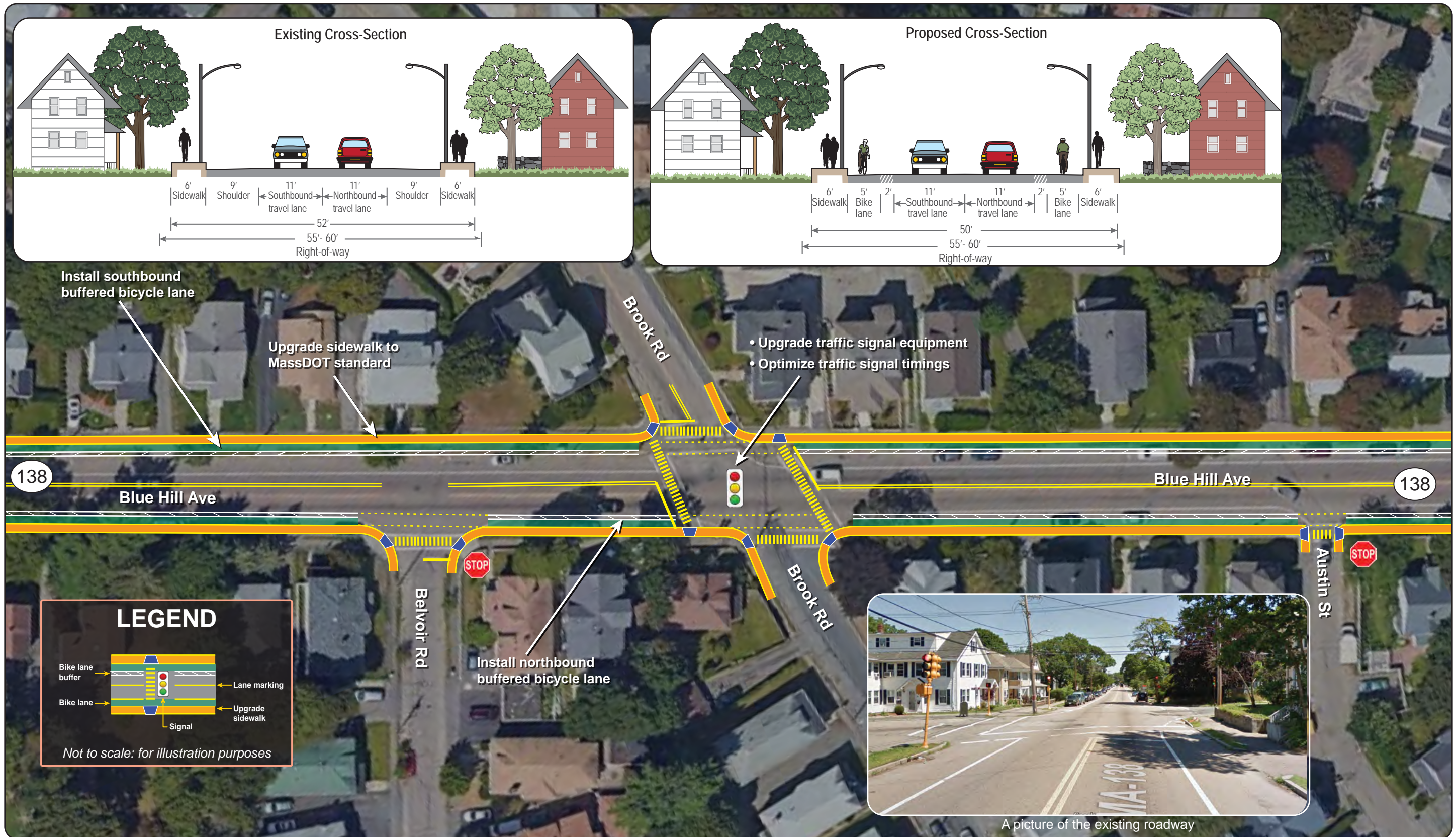


Figure 40
Improvement Concept: Alternative 2 - Dual Bicycle Lanes and Sidewalks
Route 138 at Aberdeen Road and Oak Street



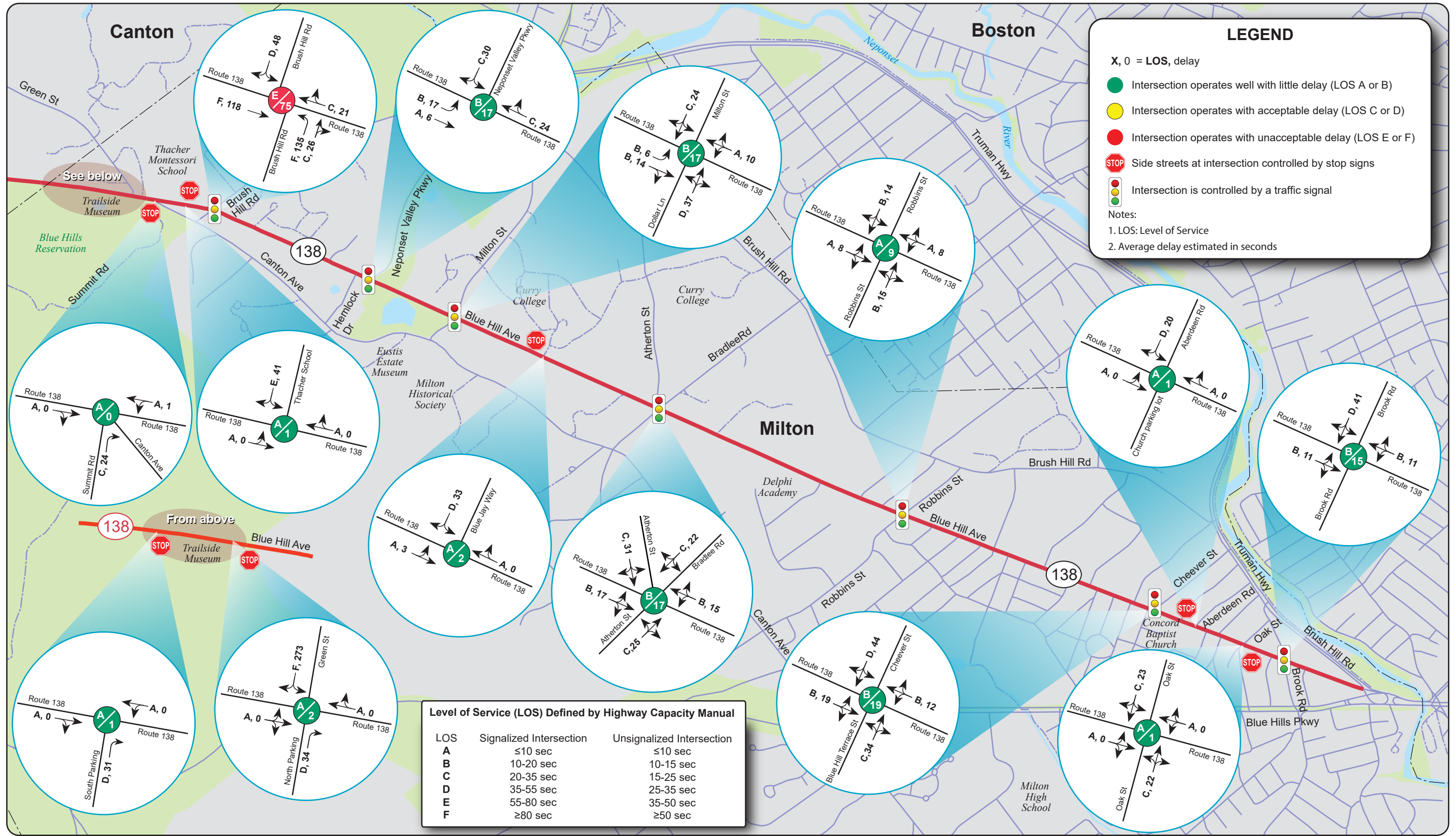


Figure 42
Future Conditions
Weekday AM Peak Hour Intersection Level of Service

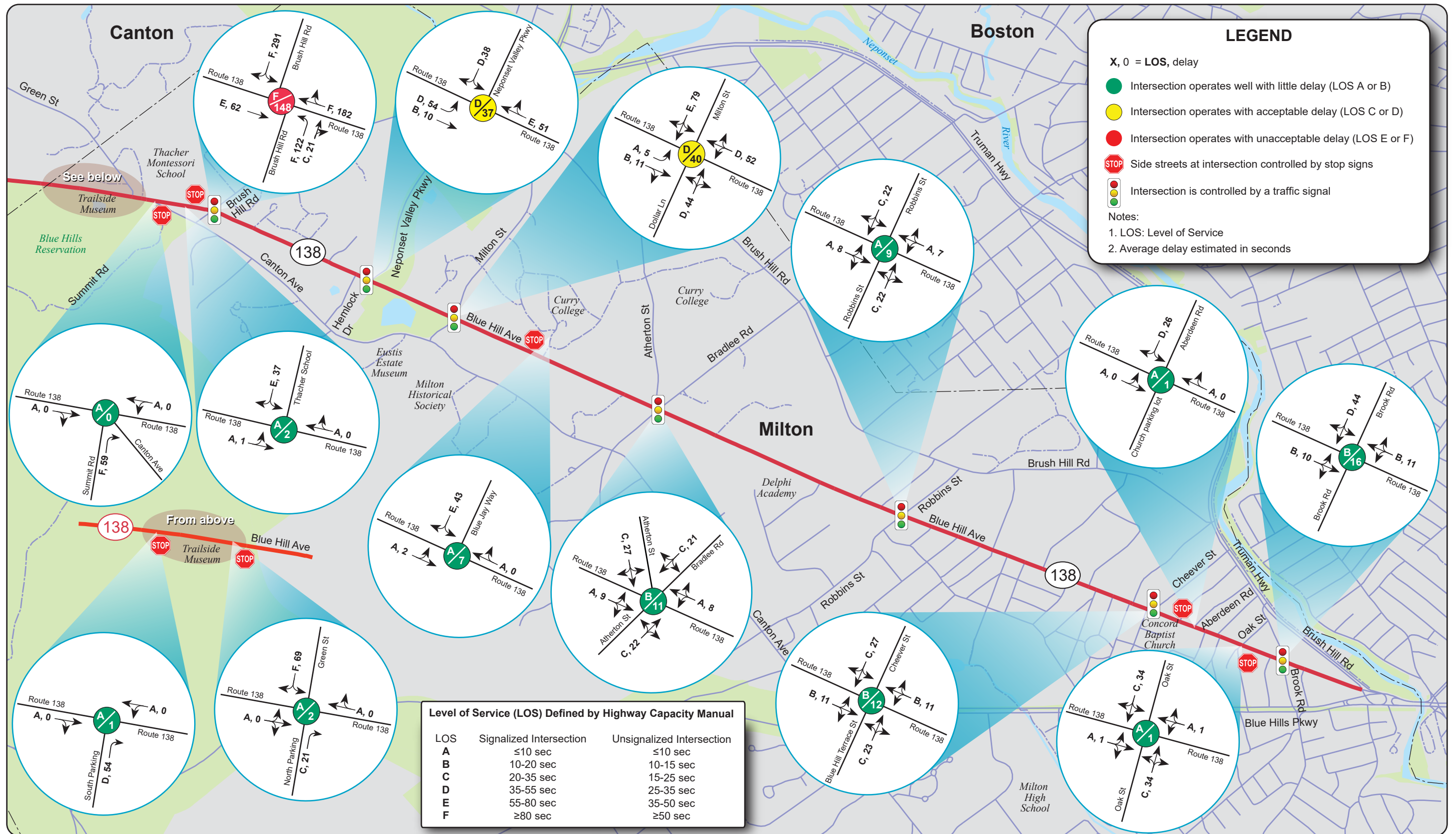


Figure 43
Future Conditions
Weekday PM Peak Hour Intersection Level of Service

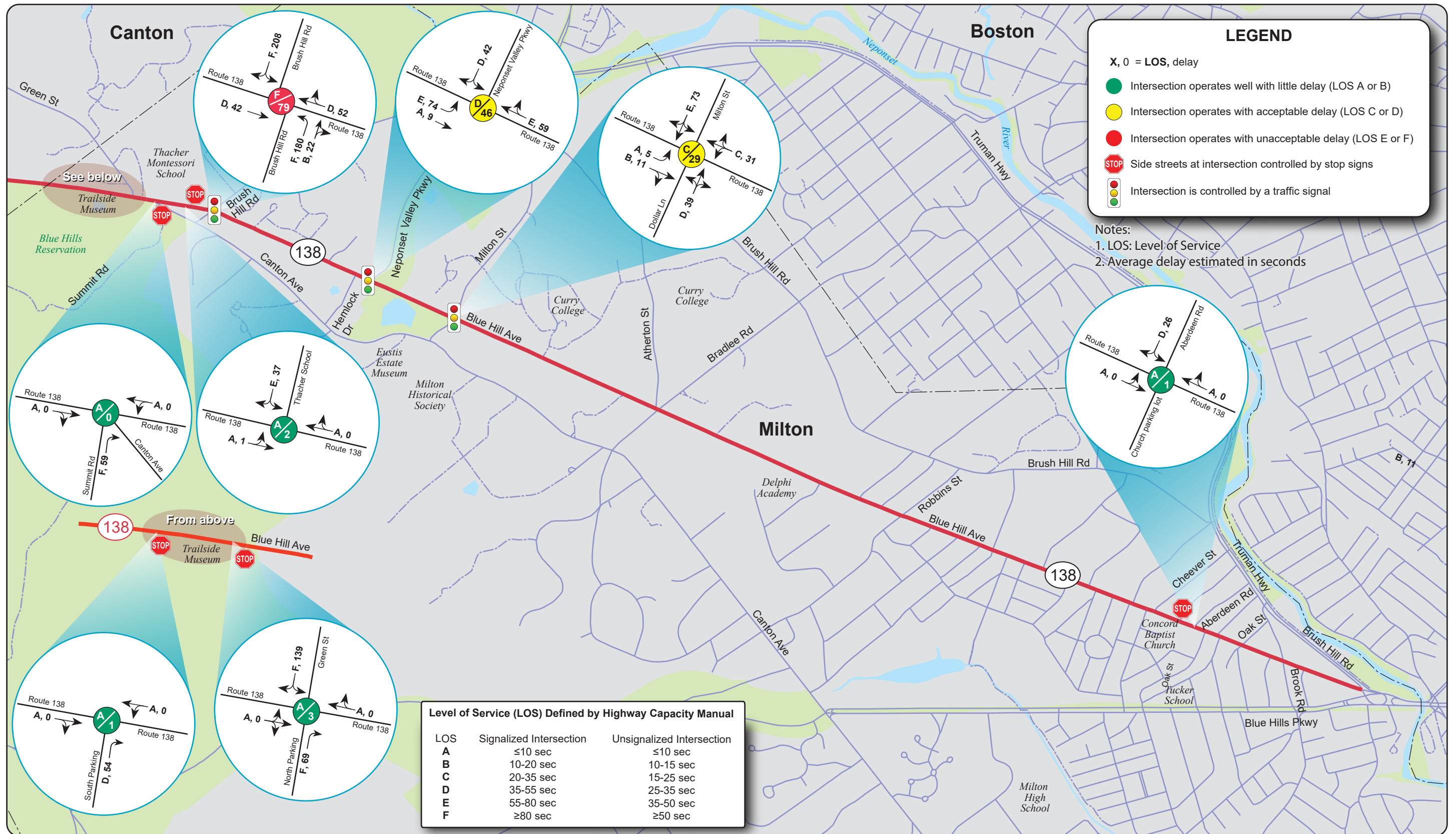


Figure 44
Future Conditions
Weekend PM Peak Hour Intersection Level of Service

Appendix A: Comments and Selection Process

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

Part 1: Review Comments

Seth Asante

From: Lee Toma @ Bike Milton
Sent: Wednesday, September 26, 2018 4:30 PM
To: sasante@ctps.org
Cc: William Clark
Subject: Re: Route 138 Priority Corridor Study in Milton - feedback

Dear Mr. Asante,

I'd like to thank you and your team for putting so much effort into the Route 138 Corridor Study. Most of the proposed changes look very promising for local residents like me.

First, I'd like to offer some suggested corrections and notes:

- Appendix Figure 1 - Route 138 is not mapped across Milton in the correct location

- Appendix P 46 & 47

Milton - Route 138 and Mystic Valley Parkway Should be Neponset Valley Parkway

- Image quality of traffic report summaries is poor, which makes them difficult to read. I don't know if this is from the source, or from the PDF export.

- Do the Future Conditions charts (Figures 42 and 43) include the effects of adding a northbound lane of traffic?

General comments:

I am pleased to see the proposed intersection improvements, and consideration of a shared-use path. In the Tucker section especially, I would prefer to see an elevated or at least a curb-separated shared-use path over painted bike lanes to prevent vehicle obstructions. I expect that many neighbors would complain about the loss of the area that they currently use for parking, but on the other hand, this could also improve visibility for people pulling out of driveways and side streets. The shared-use path option would encourage more people to bike on this very intimidating corridor, more so than bike lanes would.

I'd like to suggest adding curb bump-outs in the Tucker area to improve sight lines at intersections. I would also like to encourage your team to include additional improvements at the Oak Street crosswalk, such as a signal, improved sight lines, and possibly a raised crosswalk. This school has the highest rate of pedestrian access in town, and anything we can do to improve pedestrian safety at this site should be a high priority.

Finally, I am concerned by the option that would add a second northbound travel lane from the Canton town line to Canton Avenue. I believe that this would increase traffic volumes at some times and increase speeds at other times, both of which are extremely unpopular among many Milton residents. This option would also shift merge conflicts from the current location in Canton up into Milton. Adding the third lane would also make road crossings more challenging for the many people who hike in the Blue Hills. I expect that most Milton residents would prefer to see the second northbound lane end at the Park and Ride parking lot.

Once again, I'd like to thank you for collecting and analyzing so much data and public input to help improve the corridor for residents and travelers.

Sincerely,

Lee (Leonardo) Toma
Member, Milton Traffic Commission
Chair, Milton Bicycle Advisory Committee Member, Milton Public Schools Transportation and Traffic Safety Subcommittee

On Sep 24, 2018, at 9:16 PM, William Clark <wclark@townofmilton.org> wrote:
Sent from my iPhone

Begin forwarded message:

From: Seth Asante <sasante@ctps.org<mailto:sasante@ctps.org>>
Date: September 20, 2018 at 2:08:57 PM EDT
Subject: Route 138 Priority Corridor Study in Milton

Good Afternoon,

The draft report for the Route 138 Priority Corridor Study in Milton is available for final review. I have already sent you a Dropbox email and link to download the report. If you did not receive that email, then please use the link provided below to download a copy of the report.

<https://www.dropbox.com/sh/v9pdd0455p6j7qu/AADPX2tN3pKdKGO6X-2HCApVa?dl=0>

Please send me your final comments by September 27. If you do not have any comment, please let me know.

Thank you,
Seth

Seth A. Asante, P.E. | Chief Transportation Planner CENTRAL TRANSPORTATION PLANNING STAFF
857.702.3644 | sasante@ctps.org
www.ctps.org/bostonmpo

[cid:image001.png@01D1A555.C7335B90]

This email has been scanned for spam and viruses by Proofpoint Essentials. Click here<https://gdsprotect.cloud-protect.net/index01.php?mod_id=11&mod_option=logitem&mail_id=1537467000-dBgaTX4fy3_h&r_address=wclark%40townofmilton.org&report=1> to report this email as spam.

<image001.png>

Seth Asante

From: John Thompson
Sent: Thursday, September 27, 2018 9:21 AM
To: Seth Asante
Cc: Michael D. Dennehy; Chase Berkeley; William Clark; geraldine.vatan@state.ma.us
Subject: Route 138 Priority Corridor Study - Comments

Good Morning Seth,

I would like to offer the following comment on the Route 138 Priority Corridor Study :

If not already examined, the Town would be extremely interested in the looking at the feasibility of adding a left turn lane on Route 138 at Brush Hill Road for the northbound approach. The current configuration requires northbound vehicles use the Canton Avenue "jug-handle" for all turns. This creates a conflict at the Canton Avenue/Brush Hill Road intersection, particularly in peak hours, as southbound vehicles on Canton Avenue (bound for Route 138 South to expressway) have to criss-cross with the northbound vehicles on Canton Avenue (bound for Brush Hill Road to Paul's Bridge). We believe this condition exacerbates the already heavy backups on Canton Avenue southbound and creates an unsafe condition. Also of note, several of the DCR parking areas on Route 138 (ski area, Trailside Museum, etc.) do not allow exiting vehicles to make left turns to Route 138 south. Vehicles ultimately have to proceed northbound on Route 138 and use the Canton Avenue jug-handle to reverse direction, inviting additional vehicles into the congested Canton Avenue/Brush Hill road and Route 138/Brush Hill Road intersections.

Thank-you for all the work you do and please let me know if you have any questions.

Regards,

John P. Thompson, P.E.
Town Engineer

Town of Milton – Engineering Dept.
525 Canton Avenue
Milton, MA 02186

(617) 898-4869

Seth Asante

From: Pounds, Bryan (DOT)
Sent: Tuesday, September 25, 2018 3:58 PM
To: Seth Asante
Cc: Mark Abbott
Subject: RE: Route 138 Priority Corridor Study in Milton

Seth –

Planning has no comments, thanks.

BP

From: Seth Asante [mailto:sasante@ctps.org]
Sent: Thursday, September 20, 2018 2:09 PM
To: Vatan, Geraldine T. (DOT); Dwyer, Courtney (DOT); Kulen, Raj (DOT); Pervez, Hameed (DOT); Gascon, Cassandra (DOT); Pounds, Bryan (DOT); John Thompson; William Clark; Polin, Bonnie S. (DOT); Chase Berkeley; Michael D. Dennehy; Diaz, John; Reardon, Muazzez G. (DOT); Pastore, Karl (DCR); Jahnige, Paul (DCR); Keating, Connor (DOT); John King; John Grant
Cc: Mark Abbott
Subject: Route 138 Priority Corridor Study in Milton

Good Afternoon,

The draft report for the Route 138 Priority Corridor Study in Milton is available for final review. I have already sent you a Dropbox email and link to download the report. If you did not receive that email, then please use the link provided below to download a copy of the report.

<https://www.dropbox.com/sh/v9pdd0455p6j7qu/AADPX2tN3pKdKGO6X-2HCApVa?dl=0>

Please send me your final comments by **September 27**. If you do not have any comment, please let me know.

Thank you,
Seth

Seth A. Asante, P.E. | Chief Transportation Planner
CENTRAL TRANSPORTATION PLANNING STAFF
857.702.3644 | sasante@ctps.org
www.ctps.org/bostonmpo

Town Point Plaza, Rm. 101, 2150 | Boston, MA 02116-1690
Mo-Fri 9:00-5:00 PM | Tel: 617.879.9100 | TTY: 617.879.9100



Part 2: Selection of Study Locations



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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

TECHNICAL MEMORANDUM

DATE: January 18, 2018
TO: Boston Region Metropolitan Planning Organization
FROM: Seth Asante, MPO Staff
RE: Selection of Study Locations for the FFY 2018 *Addressing Priority Corridors from the Long-Range Transportation Plan Needs Assessment*

1 BACKGROUND

During the development of the Boston Region Metropolitan Planning Organization (MPO) Long-Range Transportation Plan (LRTP), *Charting Progress to 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 maintenance, modernization, and safety and mobility improvements. These locations are documented in the LRTP Needs Assessment.

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

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) 2018 Unified Planning Work Program (UPWP).² This memorandum presents the results of Task 2 of the work program for that study.³ Task 2 involves presenting a recommendation for locations to study to the MPO board for discussion.

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

2 PROCEDURE FOR SELECTING STUDY LOCATIONS

The process for selecting study locations consisted of three steps. First, MPO staff assembled data about the arterial segments identified in the LRTP Needs Assessment and used the data to prioritize the roadway segments. Next, MPO staff examined the arterial segments more closely by applying specific criteria. Finally, 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

MPO staff identified 44 arterial segments in 33 municipalities in the Boston region based on the following data sources:

- The Massachusetts Department of Transportation (MassDOT) 2016 Road Inventory File and 2010–14 crash database were used to assemble the following information for each arterial segment: roadway jurisdiction,

² Boston Region Metropolitan Planning Organization, Unified Planning Work Program, Federal Fiscal Year 2018, endorsed by the Boston Region Metropolitan Planning Organization on June 15, 2017 and was approved by our federal partners and took effect on October 1, 2017.

³ Karl H. Quackenbush, CTPS Executive Director, memorandum of a work program to the Boston Region Metropolitan Planning Organization, "Addressing Priority Corridors from the Long-Range Transportation Plan Needs Assessment: Federal Fiscal Year (FFY) 2017," October 19, 2017.

National Highway System status, average daily traffic (ADT), high-crash locations, and crash rates.

- The MPO's CMP data on arterial congestion were used to determine average travel speeds, travel-time index (travel time in the peak period divided by travel time at free-flow conditions), and speed index (average travel speed divided by the speed limit) on each arterial segment.
- The MPO's data on gaps in the bike network and data on the location of MassDOT bike facilities were used to identify needs for the bicycle mode, including locations where connectivity between bicycle facilities could be improved and where bicyclists' accommodations could be improved.
- Data on MBTA bus service performance and passenger loads were used to determine the percentage of bus trips that do not adhere to the schedule (in other words, that provide late service) or do not adhere to passenger load standards (resulting in crowding).
- Data on MBTA bus routes, subway lines, and commuter rail lines were used to identify which arterial segments serve MBTA buses or stations.
- Data on the MPO's Environmental Justice (EJ) transportation analysis zones were used to identify areas of concern as relates to environmental justice.
- Data selected from MassDOT's project-information database, the MPO's FFY 2018–22 TIP projects, MPO planning studies and other studies, and municipal websites were used to obtain data on projects, studies, and TIP projects that are planned or programmed for each arterial segment.

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

- Municipality
- Metropolitan Area Planning Council (MAPC) subregion
- Jurisdiction
- MassDOT district office
- Crash rate per million vehicle-miles traveled
- Number of top-200 high-crash locations
- Number of crash clusters that are eligible for Highway Safety Improvement Program (HSIP) funding
- Travel-time index
- Transit service performance
- Proximity to an EJ transportation analysis zone (within one-half mile distance)
- Relevant studies or projects within or near the segment

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

2.2 Applying Criteria

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

1. *Safety Conditions, 0–4 points (each of the four criteria is worth one point)*
 - Location has a higher-than-average crash rate for its functional class
 - Location contains an HSIP-eligible crash cluster
 - Location is identified in the Massachusetts *Top High Crash Locations Report*
 - Location has a significant number of pedestrian and bicycle crashes per year (two or more per mile) or contains one or more HSIP-eligible bike-pedestrian crash cluster
2. *Congested Conditions, 0–2 points (each of the two criteria is worth one point)*
 - Travel-time index is at least 1.3
 - Travel-time index is at least 2.0
3. *Multimodal Significance, 0–3 points (each of the three criteria is worth one point)*
 - Location currently supports transit, bicycle, or pedestrian activities
 - Location needs to have improved transit, bicycle, or pedestrian facilities
 - Location has a high volume of truck traffic serving regional commerce
4. *Regional Significance, 0–4 points (each of the four criteria is worth one point)*
 - Location is in the National Highway System
 - Location carries a significant portion of regional traffic (ADT is greater than 20,000)
 - Location lies within 0.5 miles of an EJ transportation analysis zone
 - Location is essential for the region's economic, cultural, or recreational development
5. *Regional Equity, 0–2 points (each of the two criteria is worth one point)*
 - Location is in an MAPC subregion for which there has not been a Priority Corridors study

- Location is in an MAPC subregion for which there has not been a Priority Corridors study in the previous three years.

6. *Implementation Potential, 0–3 points (each of the three criteria is worth one point)*

- Location is proposed or endorsed for study by the agency that administers the roadway
- Location is proposed or endorsed by its MAPC subregional group and is a priority for that subregional group
- Other stakeholders strongly support improvements for the location

2.3 Scoring and Rating

MPO staff rated arterial segments with a total score of 10 or fewer points as *low* priority; those with a score of 11 to 12 points as *medium* priority; and those with a total score of 13 or more points as *high* priority. MPO staff gave 15 arterial segments a high-priority rating based on safety and operational needs, multimodal and regional significance, regional equity, and support for improvements from agencies and municipalities. Staff then examined high-priority segments more closely, and excluded arterials that had projects meeting any of the following criteria from further consideration for this cycle of the Priority Corridors study: recently completed, in construction, in design, under study, or programmed in the TIP with the 25 percent design completed.

The four arterial segments with the highest scores were:

- Route 138 in Milton
- Route 114 in Peabody
- Route 3A in Quincy
- Route 16 in Wellesley

Staff also evaluated the pedestrian accommodation and safety improvement needs for these segments by applying the MPO's recently developed Pedestrian Report Card Assessment.⁴ All four locations highly qualify based on pedestrian accommodation or safety improvement requirements. Appendix A contains detailed results of the assessments. Based on this evaluation, MPO staff recommends studying the segment on Route 138 in Milton.

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

3 ARTERIAL SEGMENT SELECTED FOR STUDY: ROUTE 138 IN MILTON

The arterial segment that was selected for study was Route 138 in Milton, based on a total score of 14, using the five selection criteria (safety, congestion, multimodal and regional significance, regional equity, and implementation potential). Route 138 runs north-south through Milton, from the border of Boston to the north to the border of Canton to the south. In Milton, the roadway primarily passes through residential areas and the Blue Hills Reservation area. Current evaluation indicates that there are safety, capacity, and mobility problems in the segment. Two locations along the segment contain HSIP-eligible crash clusters and the segment has a higher-than-average crash rate for its functional class. The corridor also sees a high injury rate with 39 percent of collisions causing injuries. Additionally, several intersections in the segment are congested, which create long traffic queues during peak travel periods. Finally, accommodations for pedestrians and bicyclists are poor and need improvement—several sections in the Blue Hills Reservation and Curry College lack sidewalks.

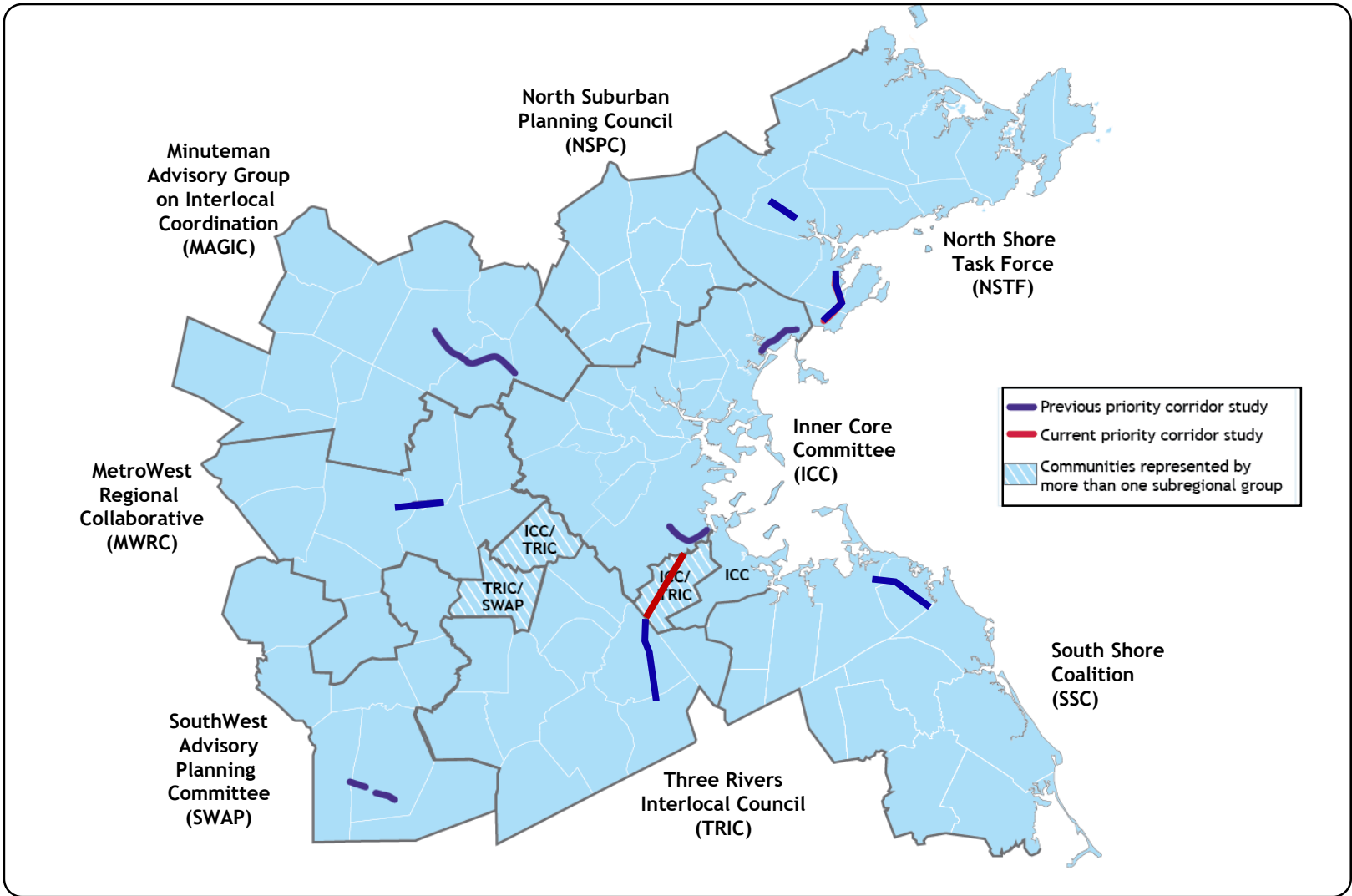
The Town of Milton is considering capacity and mobility improvements in the corridor and has expressed support for and willingness to participate in a study of this arterial segment (See Appendix B). MassDOT Highway Division District 6 supports this study and asked the MPO staff to identify the problems and develop Complete Street solutions that could be implemented by MassDOT in tandem with a future roadway improvement project.

The recommended arterial segment on Route 138 in Milton meets the selection criteria of this study, especially by supporting the transportation improvement priorities of the MPO's LRTP. While the work program for this study assumed that "as many as two" arterial segments would be selected, the MPO staff does not propose studying a second arterial segment because Route 138 in Milton is approximately 3.5 miles long and this study would require considerable resources for evaluating alternative improvement plans. Figure 1 shows the general locations of previous Priority Corridor studies, and the location identified for this year's study.

4 NEXT STEPS

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

SA/sa



BOSTON REGION MPO




FIGURE 1
Previous and Current L RTP Priority Corridor Studies
By MAPC Subregion

Route 138 Milton
 L RTP Priority Corridors
 Study

TABLE 1
Arterial Segments Considered for Study: Priority Corridors for Long-Range Transportation Plan Needs Assessment Study
(Arterial Segment Selected for Study Is Highlighted in Green)

Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Crash Rate (MVT)	Number of Top-200 High-Crash Locations 2012-14	Number of HSIP-Eligible Crash Clusters 2012-14**	Travel-Time Index	Transit Service	Crowded or Late Bus	In or Near Environmental Justice Zone	Study, Project, or TIP Project	Safety Conditions	Congested Conditions	Multimodal Significance	Regional Significance	Regional Equity	Implementation Potential	Score	Priority Rating	Summary of Comments		
Route 138	Milton	ICC and TRIC	6	MassDOT	Yes	2	1.5	0	1	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 Improvement on Route 138, project is planned to be funded through the 2020 Transportation Improvement Program for the Boston Metropolitan Planning Organization (MPO); project will also incorporate work planned originally for 607763 (described below); in the preliminary design phase. MassDOT Project #607763, Intersection and Signal Improvements at Two Locations: Route 138 (Blue Hill Avenue) at Atherton Street and Bradlee Road and Route 138 (Blue Hill Avenue) at Milton Street and Dollar Lane, programmed in federal fiscal year (FFY) 2019 Transportation Improvement Program (TIP); in the preliminary design phase.	2	2	2	4	1	3	14	High	Safety and congestion issues have been identified on this route and many locations in the segment need pedestrian and bicycle improvements. In addition, several intersections in the segment have congestion and safety issues. The Town of Milton is looking at pedestrian improvements in the corridor and has expressed unanimous support for the study. MassDOT Highway District 6 is in support of this study to identify problems and solutions that can be implemented in tandem with a future roadway improvement project in the segment. The location was suggested in the 2017 MPO outreach program.		
Route 114	Peabody	NSTF	4	MassDOT and Town	Yes	2	3.7	2	8	3.60	Three MBTA bus stops MBTA bus Routes 435 and 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, in design	4	2	2	3	1	2	14	High	Route 114 in Peabody was listed as a potential corridor in need of signal progression and improvements to accommodate pedestrians and bicyclists. However, the arterial segment was not selected because according to MassDOT Highway District 4, a road safety audit was completed for the segment in August 2016 and a consultant is starting design work as part of project #608567. The location was suggested in the 2017 MPO outreach program.		
Route 3A	Quincy	ICC	6	MassDOT, DCR, and City	Yes	3	2.9	1	4	2.76	MBTA bus Routes 201, 202, 210, 211, 212, 217, 275, 276, and 217 MBTA Red Line Rapid Transit at Quincy Center, Wollaston, and North Quincy MBTA Commuter Rail at Quincy Center	Yes	Yes	MassDOT Project #608569, Intersection Improvements at Route 3A (Southern Artery) and Broad Street. The project is planned to be funded through the FFY 2021 TIP; in the preliminary design phase. MassDOT Project #605729, Intersection and Signal Improvements at Hancock Street and East/West Squantum streets. The project consists of widening and improvements to the intersection of Hancock Street with East and West Squantum streets and improvements along Hancock Street to the MBTA access drive; completed in fall 2015. MassDOT Project #602237, Traffic Signal Installation and Intersection Improvements, Hancock Street and Southern Artery. The project reconstructed Hancock Street from Saint Ann's Road to Fenno Street, completed in fall 2007.	3	2	2	4	1	2	14	High	Route 3A (Hancock Street and Southern Artery) has received several improvement projects and a CTPS study. The location was suggested in the 2017 MPO outreach program.		
														MassDOT Project #606518. As part of the Quincy redevelopment project, the city plans to construct a new bridge over the existing MBTA tracks that will connect the downtown area at Market Square and Hancock Street. The main goal of the new bridge will be improved pedestrian conditions along Hancock Street; 25% package received (as of 12/16/2016) An FFY 2012 CTPS safety and operations study addressed problems at Route 3A and Coddington Street intersection.											
Route 16	Wellesley	MWRC	6	MassDOT and Town	Yes	4	6.4	0	5	2.57	MBTA Commuter Rail at Wellesley Square, Wellesley Hills, and Wellesley Farms	N/A	Yes	MassDOT Project #94762, Bridge Rehabilitation, Route 16 (Washington Street) over Route 9, including relocation of retaining wall; completed summer 2010. MassDOT Project #600712, Reconstruction of Route 16 from Grantland Road to the Newton City Line. The work consisted of paving, drainage improvements, sidewalk reconstruction, traffic signals, and ornamental lighting on Route 16. A signal was installed at the Washington Street/Walnut Street intersection, and the pedestrian crossing 150 feet south of Hillside Road was upgraded, completed in 2004.	3	2	2	4	1	2	14	High	The location was suggested in 2014 LRTP outreach through verbal comments at a 495/MetroWest Partnership meeting.		
Route 60	Arlington	ICC	4	Town	Yes	3	5.7	0	1	2.92	Eight MBTA bus stops MBTA bus Routes 67, 62, 76, 77, 78, 79, 80, 84, and 350	Yes	Yes	CTPS and MAPC Community Transportation Technical Assistance Program evaluated the high-crash location at the intersection at Massachusetts Avenue, March 2010. MassDOT Project #606885, the contractor is planning to finish the rest of the bike route symbols and electric work, weather permitting (as of 01/06/2017); in construction.	3	2	3	3	1	1	13	High	N/A		
Alewife Brook Parkway	Cambridge	ICC	6	DCR	Yes	2	9.3	0	3	4.77	MBTA bus Routes 79, 350, 62, 67, 74, 76, 78, 84, and 351 MBTA Rapid Transit on the Red Line MBTA Commuter Rail at Porter Square	Yes	Yes	Alewife Studies, Phase II, CTPS study (2009). DCR announced a comprehensive study of the parkway system for bike lanes. MassDOT Project #605637, Improvements at Route 2 and Route 16. The purpose of this project is to perform minor widening, eliminate a merge condition, and improve throughput capacity and vehicle queue storage at the intersection of Route 2 and Route 16 (Alewife Brook Parkway); under construction.	3	2	2	4	1	1	13	High	The Fresh Pond Residents Alliance identified Fresh Pond Parkway and Alewife Brook Parkway as locations in need of transportation improvements. Concerns include pedestrian safety of young students who walk to Shady Hill School because of high traffic volumes, environmental issues, and lack of livability.		
Route 16 (Revere Beach Parkway)	Everett	ICC	4	DCR	Yes	2	2.2	1	7	1.97	MBTA bus Routes 97, 99, 106, 110, 112, 104, 105, and 109 MBTA Orange Line Rapid Transit at Wellington and MBTA Commuter Rail at Chelsea	Yes	Yes	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updated traffic information, assessment of parkway conditions, and assessment and understanding of deficiencies along the heavily cycled parkways.	3	1	3	4	1	1	13	High	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.		

TABLE 1
Arterial Segments Considered for Study: Priority Corridors for Long-Range Transportation Plan Needs Assessment Study
(Arterial Segment Selected for Study Is Highlighted in Green)

Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Crash Rate (MVT)	Number of Top-200 High-Crash Locations 2012-14	Number of HSIP-Eligible Crash Clusters 2012-14**	Travel-Time Index	Transit Service	Crowded or Late Bus	In or Near Environmental Justice Zone	Study, Project, or TIP Project	Safety Conditions	Congested Conditions	Multimodal Significance	Regional Significance	Regional Equity	Implementation Potential	Score	Priority Rating	Summary of Comments							
Route 9	Framingham	MWRC	3	MassDOT	Yes	2	2.8	0	7	3.47	MWRTA bus Routes 1, 2, 3, 7, and 9	None	Yes	MAPC Land Use/Route 9 Corridor Study (fall 2013) MassDOT Project #603865 is located in Framingham at the intersection of Route 9 and Temple Street; in preliminary design MassDOT Project #608006, Pedestrian Hybrid Beacon Installation at Route 9 and Maynard Road; 25% design stage MassDOT Project #604991, Resurfacing and Related Work on Route 9, includes wheelchair ramp upgrades, additional sidewalks/repairs, and signal improvements; completed in autumn 2011 #602522: Framingham- Bridge Replacement, Br# F-07-006, Route 9 over the Sudbury River -- This project proposes to replace the Route 9 Bridge over the Sudbury River and includes minor incidental roadway work. (2009)	2	2	3	4	1	1	13	High	This arterial segment was not selected because according to MassDOT District 3, most of the intersections on this corridor have already been studied. In addition, MPO staff studied Route 30 in Framingham and Natick under the FFY 2013 Priority Corridors for LRTP Needs Assessment.							
														#602930: Brookline- Framingham- Natick- Newton- Southborough- Wellesley- Westborough- Traffic Signs on Route 9 -- This project will replace and update all overhead and ground-mounted guide sign panels, exit gore, warning, regulatory, and route marker panels on Route 9 and secondary roadways from the Boston-Brookline town line to I-495 in Westborough, with the exception of signing, which was updated under the I-495 Milford to Bolton contract. (2009) #604991: Framingham- Natick- Resurfacing and Related Work on Route 9 -- Route 9 will be resurfaced from approximately the Southborough/Framingham Line easterly to the Natick/Wellesley Line. (2011) #605228: Framingham- bridge replacement, F-07-001, Route 9 (Worcester Road) over reservoir outlet -- The purpose of this project is to replace the superstructure of the Route 9 bridge over the Reservoir Outlet connecting the Foss Reservoir No. 3 to the Stearnes Reservoir No. 1. (2017)																
Route 107	Lynn	ICC	4	MassDOT and Town	Yes	3	20.6	3	21	1.86	MBTA bus Routes 424, 426, 436, 441, 442, 450, 455, 456, 459, 429, and 435 MBTA Commuter Rail at River Works, Lynn/Central Square, and Swampscott	Yes	The entire segment lies within EJ zones.	MassDOT Project #604952, Bridge Replacement, Route 107 over the Saugus River; Design exception submitted (as of 01/26/2017); The construction will begin in autumn 2018. MassDOT Project #26710, Bridge Replacement, Route 107 over the Saugus River (Fox Hill Bridge); completed spring 2013 MassDOT Project #603938, Western Avenue Bridge over Saugus River (Fox Hill Bridge) TIP Project #374, Lynn Garage (transit)	4	1	2	4	1	1	13	High	This arterial segment was not selected for study because there is an ongoing Route 107 Corridor Study in Lynn and Salem, which is being conducted by MassDOT in conjunction with Lynn and Salem.							
Route 16 (Revere Beach Parkway and Mystic Valley Parkway)	Medford	ICC	4	DCR	Yes	2, 3	2.2	2	4	3.18	MBTA bus Routes 90, 97, 99, 100, 106, 108, 110, 112, and 134 MBTA Rapid Transit on the Orange Line at Wellington and on the Red Line at Porter Square MBTA Commuter Rail at West Medford and Porter Square	Yes	EJ zones are located at the ends of the segment in Somerville and Everett and 0.2 miles away in Medford.	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updating traffic information, assessing parkway conditions, and assessing and understanding deficiencies along the heavily cycled parkways. #604660: Everett- Medford- Bridge Replacements, Revere Beach Parkway (Route 16), E-12-004=M-12-018 Over The Malden River (Woods Memorial Bridge) & M-12-017 Over Mbita And Rivers Edge Drive -- The purpose of this project is to replace the existing non-operating draw bridge with a new fixed bridge. (2020)	3	2	2	4	1	1	13	High	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.							
Route 9	Natick	MWRC	3	MassDOT	Yes	2	4.4	1	10	3.30	MWRTA bus Routes 1, 4, 9, and 10	None	Yes	MAPC Land Use/Route 9 Corridor Study (fall 2013) MassDOT Project #608821, Installation of adaptive traffic control signal equipment, vehicle detection, communication equipment, and managing software at 5 traffic signals (3 in Framingham and 2 in Natick) on Route 9; in construction. MassDOT Project #605091, Work consists of bridge repairs on 4 bridges over Route 9 and Speen Street, in preliminary design MassDOT Project #601586 was completed in autumn 2015. MassDOT Project #605313 will reconstruct the Route 9/Route 27 interchange; 25% project design stage. MassDOT Project #604991, Resurfacing and Related Work on Route 9, includes wheelchair ramp upgrades, additional sidewalks/repairs, and signal improvements; completed in 2011	4	2	1	4	1	1	13	High	This segment was not selected because according to MassDOT District 3, the installation of an adaptive traffic control system for five signals and the reconstruction of the Route 9 and Oak Street intersection are currently under construction. The Route 9 and Route 27 interchange is currently in design.							

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														#602930: Brookline- Framingham- Natick- Newton- Southborough- Wellesley- Westborough- Traffic Signs On Route 9 -- This project will replace and update all overhead and ground-mounted guide sign panels, exit gore, warning, regulatory, and route marker panels on Route 9 and secondary roadways from the Boston-Brookline town line to I-495 in Westborough (completed 2009) #603004: Natick- Bridge Replacement, Br# N-03-021, Route 9 Over Lake Cochituate (2007) #607732: Framingham- Natick- Cochituate Rail Trail Construction Including Pedestrian Bridge, N-03-014, Over Route 9 & F-07-033=N-03-029 Over Route 30 (begins 2018/2019) #607993: Ayer- Natick- Lancaster- Leominster- Worcester- Stormwater Improvements Along Route 2, Route 9, Route 12, Route 2a, Route 110, Route 111 And I-290 (2018)																		
														#608281: Framingham- Natick- Adaptive Signal Control On Route 9 (Worcester Road) -- Installation of adaptive traffic control signal equipment, vehicle detection, communication equipment, and managing software at 5 traffic signals (3 in Framingham + 2 in Natick) on Route 9. (completed summer 2017)																		
Route 114	Salem	NSTF	4	MassDOT and City	Yes	2, 3	10.4	1	5	2.06	18 MBTA bus stops MBTA bus Routes 450, 451, 455, 456, 459, and 465 MBTA Commuter Rail at Salem and Beverly	Yes	Half the segment abuts EJ zones.	Transportation Improvement Study for Routes 1A, 114, and 107 and Other Roadways in Downtown Salem, 2005 CTPS study MassDOT Project #605332, Bridge Replacement (Route 114) North Street over North River; in preliminary design	4	2	2	4	0	1	13	High	This arterial segment was not selected because of regional equity--the NSTF subregion was the recipient of the FFY 2016 LRTP Priority Corridor study. This location was suggested for study in 2012 UPWP outreach via an NSTF letter. NSTF suggested that a study on Routes 114/1A and Route 127 from Swampscott to Gloucester would include suggestions about how to improve bike facilities and bike-to-rail connections in this heavily traveled tourist region. This builds on the NSTF's primary recommendation for that year and the anticipated popularity of the Essex Coastal Scenic Byway in the region.									
Route 3A	Weymouth	SSC	6	MassDOT	Yes	3	3.5	0	3	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	Yes	An EJ zone in Quincy is 0.2 miles from the segment.	MassDOT Project #608231, The intent of this project is to reconstruct Route 3A and address poor traffic operations along the corridor. The project will also upgrade accommodations for bicyclists and pedestrians; in preliminary design MassDOT Project #604382, Route 3A (Washington Street) Bridge; construction ends winter 2016/2017 MassDOT Project #608483, Work consists of resurfacing on Route 3A; in preliminary design MassDOT Project #602703, Bridge Rehabilitation, Route 3A (Lincoln Street) over the Weymouth Back River; completed in autumn 2006	3	1	2	4	1	2	13	High	A road safety audit was completed for Route 3A in Weymouth in September 2016. The audit identified the problems and needs on the roadway, and suggested short-, medium-, and long-term improvements. MassDOT District 6 indicated that a study would probably be redundant as the audit provided the information needed to advance Project #608321 in design.									
Route 18	Weymouth	SSC	6	MassDOT	Yes	3	7.1	0	10	2.55	Nine MBTA bus stops MBTA bus Route 225 MBTA Commuter Rail at South Weymouth	Yes	EJ zones lie adjacent to the segment.	Programmed TIP (2017) and MassDOT Project #601630, Reconstruction and Widening on Route 18 (Main Street), from Highland Place to Route 139; construction begins summer 2017 MassDOT Project #603161, Signalization and Improvements on Route 18 (Three Locations) at West Street, Park Avenue, and Columbian Street; completed in spring 2009 MassDOT Project #603738, Traffic Signal Improvements on Route 18 at Pond Street and Pleasant Street; completed in summer 2006	3	2	2	4	1	1	13	High	This arterial segment was not selected because according to MassDOT District 6, a MassDOT project is underway, and no project is needed at this time.									
Route 129	Wilmington	NSPC	4	MassDOT and Town	Yes	3	6.1	0	7	3.31	MBTA Commuter Rail at Wilmington, North Wilmington, Anderson/Woburn, and Reading	N/A	None	MassDOT Project #601732, Rehabilitation, Route 129 (Lowell Street) from Route 38 (Main Street) to Woburn Street. The project includes full-depth reconstruction and widening, accessible (ADA-compliant) sidewalks, new tree plantings, and bicycle accommodation within the newly paved shoulders. The intersection of Route 129 and 38 was realigned with new traffic signals and the bridge over Maple Meadow Brook was replaced; completed in 2009. MassDOT Project #608051 will reconstruct Route 38 from Route 62 to the Woburn city line and will add bike lanes, sidewalks, turn lanes, and signal upgrades; in preliminary design.	3	2	2	3	2	1	13	High	N/A									
Routes 4 and 225	Bedford and Lexington	MAGIC	4	MassDOT and Town	Yes (part)	3, 5	4.2	1	3	1.82	Three MBTA bus stops MBTA bus Route 62	Yes	None	Great Road Project: Master Plan and Conceptual Design, prepared by VHB for the Town of Bedford in 2011, in preliminary design The MassDOT-administered section, from I-95 to Hartwell Avenue, was the subject of a Town study (Hartwell Avenue Traffic Mitigation Plan -- Bedford Street Concept Plan), and a road safety audit was performed for this segment in November 2011 #29500: Bedford- Roadway Reconstruction And Traffic Signal Installation On A Section Of Great Road (Routes 4 & 225) (complete 2000) #607409: Lexington- Reconstruction On Massachusetts Avenue, From Marrett Road To Pleasant Street -- The proposed project will address safety and capacity deficiencies at three intersections along Massachusetts Avenue; Marrett Road (Route 2A), Maple Street (Route 2A) and Pleasant Street (Routes 4/225). (construction 2016-2018)	3	1	2	3	1	2	12	Medium	This arterial segment was not selected because it did not have the support of MassDOT District 4 and also sections of it had already been studied. The Town of Bedford requested in FFY 2017 that the MPO study this arterial segment from I-95 in Lexington to Loomis Street in Bedford. The MAGIC subregion requested that the FFY 2012 UPWP and FFY 2013 UPWP include a study of Routes 4 and 225. The MassDOT section from I-95 to Hartwell Avenue was the subject of a Town study.									
Route 16 (Revere Beach Parkway)	Chelsea	ICC	6	DCR	Yes	2	2.8	2	3	2.33	MBTA bus Routes 112 and 111 MBTA Commuter Rail at Chelsea	Yes	The entire segment lies within EJ zone.	The Lower North Shore Transportation Improvement Study, CTPS study (2000) DCR announced a comprehensive study of the parkway system for bike lanes.	3	2	2	4	1	0	12	Medium	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.									

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Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Crash Rate (MVT)	Number of Top-200 High-Crash Locations 2012-14	Number of HSIP-Eligible Crash Clusters 2012-14**	Travel-Time Index	Transit Service	Crowded or Late Bus	In or Near Environmental Justice Zone	Study, Project, or TIP Project	Safety Conditions	Congested Conditions	Multimodal Significance	Regional Significance	Regional Equity	Implementation Potential	Score	Priority Rating	Summary of Comments
Route 28	Milton	ICC and TRIC	6	MassDOT and Town	Yes	3	4.2	0	1	2.48	51 MBTA bus stops MBTA bus Routes 240, 245, 24, 28, 26, 30, 31, and 33 MBTA Red Line Rapid Transit at Mattapan/Ashmont Station BAT Route 12	Yes	Yes EJ zones are located at the northern end.	MassDOT Project #607342, Intersection and Signal Improvements at Route 28 (Randolph Avenue) and Chickatawbut Road; in preliminary design MassDOT Project #106901, Roadway Reconstruction on Route 28 (Randolph Avenue) from Reedsdale Road to Milton/Quincy town line; completed 2008 Conceptual TIP #1008, Reconstruct the Intersection of Blue Hills Parkway and Brook Road	2	2	2	3	1	2	12	Medium	This arterial segment was not selected because there have been several improvements in this segment in recent years.
Route 9	Newton	ICC	6	MassDOT	Yes	2	2.0	0	8	4.99	Six MBTA bus stops MBTA bus Routes 60, 52, and 59 MBTA Green Line	Yes	Yes An EJ zone in Brookline is 0.3 mi from the segment.	MassDOT Project #604327, Resurfacing and Related Work on Route 9 (Boylston Street) from the Wellesley/Newton city line to Newton/Brookline city line; completed in summer 2012 MassDOT Project #601704, Reconstruction and Signal Improvements on Walnut Street, from Homer Street to Route 9; in design; 25% package received (as of 12/23/2013) MassDOT Project #606635, Reconstruction of Highland Avenue, Needham Street, and Charles River Bridge, from Webster Street to Route 9; 75% package received (as of 09/23/2016). MassDOT Project #604327, resurfaced this segment, including updates to guardrails and improvements to the existing drainage structures; construction was completed in 2012.	2	2	2	4	1	1	12	Medium	According to MassDOT District 6, improvements were recently made to accommodate new developments. An analysis of the new existing conditions would be helpful to compare with the future projected conditions.
Route 16	Newton	ICC	6	MassDOT and City	Yes	3	2.9	0	4	1.86	MBTA Routes 59, 170, 505, 553, 554, and 556 MBTA Green Line Rapid Transit MBTA Commuter Rail at West Newton	Yes	Yes An EJ zone lies adjacent to the segment.	MassDOT Project #606780, Bridge Rehabilitation, Route 16 (Washington Street) over I-90, MBTA/CSX Corporation and Access Road; 25% package comments to DE (as of 02/19/2016). Conceptual TIP #1067, Washington Street (Phase 2), from Commonwealth Avenue to Perkins Street	2	1	2	4	1	2	12	Medium	In FFY 2014, a subregional study was conducted on Washington Street in Newton. The location was suggested in 2014 LRTP outreach through verbal comments at a 495/MetroWest partnership meeting.
Route 28	Randolph	TRIC	6	MassDOT and Town	Yes	3	5.5	0	6	2.00	50 MBTA bus stops MBTA bus Routes 240 and 238 MBTA Commuter Rail at Holbrook/Randolph BAT Route 12	Yes	Yes The entire segment lies within EJ Zones.	MassDOT Project #603716, Resurfacing and Related Work on a Section of Route 28; completed 2007/2008 Conceptual TIP #1002, Route 28 (N. Main Street) Bridge Conceptual TIP #1010, Route 28 (N. Main Street) and Liberty Street intersection Conceptual TIP #1011, Route 28 (N. Main Street) and West Street intersection FFY 2008 Safety and Operations Analyses at Intersections study Arterial Coordination Study, CTPS study (2010)	3	2	2	4	0	1	12	Medium	The location has several MassDOT projects and CTPS studies and it is not recommended for study.
Route 16 (Revere Beach Parkway)	Revere	ICC	4	DCR	Yes	2	1.5	0	4	1.86	MBTA bus Routes 110, 116, 117, 119, 424, 426, 428, 448, 449, 450, 455, and 459 MBTA Rapid Transit on Blue Line MBTA Commuter Rail at Chelsea	Yes	Yes The entire segment lies within EJ Zones.	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updating traffic information, assessing parkway conditions, and assessing and understanding deficiencies along the heavily cycled parkways. The Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.	2	1	3	4	1	1	12	Medium	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway. A congestion study was suggested through LRTP 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.
Route 20	Weston	MWRC	6	MassDOT	Yes	3	2.6	0	2	3.06	MBTA bus Route 70 MBTA Commuter Rail at Waltham and Kendal Green	Yes	Yes An EJ Zone is located 0.1 mi from the end of the segment.	No projects	1	2	2	4	1	2	12	Medium	The location was resubmitted in a comment on Draft FFY 2014 UPWP and was suggested in the 2017 MPO outreach program.
Route 2 (Fresh Pond Parkway)	Cambridge	ICC	6	DCR	Yes	2	1.8	1	3	1.31	MBTA bus Routes 75, 71, 72, 73, 74, and 78 MBTA Red Line Rapid Transit MBTA Commuter Rail at Porter Square	Yes	Yes Two EJ zones are located within 0.5 miles of the segment.	DCR announced that the agency will conduct a traffic study of several intersections along Mount Auburn Street and Fresh Pond Parkway, in partnership with the City of Cambridge and the MBTA. The study will focus on safety measures, bus prioritization, and accessibility. Conceptual TIP project #987 would acquire Minuteman Path right-of-way in Watertown to connect Minuteman Bikeway from Arlington, Cambridge, and Watertown to Dr. Paul Dudley White Bike Path in Boston.	3	1	2	4	0	1	11	Medium	The Fresh Pond Residents Alliance identified Fresh Pond Parkway and Alewife Brook Parkway as locations in need of transportation improvements. Concerns include pedestrian safety of young students who walk to Shady Hill School because of high traffic volumes, environmental issues, and lack of livability.
Memorial Drive (Routes 2 and 3)	Cambridge	ICC	6	DCR	Yes	2	3.6	0	4	3.99	MBTA bus Routes 747, 1, 47, 64, 66, 70, 70A, 71, 73, 86, and 701 MBTA Rapid Transit available on the Red and Green Lines MBTA Commuter Rail at North Station, Back Bay, Yawkey, Porter Square, and Belmont	Yes	Yes Most of the segment lies within or adjacent to EJ Zones.	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updating traffic information, assessing parkway conditions, and assessing and understanding deficiencies along the heavily cycled parkways.	3	2	1	4	1	0	11	Medium	None

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Route 99	Everett	ICC	4	City	Yes	3	2.6	0	3	2.23	40 MBTA bus stops MBTA bus Routes 97, 104, 105, 109, 110, 112, 99, and 106	Yes	The entire segment lies within EJ zones.	MassDOT Project #602383 reconstructed Route 99 with a traffic signal upgrade, from Second Street to the Malden city line in 2008; completed autumn 2007; All work is complete except punch list work (as of 02/15/2008) MassDOT Project #601580 reconstructed Route 99 from Sweetser Circle to Second Street in 2004; completed in summer 2004. MassDOT Project #602382 reconstructed Route 99 from Sweetser Circle to the Alford Street Bridge in 2013; completed spring 2013.	2	2	2	4	0	1	11	Medium	Not recommended for study because the MassDOT projects listed completely reconstructed Route 99 with signal improvements from Alford Street Bridge to the Malden city line.
Route 1	Norwood	TRIC	5	MassDOT	Yes	3	0.8	1	4	3.85	MBTA Commuter Rail at Islington, Dedham Corp Center, Endicott, Norwood Depot, Norwood Central, Windsor Gardens, and Flimptonville stops	N/A	One EJ zones lies adjacent to the southern end of the segment.	MassDOT's I-95 South Corridor Study, provided a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 that included a recommended plan of short-term and long-term improvements (June 2010) MassDOT Project #608052, Route 1 at Morse Street (approved by PRC Nov. 2014); in preliminary design MassDOT Project #605857, Route 1 at University Avenue and Everett Street; Town design is at pre-25% MassDOT Project #605321, Bridge Preservation, Route 1 over the Neponset River; in design stage	2	2	2	4	0	1	11	Medium	The location has MassDOT projects and studies and it is not recommended for study.
Route 1A	Revere	ICC	4	MassDOT	Yes	2	2.1	0	1	2.93	MBTA bus Routes 110, 116, 117, 411, 424, 426, 439, 441, 442, 448, 449, 450, and 455 MBTA Rapid Transit on Blue Line MBTA Commuter	Yes	The entire segment lies within EJ zones.	CTPS Lower North Shore Transportation Improvement Study proposed improvements for Route 1A in Revere in October 2000; an update may be necessary. Conceptual TIP Project #982, Mahoney Circle (Bell Circle) Grade Separation	2	2	2	4	0	1	11	Medium	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.
Route 1	Walpole	TRIC	5	MassDOT	Yes	3	1.5	1	3	1.53	MBTA Commuter Rail at Sharon and Walpole	N/A	One EJ zones lies adjacent to the southern end of the segment.	MassDOT's I-95 South Corridor Study presented a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 and included a recommended plan of short-term and long-term improvements (June 2010) MassDOT Project #608480, Resurfacing and related work on Route 1; in preliminary design MassDOT Project #608599, Stormwater Improvements to treat discharges from Route 1, I-95 and Route 1A to the Neponset River and an Unnamed Tributary; in preliminary design	2	1	3	4	0	1	11	Medium	The location has MassDOT projects and studies and was not recommended for study by MassDOT Highway District 5.
Route 135	Wellesley	MWRC	6	MassDOT and Town	Yes	3	6.7	0	2	1.97	MBTA Commuter Rail at Natick, Wellesley Square, and Wellesley Hills MWRTA bus Route 8	None	Most of the segment lies adjacent to EJ zones.	No projects	3	1	2	3	1	1	11	Medium	None
Route 2	Acton	MAGIC	3	MassDOT	Yes	2	1.3	0	1	1.80	MBTA Commuter Rail at South Acton and West Concord	N/A	Yes	MassDOT Project #604472, Resurfacing and Related Work on Route 2 (includes all of Acton); completed in spring 2014 MassDOT Project #607748, Intersection and Signal Improvements on Route 2 and Route 111 at Piper Road and Taylor Road; in preliminary design MassDOT Project #604609, Traffic Sign Replacement and Safety Improvements on Route 2; completed in summer 2009 TIP Project #606223, Bruce Freeman Rail Trail Construction (Phase II-B) in Acton and Concord to connect the trail across Route 2, programmed in FFY 2018 TIP	1	1	2	4	1	1	10	Low	Location has MassDOT projects. A MassDOT road safety audit is scheduled for the Piper Road/Taylor Road intersection; the project is in the preliminary design phase. The MAGIC subregion expressed interest in a Route 2 study.
Route 62	Bedford	MAGIC	4	MassDOT and Town	No	5	7.0	0	0	2.65	Three MBTA bus stops MBTA bus Route 62	Yes	None	Great Road Project: Master Plan and Conceptual Design, prepared by Vanasse Hagen Brustlin Inc. (VHB) for the Town of Bedford in 2011. The plan was to improve pedestrian and bicycle access, recommend streetscape improvements that would highlight the "center" of Bedford while taking into consideration traffic flow through the area, crosswalk locations, intersection and traffic control improvements, property access, and parking.	2	2	2	2	1	1	10	Low	Forms part of Routes 4 and 225 arterial segment.
Route 16	Holliston	MWRC	3	MassDOT and Town	Yes	3	4.8	1	2	1.09	MWRTA bus Route 6	None	None	MassDOT Project #605745, Reconstruction of Route 16 from Quail Run to the Sherborn town line; in preliminary design MassDOT Project #602462 will enhance safety and improve efficiency by installing a new traffic signal at the intersection of Route 16 at Route 126 and at Oak Street in Holliston; 25% design stage (as of 12/08/1999) 2011 CTPS study, Route 126 Corridor: Transportation Improvement Study 2008 CTPS study, Washington Street (Route 16/126) at Hollis Street	4	0	1	2	1	2	10	Low	Location has MassDOT projects and CTPS studies, which have not been implemented. The 495/Metro/West Partnership expressed interest in a Route 16 study. The section that experiences the most crashes is the town center portion (under town jurisdiction). A road safety audit was performed for the town center portion in December 2012.
Route 135	Natick	MWRC	3	Town	Yes	3	6.7	1	3	1.97	MWRTA bus Routes 10 and 11 MBTA Commuter Rail at Natick and West Natick	None	None	MassDOT Project #600573 reconstructed Route 135 in Natick in 2008. More extensive improvements were proposed in the downtown area, on East Central Street between North Main Street and Union Street, including signal upgrades, new sidewalks, pavement rehabilitation, and shoulders; Contract #32302 was completed; all construction operations have been suspended (as of 06/30/2007) 2010 CTPS study, West Central Street (Route 135) at Speen Street.	4	1	2	1	1	1	10	Low	Congestion in the downtown area; likely focus area would be on the intersection of Route 135 at Route 27 and the intersection of Route 135 at Speen Street because of the crash history of those locations.

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Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Crash Rate (MVT)	Number of Top-200 High-Crash Locations 2012-14	Number of HSIP-Eligible Crash Clusters 2012-14**	Travel-Time Index	Transit Service	Crowded or Late Bus	In or Near Environmental Justice Zone	Study, Project, or TIP Project	Safety Conditions	Congested Conditions	Multimodal Significance	Regional Significance	Regional Equity	Implementation Potential	Score	Priority Rating	Summary of Comments
Route 129	Reading	NSPC	4	MassDOT and Town	Yes	3	3.9	0	1	2.06	11 MBTA bus stops MBTA bus Route 136 MBTA Commuter Rail at Wakefield, Reading, and Woburn	Yes	None	No projects	2	2	2	1	2	1	10	Low	None
Route 9	Wellesley	MWRC	6	MassDOT	Yes	2	3.5	0	11	1.76	MBTA Commuter Rail at Wellesley Hills and Wellesley Farms MWRTA bus Route 1	None	None	MassDOT Project #601586, Intersection Improvements at Route 9 (Worcester Street) and Oak Street, from 1500 feet West of Oak Street to 300 feet East of Overbrook Drive; construction ended in spring 2015 MassDOT Project #607340, Resurfacing on Route 9, from Dearborn Street to the Natick town line; in preliminary design MassDOT Project #606530, Drainage Improvements along Route 9 Boulder Creek Culvert (Design Only); 25% design stage (as of 06/10/2015) CTPS study: Route 9 Corridor in Wellesley, 2003 MAPC Land Use/Corridor Study (fall 2013)	2	1	2	3	1	1	10	Low	MassDOT has a preliminary assessment of this corridor that will develop into 25% design plans for roadway improvements. Location was suggested in 2014 LRTP outreach at a 495/MetroWest Partnership meeting.
Route 16	Sherborn	SWAP	3	Town	Yes	3	1.3	0	1	1.96	None	N/A	None	2002 CTPS study, Traffic Congestion in SWAP Subregion: Sherborn Town Center Traffic-Flow Improvement Study Conceptual TIP #915, Washington Street (Route 16)	1	1	1	3	1	2	9	Low	The section that experiences the most crashes and congestion is the town center portion, where Route 16 and Route 27 combine and split.
Route 62	Concord	MAGIC	4	Town	Yes	3	4.3	0	0	2.66	MBTA Commuter Rail at Concord and West Concord	N/A	None	No projects	2	2	1	1	1	1	8	Low	None
Route 3A	Marshfield	SSC	5	MassDOT	Yes	3	2.0	0	2	1.41	GATRA bus MBTA Commuter Rail at Greenbush	None	None	The corridor is within the limits of MassDOT Project #605664, Resurfacing and Related Work on Route 3A (Duxbury town line northerly to Scituate town line), work includes patching and microsurfacing, shoulder reconstruction, and drainage structures; 100% design stage; no construction funding identified	1	1	2	2	1	1	8	Low	None
Route 16	Natick	MWRC	3	Town	Yes	3	1.5	0	0	1.21	None	N/A	Yes	No projects	0	0	2	3	1	2	8	Low	The 495/MetroWest Partnership expressed interest in a Route 16 study. Specific issues in this segment include improvements to accommodate pedestrians and bicyclists.
Route 1	Sharon	TRIC	5	MassDOT	Yes	3	1.3	0	1	1.36	MBTA Commuter Rail at Sharon and Walpole	N/A	None	MassDOT's I-95 South Corridor Study, provided a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 that included a recommended plan of short-term and long-term improvements (June 2010) MassDOT Project #603622, Bridge Rehabilitations, Route 1/Route I-95; completed in 2010	1	1	3	2	0	1	8	Low	Segment has MassDOT projects and studies.
Route 1	Westwood	TRIC	6	MassDOT	Yes	3	1.1	0	0	2.49	None	N/A	None	MassDOT's I-95 South Corridor Study provided a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 and included a recommended plan of short-term and long-term improvements (June 2010) MassDOT Project #603162, Route 128 Add-a-Lane Bridges (Bridge III), Route 1 and 1A over I-95/128; completed in 2012 MAPC Land Use/Route 9 Corridor Study (fall 2013).	0	2	2	3	0	1	8	Low	Segment has MassDOT projects and studies.
Route 9	Southborough	MWRC	3	MassDOT	Yes	2	1.4	0	0	2.11	MWRTA bus Route 7	None	None	The CTPS Safety and Operations at Intersections study evaluated congestion and safety issues at the Route 9/Oak Hill Road/Central Street intersection in FFY 2012. MassDOT's I-495/Route 9 study, November 2013. The western section of Route 9 in Southborough between the I-95 interchange and Crystal Pond Road was evaluated for short-term and long-term improvements as part of this study. MassDOT Project #607172, Resurfacing and Related Work on Route 9, from Westborough to just west of White Bagley Road, construction ends in summer 2016	0	2	2	2	1	0	7	Low	Most of the intersections on this corridor have already been studied, as MassDOT District 3 has noted.
Route 3A	Scituate	SSC	5	MassDOT	Yes	3	1.2	0	0	1.21	MBTA Commuter Rail at Greenbush, North Scituate, and Cohasset	N/A	None	FFY 2013 Subregional Priority Corridor Study The corridor is within the limits of MassDOT Project #605664, Resurfacing and Related Work on Route 3A (Duxbury town line northerly to Scituate town line); no construction funding identified. Work includes patching and microsurfacing, shoulder reconstruction, and drainage structures; 100% design stage.	0	0	2	1	1	1	5	Low	The FFY 2013 Subregional Priority Corridors Study was conducted within the segment. MassDOT District 5 comments refer to MassDOT Project #605664 (in the 100% design stage).

Abbreviations
AADT = Annual average daily traffic. ADA = Americans with Disabilities Act. ADT = Average daily traffic. BAT = Brockton Areas Transit Authority. CTPS = Central Transportation Planning Staff. DCR = Department of Conservation and Recreation. DEIR = Draft Environmental Impact Report. EJ = Environmental Justice. ENHC = Essex National Heritage Commission. EPDO = Equivalent property damage only. FFY = Federal fiscal year. GATRA = Greater Attleboro Taunton Regional Transit Authority. HSIP = Highway Safety Improvement Program. ICC = Inner Core Committee. LRTP = Long-Range Transportation Plan. MAGIC = Minuteman Advisory Group on Interlocal Coordination. MAPC = Metropolitan Area Planning Council. MassDOT = Massachusetts Department of Transportation. MBTA = Massachusetts Bay Transportation Authority. MPO = Boston Region Metropolitan Planning Organization. MVMT = Million vehicle-miles traveled. MWRC = MetroWest Regional Collaborative. MWRTA = MetroWest Regional Transit Authority. NSPC = North Suburban Planning Council. NSTF = North Shore Task Force. PRC = MassDOT Project Review Committee. RSA = Road safety audit. RTA = Regional transit authority. SSC = South Shore Coalition. SWAP = South West Advisory Planning Committee. TIP = Transportation Improvement Program. TRIC = Three Rivers Interlocal Council. UPWP = Unified Planning Work Program.

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.

***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 (EPDO) index. In the EPDO 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 EPDO value of 42.

Source: Central Transportation Planning Staff.

Pedestrian Report Card Assessment (PRCA): Roadway Segment



Roadway Segment Location		
Route 138 – Milton, MA		

Grading Categories	Score	Rating
Safety	2.8	Good
System Preservation	N/A	Fair
Capacity Management and Mobility	1.5	Poor
Economic Vitality	1.5	Poor

Transportation Equity	
High Priority Area	✓
Moderate Priority Area	
Not a 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/livability | 857.702.3707 | cclaude@ctps.org

Category Ratings

Good: Score of 2.3 or more (maximum 3.0)

Fair: Score is between 1.7 and 2.3

Poor: Score is 1.7 or less (minimum 0)

Grading Categories: Scoring Breakdown Roadway Segment

Capacity Management and Mobility			
Performance Measure	Weight	Rating	Weighted Score
Sidewalk Presence	3	Fair	6
Crossing Opportunities	2	Poor	2
Walkway Width	1	Poor	1
Total	6		9

Economic Vitality			
Performance Measure	Weight	Rating	Weighted Score
Pedestrian Volumes	1	Fair	2
Adjacent Bicycle Accommodations	1	Poor	1
Total	2		3

Category rating = total rating/total weight
 Rating Score:
 Good = 3
 Fair = 2
 Poor = 1

Safety			
Performance Measure	Weight	Rating	Weighted Score
Pedestrian Crashes	3	Good	9
Pedestrian-Vehicle Buffer	1	Good	3
Vehicle Travel Speed	1	Fair	2
Total	5		14

System Preservation	
Performance Measure	Rating
Sidewalk Condition	Fair

Transportation Equity Priority	
Area Condition	Yes/No
Environmental Justice zone?	✓
School or college within one-quarter mile?	✓
More than 8.9% of population older than 75 years?	✓
More than 27.5% of households do not own a vehicle?	

Category Ratings
 Good: Score of 2.3 or more (maximum 3.0)
 Fair: Score is between 1.7 and 2.3
 Poor: Score is 1.7 or less (minimum 0)

Detailed Performance Measure Information: Roadway Segment

Goal	Performance Measure	Features of Analyzed Locations
Mobility	Sidewalk Presence	Sidewalks are present on one side of the street
	Crossing Opportunities	9 crosswalks/ 3.6 miles = 2.5 crosswalks per mile
	Walkway Width	4 foot sidewalks
Economic Vitality	Pedestrian Volumes	Estimated 5 to 60 pedestrians
Safety	Adjacent Bicycle Accommodations	Some bike lanes are present at the southern portion of the corridor but the bike lanes are inconsistent
	Pedestrian Crashes	Not in HSIP cluster
	Pedestrian-Vehicle Buffer	13 feet
	Vehicle Travel Speed	32 MPH
System Preservation	Sidewalk Condition	Fair

Seth Asante

From: John Thompson
Sent: Friday, October 20, 2017 9:21 AM
To: sasante@ctps.org
Cc: geraldine.vatan@state.ma.us; Chase Berkeley; Michael D. Dennehy; William Clark
Subject: Rt. 138 corridor study extension and Rt. 28 corridor study - Milton

Good Morning Seth,

Over the past few weeks I have had a few conversations with Geri Vatan at MassDOT District 6 about an ongoing corridor study for Route 138 in Canton and the possibility of extending the study to include Milton. My understanding is that MassDOT will be undertaking a resurfacing project in FY19 for Route 138 through Canton and Milton, and would like to incorporate additional complete streets principles and improvements that may be identified by extending the corridor study. I am writing to relay Milton's enthusiastic support for this effort. The town would benefit greatly from any improvements to this corridor that would increase efficiency and increase accessibility for all users, including bicyclists and pedestrians, especially given the number of area amenities and destinations directly adjacent to Rt. 138 (Blue Hills Ski Area, DCR's Blue Hills Reservation and Trailside Museum, and Curry College to name a few).

In addition to supporting the Route 138 study, I would also like to request that State Route 28, primarily the section between I-93 and Reedsdale Road in Milton, be considered for a corridor study as well. Officials from the Town recently met with MassDOT to discuss ongoing safety issues along this section of state highway. There was recently another fatality on the roadway (there have been numerous fatalities over the past several years) in addition to many other accidents that seemingly occur on a regular basis. I know that an intersection project at the intersection of Randolph Avenue and Chickatawbut Road is already moving forward, which is fantastic, but we believe the entire corridor should be looked at for possible improvements. The corridor sees a tremendous amount of cut-through traffic which floods the town with vehicles looking to avoid and bypass the Braintree split in both the AM (northbound) and PM (southbound). The cut through traffic is travelling at high rates of speed on a four lane highway through a residential neighborhood with many driveways, no shoulders, no accommodations for bikes, and very uncomfortable conditions for pedestrians. Currently, the layout of Route 28 does very little to promote safe driving habits. Compounding the issue is the fact that a lot of traffic, particularly during peak hours, is finding its way onto smaller neighborhood streets to avoid queues and delays due to high volume. We feel that a corridor study would be a very logical and beneficial first step to begin addressing these issues.

Thank you for your attention to this matter and please feel free to reach out to me directly if you have any questions or would like any further information.

Respectfully,

John P. Thompson, P.E.
Town Engineer

Town of Milton – Engineering Dept.
525 Canton Avenue
Milton, MA 02186

(617) 898-4869

Seth Asante

From: Vatan, Geraldine (DOT)
Sent: Thursday, October 19, 2017 10:33 AM
To: Seth Asante (sasante@ctps.org)
Cc: Rose, Marie (DOT); Paul, Andrew (DOT); Polin, Bonnie (DOT); Sutton, Peter (DOT); Dwyer, Courtney (DOT)
Subject: FW: Route 138 Corridor Study Canton-Milton
Attachments: Emailing: Ma Ped Plan_DRAFT Corridor Analysis (2).jpg (96.4 KB)

Hi Seth,

I am writing to update you regarding Route 138 in Canton and Milton. As you know, there is a corridor study underway in Canton and Milton is a potential study for next year. I would like to re-iterate MassDOT's support of the Milton corridor study. OTP is developing a Statewide Pedestrian Plan, ranking corridors for improvement. Route 138 Canton-Milton has been ranked as a high priority corridor and as such may be eligible for additional funding (see attached). In the email below statements relating to support for the corridor study have been highlighted. It is my understanding that the Town of Milton has expressed their support for this study to you as well.

Thank you and I look forward to learning what CTPS decides on this issue.

Geri

Geraldine Vatan | District 6 Project Development Engineer

185 Kneeland Street Boston, MA 02111 | Office (857) 368-6115 | Cell (508) 330-1078

MassDOT Highway Division geraldine.vatan@dot.state.ma.us

Seth Asante

From: Polin, Bonnie (DOT)
Sent: Tuesday, October 3, 2017 8:36 AM
To: 'sasante@ctps.org'
Cc: Vatan, Geraldine (DOT)
Subject: Route 138 Corridor Study Canton-Milton

Seth – Good morning. I understand CTPS will be conducting a corridor study of Route 138 in Canton. It is perfect because there is a resurfacing job of Canton/Milton Route 138 on the STIP for 2020 (608484). It would be great if we could incorporate the recommendations and actually make the corridor study applicable. Therefore, is your intention to actually pull the crashes? Is it possible to conduct the RSAs for the HSIP eligible locations along the corridor? If not, let me know as soon as possible so we can do it (but it would make sense to have one as part of the corridor rather than piecemeal). Furthermore, because the resurfacing job is for both Canton and Milton, is there a chance you could extend the corridor study to cover the area of the project and then add the HSIP clusters. If not, let me know. We want to work with CTPS to make this effective for Milton, Canton, MassDOT and CTPS.

Also, just so you know, 2015 just closed so we will be updating the high crash cluster map.

Thanks, Bonnie



Bonnie Polin, Manager Highway Safety Programs

MassDOT | Highway Division | Traffic Safety Section

10 Park Plaza Suite 7210 | Boston, MA 02116

Phone: 857-368-9636 | Fax: 857-368-0628

Email: Bonnie.Polin@state.ma.us

Part 3: Public Participation

Route 138 Priority Corridor Study in Milton

Blute Conference Room

Milton Town Hall,

July 12, 2018

<u>Name</u>	<u>Affiliation</u>	<u>Email</u>
John Thompson	Town of Milton	jthompson@townofmilton.org
✓ William Clark	Town of Milton	wclark@townofmilton.org
✓ Chase Berkeley	Town of Milton	cberkeley@townofmilton.org
Michael D. Dennehy	Town of Milton	mdennehy@townofmilton.org
John King, Police Chief	Town of Milton	<u>jking@mpdmilton.org</u>
✓ Mark Alba	Town of Milton	malba@mpdmilton.org
✓ John Grant, Fire Chief	Town of Milton	jgrant@townofmilton.org
Lindsey Barbee	GPI	lbarbee@gpinet.com
✓ Diaz, John	GPI	jdiaz@gpinet.com
Karl Pastore	DCR	Kpastore@MassMail.state.ma.us
Paul Jahnige	DCR	paul.jahnige@state.ma.us
Michael Clark	MassDOT—Planning	michael.clark@state.ma.us
✓ Cassandra Gascon	MassDOT—Planning	Cassandra.Gascon@dot.state.ma.us
Bryan Pounds	MassDOT—Planning	bryan.pounds@state.ma.us
✓ Raj Kulen	MassDOT—District 6	raj.kulen@state.ma.us
✓ Courtney Dwyer	MassDOT—District 6	courtney.dwyer@state.ma.us
Geraldine Vatan	MassDOT—District 6	geraldine.vatan@state.ma.us
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Muazzez Reardon	MassDOT—Project Development	muazzez.reardon@state.ma.us
Bonnie Polin	MassDOT—Safety	bonnie.polin@state.ma.us
Connor Keating	MassDOT—Safety	connor.keating@state.ma.us
✓ Mark Abbott	Boston Region MPO	mabbott@ctps.org
✓ Seth Asante	Boston Region MPO	<u>sasante@ctps.org</u>
✓ Ben Erban	Boston Region MPO	berban@ctps.org

Route 138 Priority Corridor Study in Milton

Blute Conference Room

Milton Town Hall

July 12, 2018

Meeting Summary

- MassDOT/GPI is considering a “shared use trail” or “shared use sidewalk” concept on Route 138 south of Canton Avenue. This would take advantage of the relatively low bicycle and pedestrian volumes on this stretch and replace the proposed dual bike lanes and dual sidewalks with a single path. That would leave room for a second northbound travel lane which would complement the second northbound lane previously added up to the park-and-ride lot.
- There was also some thought about continuing the shared use trail concept past Neponset Valley Parkway. That would preserve the right-of-way which may be tight at this intersection. In this area it would make sense to keep it on the east side of the road since there’s it would provide access to a pond there, and also most of the utility poles are already located on the west side of the road.
- Courtney Dwyer would provide CTPS (Seth Asante) with more information about the shared use trail or shared-use sidewalk concept.
- The island put in at Atherton Street in front of the fire station was installed to prevent Stop and Shop trucks who missed the turn onto Neponset Valley Parkway from using the space to make a U-turn. (Stop and Shop is gone now.)
- Raj Kulen asked if it might be worth moving the existing pedestrian signal at Aberdeen Road away from the intersection to make it more obvious that it’s a mid-block crossing.
- Raj was also concerned how the residents would react to losing the ability to park in the shoulder, particularly on the north portion of the corridor.
- There was a discussion about the regional model projections, no future growth expected in the corridor.
- John Diaz expressed uncertainty about constructability due to factors like retaining walls or existing pavement widths.
- This project is programmed for the 2020 TIP.
- Next steps
 - Comments by Friday July 20
 - Include shared use trail/sidewalk concept and second northbound lane
 - Draft report sent out mid/late September

Route 138 Priority Corridor Study in Milton

Blute Conference Room

Milton Town Hall,

February 20, 2018

In Attendance:

<u>Name</u>	<u>Affiliation</u>	<u>Email</u>
John Thompson	Town of Milton	jthompson@townofmilton.org
William Clark	Town of Milton	wclark@townofmilton.org
Chase Berkeley	Town of Milton	cberkeley@townofmilton.org
Michael D. Dennehy	Town of Milton	mdennehy@townofmilton.org
Diaz, John	GPI	jdiaz@gpinet.com
Lindsey Barbee	GPI	lbarbee@gpinet.com
Michael Clark	MassDOT—Planning	michael.clark@state.ma.us
Cassandra Gascon	MassDOT—Planning	cassandra.gascon@dot.state.ma.us
Raj Kulen	MassDOT—District 6	raj.kulen@state.ma.us
Courtney Dwyer	MassDOT—District 6	courtney.dwyer@state.ma.us
Hameed Pervez	MassDOT—District 6	hameed.pervez@state.ma.us
Muazzez Reardon	MassDOT—Projects	muazzez.reardon@state.ma.us
Bonnie Polin	MassDOT—Safety	bonnie.polin@state.ma.us
Connor Keating	MassDOT—Safety	connor.keating@state.ma.us
Mark Abbott	Boston Region MPO	mabbott@ctps.org
Seth Asante	Boston Region MPO	sasante@ctps.org
Ben Erban	Boston Region MPO	berban@ctps.org

Meeting Summary

- **Summary of study tasks and expected completion date**
 - Collect stakeholder input – throughout length of project.
 - Collect data: intersection geometry, signal timings, turning movement counts (TMCs) for winter and spring, automatic traffic recorder (ATR) counts, spot speed studies, crash data, community survey data – by April
 - Analyze existing conditions – by May
 - Develop conceptual improvements – by June
 - Prepare document – by July
 - Reviews and editing – by September
- **Issues and concerns raised**
 - Safety concerns – the corridor experiences high number of crashes at many of the intersections. CTPS staff will perform further analysis on the crash data using the new methodology from the Highway Safety Manual. The following locations were expressed as areas of particular interest:
 - Left turn onto Milton Street – many accidents are reported at this intersection
 - Parking along Route 138 – it is not allowed, but the shoulders are used for parking anyway between Blue Hill Terrace and Route 28. The parked cars crowd the travelled way and are a safety risk. The corridor lacks “No Parking” signs. Parking enforcement is state highway jurisdiction, but is enforced by town police.
 - Curry College entrance (Blue Jay Way) – this location lacks sidewalks and sees a fair amount of pedestrian traffic, especially from people using the bus stops on the Route 716. Installing sidewalks in the vicinity was previously planned but not completed.
 - Pedestrian crossing at Oak Street – Tucker Elementary School generates significant pedestrian traffic at this location. There is no pedestrian signal for crossing Route 138; usually a crossing guard is employed during school hours.

Milton is considering asking this to either be designated a school zone or installing some kind of pedestrian signal. It was proposed to move the signalized crossing at Aberdeen Road to this location to better reflect usage patterns.
 - Pedestrian/bicycle accommodations at Blue Hill Recreational Area – the lack of these facilities (sidewalks, crosswalks, and bicycle lanes) leading up to the recreation area are a safety and comfort issue for visitors.

- Milton Fire Station at Bradlee Road/Atherton Street – employing signal preemption at the existing traffic signal could improve safety and responsiveness for emergency vehicles leaving the garage.
 - No additional RSAs should be needed. Bradlee Road/Atherton Street intersection and Milton Street/Dollar Street intersection were part of previous Road Safety Audits. Both RSAs are available online and Seth Asante has the link.
 - Include the fire and police chiefs on the project team in order to have their input.

- Congestion – the entire corridor has congestion issues. Conditions are often just as bad on weekends due to recreational activity. Particular areas of concern are:
 - Signal optimization – the signal timing plans are several decades old and will need to be updated. In particular, the signal at Royall Street intersection was brought up as a bottleneck location due to the north/south movements not receiving adequate green time.
 - Cut-through traffic – during the PM peak period, drivers will often take Blue Hills Parkway instead of Route 138 southbound to avoid congestion, and then proceed back to Route 138 via Canton Avenue or the side streets.
 - Route 138 and Canton Avenue has congestion issues
 - Paul's Bridge – this bridge, which is west of the corridor where Neponset Valley Parkway crosses the Neponset River, receives high volume traffic and is used by commuters and truckers to bypass major roads into Boston and to the trucking depot down the road in Boston. However, they avoid the Route 138 and Neponset Valley Parkway intersection because it is not signalized.
 - Trucks can use Neponset Valley Parkway unlike all the other parkways in the state.
 - The sports field near Paul's Bridge on Neponset Valley Parkway also sees high traffic volume on weekends.

- Additional issues and concerns from Milton residents were gathered using an online mapping tool and can be viewed here: <http://wikimapping.com/wikimap/Milton.html>. This outreach effort was well received by citizens.

- **Prior and future projects along the corridor**

- Prior studies along this corridor include 25% design plans for a signal at Neponset Valley Parkway put together by GPI, and Road Safety Audits at Route 138 intersections at Milton Street/Dollar Street and Bradlee Road/Atherton Street.
- Expanded scope and funding: The Route 138 corridor has come up on lists because of its high pedestrian potential. MassDOT is expanding the scope of the existing resurfacing project for Route 138 to incorporate complete streets objectives. The results of the CTPS investigation will be incorporated into the new project scope. This expansion will require new funding sources which are yet to be determined.
- Water infrastructure upgrades may also be required. In particular, drainage in the 700 block of Blue Hill Avenue (Route 138) was brought up as an issue. Milton will investigate aging water infrastructure on Blue Hill Avenue and plan the timeline for those repairs to align with any resurfacing and other roadway improvements.
- All parties are interested in keeping communication channels open throughout the course of these projects.

- **Follow-up tasks**

- Work with MassDOT Safety to obtain any missing police crash reports along the corridor.
- Have MassDOT Safety assist with using the improved “expected crashes” metric from the Highway Safety Manual for safety analysis. Talk to Connor Keating.
- Should look at the crashes between clusters #5 and #6.
- The winter counts are in March, which may be after the peak skiing season. It may be worth it to reach out to the Blue Hill Ski Area to get historical data so we can figure out what traffic would look like on crowded ski days. DCR has jurisdiction of this property. Contact Karl Pastore for traffic data for the Blue Hill Ski Area on heavy skiing days.

Appendix B: Traffic Data Collection

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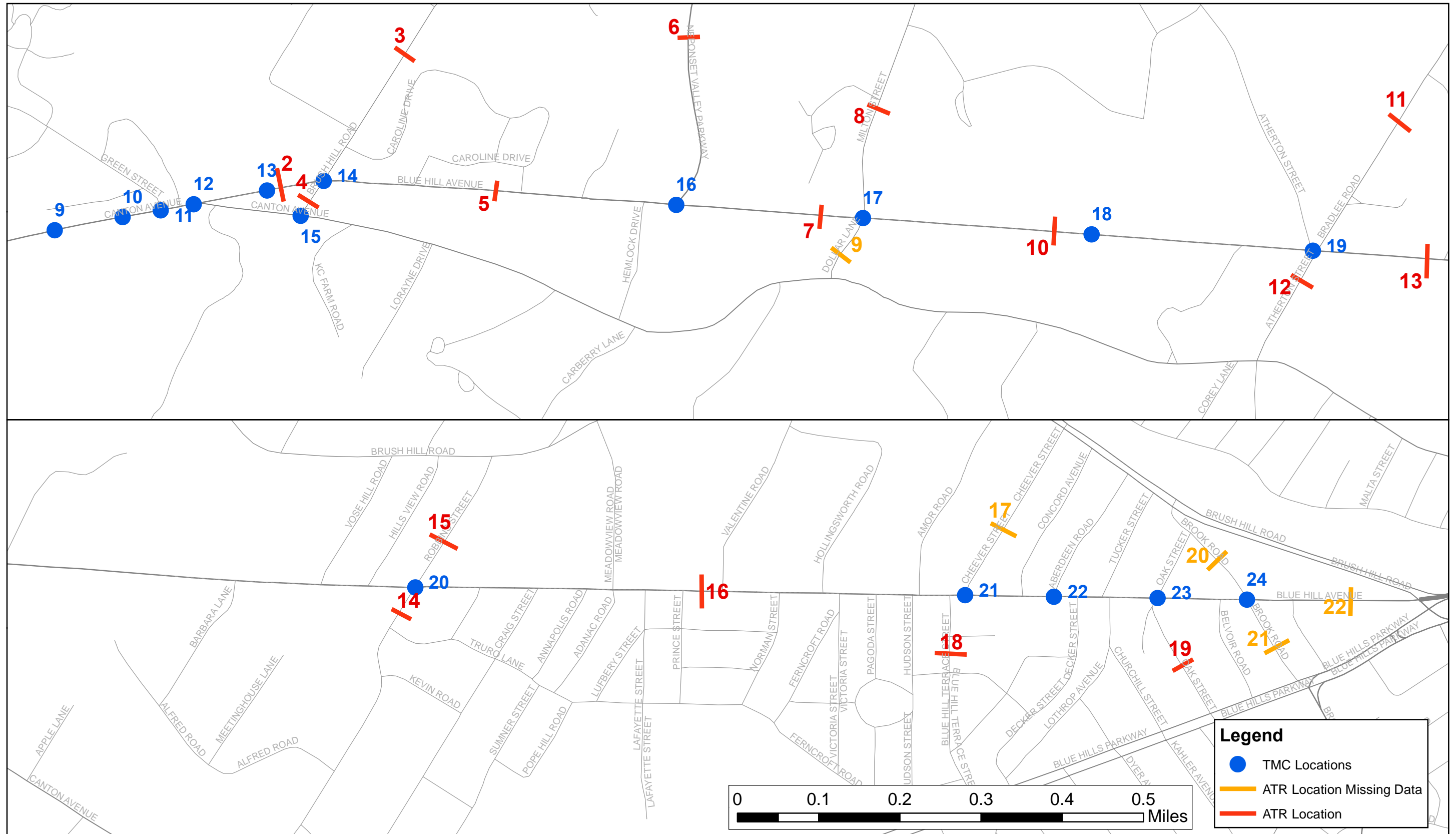


Figure B-1
Map of Turning Movement Count and Automatic Traffic Recorder Locations
Route 138 in Milton

Part 1: Turning Movement Count (TMC) Data

Study Name Milton - Route 138 and Blue Hills South Parking Lot Entrance TM8 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound						Westbound						Northbound						Crosswalk	
		T	L	U	I	O	R	L	U	I	O	R	T	U	I	O	Total	Pedestrians	Total		
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0	
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
6:00 AM - 9:00 AM	Cars	917	1	0	918	1253	0	0	0	0	2	1	1253	0	1254	917	2172	E	0	0	
One Hour Peak	%	85%	100%	0%	85%	84%	0%	0%	0%	0%	100%	100%	84%	0%	84%	85%	85%	0%	0%	0%	
7:30 AM - 8:30 AM	Light Goods Vehicles	89	0	0	89	165	0	0	0	0	0	0	165	0	165	89	254	S	0	0	
	%	8%	0%	0%	8%	11%	0%	0%	0%	0%	0%	0%	11%	0%	11%	8%	10%	0%	0%	0%	
	Buses	26	0	0	26	5	0	0	0	0	0	0	5	0	5	26	31	0	0	0	
	%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	0%	0%	
	Single-Unit Trucks	23	0	0	23	50	0	0	0	0	0	0	50	0	50	23	73				
	%	2%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%	3%	0%	3%	2%	3%				
	Articulated Trucks	19	0	0	19	15	0	0	0	0	0	0	15	0	15	19	34				
	%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	2%	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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	Total	1074	1	0	1075	1488	0	0	0	0	2	1	1488	0	1489	1074	2564				
	PHF	0.95	0.25	0	0.95	0.97	0	0	0	0	0.5	0.25	0.97	0	0.97	0.95	0.96				
	Approach %				42%	58%				0%	0%				58%	42%					
Peak 2	Motorcycles	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	1	N	0	0	
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
3:00 PM - 6:00 PM	Cars	1028	2	0	1030	1025	0	0	0	0	12	10	1025	0	1035	1028	2065	E	0	0	
One Hour Peak	%	81%	100%	0%	81%	88%	0%	0%	0%	0%	92%	91%	88%	0%	88%	81%	84%	0%	0%	0%	
3:30 PM - 4:30 PM	Light Goods Vehicles	199	0	0	199	99	0	0	0	0	0	0	99	0	99	199	298	S	0	0	
	%	16%	0%	0%	16%	9%	0%	0%	0%	0%	0%	0%	9%	0%	8%	16%	12%	0%	0%	0%	
	Buses	10	0	0	10	10	0	0	0	0	1	1	10	0	11	10	21	0	0	0	
	%	1%	0%	0%	1%	1%	0%	0%	0%	0%	8%	9%	1%	0%	1%	1%	1%	0%	0%	0%	
	Single-Unit Trucks	25	0	0	25	15	0	0	0	0	0	0	15	0	15	25	40				
	%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	2%	2%				
	Articulated Trucks	6	0	0	6	9	0	0	0	0	0	0	9	0	9	6	15				
	%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%				
	Bicycles on Road	0	0	0	0	5	0	0	0	0	0	0	5	0	5	0	5				
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	Total	1268	2	0	1270	1164	0	0	0	0	13	11	1164	0	1175	1268	2445				
	PHF	0.98	0.5	0	0.98	0.88	0	0	0	0	0.54	0.55	0.88	0	0.88	0.98	0.95				
	Approach %				52%	48%				0%	1%				48%	52%					

Study Name Milton - Route 138 and Blue Hills South Parking Lot Entrance TM8 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound						Westbound						Northbound				Crosswalk		
		T	L	U	I	O	R	L	U	I	O	R	T	U	I	O	Total	Direction	Pedestrians	Total
Peak 1	Motorcycles	1	0	0	1	1	0	0	0	0	0	0	1	0	1	1	2	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
8:00 AM - 11:00 AM	Cars	897	16	0	913	816	0	0	0	0	83	67	816	0	883	897	1796	E	0	0
One Hour Peak	%	86%	100%	0%	87%	85%	0%	0%	0%	98%	97%	85%	0%	86%	86%	86%		0%		
10:00 AM - 11:00 AM	Light Goods Vehicles	109	0	0	109	109	0	0	0	0	2	2	109	0	111	109	220	S	0	0
	%	10%	0%	0%	10%	11%	0%	0%	0%	2%	3%	11%	0%	11%	10%	11%		0%		
	Buses	6	0	0	6	4	0	0	0	0	0	0	4	0	4	6	10		0	0
	%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%				
	Single-Unit Trucks	21	0	0	21	19	0	0	0	0	0	0	19	0	19	21	40			
	%	2%	0%	0%	2%	2%	0%	0%	0%	0%	0%	2%	0%	2%	2%	2%				
	Articulated Trucks	4	0	0	4	5	0	0	0	0	0	0	5	0	5	4	9			
	%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%				
	Bicycles on Road	1	0	0	1	9	0	0	0	0	0	0	9	0	9	1	10			
	%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%				
	Total	1039	16	0	1055	963	0	0	0	0	85	69	963	0	1032	1039	2087			
	PHF	0.93	0.8	0	0.93	0.92	0	0	0	0	0.79	0.78	0.92	0	0.93	0.93	0.96			
	Approach %				51%	46%				0%	4%			49%	50%					
Peak 2	Motorcycles	3	0	0	3	6	0	0	0	0	0	0	6	0	6	3	9	N	3	3
Specified Period	%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%		100%	
2:00 PM - 5:00 PM	Cars	1142	14	0	1156	1067	0	0	0	0	76	62	1067	0	1129	1142	2285	E	0	0
One Hour Peak	%	89%	100%	0%	89%	90%	0%	0%	0%	95%	94%	90%	0%	90%	89%	90%		0%		
2:00 PM - 3:00 PM	Light Goods Vehicles	113	0	0	113	78	0	0	0	0	3	3	78	0	81	113	194	S	6	6
	%	9%	0%	0%	9%	7%	0%	0%	0%	4%	5%	7%	0%	6%	9%	8%		100%		
	Buses	5	0	0	5	5	0	0	0	0	0	0	5	0	5	5	10		9	9
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	Single-Unit Trucks	15	0	0	15	17	0	0	0	0	0	0	17	0	17	15	32			
	%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%				
	Articulated Trucks	3	0	0	3	2	0	0	0	0	0	0	2	0	2	3	5			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	Bicycles on Road	2	0	0	2	8	0	0	0	0	1	1	8	0	9	2	11			
	%	0%	0%	0%	0%	1%	0%	0%	0%	1%	2%	1%	0%	1%	0%	0%				
	Total	1283	14	0	1297	1183	0	0	0	0	80	66	1183	0	1249	1283	2546			
	PHF	0.94	0.88	0	0.94	0.92	0	0	0	0	0.8	0.72	0.92	0	0.93	0.94	0.96			
	Approach %				51%	46%				0%	3%			49%	50%					

Study Name Milton - Route 138 and Blue Hills South Parking Lot Exit TM9 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk											
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total	Pedestrians	Total							
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0		
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%			
6:00 AM - 9:00 AM	Cars	0	917	0	0	917	1253	1	0	0	0	1	0	0	1252	0	0	1252	917	0	0	0	0	0	0	2170	E	0	0
One Hour Peak	%	0%	85%	0%	0%	85%	84%	100%	0%	0%	0%	100%	0%	0%	84%	0%	0%	84%	85%	0%	0%	0%	0%	0%	0%	84%		0%	
7:30 AM - 8:30 AM	Light Goods Vehicles	0	97	0	0	97	164	0	0	0	0	0	0	0	164	0	0	164	97	0	0	0	0	0	0	261	S	0	0
	%	0%	9%	0%	0%	9%	11%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	11%	9%	0%	0%	0%	0%	0%	0%	10%		0%	
	Buses	0	26	0	0	26	6	0	0	0	0	0	0	0	6	0	0	6	26	0	0	0	0	0	0	32	W	0	0
	%	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	1%		0%	
	Single-Unit Trucks	0	23	0	0	23	51	0	0	0	0	0	0	0	51	0	0	51	23	0	0	0	0	0	0	74		0	0
	%	0%	2%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%	3%		0%	
	Articulated Trucks	0	19	0	0	19	15	0	0	0	0	0	0	0	15	0	0	15	19	0	0	0	0	0	0	34			
	%	0%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	2%	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	0	0	0			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	0	1082	0	0	1082	1489	1	0	0	0	1	0	0	1488	0	0	1488	1082	0	0	0	0	0	0	2571			
	PHF	0	0.94	0	0	0.94	0.96	0.25	0	0	0	0.25	0	0	0.96	0	0	0.96	0.94	0	0	0	0	0	0	0.95			
	Approach %					42%	58%					0%	0%					58%	42%					0%	0%				
Peak 2	Motorcycles	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
3:00 PM - 6:00 PM	Cars	0	1123	0	0	1123	1048	8	0	0	0	8	0	0	1040	0	0	1040	1123	0	0	0	0	0	0	2171	E	0	0
One Hour Peak	%	0%	88%	0%	0%	88%	90%	80%	0%	0%	0%	80%	0%	0%	90%	0%	0%	90%	88%	0%	0%	0%	0%	0%	0%	89%		0%	
4:45 PM - 5:45 PM	Light Goods Vehicles	0	128	0	0	128	86	2	0	0	0	2	0	0	84	0	0	84	128	0	0	0	0	0	0	214	S	0	0
	%	0%	10%	0%	0%	10%	7%	20%	0%	0%	0%	20%	0%	0%	7%	0%	0%	7%	10%	0%	0%	0%	0%	0%	0%	9%		0%	
	Buses	0	7	0	0	7	11	0	0	0	0	0	0	0	11	0	0	11	7	0	0	0	0	0	0	18	W	0	0
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%		0%	
	Single-Unit Trucks	0	15	0	0	15	16	0	0	0	0	0	0	0	16	0	0	16	15	0	0	0	0	0	0	31		0	0
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%			
	Articulated Trucks	0	2	0	0	2	3	0	0	0	0	0	0	0	3	0	0	3	2	0	0	0	0	0	0	5			
	%	0%	0%	0%	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	1	0	0	1	2	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	3			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	0	1277	0	0	1277	1166	10	0	0	0	10	0	0	1156	0	0	1156	1277	0	0	0	0	0	0	2443			
	PHF	0	0.95	0	0	0.95	0.91	0.5	0	0	0	0.5	0	0	0.9	0	0	0.9	0.95	0	0	0	0	0	0	0.93			
	Approach %					52%	48%					0%	0%					47%	52%					0%	0%				

Study Name Milton - Route 138 and Blue Hills North Parking Lot Entrance TM10 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound						Westbound						Northbound						Crosswalk	
		T	L	U	I	O	R	L	U	I	O	R	T	U	I	O	Total	Pedestrians	Total		
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0	
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%		
6:00 AM - 9:00 AM	Cars	932	6	0	938	1259	0	0	0	0	11	5	1259	0	1264	932	2202	E	0	0	
One Hour Peak	%	86%	100%	0%	86%	84%	0%	0%	0%	0%	85%	71%	84%	0%	84%	86%	85%		0%		
7:30 AM - 8:30 AM	Light Goods Vehicles	91	0	0	91	162	0	0	0	0	1	1	162	0	163	91	254	S	0	0	
	%	8%	0%	0%	8%	11%	0%	0%	0%	0%	8%	14%	11%	0%	11%	8%	10%		0%		
	Buses	26	0	0	26	6	0	0	0	0	0	0	6	0	6	26	32		0	0	
	%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%				
	Single-Unit Trucks	21	0	0	21	48	0	0	0	0	0	0	48	0	48	21	69				
	%	2%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%	3%	0%	3%	2%	3%				
	Articulated Trucks	20	0	0	20	15	0	0	0	0	1	1	15	0	16	20	36				
	%	2%	0%	0%	2%	1%	0%	0%	0%	0%	8%	14%	1%	0%	1%	2%	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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	Total	1090	6	0	1096	1490	0	0	0	0	13	7	1490	0	1497	1090	2593				
	PHF	0.94	0.75	0	0.94	0.96	0	0	0	0	0.65	0.58	0.96	0	0.96	0.94	0.95				
	Approach %				42%	57%				0%	1%			58%	42%						
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0	
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%		
3:00 PM - 6:00 PM	Cars	1127	4	0	1131	1069	0	0	0	0	10	6	1069	0	1075	1127	2206	E	0	0	
One Hour Peak	%	88%	100%	0%	88%	92%	0%	0%	0%	0%	91%	86%	92%	0%	92%	88%	90%		0%		
5:00 PM - 6:00 PM	Light Goods Vehicles	123	0	0	123	57	0	0	0	0	1	1	57	0	58	123	181	S	0	0	
	%	10%	0%	0%	10%	5%	0%	0%	0%	0%	9%	14%	5%	0%	5%	10%	7%		0%		
	Buses	11	0	0	11	15	0	0	0	0	0	0	15	0	15	11	26		0	0	
	%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%				
	Single-Unit Trucks	18	0	0	18	15	0	0	0	0	0	0	15	0	15	18	33				
	%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%				
	Articulated Trucks	3	0	0	3	5	0	0	0	0	0	0	5	0	5	3	8				
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	Bicycles on Road	1	0	0	1	2	0	0	0	0	0	0	2	0	2	1	3				
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	Total	1283	4	0	1287	1163	0	0	0	0	11	7	1163	0	1170	1283	2457				
	PHF	0.96	1	0	0.96	0.95	0	0	0	0	0.55	0.44	0.95	0	0.95	0.96	0.98				
	Approach %				52%	47%				0%	0%			48%	52%						

Study Name Milton - Route 138 and Blue Hills North Parking Lot Entrance TM10 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound					Westbound					Northbound					Crosswalk			
		T	L	U	I	O	R	L	U	I	O	R	T	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	1	0	0	1	1	0	0	0	0	0	0	1	0	1	1	2	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
8:00 AM - 11:00 AM	Cars	905	13	0	918	841	0	0	0	0	50	37	841	0	878	905	1796	E	1	1
One Hour Peak	%	87%	87%	0%	87%	88%	0%	0%	0%	0%	91%	93%	88%	0%	88%	87%	88%		100%	
10:00 AM - 11:00 AM	Light Goods Vehicles	97	2	0	99	75	0	0	0	0	4	2	75	0	77	97	176	S	0	0
	%	9%	13%	0%	9%	8%	0%	0%	0%	0%	7%	5%	8%	0%	8%	9%	9%		0%	
	Buses	6	0	0	6	4	0	0	0	0	0	0	4	0	4	6	10		1	1
	%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%			
	Single-Unit Trucks	26	0	0	26	18	0	0	0	0	0	0	18	0	18	26	44			
	%	3%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	2%	0%	2%	3%	2%			
	Articulated Trucks	4	0	0	4	6	0	0	0	0	0	0	6	0	6	4	10			
	%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%			
	Bicycles on Road	1	0	0	1	8	0	0	0	0	1	1	8	0	9	1	10			
	%	0%	0%	0%	0%	1%	0%	0%	0%	0%	2%	3%	1%	0%	1%	0%	0%			
	Total	1040	15	0	1055	953	0	0	0	0	55	40	953	0	993	1040	2048			
	PHF	0.93	0.47	0	0.91	0.92	0	0	0	0	0.69	0.83	0.92	0	0.92	0.93	0.95			
	Approach %				52%	47%					0%	3%			48%	51%				
Peak 2	Motorcycles	3	0	0	3	6	0	0	0	0	0	0	6	0	6	3	9	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
2:00 PM - 5:00 PM	Cars	1152	22	0	1174	1105	0	0	0	0	57	35	1105	0	1140	1152	2314	E	0	0
One Hour Peak	%	89%	88%	0%	89%	90%	0%	0%	0%	0%	93%	97%	90%	0%	90%	89%	90%		0%	
2:00 PM - 3:00 PM	Light Goods Vehicles	114	0	0	114	81	0	0	0	0	0	0	81	0	81	114	195	S	0	0
	%	9%	0%	0%	9%	7%	0%	0%	0%	0%	0%	0%	7%	0%	6%	9%	8%		0%	
	Buses	1	0	0	1	5	0	0	0	0	0	0	5	0	5	1	6		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Single-Unit Trucks	19	0	0	19	18	0	0	0	0	0	0	18	0	18	19	37			
	%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%			
	Articulated Trucks	2	0	0	2	3	0	0	0	0	0	0	3	0	3	2	5			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Bicycles on Road	2	3	0	5	7	0	0	0	0	4	1	7	0	8	2	13			
	%	0%	12%	0%	0%	1%	0%	0%	0%	0%	7%	3%	1%	0%	1%	0%	1%			
	Total	1293	25	0	1318	1225	0	0	0	0	61	36	1225	0	1261	1293	2579			
	PHF	0.94	0.69	0	0.95	0.92	0	0	0	0	0.66	0.6	0.92	0	0.92	0.94	0.96			
	Approach %				51%	47%					0%	2%			49%	50%				

Study Name Milton - Route 138 at Blue Hills North Parking Lot Exit and Green Street TM11 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk											
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total	Pedestrians	Total							
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0		
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
6:00 AM - 9:00 AM	Cars	6	925	0	0	931	1277	8	0	0	0	8	0	0	1264	0	0	1264	932	7	0	5	0	12	6	2215	E	0	0
One Hour Peak	%	86%	85%	0%	0%	85%	85%	80%	0%	0%	0%	80%	0%	0%	85%	0%	0%	85%	85%	100%	0%	71%	0%	86%	75%	85%	0%		
7:30 AM - 8:30 AM	Light Goods Vehicles	1	92	0	0	93	160	1	0	0	0	1	0	0	158	1	0	159	92	0	0	1	0	1	2	254	S	0	0
	%	14%	8%	0%	0%	9%	11%	10%	0%	0%	0%	10%	0%	0%	11%	100%	0%	11%	8%	0%	0%	14%	0%	7%	25%	10%	0%		
	Buses	0	26	0	0	26	4	0	0	0	0	0	0	0	4	0	0	4	26	0	0	0	0	0	0	30	W	0	0
	%	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	1%	0%		
	Single-Unit Trucks	0	23	0	0	23	44	1	0	0	0	1	0	0	43	0	0	43	23	0	0	0	0	0	0	67		0	0
	%	0%	2%	0%	0%	2%	3%	10%	0%	0%	0%	10%	0%	0%	3%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%	3%			
	Articulated Trucks	0	19	0	0	19	13	0	0	0	0	0	0	0	13	0	0	13	19	0	0	0	0	0	0	32			
	%	0%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%			
	Bicycles on Road	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	7%	0%	0%			
	Total	7	1085	0	0	1092	1499	10	0	0	0	10	0	0	1482	1	0	1483	1092	7	0	7	0	14	8	2599			
	PHF	0.44	0.96	0	0	0.96	0.96	0.62	0	0	0	0.62	0	0	0.95	0.25	0	0.95	0.95	0.44	0	0.35	0	0.7	0.5	0.95			
	Approach %					42%	58%					0%	0%					57%	42%					1%	0%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00 PM - 6:00 PM	Cars	15	1116	0	0	1131	1046	13	0	1	0	14	0	0	1027	6	0	1033	1126	9	0	6	0	15	21	2193	E	0	0
One Hour Peak	%	83%	88%	0%	0%	87%	90%	93%	0%	100%	0%	93%	0%	0%	90%	100%	0%	90%	88%	100%	0%	86%	0%	94%	88%	89%	0%		
5:00 PM - 6:00 PM	Light Goods Vehicles	3	128	0	0	131	86	1	0	0	0	1	0	0	84	0	0	84	128	0	0	1	0	1	3	217	S	0	0
	%	17%	10%	0%	0%	10%	7%	7%	0%	0%	0%	7%	0%	0%	7%	0%	0%	7%	10%	0%	0%	14%	0%	6%	13%	9%	0%		
	Buses	0	11	0	0	11	15	0	0	0	0	0	0	0	15	0	0	15	11	0	0	0	0	0	0	26	W	1	1
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	100%		
	Single-Unit Trucks	0	16	0	0	16	14	0	0	0	0	0	0	0	14	0	0	14	16	0	0	0	0	0	0	30		1	1
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%			
	Articulated Trucks	0	3	0	0	3	5	0	0	0	0	0	0	0	5	0	0	5	3	0	0	0	0	0	0	8			
	%	0%	0%	0%	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	1	0	0	1	2	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	3			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	18	1275	0	0	1293	1168	14	0	1	0	15	0	0	1147	6	0	1153	1285	9	0	7	0	16	24	2477			
	PHF	0.64	0.95	0	0	0.94	0.95	0.44	0	0.25	0	0.47	0	0	0.96	0.5	0	0.95	0.95	0.75	0	0.58	0	0.8	0.6	0.97			
	Approach %					52%	47%					1%	0%					47%	52%					1%	1%				

Study Name Milton - Route 138 at Blue Hills North Parking Lot Exit and Green Street TM11 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk												
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total	Pedestrians	Total								
Peak 1	Motorcycles	0	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	2	N	0	0			
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
8:00 AM - 11:00 AM	Cars	2	905	0	0	907	826	16	2	3	0	21	0	0	807	4	0	811	918	10	0	3	0	13	8	1752	E	5	5	
One Hour Peak	%	40%	87%	0%	0%	87%	85%	84%	100%	100%	0%	88%	0%	0%	85%	67%	0%	85%	87%	83%	0%	100%	0%	87%	62%	86%	100%	0%		
10:00 AM - 11:00 AM	Light Goods Vehicles	1	103	0	0	104	108	2	0	0	0	2	0	0	106	2	0	108	105	2	0	0	0	2	3	216	S	0	0	
	%	20%	10%	0%	0%	10%	11%	11%	0%	0%	0%	8%	0%	0%	11%	33%	0%	11%	10%	17%	0%	0%	0%	13%	23%	11%	0%	0%		
	Buses	0	6	0	0	6	4	0	0	0	0	0	0	0	4	0	0	4	6	0	0	0	0	0	0	10	W	0	0	
	%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Single-Unit Trucks	0	22	0	0	22	18	0	0	0	0	0	0	0	18	0	0	18	22	0	0	0	0	0	0	40	5	5		
	%	0%	2%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	
	Articulated Trucks	0	4	0	0	4	5	0	0	0	0	0	0	0	5	0	0	5	4	0	0	0	0	0	0	9				
	%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Bicycles on Road	2	1	0	0	3	9	1	0	0	0	1	0	0	8	0	0	8	1	0	0	0	0	0	2	12				
	%	40%	0%	0%	0%	0%	1%	5%	0%	0%	0%	4%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	15%	1%				
	Total	5	1042	0	0	1047	971	19	2	3	0	24	0	0	949	6	0	955	1057	12	0	3	0	15	13	2041				
	PHF	0.42	0.93	0	0	0.92	0.92	0.53	0.25	0.38	0	0.67	0	0	0.92	0.5	0	0.91	0.92	0.43	0	0.38	0	0.54	0.65	0.95				
	Approach %					51%	48%					1%	0%				47%	52%					1%	1%						
Peak 2	Motorcycles	0	3	0	0	3	6	0	0	0	0	0	0	0	6	0	0	6	3	0	0	0	0	0	0	9	N	0	0	
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
2:00 PM - 5:00 PM	Cars	5	1157	0	0	1162	1178	76	0	2	0	78	0	0	1099	6	2	1107	1171	10	0	3	0	13	11	2360	E	5	5	
One Hour Peak	%	71%	89%	0%	0%	89%	91%	95%	0%	100%	0%	95%	0%	0%	90%	86%	100%	90%	89%	83%	0%	100%	0%	87%	79%	90%	100%	0%		
2:00 PM - 3:00 PM	Light Goods Vehicles	1	115	0	0	116	79	3	0	0	0	3	0	0	76	1	0	77	117	2	0	0	0	2	2	198	S	0	0	
	%	14%	9%	0%	0%	9%	6%	4%	0%	0%	0%	4%	0%	0%	6%	14%	0%	6%	9%	17%	0%	0%	0%	13%	14%	8%	0%	0%		
	Buses	0	4	0	0	4	5	0	0	0	0	0	0	0	5	0	0	5	4	0	0	0	0	0	0	9	W	0	0	
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Single-Unit Trucks	0	15	0	0	15	18	0	0	0	0	0	0	0	18	0	0	18	15	0	0	0	0	0	0	33	5	5		
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%		
	Articulated Trucks	0	3	0	0	3	3	0	0	0	0	0	0	0	3	0	0	3	3	0	0	0	0	0	0	6				
	%	0%	0%	0%	0%	0%	0%	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	1	4	0	0	5	9	1	0	0	0	1	0	0	8	0	0	8	4	0	0	0	0	0	1	14				
	%	14%	0%	0%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	7%	1%				
	Total	7	1301	0	0	1308	1298	80	0	2	0	82	0	0	1215	7	2	1224	1317	12	0	3	0	15	14	2629				
	PHF	0.58	0.95	0	0	0.95	0.94	0.65	0	0.25	0	0.66	0	0	0.92	0.58	0.5	0.92	0.95	0.75	0	0.25	0	0.62	0.88	0.97				
	Approach %					50%	49%					3%	0%				47%	50%					1%	1%						

Study Name Milton - Route 138 at Canton Avenue and Summit Road TM12 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound				Southwestbound				Westbound				Northbound				Crosswalk											
		T	L	HL	U	I	O	HR	BL	HL	U	I	O	HR	R	L	U	I	O	R	BR	T	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
6:00 AM - 9:00 AM	Cars	945	0	5	0	950	824	0	0	0	4	4	484	0	0	0	0	0	0	0	475	824	0	1299	945	2253	NE	0	0
One Hour Peak	%	87%	0%	71%	0%	86%	85%	0%	0%	0%	100%	100%	89%	0%	0%	0%	0%	0%	0%	0%	89%	85%	0%	87%	87%	86%	0%	0%	
7:30 AM - 8:30 AM	Light Goods Vehicles	76	0	0	0	76	79	0	0	0	0	0	55	1	0	0	0	1	0	0	54	79	0	133	76	210	E	0	0
	%	7%	0%	0%	0%	7%	8%	0%	0%	0%	0%	0%	10%	100%	0%	0%	0%	100%	0%	0%	10%	8%	0%	9%	7%	8%	0%	0%	
	Buses	25	0	0	0	25	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	25	30	S	0	0
	%	2%	0%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	1%	0%	0%	
	Single-Unit Trucks	27	0	2	0	29	46	0	0	0	0	0	5	0	0	0	0	0	0	0	3	46	0	49	27	78	0	0	
	%	2%	0%	29%	0%	3%	5%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	5%	0%	3%	2%	3%	0	0	
	Articulated Trucks	19	0	0	0	19	12	0	0	0	0	0	2	0	0	0	0	0	0	0	2	12	0	14	19	33	0	0	
	%	2%	0%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	2%	1%	0	0	
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0	0	
	Total	1092	0	7	0	1099	966	0	0	0	4	4	546	1	0	0	0	1	1	1	534	966	0	1501	1092	2605			
	PHF	0.95	0	0.88	0	0.95	0.97	0	0	0	0.5	0.5	0.84	0.25	0	0	0	0.25	0.25	0.25	0.83	0.97	0	0.96	0.95	0.95			
	Approach %					42%	37%					0%	21%					0%	0%					58%	42%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
3:00 PM - 6:00 PM	Cars	1144	0	2	0	1146	689	0	0	0	0	0	373	1	0	0	0	1	0	0	370	689	0	1059	1144	2206	NE	0	0
One Hour Peak	%	88%	0%	100%	0%	88%	90%	0%	0%	0%	0%	0%	91%	50%	0%	0%	0%	33%	0%	0%	91%	90%	0%	90%	88%	89%	0%	0%	
5:00 PM - 6:00 PM	Light Goods Vehicles	119	0	0	0	119	49	0	0	0	0	0	29	0	0	0	0	0	0	0	29	49	0	78	119	197	E	0	0
	%	9%	0%	0%	0%	9%	6%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	7%	6%	0%	7%	9%	8%	0%	0%	
	Buses	11	0	0	0	11	11	0	0	0	0	0	4	0	0	0	0	0	0	0	4	11	0	15	11	26	S	0	0
	%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	1%	0%	0%	
	Single-Unit Trucks	16	0	0	0	16	13	0	0	0	0	0	1	0	0	0	0	0	0	0	1	13	0	14	16	30	0	0	
	%	1%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	1%	1%	1%	0	0	
	Articulated Trucks	3	0	0	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	3	7	0	0	
	%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0	0	
	Bicycles on Road	1	0	0	0	1	0	0	0	0	0	0	3	1	0	0	1	2	1	0	2	0	0	2	1	5	0	0	
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	50%	0%	0%	100%	67%	100%	0%	0%	0%	0%	0%	0%	0%	0	0	
	Total	1294	0	2	0	1296	766	0	0	0	0	0	410	2	0	0	1	3	1	0	406	766	0	1172	1294	2471			
	PHF	0.93	0	0.5	0	0.93	0.95	0	0	0	0	0	0.92	0.5	0	0	0.25	0.38	0.25	0	0.91	0.95	0	0.94	0.93	0.97			
	Approach %					52%	31%					0%	17%					0%	0%					47%	52%				

Study Name Milton - Route 138 at Canton Avenue and Summit Road TM12 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound				Southwestbound				Westbound				Northbound				Crosswalk											
		T	L	HL	U	I	O	HR	BL	HL	U	I	O	HR	R	L	U	I	O	R	BR	T	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	3	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00 AM - 11:00 AM	Cars	906	0	2	0	908	628	0	0	0	0	0	255	0	0	0	0	0	3	3	253	628	0	884	906	1792	NE	0	0
One Hour Peak	%	87%	0%	100%	0%	87%	92%	0%	0%	0%	0%	0%	94%	0%	0%	0%	0%	0%	43%	50%	94%	92%	0%	92%	87%	89%	0%	0%	0%
10:00 AM - 11:00 AM	Light Goods Vehicles	105	0	0	0	105	26	0	0	0	0	0	10	0	0	0	0	0	0	10	26	0	0	36	105	141	E	13	13
	%	10%	0%	0%	0%	10%	4%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	4%	4%	0%	4%	10%	7%	100%	0%	0%
	Buses	6	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	6	7	S	0	0
	%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
	Single-Unit Trucks	21	0	0	0	21	19	0	0	0	0	0	2	0	0	0	0	0	0	2	19	0	0	21	21	42		13	13
	%	2%	0%	0%	0%	2%	3%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%	2%	2%	2%		0%	0%
	Articulated Trucks	4	0	0	0	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	4	9		0	0
	%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%		0%	0%
	Bicycles on Road	3	1	0	0	4	1	0	0	0	0	0	5	0	0	0	0	0	4	3	5	1	0	9	3	13		0	0
	%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	57%	50%	2%	0%	0%	1%	0%	1%		0%	0%
	Total	1046	1	2	0	1049	682	0	0	0	0	0	272	0	0	0	0	0	7	6	270	682	0	958	1046	2007			
	PHF	0.92	0.25	0.25	0	0.92	0.96	0	0	0	0	0	0.83	0	0	0	0	0	0.44	0.38	0.82	0.96	0	0.91	0.92	0.94			
	Approach %					52%	34%						0%	14%				0%	0%					48%	52%				
Peak 2	Motorcycles	3	0	0	0	3	3	0	0	0	0	0	4	1	0	0	0	1	0	0	3	3	0	6	3	10	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	25%	0%	0%	0%	25%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
2:00 PM - 5:00 PM	Cars	1211	0	3	0	1214	756	0	0	0	0	0	430	2	0	0	0	2	1	1	425	756	0	1182	1211	2398	NE	0	0
One Hour Peak	%	93%	0%	75%	0%	93%	91%	0%	0%	0%	0%	0%	92%	50%	0%	0%	0%	50%	25%	33%	92%	91%	0%	91%	93%	92%	0%	0%	0%
2:00 PM - 3:00 PM	Light Goods Vehicles	63	0	0	0	63	44	0	0	0	0	0	27	0	0	0	0	0	0	0	27	44	0	71	63	134	E	1	1
	%	5%	0%	0%	0%	5%	5%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	6%	5%	0%	5%	5%	5%	100%	0%	0%
	Buses	4	0	1	0	5	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	5	0	5	4	10	S	0	0
	%	0%	0%	25%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
	Single-Unit Trucks	18	0	0	0	18	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	21	18	39		1	1
	%	1%	0%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	2%	1%	1%		0%	0%
	Articulated Trucks	2	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	2	5		0	0
	%	0%	0%	0%	0%	0%	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	1	0	0	0	1	0	7	1	0	0	0	1	3	2	6	1	0	9	0	11		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	100%	1%	25%	0%	0%	25%	75%	67%	1%	0%	0%	1%	0%	0%		0%	0%
	Total	1301	0	4	0	1305	833	0	0	1	0	1	469	4	0	0	0	4	4	3	461	833	0	1297	1301	2607			
	PHF	0.97	0	0.5	0	0.97	0.95	0	0	0.25	0	0.25	0.9	0.33	0	0	0	0.33	0.5	0.38	0.89	0.95	0	0.93	0.97	0.97			
	Approach %					50%	32%						0%	18%				0%	0%					50%	50%				

Study Name Milton - Route 138 at Thacher Montessori School TM13 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound						Northbound						Northeastbound						Eastbound						Crosswalk			
		R	BR	T	U	I	O	T	L	HL	U	I	O	HR	BL	HL	U	I	O	HR	R	L	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00 AM - 9:00 AM	Cars	46	0	910	0	956	802	802	3	0	0	805	919	9	0	0	0	9	0	0	0	0	0	0	49	1770	S	0	0
One Hour Peak	%	100%	0%	85%	0%	85%	84%	84%	100%	0%	0%	84%	85%	100%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%	85%	0%	0%	0%	
7:30 AM - 8:30 AM	Light Goods Vehicles	0	0	97	0	97	99	99	0	0	0	99	97	0	0	0	0	0	0	0	0	0	0	0	0	196	SW	0	0
	%	0%	0%	9%	0%	9%	10%	10%	0%	0%	0%	10%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	0%	
	Buses	0	0	26	0	26	5	5	0	0	0	5	26	0	0	0	0	0	0	0	0	0	0	0	0	31	W	0	0
	%	0%	0%	2%	0%	2%	1%	1%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	
	Single-Unit Trucks	0	0	24	0	24	42	42	0	0	0	42	24	0	0	0	0	0	0	0	0	0	0	0	0	66		0	0
	%	0%	0%	2%	0%	2%	4%	4%	0%	0%	0%	4%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	
	Articulated Trucks	0	0	18	0	18	12	12	0	0	0	12	18	0	0	0	0	0	0	0	0	0	0	0	0	30		0	0
	%	0%	0%	2%	0%	2%	1%	1%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	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	0	0	0		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Total	46	0	1075	0	1121	960	960	3	0	0	963	1084	9	0	0	0	9	0	0	0	0	0	49	2093				
	PHF	0.77	0	0.92	0	0.92	0.98	0.98	0.75	0	0	0.98	0.93	0.56	0	0	0	0.56	0	0	0	0	0	0	0.77	0.97			
	Approach %					54%	46%					46%	52%					0%	0%					0%	2%				
Peak 2	Motorcycles	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	N	0	0	
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00 PM - 6:00 PM	Cars	3	0	1067	0	1070	680	680	0	0	0	680	1086	19	0	0	0	19	0	0	0	0	0	3	1769	S	0	0	
One Hour Peak	%	100%	0%	82%	0%	82%	87%	87%	0%	0%	0%	87%	82%	90%	0%	0%	0%	90%	0%	0%	0%	0%	0%	100%	84%	0%	0%	0%	
3:30 PM - 4:30 PM	Light Goods Vehicles	0	0	191	0	191	74	74	0	0	0	74	193	2	0	0	0	2	0	0	0	0	0	0	267	SW	0	0	
	%	0%	0%	15%	0%	15%	9%	9%	0%	0%	0%	9%	15%	10%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	
	Buses	0	0	11	0	11	7	7	0	0	0	7	11	0	0	0	0	0	0	0	0	0	0	0	18	W	0	0	
	%	0%	0%	1%	0%	1%	1%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	
	Single-Unit Trucks	0	0	24	0	24	15	15	0	0	0	15	24	0	0	0	0	0	0	0	0	0	0	0	39		0	0	
	%	0%	0%	2%	0%	2%	2%	2%	0%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	
	Articulated Trucks	0	0	6	0	6	9	9	0	0	0	9	6	0	0	0	0	0	0	0	0	0	0	0	15		0	0	
	%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	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	0	0	0		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Total	3	0	1299	0	1302	786	786	0	0	0	786	1320	21	0	0	0	21	0	0	0	0	0	3	2109				
	PHF	0.75	0	0.96	0	0.96	0.95	0.95	0	0	0	0.95	0.96	0.75	0	0	0	0.75	0	0	0	0	0	0	0.75	0.96			
	Approach %					62%	37%					37%	63%					1%	0%					0%	0%				

Study Name Milton - Route 138 at Thacher Montessori School TM13 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound					Northbound					Northeastbound					Eastbound					Crosswalk							
		R	BR	T	U	I	O	T	L	HL	U	I	O	HR	BL	HL	U	I	O	HR	R	L	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	0	0	1	0	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
8:00 AM - 11:00 AM	Cars	0	0	907	0	907	570	570	1	0	0	571	908	1	0	0	0	1	0	0	0	0	0	0	1	1479	S	0	0
One Hour Peak	%	0%	0%	87%	0%	87%	83%	83%	100%	0%	0%	83%	87%	100%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%	85%	0%	0%	0	
10:00 AM - 11:00 AM	Light Goods Vehicles	0	0	102	0	102	87	87	0	0	0	87	102	0	0	0	0	0	0	0	0	0	0	0	189	SW	0	0	
	%	0%	0%	10%	0%	10%	13%	13%	0%	0%	0%	13%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0	
	Buses	0	0	5	0	5	4	4	0	0	0	4	5	0	0	0	0	0	0	0	0	0	0	0	9	W	0	0	
	%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0	
	Single-Unit Trucks	0	0	23	0	23	16	16	0	0	0	16	23	0	0	0	0	0	0	0	0	0	0	0	39		0	0	
	%	0%	0%	2%	0%	2%	2%	2%	0%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0	
	Articulated Trucks	0	0	4	0	4	5	5	0	0	0	5	4	0	0	0	0	0	0	0	0	0	0	0	9		0	0	
	%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0	
	Bicycles on Road	0	0	4	0	4	2	2	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	6		0	0	
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0
	Total	0	0	1046	0	1046	685	685	1	0	0	686	1047	1	0	0	0	1	0	0	0	0	0	1	1733				
	PHF	0	0	0.91	0	0.91	0.96	0.96	0.25	0	0	0.96	0.91	0.25	0	0	0	0.25	0	0	0	0	0	0	0.25	0.94			
	Approach %					60%	40%				40%	60%					0%	0%					0%	0%					
Peak 2	Motorcycles	0	0	8	0	8	5	5	0	0	0	5	8	0	0	0	0	0	0	0	0	0	0	0	13	N	0	0	
Specified Period	%	0%	0%	1%	0%	1%	1%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0	
2:00 PM - 5:00 PM	Cars	0	0	1138	0	1138	777	777	5	0	0	782	1143	5	0	0	0	5	0	0	0	0	0	5	1925	S	0	0	
One Hour Peak	%	0%	0%	89%	0%	89%	91%	91%	100%	0%	0%	91%	89%	100%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%	90%	0%	0%	0	
2:45 PM - 3:45 PM	Light Goods Vehicles	0	0	103	0	103	53	53	0	0	0	53	103	0	0	0	0	0	0	0	0	0	0	0	156	SW	0	0	
	%	0%	0%	8%	0%	8%	6%	6%	0%	0%	0%	6%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0	
	Buses	0	0	3	0	3	3	3	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	6	W	0	0	
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0	
	Single-Unit Trucks	0	0	13	0	13	11	11	0	0	0	11	13	0	0	0	0	0	0	0	0	0	0	0	24		0	0	
	%	0%	0%	1%	0%	1%	1%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0	
	Articulated Trucks	0	0	4	0	4	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4		0	0	
	%	0%	0%	0%	0%	0%	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	8	0	8	3	3	0	0	0	3	8	0	0	0	0	0	0	0	0	0	0	0	11		0	0	
	%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0	
	Total	0	0	1277	0	1277	852	852	5	0	0	857	1282	5	0	0	0	5	0	0	0	0	0	5	2139				
	PHF	0	0	0.96	0	0.96	0.94	0.94	0.42	0	0	0.95	0.97	0.42	0	0	0	0.42	0	0	0	0	0	0	0.42	0.96			
	Approach %					60%	40%				40%	60%					0%	0%					0%	0%					

Study Name Milton - Route 138 and Brush Hill Road TM14 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound					Westbound					Northbound					Eastbound					Crosswalk			
		R	T	U	I	O	R	T	L	I	O	T	L	U	I	O	R	L	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
6:00 AM - 9:00 AM	Cars	5	561	0	566	822	13	89	152	254	0	805	0	0	805	973	260	4	0	264	94	1889	E	0	0
One Hour Peak	%	71%	85%	0%	84%	83%	81%	82%	94%	89%	0%	83%	0%	0%	83%	86%	85%	67%	0%	85%	81%	84%		0%	
7:30 AM - 8:30 AM	Light Goods Vehicles	1	44	0	45	105	1	17	8	26	0	102	1	0	103	88	36	2	0	38	19	212	S	0	0
	%	14%	7%	0%	7%	11%	6%	16%	5%	9%	0%	11%	100%	0%	11%	8%	12%	33%	0%	12%	16%	9%		0%	
	Buses	0	17	0	17	5	0	0	0	0	0	5	0	0	5	26	9	0	0	9	0	31	W	0	0
	%	0%	3%	0%	3%	1%	0%	0%	0%	0%	0%	1%	0%	0%	1%	2%	3%	0%	0%	3%	0%	1%		0%	
	Single-Unit Trucks	1	22	0	23	49	2	1	1	4	0	47	0	0	47	24	1	0	0	1	2	75		0	0
	%	14%	3%	0%	3%	5%	13%	1%	1%	1%	0%	5%	0%	0%	5%	2%	0%	0%	0%	0%	2%	3%		0	0
	Articulated Trucks	0	19	0	19	11	0	0	0	0	0	11	0	0	11	19	0	0	0	0	0	30		0	0
	%	0%	3%	0%	3%	1%	0%	0%	0%	0%	0%	1%	0%	0%	1%	2%	0%	0%	0%	0%	0%	1%		0	0
	Bicycles on Road	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1		0	0
	%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%		0	0
	Total	7	663	0	670	992	16	108	161	285	0	970	1	0	971	1130	306	6	0	312	116	2238			
	PHF	0.88	0.93	0	0.94	0.98	0.8	0.9	0.89	0.9	0	0.97	0.25	0	0.96	0.93	0.92	0.5	0	0.92	0.94	0.96			
	Approach %				30%	44%						13%	0%			43%	50%			14%	5%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
3:00 PM - 6:00 PM	Cars	2	587	0	589	720	11	65	117	193	0	694	2	0	696	990	286	15	0	301	69	1779	E	0	0
One Hour Peak	%	100%	77%	0%	77%	88%	92%	89%	85%	87%	0%	88%	100%	0%	88%	78%	78%	94%	0%	79%	90%	82%		0%	
3:00 PM - 4:00 PM	Light Goods Vehicles	0	138	0	138	59	0	6	18	24	0	58	0	0	58	230	74	1	0	75	6	295	S	0	0
	%	0%	18%	0%	18%	7%	0%	8%	13%	11%	0%	7%	0%	0%	7%	18%	20%	6%	0%	20%	8%	14%		0%	
	Buses	0	5	0	5	12	0	1	0	1	0	12	0	0	12	6	1	0	0	1	1	19	W	0	0
	%	0%	1%	0%	1%	1%	0%	1%	0%	0%	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	1%	1%		0%	
	Single-Unit Trucks	0	26	0	26	17	1	1	2	4	0	16	0	0	16	31	3	0	0	3	1	49		0	0
	%	0%	3%	0%	3%	2%	8%	1%	1%	2%	0%	2%	0%	0%	2%	2%	1%	0%	0%	1%	1%	2%		0	0
	Articulated Trucks	0	10	0	10	7	0	0	0	0	0	7	0	0	7	10	0	0	0	0	0	17		0	0
	%	0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	1%		0	0
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0	0
	Total	2	766	0	768	815	12	73	137	222	0	787	2	0	789	1268	365	16	0	381	77	2160			
	PHF	0.5	0.95	0	0.95	0.95	1	0.91	0.93	0.96	0	0.94	0.5	0	0.94	0.96	0.94	0.57	0	0.94	0.92	0.97			
	Approach %				36%	38%						10%	0%			37%	59%			18%	4%				

Study Name Milton - Route 138 and Brush Hill Road TM14 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound					Westbound					Northbound					Eastbound					Crosswalk			
		R	T	U	I	O	R	T	L	I	O	T	L	U	I	O	R	L	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	0	1	0	1	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	2	N	1	1
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%		
8:00 AM - 11:00 AM	Cars	0	543	0	543	579	4	69	123	196	0	567	1	0	568	903	237	8	0	245	70	1552	E	0	0
One Hour Peak	%	0%	87%	0%	87%	84%	100%	88%	88%	88%	0%	84%	50%	0%	84%	87%	86%	89%	0%	87%	88%	86%	0%	0%	0
10:00 AM - 11:00 AM	Light Goods Vehicles	0	55	0	55	84	0	7	14	21	0	83	0	0	83	101	32	1	0	33	7	192	S	0	0
	%	0%	9%	0%	9%	12%	0%	9%	10%	9%	0%	12%	0%	0%	12%	10%	12%	11%	0%	12%	9%	11%	0%	0%	0
	Buses	0	5	0	5	4	0	0	0	0	0	4	0	0	4	5	0	0	0	0	0	9	W	0	0
	%	0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0
	Single-Unit Trucks	0	19	0	19	16	0	1	0	1	0	16	0	0	16	22	3	0	0	3	1	39		1	1
	%	0%	3%	0%	3%	2%	0%	1%	0%	0%	0%	2%	0%	0%	2%	2%	1%	0%	0%	1%	1%	2%			
	Articulated Trucks	0	3	0	3	5	0	0	1	1	0	5	0	0	5	4	0	0	0	0	0	9			
	%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%			
	Bicycles on Road	0	0	0	0	2	0	1	2	3	0	2	1	0	3	4	2	0	0	2	2	8			
	%	0%	0%	0%	0%	0%	0%	1%	1%	1%	0%	0%	50%	0%	0%	0%	1%	0%	0%	1%	3%	0%			
	Total	0	626	0	626	691	4	78	140	222	0	678	2	0	680	1040	274	9	0	283	80	1811			
	PHF	0	0.94	0	0.94	0.95	0.5	0.78	0.88	0.84	0	0.95	0.25	0	0.95	0.92	0.84	0.38	0	0.85	0.8	0.96			
	Approach %				35%	38%				12%	0%				38%	57%				16%	4%				
Peak 2	Motorcycles	0	3	0	3	7	0	1	0	1	0	7	0	0	7	7	4	0	0	4	1	15	N	0	0
Specified Period	%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	1%	0%	0%	1%	1%	1%	0%	0%	1%	1%	1%	0%	0%	0
2:00 PM - 5:00 PM	Cars	4	702	0	706	775	0	108	152	260	0	770	1	0	771	1156	302	5	0	307	113	2044	E	0	0
One Hour Peak	%	80%	91%	0%	91%	90%	0%	90%	88%	89%	0%	90%	100%	0%	90%	91%	92%	100%	0%	92%	90%	91%	0%	0%	0
3:00 PM - 4:00 PM	Light Goods Vehicles	1	54	0	55	58	0	11	18	29	0	58	0	0	58	92	20	0	0	20	12	162	S	0	0
	%	20%	7%	0%	7%	7%	0%	9%	10%	10%	0%	7%	0%	0%	7%	7%	6%	0%	0%	6%	10%	7%	0%	0%	0
	Buses	0	4	0	4	4	0	0	0	0	0	4	0	0	4	4	0	0	0	0	0	8	W	0	0
	%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0
	Single-Unit Trucks	0	7	0	7	12	0	0	1	1	0	12	0	0	12	8	0	0	0	0	0	20		0	0
	%	0%	1%	0%	1%	1%	0%	0%	1%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	1%			
	Articulated Trucks	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2			
	%	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	1	0	1	2	0	0	1	1	0	2	0	0	2	5	3	0	0	3	0	7			
	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%			
	Total	5	773	0	778	858	0	120	172	292	0	853	1	0	854	1274	329	5	0	334	126	2258			
	PHF	0.42	0.96	0	0.95	0.96	0	0.77	0.98	0.88	0	0.96	0.25	0	0.96	0.97	0.87	0.42	0	0.88	0.79	0.95			
	Approach %				34%	38%				13%	0%				38%	56%				15%	6%				

Study Name Milton - Canton Avenue and Brush Hill Road TM15 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound					Northbound					Eastbound		Crosswalk			
		R	T	U	I	O	T	L	U	I	O	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
6:00 AM - 9:00 AM	Cars	122	0	0	122	346	346	134	0	480	0	0	256	602	S	0	0
One Hour Peak	%	92%	0%	0%	92%	88%	88%	86%	0%	88%	0%	0%	89%	88%		0%	
7:30 AM - 8:30 AM	Light Goods Vehicles	10	0	0	10	41	41	17	0	58	0	0	27	68	W	0	0
	%	8%	0%	0%	8%	10%	10%	11%	0%	11%	0%	0%	9%	10%		0%	
	Buses	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Single-Unit Trucks	1	0	0	1	5	5	3	0	8	0	0	4	9			
	%	1%	0%	0%	1%	1%	1%	2%	0%	1%	0%	0%	1%	1%			
	Articulated Trucks	0	0	0	0	1	1	0	0	1	0	0	0	1			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Bicycles on Road	0	0	0	0	0	0	1	0	1	0	0	1	1			
	%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%			
	Total	133	0	0	133	393	393	155	0	548	0	0	288	681			
	PHF	0.85	0	0	0.85	0.86	0.86	0.84	0	0.86	0	0	0.89	0.87			
	Approach %				20%	58%				80%	0%	0%	42%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
3:00 PM - 6:00 PM	Cars	181	0	0	181	305	305	64	0	369	0	0	245	550	S	0	0
One Hour Peak	%	91%	0%	0%	91%	91%	91%	88%	0%	90%	0%	0%	90%	90%		0%	
5:00 PM - 6:00 PM	Light Goods Vehicles	17	0	0	17	24	24	8	0	32	0	0	25	49	W	0	0
	%	9%	0%	0%	9%	7%	7%	11%	0%	8%	0%	0%	9%	8%		0%	
	Buses	0	0	0	0	3	3	1	0	4	0	0	1	4		0	0
	%	0%	0%	0%	0%	1%	1%	1%	0%	1%	0%	0%	0%	1%			
	Single-Unit Trucks	0	0	0	0	1	1	0	0	1	0	0	0	1			
	%	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			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Bicycles on Road	1	0	1	2	4	3	0	0	3	0	0	1	5			
	%	1%	0%	100%	1%	1%	1%	0%	0%	1%	0%	0%	0%	1%			
	Total	199	0	1	200	337	336	73	0	409	0	0	272	609			
	PHF	0.9	0	0.25	0.89	0.86	0.87	0.87	0	0.92	0	0	0.93	0.91			
	Approach %				33%	55%				67%	0%	0%	45%				

Study Name Milton - Canton Avenue and Brush Hill Road TM15 TMC
Start Date Thursday, March 29, 2018 6:00 AM
End Date Saturday, March 31, 2018 5:00 PM
Site Code

Report Summary

Time Period	Class.	Southbound					Northbound					Eastbound		Total	Crosswalk		
		R	T	U	I	O	T	L	U	I	O	I	O		Pedestrians	Total	
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	N	1	1
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		100%	
8:00 AM - 11:00 AM	Cars	118	0	0	118	176	176	82	0	258	0	0	200	376	S	2	2
One Hour Peak	%	89%	0%	0%	89%	89%	89%	92%	0%	90%	0%	0%	90%	90%		100%	
9:45 AM - 10:45 AM	Light Goods Vehicles	11	0	0	11	13	13	6	0	19	0	0	17	30	W	1	1
	%	8%	0%	0%	8%	7%	7%	7%	0%	7%	0%	0%	8%	7%		100%	
	Buses	1	0	0	1	0	0	0	0	0	0	0	1	1		4	4
	%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Single-Unit Trucks	0	0	0	0	1	1	1	0	2	0	0	1	2			
	%	0%	0%	0%	0%	1%	1%	1%	0%	1%	0%	0%	0%	0%			
	Articulated Trucks	1	0	0	1	0	0	0	0	0	0	0	1	1			
	%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Bicycles on Road	2	0	0	2	8	8	0	0	8	0	0	2	10			
	%	2%	0%	0%	2%	4%	4%	0%	0%	3%	0%	0%	1%	2%			
	Total	133	0	0	133	198	198	89	0	287	0	0	222	420			
	PHF	0.85	0	0	0.85	0.88	0.88	0.86	0	0.88	0	0	0.85	0.87			
	Approach %				32%	47%				68%	0%	0%	53%				
Peak 2	Motorcycles	1	0	0	1	6	6	1	0	7	0	0	2	8	N	0	0
Specified Period	%	1%	0%	0%	1%	2%	2%	1%	0%	2%	0%	0%	1%	1%		0%	
2:00 PM - 5:00 PM	Cars	117	0	0	117	252	252	160	0	412	0	0	277	529	S	0	0
One Hour Peak	%	87%	0%	0%	87%	89%	89%	91%	0%	90%	0%	0%	90%	90%		0%	
3:15 PM - 4:15 PM	Light Goods Vehicles	13	0	0	13	16	16	13	0	29	0	0	26	42	W	0	0
	%	10%	0%	0%	10%	6%	6%	7%	0%	6%	0%	0%	8%	7%		0%	
	Buses	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Single-Unit Trucks	2	0	0	2	0	0	0	0	0	0	0	2	2			
	%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%			
	Articulated Trucks	0	0	0	0	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	1	0	0	1	8	8	1	0	9	0	0	2	10			
	%	1%	0%	0%	1%	3%	3%	1%	0%	2%	0%	0%	1%	2%			
	Total	134	0	0	134	282	282	175	0	457	0	0	309	591			
	PHF	0.93	0	0	0.93	0.79	0.79	0.88	0	0.82	0	0	0.92	0.85			
	Approach %				23%	48%				77%	0%	0%	52%				

Study Name Milton - Route 138 and Neponset Valley Parkway TM16 TMC
Start Date Thursday, March 29, 2018 6:00 AM
End Date Saturday, March 31, 2018 5:00 PM
Site Code

Report Summary

Time Period	Class.	Southbound					Northbound					Eastbound					Crosswalk			
		R	T	U	I	O	T	L	U	I	O	R	L	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0
6:00 AM - 9:00 AM	Cars	2	432	0	434	460	458	364	0	822	548	116	2	0	118	366	1374	S	0	0
One Hour Peak	%	67%	88%	0%	88%	84%	84%	83%	0%	83%	83%	69%	50%	0%	69%	82%	83%	0%	0%	0
7:30 AM - 8:30 AM	Light Goods Vehicles	0	33	0	33	51	50	54	0	104	54	21	1	0	22	54	159	W	0	0
	%	0%	7%	0%	7%	9%	9%	12%	0%	11%	8%	13%	25%	0%	13%	12%	10%	0%	0%	0
	Buses	0	5	0	5	3	3	2	0	5	17	12	0	0	12	2	22	0	0	0
	%	0%	1%	0%	1%	1%	1%	0%	0%	1%	3%	7%	0%	0%	7%	0%	1%	0%	0%	0
	Single-Unit Trucks	1	8	0	9	31	30	13	0	43	22	14	1	0	15	14	67			
	%	33%	2%	0%	2%	6%	6%	3%	0%	4%	3%	8%	25%	0%	9%	3%	4%			
	Articulated Trucks	0	14	0	14	4	4	8	0	12	19	5	0	0	5	8	31			
	%	0%	3%	0%	3%	1%	1%	2%	0%	1%	3%	3%	0%	0%	3%	2%	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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	3	492	0	495	549	545	441	0	986	660	168	4	0	172	444	1653			
	PHF	0.38	0.98	0	0.98	0.93	0.93	0.93	0	0.98	0.94	0.86	0.5	0	0.86	0.93	0.98			
	Approach %				30%	33%				60%	40%				10%	27%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0
3:00 PM - 6:00 PM	Cars	3	424	0	427	451	445	258	0	703	583	159	6	0	165	261	1295	S	0	0
One Hour Peak	%	100%	80%	0%	80%	90%	90%	82%	0%	87%	76%	69%	86%	0%	69%	82%	82%	0%	0%	0
3:00 PM - 4:00 PM	Light Goods Vehicles	0	81	0	81	35	35	36	0	71	140	59	0	0	59	36	211	W	0	0
	%	0%	15%	0%	15%	7%	7%	11%	0%	9%	18%	25%	0%	0%	25%	11%	13%	0%	0%	0
	Buses	0	4	0	4	7	6	6	0	12	5	1	1	0	2	6	18	0	0	0
	%	0%	1%	0%	1%	1%	1%	2%	0%	1%	1%	0%	14%	0%	1%	2%	1%	0%	0%	0
	Single-Unit Trucks	0	15	0	15	5	5	11	0	16	26	11	0	0	11	11	42			
	%	0%	3%	0%	3%	1%	1%	4%	0%	2%	3%	5%	0%	0%	5%	3%	3%			
	Articulated Trucks	0	8	0	8	3	3	3	0	6	10	2	0	0	2	3	16			
	%	0%	2%	0%	1%	1%	1%	1%	0%	1%	1%	1%	0%	0%	1%	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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	3	532	0	535	501	494	314	0	808	764	232	7	0	239	317	1582			
	PHF	0.75	0.92	0	0.92	0.97	0.97	0.88	0	0.95	0.93	0.87	0.44	0	0.88	0.88	0.97			
	Approach %				34%	32%				51%	48%				15%	20%				

Study Name Milton - Route 138 and Neponset Valley Parkway TM16 TMC
Start Date Thursday, March 29, 2018 6:00 AM
End Date Saturday, March 31, 2018 5:00 PM
Site Code

Report Summary

Time Period	Class.	Southbound					Northbound					Eastbound					Crosswalk			
		R	T	U	I	O	T	L	U	I	O	R	L	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	0	1	0	1	0	0	1	0	1	1	0	0	0	0	1	2	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00 AM - 11:00 AM	Cars	1	400	0	401	365	364	229	0	593	549	149	1	0	150	230	1144	S	1	1
One Hour Peak	%	50%	89%	0%	89%	89%	89%	78%	0%	85%	87%	81%	100%	0%	81%	78%	86%	100%	100%	100%
10:00 AM - 11:00 AM	Light Goods Vehicles	1	36	0	37	26	26	54	0	80	57	21	0	0	21	55	138	W	1	1
	%	50%	8%	0%	8%	6%	6%	18%	0%	11%	9%	11%	0%	0%	11%	19%	10%	100%	100%	100%
	Buses	0	3	0	3	3	3	0	0	3	5	2	0	0	2	0	8		2	2
	%	0%	1%	0%	1%	1%	1%	0%	0%	0%	1%	1%	0%	0%	1%	0%	1%			
	Single-Unit Trucks	0	7	0	7	11	11	4	0	15	18	11	0	0	11	4	33			
	%	0%	2%	0%	2%	3%	3%	1%	0%	2%	3%	6%	0%	0%	6%	1%	2%			
	Articulated Trucks	0	2	0	2	2	2	3	0	5	3	1	0	0	1	3	8			
	%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	1%	1%	1%			
	Bicycles on Road	0	0	0	0	1	1	1	0	2	0	0	0	0	0	1	2			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	2	449	0	451	408	407	292	0	699	633	184	1	0	185	294	1335			
	PHF	0.25	0.94	0	0.93	0.95	0.96	0.95	0	0.99	0.96	0.82	0.25	0	0.81	0.93	0.98			
	Approach %				34%	31%				52%	47%				14%	22%				
Peak 2	Motorcycles	0	2	0	2	1	1	4	0	5	4	2	0	0	2	4	9	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%	0%	0%	1%	1%	1%	0%	0%	0%
2:00 PM - 5:00 PM	Cars	2	519	0	521	429	427	357	0	784	705	186	2	0	188	359	1493	S	0	0
One Hour Peak	%	100%	90%	0%	90%	93%	93%	90%	0%	91%	89%	86%	100%	0%	86%	90%	90%	0%	0%	0%
2:45 PM - 3:45 PM	Light Goods Vehicles	0	39	0	39	26	26	22	0	48	61	22	0	0	22	22	109	W	0	0
	%	0%	7%	0%	7%	6%	6%	6%	0%	6%	8%	10%	0%	0%	10%	6%	7%	0%	0%	0%
	Buses	0	2	0	2	1	1	2	0	3	3	1	0	0	1	2	6		0	0
	%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%			
	Single-Unit Trucks	0	10	0	10	2	2	10	0	12	13	3	0	0	3	10	25			
	%	0%	2%	0%	2%	0%	0%	3%	0%	1%	2%	1%	0%	0%	1%	3%	2%			
	Articulated Trucks	0	2	0	2	0	0	0	0	0	4	2	0	0	2	0	4			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	1%	0%	0%			
	Bicycles on Road	0	3	0	3	4	4	1	0	5	4	1	0	0	1	1	9			
	%	0%	1%	0%	1%	1%	1%	0%	0%	1%	1%	0%	0%	0%	0%	1%				
	Total	2	577	0	579	463	461	396	0	857	794	217	2	0	219	398	1655			
	PHF	0.5	0.91	0	0.92	0.86	0.87	0.87	0	0.94	0.95	0.9	0.5	0	0.9	0.87	0.97			
	Approach %				35%	28%				52%	48%				13%	24%				

Study Name Milton - Route 138 at Dollar Lane and Milton Street TM17 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk											
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total	Pedestrians	Total							
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00 AM - 9:00 AM	Cars	24	404	0	0	428	488	34	166	23	0	223	107	7	423	9	0	439	439	12	100	31	0	143	199	1233	E	0	0
One Hour Peak	%	86%	88%	0%	0%	88%	82%	92%	89%	92%	0%	90%	88%	88%	80%	82%	0%	81%	89%	100%	88%	91%	0%	90%	88%	86%	0%	0%	0%
7:15 AM - 8:15 AM	Light Goods Vehicles	3	26	1	0	30	64	2	19	2	0	23	10	1	61	2	0	64	28	0	8	1	0	9	24	126	S	0	0
	%	11%	6%	100%	0%	6%	11%	5%	10%	8%	0%	9%	8%	13%	12%	18%	0%	12%	6%	0%	7%	3%	0%	6%	11%	9%	0%	0%	0%
	Buses	0	4	0	0	4	4	0	0	0	0	0	2	0	3	0	0	3	4	0	2	1	0	3	0	10	W	0	0
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	1%	1%	0%	2%	3%	0%	2%	0%	1%	0%	0%	0%
	Single-Unit Trucks	1	9	0	0	10	36	1	2	0	0	3	3	0	34	0	0	34	9	0	3	1	0	4	3	51		0	0
	%	4%	2%	0%	0%	2%	6%	3%	1%	0%	0%	1%	2%	0%	6%	0%	0%	6%	2%	0%	3%	3%	0%	3%	1%	4%		0	0
	Articulated Trucks	0	15	0	0	15	5	0	0	0	0	0	0	0	5	0	0	5	15	0	0	0	0	0	0	20		0	0
	%	0%	3%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	1%		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	0	0	0		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0	0
	Total	28	458	1	0	487	597	37	187	25	0	249	122	8	526	11	0	545	495	12	113	34	0	159	226	1440			
	PHF	0.64	0.96	0.25	0	0.94	0.93	0.77	0.88	0.69	0	0.92	0.87	0.67	0.91	0.46	0	0.91	0.98	0.6	0.88	0.85	0	0.85	0.86	0.97			
	Approach %					34%	41%					17%	8%					38%	34%					11%	16%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	1	1
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0	0
3:00 PM - 6:00 PM	Cars	20	414	5	0	439	476	26	93	9	0	128	120	9	428	15	0	452	437	14	106	22	0	142	128	1161	E	0	0
One Hour Peak	%	80%	81%	63%	0%	81%	90%	96%	82%	82%	0%	84%	90%	90%	90%	88%	0%	90%	82%	93%	91%	79%	0%	89%	82%	86%	0%	0%	0%
3:00 PM - 4:00 PM	Light Goods Vehicles	4	71	3	0	78	35	1	15	1	0	17	12	0	30	2	0	32	73	1	9	4	0	14	21	141	S	0	0
	%	16%	14%	38%	0%	14%	7%	4%	13%	9%	0%	11%	9%	0%	6%	12%	0%	6%	14%	7%	8%	14%	0%	9%	13%	10%	0%	0%	0%
	Buses	1	4	0	0	5	8	0	4	0	0	4	1	1	6	0	0	7	4	0	0	2	0	2	5	18	W	0	0
	%	4%	1%	0%	0%	1%	2%	0%	4%	0%	0%	3%	1%	10%	1%	0%	0%	1%	1%	0%	0%	7%	0%	1%	3%	1%	0%	0%	0%
	Single-Unit Trucks	0	16	0	0	16	6	0	2	0	0	2	1	0	6	0	0	6	16	0	1	0	0	1	2	25		1	1
	%	0%	3%	0%	0%	3%	1%	0%	2%	0%	0%	1%	1%	0%	1%	0%	0%	1%	3%	0%	1%	0%	0%	1%	1%	2%		0	0
	Articulated Trucks	0	5	0	0	5	3	0	0	1	0	1	0	0	3	0	0	3	6	0	0	0	0	0	0	9		0	0
	%	0%	1%	0%	0%	1%	1%	0%	0%	9%	0%	1%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%		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	0	0	0		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0	0
	Total	25	510	8	0	543	528	27	114	11	0	152	134	10	473	17	0	500	536	15	116	28	0	159	156	1354			
	PHF	0.78	0.9	0.33	0	0.94	0.93	0.52	0.89	0.55	0	0.76	0.86	0.83	0.97	0.71	0	0.95	0.92	0.62	0.85	0.7	0	0.92	0.91	0.95			
	Approach %					40%	39%					11%	10%					37%	40%					12%	12%				

Study Name Milton - Route 138 at Dollar Lane and Milton Street TM17 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Saturday, March 31, 2018 5:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk											
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total	Pedestrians	Total							
Peak 1	Motorcycles	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	N	1	1
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%		
8:00 AM - 11:00 AM	Cars	15	378	0	0	393	365	8	63	11	0	82	80	8	336	8	0	352	401	12	72	21	0	105	86	932	E	0	0
One Hour Peak	%	88%	90%	0%	0%	90%	87%	100%	89%	73%	0%	87%	90%	89%	88%	100%	0%	88%	89%	92%	91%	81%	0%	89%	90%	89%	0%		
10:00 AM - 11:00 AM	Light Goods Vehicles	2	32	1	0	35	37	0	7	3	0	10	8	0	33	0	0	33	36	1	7	4	0	12	9	90	S	0	0
	%	12%	8%	100%	0%	8%	9%	0%	10%	20%	0%	11%	9%	0%	9%	0%	0%	8%	8%	8%	9%	15%	0%	10%	9%	9%	0%		
	Buses	0	3	0	0	3	4	0	0	0	0	0	0	0	3	0	0	3	3	0	0	1	0	1	0	7	W	0	0
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	4%	0%	1%	0%	1%	0%		
	Single-Unit Trucks	0	5	0	0	5	9	0	0	1	0	1	1	1	9	0	0	10	6	0	0	0	0	0	0	16		1	1
	%	0%	1%	0%	0%	1%	2%	0%	0%	7%	0%	1%	1%	11%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	2%			
	Articulated Trucks	0	2	0	0	2	2	0	0	0	0	0	0	0	2	0	0	2	2	0	0	0	0	0	0	4			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Bicycles on Road	0	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	1	2			
	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%			
	Total	17	421	1	0	439	418	8	71	15	0	94	89	9	384	8	0	401	449	13	79	26	0	118	96	1052			
	PHF	0.47	0.89	0.25	0	0.9	0.91	1	0.77	0.54	0	0.81	0.72	0.56	0.91	0.67	0	0.93	0.91	0.65	0.66	0.72	0	0.69	0.89	0.97			
	Approach %					42%	40%											38%	43%					11%	9%				
Peak 2	Motorcycles	0	2	0	0	2	2	0	2	0	0	2	0	0	2	0	0	2	2	0	0	0	0	0	2	6	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%		
2:00 PM - 5:00 PM	Cars	24	505	1	0	530	480	17	65	17	0	99	95	9	435	15	0	459	529	7	85	28	0	120	104	1208	E	0	0
One Hour Peak	%	89%	93%	100%	0%	93%	94%	89%	89%	100%	0%	91%	90%	100%	94%	88%	0%	94%	93%	88%	89%	93%	0%	90%	89%	93%	0%		
3:00 PM - 4:00 PM	Light Goods Vehicles	2	27	0	0	29	26	2	6	0	0	8	7	0	22	2	0	24	28	1	7	2	0	10	10	71	S	1	1
	%	7%	5%	0%	0%	5%	5%	11%	8%	0%	0%	7%	7%	0%	5%	12%	0%	5%	5%	13%	7%	7%	0%	7%	9%	5%	100%		
	Buses	0	2	0	0	2	1	0	0	0	0	0	2	0	1	0	0	1	2	0	2	0	0	2	0	5	W	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%	0%	0%		
	Single-Unit Trucks	0	5	0	0	5	2	0	0	0	0	0	2	0	2	0	0	2	5	0	2	0	0	2	0	9		1	1
	%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	1%	0%	2%	0%	0%	1%	0%	1%			
	Articulated Trucks	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1			
	%	0%	0%	0%	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	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	2			
	%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%			
	Total	27	542	1	0	570	512	19	73	17	0	109	106	9	463	17	0	489	567	8	96	30	0	134	117	1302			
	PHF	0.75	0.91	0.25	0	0.93	0.93	0.79	0.96	0.61	0	0.91	0.76	0.56	0.94	0.85	0	0.93	0.89	0.67	0.75	0.83	0	0.84	0.89	0.95			
	Approach %					44%	39%											38%	44%					10%	9%				

Study Name Milton - Route 138 and Blue Jay Way/Curry College TM18 TMC
Start Date Thursday, March 29, 2018 6:00 AM
End Date Thursday, March 29, 2018 6:00 PM
Site Code

Report Summary

Time Period	Class.	Southbound					Northbound					Eastbound					Crosswalk			
		R	T	U	I	O	T	L	U	I	O	R	L	U	I	O	Total	Pedestrians	Total	
Peak 1	Motorcycles	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	N	1	1
Specified Period	%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%			100%	
6:00 AM - 9:00 AM	Cars	58	419	0	477	393	388	126	0	514	431	12	5	0	17	184	1008	S	0	0
One Hour Peak	%	95%	87%	0%	88%	81%	80%	96%	0%	84%	87%	80%	100%	0%	85%	96%	86%		0%	
7:30 AM - 8:30 AM	Light Goods Vehicles	2	32	0	34	54	54	4	0	58	34	2	0	0	2	6	94	W	16	16
	%	3%	7%	0%	6%	11%	11%	3%	0%	9%	7%	13%	0%	0%	10%	3%	8%		100%	
	Buses	0	4	0	4	3	3	0	0	3	4	0	0	0	0	0	7		17	17
	%	0%	1%	0%	1%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%			
	Single-Unit Trucks	0	11	0	11	34	34	1	0	35	12	1	0	0	1	1	47			
	%	0%	2%	0%	2%	7%	7%	1%	0%	6%	2%	7%	0%	0%	5%	1%	4%			
	Articulated Trucks	0	14	0	14	4	4	0	0	4	14	0	0	0	0	0	18			
	%	0%	3%	0%	3%	1%	1%	0%	0%	1%	3%	0%	0%	0%	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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	61	480	0	541	488	483	131	0	614	495	15	5	0	20	192	1175			
	PHF	0.64	0.94	0	0.93	0.91	0.91	0.61	0	0.95	0.95	0.42	0.42	0	0.42	0.62	0.92			
	Approach %				46%	42%				52%	42%				2%	16%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
3:00 PM - 6:00 PM	Cars	23	349	0	372	460	409	71	0	480	441	92	51	0	143	94	995	S	0	0
One Hour Peak	%	96%	80%	0%	81%	89%	88%	95%	0%	89%	82%	91%	94%	0%	92%	95%	86%		0%	
3:00 PM - 4:00 PM	Light Goods Vehicles	1	63	0	64	42	39	3	0	42	72	9	3	0	12	4	118	W	1	1
	%	4%	14%	0%	14%	8%	8%	4%	0%	8%	13%	9%	6%	0%	8%	4%	10%		100%	
	Buses	0	5	0	5	8	8	0	0	8	5	0	0	0	0	0	13		1	1
	%	0%	1%	0%	1%	2%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	1%			
	Single-Unit Trucks	0	15	0	15	4	4	1	0	5	15	0	0	0	0	1	20			
	%	0%	3%	0%	3%	1%	1%	1%	0%	1%	3%	0%	0%	0%	0%	1%	2%			
	Articulated Trucks	0	6	0	6	3	3	0	0	3	6	0	0	0	0	0	9			
	%	0%	1%	0%	1%	1%	1%	0%	0%	1%	1%	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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	24	438	0	462	517	463	75	0	538	539	101	54	0	155	99	1155			
	PHF	0.75	0.89	0	0.88	0.94	0.93	0.78	0	0.91	0.93	0.7	0.68	0	0.69	0.85	0.93			
	Approach %				40%	45%				47%	47%				13%	9%				

Study Name Milton - Route 138 at Bradlee Road and Atherton Street TM19 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Thursday, March 29, 2018 6:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound					Westbound					Northbound					Northeastbound					Eastbound					Crosswalk															
		R	BR	T	L	U	I	O	R	T	BL	L	U	I	O	R	T	L	HL	U	I	O	HR	BR	BL	HL	U	I	O	HR	R	T	L	U	I	O	Total	Pedestrians	Total			
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
6:00 AM - 9:00 AM	Cars	2	0	403	3	0	408	412	27	41	0	38	0	106	34	6	381	23	0	0	410	469	1	2	0	0	0	3	0	0	27	23	4	0	54	66	981	E	0	0		
One Hour Peak	%	100%	0%	90%	100%	0%	90%	81%	96%	89%	0%	90%	0%	91%	92%	86%	80%	79%	0%	0%	80%	89%	100%	100%	0%	0%	0%	100%	0%	0%	84%	52%	57%	0%	84%	86%	85%	0%	0%	0%		
7:15 AM - 8:15 AM	Light Goods Vehicles	0	0	20	0	0	20	56	1	5	1	4	0	11	1	0	53	4	1	0	58	28	0	0	0	0	0	0	2	0	4	1	2	0	7	9	96	S	0	0		
	%	0%	0%	4%	0%	0%	4%	11%	4%	11%	100%	10%	0%	9%	3%	0%	11%	14%	100%	0%	11%	5%	0%	0%	0%	0%	0%	0%	100%	0%	13%	4%	29%	0%	11%	12%	8%	0%	0%	0%		
	Buses	0	0	3	0	0	3	3	0	0	0	0	0	0	1	0	3	1	0	0	4	4	0	0	0	0	0	0	0	0	1	1	0	0	2	1	9	SW	1	1		
	%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	3%	0%	1%	3%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	3%	4%	0%	0%	3%	1%	1%	100%	0%	0%			
	Single-Unit Trucks	0	0	10	0	0	10	31	0	0	0	0	0	0	1	1	31	1	0	0	33	10	0	0	0	0	0	0	0	0	0	0	0	0	0	1	43	W	1	1		
	%	0%	0%	2%	0%	0%	2%	6%	0%	0%	0%	0%	0%	3%	14%	7%	3%	0%	0%	6%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	100%	0%	0%			
	Articulated Trucks	0	0	14	0	0	14	6	0	0	0	0	0	0	0	0	6	0	0	0	6	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20		2	2		
	%	0%	0%	3%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%		0%	0%			
	Bicycles on Road	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1		0	0		
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	2%	0%	0%		0%	0%				
	Total	2	0	450	3	0	455	509	28	46	1	42	0	117	37	7	474	29	1	0	511	525	1	2	0	0	0	3	2	0	32	25	7	0	64	77	1150					
	PHF	0.25	0	0.95	0.38	0	0.96	0.96	0.58	0.77	0.25	0.95	0	0.98	0.71	0.44	0.96	0.72	0.25	0	0.96	0.94	0.25	0.25	0	0	0	0.38	0.5	0	0.67	0.69	0.58	0	0.67	0.77	0.96					
	Approach %						40%	44%						10%	3%						44%	46%						0%	0%						6%	7%						
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0				
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
3:00 PM - 6:00 PM	Cars	4	0	323	6	0	333	413	10	33	2	24	0	69	64	29	396	31	1	0	457	361	0	1	2	0	0	3	3	0	14	28	5	0	47	68	909	E	0	0		
One Hour Peak	%	67%	0%	78%	86%	0%	78%	90%	91%	77%	100%	92%	0%	84%	85%	85%	90%	91%	50%	0%	89%	79%	0%	50%	100%	0%	0%	75%	75%	0%	82%	88%	83%	0%	85%	82%	84%	0%	0%	0%		
3:00 PM - 4:00 PM	Light Goods Vehicles	2	0	65	0	0	67	33	1	8	0	2	0	11	7	4	31	3	1	0	39	70	0	1	0	0	0	1	1	0	3	2	1	0	6	13	124	S	0	0		
	%	33%	0%	16%	0%	0%	16%	7%	9%	19%	0%	8%	0%	13%	9%	12%	7%	9%	50%	0%	8%	15%	0%	50%	0%	0%	0%	25%	25%	0%	18%	6%	17%	0%	11%	16%	12%	0%	0%	0%		
	Buses	0	0	5	0	0	5	7	0	1	0	0	0	1	2	1	7	0	0	0	8	5	0	0	0	0	0	0	0	0	0	1	0	0	1	1	15	SW	0	0		
	%	0%	0%	1%	0%	0%	1%	2%	0%	2%	0%	0%	0%	1%	3%	3%	2%	0%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	1%	1%	0%	0%	0%		
	Single-Unit Trucks	0	0	13	1	0	14	4	0	1	0	0	0	1	2	0	4	0	0	0	4	13	0	0	0	0	0	0	0	0	0	1	0	0	1	1	20	W	1	1		
	%	0%	0%	3%	14%	0%	3%	1%	0%	2%	0%	0%	0%	1%	3%	0%	1%	0%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	1%	2%	100%	0%	0%		
	Articulated Trucks	0	0	6	0	0	6	3	0	0	0	0	0	0	0	0	3	0	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9		1	1		
	%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%		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	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0		
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	0%		
	Total	6	0	412	7	0	425	460	11	43	2	26	0	82	75	34	441	34	2	0	511	455	0	2	2	0	0	4	4	0	17	32	6	0	55	83	1077					
	PHF	0.75	0	0.87	0.44	0	0.87	0.96	0.69	0.83	0.5	0.81	0	0.89	0.78	0.77	0.95	0.71	0.5	0	0.95	0.87	0	0.25	0.5	0	0	0.5	0.5	0	0.71	0.89	0.5	0	0.92	0.83	0.93					
	Approach %						39%	43%						8%	7%						47%	42%						0%	0%						5%	8%						

Study Name Milton - Route 138 and Robbins Street TM20 TMC
Start Date Thursday, March 29, 2018 6:00 AM
End Date Thursday, March 29, 2018 6:00 PM
Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk											
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total	Pedestrians	Total							
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0	
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
6:00 AM - 9:00 AM	Cars	7	415	0	0	422	426	12	26	25	0	63	23	10	404	3	1	418	444	3	13	10	0	26	36	929	E	0	0
One Hour Peak	%	100%	88%	0%	0%	89%	83%	80%	90%	81%	0%	84%	88%	83%	83%	75%	100%	83%	88%	100%	93%	100%	0%	96%	90%	86%	0%	0%	
7:30 AM - 8:30 AM	Light Goods Vehicles	0	22	0	0	22	44	1	3	5	0	9	2	1	43	1	0	45	27	0	1	0	0	1	4	77	S	0	0
	%	0%	5%	0%	0%	5%	9%	7%	10%	16%	0%	12%	8%	8%	9%	25%	0%	9%	5%	0%	7%	0%	0%	4%	10%	7%	0%	0%	
	Buses	0	6	0	0	6	4	0	0	0	0	0	1	1	4	0	0	5	6	0	0	0	0	0	0	11	W	0	0
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	4%	8%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	
	Single-Unit Trucks	0	12	0	0	12	32	2	0	1	0	3	0	0	30	0	0	30	13	0	0	0	0	0	0	45	0	0	
	%	0%	3%	0%	0%	3%	6%	13%	0%	3%	0%	4%	0%	0%	6%	0%	0%	6%	3%	0%	0%	0%	0%	0%	0%	4%	0%	0%	
	Articulated Trucks	0	14	0	0	14	4	0	0	0	0	0	0	0	4	0	0	4	14	0	0	0	0	0	0	18	0	0	
	%	0%	3%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	2%	0%	0%	
	Bicycles on Road	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Total	7	469	0	0	476	511	15	29	31	0	75	26	12	486	4	1	503	504	3	14	10	0	27	40	1081			
	PHF	0.44	0.95	0	0	0.96	0.9	0.62	0.72	0.78	0	0.82	0.54	0.5	0.91	0.5	0.25	0.9	0.94	0.38	0.58	0.5	0	0.56	0.91	0.92			
	Approach %					44%	47%					7%	2%				47%	47%					2%	4%					
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00 PM - 6:00 PM	Cars	9	328	3	0	340	418	4	31	6	0	41	50	16	409	0	0	425	337	3	31	5	0	39	40	845	E	1	1
One Hour Peak	%	100%	81%	60%	0%	81%	90%	80%	86%	86%	0%	85%	88%	89%	90%	0%	0%	90%	81%	100%	91%	100%	0%	93%	89%	86%	100%	0%	
3:00 PM - 4:00 PM	Light Goods Vehicles	0	56	2	0	58	31	1	4	1	0	6	6	2	30	0	0	32	57	0	2	0	0	2	4	98	S	0	0
	%	0%	14%	40%	0%	14%	7%	20%	11%	14%	0%	13%	11%	11%	7%	0%	0%	7%	14%	0%	6%	0%	0%	5%	9%	10%	0%	0%	
	Buses	0	5	0	0	5	7	0	0	0	0	0	0	0	7	0	0	7	5	0	0	0	0	0	0	12	W	2	2
	%	0%	1%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	100%	0%	
	Single-Unit Trucks	0	10	0	0	10	4	0	1	0	0	1	1	0	4	0	0	4	10	0	1	0	0	1	1	16	3	3	
	%	0%	2%	0%	0%	2%	1%	0%	3%	0%	0%	2%	2%	0%	1%	0%	0%	1%	2%	0%	3%	0%	0%	2%	2%	2%	0%	0%	
	Articulated Trucks	0	7	0	0	7	3	0	0	0	0	0	0	0	3	0	0	3	7	0	0	0	0	0	0	10	0	0	
	%	0%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%	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	0	0	0	0	0	
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Total	9	406	5	0	420	463	5	36	7	0	48	57	18	453	0	0	471	416	3	34	5	0	42	45	981			
	PHF	0.56	0.85	0.42	0	0.88	0.96	0.42	0.9	0.44	0	0.86	0.71	0.75	0.95	0	0	0.95	0.87	0.38	0.77	0.31	0	0.88	0.87	0.93			
	Approach %					43%	47%					5%	6%				48%	42%					4%	5%					

Study Name Milton - Route 138 at Blue Hill Terrace Street and Cheever Street TM21 TMC
Start Date Thursday, March 29, 2018 6:00 AM
End Date Thursday, March 29, 2018 6:00 PM
Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk											
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	Total	Pedestrians	Total			
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	1	1		
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%			
6:00 AM - 9:00 AM	Cars	7	356	10	0	373	453	14	33	97	0	144	70	46	437	1	0	484	456	3	14	2	0	19	41	1020	E	4	4
One Hour Peak	%	100%	87%	100%	0%	88%	83%	100%	94%	94%	0%	95%	91%	94%	83%	100%	0%	84%	89%	100%	78%	100%	0%	83%	95%	87%	100%		
7:15 AM - 8:15 AM	Light Goods Vehicles	0	23	0	0	23	53	0	2	4	0	6	7	3	53	0	0	56	27	0	4	0	0	4	2	89	S	1	1
	%	0%	6%	0%	0%	5%	10%	0%	6%	4%	0%	4%	9%	6%	10%	0%	0%	10%	5%	0%	22%	0%	0%	17%	5%	8%	100%		
	Buses	0	4	0	0	4	4	0	0	2	0	2	0	0	4	0	0	4	6	0	0	0	0	0	0	10	W	0	0
	%	0%	1%	0%	0%	1%	1%	0%	0%	2%	0%	1%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%		
	Single-Unit Trucks	0	9	0	0	9	29	0	0	0	0	0	0	0	29	0	0	29	9	0	0	0	0	0	0	38		6	6
	%	0%	2%	0%	0%	2%	5%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	5%	2%	0%	0%	0%	0%	0%	0%	3%			
	Articulated Trucks	0	15	0	0	15	5	0	0	0	0	0	0	0	5	0	0	5	15	0	0	0	0	0	0	20			
	%	0%	4%	0%	0%	4%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	2%			
	Bicycles on Road	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
	Total	7	407	10	0	424	545	14	35	103	0	152	77	49	529	1	0	579	513	3	18	2	0	23	43	1178			
	PHF	0.35	0.86	0.62	0	0.86	0.86	0.44	0.62	0.76	0	0.75	0.62	0.68	0.86	0.25	0	0.84	0.84	0.38	0.41	0.5	0	0.48	0.67	0.82			
	Approach %					36%	46%					13%	7%				49%	44%					2%	4%					
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	6	6	
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%		
3:00 PM - 6:00 PM	Cars	6	330	16	1	353	414	14	8	31	0	53	58	37	397	3	0	437	363	2	5	2	0	9	17	852	E	5	5
One Hour Peak	%	86%	79%	94%	100%	80%	89%	88%	89%	91%	0%	90%	84%	80%	89%	100%	0%	88%	80%	67%	83%	67%	0%	75%	89%	85%	100%		
3:00 PM - 4:00 PM	Light Goods Vehicles	1	61	1	0	63	36	1	1	0	0	2	9	7	34	0	0	41	61	0	1	1	0	2	2	108	S	1	1
	%	14%	15%	6%	0%	14%	8%	6%	11%	0%	0%	3%	13%	15%	8%	0%	0%	8%	13%	0%	17%	33%	0%	17%	11%	11%	100%		
	Buses	0	6	0	0	6	7	0	0	2	0	2	2	2	7	0	0	9	8	0	0	0	0	0	0	17	W	3	3
	%	0%	1%	0%	0%	1%	2%	0%	0%	6%	0%	3%	3%	4%	2%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	2%	100%		
	Single-Unit Trucks	0	15	0	0	15	4	0	0	1	0	1	0	0	4	0	0	4	17	1	0	0	0	1	0	21		15	15
	%	0%	4%	0%	0%	3%	1%	0%	0%	3%	0%	2%	0%	0%	1%	0%	0%	1%	4%	33%	0%	0%	0%	8%	0%	2%			
	Articulated Trucks	0	6	0	0	6	4	1	0	0	0	1	0	0	3	0	0	3	6	0	0	0	0	0	0	10			
	%	0%	1%	0%	0%	1%	1%	6%	0%	0%	0%	2%	0%	0%	1%	0%	0%	1%	1%	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	0	0	0			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
	Total	7	418	17	1	443	465	16	9	34	0	59	69	46	445	3	0	494	455	3	6	3	0	12	19	1008			
	PHF	0.58	0.88	0.61	0.25	0.88	0.91	0.67	0.75	0.71	0	0.74	0.64	0.64	0.93	0.38	0	0.91	0.86	0.38	0.5	0.38	0	0.6	0.79	0.94			
	Approach %					44%	46%					6%	7%				49%	45%					1%	2%					

Study Name Milton - Route 138 at Aberdeen Road and Concord Baptist Church TM22 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Sunday, April 01, 2018 12:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk											
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total	Pedestrians	Total							
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	3	3		
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	3	
6:00 AM - 9:00 AM	Cars	32	361	1	0	394	460	0	0	0	0	0	3	2	451	2	1	456	367	5	0	9	0	14	34	864	E	3	3
One Hour Peak	%	94%	88%	100%	0%	88%	82%	0%	0%	0%	0%	0%	100%	100%	82%	100%	100%	82%	88%	100%	0%	100%	0%	100%	94%	85%	100%	3	
7:15 AM - 8:15 AM	Light Goods Vehicles	2	21	0	0	23	60	0	0	0	0	0	0	0	60	0	0	60	21	0	0	0	0	0	2	83	S	2	2
	%	6%	5%	0%	0%	5%	11%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	11%	5%	0%	0%	0%	0%	0%	6%	8%	100%	2	
	Buses	0	4	0	1	5	5	0	0	0	0	0	0	0	4	0	0	4	4	0	0	0	0	0	0	9	W	2	2
	%	0%	1%	0%	100%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	100%	2	
	Single-Unit Trucks	0	10	0	0	10	28	0	0	0	0	0	0	0	28	0	0	28	10	0	0	0	0	0	0	38		10	10
	%	0%	2%	0%	0%	2%	5%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	5%	2%	0%	0%	0%	0%	0%	0%	4%		10	10
	Articulated Trucks	0	14	0	0	14	4	0	0	0	0	0	0	0	4	0	0	4	14	0	0	0	0	0	0	18		0	0
	%	0%	3%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	2%		0	0
	Bicycles on Road	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0	0
	Total	34	410	1	1	446	558	0	0	0	0	0	3	2	548	2	1	553	416	5	0	9	0	14	36	1013			
	PHF	0.65	0.91	0.25	0.25	0.88	0.87	0	0	0	0	0	0.38	0.5	0.86	0.5	0.25	0.86	0.9	0.62	0	0.45	0	0.58	0.69	0.88			
	Approach %					44%	55%						0%	0%			55%	41%					1%	4%					
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	3	3
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	3	
3:00 PM - 6:00 PM	Cars	14	359	4	0	377	420	1	0	1	0	2	5	1	411	4	0	416	362	2	0	8	0	10	18	805	E	11	11
One Hour Peak	%	93%	81%	80%	0%	81%	89%	100%	0%	100%	0%	100%	83%	100%	89%	100%	0%	89%	81%	67%	0%	89%	0%	77%	90%	85%	100%	11	
3:00 PM - 4:00 PM	Light Goods Vehicles	1	60	1	0	62	34	0	0	0	0	0	1	0	34	0	0	34	61	1	0	0	1	2	2	98	S	3	3
	%	7%	14%	20%	0%	13%	7%	0%	0%	0%	0%	0%	17%	0%	7%	0%	0%	7%	14%	33%	0%	0%	100%	15%	10%	10%	100%	3	
	Buses	0	6	0	0	6	7	0	0	0	0	0	0	0	7	0	0	7	6	0	0	0	0	0	0	13	W	5	5
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	1%	100%	5	
	Single-Unit Trucks	0	12	0	0	12	5	0	0	0	0	0	0	0	4	0	0	4	12	0	0	1	0	1	0	17		22	22
	%	0%	3%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	3%	0%	0%	11%	0%	8%	0%	2%		22	22
	Articulated Trucks	0	6	0	0	6	4	0	0	0	0	0	0	0	4	0	0	4	6	0	0	0	0	0	0	10		0	0
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%		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	0	0	0		0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0	0
	Total	15	443	5	0	463	470	1	0	1	0	2	6	1	460	4	0	465	447	3	0	9	1	13	20	943			
	PHF	0.62	0.89	0.62	0	0.9	0.92	0.25	0	0.25	0	0.25	0.5	0.25	0.92	0.5	0	0.92	0.89	0.75	0	0.75	0.25	0.81	0.62	0.92			
	Approach %					49%	50%						0%	1%			49%	47%					1%	2%					

Study Name Milton - Route 138 at Aberdeen Road and Concord Baptist Church TM22 TMC
 Start Date Thursday, March 29, 2018 6:00 AM
 End Date Sunday, April 01, 2018 12:00 PM
 Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk											
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total	Pedestrians	Total							
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	16	16		
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%			
8:00 AM - 12:00 PM	Cars	28	305	66	4	403	365	0	0	0	0	0	80	14	357	7	1	379	309	3	0	4	0	7	35	789	E	91	91
One Hour Peak	%	97%	95%	100%	100%	96%	94%	0%	0%	0%	0%	0%	100%	100%	94%	100%	100%	94%	95%	100%	0%	100%	0%	100%	97%	95%	100%		
9:15 AM - 10:15 AM	Light Goods Vehicles	1	10	0	0	11	20	0	0	0	0	0	0	0	20	0	0	20	10	0	0	0	0	0	1	31	S	54	54
	%	3%	3%	0%	0%	3%	5%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	5%	3%	0%	0%	0%	0%	0%	3%	4%	100%		
	Buses	0	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	2	W	6	6
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%		
	Single-Unit Trucks	0	4	0	0	4	2	0	0	0	0	0	0	0	2	0	0	2	4	0	0	0	0	0	0	6		167	167
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%			
	Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	%	0%	0%	0%	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	0	0	0			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	29	320	66	4	419	388	0	0	0	0	0	80	14	380	7	1	402	324	3	0	4	0	7	36	828			
	PHF	0.66	0.89	0.49	0.5	0.88	0.77	0	0	0	0	0	0.47	0.39	0.77	0.58	0.25	0.8	0.89	0.38	0	0.33	0	0.44	0.64	0.93			
	Approach %					51%	47%						0%	10%				49%	39%					1%	4%				

Study Name Milton - Route 138 and Oak Street TM23 TMC
Start Date Thursday, March 29, 2018 6:00 AM
End Date Thursday, March 29, 2018 6:00 PM
Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Crosswalk											
		R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total	Pedestrians	Total							
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	7	7		
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%			
6:00 AM - 9:00 AM	Cars	1	337	8	0	346	446	7	6	3	0	16	46	32	437	2	0	471	342	2	6	2	0	10	9	843	E	16	16
One Hour Peak	%	100%	85%	80%	0%	85%	82%	100%	100%	75%	0%	94%	94%	97%	82%	67%	0%	82%	85%	100%	100%	100%	0%	100%	90%	84%	100%		
7:30 AM - 8:30 AM	Light Goods Vehicles	0	25	2	0	27	61	0	0	0	0	3	1	61	1	0	63	25	0	0	0	0	0	1	90	S	0	0	
	%	0%	6%	20%	0%	7%	11%	0%	0%	0%	0%	6%	3%	11%	33%	0%	11%	6%	0%	0%	0%	0%	0%	10%	9%	0%			
	Buses	0	6	0	0	6	4	0	0	0	0	0	0	4	0	0	4	6	0	0	0	0	0	0	10	W	1	1	
	%	0%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	100%			
	Single-Unit Trucks	0	14	0	0	14	29	0	0	1	0	1	0	0	29	0	0	29	15	0	0	0	0	0	0	44		24	24
	%	0%	4%	0%	0%	3%	5%	0%	0%	25%	0%	6%	0%	0%	5%	0%	0%	5%	4%	0%	0%	0%	0%	0%	4%	4%			
	Articulated Trucks	0	13	0	0	13	4	0	0	0	0	0	0	4	0	0	4	13	0	0	0	0	0	0	0	17			
	%	0%	3%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	2%	2%			
	Bicycles on Road	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
	Total	1	395	10	0	406	545	7	6	4	0	17	49	33	536	3	0	572	401	2	6	2	0	10	10	1005			
	PHF	0.25	0.94	0.62	0	0.93	0.84	0.58	0.38	0.5	0	0.47	0.64	0.59	0.84	0.38	0	0.85	0.94	0.5	0.38	0.5	0	0.5	0.5	0.87			
	Approach %					40%	54%											57%	40%					1%	1%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	66	66	
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%		
3:00 PM - 6:00 PM	Cars	1	361	7	1	370	424	5	1	3	0	9	19	9	415	10	0	434	372	8	3	3	0	14	12	827	E	66	66
One Hour Peak	%	100%	82%	100%	100%	83%	90%	100%	100%	100%	0%	100%	100%	100%	90%	91%	0%	90%	82%	73%	100%	100%	0%	82%	92%	86%	100%		
3:00 PM - 4:00 PM	Light Goods Vehicles	0	56	0	0	56	31	0	0	0	0	0	0	31	1	0	32	58	2	0	0	0	2	1	90	S	0	0	
	%	0%	13%	0%	0%	13%	7%	0%	0%	0%	0%	0%	0%	7%	9%	0%	7%	13%	18%	0%	0%	0%	12%	8%	9%	0%			
	Buses	0	3	0	0	3	7	0	0	0	0	0	0	7	0	0	7	4	1	0	0	0	1	0	11	W	23	23	
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	1%	9%	0%	0%	0%	6%	0%	1%	100%			
	Single-Unit Trucks	0	13	0	0	13	5	0	0	0	0	0	0	5	0	0	5	13	0	0	0	0	0	0	0	18		155	155
	%	0%	3%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	2%	2%			
	Articulated Trucks	0	6	0	0	6	4	0	0	0	0	0	0	4	0	0	4	6	0	0	0	0	0	0	0	10			
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	1%		
	Bicycles on Road	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
	Total	1	439	7	1	448	472	5	1	3	0	9	19	9	463	11	0	483	453	11	3	3	0	17	13	957			
	PHF	0.25	0.81	0.44	0.25	0.8	0.89	0.62	0.25	0.25	0	0.38	0.79	0.56	0.89	0.69	0	0.89	0.83	0.55	0.75	0.75	0	0.71	0.81	0.97			
	Approach %					47%	49%											50%	47%					2%	1%				

Study Name Milton - Route 138 and Brook Road TM24 TMC
Start Date Thursday, March 29, 2018 6:00 AM
End Date Thursday, March 29, 2018 6:00 PM
Site Code

Report Summary

Time Period	Class.	Southbound				Westbound				Northbound				Eastbound				Total	Crosswalk						
		R	T	L	U	I	O	I	O	R	T	L	U	I	O	R	T		L	U	I	O	Pedestrians	Total	
Peak 1	Motorcycles	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	1	N	1	1
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%		100%	
6:00 AM - 9:00 AM	Cars	17	345	9	0	371	407	0	219	40	402	4	0	446	349	4	170	5	0	179	21	996	E	7	7
One Hour Peak	%	89%	85%	100%	0%	86%	81%	0%	91%	85%	81%	80%	0%	82%	86%	100%	92%	63%	0%	91%	88%	85%		100%	
7:30 AM - 8:30 AM	Light Goods Vehicles	2	26	0	0	28	60	0	14	3	58	0	0	61	26	0	11	2	0	13	2	102	S	1	1
	%	11%	6%	0%	0%	6%	12%	0%	6%	6%	12%	0%	0%	11%	6%	0%	6%	25%	0%	7%	8%	9%		100%	
	Buses	0	6	0	0	6	3	0	0	0	3	0	0	3	6	0	0	0	0	0	0	9	W	1	1
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%		100%	
	Single-Unit Trucks	0	14	0	0	14	28	0	5	4	27	1	0	32	14	0	1	1	0	2	1	48		10	10
	%	0%	3%	0%	0%	3%	6%	0%	2%	9%	5%	20%	0%	6%	3%	0%	1%	13%	0%	1%	4%	4%			
	Articulated Trucks	0	13	0	0	13	4	0	1	0	4	0	0	4	13	0	1	0	0	1	0	18			
	%	0%	3%	0%	0%	3%	1%	0%	0%	0%	1%	0%	0%	1%	3%	0%	1%	0%	0%	1%	0%	2%			
	Bicycles on Road	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	0	2			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%			
	Total	19	404	9	0	432	503	0	241	47	495	5	0	547	408	4	185	8	0	197	24	1176			
	PHF	0.59	0.93	0.45	0	0.91	0.91	0	0.84	0.65	0.9	0.42	0	0.88	0.92	0.5	0.94	0.67	0	0.93	0.75	0.9			
	Approach %					37%	43%	0%	20%					47%	35%					17%	2%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	2	2
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		100%	
3:00 PM - 6:00 PM	Cars	33	379	14	0	426	378	0	232	39	373	6	0	418	383	4	179	5	0	188	39	1032	E	2	2
One Hour Peak	%	92%	87%	100%	0%	88%	94%	0%	91%	87%	94%	100%	0%	94%	87%	80%	92%	100%	0%	92%	93%	91%		100%	
4:45 PM - 5:45 PM	Light Goods Vehicles	3	38	0	0	41	19	0	16	5	19	0	0	24	39	1	11	0	0	12	3	77	S	4	4
	%	8%	9%	0%	0%	8%	5%	0%	6%	11%	5%	0%	0%	5%	9%	20%	6%	0%	0%	6%	7%	7%		100%	
	Buses	0	7	0	0	7	2	0	1	1	2	0	0	3	7	0	0	0	0	0	0	10	W	3	3
	%	0%	2%	0%	0%	1%	0%	0%	0%	2%	1%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%		100%	
	Single-Unit Trucks	0	8	0	0	8	1	0	4	0	1	0	0	1	8	0	4	0	0	4	0	13		11	11
	%	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	2%	0%	2%	0%	0%	2%	0%	1%			
	Articulated Trucks	0	2	0	0	2	1	0	0	0	1	0	0	1	2	0	0	0	0	0	0	3			
	%	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	1	0	0	0	0	0	0	0	1	0	0	1	0	1			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%			
	Total	36	434	14	0	484	401	0	254	45	396	6	0	447	439	5	195	5	0	205	42	1136			
	PHF	0.75	0.94	0.58	0	0.93	0.93	0	0.93	0.75	0.92	0.5	0	0.9	0.94	0.42	0.9	0.42	0	0.88	0.7	0.96			
	Approach %					43%	35%	0%	22%					39%	39%					18%	4%				

Part 2: Automatic Traffic Recorder (ATR) Data

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 1 NB

Site Reference: 180060000594
 Site ID: 000000000101
 Location: RTE.138 NO.OF PARK AND RIDE LOT
 Direction: NORTH

File: SPD6687_NB.prn
 City: CANTON
 County: SPEED NB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	231		197	235	220	220	244	430	259	1557
02:00	124		114	110	148	124	162	269	154	927
03:00	85		63	71	79	74	140	219	109	657
04:00	98		72	75	92	84	128	61	87	526
05:00	245		269	269	235	254	114	126	209	1258
06:00	713		670	618	518	629	223	173	485	2915
07:00	815		940	772	592	779	404	320	640	3843
08:00	860		1058	760	602	820	478	388	691	4146
09:00	759		1039	650	617	766	611	493	694	4169
10:00	715		771	620	576	670	602	585	644	3869
11:00	620	666	597	565	581	605	577	546	593	4152
12:00	495	569	515	563	595	547	616	505	551	3858
13:00	510	581	524	645	746	601	788	608	628	4402
14:00	581	577	523	605	802	617	984	817	698	4889
15:00	588	652	592	594	936	672	894	806	723	5062
16:00	667	754	658	631	981	738	873	706	752	5270
17:00	540	659	503	620	926	649	779	520	649	4547
18:00	418	608	546	534	890	599	750	503	607	4249
19:00	446	764	523	640	920	658	845	722	694	4860
20:00	468	552	537	514	763	566	612	775	603	4221
21:00	528	555	568	579	682	582	586	679	596	4177
22:00	497	523	540	504	664	545	631	592	564	3951
23:00	353	480	456	432	553	454	562	512	478	3348
24:00	250	316	339	373	410	337	517	391	370	2596
TOTALS	11606	8256	12614	11979	14128	12590	13120	11746	12478	83449
% AVG WKDY	92.1	65.5	100.1	95.1	112.2		104.2	93.2		
% AVG WEEK	93	66.1	101	96	113.2		105.1	94.1		
AM Times	08:00	11:00	08:00	07:00	09:00	08:00	12:00	10:00	09:00	
AM Peaks	860	666	1058	772	617	820	616	585	694	
PM Times	16:00	19:00	16:00	13:00	16:00	16:00	14:00	14:00	16:00	
PM Peaks	667	764	658	645	981	738	984	817	752	

U2
 AWD 27291
 FAC .97(.95)
 ADT 25,100

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 1 SB

Site Reference: 180060000153
 Site ID: 000000000102
 Location: RTE.138 NO.OF PARK AND RIDE LOT
 Direction: SOUTH

File: SPD6687_SB.prn
 City: CANTON
 County: SPEED SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	241		160	203	226	207	285	352	244	1467
02:00	120		85	85	122	103	208	258	146	878
03:00	106		53	50	96	76	120	214	106	639
04:00	101		68	66	76	77	113	161	97	585
05:00	150		118	132	143	135	110	98	125	751
06:00	382		347	314	306	337	170	122	273	1641
07:00	557		598	565	494	553	338	224	462	2776
08:00	719		917	822	740	799	556	359	685	4113
09:00	779		830	874	833	829	672	460	741	4448
10:00	663		754	681	791	722	819	584	715	4292
11:00	653	675	720	705	770	704	807	695	717	5025
12:00	653	715	753	699	759	715	828	724	733	5131
13:00	670	693	742	790	920	763	960	783	794	5558
14:00	747	770	790	798	971	815	964	777	831	5817
15:00	762	918	899	913	1016	901	937	780	889	6225
16:00	814	1014	1005	1074	1074	996	987	749	959	6717
17:00	772	970	946	1043	1101	966	786	741	908	6359
18:00	772	1009	1033	1065	1073	990	776	769	928	6497
19:00	764	1072	1112	1017	984	989	807	756	930	6512
20:00	708	881	909	1004	892	878	758	772	846	5924
21:00	596	726	747	725	730	704	680	738	706	4942
22:00	534	618	642	622	674	618	601	642	619	4333
23:00	433	437	429	451	609	471	581	495	490	3435
24:00	329	299	311	390	437	353	518	360	377	2644
TOTALS	13025	10797	14968	15088	15837	14701	14381	12613	14321	96709
% AVG WKDY	88.5	73.4	101.8	102.6	107.7		97.8	85.7		
% AVG WEEK	90.9	75.3	104.5	105.3	110.5		100.4	88		
AM Times	09:00	12:00	08:00	09:00	09:00	09:00	12:00	12:00	09:00	
AM Peaks	779	715	917	874	833	829	828	724	741	
PM Times	16:00	19:00	19:00	16:00	17:00	16:00	16:00	13:00	16:00	
PM Peaks	814	1072	1112	1074	1101	996	987	783	959	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

STA. 2

TOTAL

Site Reference: 180060000766
 Site ID: 000000000201
 Location: RTE.138 SO. OF BRUSH HILL RD.
 Direction: ROAD TOTAL

File: V2.prn
 City: MILTON
 County: VOLUME NB&SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	338		279	350	409	344	534	623	422	2533
02:00	158		151	167	247	180	344	414	246	1481
03:00	143		118	107	162	132	254	300	180	1084
04:00	160		134	142	132	142	226	212	167	1006
05:00	322		344	366	335	341	234	149	291	1750
06:00	1302		1234	1272	1000	1202	416	180	900	5404
07:00	1971		2016	2036	1755	1944	788	366	1488	8932
08:00	2498		2618	2527	2016	2414	1136	577	1895	11372
09:00	2697		2710	2599	2142	2537	1538	825	2085	12511
10:00	2150		2033	2073	1960	2054	1826	1273	1885	11315
11:00	1950		1857	1861	1904	1893	1906	1737	1869	11215
12:00	1705	1629	1654	1824	1938	1750	2093	1785	1804	12628
13:00	1766	1684	1882	1956	2305	1918	2370	2076	2005	14039
14:00	1800	1876	1938	1959	2489	2012	2463	2361	2126	14886
15:00	2112	2188	2186	2179	2513	2235	2533	2255	2280	15966
16:00	2575	2673	2446	2604	2650	2589	2450	2172	2510	17570
17:00	2321	2610	2436	2589	2577	2506	2199	1917	2378	16649
18:00	2193	2745	2449	2661	2737	2557	1959	2041	2397	16785
19:00	1853	2311	2461	2479	2329	2286	2027	2173	2233	15633
20:00	1526	1663	1836	1997	1787	1761	1768	2398	1853	12975
21:00	1296	1399	1477	1479	1495	1429	1571	1980	1528	10697
22:00	1076	1147	1258	1260	1432	1234	1325	1396	1270	8894
23:00	793	844	906	918	1192	930	1213	924	970	6790
24:00	560	538	585	716	839	647	959	652	692	4849
TOTALS	35265	23307	37008	38121	38345	37037	34132	30786	35474	236964
% AVG WKDY	95.2	62.9	99.9	102.9	103.5		92.1	83.1		
% AVG WEEK	99.4	65.7	104.3	107.4	108		96.2	86.7		
AM Times	09:00	12:00	09:00	09:00	09:00	09:00	12:00	12:00	09:00	
AM Peaks	2697	1629	2710	2599	2142	2537	2093	1785	2085	
PM Times	16:00	18:00	19:00	18:00	18:00	16:00	15:00	20:00	16:00	
PM Peaks	2575	2745	2461	2661	2737	2589	2533	2398	2510	

u2

AWD 37037

FAC .97(.95)

ADT 34,100

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 2 NB

Site Reference: 180060000766
 Site ID: 000000000201
 Location: RTE.138 SO. OF BRUSH HILL RD.
 Direction: NORTH

File: V2.prn
 City: MILTON
 County: VOLUME NB&SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	139		120	144	169	143	223	288	180	1083
02:00	64		66	68	131	82	135	198	110	662
03:00	70		57	45	61	58	131	129	82	493
04:00	82		65	75	59	70	115	103	83	499
05:00	198		208	210	190	201	127	78	168	1011
06:00	864		829	870	639	800	214	92	584	3508
07:00	1257		1207	1251	1088	1200	387	184	895	5374
08:00	1304		1352	1287	965	1227	499	260	944	5667
09:00	1128		1223	1230	985	1141	690	376	938	5632
10:00	1027		1069	1052	890	1009	739	575	892	5352
11:00	836		868	866	766	834	768	805	818	4909
12:00	742	683	652	775	808	732	800	776	748	5236
13:00	751	735	767	702	902	771	855	823	790	5535
14:00	715	733	763	770	881	772	907	948	816	5717
15:00	750	778	738	784	876	785	933	886	820	5745
16:00	813	837	839	923	905	863	941	838	870	6096
17:00	800	788	805	847	871	822	889	758	822	5758
18:00	789	857	788	897	977	861	843	898	864	6049
19:00	693	761	724	815	940	786	887	1018	834	5838
20:00	565	587	637	666	672	625	718	1144	712	4989
21:00	530	531	553	564	622	560	697	958	636	4455
22:00	461	439	514	533	610	511	588	669	544	3814
23:00	328	363	420	398	515	404	542	425	427	2991
24:00	224	217	248	288	354	266	427	303	294	2061
TOTALS	15130	8309	15512	16060	15876	15523	14055	13532	14871	98474
% AVG WKDY	97.4	53.5	99.9	103.4	102.2		90.5	87.1		
% AVG WEEK	101.7	55.8	104.3	107.9	106.7		94.5	90.9		
AM Times	08:00	12:00	08:00	08:00	07:00	08:00	12:00	11:00	08:00	
AM Peaks	1304	683	1352	1287	1088	1227	800	805	944	
PM Times	16:00	18:00	16:00	16:00	18:00	16:00	16:00	20:00	16:00	
PM Peaks	813	857	839	923	977	863	941	1144	870	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

STA. 2 SB

Site Reference: 180060000766
 Site ID: 000000000201
 Location: RTE.138 SO. OF BRUSH HILL RD.
 Direction: SOUTH

File: V2.prn
 City: MILTON
 County: VOLUME NB&SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	199		159	206	240	201	311	335	241	1450
02:00	94		85	99	116	98	209	216	136	819
03:00	73		61	62	101	74	123	171	98	591
04:00	78		69	67	73	71	111	109	84	507
05:00	124		136	156	145	140	107	71	123	739
06:00	438		405	402	361	401	202	88	316	1896
07:00	714		809	785	667	743	401	182	593	3558
08:00	1194		1266	1240	1051	1187	637	317	950	5705
09:00	1569		1487	1369	1157	1395	848	449	1146	6879
10:00	1123		964	1021	1070	1044	1087	698	993	5963
11:00	1114		989	995	1138	1059	1138	932	1051	6306
12:00	963	946	1002	1049	1130	1018	1293	1009	1056	7392
13:00	1015	949	1115	1254	1403	1147	1515	1253	1214	8504
14:00	1085	1143	1175	1189	1608	1240	1556	1413	1309	9169
15:00	1362	1410	1448	1395	1637	1450	1600	1369	1460	10221
16:00	1762	1836	1607	1681	1745	1726	1509	1334	1639	11474
17:00	1521	1822	1631	1742	1706	1684	1310	1159	1555	10891
18:00	1404	1888	1661	1764	1760	1695	1116	1143	1533	10736
19:00	1160	1550	1737	1664	1389	1500	1140	1155	1399	9795
20:00	961	1076	1199	1331	1115	1136	1050	1254	1140	7986
21:00	766	868	924	915	873	869	874	1022	891	6242
22:00	615	708	744	727	822	723	737	727	725	5080
23:00	465	481	486	520	677	525	671	499	542	3799
24:00	336	321	337	428	485	381	532	349	398	2788
TOTALS	20135	14998	21496	22061	22469	21507	20077	17254	20592	138490
% AVG WKDY	93.6	69.7	99.9	102.5	104.4		93.3	80.2		
% AVG WEEK	97.7	72.8	104.3	107.1	109.1		97.4	83.7		
AM Times	09:00	12:00	09:00	09:00	09:00	09:00	12:00	12:00	09:00	
AM Peaks	1569	946	1487	1369	1157	1395	1293	1009	1146	
PM Times	16:00	18:00	19:00	18:00	18:00	16:00	15:00	14:00	16:00	
PM Peaks	1762	1888	1737	1764	1760	1726	1600	1413	1639	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

STA. 3

TOTAL

Site Reference: 180060000534
 Site ID: 000000000303
 Location: BRUSH HILL RD. WEST OF RTE.138
 Direction: ROAD TOTAL

File: V3.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	42		44	37	49	43	73	95	56	340
02:00	16		26	25	30	24	48	54	33	199
03:00	22		12	12	19	16	30	40	22	135
04:00	9		25	14	14	15	32	21	19	115
05:00	27		29	33	23	28	32	20	27	164
06:00	113		115	102	105	108	42	27	84	504
07:00	232		236	233	203	226	103	50	176	1057
08:00	352		388	412	321	368	181	100	292	1754
09:00	377		411	406	350	386	282	173	333	1999
10:00	282		360	347	339	332	319	281	321	1928
11:00	301		298	344	365	327	380	346	339	2034
12:00	269	326	304	343	361	320	452	371	346	2426
13:00	305	345	346	360	426	356	466	466	387	2714
14:00	312	339	378	406	406	368	495	472	401	2808
15:00	378	415	440	415	517	433	423	440	432	3028
16:00	481	483	494	473	618	509	469	394	487	3412
17:00	413	465	514	514	620	505	406	373	472	3305
18:00	420	452	596	461	549	495	359	386	460	3223
19:00	309	423	477	463	386	411	355	348	394	2761
20:00	291	294	327	301	320	306	326	381	320	2240
21:00	180	217	241	237	257	226	257	295	240	1684
22:00	153	188	188	196	215	188	245	207	198	1392
23:00	101	128	153	137	180	139	187	130	145	1016
24:00	69	86	84	114	126	95	138	89	100	706

TOTALS	5454	4161	6486	6385	6799	6224	6100	5559	6084	40944
% AVG WKDY	87.6	66.8	104.2	102.5	109.2		98	89.3		
% AVG WEEK	89.6	68.3	106.6	104.9	111.7		100.2	91.3		
AM Times	09:00	12:00	09:00	08:00	11:00	09:00	12:00	12:00	12:00	
AM Peaks	377	326	411	412	365	386	452	371	346	
PM Times	16:00	16:00	18:00	17:00	17:00	16:00	14:00	14:00	16:00	
PM Peaks	481	483	596	514	620	509	495	472	487	

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AWD 6224

FAC 1,97(.93)

ADT 5,600

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

Page: 1

STA. 3 EB

Site Reference: 180060000534
 Site ID: 000000000303
 Location: BRUSH HILL RD. WEST OF RTE.138
 Direction: EAST

File: V3.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	14		10	11	12	11	19	25	15	91
02:00	6		9	7	7	7	12	20	10	61
03:00	6		3	4	6	4	8	13	6	40
04:00	1		10	4	3	4	10	4	5	32
05:00	8		10	8	6	8	9	10	8	51
06:00	36		38	32	29	33	11	14	26	160
07:00	84		80	85	62	77	28	14	58	353
08:00	100		109	112	72	98	37	32	77	462
09:00	104		108	100	68	95	57	39	79	476
10:00	79		89	103	90	90	52	64	79	477
11:00	75		93	91	102	90	96	77	89	534
12:00	65	84	60	88	95	78	106	80	82	578
13:00	72	101	88	94	118	94	113	129	102	715
14:00	78	78	83	111	95	89	115	134	99	694
15:00	83	95	109	85	103	95	101	107	97	683
16:00	94	102	96	95	78	93	123	93	97	681
17:00	82	85	90	65	87	81	103	92	86	604
18:00	76	75	69	82	65	73	98	104	81	569
19:00	49	87	69	74	70	69	89	96	76	534
20:00	55	52	70	47	58	56	69	129	68	480
21:00	40	48	56	57	65	53	63	93	60	422
22:00	33	44	54	46	51	45	65	54	49	347
23:00	22	29	39	30	44	32	51	37	36	252
24:00	18	29	24	27	36	26	37	32	29	203
TOTALS	1280	909	1466	1458	1422	1401	1472	1492	1414	9499
% AVG WKDY	91.3	64.8	104.6	104	101.4		105	106.4		
% AVG WEEK	90.5	64.2	103.6	103.1	100.5		104.1	105.5		
AM Times	09:00	12:00	08:00	08:00	11:00	08:00	12:00	12:00	11:00	
AM Peaks	104	84	109	112	102	98	106	80	89	
PM Times	16:00	16:00	15:00	14:00	13:00	15:00	16:00	14:00	13:00	
PM Peaks	94	102	109	111	118	95	123	134	102	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

STA. 3 WB

Site Reference: 180060000534
 Site ID: 000000000303
 Location: BRUSH HILL RD. WEST OF RTE.138
 Direction: WEST

File: V3.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	28		34	26	37	31	54	70	41	249
02:00	10		17	18	23	17	36	34	23	138
03:00	16		9	8	13	11	22	27	15	95
04:00	8		15	10	11	11	22	17	13	83
05:00	19		19	25	17	20	23	10	18	113
06:00	77		77	70	76	75	31	13	57	344
07:00	148		156	148	141	148	75	36	117	704
08:00	252		279	300	249	270	144	68	215	1292
09:00	273		303	306	282	291	225	134	253	1523
10:00	203		271	244	249	241	267	217	241	1451
11:00	226		205	253	263	236	284	269	250	1500
12:00	204	242	244	255	266	242	346	291	264	1848
13:00	233	244	258	266	308	261	353	337	285	1999
14:00	234	261	295	295	311	279	380	338	302	2114
15:00	295	320	331	330	414	338	322	333	335	2345
16:00	387	381	398	378	540	416	346	301	390	2731
17:00	331	380	424	449	533	423	303	281	385	2701
18:00	344	377	527	379	484	422	261	282	379	2654
19:00	260	336	408	389	316	341	266	252	318	2227
20:00	236	242	257	254	262	250	257	252	251	1760
21:00	140	169	185	180	192	173	194	202	180	1262
22:00	120	144	134	150	164	142	180	153	149	1045
23:00	79	99	114	107	136	107	136	93	109	764
24:00	51	57	60	87	90	69	101	57	71	503
TOTALS	4174	3252	5020	4927	5377	4814	4628	4067	4661	31445
% AVG WKDY	86.7	67.5	104.2	102.3	111.6		96.1	84.4		
% AVG WEEK	89.5	69.7	107.7	105.7	115.3		99.2	87.2		
AM Times	09:00	12:00	09:00	09:00	09:00	09:00	12:00	12:00	12:00	
AM Peaks	273	242	303	306	282	291	346	291	264	
PM Times	16:00	16:00	18:00	17:00	16:00	17:00	14:00	14:00	16:00	
PM Peaks	387	381	527	449	540	423	380	338	390	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

Page: 1

STA. 4 WB
 1-WAY

Site Reference: 180060000016
 Site ID: 000000000404
 Location: BRUSH HILL RD. EAST OF RTE. 138
 Direction: WEST

File: V4.prn
 City: MILTON
 County: VOLUME WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	17		13	19	17	16	29	30	20	125
02:00	5		7	6	14	8	17	24	12	73
03:00	10		4	2	5	5	12	13	7	46
04:00	2		3	5	2	3	10	5	4	27
05:00	17		18	11	8	13	8	9	11	71
06:00	68		70	80	57	68	18	16	51	309
07:00	171		176	169	127	160	54	25	120	722
08:00	310		273	299	203	271	83	66	205	1234
09:00	315		313	247	212	271	159	77	220	1323
10:00	183		213	224	257	219	194	135	201	1206
11:00	156		230	215	254	213	228	197	213	1280
12:00	159	223	176	192	237	197	342	222	221	1551
13:00	149	174	183	239	287	206	327	326	240	1685
14:00	176	212	202	193	231	202	407	333	250	1754
15:00	232	227	300	214	337	262	325	257	270	1892
16:00	287	310	274	249	405	305	337	304	309	2166
17:00	243	301	340	302	401	317	288	213	298	2088
18:00	210	294	327	346	361	307	242	254	290	2034
19:00	162	230	333	318	193	247	220	262	245	1718
20:00	127	131	148	126	155	137	141	278	158	1106
21:00	94	104	103	109	140	110	116	177	120	843
22:00	57	100	85	76	111	85	112	99	91	640
23:00	48	42	47	46	71	50	67	57	54	378
24:00	18	41	38	41	50	37	52	32	38	272
TOTALS	3216	2389	3876	3728	4135	3709	3788	3411	3648	24543
% AVG WKDY	86.7	64.4	104.5	100.5	111.4		102.1	91.9		
% AVG WEEK	88.1	65.4	106.2	102.1	113.3		103.8	93.5		
AM Times	09:00	12:00	09:00	08:00	10:00	08:00	12:00	12:00	12:00	
AM Peaks	315	223	313	299	257	271	342	222	221	
PM Times	16:00	16:00	17:00	18:00	16:00	17:00	14:00	14:00	16:00	
PM Peaks	287	310	340	346	405	317	407	333	309	

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AWD 3709

FAC .97(.93)

ADT 3,300

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 5 NB

Site Reference: 180060000535
 Site ID: 000000000501
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: NORTH

File: SPD501.prn
 City: MILTON
 County: SPEED NB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	129		112	137	157	133	209	268	168	1012
02:00	60		63	59	99	70	131	185	99	597
03:00	65		48	42	57	53	123	121	76	456
04:00	71		55	64	54	61	104	91	73	439
05:00	171		183	184	168	176	101	71	146	878
06:00	699		665	678	525	641	189	89	474	2845
07:00	925		869	907	844	886	328	176	674	4049
08:00	963		954	939	734	897	433	256	713	4279
09:00	837		907	849	795	847	603	367	726	4358
10:00	728		798	769	728	755	636	567	704	4226
11:00	644		679	672	664	664	681	737	679	4077
12:00	590	567	567	619	700	608	721	739	643	4503
13:00	595	618	609	621	761	640	762	765	675	4731
14:00	610	614	670	652	747	658	808	839	705	4940
15:00	654	700	675	666	747	688	817	817	725	5076
16:00	682	729	713	779	742	729	826	749	745	5220
17:00	667	654	692	740	709	692	815	719	713	4996
18:00	699	687	684	729	807	721	754	800	737	5160
19:00	583	654	629	681	789	667	779	876	713	4991
20:00	476	507	566	538	587	534	652	941	609	4267
21:00	458	471	514	511	556	502	609	789	558	3908
22:00	403	396	477	487	558	464	529	580	490	3430
23:00	293	325	363	374	464	363	482	391	384	2692
24:00	189	204	228	265	332	243	390	261	267	1869
TOTALS	12191	7126	12720	12962	13324	12692	12482	12194	12496	82999
% AVG WKDY	96	56.1	100.2	102.1	104.9		98.3	96		
% AVG WEEK	97.5	57	101.7	103.7	106.6		99.8	97.5		
AM Times	08:00	12:00	08:00	08:00	07:00	08:00	12:00	12:00	09:00	
AM Peaks	963	567	954	939	844	897	721	739	726	
PM Times	18:00	16:00	16:00	16:00	18:00	16:00	16:00	20:00	16:00	
PM Peaks	699	729	713	779	807	729	826	941	745	

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AWD 22817

FAC .97(.95)

ADT 21,000

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 55B

Site Reference: 180060000461
 Site ID: 000000000502
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: SOUTH

File: SPD502.prn
 City: MILTON
 County: SPEED SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	130		117	145	160	138	213	211	162	976
02:00	64		64	62	83	68	151	144	94	568
03:00	46		43	50	73	53	84	116	68	412
04:00	52		54	42	54	50	76	86	60	364
05:00	75		96	109	114	98	76	45	85	515
06:00	226		243	218	219	226	130	66	183	1102
07:00	346		382	404	377	377	235	121	310	1865
08:00	542		542	515	515	528	356	209	446	2679
09:00	495		585	565	540	546	445	249	479	2879
10:00	432		458	515	516	480	590	390	483	2901
11:00	426		508	470	597	500	587	500	514	3088
12:00	436	454	536	568	604	519	591	560	535	3749
13:00	492	482	609	613	707	580	704	681	612	4288
14:00	564	549	591	604	705	602	628	732	624	4373
15:00	672	681	647	707	613	664	682	715	673	4717
16:00	676	687	665	670	609	661	707	742	679	4756
17:00	656	637	632	624	610	631	717	665	648	4541
18:00	709	627	615	642	620	642	628	642	640	4483
19:00	581	681	667	607	689	645	663	654	648	4542
20:00	455	550	650	664	631	590	596	650	599	4196
21:00	406	488	575	550	510	505	507	574	515	3610
22:00	349	415	476	464	507	442	393	429	433	3033
23:00	252	300	299	342	453	329	373	312	333	2331
24:00	205	217	223	282	330	251	336	211	257	1804
TOTALS	9287	6768	10277	10432	10836	10125	10468	9704	10080	67772
% AVG WKDY	91.7	66.8	101.5	103	107		103.3	95.8		
% AVG WEEK	92.1	67.1	101.9	103.4	107.5		103.8	96.2		
AM Times	08:00	12:00	09:00	12:00	12:00	09:00	12:00	12:00	12:00	
AM Peaks	542	454	585	568	604	546	591	560	535	
PM Times	18:00	16:00	19:00	15:00	13:00	15:00	17:00	16:00	16:00	
PM Peaks	709	687	667	707	707	664	717	742	679	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

STA. 6

TOTAL

Site Reference: 180060000494
 Site ID: 000000000603
 Location: NEPONSET VALLEY PKWY WEST OF RTE. 138
 Direction: ROAD TOTAL

File: V6.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	87		83	105	121	99	155	178	121	729
02:00	59		56	42	78	58	104	115	75	454
03:00	46		57	32	48	45	75	71	54	329
04:00	60		51	63	48	55	57	61	56	340
05:00	137		155	178	149	154	73	52	124	744
06:00	492		466	487	384	457	184	68	346	2081
07:00	626		627	654	578	621	279	126	481	2890
08:00	621		634	669	520	611	360	191	499	2995
09:00	515		616	548	496	543	402	215	465	2792
10:00	457		500	536	490	495	472	319	462	2774
11:00	481		495	484	535	498	506	522	503	3023
12:00	395	447	434	493	528	459	568	510	482	3375
13:00	500	467	472	510	577	505	537	612	525	3675
14:00	494	555	521	527	604	540	546	650	556	3897
15:00	524	582	583	575	599	572	604	586	579	4053
16:00	549	617	608	576	639	597	602	563	593	4154
17:00	534	556	625	610	620	589	587	485	573	4017
18:00	563	573	571	568	595	574	513	575	565	3958
19:00	452	524	539	481	578	514	529	570	524	3673
20:00	364	409	402	450	458	416	469	570	446	3122
21:00	334	323	374	348	378	351	434	492	383	2683
22:00	272	275	322	338	404	322	352	344	329	2307
23:00	212	233	231	242	312	246	293	206	247	1729
24:00	148	152	186	203	247	187	272	161	195	1369
TOTALS	8922	5713	9608	9719	9986	9508	8973	8242	9183	61163
% AVG WKDY	93.8	60	101	102.2	105		94.3	86.6		
% AVG WEEK	97.1	62.2	104.6	105.8	108.7		97.7	89.7		
AM Times	07:00	12:00	08:00	08:00	07:00	07:00	12:00	11:00	11:00	
AM Peaks	626	447	634	669	578	621	568	522	503	
PM Times	18:00	16:00	17:00	17:00	16:00	16:00	15:00	14:00	16:00	
PM Peaks	563	617	625	610	639	597	604	650	593	

U3

AWD 9508

FAC .96(.96)

ADT 8,800

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 6 EB

Site Reference: 180060000494
 Site ID: 000000000603
 Location: NEPONSET VALLEY PKWY WEST OF RTE. 138
 Direction: EAST

File: V6.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	51		43	64	73	57	90	125	74	446
02:00	32		35	26	49	35	67	79	48	288
03:00	28		33	18	27	26	48	39	32	193
04:00	40		33	41	30	36	38	41	37	223
05:00	104		115	132	102	113	48	41	90	542
06:00	394		372	390	300	364	125	47	271	1628
07:00	511		494	515	449	492	187	87	373	2243
08:00	447		477	489	347	440	242	128	355	2130
09:00	361		441	400	341	385	271	148	327	1962
10:00	294		347	380	334	338	287	218	310	1860
11:00	304		319	309	313	311	307	354	317	1906
12:00	259	279	251	307	321	283	354	342	301	2113
13:00	304	292	293	304	355	309	343	393	326	2284
14:00	291	342	315	314	355	323	343	415	339	2375
15:00	322	362	345	338	344	342	372	372	350	2455
16:00	312	352	341	329	349	336	391	345	345	2419
17:00	284	275	329	302	325	303	354	307	310	2176
18:00	300	283	280	300	341	300	333	385	317	2222
19:00	257	289	286	273	317	284	356	353	304	2131
20:00	196	236	217	240	272	232	303	400	266	1864
21:00	212	198	218	213	233	214	294	354	246	1722
22:00	175	168	203	224	255	205	232	225	211	1482
23:00	139	155	150	159	193	159	190	139	160	1125
24:00	91	94	120	122	154	116	172	112	123	865
TOTALS	5708	3325	6057	6189	6179	6003	5747	5449	5832	38654
% AVG WKDY	95	55.3	100.8	103	102.9		95.7	90.7		
% AVG WEEK	97.8	57	103.8	106.1	105.9		98.5	93.4		
AM Times	07:00	12:00	07:00	07:00	07:00	07:00	12:00	11:00	07:00	
AM Peaks	511	279	494	515	449	492	354	354	373	
PM Times	15:00	15:00	15:00	15:00	13:00	15:00	16:00	14:00	15:00	
PM Peaks	322	362	345	338	355	342	391	415	350	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

STA. 6 WB

Site Reference: 180060000494
 Site ID: 000000000603
 Location: NEPONSET VALLEY PKWY WEST OF RTE. 138
 Direction: WEST

File: V6.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	36		40	41	48	41	65	53	47	283
02:00	27		21	16	29	23	37	36	27	166
03:00	18		24	14	21	19	27	32	22	136
04:00	20		18	22	18	19	19	20	19	117
05:00	33		40	46	47	41	25	11	33	202
06:00	98		94	97	84	93	59	21	75	453
07:00	115		133	139	129	129	92	39	107	647
08:00	174		157	180	173	171	118	63	144	865
09:00	154		175	148	155	158	131	67	138	830
10:00	163		153	156	156	157	185	101	152	914
11:00	177		176	175	222	187	199	168	186	1117
12:00	136	168	183	186	207	176	214	168	180	1262
13:00	196	175	179	206	222	195	194	219	198	1391
14:00	203	213	206	213	249	216	203	235	217	1522
15:00	202	220	238	237	255	230	232	214	228	1598
16:00	237	265	267	247	290	261	211	218	247	1735
17:00	250	281	296	308	295	286	233	178	263	1841
18:00	263	290	291	268	254	273	180	190	248	1736
19:00	195	235	253	208	261	230	173	217	220	1542
20:00	168	173	185	210	186	184	166	170	179	1258
21:00	122	125	156	135	145	136	140	138	137	961
22:00	97	107	119	114	149	117	120	119	117	825
23:00	73	78	81	83	119	86	103	67	86	604
24:00	57	58	66	81	93	71	100	49	72	504
TOTALS	3214	2388	3551	3530	3807	3499	3226	2793	3342	22509
% AVG WKDY	91.8	68.2	101.4	100.8	108.8		92.1	79.8		
% AVG WEEK	96.1	71.4	106.2	105.6	113.9		96.5	83.5		
AM Times	11:00	12:00	12:00	12:00	11:00	11:00	12:00	11:00	11:00	
AM Peaks	177	168	183	186	222	187	214	168	186	
PM Times	18:00	18:00	17:00	17:00	17:00	17:00	17:00	14:00	17:00	
PM Peaks	263	290	296	308	295	286	233	235	263	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 7NB

Site Reference: 180060000532
 Site ID: 000000000701
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: NORTH

File: SPD8028_NB.prn
 City: MILTON
 County: SPEED NB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	91		79	84	100	88	152	164	111	670
02:00	40		30	35	67	43	78	118	61	368
03:00	35		30	33	38	34	78	84	49	298
04:00	46		28	30	38	35	74	57	45	273
05:00	74		80	63	79	74	58	39	65	393
06:00	311		322	303	270	301	79	47	222	1332
07:00	450		433	471	431	446	161	95	340	2041
08:00	543		518	486	461	502	203	150	393	2361
09:00	507		519	544	475	511	346	218	434	2609
10:00	477		504	486	439	476	356	339	433	2601
11:00	391		410	449	406	414	397	438	415	2491
12:00	355		323	371	427	369	402	399	379	2277
13:00	329	377	351	346	449	370	442	389	383	2683
14:00	346	292	386	373	448	369	491	455	398	2791
15:00	379	372	344	391	455	388	445	458	406	2844
16:00	408	384	425	480	446	428	493	423	437	3059
17:00	408	415	393	458	462	427	468	432	433	3036
18:00	415	417	407	470	502	442	433	432	439	3076
19:00	359	368	393	447	505	414	456	529	436	3057
20:00	306	282	358	337	346	325	380	557	366	2566
21:00	254	304	333	330	328	309	329	474	336	2352
22:00	261	248	308	293	327	287	294	383	302	2114
23:00	168	206	236	227	310	229	306	259	244	1712
24:00	122	125	128	168	183	145	230	165	160	1121
TOTALS	7075	3790	7338	7675	7992	7426	7151	7104	7287	48125
% AVG WKDY	95.2	51	98.8	103.3	107.6		96.2	95.6		
% AVG WEEK	97	52	100.6	105.3	109.6		98.1	97.4		
AM Times	08:00		09:00	09:00	09:00	09:00	12:00	11:00	09:00	
AM Peaks	543		519	544	475	511	402	438	434	
PM Times	18:00	18:00	16:00	16:00	19:00	18:00	16:00	20:00	18:00	
PM Peaks	415	417	425	480	505	442	493	557	439	

U2

AWD 15496

FAL .97(.95)

ADT 14,300

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 7 SB

Site Reference: 180060000822
 Site ID: 000000000702
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: SOUTH

File: SPD8028.prn
 City: MILTON
 County: SPEED SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	106		74	108	129	104	161	174	125	752
02:00	45		41	46	51	45	124	110	69	417
03:00	30		22	34	61	36	60	91	49	298
04:00	38		35	28	40	35	59	64	44	264
05:00	42		66	63	71	60	51	42	55	335
06:00	159		171	158	148	159	82	48	127	766
07:00	295		339	335	299	317	164	83	252	1515
08:00	476		500	470	417	465	275	156	382	2294
09:00	482		520	476	467	486	346	198	414	2489
10:00	367		364	408	403	385	429	302	378	2273
11:00	338		386	355	456	383	448	371	392	2354
12:00	375		392	443	478	422	437	424	424	2549
13:00	383	383	520	517	575	475	550	525	493	3453
14:00	454	442	446	453	604	479	546	587	504	3532
15:00	566	595	520	563	518	552	523	601	555	3886
16:00	553	563	506	536	484	528	563	571	539	3776
17:00	471	462	456	450	436	455	550	526	478	3351
18:00	497	483	452	482	428	468	491	482	473	3315
19:00	456	508	512	497	482	491	508	491	493	3454
20:00	389	449	516	522	475	470	483	531	480	3365
21:00	356	425	468	463	399	422	409	498	431	3018
22:00	298	354	407	381	413	370	311	358	360	2522
23:00	225	249	241	275	358	269	326	266	277	1940
24:00	168	161	172	213	257	194	274	183	204	1428
TOTALS	7569	5074	8126	8276	8449	8070	8170	7682	7998	53346
% AVG WKDY	93.7	62.8	100.6	102.5	104.6		101.2	95.1		
% AVG WEEK	94.6	63.4	101.6	103.4	105.6		102.1	96		
AM Times	09:00		09:00	09:00	12:00	09:00	11:00	12:00	12:00	
AM Peaks	482		520	476	478	486	448	424	424	
PM Times	15:00	15:00	13:00	15:00	14:00	15:00	16:00	15:00	15:00	
PM Peaks	566	595	520	563	604	552	563	601	555	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA 8 EB

Site Reference: 180060000108
 Site ID: 000000000803
 Location: MILTON ST. WEST OF RTE. 138
 Direction: EAST

File: V8.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	16		9	17	15	14	16	12	14	85
02:00	3		3	8	8	5	8	14	7	44
03:00	3		5	2	3	3	5	7	4	25
04:00	10		5	10	3	7	4	5	6	37
05:00	11		18	15	11	13	10	2	11	67
06:00	26		36	28	25	28	14	5	22	134
07:00	79		76	78	60	73	21	7	53	321
08:00	160		183	168	88	149	30	23	108	652
09:00	108		132	142	90	118	70	40	97	582
10:00	86		129	106	82	100	107	61	95	571
11:00	89		87	80	115	92	116	67	92	554
12:00	75		82	116	109	95	112	65	93	559
13:00	94	89	108	116	115	104	112	87	103	721
14:00	110	127	101	107	140	117	127	89	114	801
15:00	130	141	139	141	153	140	112	87	129	903
16:00	150	187	186	170	167	172	135	53	149	1048
17:00	193	206	216	192	252	211	111	77	178	1247
18:00	179	226	274	194	169	208	88	59	169	1189
19:00	137	189	169	188	136	163	89	73	140	981
20:00	95	87	96	102	92	94	71	73	88	616
21:00	45	76	74	78	57	66	59	45	62	434
22:00	54	59	61	61	55	58	55	33	54	378
23:00	24	19	22	36	47	29	33	20	28	201
24:00	13	17	21	31	26	21	22	15	20	145
TOTALS	1890	1423	2232	2186	2018	2080	1527	1019	1836	12295
% AVG WKDY	90.8	68.4	107.3	105	97		73.4	48.9		
% AVG WEEK	102.9	77.5	121.5	119	109.9		83.1	55.5		
AM Times	08:00		08:00	08:00	11:00	08:00	11:00	11:00	08:00	
AM Peaks	160		183	168	115	149	116	67	108	
PM Times	17:00	18:00	18:00	18:00	17:00	17:00	16:00	14:00	17:00	
PM Peaks	193	226	274	194	252	211	135	89	178	

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AWD 2080

FAC .97(.93)

ADT 1,900

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

STA 8WB

Site Reference: 180060000108
 Site ID: 000000000803
 Location: MILTON ST. WEST OF RTE. 138
 Direction: WEST

File: V8.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	10		11	12	17	12	17	13	13	80
02:00	6		4	9	12	7	9	14	9	54
03:00	12		5	8	8	8	12	9	9	54
04:00	7		10	11	8	9	7	12	9	55
05:00	15		21	21	13	17	9	5	14	84
06:00	50		51	61	44	51	26	7	39	239
07:00	172		165	167	132	159	55	25	119	716
08:00	209		257	229	121	204	50	32	149	898
09:00	159		161	181	140	160	97	45	130	783
10:00	102		118	121	131	118	91	58	103	621
11:00	81		105	104	106	99	93	70	93	559
12:00	80		85	112	124	100	143	73	102	617
13:00	100	95	125	130	137	117	112	84	111	783
14:00	115	97	102	120	124	111	123	89	110	770
15:00	102	106	116	117	141	116	111	91	112	784
16:00	154	160	144	162	177	159	108	90	142	995
17:00	153	185	158	196	186	175	119	70	152	1067
18:00	163	202	170	190	187	182	108	78	156	1098
19:00	140	151	175	190	119	155	99	96	138	970
20:00	86	89	112	122	103	102	78	82	96	672
21:00	81	90	98	79	60	81	64	66	76	538
22:00	57	62	64	74	67	64	53	44	60	421
23:00	28	23	29	48	48	35	41	27	34	244
24:00	20	21	19	26	29	23	29	19	23	163
TOTALS	2102	1281	2305	2490	2234	2264	1654	1199	1999	13265
% AVG WKDY	92.8	56.5	101.8	109.9	98.6		73	52.9		
% AVG WEEK	105.1	64	115.3	124.5	111.7		82.7	59.9		
AM Times	08:00		08:00	08:00	09:00	08:00	12:00	12:00	08:00	
AM Peaks	209		257	229	140	204	143	73	149	
PM Times	18:00	18:00	19:00	17:00	18:00	18:00	14:00	19:00	18:00	
PM Peaks	163	202	175	196	187	182	123	96	156	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

Page: 1

STA. 9 WB

Site Reference: 180060000151
 Site ID: 000000000904
 Location: DOLLAR LN. EAST OF RTE. 138
 Direction: WEST

File: V904.prn
 City: MILTON
 County: VOLUME WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	10		6	13	9	9	14	12	10	64
02:00	5		5	8	9	6	8	14	8	49
03:00	10		1	2	6	4	6	6	5	31
04:00	4		8	9	8	7	8	8	7	45
05:00	14		16	21	14	16	8	2	12	75
06:00	53		49	70	53	56	31	6	43	262
07:00	197		184	164	138	170	49	22	125	754
08:00	292		280	279	131	245	50	32	177	1064
09:00	203		216	243	163	206	83	36	157	944
10:00	110		137	132	109	122	95	50	105	633
11:00	97		108	102	97	101	108	66	96	578
12:00	91		81	125	131	107	144	69	106	641
13:00	97	92	129	124	140	116	119	104	115	805
14:00	124	104	96	126	126	115	121	91	112	788
15:00	114	118	137	123	155	129	121	117	126	885
16:00	185	158	168	176	165	170	125	80	151	1057
17:00	189	191	182	214	195	194	141	78	170	1190
18:00	194	211	199	185	187	195	125	81	168	1182
19:00	142	123	162	171	128	145	83	129	134	938
20:00	64	82	119	81	91	87	78	118	90	633
21:00	61	70	82	80	62	71	67	79	71	501
22:00	50	45	68	64	72	59	56	70	60	425
23:00	29	22	31	60	48	38	40	30	37	260
24:00	26	21	18	32	25	24	31	24	25	177
TOTALS	2361	1237	2482	2604	2262	2392	1711	1324	2110	13981
% AVG WKDY	98.7	51.7	103.7	108.8	94.5		71.5	55.3		
% AVG WEEK	111.8	58.6	117.6	123.4	107.2		81	62.7		
AM Times	08:00		08:00	08:00	09:00	08:00	12:00	12:00	08:00	
AM Peaks	292		280	279	163	245	144	69	177	
PM Times	18:00	18:00	18:00	17:00	17:00	18:00	17:00	19:00	17:00	
PM Peaks	194	211	199	214	195	195	141	129	170	

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WB ONLY

EB NO DATA.

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

STA. 10
 TOTAL

Site Reference: 180060000423
 Site ID: 000000001001
 Location: RTE. 138 NO. OF MILTON ST.
 Direction: ROAD TOTAL

File: V10.prn
 City: MILTON
 County: VOLUME NB&SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	216		171	207	240	208	323	350	251	1507
02:00	85		73	91	130	94	216	242	139	837
03:00	70		60	73	105	77	149	199	109	656
04:00	86		67	68	78	74	143	137	96	579
05:00	130		150	146	163	147	110	85	130	784
06:00	546		554	524	458	520	172	93	391	2347
07:00	889		891	945	779	876	355	181	673	4040
08:00	1250		1227	1197	1049	1180	529	305	926	5557
09:00	1221		1201	1149	1049	1155	741	433	965	5794
10:00	1079		941	996	891	976	854	672	905	5433
11:00	953		863	878	933	906	881	817	887	5325
12:00	855		808	909	954	881	844	830	866	5200
13:00	796	827	918	925	1111	915	1023	930	932	6530
14:00	894	814	888	901	1157	930	1091	1041	969	6786
15:00	1155	1064	938	1031	1291	1095	1041	1128	1092	7648
16:00	1076	1178	1005	1140	1330	1145	1116	1067	1130	7912
17:00	950	994	915	967	1325	1030	1107	1042	1042	7300
18:00	1013	1019	960	1041	1160	1038	985	961	1019	7139
19:00	966	1073	1069	1336	1066	1102	1063	1099	1096	7672
20:00	890	892	986	1071	916	951	955	1220	990	6930
21:00	794	842	898	889	809	846	822	1135	884	6189
22:00	681	731	811	769	799	758	692	863	763	5346
23:00	472	487	531	533	716	547	698	609	578	4046
24:00	344	303	329	389	462	365	566	413	400	2806
TOTALS	17411	10224	17254	18175	18971	17816	16476	15852	17233	114363
% AVG WKDY	97.7	57.3	96.8	102	106.4		92.4	88.9		
% AVG WEEK	101	59.3	100.1	105.4	110		95.6	91.9		
AM Times	08:00		08:00	08:00	08:00	08:00	11:00	12:00	09:00	
AM Peaks	1250		1227	1197	1049	1180	881	830	965	
PM Times	15:00	16:00	19:00	19:00	16:00	16:00	16:00	20:00	16:00	
PM Peaks	1155	1178	1069	1336	1330	1145	1116	1220	1130	

U2
 AWD 17816
 FAC .97(.95)
 ADT 16,400

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 10 NB

Site Reference: 180060000423
 Site ID: 000000001001
 Location: RTE. 138 NO. OF MILTON ST.
 Direction: NORTH

File: V10.prn
 City: MILTON
 County: VOLUME NB&SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	100		84	95	106	96	153	162	116	700
02:00	41		32	41	71	46	80	123	64	388
03:00	37		31	28	39	33	82	95	52	312
04:00	45		32	37	34	37	77	62	47	287
05:00	78		75	64	86	75	56	33	65	392
06:00	355		366	358	299	344	89	49	252	1516
07:00	557		507	546	479	522	175	91	392	2355
08:00	704		628	627	548	626	225	139	478	2871
09:00	630		622	638	534	606	372	228	504	3024
10:00	617		573	566	466	555	411	359	498	2992
11:00	509		473	518	427	481	433	442	467	2802
12:00	436		377	430	470	428	415	401	421	2529
13:00	371	408	395	393	478	409	451	404	414	2900
14:00	385	353	413	415	490	411	516	447	431	3019
15:00	412	425	390	411	514	430	490	482	446	3124
16:00	463	491	472	544	485	491	513	440	486	3408
17:00	468	480	463	498	545	490	527	479	494	3460
18:00	464	510	502	539	543	511	477	460	499	3495
19:00	435	472	477	534	561	495	476	594	507	3549
20:00	377	369	421	411	391	393	415	641	432	3025
21:00	328	349	371	388	364	360	373	555	389	2728
22:00	301	300	354	336	359	330	344	448	348	2442
23:00	213	215	260	259	331	255	339	301	274	1918
24:00	144	132	143	175	193	157	264	206	179	1257
TOTALS	8470	4504	8461	8851	8813	8581	7753	7641	8255	54493
% AVG WKDY	98.7	52.4	98.6	103.1	102.7		90.3	89		
% AVG WEEK	102.6	54.5	102.4	107.2	106.7		93.9	92.5		
AM Times	08:00		08:00	09:00	08:00	08:00	11:00	11:00	09:00	
AM Peaks	704		628	638	548	626	433	442	504	
PM Times	17:00	18:00	18:00	16:00	19:00	18:00	17:00	20:00	19:00	
PM Peaks	468	510	502	544	561	511	527	641	507	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

STA. 10 SB

Site Reference: 180060000423
 Site ID: 000000001001
 Location: RTE. 138 NO. OF MILTON ST.
 Direction: SOUTH

File: V10.prn
 City: MILTON
 County: VOLUME NB&SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	116		87	112	134	112	170	188	134	807
02:00	44		41	50	59	48	136	119	74	449
03:00	33		29	45	66	43	67	104	57	344
04:00	41		35	31	44	37	66	75	48	292
05:00	52		75	82	77	71	54	52	65	392
06:00	191		188	166	159	176	83	44	138	831
07:00	332		384	399	300	353	180	90	280	1685
08:00	546		599	570	501	554	304	166	447	2686
09:00	591		579	511	515	549	369	205	461	2770
10:00	462		368	430	425	421	443	313	406	2441
11:00	444		390	360	506	425	448	375	420	2523
12:00	419		431	479	484	453	429	429	445	2671
13:00	425	419	523	532	633	506	572	526	518	3630
14:00	509	461	475	486	667	519	575	594	538	3767
15:00	743	639	548	620	777	665	551	646	646	4524
16:00	613	687	533	596	845	654	603	627	643	4504
17:00	482	514	452	469	780	539	580	563	548	3840
18:00	549	509	458	502	617	527	508	501	520	3644
19:00	531	601	592	802	505	606	587	505	589	4123
20:00	513	523	565	660	525	557	540	579	557	3905
21:00	466	493	527	501	445	486	449	580	494	3461
22:00	380	431	457	433	440	428	348	415	414	2904
23:00	259	272	271	274	385	292	359	308	304	2128
24:00	200	171	186	214	269	208	302	207	221	1549
TOTALS	8941	5720	8793	9324	10158	9229	8723	8211	8967	59870
% AVG WKDY	96.8	61.9	95.2	101	110		94.5	88.9		
% AVG WEEK	99.7	63.7	98	103.9	113.2		97.2	91.5		
AM Times	09:00		08:00	08:00	09:00	08:00	11:00	12:00	09:00	
AM Peaks	591		599	570	515	554	448	429	461	
PM Times	15:00	16:00	19:00	19:00	16:00	15:00	16:00	15:00	15:00	
PM Peaks	743	687	592	802	845	665	603	646	646	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

STA. 11
 TOTAL

Site Reference: 180060000742
 Site ID: 000000110304
 Location: BRADLEE RD. WEST OF RTE.138
 Direction: ROAD TOTAL

File: V11.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	20		26	25	38	27	33	40	30	182
02:00	10		3	6	14	8	24	30	14	87
03:00	3		6	6	8	5	22	16	10	61
04:00	9		1	1	4	3	13	10	6	38
05:00	16		16	12	19	15	10	6	13	79
06:00	39		32	42	33	36	10	9	27	165
07:00	93		84	96	83	89	23	18	66	397
08:00	170		172	140	102	146	50	26	110	660
09:00	121		128	122	117	122	75	63	104	626
10:00	87		110	106	109	103	119	71	100	602
11:00	78		97	85	114	93	125	108	101	607
12:00	84		80	112	123	99	140	131	111	670
13:00	89		103	128	118	109	135	135	118	708
14:00	125	92	103	106	119	109	169	136	121	850
15:00	131	137	120	121	141	130	147	141	134	938
16:00	140	139	145	139	181	148	171	116	147	1031
17:00	153	155	147	173	184	162	159	134	157	1105
18:00	143	144	142	165	141	147	126	135	142	996
19:00	118	114	140	121	149	128	144	157	134	943
20:00	114	103	117	107	115	111	142	139	119	837
21:00	91	90	98	109	97	97	118	123	103	726
22:00	56	80	91	72	98	79	80	76	79	553
23:00	35	37	46	71	70	51	70	55	54	384
24:00	29	29	25	35	41	31	57	27	34	243
TOTALS	1954	1120	2032	2100	2218	2048	2162	1902	2034	13488
% AVG WKDY	95.4	54.6	99.2	102.5	108.3		105.5	92.8		
% AVG WEEK	96	55	99.9	103.2	109		106.2	93.5		
AM Times	08:00		08:00	08:00	12:00	08:00	12:00	12:00	12:00	
AM Peaks	170		172	140	123	146	140	131	111	
PM Times	17:00	17:00	17:00	17:00	17:00	17:00	16:00	19:00	17:00	
PM Peaks	153	155	147	173	184	162	171	157	157	

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 AWD 2048
 FAC .97(.93)
 ADT 1,800

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

Page: 1

STA. 11 EB

Site Reference: 180060000742
 Site ID: 000000110304
 Location: BRADLEE RD. WEST OF RTE.138
 Direction: EAST

File: V11.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	12		20	19	22	18	23	27	20	123
02:00	4		2	4	13	5	14	20	9	57
03:00	2		4	2	6	3	13	10	6	37
04:00	6		1	0	1	2	9	8	4	25
05:00	7		6	3	7	5	5	4	5	32
06:00	19		18	26	20	20	5	4	15	92
07:00	57		48	52	50	51	10	9	37	226
08:00	101		108	79	48	84	19	11	61	366
09:00	77		81	72	67	74	32	31	60	360
10:00	47		71	55	58	57	49	41	53	321
11:00	42		59	45	50	49	65	61	53	322
12:00	52		45	61	70	57	72	56	59	356
13:00	50		56	70	63	59	83	75	66	397
14:00	66	51	65	68	67	63	86	80	69	483
15:00	77	76	70	68	92	76	84	86	79	553
16:00	71	79	90	82	92	82	98	69	83	581
17:00	90	79	76	98	104	89	84	67	85	598
18:00	83	64	69	84	74	74	82	74	75	530
19:00	67	50	74	62	88	68	89	79	72	509
20:00	61	56	67	66	65	63	89	81	69	485
21:00	58	61	61	75	53	61	69	67	63	444
22:00	34	48	53	43	54	46	42	49	46	323
23:00	22	20	20	38	46	29	46	33	32	225
24:00	16	16	16	25	28	20	36	13	21	150
TOTALS	1121	600	1180	1197	1238	1155	1204	1055	1142	7595
% AVG WKDY	97	51.9	102.1	103.6	107.1		104.2	91.3		
% AVG WEEK	98.1	52.5	103.3	104.8	108.4		105.4	92.3		
AM Times	08:00		08:00	08:00	12:00	08:00	12:00	11:00	08:00	
AM Peaks	101		108	79	70	84	72	61	61	
PM Times	17:00	16:00	16:00	17:00	17:00	17:00	16:00	15:00	17:00	
PM Peaks	90	79	90	98	104	89	98	86	85	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

Page: 2

STA. 11 WB

Site Reference: 180060000742
 Site ID: 000000110304
 Location: BRADLEE RD. WEST OF RTE.138
 Direction: WEST

File: V11.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	8		6	6	16	9	10	13	9	59
02:00	6		1	2	1	2	10	10	5	30
03:00	1		2	4	2	2	9	6	4	24
04:00	3		0	1	3	1	4	2	2	13
05:00	9		10	9	12	10	5	2	7	47
06:00	20		14	16	13	15	5	5	12	73
07:00	36		36	44	33	37	13	9	28	171
08:00	69		64	61	54	62	31	15	49	294
09:00	44		47	50	50	47	43	32	44	266
10:00	40		39	51	51	45	70	30	46	281
11:00	36		38	40	64	44	60	47	47	285
12:00	32		35	51	53	42	68	75	52	314
13:00	39		47	58	55	49	52	60	51	311
14:00	59	41	38	38	52	45	83	56	52	367
15:00	54	61	50	53	49	53	63	55	55	385
16:00	69	60	55	57	89	66	73	47	64	450
17:00	63	76	71	75	80	73	75	67	72	507
18:00	60	80	73	81	67	72	44	61	66	466
19:00	51	64	66	59	61	60	55	78	62	434
20:00	53	47	50	41	50	48	53	58	50	352
21:00	33	29	37	34	44	35	49	56	40	282
22:00	22	32	38	29	44	33	38	27	32	230
23:00	13	17	26	33	24	22	24	22	22	159
24:00	13	13	9	10	13	11	21	14	13	93
TOTALS	833	520	852	903	980	883	958	847	884	5893
% AVG WKDY	94.3	58.8	96.4	102.2	110.9		108.4	95.9		
% AVG WEEK	94.2	58.8	96.3	102.1	110.8		108.3	95.8		
AM Times	08:00		08:00	08:00	11:00	08:00	10:00	12:00	12:00	
AM Peaks	69		64	61	64	62	70	75	52	
PM Times	16:00	18:00	18:00	18:00	16:00	17:00	14:00	19:00	17:00	
PM Peaks	69	80	73	81	89	73	83	78	72	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

STA. 12

TOTAL

Site Reference: 180060000863
 Site ID: 000000120304
 Location: ATHERTON ST. EAST OF RTE.138
 Direction: ROAD TOTAL

File: V12.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	15		12	22	15	16	22	17	17	103
02:00	3		6	6	12	6	13	11	8	51
03:00	3		3	2	5	3	7	17	6	37
04:00	5		2	1	2	2	7	7	4	24
05:00	8		9	4	6	6	5	7	6	39
06:00	33		29	41	24	31	6	6	23	139
07:00	74		75	81	60	72	18	19	54	327
08:00	201		150	150	96	149	41	15	108	653
09:00	139		156	168	108	142	48	34	108	653
10:00	106		119	117	100	110	81	45	94	568
11:00	85		92	75	85	84	90	71	83	498
12:00	77		85	113	97	93	98	102	95	572
13:00	88		106	106	128	107	93	71	98	592
14:00	101	79	83	93	133	97	139	94	103	722
15:00	108	129	112	126	125	120	108	87	113	795
16:00	146	150	156	158	198	161	109	83	142	1000
17:00	163	191	179	193	217	188	83	72	156	1098
18:00	117	186	161	163	155	156	92	105	139	979
19:00	120	107	139	144	114	124	89	101	116	814
20:00	69	80	97	99	66	82	66	103	82	580
21:00	61	70	82	72	61	69	58	84	69	488
22:00	34	54	52	72	50	52	55	56	53	373
23:00	26	32	34	37	52	36	38	37	36	256
24:00	16	27	19	31	30	24	32	15	24	170
TOTALS	1798	1105	1958	2074	1939	1930	1398	1259	1737	11531
% AVG WKDY	93.1	57.2	101.4	107.4	100.4		72.4	65.2		
% AVG WEEK	103.5	63.6	112.7	119.4	111.6		80.4	72.4		
AM Times	08:00		09:00	09:00	09:00	08:00	12:00	12:00	08:00	
AM Peaks	201		156	168	108	149	98	102	108	
PM Times	17:00	17:00	17:00	17:00	17:00	17:00	14:00	18:00	17:00	
PM Peaks	163	191	179	193	217	188	139	105	156	

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AWD 1930

FAC .97(.93)

ADT 1,700

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

Page: 1

STA. 12 EB

Site Reference: 180060000863
 Site ID: 000000120304
 Location: ATHERTON ST. EAST OF RTE.138
 Direction: EAST

File: V12.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	6		3	7	1	4	6	2	4	25
02:00	1		0	0	4	1	4	4	2	13
03:00	1		0	0	2	0	3	7	2	13
04:00	1		0	0	1	0	0	2	0	4
05:00	6		3	2	4	3	3	2	3	20
06:00	13		9	13	7	10	4	3	8	49
07:00	16		19	24	14	18	8	9	15	90
08:00	56		40	44	30	42	19	7	32	196
09:00	31		32	49	30	35	18	13	28	173
10:00	30		29	33	43	33	38	21	32	194
11:00	29		38	28	38	33	33	27	32	193
12:00	37		29	37	43	36	39	46	38	231
13:00	39		39	40	59	44	28	24	38	229
14:00	45	34	25	36	55	39	67	29	41	291
15:00	46	63	47	60	57	54	40	31	49	344
16:00	68	73	61	78	129	81	40	28	68	477
17:00	67	100	102	101	130	100	40	26	80	566
18:00	47	93	84	73	89	77	32	32	64	450
19:00	62	53	68	87	48	63	35	25	54	378
20:00	29	29	35	37	28	31	21	29	29	208
21:00	23	24	29	19	23	23	18	24	22	160
22:00	15	19	14	30	17	19	19	12	18	126
23:00	5	16	12	14	13	12	13	8	11	81
24:00	4	14	6	7	5	7	8	4	6	48
TOTALS	677	518	724	819	870	765	536	415	676	4559
% AVG WKDY	88.4	67.7	94.6	107	113.7		70	54.2		
% AVG WEEK	100.1	76.6	107.1	121.1	128.6		79.2	61.3		
AM Times	08:00		08:00	09:00	10:00	08:00	12:00	12:00	12:00	
AM Peaks	56		40	49	43	42	39	46	38	
PM Times	16:00	17:00	17:00	17:00	17:00	17:00	14:00	18:00	17:00	
PM Peaks	68	100	102	101	130	100	67	32	80	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

STA. 12WB

Site Reference: 180060000863
 Site ID: 000000120304
 Location: ATHERTON ST. EAST OF RTE.138
 Direction: WEST

File: V12.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	9		9	15	14	11	16	15	13	78
02:00	2		6	6	8	5	9	7	6	38
03:00	2		3	2	3	2	4	10	4	24
04:00	4		2	1	1	2	7	5	3	20
05:00	2		6	2	2	3	2	5	3	19
06:00	20		20	28	17	21	2	3	15	90
07:00	58		56	57	46	54	10	10	39	237
08:00	145		110	106	66	106	22	8	76	457
09:00	108		124	119	78	107	30	21	80	480
10:00	76		90	84	57	76	43	24	62	374
11:00	56		54	47	47	51	57	44	50	305
12:00	40		56	76	54	56	59	56	56	341
13:00	49		67	66	69	62	65	47	60	363
14:00	56	45	58	57	78	58	72	65	61	431
15:00	62	66	65	66	68	65	68	56	64	451
16:00	78	77	95	80	69	79	69	55	74	523
17:00	96	91	77	92	87	88	43	46	76	532
18:00	70	93	77	90	66	79	60	73	75	529
19:00	58	54	71	57	66	61	54	76	62	436
20:00	40	51	62	62	38	50	45	74	53	372
21:00	38	46	53	53	38	45	40	60	46	328
22:00	19	35	38	42	33	33	36	44	35	247
23:00	21	16	22	23	39	24	25	29	25	175
24:00	12	13	13	24	25	17	24	11	17	122

TOTALS	1121	587	1234	1255	1069	1155	862	844	1055	6972

% AVG WKDY	97	50.8	106.8	108.6	92.5		74.6	73		
% AVG WEEK	106.2	55.6	116.9	118.9	101.3		81.7	80		

AM Times	08:00		09:00	09:00	09:00	09:00	12:00	12:00	09:00	
AM Peaks	145		124	119	78	107	59	56	80	

PM Times	17:00	18:00	16:00	17:00	17:00	17:00	14:00	19:00	17:00	
PM Peaks	96	93	95	92	87	88	72	76	76	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 13 NB

Site Reference: 180060000787
 Site ID: 000000001301
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: NORTH

File: SPD1301.prn
 City: MILTON
 County: SPEED NB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	75		77	82	85	79	150	142	101	611
02:00	38		35	38	74	46	69	108	60	362
03:00	28		25	28	35	29	77	93	47	286
04:00	37		26	33	32	32	71	63	43	262
05:00	65		67	50	76	64	48	33	56	339
06:00	299		304	309	254	291	74	51	215	1291
07:00	412		451	430	399	423	149	97	323	1938
08:00	501		488	480	423	473	204	136	372	2232
09:00	411		467	451	419	437	314	208	378	2270
10:00	376		427	392	343	384	344	327	368	2209
11:00	322		339	387	313	340	373	397	355	2131
12:00	291		305	341	360	324	353	357	334	2007
13:00	282		325	308	371	321	367	349	333	2002
14:00	269	304	314	310	389	317	409	378	339	2373
15:00	302	369	328	328	372	339	401	387	355	2487
16:00	360	390	380	450	389	393	395	382	392	2746
17:00	379	400	367	410	432	397	434	373	399	2795
18:00	399	448	399	444	439	425	352	371	407	2852
19:00	330	394	379	417	448	393	376	438	397	2782
20:00	269	259	343	318	299	297	349	460	328	2297
21:00	238	282	302	297	291	282	292	392	299	2094
22:00	227	226	272	257	288	254	291	321	268	1882
23:00	164	184	216	220	276	212	288	203	221	1551
24:00	103	114	126	159	178	136	224	152	150	1056
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TOTALS	6177	3370	6762	6939	6985	6688	6404	6218	6540	42855
% AVG WKDY	92.3	50.3	101.1	103.7	104.4		95.7	92.9		
% AVG WEEK	94.4	51.5	103.3	106.1	106.8		97.9	95		
AM Times	08:00		08:00	08:00	08:00	08:00	11:00	11:00	09:00	
AM Peaks	501		488	480	423	473	373	397	378	
PM Times	18:00	18:00	18:00	16:00	19:00	18:00	17:00	20:00	18:00	
PM Peaks	399	448	399	450	448	425	434	460	407	

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AWD 13297

FAC .97

ADT 12,900

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 13 SB

Site Reference: 180060000554
 Site ID: 000000001302
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: SOUTH

File: SPD1302.prn
 City: MILTON
 County: SPEED SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	79		63	93	97	83	149	158	106	639
02:00	33		33	36	52	38	115	100	61	369
03:00	28		23	32	55	34	57	85	46	280
04:00	29		32	25	38	31	60	71	42	255
05:00	45		60	65	71	60	51	43	55	335
06:00	147		153	137	135	143	79	38	114	689
07:00	258		292	295	267	278	145	78	222	1335
08:00	422		463	442	392	429	246	145	351	2110
09:00	440		491	438	414	445	305	179	377	2267
10:00	330		294	360	325	327	353	274	322	1936
11:00	283		291	296	354	306	366	311	316	1901
12:00	298		329	345	364	334	321	358	335	2015
13:00	294		350	375	403	355	465	441	388	2328
14:00	327	346	348	337	454	362	442	504	394	2758
15:00	423	473	429	455	411	438	427	525	449	3143
16:00	421	453	417	422	453	433	488	520	453	3174
17:00	347	358	366	373	351	359	459	445	385	2699
18:00	414	398	374	382	366	386	419	399	393	2752
19:00	340	372	431	415	379	387	435	373	392	2745
20:00	304	351	410	405	404	374	389	411	382	2674
21:00	278	308	331	329	350	319	351	414	337	2361
22:00	220	289	281	311	343	288	265	286	285	1995
23:00	188	213	211	228	317	231	304	227	241	1688
24:00	143	134	158	177	233	169	249	155	178	1249
TOTALS	6091	3695	6630	6773	7028	6609	6940	6540	6624	43697
% AVG WKDY	92.1	55.9	100.3	102.4	106.3		105	98.9		
% AVG WEEK	91.9	55.7	100	102.2	106		104.7	98.7		
AM Times	09:00		09:00	08:00	09:00	09:00	11:00	12:00	09:00	
AM Peaks	440		491	442	414	445	366	358	377	
PM Times	15:00	15:00	19:00	15:00	14:00	15:00	16:00	15:00	16:00	
PM Peaks	423	473	431	455	454	438	488	525	453	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 14 EB

Site Reference: 180060000448
 Site ID: 000000001403
 Location: Robbins St. EB, east of Rte.138
 Direction: EAST

File: D0327029.prn
 City: Milton
 County: Volume EB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	3		0	4	4	2	7	4	3	22
02:00	1		1	0	0	0	2	3	1	7
03:00	1		1	0	0	0	2	1	0	5
04:00	0		1	1	1	0	0	3	1	6
05:00	1		0	0	3	1	0	1	0	5
06:00	4		6	2	6	4	1	3	3	22
07:00	8		7	18	7	10	6	3	8	49
08:00	38		39	37	31	36	18	10	28	173
09:00	46		42	42	47	44	30	10	36	217
10:00	26		36	43	34	34	24	22	30	185
11:00	26		17	23	39	26	37	22	27	164
12:00	24		54	27	38	35	33	33	34	209
13:00	29		46	29	41	36	32	27	34	204
14:00	32	34	33	29	56	36	35	34	36	253
15:00	31	36	30	33	37	33	32	26	32	225
16:00	44	46	48	57	48	48	34	24	43	301
17:00	59	57	66	54	29	53	32	32	47	329
18:00	55	82	51	60	41	57	43	22	50	354
19:00	30	52	48	48	35	42	26	26	37	265
20:00	20	31	32	36	23	28	22	27	27	191
21:00	10	11	15	17	21	14	19	19	16	112
22:00	9	12	17	19	17	14	16	7	13	97
23:00	12	9	6	9	13	9	9	3	8	61
24:00	1	2	3	4	4	2	9	6	4	29
TOTALS	510	372	599	592	575	564	469	368	518	3485
% AVG WKDY	90.4	65.9	106.2	104.9	101.9		83.1	65.2		
% AVG WEEK	98.4	71.8	115.6	114.2	111		90.5	71		
AM Times	09:00		12:00	10:00	09:00	09:00	11:00	12:00	09:00	
AM Peaks	46		54	43	47	44	37	33	36	
PM Times	17:00	18:00	17:00	18:00	14:00	18:00	18:00	14:00	18:00	
PM Peaks	59	82	66	60	56	57	43	34	50	

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AWD 1215

FAC .97(.93)

ADT 1,100

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 14 WB

Site Reference: 180060000668

Site ID: 000000001404

Location: Robbins St. WB, east of Rte.138

Direction: WEST

File: D0327030.prn

City: Milton

County: Volume WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	5		1	3	5	3	3	5	3	22
02:00	2		1	0	2	1	4	7	2	16
03:00	1		1	0	1	0	1	2	1	6
04:00	1		1	1	1	1	0	2	1	6
05:00	1		0	3	3	1	0	2	1	9
06:00	3		4	2	4	3	2	3	3	18
07:00	12		20	11	8	12	2	6	9	59
08:00	59		68	64	34	56	18	4	41	247
09:00	67		62	70	56	63	26	15	49	296
10:00	36		39	48	37	40	35	21	36	216
11:00	18		34	27	50	32	37	19	30	185
12:00	32		37	35	36	35	50	37	37	227
13:00	29		31	32	49	35	49	46	39	236
14:00	31	28	27	42	43	34	34	32	33	237
15:00	39	35	35	40	53	40	37	29	38	268
16:00	48	47	49	59	41	48	49	31	46	324
17:00	58	66	59	74	43	60	42	33	53	375
18:00	44	53	49	57	51	50	38	33	46	325
19:00	44	33	51	49	45	44	35	32	41	289
20:00	25	36	29	30	29	29	20	22	27	191
21:00	16	39	39	32	26	30	27	23	28	202
22:00	12	17	18	20	25	18	24	9	17	125
23:00	11	8	9	10	20	11	10	10	11	78
24:00	4	3	8	8	5	5	12	4	6	44
TOTALS	598	365	672	717	667	651	555	427	598	4001
% AVG WKDY	91.8	56	103.2	110.1	102.4		85.2	65.5		
% AVG WEEK	100	61	112.3	119.8	111.5		92.8	71.4		
AM Times	09:00		08:00	09:00	09:00	09:00	12:00	12:00	09:00	
AM Peaks	67		68	70	56	63	50	37	49	
PM Times	17:00	17:00	17:00	17:00	15:00	17:00	13:00	13:00	17:00	
PM Peaks	58	66	59	74	53	60	49	46	53	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

Page: 1

Site Reference: 180060000400
 Site ID: 000000150304
 Location: ROBBINS ST. WEST OF RTE. 138
 Direction: ROAD TOTAL

STA. 15
 TOTAL

File: V15.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	3		1	5	7	4	9	12	6	37
02:00	1		1	0	2	1	5	7	2	16
03:00	1		0	0	1	0	4	2	1	8
04:00	0		1	0	0	0	3	3	1	7
05:00	1		0	1	1	0	0	0	0	3
06:00	6		4	5	7	5	2	0	4	24
07:00	19		24	29	10	20	5	7	15	94
08:00	78		78	65	60	70	25	22	54	328
09:00	65		88	77	67	74	42	24	60	363
10:00	44		52	49	53	49	45	30	45	273
11:00	34		49	38	53	43	72	44	48	290
12:00	32		53	48	70	50	75	70	58	348
13:00	40		31	52	61	46	65	59	51	308
14:00	50	53	50	39	59	50	50	57	51	358
15:00	49	63	54	52	59	55	44	67	55	388
16:00	61	65	63	85	70	68	68	57	67	469
17:00	77	91	83	78	61	78	64	66	74	520
18:00	65	100	74	74	84	79	61	41	71	499
19:00	71	70	80	81	61	72	60	33	65	456
20:00	31	60	56	48	47	48	28	45	45	315
21:00	20	29	29	41	34	30	28	36	31	217
22:00	14	27	24	32	30	25	35	12	24	174
23:00	6	12	7	11	20	11	18	11	12	85
24:00	6	4	8	12	7	7	20	10	9	67
TOTALS	774	574	910	922	924	885	828	715	849	5647
% AVG WKDY	87.4	64.8	102.8	104.1	104.4		93.5	80.7		
% AVG WEEK	91.1	67.6	107.1	108.5	108.8		97.5	84.2		
AM Times	08:00		09:00	09:00	12:00	09:00	12:00	12:00	09:00	
AM Peaks	78		88	77	70	74	75	70	60	
PM Times	17:00	18:00	17:00	16:00	18:00	18:00	16:00	15:00	17:00	
PM Peaks	77	100	83	85	84	79	68	67	74	

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AWD 885

FAC .97(.93)

ADT 800

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

Page: 1

STA 15 EB

Site Reference: 180060000400
 Site ID: 000000150304
 Location: ROBBINS ST. WEST OF RTE. 138
 Direction: EAST

File: V15.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	1		0	2	3	1	6	5	2	17
02:00	0		0	0	0	0	2	2	0	4
03:00	1		0	0	0	0	1	1	0	3
04:00	0		0	0	0	0	1	2	0	3
05:00	0		0	0	0	0	0	0	0	0
06:00	2		3	2	3	2	1	0	1	11
07:00	9		8	15	4	9	4	4	7	44
08:00	36		31	29	35	32	14	18	27	163
09:00	27		44	33	29	33	25	10	28	168
10:00	17		22	24	30	23	19	14	21	126
11:00	19		17	17	28	20	37	18	22	136
12:00	16		28	23	30	24	39	30	27	166
13:00	16		13	23	30	20	26	20	21	128
14:00	23	30	28	19	25	25	28	30	26	183
15:00	17	33	27	23	24	24	20	24	24	168
16:00	30	30	26	40	35	32	33	24	31	218
17:00	33	35	34	32	24	31	22	30	30	210
18:00	34	52	37	32	37	38	29	22	34	243
19:00	27	41	35	39	25	33	28	17	30	212
20:00	14	23	33	27	22	23	12	23	22	154
21:00	7	6	8	13	15	9	16	13	11	78
22:00	4	6	8	14	14	9	14	4	9	64
23:00	3	4	3	3	4	3	7	3	3	27
24:00	1	1	1	5	4	2	10	7	4	29
TOTALS	337	261	406	415	421	393	394	321	380	2555
% AVG WKDY	85.7	66.4	103.3	105.5	107.1		100.2	81.6		
% AVG WEEK	88.6	68.6	106.8	109.2	110.7		103.6	84.4		
AM Times	08:00		09:00	09:00	08:00	09:00	12:00	12:00	09:00	
AM Peaks	36		44	33	35	33	39	30	28	
PM Times	18:00	18:00	18:00	16:00	18:00	18:00	16:00	14:00	18:00	
PM Peaks	34	52	37	40	37	38	33	30	34	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

Page: 2

STA. 15 WB

Site Reference: 180060000400
 Site ID: 000000150304
 Location: ROBBINS ST. WEST OF RTE. 138
 Direction: WEST

File: V15.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	2		1	3	4	2	3	7	3	20
02:00	1		1	0	2	1	3	5	2	12
03:00	0		0	0	1	0	3	1	0	5
04:00	0		1	0	0	0	2	1	0	4
05:00	1		0	1	1	0	0	0	0	3
06:00	4		1	3	4	3	1	0	2	13
07:00	10		16	14	6	11	1	3	8	50
08:00	42		47	36	25	37	11	4	27	165
09:00	38		44	44	38	41	17	14	32	195
10:00	27		30	25	23	26	26	16	24	147
11:00	15		32	21	25	23	35	26	25	154
12:00	16		25	25	40	26	36	40	30	182
13:00	24		18	29	31	25	39	39	30	180
14:00	27	23	22	20	34	25	22	27	25	175
15:00	32	30	27	29	35	30	24	43	31	220
16:00	31	35	37	45	35	36	35	33	35	251
17:00	44	56	49	46	37	46	42	36	44	310
18:00	31	48	37	42	47	41	32	19	36	256
19:00	44	29	45	42	36	39	32	16	34	244
20:00	17	37	23	21	25	24	16	22	23	161
21:00	13	23	21	28	19	20	12	23	19	139
22:00	10	21	16	18	16	16	21	8	15	110
23:00	3	8	4	8	16	7	11	8	8	58
24:00	5	3	7	7	3	5	10	3	5	38
TOTALS	437	313	504	507	503	484	434	394	458	3092
% AVG WKDY	90.2	64.6	104.1	104.7	103.9		89.6	81.4		
% AVG WEEK	95.4	68.3	110	110.6	109.8		94.7	86		
AM Times	08:00		08:00	09:00	12:00	09:00	12:00	12:00	09:00	
AM Peaks	42		47	44	40	41	36	40	32	
PM Times	17:00	17:00	17:00	17:00	18:00	17:00	17:00	15:00	17:00	
PM Peaks	44	56	49	46	47	46	42	43	44	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

STA. 16
 TOTAL

Site Reference: 180060000874
 Site ID: 000000001601
 Location: RTE.138 NORTH OF ROBBINS ST.
 Direction: ROAD TOTAL

File: V16.prn
 City: MILTON
 County: VOLUME NB&SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	151		69	112	107	109	198	296	155	933
02:00	65		48	45	71	57	100	196	87	525
03:00	51		25	34	67	44	83	172	72	432
04:00	66		48	35	43	48	90	116	66	398
05:00	109		70	98	114	97	60	73	87	524
06:00	440		400	405	332	394	101	85	293	1763
07:00	704		673	708	565	662	190	167	501	3007
08:00	962		1020	769	731	870	270	276	671	4028
09:00	911		965	922	823	905	475	348	740	4444
10:00	714		727	658	683	695	655	576	668	4013
11:00	600		623	551	697	617	693	696	643	3860
12:00	596		584	508	676	591	642	705	618	3711
13:00	543		595	476	809	605	830	747	666	4000
14:00	542		487	483	845	589	847	824	671	4028
15:00	599	484	504	554	789	586	823	920	667	4673
16:00	793	718	506	692	830	707	899	883	760	5321
17:00	752	760	529	479	814	666	849	810	713	4993
18:00	800	777	596	490	819	696	785	741	715	5008
19:00	605	665	458	691	850	653	804	803	696	4876
20:00	543	515	430	470	701	531	707	641	572	4007
21:00	494	537	326	362	514	446	621	449	471	3303
22:00	418	469	295	378	469	405	526	329	412	2884
23:00	334	350	257	256	444	328	569	222	347	2432
24:00	244	191	160	192	219	201	460	174	234	1640
TOTALS	12036	5466	10395	10368	13012	11502	12277	11249	11525	74803
% AVG WKDY	104.6	47.5	90.3	90.1	113.1		106.7	97.8		
% AVG WEEK	104.4	47.4	90.1	89.9	112.9		106.5	97.6		
AM Times	08:00		08:00	09:00	09:00	09:00	11:00	12:00	09:00	
AM Peaks	962		1020	922	823	905	693	705	740	
PM Times	18:00	18:00	18:00	16:00	19:00	16:00	16:00	15:00	16:00	
PM Peaks	800	777	596	692	850	707	899	920	760	

U2

AWD 11502

FAL .97 (.95)

ADT 10,600

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 16 NB

Site Reference: 180060000874
 Site ID: 000000001601
 Location: RTE.138 NORTH OF ROBBINS ST.
 Direction: NORTH

File: V16.prn
 City: MILTON
 County: VOLUME NB&SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	83		0	36	24	35	68	157	61	368
02:00	31		11	7	8	14	40	97	32	194
03:00	26		2	6	36	17	10	87	27	167
04:00	29		20	1	14	16	24	65	25	153
05:00	44		5	40	39	32	18	45	31	191
06:00	138		92	101	72	100	23	38	77	464
07:00	253		215	243	160	217	43	74	164	988
08:00	415		477	216	281	347	93	140	270	1622
09:00	450		458	414	386	427	158	154	336	2020
10:00	321		300	230	330	295	293	258	288	1732
11:00	289		266	139	358	263	330	296	279	1678
12:00	305		276	172	332	271	291	347	287	1723
13:00	277		289	168	411	286	452	433	338	2030
14:00	294		163	163	448	267	422	480	328	1970
15:00	291	136	172	229	405	246	413	545	313	2191
16:00	429	323	133	222	434	308	481	503	360	2525
17:00	381	366	133	77	375	266	441	444	316	2217
18:00	412	325	154	51	372	262	414	380	301	2108
19:00	282	289	96	280	385	266	425	361	302	2118
20:00	300	270	100	188	401	251	377	215	264	1851
21:00	274	279	59	96	249	191	340	71	195	1368
22:00	213	256	44	137	200	170	258	15	160	1123
23:00	182	174	51	51	165	124	304	31	136	958
24:00	142	84	42	50	55	74	246	39	94	658
TOTALS	5861	2502	3558	3317	5940	4745	5964	5275	4984	32417
% AVG WKDY	123.5	52.7	74.9	69.9	125.1		125.6	111.1		
% AVG WEEK	117.5	50.2	71.3	66.5	119.1		119.6	105.8		
AM Times	09:00		08:00	09:00	09:00	09:00	11:00	12:00	09:00	
AM Peaks	450		477	414	386	427	330	347	336	
PM Times	16:00	17:00	13:00	19:00	14:00	16:00	16:00	15:00	16:00	
PM Peaks	429	366	289	280	448	308	481	545	360	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

STA. 16 SB

Site Reference: 180060000874
 Site ID: 000000001601
 Location: RTE.138 NORTH OF ROBBINS ST.
 Direction: SOUTH

File: V16.prn
 City: MILTON
 County: VOLUME NB&SB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	68		69	76	83	74	130	139	94	565
02:00	34		37	38	63	43	60	99	55	331
03:00	25		23	28	31	26	73	85	44	265
04:00	37		28	34	29	32	66	51	40	245
05:00	65		65	59	75	65	42	28	55	333
06:00	302		308	304	260	293	78	47	216	1299
07:00	451		458	465	405	444	147	93	336	2019
08:00	547		543	553	450	523	177	136	401	2406
09:00	461		507	508	437	478	317	194	404	2424
10:00	393		427	428	353	400	362	318	380	2281
11:00	311		357	412	339	354	363	400	363	2182
12:00	291		308	336	344	319	351	358	331	1988
13:00	266		306	308	398	319	378	314	328	1970
14:00	248		324	320	397	322	425	344	343	2058
15:00	308	348	332	325	384	339	410	375	354	2482
16:00	364	395	373	470	396	399	418	380	399	2796
17:00	371	394	396	402	439	400	408	366	396	2776
18:00	388	452	442	439	447	433	371	361	414	2900
19:00	323	376	362	411	465	387	379	442	394	2758
20:00	243	245	330	282	300	280	330	426	308	2156
21:00	220	258	267	266	265	255	281	378	276	1935
22:00	205	213	251	241	269	235	268	314	251	1761
23:00	152	176	206	205	279	203	265	191	210	1474
24:00	102	107	118	142	164	126	214	135	140	982
TOTALS	6175	2964	6837	7051	7072	6749	6313	5974	6532	42386
% AVG WKDY	91.4	43.9	101.3	104.4	104.7		93.5	88.5		
% AVG WEEK	94.5	45.3	104.6	107.9	108.2		96.6	91.4		
AM Times	08:00		08:00	08:00	08:00	08:00	11:00	11:00	09:00	
AM Peaks	547		543	553	450	523	363	400	404	
PM Times	18:00	18:00	18:00	16:00	19:00	18:00	14:00	19:00	18:00	
PM Peaks	388	452	442	470	465	433	425	442	414	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

STA. 18
 TOTAL

Site Reference: 180060000513
 Site ID: 000000180304
 Location: BLUE HILL TERRACE ST. EAST OF RTE.138
 Direction: ROAD TOTAL

File: V18.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	10		12	9	17	12	18	22	14	88
02:00	3		4	5	8	5	11	17	8	48
03:00	8		2	4	4	4	8	8	5	34
04:00	8		6	4	5	5	7	3	5	33
05:00	6		9	5	7	6	1	3	5	31
06:00	21		16	19	16	18	6	5	13	83
07:00	64		81	65	51	65	16	9	47	286
08:00	230		243	246	93	203	36	30	146	878
09:00	169		179	167	111	156	56	45	121	727
10:00	64		94	101	80	84	82	63	80	484
11:00	74		76	89	77	79	114	77	84	507
12:00	60		70	81	107	79	114	87	86	519
13:00	70		79	91	101	85	100	79	86	520
14:00	84		82	75	104	86	112	109	94	566
15:00	132	124	133	108	97	118	89	83	109	766
16:00	137	126	167	137	119	137	105	91	126	882
17:00	147	165	151	141	125	145	105	77	130	911
18:00	165	171	161	153	142	158	99	78	138	969
19:00	129	141	137	137	131	135	76	79	118	830
20:00	82	79	91	84	95	86	102	95	89	628
21:00	65	73	67	94	76	75	66	52	70	493
22:00	37	58	50	50	73	53	50	42	51	360
23:00	22	25	33	37	55	34	43	32	35	247
24:00	24	18	19	27	21	21	36	11	22	156
<hr/>										
TOTALS	1811	980	1962	1929	1715	1849	1452	1197	1682	11046
% AVG WKDY	97.9	53	106.1	104.3	92.7		78.5	64.7		
% AVG WEEK	107.6	58.2	116.6	114.6	101.9		86.3	71.1		
AM Times	08:00		08:00	08:00	09:00	08:00	11:00	12:00	08:00	
AM Peaks	230		243	246	111	203	114	87	146	
PM Times	18:00	18:00	16:00	18:00	18:00	18:00	14:00	14:00	18:00	
PM Peaks	165	171	167	153	142	158	112	109	138	

uo
 AWD 1849
 FAC .97(.93)
 ADT 1,700

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

STA. 18 EB

Site Reference: 180060000513
 Site ID: 000000180304
 Location: BLUE HILL TERRACE ST. EAST OF RTE.138
 Direction: EAST

File: V18.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	2		2	2	8	3	10	11	5	35
02:00	1		4	4	3	3	3	7	3	22
03:00	3		0	2	0	1	2	3	1	10
04:00	2		2	1	1	1	2	1	1	9
05:00	3		2	4	2	2	0	1	2	12
06:00	6		7	5	5	5	1	3	4	27
07:00	21		27	16	16	20	7	6	15	93
08:00	89		90	88	36	75	13	14	55	330
09:00	58		53	56	43	52	25	19	42	254
10:00	25		34	47	32	34	32	24	32	194
11:00	33		33	40	43	37	48	36	38	233
12:00	26		23	25	40	28	44	27	30	185
13:00	28		38	39	41	36	45	32	37	223
14:00	39		25	37	54	38	52	55	43	262
15:00	58	62	63	41	50	54	46	36	50	356
16:00	69	54	75	71	65	66	41	51	60	426
17:00	70	75	70	77	61	70	55	33	63	441
18:00	83	92	94	78	72	83	44	40	71	503
19:00	67	86	74	73	69	73	37	32	62	438
20:00	39	33	40	38	40	38	52	47	41	289
21:00	32	32	37	47	35	36	23	16	31	222
22:00	19	28	26	23	35	26	23	21	25	175
23:00	6	13	12	19	26	15	20	11	15	107
24:00	16	12	10	14	12	12	15	4	11	83
TOTALS	795	487	841	847	789	808	640	530	737	4929
% AVG WKDY	98.3	60.2	104	104.8	97.6		79.2	65.5		
% AVG WEEK	107.8	66	114.1	114.9	107		86.8	71.9		
AM Times	08:00		08:00	08:00	09:00	08:00	11:00	11:00	08:00	
AM Peaks	89		90	88	43	75	48	36	55	
PM Times	18:00	18:00	18:00	18:00	18:00	18:00	17:00	14:00	18:00	
PM Peaks	83	92	94	78	72	83	55	55	71	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

STA. 18 WB

Site Reference: 180060000513
 Site ID: 000000180304
 Location: BLUE HILL TERRACE ST. EAST OF RTE.138
 Direction: WEST

File: V18.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	8		10	7	9	8	8	11	8	53
02:00	2		0	1	5	2	8	10	4	26
03:00	5		2	2	4	3	6	5	4	24
04:00	6		4	3	4	4	5	2	4	24
05:00	3		7	1	5	4	1	2	3	19
06:00	15		9	14	11	12	5	2	9	56
07:00	43		54	49	35	45	9	3	32	193
08:00	141		153	158	57	127	23	16	91	548
09:00	111		126	111	68	104	31	26	78	473
10:00	39		60	54	48	50	50	39	48	290
11:00	41		43	49	34	41	66	41	45	274
12:00	34		47	56	67	51	70	60	55	334
13:00	42		41	52	60	48	55	47	49	297
14:00	45		57	38	50	47	60	54	50	304
15:00	74	62	70	67	47	64	43	47	58	410
16:00	68	72	92	66	54	70	64	40	65	456
17:00	77	90	81	64	64	75	50	44	67	470
18:00	82	79	67	75	70	74	55	38	66	466
19:00	62	55	63	64	62	61	39	47	56	392
20:00	43	46	51	46	55	48	50	48	48	339
21:00	33	41	30	47	41	38	43	36	38	271
22:00	18	30	24	27	38	27	27	21	26	185
23:00	16	12	21	18	29	19	23	21	20	140
24:00	8	6	9	13	9	9	21	7	10	73
<hr/>										
TOTALS	1016	493	1121	1082	926	1031	812	667	934	6117
<hr/>										
% AVG WKDY	98.5	47.8	108.7	104.9	89.8		78.7	64.6		
% AVG WEEK	108.7	52.7	120	115.8	99.1		86.9	71.4		
<hr/>										
AM Times	08:00		08:00	08:00	09:00	08:00	12:00	12:00	08:00	
AM Peaks	141		153	158	68	127	70	60	91	
<hr/>										
PM Times	18:00	17:00	16:00	18:00	18:00	17:00	16:00	14:00	17:00	
PM Peaks	82	90	92	75	70	75	64	54	67	

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE
 Starting: 3/27/2018

Site Reference: 180060000756
 Site ID: 000000190304
 Location: OAK ST. EAST OF RTE. 138
 Direction: ROAD TOTAL

STA. 19
 TOTAL

File: V19.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	5		2	0	2	2	2	10	3	21
02:00	1		1	0	1	0	1	3	1	7
03:00	13		0	0	0	3	1	1	2	15
04:00	2		2	1	2	1	3	0	1	10
05:00	0		0	1	1	0	0	2	0	4
06:00	2		1	2	4	2	1	3	2	13
07:00	8		9	8	4	7	1	3	5	33
08:00	32		35	28	15	27	10	4	20	124
09:00	22		26	15	12	18	9	7	15	91
10:00	7		21	11	25	16	11	7	13	82
11:00	9		11	8	11	9	14	14	11	67
12:00	9		14	9	21	13	34	21	18	108
13:00	10		7	20	18	13	15	14	14	84
14:00	13		10	16	18	14	15	25	16	97
15:00	14	12	15	15	10	13	21	20	15	107
16:00	17	24	22	26	14	20	17	16	19	136
17:00	22	11	22	15	19	17	22	15	18	126
18:00	24	27	25	23	19	23	21	13	21	152
19:00	23	18	22	32	20	23	20	12	21	147
20:00	10	26	17	18	23	18	13	9	16	116
21:00	9	17	16	19	17	15	20	11	15	109
22:00	7	14	13	9	22	13	15	4	12	84
23:00	3	5	3	6	11	5	4	10	6	42
24:00	0	3	8	4	7	4	6	1	4	29

TOTALS	262	157	302	286	296	276	276	225	268	1804
% AVG WKDY	94.9	56.8	109.4	103.6	107.2		100	81.5		
% AVG WEEK	97.7	58.5	112.6	106.7	110.4		102.9	83.9		
AM Times	08:00		08:00	08:00	10:00	08:00	12:00	12:00	08:00	
AM Peaks	32		35	28	25	27	34	21	20	
PM Times	18:00	18:00	18:00	19:00	20:00	18:00	17:00	14:00	18:00	
PM Peaks	24	27	25	32	23	23	22	25	21	

UO
 AWD 276
 FAC .97(.93)
 ADT 250

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/27/2018

Page: 1

STA. 19 EB

Site Reference: 180060000756
 Site ID: 000000190304
 Location: OAK ST. EAST OF RTE. 138
 Direction: EAST

File: V19.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	1		0	0	2	0	1	1	0	5
02:00	0		1	0	0	0	1	2	0	4
03:00	7		0	0	0	1	1	0	1	8
04:00	1		1	0	1	0	1	0	0	4
05:00	0		0	1	0	0	0	1	0	2
06:00	1		1	1	3	1	0	1	1	7
07:00	7		6	6	3	5	1	2	4	25
08:00	17		18	15	9	14	6	1	11	66
09:00	9		9	5	9	8	4	4	6	40
10:00	6		13	10	11	10	9	3	8	52
11:00	5		7	3	7	5	8	7	6	37
12:00	3		4	7	11	6	14	12	8	51
13:00	4		6	14	11	8	9	6	8	50
14:00	9		6	4	13	8	9	16	9	57
15:00	6	6	8	3	3	5	10	13	7	49
16:00	8	12	10	10	6	9	9	9	9	64
17:00	12	6	13	9	11	10	12	6	9	69
18:00	19	14	10	15	9	13	10	4	11	81
19:00	13	11	15	11	9	11	10	8	11	77
20:00	4	12	10	11	13	10	10	6	9	66
21:00	7	10	8	6	11	8	9	6	8	57
22:00	3	5	7	4	13	6	8	2	6	42
23:00	2	1	0	3	7	2	3	6	3	22
24:00	0	2	2	1	2	1	1	1	1	9

TOTALS 144 79 155 139 164 141 146 117 136 944

% AVG WKDY 102.1 56 109.9 98.5 116.3 103.5 82.9
 % AVG WEEK 105.8 58 113.9 102.2 120.5 107.3 86

AM Times 08:00 08:00 08:00 10:00 08:00 12:00 12:00 08:00
 AM Peaks 17 18 15 11 14 14 12 11

PM Times 18:00 18:00 19:00 18:00 14:00 18:00 17:00 14:00 18:00
 PM Peaks 19 14 15 15 13 13 12 16 11

MassDOT Highway Division
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/27/2018

STA. 19 WB

Site Reference: 180060000756
 Site ID: 000000190304
 Location: OAK ST. EAST OF RTE. 138
 Direction: WEST

File: V19.prn
 City: MILTON
 County: VOLUME EB&WB

TIME	MON 2	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 31	SUN 1	WEEK AVG	TOTAL
01:00	4		2	0	0	1	1	9	2	16
02:00	1		0	0	1	0	0	1	0	3
03:00	6		0	0	0	1	0	1	1	7
04:00	1		1	1	1	1	2	0	1	6
05:00	0		0	0	1	0	0	1	0	2
06:00	1		0	1	1	0	1	2	1	6
07:00	1		3	2	1	1	0	1	1	8
08:00	15		17	13	6	12	4	3	9	58
09:00	13		17	10	3	10	5	3	8	51
10:00	1		8	1	14	6	2	4	5	30
11:00	4		4	5	4	4	6	7	5	30
12:00	6		10	2	10	7	20	9	9	57
13:00	6		1	6	7	5	6	8	5	34
14:00	4		4	12	5	6	6	9	6	40
15:00	8	6	7	12	7	8	11	7	8	58
16:00	9	12	12	16	8	11	8	7	10	72
17:00	10	5	9	6	8	7	10	9	8	57
18:00	5	13	15	8	10	10	11	9	10	71
19:00	10	7	7	21	11	11	10	4	10	70
20:00	6	14	7	7	10	8	3	3	7	50
21:00	2	7	8	13	6	7	11	5	7	52
22:00	4	9	6	5	9	6	7	2	6	42
23:00	1	4	3	3	4	3	1	4	2	20
24:00	0	1	6	3	5	3	5	0	2	20
TOTALS	118	78	147	147	132	128	130	108	123	860
% AVG WKDY	92.1	60.9	114.8	114.8	103.1		101.5	84.3		
% AVG WEEK	95.9	63.4	119.5	119.5	107.3		105.6	87.8		
AM Times	08:00		08:00	08:00	10:00	08:00	12:00	01:00	08:00	
AM Peaks	15		17	13	14	12	20	9	9	
PM Times	17:00	20:00	18:00	19:00	19:00	16:00	15:00	14:00	16:00	
PM Peaks	10	14	15	21	11	11	11	9	10	

MassDOT Highway Division
 SPEED SUMMARY
 Tue 3/27/2018

Site Reference: 180060000535
 Site ID: 000000000501
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: NORTH
 Lane: 1

STA. 5 NB

File: SPD501.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
12:00	35	80	305	133	12	0	0	0	0	1	0	0	0	0	1	567
13:00	32	100	321	153	11	1	0	0	0	0	0	0	0	0	0	618
14:00	17	126	318	139	8	1	0	1	0	0	1	0	0	0	3	614
15:00	26	180	355	117	20	0	0	0	0	0	0	2	0	0	0	700
16:00	30	148	422	115	10	0	0	0	0	3	0	1	0	0	0	729
17:00	21	175	362	88	2	0	0	0	0	2	0	0	2	0	2	654
18:00	11	180	400	85	9	0	0	0	0	0	0	0	0	0	2	687
19:00	16	106	388	136	6	0	0	0	0	0	1	0	0	0	1	654
20:00	3	96	258	136	12	2	0	0	0	0	0	0	0	0	0	507
21:00	6	109	258	81	15	0	0	0	0	0	2	0	0	0	0	471
22:00	4	55	233	96	8	0	0	0	0	0	0	0	0	0	0	396
23:00	2	31	151	119	20	2	0	0	0	0	0	0	0	0	0	325
24:00	0	11	89	87	14	2	1	0	0	0	0	0	0	0	0	204
DAY TOTAL	203	1397	3860	1485	147	8	1	1	0	6	4	3	2	0	9	7126
PERCENTS	2.9%	19.7%	54.2%	20.9%	2.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	100%

Statistical Information...

15th Percentile Speed
 22.1 mph

85th Percentile Speed
 31.0 mph

Median Speed
 26.6 mph

Average Speed
 26.4 mph

10 MPH Pace Speed
 24 mph to 34 mph
 5345 vehicles in pace
 Representing 75.0% of the total vehicles

Vehicles > 65 MPH
 18
 0.3%

MassDOT Highway Division
 SPEED SUMMARY
 Wed 3/28/2018

Site Reference: 180060000535
 Site ID: 000000000501
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: NORTH
 Lane: 1

File: SPD501.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	1	44	53	13	1	0	0	0	0	0	0	0	0	0	112
02:00	0	2	19	27	13	2	0	0	0	0	0	0	0	0	0	63
03:00	1	3	14	23	5	2	0	0	0	0	0	0	0	0	0	48
04:00	0	1	18	22	11	3	0	0	0	0	0	0	0	0	0	55
05:00	0	15	43	95	26	4	0	0	0	0	0	0	0	0	0	183
06:00	29	140	355	125	14	2	0	0	0	0	0	0	0	0	0	665
07:00	46	294	438	81	8	0	0	0	0	2	0	0	0	0	0	869
08:00	33	348	489	81	2	1	0	0	0	0	0	0	0	0	0	954
09:00	19	240	536	106	4	1	0	0	0	0	0	1	0	0	0	907
10:00	44	246	414	86	4	1	0	0	0	3	0	0	0	0	0	798
11:00	26	173	364	100	10	2	0	0	0	0	2	0	0	0	2	679
12:00	12	67	351	128	9	0	0	0	0	0	0	0	0	0	0	567
13:00	8	100	375	116	10	0	0	0	0	0	0	0	0	0	0	609
14:00	17	126	377	135	13	0	1	0	0	1	0	0	0	0	0	670
15:00	4	122	383	149	13	0	0	0	0	2	0	2	0	0	0	675
16:00	11	195	402	98	6	0	0	0	0	1	0	0	0	0	0	713
17:00	33	219	351	82	7	0	0	0	0	0	0	0	0	0	0	692
18:00	26	152	359	137	6	1	0	2	0	0	0	0	0	1	0	684
19:00	25	150	353	90	5	1	2	0	1	0	0	2	0	0	0	629
20:00	3	133	339	81	7	1	0	0	0	0	0	0	0	0	2	566
21:00	12	125	271	89	16	0	0	0	0	0	0	0	0	0	1	514
22:00	9	80	274	105	9	0	0	0	0	0	0	0	0	0	0	477
23:00	8	20	226	96	12	1	0	0	0	0	0	0	0	0	0	363
24:00	2	8	111	92	13	2	0	0	0	0	0	0	0	0	0	228
DAY TOTAL	368	2960	6906	2197	236	25	3	2	1	9	2	5	0	1	5	12720
PERCENTS	2.9%	23.3%	54.3%	17.3%	1.9%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 21.6 mph

85th Percentile Speed
 30.3 mph

Median Speed
 26.2 mph

Average Speed
 26.0 mph

10 MPH Pace Speed
 19 mph to 29 mph
 9866 vehicles in pace
 Representing 77.5% of the total vehicles

Vehicles > 65 MPH
 13
 0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Thu 3/29/2018

Site Reference: 180060000535
 Site ID: 000000000501
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: NORTH
 Lane: 1

File: SPD501.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	3	27	76	30	1	0	0	0	0	0	0	0	0	0	137
02:00	0	3	19	25	11	1	0	0	0	0	0	0	0	0	0	59
03:00	0	1	14	14	9	4	0	0	0	0	0	0	0	0	0	42
04:00	0	1	18	27	13	3	0	0	0	2	0	0	0	0	0	64
05:00	1	4	68	85	22	2	0	0	0	0	0	2	0	0	0	184
06:00	14	204	292	148	16	3	0	1	0	0	0	0	0	0	0	678
07:00	23	347	450	80	5	0	1	0	1	0	0	0	0	0	0	907
08:00	35	382	429	86	5	1	1	0	0	0	0	0	0	0	0	939
09:00	60	214	492	71	9	0	1	0	0	1	0	1	0	0	0	849
10:00	61	193	394	113	6	1	0	0	1	0	0	0	0	0	0	769
11:00	33	119	348	157	12	0	0	1	2	0	0	0	0	0	0	672
12:00	23	91	359	139	7	0	0	0	0	0	0	0	0	0	0	619
13:00	6	139	339	123	12	0	2	0	0	0	0	0	0	0	0	621
14:00	18	122	369	125	9	0	1	0	0	0	4	2	0	0	2	652
15:00	40	130	368	111	16	0	0	0	0	0	0	0	0	1	0	666
16:00	38	239	429	66	6	0	0	0	1	0	0	0	0	0	0	779
17:00	44	226	372	94	3	1	0	0	0	0	0	0	0	0	0	740
18:00	29	257	358	77	6	0	0	0	0	0	0	0	0	0	2	729
19:00	55	255	288	78	0	0	1	0	0	2	0	0	0	0	2	681
20:00	54	219	191	63	6	0	0	1	1	0	0	1	0	0	2	538
21:00	8	106	302	83	8	2	0	0	0	0	0	0	0	0	2	511
22:00	7	92	283	98	5	0	0	0	0	1	0	0	0	0	1	487
23:00	7	67	174	103	21	2	0	0	0	0	0	0	0	0	0	374
24:00	5	23	126	96	10	2	0	1	0	0	0	2	0	0	0	265
DAY TOTAL	561	3437	6509	2138	247	23	7	4	6	6	4	8	0	1	11	12962
PERCENTS	4.4%	26.6%	50.3%	16.5%	2.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 21.0 mph

85th Percentile Speed
 30.2 mph

Median Speed
 25.9 mph

Average Speed
 25.6 mph

10 MPH Pace Speed
 19 mph to 29 mph
 9946 vehicles in pace
 Representing 76.7% of the total vehicles

Vehicles > 65 MPH
 24
 0.2%

MassDOT Highway Division
 SPEED SUMMARY
 Fri 3/30/2018

Site Reference: 180060000535
 Site ID: 000000000501
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: NORTH
 Lane: 1

File: SPD501.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	3	9	65	58	19	1	0	0	2	0	0	0	0	0	0	157
02:00	2	3	39	42	12	0	1	0	0	0	0	0	0	0	0	99
03:00	1	1	13	23	17	2	0	0	0	0	0	0	0	0	0	57
04:00	0	0	12	27	14	1	0	0	0	0	0	0	0	0	0	54
05:00	2	15	48	84	13	3	0	0	1	0	2	0	0	0	0	168
06:00	17	98	205	173	28	1	0	0	1	0	0	0	0	0	2	525
07:00	43	293	380	107	15	1	1	0	0	0	2	0	0	0	2	844
08:00	34	214	376	103	4	0	1	0	1	1	0	0	0	0	0	734
09:00	30	198	444	112	8	2	0	0	0	0	0	1	0	0	0	795
10:00	11	273	340	95	9	0	0	0	0	0	0	0	0	0	0	728
11:00	3	92	363	191	12	2	1	0	0	0	0	0	0	0	0	664
12:00	32	119	376	158	13	2	0	0	0	0	0	0	0	0	0	700
13:00	43	208	403	102	5	0	0	0	0	0	0	0	0	0	0	761
14:00	21	272	377	69	8	0	0	0	0	0	0	0	0	0	0	747
15:00	37	383	267	56	4	0	0	0	0	0	0	0	0	0	0	747
16:00	8	291	380	60	3	0	0	0	0	0	0	0	0	0	0	742
17:00	139	213	302	54	1	0	0	0	0	0	0	0	0	0	0	709
18:00	77	264	406	58	2	0	0	0	0	0	0	0	0	0	0	807
19:00	14	217	409	137	11	1	0	0	0	0	0	0	0	0	0	789
20:00	14	190	295	76	11	1	0	0	0	0	0	0	0	0	0	587
21:00	2	141	315	92	6	0	0	0	0	0	0	0	0	0	0	556
22:00	3	174	286	86	8	1	0	0	0	0	0	0	0	0	0	558
23:00	6	85	278	91	4	0	0	0	0	0	0	0	0	0	0	464
24:00	0	32	175	109	16	0	0	0	0	0	0	0	0	0	0	332
DAY TOTAL	542	3785	6554	2163	243	18	4	0	5	1	4	1	0	0	4	13324
PERCENTS	4.1%	28.5%	49.2%	16.3%	1.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 20.9 mph

85th Percentile Speed
 30.0 mph

Median Speed
 25.8 mph

Average Speed
 25.5 mph

10 MPH Pace Speed
 19 mph to 29 mph
 10339 vehicles in pace
 Representing 77.5% of the total vehicles

Vehicles > 65 MPH
 9
 0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Sat 3/31/2018

Site Reference: 180060000535
 Site ID: 000000000501
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: NORTH
 Lane: 1

File: SPD501.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	9	73	105	22	0	0	0	0	0	0	0	0	0	0	209
02:00	0	0	34	73	18	3	2	1	0	0	0	0	0	0	0	131
03:00	0	0	35	57	27	2	1	1	0	0	0	0	0	0	0	123
04:00	1	2	23	59	17	2	0	0	0	0	0	0	0	0	0	104
05:00	0	6	31	43	19	2	0	0	0	0	0	0	0	0	0	101
06:00	0	3	57	96	30	3	0	0	0	0	0	0	0	0	0	189
07:00	0	20	146	138	22	2	0	0	0	0	0	0	0	0	0	328
08:00	1	27	224	160	17	4	0	0	0	0	0	0	0	0	0	433
09:00	23	59	274	217	27	3	0	0	0	0	0	0	0	0	0	603
10:00	5	84	339	190	17	1	0	0	0	0	0	0	0	0	0	636
11:00	22	146	309	184	20	0	0	0	0	0	0	0	0	0	0	681
12:00	10	140	345	213	13	0	0	0	0	0	0	0	0	0	0	721
13:00	12	168	405	160	15	2	0	0	0	0	0	0	0	0	0	762
14:00	34	307	385	75	7	0	0	0	0	0	0	0	0	0	0	808
15:00	10	242	460	97	7	0	1	0	0	0	0	0	0	0	0	817
16:00	10	174	503	128	9	2	0	0	0	0	0	0	0	0	0	826
17:00	19	165	464	161	6	0	0	0	0	0	0	0	0	0	0	815
18:00	15	165	354	194	26	0	0	0	0	0	0	0	0	0	0	754
19:00	3	115	434	208	19	0	0	0	0	0	0	0	0	0	0	779
20:00	4	164	372	102	10	0	0	0	0	0	0	0	0	0	0	652
21:00	9	163	355	76	6	0	0	0	0	0	0	0	0	0	0	609
22:00	10	124	295	91	8	1	0	0	0	0	0	0	0	0	0	529
23:00	1	43	307	119	10	2	0	0	0	0	0	0	0	0	0	482
24:00	1	51	193	120	24	1	0	0	0	0	0	0	0	0	0	390

DAY TOTAL	190	2377	6417	3066	396	30	4	2	0	0	0	0	0	0	0	12482
PERCENTS	1.6%	19.1%	51.5%	24.5%	3.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
22.5 mph

85th Percentile Speed
31.7 mph

Median Speed
26.9 mph

Average Speed
26.9 mph

10 MPH Pace Speed
24 mph to 34 mph
9483 vehicles in pace
Representing 75.9% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Sun 4/1/2018

Site Reference: 180060000535
 Site ID: 000000000501
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: NORTH
 Lane: 1

File: SPD501.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	2	8	137	104	17	0	0	0	0	0	0	0	0	0	0	268
02:00	0	8	72	72	30	1	2	0	0	0	0	0	0	0	0	185
03:00	1	1	43	55	13	5	1	1	0	0	1	0	0	0	0	121
04:00	0	2	32	42	13	1	0	1	0	0	0	0	0	0	0	91
05:00	0	1	17	36	13	3	0	1	0	0	0	0	0	0	0	71
06:00	0	0	28	39	18	4	0	0	0	0	0	0	0	0	0	89
07:00	0	0	45	77	46	6	0	0	0	0	0	0	0	2	0	176
08:00	0	7	76	127	39	6	1	0	0	0	0	0	0	0	0	256
09:00	1	9	94	200	57	5	1	0	0	0	0	0	0	0	0	367
10:00	0	16	286	224	36	5	0	0	0	0	0	0	0	0	0	567
11:00	5	69	364	261	37	1	0	0	0	0	0	0	0	0	0	737
12:00	4	69	368	258	38	2	0	0	0	0	0	0	0	0	0	739
13:00	2	63	459	226	13	2	0	0	0	0	0	0	0	0	0	765
14:00	20	184	494	130	10	1	0	0	0	0	0	0	0	0	0	839
15:00	5	118	525	155	9	4	0	1	0	0	0	0	0	0	0	817
16:00	15	154	408	158	14	0	0	0	0	0	0	0	0	0	0	749
17:00	2	73	426	202	15	1	0	0	0	0	0	0	0	0	0	719
18:00	7	112	479	188	14	0	0	0	0	0	0	0	0	0	0	800
19:00	11	230	491	134	10	0	0	0	0	0	0	0	0	0	0	876
20:00	45	428	391	72	4	1	0	0	0	0	0	0	0	0	0	941
21:00	40	300	383	60	5	1	0	0	0	0	0	0	0	0	0	789
22:00	2	124	320	124	10	0	0	0	0	0	0	0	0	0	0	580
23:00	0	41	201	130	18	1	0	0	0	0	0	0	0	0	0	391
24:00	0	14	130	90	22	4	0	1	0	0	0	0	0	0	0	261
DAY TOTAL	162	2031	6269	3164	501	54	5	5	0	0	1	0	0	2	0	12194
PERCENTS	1.4%	16.7%	51.5%	25.9%	4.1%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 23.1 mph

85th Percentile Speed
 32.0 mph

Median Speed
 27.1 mph

Average Speed
 27.3 mph

10 MPH Pace Speed
 24 mph to 34 mph
 9433 vehicles in pace
 Representing 77.3% of the total vehicles

Vehicles > 65 MPH
 3
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Mon 4/2/2018

Site Reference: 180060000535
 Site ID: 000000000501
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: NORTH
 Lane: 1

File: SPD501.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	1	2	55	54	14	3	0	0	0	0	0	0	0	0	0	129
02:00	0	0	10	31	17	1	1	0	0	0	0	0	0	0	0	60
03:00	0	0	19	31	11	4	0	0	0	0	0	0	0	0	0	65
04:00	0	3	13	41	11	3	0	0	0	0	0	0	0	0	0	71
05:00	0	6	51	79	29	5	0	0	1	0	0	0	0	0	0	171
06:00	15	114	380	167	19	4	0	0	0	0	0	0	0	0	0	699
07:00	41	309	490	77	8	0	0	0	0	0	0	0	0	0	0	925
08:00	15	304	548	83	12	1	0	0	0	0	0	0	0	0	0	963
09:00	4	222	512	93	6	0	0	0	0	0	0	0	0	0	0	837
10:00	13	209	412	90	4	0	0	0	0	0	0	0	0	0	0	728
11:00	31	132	369	105	7	0	0	0	0	0	0	0	0	0	0	644
12:00	2	105	319	155	8	1	0	0	0	0	0	0	0	0	0	590
13:00	7	108	343	126	11	0	0	0	0	0	0	0	0	0	0	595
14:00	10	129	309	150	12	0	0	0	0	0	0	0	0	0	0	610
15:00	2	98	375	159	20	0	0	0	0	0	0	0	0	0	0	654
16:00	8	131	376	156	10	0	0	0	1	0	0	0	0	0	0	682
17:00	8	131	400	123	5	0	0	0	0	0	0	0	0	0	0	667
18:00	1	104	414	172	8	0	0	0	0	0	0	0	0	0	0	699
19:00	16	95	309	148	14	1	0	0	0	0	0	0	0	0	0	583
20:00	2	81	259	111	21	2	0	0	0	0	0	0	0	0	0	476
21:00	0	54	283	111	10	0	0	0	0	0	0	0	0	0	0	458
22:00	3	54	228	108	10	0	0	0	0	0	0	0	0	0	0	403
23:00	0	30	131	112	18	1	1	0	0	0	0	0	0	0	0	293
24:00	0	11	69	84	23	1	0	1	0	0	0	0	0	0	0	189

DAY TOTAL	179	2432	6674	2566	308	27	2	1	2	0	0	0	0	0	0	12191
PERCENTS	1.5%	20.0%	54.8%	21.0%	2.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
22.4 mph

85th Percentile Speed
31.1 mph

Median Speed
26.6 mph

Average Speed
26.6 mph

10 MPH Pace Speed
24 mph to 34 mph
9240 vehicles in pace
Representing 75.7% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 4/3/2018

Site Reference: 180060000535
 Site ID: 000000000501
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: NORTH
 Lane: 1

File: SPD501.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	7	40	72	13	2	0	0	0	0	0	0	0	0	0	134
02:00	0	2	12	33	14	0	0	0	0	0	0	0	0	0	0	61
03:00	0	1	14	33	11	1	2	0	0	0	0	0	0	0	0	62
04:00	0	0	11	31	12	1	1	0	0	0	0	0	0	0	0	56
05:00	1	5	64	92	23	0	0	0	0	0	0	0	0	0	0	185
06:00	24	111	360	164	16	4	1	0	0	0	0	0	0	0	0	680
07:00	17	241	547	116	16	1	1	0	0	0	0	0	0	0	0	939
08:00	17	269	558	100	10	3	0	0	0	0	0	0	0	0	0	957
09:00	9	360	454	113	6	2	0	0	0	0	0	0	0	0	0	944
10:00	25	189	400	154	7	0	0	0	0	0	1	0	0	0	0	776

DAY TOTAL	93	1185	2460	908	128	14	5	0	0	0	1	0	0	0	0	4794
PERCENTS	2.0%	24.8%	51.4%	18.9%	2.6%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 21.7 mph

85th Percentile Speed
 30.9 mph

Median Speed
 26.3 mph

Average Speed
 26.2 mph

10 MPH Pace Speed
 19 mph to 29 mph
 3645 vehicles in pace
 Representing 76.0% of the total vehicles

Vehicles > 65 MPH
 1
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 3/27/2018

STA. 5 SB

Site Reference: 180060000461
 Site ID: 000000000502
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: SOUTH
 Lane: 1

File: SPD502.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
12:00	82	123	194	47	2	0	0	0	0	2	0	0	3	0	1	454
13:00	87	107	220	60	6	0	0	0	0	2	0	0	0	0	0	482
14:00	88	196	206	46	6	0	0	0	2	2	2	0	0	1	0	549
15:00	188	220	235	35	3	0	0	0	0	0	0	0	0	0	0	681
16:00	336	184	142	19	5	0	0	1	0	0	0	0	0	0	0	687
17:00	619	1	2	7	1	1	0	5	0	1	0	0	0	0	0	637
18:00	471	84	67	4	1	0	0	0	0	0	0	0	0	0	0	627
19:00	181	231	239	29	1	0	0	0	0	0	0	0	0	0	0	681
20:00	37	189	264	53	4	0	1	0	0	0	0	0	0	0	2	550
21:00	58	169	217	42	2	0	0	0	0	0	0	0	0	0	0	488
22:00	40	139	180	54	1	1	0	0	0	0	0	0	0	0	0	415
23:00	12	59	158	61	9	0	0	0	0	0	0	0	0	0	1	300
24:00	6	29	116	56	9	1	0	0	0	0	0	0	0	0	0	217
DAY TOTAL	2205	1731	2240	513	50	3	1	6	2	7	2	0	3	1	4	6768
PERCENTS	32.6%	25.6%	33.1%	7.6%	0.8%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
8.8 mph

85th Percentile Speed
28.1 mph

Median Speed
22.4 mph

Average Speed
20.3 mph

10 MPH Pace Speed
19 mph to 29 mph
3971 vehicles in pace
Representing 58.6% of the total vehicles

Vehicles > 65 MPH
10
0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Wed 3/28/2018

Site Reference: 180060000461
 Site ID: 000000000502
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: SOUTH
 Lane: 1

File: SPD502.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	2	21	51	42	1	0	0	0	0	0	0	0	0	0	0	117
02:00	3	5	22	20	12	2	0	0	0	0	0	0	0	0	0	64
03:00	1	2	14	18	8	0	0	0	0	0	0	0	0	0	0	43
04:00	2	6	23	16	5	2	0	0	0	0	0	0	0	0	0	54
05:00	9	12	35	27	10	1	2	0	0	0	0	0	0	0	0	96
06:00	12	39	117	71	2	2	0	0	0	0	0	0	0	0	0	243
07:00	40	92	167	77	5	1	0	0	0	0	0	0	0	0	0	382
08:00	34	171	263	70	4	0	0	0	0	0	0	0	0	0	0	542
09:00	51	189	283	56	6	0	0	0	0	0	0	0	0	0	0	585
10:00	14	108	253	76	7	0	0	0	0	0	0	0	0	0	0	458
11:00	37	162	249	50	10	0	0	0	0	0	0	0	0	0	0	508
12:00	32	143	277	78	5	1	0	0	0	0	0	0	0	0	0	536
13:00	59	183	297	60	10	0	0	0	0	0	0	0	0	0	0	609
14:00	48	194	287	58	4	0	0	0	0	0	0	0	0	0	0	591
15:00	227	187	180	50	3	0	0	0	0	0	0	0	0	0	0	647
16:00	292	137	194	40	2	0	0	0	0	0	0	0	0	0	0	665
17:00	617	3	9	1	1	1	0	0	0	0	0	0	0	0	0	632
18:00	612	2	1	0	0	0	0	0	0	0	0	0	0	0	0	615
19:00	663	0	2	0	0	0	0	2	0	0	0	0	0	0	0	667
20:00	108	268	237	34	0	3	0	0	0	0	0	0	0	0	0	650
21:00	22	229	285	38	1	0	0	0	0	0	0	0	0	0	0	575
22:00	22	158	228	61	6	1	0	0	0	0	0	0	0	0	0	476
23:00	8	71	161	53	4	0	2	0	0	0	0	0	0	0	0	299
24:00	7	24	113	70	8	1	0	0	0	0	0	0	0	0	0	223

DAY TOTAL	2922	2406	3748	1066	114	15	4	2	0	0	0	0	0	0	0	10277
PERCENTS	28.5%	23.5%	36.5%	10.3%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 10.0 mph

85th Percentile Speed
 28.6 mph

Median Speed
 23.6 mph

Average Speed
 21.2 mph

10 MPH Pace Speed
 19 mph to 29 mph
 6154 vehicles in pace
 Representing 59.8% of the total vehicles

Vehicles > 65 MPH
 0
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Thu 3/29/2018

Site Reference: 180060000461
 Site ID: 000000000502
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: SOUTH
 Lane: 1

File: SPD502.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	6	26	57	47	8	1	0	0	0	0	0	0	0	0	0	145
02:00	3	5	29	23	2	0	0	0	0	0	0	0	0	0	0	62
03:00	0	2	23	19	2	4	0	0	0	0	0	0	0	0	0	50
04:00	1	1	15	18	5	2	0	0	0	0	0	0	0	0	0	42
05:00	3	10	41	34	18	3	0	0	0	0	0	0	0	0	0	109
06:00	21	35	92	61	7	2	0	0	0	0	0	0	0	0	0	218
07:00	37	115	161	80	9	2	0	0	0	0	0	0	0	0	0	404
08:00	65	133	249	61	7	0	0	0	0	0	0	0	0	0	0	515
09:00	42	139	278	99	7	0	0	0	0	0	0	0	0	0	0	565
10:00	30	127	289	57	11	0	1	0	0	0	0	0	0	0	0	515
11:00	39	119	224	84	3	1	0	0	0	0	0	0	0	0	0	470
12:00	54	152	291	69	2	0	0	0	0	0	0	0	0	0	0	568
13:00	136	179	238	58	2	0	0	0	0	0	0	0	0	0	0	613
14:00	57	202	272	68	5	0	0	0	0	0	0	0	0	0	0	604
15:00	143	243	271	46	4	0	0	0	0	0	0	0	0	0	0	707
16:00	497	74	82	13	3	1	0	0	0	0	0	0	0	0	0	670
17:00	563	32	18	5	1	0	1	2	0	0	0	0	0	0	2	624
18:00	519	56	56	5	6	0	0	0	0	0	0	0	0	0	0	642
19:00	604	2	1	0	0	0	0	0	0	0	0	0	0	0	0	607
20:00	290	221	138	12	3	0	0	0	0	0	0	0	0	0	0	664
21:00	31	246	232	37	3	1	0	0	0	0	0	0	0	0	0	550
22:00	5	213	201	39	4	2	0	0	0	0	0	0	0	0	0	464
23:00	16	98	174	47	7	0	0	0	0	0	0	0	0	0	0	342
24:00	3	77	144	55	3	0	0	0	0	0	0	0	0	0	0	282

DAY TOTAL	3165	2507	3576	1037	122	19	2	2	0	0	0	0	0	0	2	10432
PERCENTS	30.4%	24.1%	34.3%	10.0%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
9.4 mph

85th Percentile Speed
28.5 mph

Median Speed
23.1 mph

Average Speed
20.8 mph

10 MPH Pace Speed
19 mph to 29 mph
6083 vehicles in pace
Representing 58.3% of the total vehicles

Vehicles > 65 MPH
2
0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Fri 3/30/2018

Site Reference: 180060000461
 Site ID: 000000000502
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: SOUTH
 Lane: 1

File: SPD502.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	5	35	75	41	3	0	1	0	0	0	0	0	0	0	0	160
02:00	0	20	34	17	11	0	1	0	0	0	0	0	0	0	0	83
03:00	1	10	27	29	6	0	0	0	0	0	0	0	0	0	0	73
04:00	1	2	24	21	6	0	0	0	0	0	0	0	0	0	0	54
05:00	4	14	34	47	11	2	2	0	0	0	0	0	0	0	0	114
06:00	9	41	88	63	12	6	0	0	0	0	0	0	0	0	0	219
07:00	15	63	215	79	5	0	0	0	0	0	0	0	0	0	0	377
08:00	78	198	199	36	2	2	0	0	0	0	0	0	0	0	0	515
09:00	137	150	196	50	6	1	0	0	0	0	0	0	0	0	0	540
10:00	59	174	222	58	3	0	0	0	0	0	0	0	0	0	0	516
11:00	74	178	284	57	4	0	0	0	0	0	0	0	0	0	0	597
12:00	68	175	304	55	1	1	0	0	0	0	0	0	0	0	0	604
13:00	261	194	217	32	2	0	0	1	0	0	0	0	0	0	0	707
14:00	473	140	82	8	1	0	1	0	0	0	0	0	0	0	0	705
15:00	608	0	0	1	2	1	1	0	0	0	0	0	0	0	0	613
16:00	603	1	2	1	0	0	2	0	0	0	0	0	0	0	0	609
17:00	597	10	1	0	1	0	1	0	0	0	0	0	0	0	0	610
18:00	607	7	2	0	1	0	0	1	0	0	2	0	0	0	0	620
19:00	188	238	223	38	2	0	0	0	0	0	0	0	0	0	0	689
20:00	68	260	267	35	1	0	0	0	0	0	0	0	0	0	0	631
21:00	54	199	209	42	5	1	0	0	0	0	0	0	0	0	0	510
22:00	40	161	266	36	4	0	0	0	0	0	0	0	0	0	0	507
23:00	3	138	251	57	4	0	0	0	0	0	0	0	0	0	0	453
24:00	18	51	197	57	7	0	0	0	0	0	0	0	0	0	0	330

DAY TOTAL	3971	2459	3419	860	100	14	9	2	0	0	2	0	0	0	0	10836
PERCENTS	36.7%	22.7%	31.6%	8.0%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
7.8 mph

85th Percentile Speed
28.1 mph

Median Speed
22.0 mph

Average Speed
19.7 mph

10 MPH Pace Speed
19 mph to 29 mph
5878 vehicles in pace
Representing 54.2% of the total vehicles

Vehicles > 65 MPH
2
0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Sat 3/31/2018

Site Reference: 180060000461
 Site ID: 000000000502
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: SOUTH
 Lane: 1

File: SPD502.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	4	37	115	50	4	3	0	0	0	0	0	0	0	0	0	213
02:00	5	21	73	40	8	3	1	0	0	0	0	0	0	0	0	151
03:00	0	7	36	32	8	0	1	0	0	0	0	0	0	0	0	84
04:00	0	8	27	27	8	5	1	0	0	0	0	0	0	0	0	76
05:00	0	7	33	18	15	2	1	0	0	0	0	0	0	0	0	76
06:00	3	16	51	43	14	2	1	0	0	0	0	0	0	0	0	130
07:00	2	22	109	72	25	3	2	0	0	0	0	0	0	0	0	235
08:00	8	25	161	132	28	2	0	0	0	0	0	0	0	0	0	356
09:00	14	54	220	135	19	3	0	0	0	0	0	0	0	0	0	445
10:00	20	105	335	117	13	0	0	0	0	0	0	0	0	0	0	590
11:00	56	131	301	94	4	1	0	0	0	0	0	0	0	0	0	587
12:00	42	93	330	121	5	0	0	0	0	0	0	0	0	0	0	591
13:00	75	188	322	110	9	0	0	0	0	0	0	0	0	0	0	704
14:00	418	67	116	25	2	0	0	0	0	0	0	0	0	0	0	628
15:00	434	82	136	25	0	1	0	4	0	0	0	0	0	0	0	682
16:00	187	166	278	70	4	2	0	0	0	0	0	0	0	0	0	707
17:00	67	165	398	84	3	0	0	0	0	0	0	0	0	0	0	717
18:00	62	149	306	100	10	1	0	0	0	0	0	0	0	0	0	628
19:00	35	201	345	72	10	0	0	0	0	0	0	0	0	0	0	663
20:00	58	252	241	41	4	0	0	0	0	0	0	0	0	0	0	596
21:00	42	232	202	25	5	1	0	0	0	0	0	0	0	0	0	507
22:00	14	116	206	51	5	0	1	0	0	0	0	0	0	0	0	393
23:00	14	109	208	40	2	0	0	0	0	0	0	0	0	0	0	373
24:00	9	70	192	60	5	0	0	0	0	0	0	0	0	0	0	336
DAY TOTAL	1569	2323	4741	1584	210	29	8	4	0	0	0	0	0	0	0	10468
PERCENTS	15.0%	22.2%	45.3%	15.2%	2.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 19.0 mph

85th Percentile Speed
 29.8 mph

Median Speed
 25.4 mph

Average Speed
 23.9 mph

10 MPH Pace Speed
 19 mph to 29 mph
 7064 vehicles in pace
 Representing 67.4% of the total vehicles

Vehicles > 65 MPH
 0
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Sun 4/1/2018

Site Reference: 180060000461
 Site ID: 000000000502
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: SOUTH
 Lane: 1

File: SPD502.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	2	38	125	41	2	3	0	0	0	0	0	0	0	0	0	211
02:00	3	18	75	44	4	0	0	0	0	0	0	0	0	0	0	144
03:00	0	15	59	34	6	2	0	0	0	0	0	0	0	0	0	116
04:00	0	15	33	26	10	2	0	0	0	0	0	0	0	0	0	86
05:00	1	2	22	14	6	0	0	0	0	0	0	0	0	0	0	45
06:00	0	5	29	25	6	1	0	0	0	0	0	0	0	0	0	66
07:00	0	12	53	34	20	1	0	1	0	0	0	0	0	0	0	121
08:00	0	3	100	89	16	0	1	0	0	0	0	0	0	0	0	209
09:00	5	15	128	82	17	2	0	0	0	0	0	0	0	0	0	249
10:00	4	51	196	125	12	2	0	0	0	0	0	0	0	0	0	390
11:00	8	57	304	119	11	1	0	0	0	0	0	0	0	0	0	500
12:00	15	104	304	123	12	1	0	0	1	0	0	0	0	0	0	560
13:00	56	155	347	120	2	1	0	0	0	0	0	0	0	0	0	681
14:00	138	240	302	51	1	0	0	0	0	0	0	0	0	0	0	732
15:00	194	174	290	52	5	0	0	0	0	0	0	0	0	0	0	715
16:00	90	245	322	79	6	0	0	0	0	0	0	0	0	0	0	742
17:00	76	189	321	74	5	0	0	0	0	0	0	0	0	0	0	665
18:00	24	152	345	113	8	0	0	0	0	0	0	0	0	0	0	642
19:00	65	168	344	74	3	0	0	0	0	0	0	0	0	0	0	654
20:00	47	255	300	43	5	0	0	0	0	0	0	0	0	0	0	650
21:00	26	213	281	53	1	0	0	0	0	0	0	0	0	0	0	574
22:00	18	131	217	58	5	0	0	0	0	0	0	0	0	0	0	429
23:00	2	48	184	68	9	1	0	0	0	0	0	0	0	0	0	312
24:00	0	29	117	55	10	0	0	0	0	0	0	0	0	0	0	211
DAY TOTAL	774	2334	4798	1596	182	17	1	1	1	0	0	0	0	0	0	9704
PERCENTS	8.0%	24.1%	49.5%	16.5%	1.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed 20.5 mph	85th Percentile Speed 30.1 mph
Median Speed 25.8 mph	Average Speed 25.0 mph
10 MPH Pace Speed 19 mph to 29 mph 7132 vehicles in pace Representing 73.4% of the total vehicles	Vehicles > 65 MPH 0 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Mon 4/2/2018

Site Reference: 180060000461
 Site ID: 000000000502
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: SOUTH
 Lane: 1

File: SPD502.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	14	72	37	6	1	0	0	0	0	0	0	0	0	0	130
02:00	0	3	24	29	6	1	1	0	0	0	0	0	0	0	0	64
03:00	0	5	16	14	9	2	0	0	0	0	0	0	0	0	0	46
04:00	0	7	19	21	5	0	0	0	0	0	0	0	0	0	0	52
05:00	1	5	21	34	13	0	0	0	0	1	0	0	0	0	0	75
06:00	3	37	101	58	23	4	0	0	0	0	0	0	0	0	0	226
07:00	9	42	163	119	12	1	0	0	0	0	0	0	0	0	0	346
08:00	26	150	278	78	10	0	0	0	0	0	0	0	0	0	0	542
09:00	110	141	194	46	4	0	0	0	0	0	0	0	0	0	0	495
10:00	11	97	246	75	1	2	0	0	0	0	0	0	0	0	0	432
11:00	28	127	196	69	5	1	0	0	0	0	0	0	0	0	0	426
12:00	35	77	230	88	6	0	0	0	0	0	0	0	0	0	0	436
13:00	36	110	262	78	6	0	0	0	0	0	0	0	0	0	0	492
14:00	147	148	202	62	5	0	0	0	0	0	0	0	0	0	0	564
15:00	174	200	245	46	6	0	1	0	0	0	0	0	0	0	0	672
16:00	170	192	273	36	4	1	0	0	0	0	0	0	0	0	0	676
17:00	257	114	221	64	0	0	0	0	0	0	0	0	0	0	0	656
18:00	79	220	321	86	2	1	0	0	0	0	0	0	0	0	0	709
19:00	21	165	301	87	7	0	0	0	0	0	0	0	0	0	0	581
20:00	25	137	242	47	4	0	0	0	0	0	0	0	0	0	0	455
21:00	7	98	242	50	9	0	0	0	0	0	0	0	0	0	0	406
22:00	6	78	197	64	4	0	0	0	0	0	0	0	0	0	0	349
23:00	5	47	142	53	5	0	0	0	0	0	0	0	0	0	0	252
24:00	3	25	105	60	10	2	0	0	0	0	0	0	0	0	0	205

DAY TOTAL	1153	2239	4313	1401	162	16	2	0	0	1	0	0	0	0	0	9287
PERCENTS	12.5%	24.2%	46.5%	15.0%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
19.5 mph

85th Percentile Speed
29.7 mph

Median Speed
25.5 mph

Average Speed
24.2 mph

10 MPH Pace Speed
19 mph to 29 mph
6552 vehicles in pace
Representing 70.5% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 4/3/2018

Site Reference: 180060000461
 Site ID: 000000000502
 Location: RTE.138 NO. OF BRUSH HILL RD.
 Direction: SOUTH
 Lane: 1

File: SPD502.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	5	70	34	9	0	0	0	0	0	0	0	0	0	0	118
02:00	1	5	27	19	2	1	0	0	0	0	0	0	0	0	0	55
03:00	0	2	22	11	7	0	0	0	0	0	0	0	0	0	0	42
04:00	1	2	11	19	4	0	1	0	0	0	0	0	0	0	0	38
05:00	3	10	41	31	12	4	0	0	0	0	0	0	0	0	0	101
06:00	8	44	101	69	11	0	0	0	0	0	0	0	0	0	0	233
07:00	11	45	198	91	11	0	0	0	0	0	0	0	0	0	0	356
08:00	52	124	270	82	8	0	0	0	0	0	0	0	0	0	0	536
09:00	150	128	238	58	5	0	0	0	0	0	0	0	0	0	0	579
10:00	23	94	270	100	7	1	0	0	0	0	0	0	0	0	0	495
DAY TOTAL	249	459	1248	514	76	6	1	0	0	0	0	0	0	0	0	2553
PERCENTS	9.8%	18.0%	48.9%	20.2%	2.9%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 20.5 mph

85th Percentile Speed
 31.1 mph

Median Speed
 26.3 mph

Average Speed
 25.3 mph

10 MPH Pace Speed
 24 mph to 34 mph
 1762 vehicles in pace
 Representing 69.0% of the total vehicles

Vehicles > 65 MPH
 0
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 3/27/2018

STA. 7NB

Site Reference: 180060000532
 Site ID: 000000000701
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: NORTH
 Lane: 1

File: SPD8028_NB.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
13:00	44	12	74	185	57	3	0	0	0	2	0	0	0	0	0	377
14:00	40	3	60	143	41	3	0	1	0	0	1	0	0	0	0	292
15:00	35	15	77	179	49	5	0	0	1	4	5	0	0	0	2	372
16:00	37	9	125	178	33	0	0	0	0	2	0	0	0	0	0	384
17:00	30	17	143	180	35	5	0	0	1	0	0	0	1	0	3	415
18:00	32	32	160	154	32	2	1	0	0	0	2	0	0	0	2	417
19:00	41	15	113	159	31	4	1	0	0	0	0	0	2	2	0	368
20:00	15	5	102	130	28	2	0	0	0	0	0	0	0	0	0	282
21:00	27	17	95	127	32	2	0	0	0	2	0	0	0	1	1	304
22:00	14	6	91	112	24	1	0	0	0	0	0	0	0	0	0	248
23:00	20	2	54	82	44	3	0	0	0	1	0	0	0	0	0	206
24:00	10	2	28	66	15	2	1	0	0	0	1	0	0	0	0	125
DAY TOTAL	345	135	1122	1695	421	32	3	1	2	11	9	0	3	3	8	3790
PERCENTS	9.2%	3.6%	29.7%	44.8%	11.2%	0.9%	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.2%	100%

Statistical Information...

15th Percentile Speed
 24.4 mph

85th Percentile Speed
 33.8 mph

Median Speed
 29.9 mph

Average Speed
 28.6 mph

10 MPH Pace Speed
 24 mph to 34 mph
 2817 vehicles in pace
 Representing 74.3% of the total vehicles

Vehicles > 65 MPH
 23
 0.6%

MassDOT Highway Division
 SPEED SUMMARY
 Wed 3/28/2018

Site Reference: 180060000532
 Site ID: 000000000701
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: NORTH
 Lane: 1

File: SPD8028_NB.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	9	4	16	36	12	1	0	1	0	0	0	0	0	0	0	79
02:00	2	0	5	14	7	1	0	0	1	0	0	0	0	0	0	30
03:00	2	1	11	8	5	1	2	0	0	0	0	0	0	0	0	30
04:00	2	0	6	9	7	2	1	1	0	0	0	0	0	0	0	28
05:00	5	5	8	35	24	2	0	1	0	0	0	0	0	0	0	80
06:00	19	30	108	120	34	8	0	0	0	0	1	0	0	0	2	322
07:00	30	23	128	206	39	2	0	0	1	2	0	0	0	0	2	433
08:00	44	39	208	180	36	3	1	0	0	0	0	0	3	0	4	518
09:00	28	33	225	203	29	0	1	0	0	0	0	0	0	0	0	519
10:00	32	40	212	180	37	1	0	0	0	0	1	0	0	0	1	504
11:00	33	22	162	164	27	0	0	0	0	1	0	1	0	0	0	410
12:00	35	5	78	153	43	1	0	1	0	0	5	2	0	0	0	323
13:00	35	8	107	147	50	1	1	0	0	0	0	0	0	0	2	351
14:00	38	8	82	196	55	2	0	0	0	0	3	2	0	0	0	386
15:00	28	5	95	156	55	3	2	0	0	0	0	0	0	0	0	344
16:00	46	20	128	183	44	0	0	0	0	3	0	0	1	0	0	425
17:00	21	15	139	178	40	0	0	0	0	0	0	0	0	0	0	393
18:00	43	12	128	178	37	3	0	0	2	0	0	0	1	2	1	407
19:00	24	30	161	160	17	1	0	0	0	0	0	0	0	0	0	393
20:00	21	15	143	154	23	2	0	0	0	0	0	0	0	0	0	358
21:00	11	25	114	138	38	5	0	0	0	0	2	0	0	0	0	333
22:00	17	12	93	149	30	5	0	0	0	0	2	0	0	0	0	308
23:00	17	10	48	120	29	7	2	0	2	0	0	1	0	0	0	236
24:00	4	0	39	68	12	2	2	1	0	0	0	0	0	0	0	128
DAY TOTAL	546	362	2444	3135	730	53	12	5	6	6	14	6	5	2	12	7338
PERCENTS	7.5%	5.0%	33.4%	42.8%	10.0%	0.8%	0.2%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	100%

Statistical Information...

15th Percentile Speed
 24.4 mph

85th Percentile Speed
 33.6 mph

Median Speed
 29.5 mph

Average Speed
 28.5 mph

10 MPH Pace Speed
 24 mph to 34 mph
 5579 vehicles in pace
 Representing 76.0% of the total vehicles

Vehicles > 65 MPH
 39
 0.5%

MassDOT Highway Division
 SPEED SUMMARY
 Thu 3/29/2018

Site Reference: 180060000532
 Site ID: 000000000701
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: NORTH
 Lane: 1

File: SPD8028_NB.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	9	0	18	30	22	4	1	0	0	0	0	0	0	0	0	84
02:00	3	0	11	13	6	1	0	1	0	0	0	0	0	0	0	35
03:00	1	0	9	9	12	1	1	0	0	0	0	0	0	0	0	33
04:00	1	1	5	13	9	1	0	0	0	0	0	0	0	0	0	30
05:00	3	2	6	27	17	5	3	0	0	0	0	0	0	0	0	63
06:00	16	23	97	123	40	4	0	0	0	0	0	0	0	0	0	303
07:00	48	28	159	187	38	8	0	0	3	0	0	0	0	0	0	471
08:00	43	46	189	166	33	2	0	0	1	3	0	0	0	2	1	486
09:00	57	51	198	191	40	1	0	0	0	0	2	2	0	0	2	544
10:00	51	32	157	207	31	0	3	0	1	2	2	0	0	0	0	486
11:00	38	30	145	194	36	4	1	1	0	0	0	0	0	0	0	449
12:00	27	14	124	149	52	3	1	1	0	0	0	0	0	0	0	371
13:00	32	7	105	166	36	0	0	0	0	0	0	0	0	0	0	346
14:00	15	13	114	194	33	3	0	1	0	0	0	0	0	0	0	373
15:00	25	17	114	179	50	3	2	0	0	1	0	0	0	0	0	391
16:00	28	28	180	212	29	1	0	0	0	0	0	0	1	0	1	480
17:00	21	26	162	208	37	0	0	3	0	0	0	0	0	0	1	458
18:00	26	33	150	221	38	2	0	0	0	0	0	0	0	0	0	470
19:00	31	38	206	151	17	1	0	0	1	0	0	0	0	0	2	447
20:00	22	13	158	120	20	4	0	0	0	0	0	0	0	0	0	337
21:00	11	17	123	147	29	2	1	0	0	0	0	0	0	0	0	330
22:00	13	18	113	121	28	0	0	0	0	0	0	0	0	0	0	293
23:00	5	6	76	108	29	3	0	0	0	0	0	0	0	0	0	227
24:00	7	8	38	82	32	1	0	0	0	0	0	0	0	0	0	168
DAY TOTAL	533	451	2657	3218	714	54	13	7	6	6	4	2	1	2	7	7675
PERCENTS	7.0%	5.9%	34.7%	42.0%	9.4%	0.8%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 24.3 mph

85th Percentile Speed
 33.5 mph

Median Speed
 29.3 mph

Average Speed
 28.3 mph

10 MPH Pace Speed
 24 mph to 34 mph
 5875 vehicles in pace
 Representing 76.5% of the total vehicles

Vehicles > 65 MPH
 16
 0.2%

MassDOT Highway Division
 SPEED SUMMARY
 Fri 3/30/2018

Site Reference: 180060000532
 Site ID: 000000000701
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: NORTH
 Lane: 1

File: SPD8028_NB.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	2	6	30	39	23	0	0	0	0	0	0	0	0	0	0	100
02:00	1	2	14	36	14	0	0	0	0	0	0	0	0	0	0	67
03:00	4	2	6	11	10	4	1	0	0	0	0	0	0	0	0	38
04:00	3	0	3	14	18	0	0	0	0	0	0	0	0	0	0	38
05:00	4	1	9	41	16	4	2	0	0	0	0	0	0	0	2	79
06:00	16	6	67	129	42	7	1	0	0	0	0	0	0	2	0	270
07:00	41	32	134	171	47	2	0	0	2	0	0	2	0	0	0	431
08:00	41	31	181	169	35	3	0	1	0	0	0	0	0	0	0	461
09:00	42	18	178	197	39	1	0	0	0	0	0	0	0	0	0	475
10:00	27	32	146	202	30	2	0	0	0	0	0	0	0	0	0	439
11:00	26	6	101	210	61	1	0	0	0	0	0	0	0	0	1	406
12:00	33	15	121	200	54	2	0	0	1	0	0	0	1	0	0	427
13:00	22	31	153	185	48	4	2	0	0	0	0	2	0	0	2	449
14:00	16	37	145	211	35	2	0	0	0	0	2	0	0	0	0	448
15:00	27	63	229	118	14	1	0	2	0	0	0	1	0	0	0	455
16:00	25	44	215	140	19	1	0	0	0	2	0	0	0	0	0	446
17:00	40	67	226	110	17	1	0	0	1	0	0	0	0	0	0	462
18:00	26	54	217	190	15	0	0	0	0	0	0	0	0	0	0	502
19:00	34	21	160	222	68	0	0	0	0	0	0	0	0	0	0	505
20:00	22	20	122	152	29	0	0	0	0	1	0	0	0	0	0	346
21:00	21	20	125	138	19	5	0	0	0	0	0	0	0	0	0	328
22:00	18	19	133	135	20	2	0	0	0	0	0	0	0	0	0	327
23:00	11	9	111	152	22	3	0	0	0	0	0	2	0	0	0	310
24:00	9	1	57	86	28	2	0	0	0	0	0	0	0	0	0	183
DAY TOTAL	511	537	2883	3258	723	47	6	3	4	3	2	7	1	2	5	7992
PERCENTS	6.4%	6.8%	36.1%	40.8%	9.1%	0.6%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 24.3 mph

85th Percentile Speed
 33.4 mph

Median Speed
 29.1 mph

Average Speed
 28.3 mph

10 MPH Pace Speed
 24 mph to 34 mph
 6141 vehicles in pace
 Representing 76.8% of the total vehicles

Vehicles > 65 MPH
 17
 0.2%

MassDOT Highway Division
 SPEED SUMMARY
 Sat 3/31/2018

Site Reference: 180060000532
 Site ID: 000000000701
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: NORTH
 Lane: 1

File: SPD8028_NB.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	6	5	28	80	30	3	0	0	0	0	0	0	0	0	0	152
02:00	6	1	15	37	17	2	0	0	0	0	0	0	0	0	0	78
03:00	4	1	18	34	17	2	2	0	0	0	0	0	0	0	0	78
04:00	2	1	15	33	18	3	1	1	0	0	0	0	0	0	0	74
05:00	3	0	11	24	13	7	0	0	0	0	0	0	0	0	0	58
06:00	7	0	11	30	25	5	1	0	0	0	0	0	0	0	0	79
07:00	11	1	16	85	44	2	2	0	0	0	0	0	0	0	0	161
08:00	14	0	33	107	45	4	0	0	0	0	0	0	0	0	0	203
09:00	34	12	48	165	76	9	2	0	0	0	0	0	0	0	0	346
10:00	24	8	52	185	84	3	0	0	0	0	0	0	0	0	0	356
11:00	38	6	83	184	78	6	0	0	0	0	0	0	0	2	0	397
12:00	23	11	74	207	70	16	0	1	0	0	0	0	0	0	0	402
13:00	25	9	121	212	66	4	0	0	0	0	4	0	0	0	1	442
14:00	45	11	135	232	66	2	0	0	0	0	0	0	0	0	0	491
15:00	39	12	110	230	53	1	0	0	0	0	0	0	0	0	0	445
16:00	31	10	118	237	89	8	0	0	0	0	0	0	0	0	0	493
17:00	39	6	116	239	64	3	0	0	0	0	1	0	0	0	0	468
18:00	27	4	76	205	105	14	1	1	0	0	0	0	0	0	0	433
19:00	31	5	91	256	68	4	1	0	0	0	0	0	0	0	0	456
20:00	19	12	102	203	42	2	0	0	0	0	0	0	0	0	0	380
21:00	18	23	113	127	44	4	0	0	0	0	0	0	0	0	0	329
22:00	11	8	120	138	17	0	0	0	0	0	0	0	0	0	0	294
23:00	21	13	105	140	19	8	0	0	0	0	0	0	0	0	0	306
24:00	14	4	62	116	32	2	0	0	0	0	0	0	0	0	0	230
DAY TOTAL	492	163	1673	3506	1182	114	10	3	0	0	5	0	0	2	1	7151
PERCENTS	6.9%	2.3%	23.4%	49.1%	16.6%	1.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 25.3 mph

85th Percentile Speed
 35.0 mph

Median Speed
 30.8 mph

Average Speed
 29.7 mph

10 MPH Pace Speed
 24 mph to 34 mph
 5179 vehicles in pace
 Representing 72.4% of the total vehicles

Vehicles > 65 MPH
 8
 0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Sun 4/1/2018

Site Reference: 180060000532
 Site ID: 000000000701
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: NORTH
 Lane: 1

File: SPD8028_NB.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	13	2	36	95	16	2	0	0	0	0	0	0	0	0	0	164
02:00	5	1	32	61	14	1	4	0	0	0	0	0	0	0	0	118
03:00	2	3	23	34	17	5	0	0	0	0	0	0	0	0	0	84
04:00	4	3	11	25	11	0	1	0	1	1	0	0	0	0	0	57
05:00	3	0	4	17	11	4	0	0	0	0	0	0	0	0	0	39
06:00	2	1	3	21	18	2	0	0	0	0	0	0	0	0	0	47
07:00	6	3	8	28	43	6	1	0	0	0	0	0	0	0	0	95
08:00	12	4	17	55	48	10	4	0	0	0	0	0	0	0	0	150
09:00	12	1	18	107	73	7	0	0	0	0	0	0	0	0	0	218
10:00	21	2	49	167	90	8	2	0	0	0	0	0	0	0	0	339
11:00	40	0	80	223	84	10	1	0	0	0	0	0	0	0	0	438
12:00	39	5	46	203	96	8	2	0	0	0	0	0	0	0	0	399
13:00	23	1	81	198	79	6	1	0	0	0	0	0	0	0	0	389
14:00	31	14	124	223	54	8	1	0	0	0	0	0	0	0	0	455
15:00	29	11	135	221	60	0	0	0	0	0	0	0	0	0	2	458
16:00	24	8	119	206	59	6	1	0	0	0	0	0	0	0	0	423
17:00	40	5	70	246	66	5	0	0	0	0	0	0	0	0	0	432
18:00	41	14	98	207	66	5	1	0	0	0	0	0	0	0	0	432
19:00	33	26	161	247	61	1	0	0	0	0	0	0	0	0	0	529
20:00	26	39	242	202	44	2	1	0	0	0	0	0	0	0	1	557
21:00	24	45	223	157	22	1	0	0	2	0	0	0	0	0	0	474
22:00	12	28	137	178	25	3	0	0	0	0	0	0	0	0	0	383
23:00	13	14	94	103	33	2	0	0	0	0	0	0	0	0	0	259
24:00	10	1	40	81	26	5	2	0	0	0	0	0	0	0	0	165
DAY TOTAL	465	231	1851	3305	1116	107	22	0	3	1	0	0	0	0	3	7104
PERCENTS	6.6%	3.3%	26.1%	46.5%	15.7%	1.5%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 25.0 mph

85th Percentile Speed
 34.8 mph

Median Speed
 30.5 mph

Average Speed
 29.4 mph

10 MPH Pace Speed
 24 mph to 34 mph
 5156 vehicles in pace
 Representing 72.5% of the total vehicles

Vehicles > 65 MPH
 3
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Mon 4/2/2018

Site Reference: 180060000532
 Site ID: 000000000701
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: NORTH
 Lane: 1

File: SPD8028_NB.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	3	1	22	47	15	2	1	0	0	0	0	0	0	0	0	91
02:00	3	3	4	11	13	6	0	0	0	0	0	0	0	0	0	40
03:00	3	0	5	18	8	1	0	0	0	0	0	0	0	0	0	35
04:00	1	1	6	20	12	6	0	0	0	0	0	0	0	0	0	46
05:00	8	1	4	31	24	6	0	0	0	0	0	0	0	0	0	74
06:00	25	15	78	139	48	5	1	0	0	0	0	0	0	0	0	311
07:00	33	15	168	179	51	3	1	0	0	0	0	0	0	0	0	450
08:00	44	41	214	194	48	2	0	0	0	0	0	0	0	0	0	543
09:00	32	30	206	208	31	0	0	0	0	0	0	0	0	0	0	507
10:00	19	22	192	210	34	0	0	0	0	0	0	0	0	0	0	477
11:00	19	22	134	175	37	4	0	0	0	0	0	0	0	0	0	391
12:00	23	6	106	177	37	4	0	0	0	0	0	2	0	0	0	355
13:00	20	7	100	156	43	3	0	0	0	0	0	0	0	0	0	329
14:00	22	7	67	187	62	1	0	0	0	0	0	0	0	0	0	346
15:00	23	5	78	216	50	3	0	0	0	2	0	2	0	0	0	379
16:00	20	13	142	189	42	2	0	0	0	0	0	0	0	0	0	408
17:00	24	13	120	197	48	4	0	0	0	0	2	0	0	0	0	408
18:00	30	12	115	204	48	4	0	0	2	0	0	0	0	0	0	415
19:00	26	8	59	196	65	5	0	0	0	0	0	0	0	0	0	359
20:00	12	10	79	154	47	4	0	0	0	0	0	0	0	0	0	306
21:00	11	2	86	132	23	0	0	0	0	0	0	0	0	0	0	254
22:00	14	11	74	114	47	1	0	0	0	0	0	0	0	0	0	261
23:00	10	3	37	76	40	1	0	0	0	1	0	0	0	0	0	168
24:00	7	3	21	66	18	5	0	0	2	0	0	0	0	0	0	122
DAY TOTAL	432	251	2117	3296	891	72	3	0	4	3	2	4	0	0	0	7075
PERCENTS	6.2%	3.6%	30.0%	46.6%	12.6%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 24.9 mph

85th Percentile Speed
 33.9 mph

Median Speed
 30.1 mph

Average Speed
 29.1 mph

10 MPH Pace Speed
 24 mph to 34 mph
 5413 vehicles in pace
 Representing 76.5% of the total vehicles

Vehicles > 65 MPH
 6
 0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 4/3/2018

Site Reference: 180060000532
 Site ID: 000000000701
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: NORTH
 Lane: 1

File: SPD8028_NB.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	4	0	19	50	12	1	0	0	0	0	0	0	0	0	0	86
02:00	0	0	8	20	9	0	0	0	0	0	0	0	0	0	0	37
03:00	0	0	9	21	7	2	0	1	0	0	0	0	0	0	0	40
04:00	1	0	5	14	16	3	1	0	0	0	0	0	0	0	0	40
05:00	1	4	9	36	22	2	1	0	0	0	0	0	0	0	0	75
06:00	20	4	74	153	57	6	0	3	0	0	2	0	0	0	0	319
07:00	26	19	163	238	52	7	0	0	0	0	2	2	0	0	0	509
08:00	37	40	186	197	44	2	0	0	1	0	0	2	0	2	1	512
09:00	55	56	204	193	51	6	0	0	0	2	0	0	0	0	0	567
10:00	36	36	140	225	61	3	0	0	0	0	0	0	1	0	0	502
DAY TOTAL	180	159	817	1147	331	32	2	4	1	2	4	4	1	2	1	2687
PERCENTS	6.7%	6.0%	30.5%	42.7%	12.4%	1.2%	0.1%	0.2%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 24.4 mph

85th Percentile Speed
 33.9 mph

Median Speed
 29.8 mph

Average Speed
 28.9 mph

10 MPH Pace Speed
 24 mph to 34 mph
 1964 vehicles in pace
 Representing 73.0% of the total vehicles

Vehicles > 65 MPH
 12
 0.4%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 3/27/2018

STA. 7 SB

Site Reference: 180060000822
 Site ID: 000000000702
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: SOUTH
 Lane: 1

File: SPDB028.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
13:00	0	0	10	43	138	124	50	18	0	0	0	0	0	0	0	383
14:00	0	0	26	71	131	146	62	6	0	0	0	0	0	0	0	442
15:00	0	5	8	79	218	217	58	8	2	0	0	0	0	0	0	595
16:00	92	24	36	89	150	122	43	4	1	0	0	0	0	0	2	563
17:00	17	21	66	116	138	86	15	3	0	0	0	0	0	0	0	462
18:00	37	35	48	63	139	118	34	9	0	0	0	0	0	0	0	483
19:00	0	1	20	93	214	145	31	4	0	0	0	0	0	0	0	508
20:00	0	0	5	34	217	152	37	3	0	1	0	0	0	0	0	449
21:00	0	0	3	26	205	145	37	9	0	0	0	0	0	0	0	425
22:00	0	0	2	60	138	115	30	8	1	0	0	0	0	0	0	354
23:00	1	1	0	10	65	115	45	8	4	0	0	0	0	0	0	249
24:00	0	0	0	2	43	73	31	11	1	0	0	0	0	0	0	161
DAY TOTAL	147	87	224	686	1796	1558	473	91	9	1	0	0	0	0	2	5074
PERCENTS	2.9%	1.8%	4.5%	13.6%	35.4%	30.7%	9.3%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 31.2 mph

85th Percentile Speed
 43.4 mph

Median Speed
 37.9 mph

Average Speed
 37.1 mph

10 MPH Pace Speed
 34 mph to 44 mph
 3354 vehicles in pace
 Representing 66.1% of the total vehicles

Vehicles > 65 MPH
 2
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Wed 3/28/2018

Site Reference: 180060000822
 Site ID: 000000000702
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: SOUTH
 Lane: 1

File: SPD8028.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	2	12	33	22	2	2	1	0	0	0	0	0	74
02:00	0	0	0	1	7	9	12	8	3	1	0	0	0	0	0	41
03:00	0	0	0	1	0	6	4	6	4	1	0	0	0	0	0	22
04:00	0	0	0	1	6	3	16	7	1	1	0	0	0	0	0	35
05:00	0	0	0	2	10	22	18	8	5	1	0	0	0	0	0	66
06:00	0	0	1	4	32	82	35	14	3	0	0	0	0	0	0	171
07:00	0	1	6	19	99	125	66	22	1	0	0	0	0	0	0	339
08:00	0	0	6	55	182	177	68	12	0	0	0	0	0	0	0	500
09:00	0	0	4	72	215	170	53	5	1	0	0	0	0	0	0	520
10:00	0	0	1	43	128	128	57	6	1	0	0	0	0	0	0	364
11:00	0	5	6	61	135	127	42	10	0	0	0	0	0	0	0	386
12:00	0	0	5	50	136	140	49	11	0	1	0	0	0	0	0	392
13:00	0	1	7	54	181	198	62	17	0	0	0	0	0	0	0	520
14:00	1	0	4	68	142	164	58	9	0	0	0	0	0	0	0	446
15:00	1	1	14	78	208	160	46	12	0	0	0	0	0	0	0	520
16:00	29	25	35	91	149	117	51	7	2	0	0	0	0	0	0	506
17:00	15	36	88	141	131	34	10	1	0	0	0	0	0	0	0	456
18:00	119	28	61	88	91	47	9	3	2	0	2	0	0	0	2	452
19:00	236	79	85	63	39	4	4	1	0	0	1	0	0	0	0	512
20:00	0	1	8	63	226	167	43	5	1	2	0	0	0	0	0	516
21:00	0	0	4	62	219	152	25	4	2	0	0	0	0	0	0	468
22:00	0	0	0	41	176	146	38	3	2	0	0	1	0	0	0	407
23:00	0	0	0	11	60	116	44	10	0	0	0	0	0	0	0	241
24:00	0	0	0	0	21	70	61	13	5	0	1	1	0	0	0	172

DAY TOTAL	401	177	335	1071	2605	2397	893	196	35	8	4	2	0	0	2	8126
PERCENTS	5.0%	2.2%	4.2%	13.2%	32.1%	29.5%	11.0%	2.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
30.4 mph

85th Percentile Speed
43.8 mph

Median Speed
38.0 mph

Average Speed
36.9 mph

10 MPH Pace Speed
34 mph to 44 mph
5002 vehicles in pace
Representing 61.5% of the total vehicles

Vehicles > 65 MPH
8
0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Thu 3/29/2018

Site Reference: 180060000822
 Site ID: 000000000702
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: SOUTH
 Lane: 1

File: SPD8028.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	1	0	1	21	40	34	9	2	0	0	0	0	0	0	108
02:00	0	0	0	1	5	19	13	5	2	1	0	0	0	0	0	46
03:00	0	0	0	1	6	7	11	7	1	0	0	0	1	0	0	34
04:00	0	0	0	1	4	4	9	6	2	1	1	0	0	0	0	28
05:00	0	0	0	1	3	20	18	15	5	1	0	0	0	0	0	63
06:00	0	0	0	1	22	56	49	22	6	1	1	0	0	0	0	158
07:00	1	0	0	17	68	147	91	9	2	0	0	0	0	0	0	335
08:00	1	0	17	51	152	177	62	10	0	0	0	0	0	0	0	470
09:00	0	0	8	52	112	202	81	20	1	0	0	0	0	0	0	476
10:00	0	0	13	50	143	138	56	7	0	0	1	0	0	0	0	408
11:00	0	1	8	60	101	127	49	8	1	0	0	0	0	0	0	355
12:00	0	4	16	56	165	150	42	7	2	1	0	0	0	0	0	443
13:00	3	2	11	63	231	161	41	4	1	0	0	0	0	0	0	517
14:00	9	3	14	71	157	152	40	6	1	0	0	0	0	0	0	453
15:00	1	2	22	95	220	181	33	5	3	1	0	0	0	0	0	563
16:00	4	1	34	89	225	144	32	7	0	0	0	0	0	0	0	536
17:00	33	24	29	81	158	95	29	1	0	0	0	0	0	0	0	450
18:00	34	17	58	93	172	79	27	2	0	0	0	0	0	0	0	482
19:00	465	13	5	10	0	0	0	2	0	0	2	0	0	0	0	497
20:00	18	0	12	101	239	126	24	2	0	0	0	0	0	0	0	522
21:00	0	0	1	81	216	114	46	3	2	0	0	0	0	0	0	463
22:00	0	0	7	34	173	120	43	4	0	0	0	0	0	0	0	381
23:00	0	0	0	30	108	99	31	5	2	0	0	0	0	0	0	275
24:00	0	0	0	6	63	96	38	9	1	0	0	0	0	0	0	213

DAY TOTAL	569	68	255	1046	2764	2454	899	175	34	6	5	0	1	0	0	8276
PERCENTS	6.9%	0.9%	3.1%	12.7%	33.4%	29.7%	10.8%	2.1%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
30.7 mph

85th Percentile Speed
43.8 mph

Median Speed
38.0 mph

Average Speed
36.6 mph

10 MPH Pace Speed
34 mph to 44 mph
5218 vehicles in pace
Representing 63.0% of the total vehicles

Vehicles > 65 MPH
6
0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Fri 3/30/2018

Site Reference: 180060000822
 Site ID: 000000000702
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: SOUTH
 Lane: 1

File: SPD8028.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	4	32	58	21	11	3	0	0	0	0	0	0	129
02:00	0	0	0	3	15	17	11	2	3	0	0	0	0	0	0	51
03:00	0	0	0	9	9	12	19	9	3	0	0	0	0	0	0	61
04:00	0	0	0	1	6	7	17	8	1	0	0	0	0	0	0	40
05:00	0	0	0	3	7	16	21	17	6	1	0	0	0	0	0	71
06:00	0	0	2	8	19	44	45	25	5	0	0	0	0	0	0	148
07:00	0	0	0	4	73	150	50	18	3	1	0	0	0	0	0	299
08:00	3	3	18	53	148	119	57	16	0	0	0	0	0	0	0	417
09:00	0	0	22	68	153	159	59	6	0	0	0	0	0	0	0	467
10:00	0	11	12	60	135	140	40	4	1	0	0	0	0	0	0	403
11:00	0	0	22	59	167	145	49	13	1	0	0	0	0	0	0	456
12:00	0	1	4	49	189	172	56	4	2	1	0	0	0	0	0	478
13:00	0	3	17	97	253	167	34	4	0	0	0	0	0	0	0	575
14:00	17	9	44	116	241	136	37	4	0	0	0	0	0	0	0	604
15:00	442	27	18	13	8	3	2	3	0	1	0	1	0	0	0	518
16:00	471	2	2	4	0	1	4	0	0	0	0	0	0	0	0	484
17:00	407	2	2	12	4	6	0	3	0	0	0	0	0	0	0	436
18:00	292	17	35	27	40	9	0	2	0	0	0	2	2	1	1	428
19:00	0	6	24	66	194	156	30	5	1	0	0	0	0	0	0	482
20:00	0	0	4	86	222	135	26	2	0	0	0	0	0	0	0	475
21:00	0	0	4	66	185	114	28	1	1	0	0	0	0	0	0	399
22:00	0	0	12	52	167	144	28	9	1	0	0	0	0	0	0	413
23:00	0	0	1	45	132	124	49	6	1	0	0	0	0	0	0	358
24:00	0	0	0	17	88	95	42	14	1	0	0	0	0	0	0	257
DAY TOTAL	1632	81	243	922	2487	2129	725	186	33	4	0	3	2	1	1	8449
PERCENTS	19.4%	1.0%	2.9%	11.0%	29.5%	25.2%	8.5%	2.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 14.8 mph

85th Percentile Speed
 43.3 mph

Median Speed
 36.7 mph

Average Speed
 32.9 mph

10 MPH Pace Speed
 34 mph to 44 mph
 4616 vehicles in pace
 Representing 54.6% of the total vehicles

Vehicles > 65 MPH
 7
 0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Sat 3/31/2018

Site Reference: 180060000822
 Site ID: 000000000702
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: SOUTH
 Lane: 1

File: SPD8028.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	1	0	15	40	64	34	7	0	0	0	0	0	0	0	161
02:00	0	0	0	5	29	48	27	11	2	2	0	0	0	0	0	124
03:00	0	0	0	0	14	19	16	8	1	2	0	0	0	0	0	60
04:00	0	0	0	1	6	17	19	8	6	1	1	0	0	0	0	59
05:00	0	0	0	0	6	15	13	11	5	0	1	0	0	0	0	51
06:00	0	0	0	1	8	27	28	14	3	1	0	0	0	0	0	82
07:00	0	0	0	3	34	53	40	28	4	1	1	0	0	0	0	164
08:00	1	0	0	5	43	119	67	29	8	3	0	0	0	0	0	275
09:00	0	0	2	17	83	121	95	25	3	0	0	0	0	0	0	346
10:00	0	0	0	17	141	174	81	13	3	0	0	0	0	0	0	429
11:00	0	0	0	13	124	198	94	19	0	0	0	0	0	0	0	448
12:00	3	0	6	19	139	181	75	10	2	2	0	0	0	0	0	437
13:00	0	1	0	33	181	226	91	15	2	1	0	0	0	0	0	550
14:00	3	6	15	81	209	182	44	4	0	2	0	0	0	0	0	546
15:00	1	2	21	95	185	148	59	10	1	1	0	0	0	0	0	523
16:00	0	0	1	68	185	229	71	7	2	0	0	0	0	0	0	563
17:00	0	1	3	38	188	233	71	14	2	0	0	0	0	0	0	550
18:00	0	0	0	58	185	171	67	9	1	0	0	0	0	0	0	491
19:00	0	1	5	70	221	161	42	7	1	0	0	0	0	0	0	508
20:00	0	0	3	55	241	135	41	8	0	0	0	0	0	0	0	483
21:00	0	0	4	74	185	113	25	7	0	1	0	0	0	0	0	409
22:00	0	0	0	22	106	140	38	5	0	0	0	0	0	0	0	311
23:00	0	0	2	32	131	116	39	6	0	0	0	0	0	0	0	326
24:00	0	0	3	16	84	113	50	7	0	0	0	0	0	1	0	274
DAY TOTAL	8	12	65	738	2768	3003	1227	282	46	17	3	0	0	1	0	8170
PERCENTS	0.1%	0.2%	0.8%	9.1%	33.9%	36.8%	15.0%	3.4%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 34.7 mph

85th Percentile Speed
 45.4 mph

Median Speed
 39.8 mph

Average Speed
 40.0 mph

10 MPH Pace Speed
 34 mph to 44 mph
 5771 vehicles in pace
 Representing 70.6% of the total vehicles

Vehicles > 65 MPH
 4
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Sun 4/1/2018

Site Reference: 180060000822
 Site ID: 000000000702
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: SOUTH
 Lane: 1

File: SPD8028.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	9	38	86	37	3	1	0	0	0	0	0	0	174
02:00	0	0	0	3	25	42	33	7	0	0	0	0	0	0	0	110
03:00	0	0	2	0	15	43	21	6	3	1	0	0	0	0	0	91
04:00	0	0	0	2	16	16	21	4	3	1	1	0	0	0	0	64
05:00	0	0	0	1	2	15	10	10	4	0	0	0	0	0	0	42
06:00	0	0	1	1	8	11	17	9	1	0	0	0	0	0	0	48
07:00	0	0	0	1	13	24	22	16	7	0	0	0	0	0	0	83
08:00	0	0	0	0	27	61	45	16	5	0	2	0	0	0	0	156
09:00	0	0	0	3	40	80	48	25	2	0	0	0	0	0	0	198
10:00	0	0	2	7	60	151	64	18	0	0	0	0	0	0	0	302
11:00	0	0	0	14	115	151	77	13	1	0	0	0	0	0	0	371
12:00	0	0	0	17	131	167	72	35	1	1	0	0	0	0	0	424
13:00	0	0	1	52	194	200	61	15	2	0	0	0	0	0	0	525
14:00	0	0	10	50	276	188	53	6	3	0	0	1	0	0	0	587
15:00	0	0	3	70	274	202	48	4	0	0	0	0	0	0	0	601
16:00	0	0	17	83	255	168	41	7	0	0	0	0	0	0	0	571
17:00	0	0	0	40	219	182	72	13	0	0	0	0	0	0	0	526
18:00	0	0	3	33	152	210	70	13	1	0	0	0	0	0	0	482
19:00	0	0	9	52	186	172	63	7	2	0	0	0	0	0	0	491
20:00	0	0	2	78	232	179	37	3	0	0	0	0	0	0	0	531
21:00	0	0	4	82	246	134	26	6	0	0	0	0	0	0	0	498
22:00	0	0	14	32	140	128	37	7	0	0	0	0	0	0	0	358
23:00	0	0	1	9	97	106	46	6	1	0	0	0	0	0	0	266
24:00	0	0	0	4	51	85	28	10	5	0	0	0	0	0	0	183
DAY TOTAL	0	0	69	643	2812	2801	1049	259	42	3	3	1	0	0	0	7682
PERCENTS	0.0%	0.0%	0.9%	8.4%	36.7%	36.5%	13.7%	3.3%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
34.8 mph

85th Percentile Speed
45.0 mph

Median Speed
39.6 mph

Average Speed
39.8 mph

10 MPH Pace Speed
34 mph to 44 mph
5613 vehicles in pace
Representing 73.0% of the total vehicles

Vehicles > 65 MPH
4
0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Mon 4/2/2018

Site Reference: 180060000822
 Site ID: 000000000702
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: SOUTH
 Lane: 1

File: SPD8028.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	1	21	43	30	7	2	1	1	0	0	0	0	106
02:00	0	0	0	0	6	14	16	5	1	0	3	0	0	0	0	45
03:00	0	0	0	0	5	9	6	6	2	1	0	0	1	0	0	30
04:00	0	0	0	0	3	9	15	10	1	0	0	0	0	0	0	38
05:00	0	0	0	3	5	8	8	14	4	0	0	0	0	0	0	42
06:00	0	0	2	2	21	61	52	17	2	1	0	1	0	0	0	159
07:00	1	0	0	4	50	131	76	28	5	0	0	0	0	0	0	295
08:00	0	0	5	42	186	170	66	7	0	0	0	0	0	0	0	476
09:00	0	0	16	64	194	142	61	5	0	0	0	0	0	0	0	482
10:00	0	0	4	18	110	160	55	19	0	1	0	0	0	0	0	367
11:00	0	2	14	51	103	107	51	9	1	0	0	0	0	0	0	338
12:00	0	0	3	28	108	151	72	10	2	1	0	0	0	0	0	375
13:00	0	0	1	25	115	170	59	10	3	0	0	0	0	0	0	383
14:00	1	0	18	48	190	120	65	11	0	1	0	0	0	0	0	454
15:00	0	3	24	95	218	177	38	9	2	0	0	0	0	0	0	566
16:00	0	5	15	76	240	166	43	7	1	0	0	0	0	0	0	553
17:00	0	1	7	45	170	191	46	11	0	0	0	0	0	0	0	471
18:00	0	6	13	63	173	180	51	10	1	0	0	0	0	0	0	497
19:00	0	0	3	63	143	182	61	4	0	0	0	0	0	0	0	456
20:00	0	0	0	47	174	129	33	4	2	0	0	0	0	0	0	389
21:00	0	0	0	19	138	159	31	8	1	0	0	0	0	0	0	356
22:00	0	0	0	23	129	112	28	5	1	0	0	0	0	0	0	298
23:00	0	0	4	14	71	93	33	10	0	0	0	0	0	0	0	225
24:00	0	0	1	11	30	83	29	13	1	0	0	0	0	0	0	168

DAY TOTAL	2	17	130	742	2603	2767	1025	239	32	6	4	1	1	0	0	7569
PERCENTS	0.1%	0.3%	1.8%	9.9%	34.4%	36.5%	13.5%	3.1%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
34.5 mph

85th Percentile Speed
44.9 mph

Median Speed
39.5 mph

Average Speed
39.6 mph

10 MPH Pace Speed
34 mph to 44 mph
5370 vehicles in pace
Representing 70.9% of the total vehicles

Vehicles > 65 MPH
6
0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 4/3/2018

Site Reference: 180060000822
 Site ID: 000000000702
 Location: RTE. 138 NO. OF NEPONSET VALLEY PKWY
 Direction: SOUTH
 Lane: 1

File: SPD8028.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	3	21	38	25	7	2	0	0	0	0	0	0	96
02:00	0	0	0	2	4	13	13	3	2	1	0	0	0	0	0	38
03:00	0	0	0	0	4	15	6	4	3	0	1	0	0	0	0	33
04:00	0	1	0	0	3	4	8	5	1	2	0	0	0	0	0	24
05:00	0	0	0	4	11	17	20	9	6	0	1	0	0	0	0	68
06:00	1	1	0	2	26	64	47	19	3	1	0	0	0	0	0	164
07:00	3	0	0	6	96	135	64	14	2	0	0	0	0	0	0	320
08:00	0	1	10	67	195	185	69	14	1	0	0	0	0	0	0	542
09:00	0	0	12	68	175	176	68	5	1	0	0	0	0	0	0	505
10:00	0	0	6	31	134	151	49	13	0	1	0	0	0	0	0	385
DAY TOTAL	4	3	28	183	669	798	369	93	21	5	2	0	0	0	0	2175
PERCENTS	0.2%	0.2%	1.3%	8.5%	30.8%	36.7%	17.0%	4.2%	0.9%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 34.8 mph

85th Percentile Speed
 46.2 mph

Median Speed
 40.3 mph

Average Speed
 40.3 mph

10 MPH Pace Speed
 34 mph to 44 mph
 1467 vehicles in pace
 Representing 67.4% of the total vehicles

Vehicles > 65 MPH
 2
 0.1%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 3/27/2018

STA. 13 NB

Site Reference: 180060000787
 Site ID: 000000001301
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: NORTH
 Lane: 1

File: SPD1301.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
14:00	53	4	21	95	109	17	5	0	0	0	0	0	0	0	0	304
15:00	55	10	28	117	125	29	5	0	0	0	0	0	0	0	0	369
16:00	62	3	28	139	131	23	4	0	0	0	0	0	0	0	0	390
17:00	33	7	28	164	123	45	0	0	0	0	0	0	0	0	0	400
18:00	34	19	41	169	150	33	1	1	0	0	0	0	0	0	0	448
19:00	16	1	33	138	159	42	3	2	0	0	0	0	0	0	0	394
20:00	9	1	22	125	81	19	2	0	0	0	0	0	0	0	0	259
21:00	10	1	31	129	99	11	0	1	0	0	0	0	0	0	0	282
22:00	2	7	28	108	69	11	1	0	0	0	0	0	0	0	0	226
23:00	2	5	19	79	64	15	0	0	0	0	0	0	0	0	0	184
24:00	2	1	12	37	45	13	2	2	0	0	0	0	0	0	0	114
DAY TOTAL	278	59	291	1300	1155	258	23	6	0	0	0	0	0	0	0	3370
PERCENTS	8.3%	1.8%	8.7%	38.6%	34.3%	7.6%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 26.9 mph

85th Percentile Speed
 38.1 mph

Median Speed
 33.1 mph

Average Speed
 31.7 mph

10 MPH Pace Speed
 29 mph to 39 mph
 2455 vehicles in pace
 Representing 72.8% of the total vehicles

Vehicles > 65 MPH
 0
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Wed 3/28/2018

Site Reference: 180060000787
 Site ID: 000000001301
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: NORTH
 Lane: 1

File: SPD1301.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	34	26	13	3	1	0	0	0	0	0	0	0	77
02:00	0	0	2	12	14	6	1	0	0	0	0	0	0	0	0	35
03:00	2	1	1	6	8	3	4	0	0	0	0	0	0	0	0	25
04:00	2	0	1	4	7	8	4	0	0	0	0	0	0	0	0	26
05:00	1	0	2	9	28	17	7	2	1	0	0	0	0	0	0	67
06:00	25	3	10	97	119	45	3	2	0	0	0	0	0	0	0	304
07:00	16	3	21	189	164	47	11	0	0	0	0	0	0	0	0	451
08:00	25	1	37	256	151	17	1	0	0	0	0	0	0	0	0	488
09:00	34	4	28	195	168	34	3	1	0	0	0	0	0	0	0	467
10:00	28	8	43	172	140	33	1	2	0	0	0	0	0	0	0	427
11:00	25	4	32	148	116	14	0	0	0	0	0	0	0	0	0	339
12:00	34	7	19	108	110	24	3	0	0	0	0	0	0	0	0	305
13:00	54	5	24	88	108	42	4	0	0	0	0	0	0	0	0	325
14:00	93	2	8	80	103	26	2	0	0	0	0	0	0	0	0	314
15:00	88	3	18	88	107	21	2	1	0	0	0	0	0	0	0	328
16:00	55	2	16	133	147	23	2	2	0	0	0	0	0	0	0	380
17:00	72	6	24	107	129	19	9	0	0	1	0	0	0	0	0	367
18:00	51	3	19	129	161	32	3	0	1	0	0	0	0	0	0	399
19:00	44	4	24	126	137	36	5	3	0	0	0	0	0	0	0	379
20:00	18	5	39	163	97	15	6	0	0	0	0	0	0	0	0	343
21:00	2	6	31	140	102	16	4	1	0	0	0	0	0	0	0	302
22:00	7	5	24	134	88	13	1	0	0	0	0	0	0	0	0	272
23:00	4	1	12	89	84	21	0	3	0	0	2	0	0	0	0	216
24:00	9	3	8	49	48	6	2	0	1	0	0	0	0	0	0	126

DAY TOTAL	689	76	443	2556	2362	531	81	18	3	1	2	0	0	0	0	6762
PERCENTS	10.2%	1.2%	6.6%	37.8%	35.0%	7.9%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
26.8 mph

85th Percentile Speed
38.2 mph

Median Speed
33.3 mph

Average Speed
31.6 mph

10 MPH Pace Speed
29 mph to 39 mph
4918 vehicles in pace
Representing 72.7% of the total vehicles

Vehicles > 65 MPH
2
0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Thu 3/29/2018

Site Reference: 180060000787
 Site ID: 000000001301
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: NORTH
 Lane: 1

File: SPD1301.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	4	1	2	25	33	15	1	1	0	0	0	0	0	0	0	82
02:00	0	0	3	12	17	1	2	3	0	0	0	0	0	0	0	38
03:00	0	0	1	9	11	3	3	0	1	0	0	0	0	0	0	28
04:00	2	0	0	7	17	6	1	0	0	0	0	0	0	0	0	33
05:00	2	0	2	11	18	10	3	4	0	0	0	0	0	0	0	50
06:00	13	1	11	116	133	26	8	1	0	0	0	0	0	0	0	309
07:00	29	1	30	186	149	29	6	0	0	0	0	0	0	0	0	430
08:00	47	7	41	182	157	42	4	0	0	0	0	0	0	0	0	480
09:00	40	2	46	201	137	19	6	0	0	0	0	0	0	0	0	451
10:00	35	16	37	143	142	18	0	1	0	0	0	0	0	0	0	392
11:00	49	5	14	145	155	15	4	0	0	0	0	0	0	0	0	387
12:00	68	5	41	113	92	20	2	0	0	0	0	0	0	0	0	341
13:00	50	6	15	125	99	11	0	2	0	0	0	0	0	0	0	308
14:00	44	4	15	119	110	18	0	0	0	0	0	0	0	0	0	310
15:00	57	9	10	95	119	29	9	0	0	0	0	0	0	0	0	328
16:00	71	3	52	192	115	16	1	0	0	0	0	0	0	0	0	450
17:00	40	2	39	174	123	29	2	0	1	0	0	0	0	0	0	410
18:00	59	10	28	154	149	43	0	1	0	0	0	0	0	0	0	444
19:00	41	5	35	198	120	18	0	0	0	0	0	0	0	0	0	417
20:00	6	2	50	144	104	10	1	1	0	0	0	0	0	0	0	318
21:00	7	14	57	122	76	17	3	1	0	0	0	0	0	0	0	297
22:00	11	1	18	134	78	11	2	2	0	0	0	0	0	0	0	257
23:00	9	10	19	98	68	14	2	0	0	0	0	0	0	0	0	220
24:00	6	1	12	62	61	16	1	0	0	0	0	0	0	0	0	159
DAY TOTAL	690	105	578	2767	2283	436	61	17	2	0	0	0	0	0	0	6939
PERCENTS	10.0%	1.6%	8.4%	39.9%	32.9%	6.2%	0.8%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 26.1 mph

85th Percentile Speed
 37.9 mph

Median Speed
 32.8 mph

Average Speed
 31.2 mph

10 MPH Pace Speed
 29 mph to 39 mph
 5050 vehicles in pace
 Representing 72.7% of the total vehicles

Vehicles > 65 MPH
 0
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Fri 3/30/2018

Site Reference: 180060000787
 Site ID: 000000001301
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: NORTH
 Lane: 1

File: SPD1301.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	1	2	13	33	21	13	2	0	0	0	0	0	0	0	0	85
02:00	1	1	10	14	22	20	6	0	0	0	0	0	0	0	0	74
03:00	2	2	3	11	9	6	0	2	0	0	0	0	0	0	0	35
04:00	0	1	1	5	11	10	3	1	0	0	0	0	0	0	0	32
05:00	5	1	3	11	42	9	3	2	0	0	0	0	0	0	0	76
06:00	29	2	9	50	116	34	13	1	0	0	0	0	0	0	0	254
07:00	48	1	14	138	155	36	7	0	0	0	0	0	0	0	0	399
08:00	49	1	21	178	153	20	1	0	0	0	0	0	0	0	0	423
09:00	41	9	44	187	117	19	2	0	0	0	0	0	0	0	0	419
10:00	29	9	39	123	114	24	4	1	0	0	0	0	0	0	0	343
11:00	52	4	23	85	107	37	2	0	2	1	0	0	0	0	0	313
12:00	67	7	22	104	132	25	3	0	0	0	0	0	0	0	0	360
13:00	68	5	47	124	90	31	6	0	0	0	0	0	0	0	0	371
14:00	53	0	28	152	126	30	0	0	0	0	0	0	0	0	0	389
15:00	48	3	38	147	116	18	2	0	0	0	0	0	0	0	0	372
16:00	53	3	40	146	132	15	0	0	0	0	0	0	0	0	0	389
17:00	47	3	32	173	151	26	0	0	0	0	0	0	0	0	0	432
18:00	49	6	50	179	130	25	0	0	0	0	0	0	0	0	0	439
19:00	42	1	35	169	160	32	9	0	0	0	0	0	0	0	0	448
20:00	26	1	33	131	93	13	2	0	0	0	0	0	0	0	0	299
21:00	12	5	44	131	88	10	1	0	0	0	0	0	0	0	0	291
22:00	8	12	41	138	74	13	2	0	0	0	0	0	0	0	0	288
23:00	11	2	40	127	76	18	2	0	0	0	0	0	0	0	0	276
24:00	6	1	16	69	70	15	1	0	0	0	0	0	0	0	0	178
DAY TOTAL	747	82	646	2625	2305	499	71	7	2	1	0	0	0	0	0	6985
PERCENTS	10.7%	1.2%	9.3%	37.6%	33.0%	7.1%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 25.7 mph

85th Percentile Speed
 38.0 mph

Median Speed
 32.9 mph

Average Speed
 31.1 mph

10 MPH Pace Speed
 29 mph to 39 mph
 4930 vehicles in pace
 Representing 70.5% of the total vehicles

Vehicles > 65 MPH
 0
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Sat 3/31/2018

Site Reference: 180060000787
 Site ID: 000000001301
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: NORTH
 Lane: 1

File: SPD1301.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	3	4	16	57	49	15	6	0	0	0	0	0	0	0	0	150
02:00	0	1	3	15	33	14	3	0	0	0	0	0	0	0	0	69
03:00	2	3	4	13	30	18	4	2	0	0	1	0	0	0	0	77
04:00	2	3	2	15	26	17	6	0	0	0	0	0	0	0	0	71
05:00	3	4	1	7	16	13	4	0	0	0	0	0	0	0	0	48
06:00	3	1	3	14	24	23	4	2	0	0	0	0	0	0	0	74
07:00	4	2	0	42	64	29	8	0	0	0	0	0	0	0	0	149
08:00	9	1	12	44	89	40	9	0	0	0	0	0	0	0	0	204
09:00	30	7	2	77	144	43	11	0	0	0	0	0	0	0	0	314
10:00	39	4	23	107	135	31	4	0	0	1	0	0	0	0	0	344
11:00	58	9	14	111	131	39	9	2	0	0	0	0	0	0	0	373
12:00	104	4	20	92	107	18	4	0	4	0	0	0	0	0	0	353
13:00	102	9	14	113	110	18	1	0	0	0	0	0	0	0	0	367
14:00	114	2	18	114	127	29	4	1	0	0	0	0	0	0	0	409
15:00	112	11	8	93	128	41	7	1	0	0	0	0	0	0	0	401
16:00	113	4	15	107	121	32	3	0	0	0	0	0	0	0	0	395
17:00	85	8	19	136	157	19	8	2	0	0	0	0	0	0	0	434
18:00	87	9	14	93	105	42	2	0	0	0	0	0	0	0	0	352
19:00	58	2	15	117	134	49	1	0	0	0	0	0	0	0	0	376
20:00	14	1	29	153	129	23	0	0	0	0	0	0	0	0	0	349
21:00	13	2	36	121	104	15	1	0	0	0	0	0	0	0	0	292
22:00	3	3	27	142	96	20	0	0	0	0	0	0	0	0	0	291
23:00	0	2	45	123	96	15	6	1	0	0	0	0	0	0	0	288
24:00	8	6	21	96	66	21	5	1	0	0	0	0	0	0	0	224
DAY TOTAL	966	102	361	2002	2221	624	110	12	4	1	1	0	0	0	0	6404
PERCENTS	15.1%	1.6%	5.7%	31.3%	34.7%	9.8%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 18.9 mph

85th Percentile Speed
 38.5 mph

Median Speed
 33.4 mph

Average Speed
 30.8 mph

10 MPH Pace Speed
 29 mph to 39 mph
 4223 vehicles in pace
 Representing 65.9% of the total vehicles

Vehicles > 65 MPH
 1
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Sun 4/1/2018

Site Reference: 180060000787
 Site ID: 000000001301
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: NORTH
 Lane: 1

File: SPD1301.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	4	0	4	49	65	16	3	0	1	0	0	0	0	0	0	142
02:00	3	0	5	40	43	13	2	0	2	0	0	0	0	0	0	108
03:00	4	1	7	26	35	14	2	4	0	0	0	0	0	0	0	93
04:00	1	0	5	16	29	10	0	0	0	1	0	0	0	1	0	63
05:00	1	0	0	7	10	6	7	0	2	0	0	0	0	0	0	33
06:00	3	0	1	8	22	9	8	0	0	0	0	0	0	0	0	51
07:00	5	2	1	14	36	22	12	5	0	0	0	0	0	0	0	97
08:00	9	2	4	21	59	33	4	3	0	1	0	0	0	0	0	136
09:00	20	3	7	37	110	26	4	0	1	0	0	0	0	0	0	208
10:00	28	4	15	72	152	49	7	0	0	0	0	0	0	0	0	327
11:00	72	5	4	115	163	32	6	0	0	0	0	0	0	0	0	397
12:00	96	10	9	91	108	33	8	2	0	0	0	0	0	0	0	357
13:00	82	7	10	85	133	27	0	4	0	0	0	1	0	0	0	349
14:00	82	5	25	131	86	38	7	4	0	0	0	0	0	0	0	378
15:00	79	1	26	106	122	45	8	0	0	0	0	0	0	0	0	387
16:00	51	5	14	124	147	31	9	0	0	0	0	1	0	0	0	382
17:00	63	4	28	123	117	35	3	0	0	0	0	0	0	0	0	373
18:00	47	3	14	112	133	49	5	2	0	6	0	0	0	0	0	371
19:00	36	3	23	181	161	28	6	0	0	0	0	0	0	0	0	438
20:00	30	10	65	212	125	15	3	0	0	0	0	0	0	0	0	460
21:00	8	16	45	209	86	26	2	0	0	0	0	0	0	0	0	392
22:00	7	0	28	160	113	11	2	0	0	0	0	0	0	0	0	321
23:00	2	3	15	78	85	14	5	1	0	0	0	0	0	0	0	203
24:00	5	1	8	34	71	21	8	4	0	0	0	0	0	0	0	152
DAY TOTAL	738	85	363	2051	2211	603	121	29	6	8	0	2	0	1	0	6218
PERCENTS	11.9%	1.4%	5.9%	33.0%	35.6%	9.7%	2.0%	0.4%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 25.5 mph

85th Percentile Speed
 38.6 mph

Median Speed
 33.7 mph

Average Speed
 31.7 mph

10 MPH Pace Speed
 29 mph to 39 mph
 4262 vehicles in pace
 Representing 68.5% of the total vehicles.

Vehicles > 65 MPH
 3
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Mon 4/2/2018

Site Reference: 180060000787
 Site ID: 000000001301
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: NORTH
 Lane: 1

File: SPD1301.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	1	1	5	25	31	9	2	1	0	0	0	0	0	0	0	75
02:00	0	1	2	6	16	10	1	2	0	0	0	0	0	0	0	38
03:00	0	0	0	5	11	7	4	1	0	0	0	0	0	0	0	28
04:00	1	1	0	10	15	8	0	2	0	0	0	0	0	0	0	37
05:00	3	0	0	6	29	18	6	0	2	1	0	0	0	0	0	65
06:00	16	4	12	73	134	53	7	0	0	0	0	0	0	0	0	299
07:00	50	3	12	147	150	48	0	0	2	0	0	0	0	0	0	412
08:00	50	6	41	185	184	32	3	0	0	0	0	0	0	0	0	501
09:00	30	5	37	145	170	24	0	0	0	0	0	0	0	0	0	411
10:00	24	11	58	156	114	13	0	0	0	0	0	0	0	0	0	376
11:00	10	2	44	145	104	15	1	1	0	0	0	0	0	0	0	322
12:00	22	11	31	107	99	15	5	1	0	0	0	0	0	0	0	291
13:00	24	2	13	110	106	23	2	0	1	1	0	0	0	0	0	282
14:00	27	3	14	83	99	31	10	2	0	0	0	0	0	0	0	269
15:00	40	8	26	87	102	36	3	0	0	0	0	0	0	0	0	302
16:00	26	2	35	149	121	20	6	1	0	0	0	0	0	0	0	360
17:00	34	8	30	160	122	22	2	1	0	0	0	0	0	0	0	379
18:00	20	4	25	135	170	42	2	1	0	0	0	0	0	0	0	399
19:00	32	3	7	111	133	38	6	0	0	0	0	0	0	0	0	330
20:00	4	3	19	118	88	31	6	0	0	0	0	0	0	0	0	269
21:00	5	0	34	103	76	18	2	0	0	0	0	0	0	0	0	238
22:00	3	1	21	121	69	10	0	0	2	0	0	0	0	0	0	227
23:00	5	10	34	59	41	13	2	0	0	0	0	0	0	0	0	164
24:00	3	0	1	37	42	16	1	1	2	0	0	0	0	0	0	103

DAY TOTAL	430	89	501	2283	2226	552	71	14	9	2	0	0	0	0	0	6177
PERCENTS	7.0%	1.5%	8.2%	37.0%	36.0%	8.9%	1.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 28.1 mph

85th Percentile Speed
 38.4 mph

Median Speed
 33.5 mph

Average Speed
 32.4 mph

10 MPH Pace Speed
 29 mph to 39 mph
 4509 vehicles in pace
 Representing 72.9% of the total vehicles

Vehicles > 65 MPH
 0
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 4/3/2018

Site Reference: 180060000787
 Site ID: 000000001301
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: NORTH
 Lane: 1

File: SPD1301.prn
 City: MILTON
 County: SPEED NB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	6	30	32	13	2	0	0	0	0	0	0	0	0	83
02:00	0	1	2	11	12	4	2	2	0	0	0	0	0	0	0	34
03:00	2	1	1	6	14	4	4	1	1	0	0	0	0	0	0	34
04:00	1	0	0	3	14	10	4	0	0	0	0	0	0	0	0	32
05:00	0	1	5	10	34	16	3	0	1	0	0	0	0	0	0	70
06:00	15	1	7	93	147	42	3	2	0	0	0	0	0	0	0	310
07:00	36	1	18	170	188	64	4	2	0	0	0	0	0	0	0	483
08:00	44	1	42	199	172	22	5	0	0	0	0	0	0	0	0	485
09:00	65	4	40	155	156	21	5	2	0	0	0	0	0	0	0	448
10:00	64	2	22	137	151	26	1	2	0	0	0	0	0	0	0	405
11:00	67	8	13	117	99	23	0	0	1	0	0	0	0	0	0	328
DAY TOTAL	294	20	156	931	1019	245	33	11	3	0	0	0	0	0	0	2712
PERCENTS	10.9%	0.8%	5.8%	34.3%	37.5%	9.0%	1.2%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 27.0 mph

85th Percentile Speed
 38.4 mph

Median Speed
 33.8 mph

Average Speed
 31.8 mph

10 MPH Pace Speed
 29 mph to 39 mph
 1950 vehicles in pace
 Representing 71.9% of the total vehicles

Vehicles > 65 MPH
 0
 0.0%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 3/27/2018

STA. 13 SB

Site Reference: 180060000554
 Site ID: 000000001302
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: SOUTH
 Lane: 1

File: SPD1302.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
14:00	0	1	1	1	22	110	130	63	17	1	0	0	0	0	0	346
15:00	4	0	0	8	39	147	155	94	19	3	1	0	1	0	2	473
16:00	2	0	1	8	41	130	175	77	16	1	0	0	0	0	2	453
17:00	0	0	1	12	19	105	149	56	14	2	0	0	0	0	0	358
18:00	1	1	2	3	18	105	179	68	20	0	0	1	0	0	0	398
19:00	1	1	1	12	27	114	149	60	6	1	0	0	0	0	0	372
20:00	0	0	0	5	29	125	130	49	10	2	0	0	0	0	1	351
21:00	0	0	0	5	46	125	97	32	2	1	0	0	0	0	0	308
22:00	1	0	0	18	56	100	75	30	3	5	0	1	0	0	0	289
23:00	0	0	0	0	9	88	77	26	10	2	0	1	0	0	0	213
24:00	0	0	0	1	6	41	62	16	5	1	1	1	0	0	0	134
DAY TOTAL	9	3	6	73	312	1190	1378	571	122	19	2	4	1	0	5	3695
PERCENTS	0.3%	0.1%	0.2%	2.0%	8.5%	32.3%	37.2%	15.4%	3.3%	0.5%	0.0%	0.1%	0.0%	0.0%	0.1%	100%

Statistical Information...

15th Percentile Speed
 39.6 mph

85th Percentile Speed
 50.5 mph

Median Speed
 44.9 mph

Average Speed
 44.8 mph

10 MPH Pace Speed
 39 mph to 49 mph
 2568 vehicles in pace
 Representing 69.4% of the total vehicles

Vehicles > 65 MPH
 12
 0.3%

MassDOT Highway Division
 SPEED SUMMARY
 Wed 3/28/2018

Site Reference: 180060000554
 Site ID: 000000001302
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: SOUTH
 Lane: 1

File: SPD1302.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	0	3	13	34	6	5	2	0	0	0	0	0	63
02:00	0	0	0	0	3	9	6	9	4	0	2	0	0	0	0	33
03:00	0	0	1	0	0	5	3	4	7	2	1	0	0	0	0	23
04:00	0	0	0	0	1	5	4	12	5	4	1	0	0	0	0	32
05:00	0	0	0	0	0	7	15	17	12	5	3	1	0	0	0	60
06:00	0	0	0	2	0	32	57	43	15	4	0	0	0	0	0	153
07:00	0	0	2	6	17	87	103	56	15	5	0	0	0	1	0	292
08:00	0	0	0	8	36	179	175	56	5	1	1	0	0	0	2	463
09:00	2	3	4	23	39	188	152	66	10	1	3	0	0	0	0	491
10:00	0	1	0	2	26	104	99	53	8	0	1	0	0	0	0	294
11:00	0	1	1	3	10	76	141	46	7	3	3	0	0	0	0	291
12:00	0	0	1	1	27	85	154	53	6	0	2	0	0	0	0	329
13:00	2	0	1	1	10	116	146	55	17	1	0	0	1	0	0	350
14:00	5	0	1	8	23	120	136	42	8	1	2	0	0	0	2	348
15:00	2	1	0	11	23	138	167	59	20	7	0	0	0	0	1	429
16:00	2	0	0	6	19	105	194	78	9	2	2	0	0	0	0	417
17:00	2	0	2	3	26	124	135	58	13	2	1	0	0	0	0	366
18:00	3	0	3	12	16	96	174	60	10	0	0	0	0	0	0	374
19:00	0	0	0	13	38	138	178	53	9	2	0	0	0	0	0	431
20:00	0	0	0	12	34	162	151	43	7	1	0	0	0	0	0	410
21:00	0	0	1	7	23	144	118	32	6	0	0	0	0	0	0	331
22:00	0	0	0	5	39	96	92	34	9	5	1	0	0	0	0	281
23:00	0	0	0	1	9	75	72	42	10	2	0	0	0	0	0	211
24:00	0	0	0	0	8	33	61	36	13	2	2	1	1	1	0	158

DAY TOTAL	18	6	17	124	430	2137	2567	1013	230	52	25	2	2	2	5	6630
PERCENTS	0.3%	0.1%	0.3%	1.9%	6.5%	32.3%	38.8%	15.3%	3.5%	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 39.9 mph

85th Percentile Speed
 50.7 mph

Median Speed
 45.1 mph

Average Speed
 45.1 mph

10 MPH Pace Speed
 39 mph to 49 mph
 4704 vehicles in pace
 Representing 70.9% of the total vehicles

Vehicles > 65 MPH
 36
 0.5%

MassDOT Highway Division
 SPEED SUMMARY
 Thu 3/29/2018

Site Reference: 180060000554
 Site ID: 000000001302
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: SOUTH
 Lane: 1

File: SPD1302.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	0	2	22	44	16	5	4	0	0	0	0	0	93
02:00	0	0	0	0	2	8	13	7	4	1	1	0	0	0	0	36
03:00	0	0	0	0	3	4	8	6	11	0	0	0	0	0	0	32
04:00	0	0	0	0	0	3	4	10	3	4	0	1	0	0	0	25
05:00	0	0	0	0	0	8	12	22	13	5	4	1	0	0	0	65
06:00	0	0	0	1	8	19	45	36	18	6	1	0	1	2	0	137
07:00	2	0	1	0	13	49	116	74	34	5	0	1	0	0	0	295
08:00	4	0	1	9	38	130	158	81	18	1	0	1	1	0	0	442
09:00	2	0	3	8	34	140	159	73	17	1	1	0	0	0	0	438
10:00	2	1	0	4	22	113	143	64	8	1	0	0	1	1	0	360
11:00	1	0	2	3	15	82	125	53	15	0	0	0	0	0	0	296
12:00	8	1	0	0	18	86	153	63	15	0	0	1	0	0	0	345
13:00	6	0	0	7	21	128	143	48	10	7	1	0	0	0	4	375
14:00	9	0	1	8	26	96	120	57	20	0	0	0	0	0	0	337
15:00	2	0	2	8	46	149	171	60	15	2	0	0	0	0	0	455
16:00	5	0	3	14	17	129	166	78	6	1	0	1	0	0	2	422
17:00	1	0	3	8	38	87	142	75	15	2	0	2	0	0	0	373
18:00	0	0	0	8	35	118	161	47	10	2	1	0	0	0	0	382
19:00	0	0	1	17	33	178	128	53	5	0	0	0	0	0	0	415
20:00	0	0	1	19	85	148	122	27	3	0	0	0	0	0	0	405
21:00	0	0	1	13	38	160	92	19	5	1	0	0	0	0	0	329
22:00	0	0	0	5	42	139	95	19	8	2	1	0	0	0	0	311
23:00	5	0	1	10	31	81	70	20	6	4	0	0	0	0	0	228
24:00	0	0	0	1	19	51	72	28	4	2	0	0	0	0	0	177
DAY TOTAL	47	2	20	143	586	2128	2462	1036	268	51	10	8	3	3	6	6773
PERCENTS	0.7%	0.1%	0.3%	2.2%	8.7%	31.5%	36.4%	15.3%	3.9%	0.7%	0.1%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
39.5 mph

85th Percentile Speed
50.8 mph

Median Speed
44.9 mph

Average Speed
44.8 mph

10 MPH Pace Speed
39 mph to 49 mph
4590 vehicles in pace
Representing 67.7% of the total vehicles

Vehicles > 65 MPH
30
0.4%

MassDOT Highway Division
 SPEED SUMMARY
 Fri 3/30/2018

Site Reference: 180060000554
 Site ID: 000000001302
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: SOUTH
 Lane: 1

File: SPD1302.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	5	6	18	36	19	3	4	4	2	0	0	0	97
02:00	0	0	0	0	4	17	19	4	6	2	0	0	0	0	0	52
03:00	0	0	0	0	7	11	13	15	8	1	0	0	0	0	0	55
04:00	0	0	0	2	2	3	13	10	4	3	0	1	0	0	0	38
05:00	0	0	1	0	6	6	19	21	14	1	0	2	1	0	0	71
06:00	0	0	0	1	3	15	49	39	20	8	0	0	0	0	0	135
07:00	1	0	0	1	13	42	132	55	14	5	3	1	0	0	0	267
08:00	3	0	1	1	14	122	162	69	19	1	0	0	0	0	0	392
09:00	0	1	10	30	64	127	134	37	11	0	0	0	0	0	0	414
10:00	4	5	9	15	43	111	94	37	4	2	1	0	0	0	0	325
11:00	1	0	1	2	20	105	154	57	13	0	1	0	0	0	0	354
12:00	1	1	1	3	19	116	166	47	7	0	3	0	0	0	0	364
13:00	1	1	0	1	31	140	175	50	4	0	0	0	0	0	0	403
14:00	0	0	2	6	34	147	192	67	3	1	0	2	0	0	0	454
15:00	4	1	1	4	50	148	137	56	8	1	0	0	0	0	1	411
16:00	0	0	1	6	44	135	184	65	14	3	1	0	0	0	0	453
17:00	0	0	1	4	18	79	168	70	10	1	0	0	0	0	0	351
18:00	0	0	0	7	33	132	129	51	12	2	0	0	0	0	0	366
19:00	0	0	0	6	46	129	142	46	9	1	0	0	0	0	0	379
20:00	0	0	0	11	64	167	125	32	3	2	0	0	0	0	0	404
21:00	0	0	0	2	40	149	126	29	3	1	0	0	0	0	0	350
22:00	0	0	3	8	33	154	112	27	3	2	0	1	0	0	0	343
23:00	0	0	1	7	41	118	103	37	8	2	0	0	0	0	0	317
24:00	0	0	0	6	18	70	83	37	14	5	0	0	0	0	0	233

DAY TOTAL	15	9	32	128	653	2261	2667	977	214	48	13	9	1	0	1	7028
PERCENTS	0.3%	0.2%	0.5%	1.9%	9.3%	32.2%	37.9%	13.9%	3.0%	0.6%	0.1%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 39.5 mph

85th Percentile Speed
 50.1 mph

Median Speed
 44.8 mph

Average Speed
 44.7 mph

10 MPH Pace Speed
 39 mph to 49 mph
 4928 vehicles in pace
 Representing 70.1% of the total vehicles

Vehicles > 65 MPH
 24
 0.3%

MassDOT Highway Division
 SPEED SUMMARY
 Sat 3/31/2018

Site Reference: 180060000554
 Site ID: 000000001302
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: SOUTH
 Lane: 1

File: SPD1302.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	2	1	1	11	46	42	35	5	2	2	0	2	0	0	149
02:00	0	0	0	0	1	29	53	20	8	3	1	0	0	0	0	115
03:00	0	0	1	0	5	10	20	11	8	2	0	0	0	0	0	57
04:00	0	0	0	0	1	9	20	12	7	8	1	1	1	0	0	60
05:00	0	0	0	1	0	5	15	14	11	2	0	2	0	1	0	51
06:00	0	0	1	2	0	11	22	21	7	11	1	2	1	0	0	79
07:00	0	0	0	3	4	29	48	36	9	9	5	2	0	0	0	145
08:00	3	0	0	0	1	34	84	79	28	11	3	3	0	0	0	246
09:00	0	0	0	0	6	57	118	97	22	4	0	1	0	0	0	305
10:00	0	0	0	0	11	54	162	96	28	2	0	0	0	0	0	353
11:00	2	0	1	5	9	77	148	94	28	0	1	1	0	0	0	366
12:00	0	0	1	3	7	65	130	97	13	4	1	0	0	0	0	321
13:00	2	0	2	0	11	91	242	97	17	3	0	0	0	0	0	465
14:00	0	1	4	6	30	140	178	64	15	1	0	1	0	0	2	442
15:00	3	3	0	7	30	136	168	60	18	0	1	0	0	0	1	427
16:00	0	1	1	8	33	155	186	84	17	2	0	0	0	1	0	488
17:00	0	0	1	0	25	114	212	93	13	1	0	0	0	0	0	459
18:00	0	0	0	4	19	149	166	68	9	3	1	0	0	0	0	419
19:00	0	0	2	6	41	157	162	49	15	3	0	0	0	0	0	435
20:00	0	0	2	10	34	168	131	33	11	0	0	0	0	0	0	389
21:00	1	0	1	13	66	136	98	31	4	1	0	0	0	0	0	351
22:00	0	0	0	7	31	92	88	32	10	4	0	0	0	0	1	265
23:00	0	0	0	4	27	121	102	42	7	1	0	0	0	0	0	304
24:00	0	0	0	3	26	95	90	28	6	1	0	0	0	0	0	249

DAY TOTAL	11	7	18	83	429	1980	2685	1293	316	78	17	13	4	2	4	6940
PERCENTS	0.2%	0.2%	0.3%	1.2%	6.2%	28.6%	38.7%	18.7%	4.5%	1.1%	0.2%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 40.3 mph

85th Percentile Speed
 51.7 mph

Median Speed
 45.8 mph

Average Speed
 45.8 mph

10 MPH Pace Speed
 39 mph to 49 mph
 4665 vehicles in pace
 Representing 67.2% of the total vehicles

Vehicles > 65 MPH
 40
 0.6%

MassDOT Highway Division
 SPEED SUMMARY
 Sun 4/1/2018

Site Reference: 180060000554
 Site ID: 000000001302
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: SOUTH
 Lane: 1

File: SPD1302.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	1	20	55	59	17	5	0	1	0	0	0	0	158
02:00	0	0	0	0	7	34	35	17	5	1	1	0	0	0	0	100
03:00	0	0	0	2	4	18	32	19	5	2	1	1	0	1	0	85
04:00	0	0	0	1	3	10	23	21	7	2	3	1	0	0	0	71
05:00	0	0	0	2	2	5	12	14	3	3	1	1	0	0	0	43
06:00	0	0	0	1	2	9	7	8	9	1	1	0	0	0	0	38
07:00	0	0	1	0	1	12	28	19	11	6	0	0	0	0	0	78
08:00	0	0	2	0	2	17	45	49	23	6	1	0	0	0	0	145
09:00	0	0	0	7	1	28	73	53	14	2	1	0	0	0	0	179
10:00	1	0	5	0	7	36	119	81	16	8	1	0	0	0	0	274
11:00	0	0	0	0	10	91	126	70	10	3	0	0	1	0	0	311
12:00	0	1	0	0	18	82	137	90	22	4	1	2	0	1	0	358
13:00	0	0	0	0	21	124	202	76	14	1	1	0	0	0	2	441
14:00	0	0	0	6	50	163	208	65	10	2	0	0	0	0	0	504
15:00	6	1	1	3	59	173	214	55	11	2	0	0	0	0	0	525
16:00	1	5	6	11	61	222	151	46	17	0	0	0	0	0	0	520
17:00	0	0	0	0	33	145	172	75	15	2	3	0	0	0	0	445
18:00	0	0	0	0	24	113	169	78	13	2	0	0	0	0	0	399
19:00	0	0	2	5	27	113	144	66	13	2	1	0	0	0	0	373
20:00	0	0	0	4	42	171	148	38	6	2	0	0	0	0	0	411
21:00	0	0	1	11	59	194	119	23	5	1	1	0	0	0	0	414
22:00	0	0	0	9	31	99	103	38	4	2	0	0	0	0	0	286
23:00	0	0	0	2	17	70	83	43	9	3	0	0	0	0	0	227
24:00	0	0	0	1	6	42	80	16	9	0	1	0	0	0	0	155

DAY TOTAL	8	7	18	66	507	2026	2489	1077	256	57	19	5	1	2	2	6540
PERCENTS	0.2%	0.2%	0.3%	1.1%	7.8%	31.0%	38.1%	16.4%	3.9%	0.8%	0.2%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed 39.9 mph	85th Percentile Speed 51.0 mph
Median Speed 45.3 mph	Average Speed 45.3 mph
10 MPH Pace Speed 39 mph to 49 mph 4515 vehicles in pace Representing 69.0% of the total vehicles	Vehicles > 65 MPH 29 0.4%

MassDOT Highway Division
 SPEED SUMMARY
 Mon 4/2/2018

Site Reference: 180060000554
 Site ID: 000000001302
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: SOUTH
 Lane: 1

File: SPD1302.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	0	3	25	22	20	4	2	3	0	0	0	0	79
02:00	0	0	0	1	1	4	12	10	2	2	0	0	1	0	0	33
03:00	0	0	0	0	1	4	7	8	4	2	0	0	2	0	0	28
04:00	0	0	0	0	3	7	6	6	4	2	1	0	0	0	0	29
05:00	0	0	0	1	0	0	12	17	10	3	2	0	0	0	0	45
06:00	0	0	1	1	3	21	53	37	23	5	1	1	1	0	0	147
07:00	0	0	1	1	3	63	105	59	21	5	0	0	0	0	0	258
08:00	2	1	4	6	44	135	170	44	10	4	1	1	0	0	0	422
09:00	0	0	2	10	38	155	172	53	9	0	1	0	0	0	0	440
10:00	0	0	0	5	30	94	138	49	11	2	1	0	0	0	0	330
11:00	0	0	0	9	48	81	92	45	7	1	0	0	0	0	0	283
12:00	0	0	0	1	27	73	135	49	12	0	1	0	0	0	0	298
13:00	0	1	0	1	17	65	131	64	10	3	2	0	0	0	0	294
14:00	0	1	9	9	27	99	114	53	12	2	0	0	1	0	0	327
15:00	0	0	1	0	37	147	171	56	10	1	0	0	0	0	0	423
16:00	2	4	2	6	28	112	174	86	6	0	0	1	0	0	0	421
17:00	0	0	0	2	10	80	168	68	15	3	1	0	0	0	0	347
18:00	1	0	4	9	41	134	149	69	5	2	0	0	0	0	0	414
19:00	2	0	0	0	12	144	125	47	8	2	0	0	0	0	0	340
20:00	0	0	0	0	24	120	115	36	7	2	0	0	0	0	0	304
21:00	0	1	0	5	14	102	125	26	3	1	1	0	0	0	0	278
22:00	0	0	0	1	18	93	78	27	3	0	0	0	0	0	0	220
23:00	27	8	15	10	14	43	36	26	4	5	0	0	0	0	0	188
24:00	0	0	0	1	6	30	42	45	10	6	2	1	0	0	0	143

DAY TOTAL	34	16	39	79	449	1831	2352	1000	210	55	17	4	5	0	0	6091
PERCENTS	0.6%	0.3%	0.7%	1.3%	7.4%	30.1%	38.7%	16.4%	3.4%	0.9%	0.2%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
39.8 mph

85th Percentile Speed
50.9 mph

Median Speed
45.3 mph

Average Speed
45.1 mph

10 MPH Pace Speed
39 mph to 49 mph
4183 vehicles in pace
Representing 68.6% of the total vehicles

Vehicles > 65 MPH
26
0.4%

MassDOT Highway Division
 SPEED SUMMARY
 Tue 4/3/2018

Site Reference: 180060000554
 Site ID: 000000001302
 Location: RTE 138 NORTH OF BRADLEE RD.
 Direction: SOUTH
 Lane: 1

File: SPD1302.prn
 City: MILTON
 County: SPEED SB

TIME	19	24	29	34	39	44	49	54	59	64	69	74	79	85	86+	Tota
01:00	0	0	0	0	4	18	25	15	12	2	2	0	0	0	0	78
02:00	0	0	0	0	2	8	8	9	3	1	1	2	0	0	0	34
03:00	0	0	0	0	1	4	10	9	2	1	3	1	0	0	0	31
04:00	0	0	0	0	1	4	3	9	4	2	2	1	0	0	0	26
05:00	0	0	0	1	2	6	18	19	9	6	1	0	0	0	0	62
06:00	0	0	0	0	5	27	49	46	21	5	1	0	0	0	0	154
07:00	0	0	0	0	5	68	109	84	22	4	2	1	0	0	0	295
08:00	3	0	8	5	48	153	191	57	12	0	2	0	0	0	0	479
09:00	3	0	0	3	27	147	192	82	9	3	0	0	0	0	2	468
10:00	1	0	0	1	9	96	134	63	17	1	0	0	0	0	0	322
11:00	12	2	8	1	5	46	100	50	13	7	0	0	1	0	0	245
DAY TOTAL	19	2	16	11	109	577	839	443	124	32	14	5	1	0	2	2194
PERCENTS	0.9%	0.1%	0.8%	0.6%	5.0%	26.3%	38.3%	20.2%	5.6%	1.4%	0.6%	0.2%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
 40.5 mph

85th Percentile Speed
 52.3 mph

Median Speed
 46.2 mph

Average Speed
 46.1 mph

10 MPH Pace Speed
 39 mph to 49 mph
 1416 vehicles in pace
 Representing 64.5% of the total vehicles

Vehicles > 65 MPH
 22
 1.0%

Appendix C: Traffic Signal Data

1. Existing Signal Timing Plans
2. Signal Warrant Analysis

Part 1: Existing Signal Timing Plans

MILTON

SRB3-2

TRAFFIC SIGNAL LAYOUT

BLUE HILL AVE. (RTE. 138) & BRUSH HILL RD.

Scale: 1" = 40'

Signal No. 8 - 508

Date: Aug. 18, 1978

SEQUENCE AND TIMING

	Housings	1	2	3	4	5	6	7	8	9	10	11	12	FLASH OPER.	EMERGENCY
INITIAL INTERVAL					10										
VEHICLE INTERVAL					5										
MINIMUM		45													
MAXIMUM					30										
OTHER INTERVALS			5	1		4	1								
Blue Hill Ave (N.B.)	A-B-C	↑	Y	R	R	R	R							Y	
Blue Hill Ave. (S.B.)	D-E	↑→	Y	R	R	R	R							Y	
Brush Hill Rd (W.B.)	F-G	R	R	R	G	Y	R							R	
Brush Hill Rd (E.B.)	H-J	R	R	R	G	Y	R							R	
		Phase A				Phase B									

MAJOR ITEMS REQUIRED

NOTES

NUMBER	ITEMS
2	Standard Signal Posts (8')
2	Mast Arms (1-25', 1-30')
3	2 W. 1-4, 5-3 Lens Housing All 12"
2	1 W. 3 Lens Housings All 12"
1	1 W. 4 Lens Housings All 12"
1	Controller Type 2
2	Magnetic Detectors
1	Magnetic Detector Relay
2	12" X 12" Pull Boxes
2	8" X 23" Pull Boxes
1	Service Connection
	Necessary Duct, Cable, Misc. Material,
	Labor & Equipment To Complete
	The installation.

OFFICE RECORD AND REVISIONS
Power Pole No. - 1/128
Meter No. -
Completed: 10/2/73
Checked:
Revised: Oct. 29, 1979
Supersedes Layout Dated 3/24/70
Interval 1, Minimum, changed from 40 sec. to 45 sec. 10/10/79
Interval 2, Other Intervals, changed from 4 sec. to 5 sec. 10/10/79
Initial Int. 4 Chan. to 10 From 7, 9/14/80
Maximum Int. 4 chan. from 25 to 30, 9/14/80

- SIGNAL POST
- PULL BOX (Size Specified)
- ⊗ CONTROL
- METER
- WOODEN POLE
- MAST ARM
- SONIC DETECTOR
- PRESSURE DETECTOR
- MAGNETIC DETECTOR
- ⊗ PEDESTRIAN PUSH BUTTON

- SIGNAL OR FLASHER HOUSING
- R = RED W = WALK
- Y = YELLOW FDW = FLASH DON'T WALK
- G = GREEN DW = DON'T WALK
- ↑ VA = VERTICAL ARROW
- ← LA = LEFT ARROW
- RA = RIGHT ARROW
- PROPOSED CONDUIT
- EXISTING CONDUIT
- OVERHEAD CABLE

- LOOP DETECTOR
- WALK - DON'T WALK PEDESTRIAN HOUSING
- ⊗ FLASHER & METER PEDESTAL

	Date	By
Field Survey	Made	
	Checked	
Drawing	Made	8/17/78 J.F.L.
	Checked	10/30/79 [Signature]

Loc # 2

2/1

Milton

TRAFFIC ENGINE

APPROVED

S 72-209

55 BLUE HILL
RTE.

56

561

57

58

138

AVE.

MILTON ST.

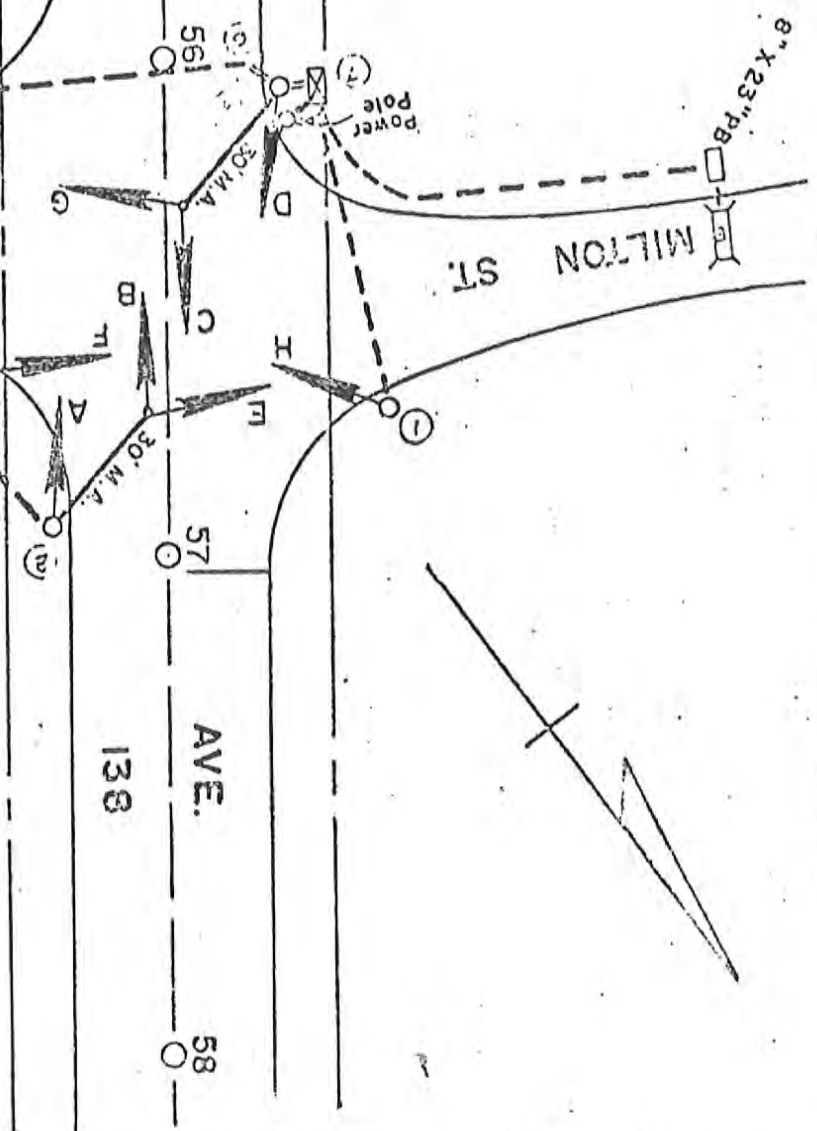
DOLLAR LANE

12" X 12" PB

12" X 12" PB

12" X 12" PB

Power Pole



SCALE

MILTON

Loc # 2
S.P. # 212

TRAFFIC SIGNAL LAYOUT

BLUE HILL AVE. (INTERSECTION) AT MILTON ST. & DOLLAR LANE

Scale: 1" = 40'

Signal No. 8-276

Date 9-5-73

SEQUENCE AND TIMING

	Housings	1	2	3	4	5	6	7	8	9	10	11	12	MOTOR SUPPLY	
INITIAL INTERVAL					7										
VEHICLE INTERVAL					5										
MINIMUM		30													
MAXIMUM					25										
OTHER INTERVALS			5	2		4									
Blue Hill Ave.	A-R-C-D	G	Y	R	R	R									
Milton St.	E-F	R	R	R	G	Y									Y
Dollar Lane	G-H	R	R	R	G	Y									R

MAJOR ITEMS REQUIRED

QUANTITY	ITEMS
2	Standard Signal Poles
2	Ring Arm (30")
4	1" x 1/2" Lens Housing
2	2" x 1/2" Lens Housing
1	Controller Type 2
2	Magnetic Detectors
1	Magnetic Detector Relay
2	12" x 12" Pull Boxes
2	8" x 2 1/2" Pull Boxes
1	Service Connection
	Necessary Duct, Conduit, Misc. Material
	Labor & Equip. Cost to Complete
	The Installation

NOTES

OFFICE RECORD AND REVISIONS
Power Pole No. _____
Motor No. - S.C. 11101-1-12-67-1111-63
Control No. _____
Checked by _____

- SIGNAL POST
- () PULL BOX (Size Specified)
- CONTROL
- ⊖ METER
- WOODEN POLE
- MAST ARM
- SONIC DETECTOR
- PRESSURE DETECTOR
- MAGNETIC DETECTOR
- PEDESTRIAN PUSH BUTTON

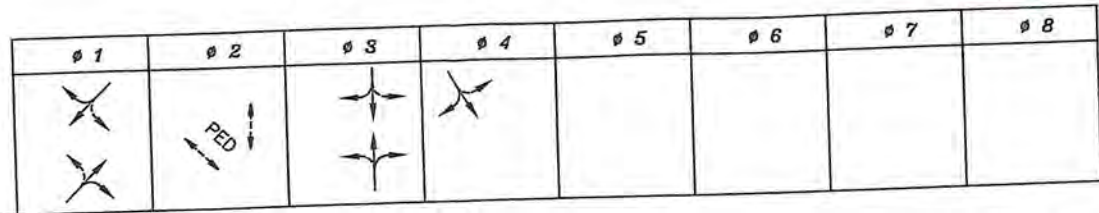
- SIGNAL FLASHER HOUSING
- R - RED
- Y - YELLOW
- G - GREEN
- VA - VERTICAL ARROW
- LA - LEFT ARROW
- RA - RIGHT ARROW
- PROPOSED CONDUIT
- EXISTING CONDUIT
- OVERHEAD CABLE

- DETECTOR
- WALK DON'T WALK
- PEDESTRIAN HOUSING
- FLASHER & METER PEDEST.

	Date	By
Field Survey	8/1/73	J.S.
Drawing	9/1/73	J.S.

Loc#3

APPROX. NORTH



SEQUENCE AND TIMING FOR PRETIMED/PUSHBUTTON ACTUATED CONTROL (ISOLATED)

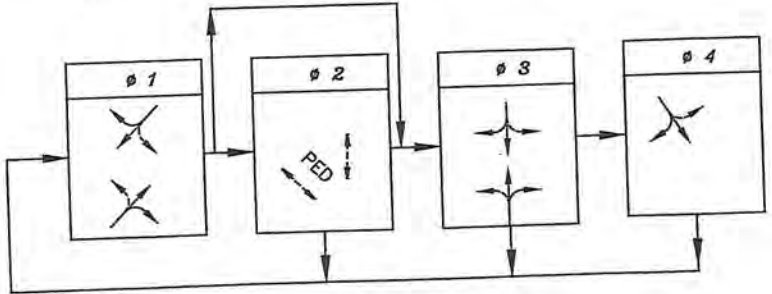
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH OPRR
BLUE HILL AVE.	NB	A,B	G	Y	R	R	R	R	R	R	R	R	R	R													FY
BLUE HILL AVE.	SB	C,D	G	Y	R	R	R	R	R	R	R	R	R	R													FY
ATHERTON ST.	WB	E,F,G	R	R	R	R	R	R	R	G	Y	R	R	R													FR
ATHERTON ST.	EB	H,J	R	R	R	R	R	R	R	R	R	R	G	Y	R												FR
BRADLEE RD.	EB	K,L	R	R	R	R	R	R	R	G	Y	R	R	R													FR
PEDESTRIAN	E-W	ALL	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW													OFF

TIMING IN SECONDS

MINIMUM GREEN (INITIAL)	22								10			4																
PASSAGE TIME (VEHICLE)	18								5			2																
MAXIMUM 1	40								20			8																
MAXIMUM 2																												
YELLOW CLEARANCE			5								4			4														
RED CLEARANCE				1				2			1				1													
WALK (W)					8																							
PEDESTRIAN CLEARANCE						10																						
RECALL				ON				OFF			OFF			OFF														
MEMORY																												

EMERGENCY ONLY

PREFERENTIAL PHASING SEQUENCE



DETECT NUMBER
①
②
③

MILTON

TRAFFIC SIGNAL LAYOUT

Loc # 4

Blue Hill Ave. (Route 138) and Robbins Street.

Scale: 1" = 20'

Signal No. 8-780

Date: 10/7/70

SEQUENCE AND TIMING

	Housings	1	2	3	4	5	6	7	8	9	10	11	12	FLASH OPER.	EMERGENCY
INITIAL INTERVAL							7								
VEHICLE INTERVAL							3								
MINIMUM		45													
MAXIMUM							20								
OTHER INTERVALS			5	1	7	11		4	1						
Blue Hill Ave.	ABCD	G	Y	R	R	R	R	R	R						Y
Robbins St.	EFGH	R	R	R	R	R	G	Y	R						R
Pedestrian		DW	DW	DW	W	FDW	DW	DW	DW						Out

MAJOR ITEMS REQUIRED

NOTES

NUMBER	ITEMS
2	Signal Mast Arm 20ft. Aluminum
1	Controller Type 3W
1	Control Cabinet Type CA or CB
1	Loop Detector Relay
2	Loop Detectors 6' X 4'
2	2-Way 3-3 lens housings 3-8" 3-12" Mast
2	2-Way 3-3 lens housings 3-8" 3-12" Post
2	Pedestrian Housings
2	Pedestrian Buttons
2	Pull Boxes 12" X 12"
1	Service Connection
	Conduit, cable, etc.

OFFICE RECORD AND REVISIONS
Power Pole No. - 28
Meter No. - S-664756
Cost Account No. 006-824-121
Completed: 10/31/71
Checked:
Timing Changes: Interval 3, changed from 2 sec. to 1 sec. - Int. 4, from 8 sec. to 7 sec. - Int. 5, from 7 sec. to 11 sec. - Int. 6, Initial from 4 sec. to 7 sec. - Int. 8 added, 1 sec., R, R & DW, Sept. 4, 1980

- SIGNAL POST
- PULL BOX (Size Specified)
- CONTROL
- METER
- WOODEN POLE
- MAST ARM
- SONIC DETECTOR
- PRESSURE DETECTOR
- MAGNETIC DETECTOR
- PEDESTRIAN PUSH BUTTON

- SIGNAL OR FLASHER HOUSING
- R = RED W = WALK
- Y = YELLOW FDW = FLASH DON'T WALK
- G = GREEN DW = DON'T WALK
- VA = VERTICAL ARROW
- LA = LEFT ARROW
- RA = RIGHT ARROW
- PROPOSED CONDUIT
- EXISTING CONDUIT
- OVERHEAD CABLE

- LOOP DETECTOR.
- WALK - DON'T WALK
- PEDESTRIAN HOUSING
- FLASHER & METER PEDESTAL

		Date	By
Field Survey	Made	5-1-70	RAP
	Checked		
Drawing	Made	10-7-70	WJP
	Checked	10-7-70	BHR

SIGNAL OPERATION CHART

Loc #5

PHASE				Ø1			Ø2			Ø3			Ø4			FLASHING
STREET	DIRECTION	MOVEMENT	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	OPERATION
ROUTE 138	NB	ALL	A,B	R	R		G	Y	R	R	R	R	R	R	R	Y
ROUTE 138	SB	ALL	C,D	R	R		G	Y	R	R	R	R	R	R	R	Y
BLUE HILL TERR.	WB	ALL	G,H	R	R		R	R	R	G	Y	R	R	R	R	R
CHEEVER ST.	EB	ALL	E,F	R	R		R	R	R	R	R	R	G	Y	R	R
PEDESTRIAN	EB/WB	ALL	P1,P2	W	FDW		DW	DW	DW	DW	DW	DW	DW	DW	DW	

TIMING IN SECONDS

MINIMUM							6			4				4		
VEHICLE EXTENSION							2			2				2		
MAXIMUM # 1 (FOR AM PEAK HOURS)							28			6				6		
MAXIMUM # 2 (FOR PM PEAK HOURS)							23			6				6		
MAXIMUM # 3																
MAXIMUM # 4																
YELLOW CLEARANCE									5			5			5	
RED CLEARANCE										2			2			2
PEDESTRIAN				6	10											
DETECTOR				LOCK			NON-LOCK			NON-LOCK			NON-LOCK			
RECALL				OFF			ON			OFF			OFF			

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

MILTON

TRAFFIC SIGNAL LAYOUT

BLUE HILL AVE. (ROUTE 138) AT BROOK ROAD.

23
Loc #6

Scale: 1" = 40'

Signal No. 8-277

Date: March 21, 1967

SEQUENCE AND TIMING

	Housings	1	2	3	4	5	6	7	8	FLASH OPER.
PERCENTAGE										
SECONDS										
INITIAL INTERVAL						7				
VEHICLE INTERVAL						5				
MINIMUM		30								
MAXIMUM						25				
OTHER INTERVALS			5	7	11		4			
BLUE HILL AVE.	ABCDE	G	Y	R	R	R	R			Y
BROOK RD. E.B.	G-F	R	R	R	R	G	Y			R
PEDESTRIAN		DW	DW	W	FDW	DW	DW			out

MAJOR ITEMS REQUIRED

NUMBER	ITEMS
5	Standard Signal Posts (4-10:1-8')
2	2 Way 3 Lens Housings (12" R)
2	1 Way 3 Lens Housings (12" R)
8	Pedestrian Indications
1	Magnetic Detectors
4	Ped. Push Buttons
1	Controller TCT-IP
1	1 Way 3 Lens Housing
	Necessary Duct, Cable etc.

NOTES

OFFICE RECORD AND REVISIONS
Meter No. - S478937
Power Pole No. - 12
Reconstructed: 2/1/68
RECEIVED
MAR 21 1967
DIST. 8 M.D.P.W.

SIGNAL POST	SIGNAL OR FLASHER HOUSING
<input type="checkbox"/> FULL BOX	R = RED
<input type="checkbox"/> CONTROL	Y = YELLOW
<input type="checkbox"/> METER	G = GREEN
<input type="checkbox"/> WOODEN POLE	VA = VERTICAL ARROW
<input type="checkbox"/> MAST ON WOODEN POLE	LA = LEFT ARROW
<input type="checkbox"/> ACTUATING UNIT	RA = RIGHT ARROW
<input type="checkbox"/> PRESSURE DETECTOR	----- PROPOSED CONDUIT
<input type="checkbox"/> MAGNETIC DETECTOR	----- EXISTING CONDUIT
<input type="checkbox"/> PEDESTRIAN PUSH BUTTON	----- OVERHEAD CABLE

	Date	By
Field Survey	Made	
	Checked	
Drawings	Made	
	Checked	
Timing and Sequence	Listed	
	Checked	
Equipment	Listed	
	Checked	

PWH. 410-R

Part 2: Signal Warrant Analysis

**Table D-1
Summary of Hourly Volumes and Warrant Analyses
Route 138 at Brush Hill Road, Milton**

Hourly period starting	Major Street			Minor Street				Warrants Satisfied				
	Route 138			Brush Hill Road		Brush Hill Road		Warrant 1	Warrant 2	Warrant 3	Warrant 4	Warrant 7
	NB Volume	SB Volume	Crossing Peds	EB		WB						
				Volume	Delay	Volume	Delay					
6:00	1,229	797	0	152	1.3	173	9.2	✓	✓	✓		0.4 correctable crash(es) per year 2011-15
7:00	1,320	1,253	0	290	Error	286	284.1	✓	✓	✓		
8:00	1,227	1,428	0	305	Error	280	167.0	✓	✓	✓		
9:00	1,061	993	-	258	-	219	-	✓	✓	✓		
10:00	867	992	-	229	-	223	-	✓	✓	✓		
11:00	703	999	-	247	-	197	-	✓	✓	✓		
12:00	735	1,106	-	256	-	199	-	✓	✓	✓		
13:00	755	1,169	-	284	-	202	-	✓	✓	✓		
14:00	767	1,418	-	327	-	247	-	✓	✓	✓		
15:00	866	1,708	0	386	67.5	278	Error	✓	✓	✓		
16:00	813	1,732	0	418	16.4	314	435.5	✓	✓	✓		
17:00	847	1,771	0	428	26.0	322	Error	✓	✓	✓		
18:00	767	1,650	-	378	-	294	-	✓	✓	✓		
19:00	630	1,202	-	251	-	135	-	✓	✓	✓		
								MET	MET	MET	NOT MET	NOT MET

EB = eastbound. NB = northbound. Peds = pedestrians. SB = southbound. WB = westbound.

Notes:

- Automatic Traffic Recorder (ATR) counts were conducted over a three-day period between 11 AM Tuesday 3/27/18 and 12 AM Friday 3/30/18.
- Turning Movement Counts (TMC) were conducted on Thursday 3/29/18 and are used for pedestrian volumes, vehicle delay, and peak hour volumes where ATR data isn't available.
- Dashes indicate where hourly data is not available.
- Vehicle delay is in vehicle-hours and is calculated using Highway Capacity Manual 2010 Two-Way Stop Controlled methodology.

**Table D-2
Summary of Hourly Volumes and Warrant Analyses
Route 138 at Neponset Valley Parkway, Milton**

Hourly period starting	Major Street			Minor Street		Warrants Satisfied				
	Route 138			Neponset Valley Parkway		Warrant 1	Warrant 2	Warrant 3	Warrant 4	Warrant 7
	NB Volume	SB Volume	Crossing Peds	EB						
			Volume	Delay						
6:00	462	337	0	136	1.0					1.8 correctable crash(es) per year 2011-15
7:00	524	485	0	169	2.6	✓	✓			
8:00	548	498	0	162	1.5	✓	✓			
9:00	503	386	-	155	-	✓	✓			
10:00	443	371	-	176	-	✓	✓			
11:00	362	418	-	179	-	✓	✓			
12:00	369	473	-	187	-	✓	✓			
13:00	368	447	-	211	-	✓	✓			
14:00	390	559	-	232	-	✓	✓	✓		
15:00	447	535	0	260	59.0	✓	✓	✓		
16:00	433	456	0	295	37.4	✓	✓	✓		
17:00	445	472	0	283	38.6	✓	✓	✓		
18:00	412	506	-	232	-	✓	✓			
19:00	335	496	-	189	-	✓	✓			
						MET	MET	MET	NOT MET	NOT MET

EB = eastbound. NB = northbound. Peds = pedestrians. SB = southbound. WB = westbound.

Notes:

- Automatic Traffic Recorder (ATR) counts were conducted over a three-day period between 11 AM Tuesday 3/27/18 and 12 AM Friday 3/30/18.
- Turning Movement Counts (TMC) were conducted on Thursday 3/29/18 and are used for pedestrian volumes, vehicle delay, and peak hour volumes where ATR data isn't available.
- Dashes indicate where hourly data is not available.
- Vehicle delay is in vehicle-hours and is calculated using Highway Capacity Manual 2010 Two-Way Stop Controlled methodology.

**Table D-3
Summary of Hourly Volumes and Warrant Analyses
Route 138 at Dollar Lane and Milton Street, Milton**

Hourly period starting	Major Street			Minor Street				Warrants Satisfied				
	Route 138			Milton Street		Dollar Lane		Warrant 1	Warrant 2	Warrant 3	Warrant 4	Warrant 7
	NB Volume	SB Volume	Crossing Peds	EB		WB						
				Volume	Delay	Volume	Delay					
6:00	462	392	0	77	1.2	174	3.0	✓	✓			1.4 correctable crash(es) per year 2011-15
7:00	524	585	0	176	Error	280	21.1	✓	✓	✓		
8:00	548	545	0	137	12.3	230	14.8	✓	✓	✓		
9:00	503	399	-	118	-	135	-		✓			
10:00	443	375	-	84	-	105	-					
11:00	362	455	-	99	-	103	-					
12:00	369	491	-	104	-	115	-					
13:00	368	474	-	112	-	109	-					
14:00	390	602	-	140	-	126	-		✓			
15:00	447	605	1	181	16.8	167	8.6	✓	✓	✓		
16:00	433	478	0	205	19.3	168	11.0	✓	✓	✓		
17:00	445	490	0	231	22.0	198	9.4	✓	✓	✓		
18:00	412	665	-	182	-	152	-	✓	✓			
19:00	335	583	-	95	-	94	-					
								NOT MET	MET	MET	NOT MET	NOT MET

EB = eastbound. NB = northbound. Peds = pedestrians. SB = southbound. WB = westbound.

Notes:

- Automatic Traffic Recorder (ATR) counts were conducted over a three-day period between 11 AM Tuesday 3/27/18 and 12 AM Friday 3/30/18.
- Turning Movement Counts (TMC) were conducted on Thursday 3/29/18 and are used for pedestrian volumes, vehicle delay, and peak hour volumes where ATR data isn't available.
- Dashes indicate where hourly data is not available.
- Vehicle delay is in vehicle-hours and is calculated using Highway Capacity Manual 2010 Two-Way Stop Controlled methodology.

**Table D-4
Summary of Hourly Volumes and Warrant Analyses
Route 138 at Bradlee Road and Atherton Street, Milton**

Hourly period starting	Major Street			Minor Street				Warrants Satisfied					
	Route 138			Bradlee Road		Atherton Street		Warrant 1	Warrant 2	Warrant 3	Warrant 4	Warrant 7	
	NB Volume	SB Volume	Crossing Peds	EB		WB							
				Volume	Delay	Volume	Delay						
6:00	527	294	0	40	0.2	57	0.3						1.0 correctable crash(es) per year 2011-15
7:00	628	453	0	63	0.5	108	0.7		✓				
8:00	630	465	0	49	0.4	122	0.8		✓				
9:00	570	327	-	45	-	87	-						
10:00	496	294	-	39	-	51	-						
11:00	404	338	-	43	-	66	-						
12:00	399	367	-	53	-	67	-						
13:00	394	345	-	39	-	53	-						
14:00	409	455	-	55	-	66	-						
15:00	502	433	0	57	0.5	84	0.6						
16:00	480	366	0	74	0.6	87	0.6						
17:00	517	385	1	78	0.6	87	0.6						
18:00	494	406	-	63	-	61	-						
19:00	400	389	-	46	-	58	-						
								NOT MET	NOT MET	NOT MET	NOT MET	NOT MET	

EB = eastbound. NB = northbound. Peds = pedestrians. SB = southbound. WB = westbound.

Notes:

- Automatic Traffic Recorder (ATR) counts were conducted over a three-day period between 11 AM Tuesday 3/27/18 and 12 AM Friday 3/30/18.
- Turning Movement Counts (TMC) were conducted on Thursday 3/29/18 and are used for pedestrian volumes, vehicle delay, and peak hour volumes where ATR data isn't available.
- Dashes indicate where hourly data is not available.
- Vehicle delay is in vehicle-hours and is calculated using Highway Capacity Manual 2010 Two-Way Stop Controlled methodology.

**Table D-5
Summary of Hourly Volumes and Warrant Analyses
Route 138 at Robbins Street, Milton**

Hourly period starting	Major Street			Minor Street				Warrants Satisfied				
	Route 138			Robbins Street		Robbins Street		Warrant 1	Warrant 2	Warrant 3	Warrant 4	Warrant 7
	NB Volume	SB Volume	Crossing Peds	EB		WB						
				Volume	Delay	Volume	Delay					
6:00	441	462	0	12	0.1	10	0.0					
7:00	484	548	0	30	0.2	61	0.5					
8:00	459	508	1	39	0.2	58	0.5					
9:00	410	428	-	23	-	-	-					
10:00	364	385	-	17	-	-	-					
11:00	323	322	-	26	-	-	-					
12:00	317	307	-	18	-	-	-					
13:00	309	322	-	26	-	-	-					
14:00	342	335	-	28	-	-	-					
15:00	407	413	0	32	0.2	48	0.3					
16:00	392	397	1	34	0.1	58	0.4					
17:00	430	444	0	40	0.1	44	0.3					
18:00	397	383	-	38	-	-	-					
19:00	307	286	-	28	-	-	-					
								NOT MET	NOT MET	NOT MET	NOT MET	NOT MET

0.0 correctable crash(es) per year 2011-15

EB = eastbound. NB = northbound. Peds = pedestrians. SB = southbound. WB = westbound.

Notes:

- Automatic Traffic Recorder (ATR) counts were conducted over a three-day period between 11 AM Tuesday 3/27/18 and 12 AM Friday 3/30/18.
- Turning Movement Counts (TMC) were conducted on Thursday 3/29/18 and are used for pedestrian volumes, vehicle delay, and peak hour volumes where ATR data isn't available.
- Dashes indicate where hourly data is not available.
- Vehicle delay is in vehicle-hours and is calculated using Highway Capacity Manual 2010 Two-Way Stop Controlled methodology.

**Table D-6
Summary of Hourly Volumes and Warrant Analyses
Route 138 at Blue Hill Terrace Street and Cheever Street, Milton**

Hourly period starting	Major Street			Minor Street				Warrants Satisfied					
	Route 138			Cheever Street		Blue Hill Terrace		Warrant 1	Warrant 2	Warrant 3	Warrant 4	Warrant 7	
	NB Volume	SB Volume	Crossing Peds	EB		WB							
				Volume	Delay	Volume	Delay						
6:00	229	462	0	52	0.0	47	0.3						
7:00	347	548	2	156	0.2	153	13.1	✓	✓	✓			
8:00	436	508	0	119	0.1	108	1.5		✓				
9:00	265	428	-	57	-	-	-						
10:00	203	385	-	46	-	-	-						
11:00	224	322	-	52	-	-	-						
12:00	229	307	-	47	-	-	-						
13:00	163	322	-	48	-	-	-						
14:00	179	335	-	66	-	-	-						
15:00	226	413	7	77	0.1	59	0.5						
16:00	192	397	3	78	0.1	65	0.5						
17:00	177	444	1	74	0.1	77	0.8						
18:00	222	383	-	61	-	-	-						
19:00	186	286	-	48	-	-	-						
								NOT MET	NOT MET	MET	NOT MET	NOT MET	NOT MET

0.4 correctable crash(es) per year 2011-15

EB = eastbound. NB = northbound. Peds = pedestrians. SB = southbound. WB = westbound.

Notes:

- Automatic Traffic Recorder (ATR) counts were conducted over a three-day period between 11 AM Tuesday 3/27/18 and 12 AM Friday 3/30/18.
- Turning Movement Counts (TMC) were conducted on Thursday 3/29/18 and are used for pedestrian volumes, vehicle delay, and peak hour volumes where ATR data isn't available.
- Dashes indicate where hourly data is not available.
- Vehicle delay is in vehicle-hours and is calculated using Highway Capacity Manual 2010 Two-Way Stop Controlled methodology.

**Table D-7
Summary of Hourly Volumes and Warrant Analyses
Route 138 at Oak Street, Milton**

Hourly period starting	Major Street			Minor Street				Warrants Satisfied				
	Route 138			Oak Street		Oak Street		Warrant 1	Warrant 2	Warrant 3	Warrant 4	Warrant 7
	NB Volume	SB Volume	Crossing Peds	EB		WB						
				Volume	Delay	Volume	Delay					
6:00	229	462	1	3	0.0	11	0.0					
7:00	347	548	5	15	0.1	25	0.2					
8:00	436	508	19	14	0.1	7	0.1					
9:00	265	428	-	5	-	-	-					
10:00	203	385	-	5	-	-	-					
11:00	224	322	-	6	-	-	-					
12:00	229	307	-	4	-	-	-					
13:00	163	322	-	8	-	-	-					
14:00	179	335	-	8	-	-	-					
15:00	226	413	66	13	0.1	9	0.1					
16:00	192	397	8	7	0.0	19	0.1					
17:00	177	444	3	12	0.0	54	0.3					
18:00	222	383	-	12	-	-	-					
19:00	186	286	-	9	-	-	-					
								NOT MET	NOT MET	NOT MET	NOT MET	NOT MET

0.2 correctable crash(es) per year 2011-15

EB = eastbound. NB = northbound. Peds = pedestrians. SB = southbound. WB = westbound.

Notes:

- Automatic Traffic Recorder (ATR) counts were conducted over a three-day period between 11 AM Tuesday 3/27/18 and 12 AM Friday 3/30/18.
- Turning Movement Counts (TMC) were conducted on Thursday 3/29/18 and are used for pedestrian volumes, vehicle delay, and peak hour volumes where ATR data isn't available.
- Dashes indicate where hourly data is not available.
- Vehicle delay is in vehicle-hours and is calculated using Highway Capacity Manual 2010 Two-Way Stop Controlled methodology.
- This intersection is near a school (Oak Street School) which may make it eligible for Warrant 5 - School Crossing. However, this warrant requires a separate engineering study to assess property.

**Table D-8
Summary of Hourly Volumes and Warrant Analyses
Route 138 at Brook Road, Milton**

Hourly period starting	Major Street			Minor Street		Warrants Satisfied				
	Route 138			Brook Road		Warrant 1	Warrant 2	Warrant 3	Warrant 4	Warrant 7
	NB Volume	SB Volume	Crossing Peds	EB						
				Volume	Delay					
6:00	465	255	2	75	0.2					
7:00	530	434	3	180	2.3	✓	✓			
8:00	508	383	3	163	1.5	✓	✓			
9:00	-	-	-	-	-					
10:00	-	-	-	-	-					
11:00	-	-	-	-	-					
12:00	-	-	-	-	-					
13:00	-	-	-	-	-					
14:00	-	-	-	-	-					
15:00	454	480	2	171	2.2	✓	✓			
16:00	401	435	6	207	2.7	✓	✓			
17:00	437	482	6	186	1.4	✓	✓			
18:00	-	-	-	-	-					
19:00	-	-	-	-	-					
						NOT MET	MET	NOT MET	NOT MET	NOT MET

1.0 correctable crash(es) per year 2011-15

EB = eastbound. NB = northbound. Peds = pedestrians. SB = southbound. WB = westbound.

Notes:

- Automatic Traffic Recorder (ATR) counts were conducted over a three-day period between 11 AM Tuesday 3/27/18 and 12 AM Friday 3/30/18.
- Turning Movement Counts (TMC) were conducted on Thursday 3/29/18 and are used for pedestrian volumes, vehicle delay, and peak hour volumes where ATR data isn't available.
- Dashes indicate where hourly data is not available.
- Vehicle delay is in vehicle-hours and is calculated using Highway Capacity Manual 2010 Two-Way Stop Controlled methodology.

Appendix D: Bus Schedules

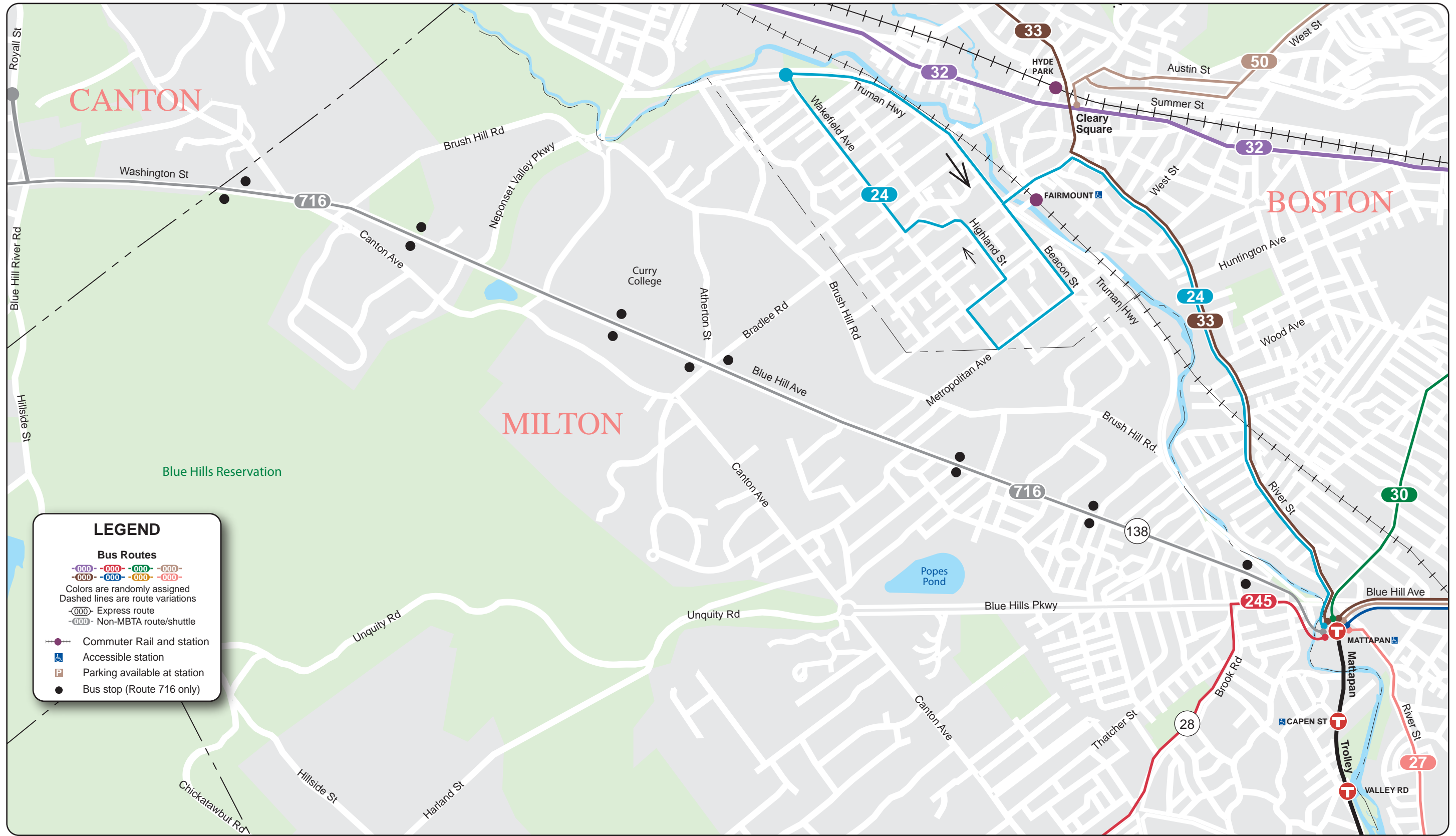
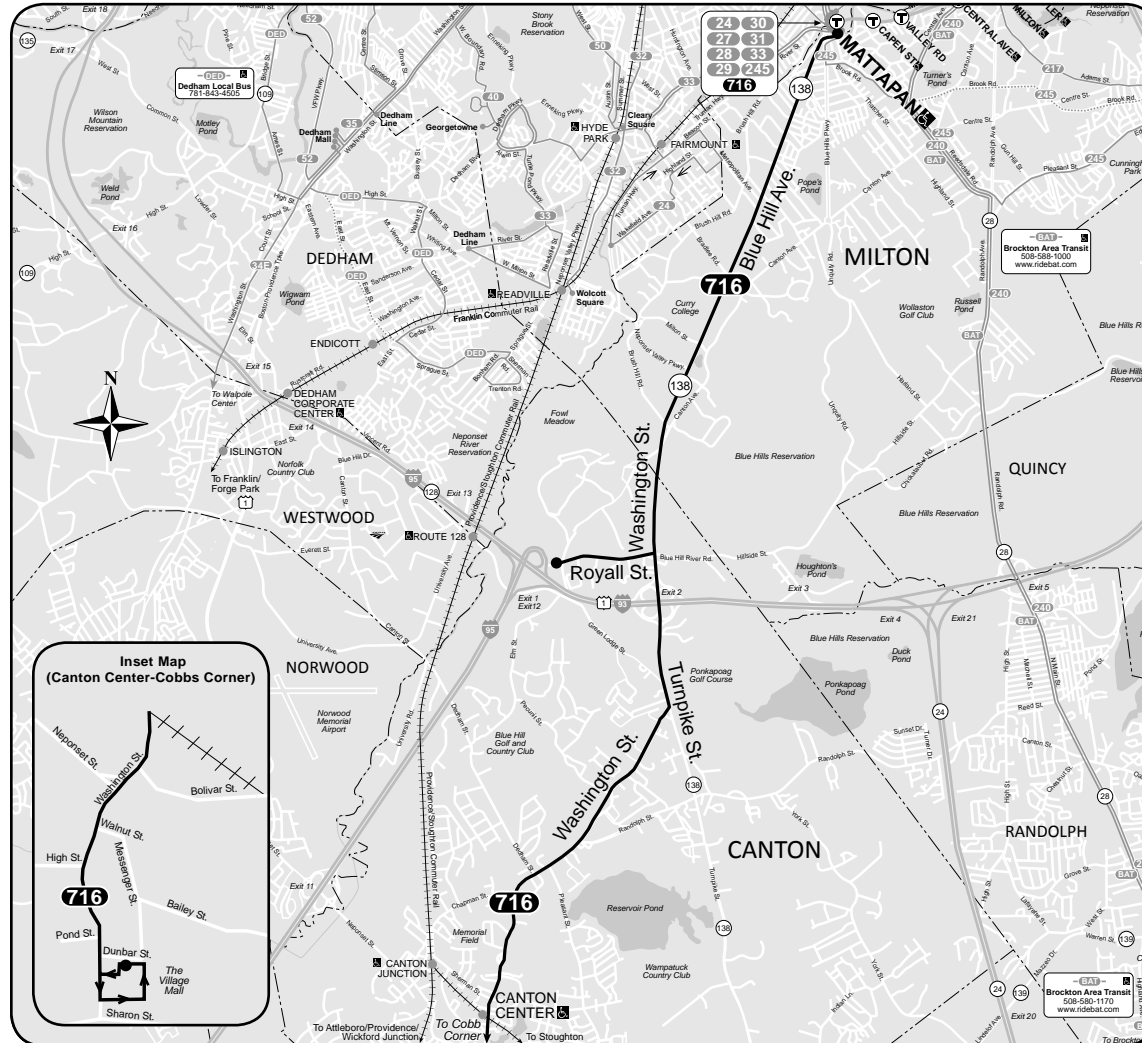


Figure 19
Regional Transit Service in the Study Area

*Addressing Priority Corridors from
the LRTP Needs Assessment:
Route 138 in Milton*

Route 716 Cobbs Corner - Mattapan Station



716

Fall September 1, 2017 - December 30, 2017

Cobbs Corner- Mattapan Station

Serving

- Curry College
- Fuller Village
- Canton Park-and-Ride Lot
- Royall Street
- Village Mall
- Providence/Stoughton Commuter Rail



T Massachusetts Bay Transportation Authority **massDOT**
Massachusetts Department of Transportation

Information 617-222-3200 • 1-800-392-6100
(TTY) 617-222-5146 • www.mbta.com

716

Inbound					Outbound				
Cobbs Corner	Canton Center	Royall St.	Curry College	Mattapan Station	Mattapan Station	Curry College	Royall St. Trailside Museum Park-n-Ride	Canton Center	Cobbs Corner
6:20A	6:25A	6:35A	6:45A	6:55A	5:50A	6:00A	6:05A	6:10A	6:15A
7:40	7:45	7:55	8:10	8:25	7:00	7:10	7:20	7:30	7:35
9:20	9:25	9:35	9:45	9:55	8:30	8:45	9:00	9:10	9:15
10:40	10:45	10:55	11:05	11:15	10:00	10:10	10:20	10:30	10:35
12:00N	12:05P	12:15P	12:25P	12:35P	11:20	11:30	11:40	11:50	11:55
2:45P	2:50	3:00	3:10	3:20	2:05P	2:15P	2:25P	2:35P	2:40P
4:15	4:25	4:40	4:55	5:10	3:25	3:40	3:55	4:05	4:10
6:05	6:10	6:20	6:30	6:40	5:15	5:30	5:45	5:55	6:00
					6:45	6:55	7:05	7:15	7:20

Weekday

No Service:
Sundays

This service is operated by A&A Metro, 800-437-3844, under contract to the MBTA.

Bus will stop at any safe location along the route, except Royall Street which has designated stops. Please signal to the driver if you wish to board.

Rt.138 is dark and the traffic moves quickly. If you want to board the bus at a location which you do not use daily, please call A&A Metro at 800-437-3844. The dispatcher will tell the driver to look for you.

Service subject to change.
In the event of weather emergency please call the carrier.

716

Inbound					Outbound				
Cobbs Corner	Canton Center	Royall St.	Curry College	Mattapan Station	Mattapan Station	Curry College	Royall St. Trailside Museum Park-n-Ride	Canton Center	Cobbs Corner
8:30A	8:34A	8:42A	8:50A	8:55A	8:00A	8:04A	8:12A	8:20A	8:25A
9:30	9:34	9:42	9:50	9:55	9:00	9:04	9:12	9:20	9:25
10:30	10:34	10:42	10:50	10:55	10:00	10:04	10:12	10:20	10:25
11:30	11:34	11:42	11:50	11:55	11:00	11:04	11:12	11:20	11:25
1:30P	1:34P	1:42P	1:50P	1:55P	1:00P	1:04P	1:12P	1:20P	1:25P
2:30	2:34	2:42	2:50	2:55	2:00	2:04	2:12	2:20	2:25
3:30	3:34	3:42	3:50	3:55	3:00	3:04	3:12	3:20	3:25
4:30	4:34	4:42	4:50	4:55	4:00	4:04	4:12	4:20	4:25
5:30	5:34	5:42	5:50	5:55	5:00	5:04	5:12	5:20	5:25

Saturday

Exact fare only.

FARE: \$1.70
STUDENT: \$0.85*
SENIOR/TAP: \$0.85**

No transfers are given or accepted on this Route.

FREE FARES: Children 11 and under ride free when accompanied by an adult.
Blind Access CharlieCard holders ride free; if using a guide, the guide rides free.

*Available to students through participating middle schools and high schools.

**Available to Medicare cardholders, seniors 65+, and persons with disabilities.

The following MBTA passes are accepted:
Monthly Commuter Rail Zone 1A pass (or higher) - recommended for frequent subway/bus customers.

Monthly Local Bus Pass on CharlieTicket only.

Monthly Senior/TAP pass on CharlieTicket - available ONLY at the CharlieCard Store.

Call 617-222-3200 or 617-222-5854 (TTY) for more information.

1 Day and 7 Day Link Passes.

All buses are accessible to persons with disabilities

Fall 2017 Holidays

October 9: see Weekday November 11: see Saturday
September 4, November 23 & December 25: see Sunday

PROVIDENCE/STOUGHTON LINE Effective May 22, 2017



Monday to Friday

Inbound to Boston		AM													PM																										
ZONE	STATION	TRAIN #	800	802	900	804	902	806	842	808	904	810	812	906	814	908	816	910	818	820	912	822	824	914	826	916	828	918	830	920	822	832	924	834	836	926	838	928			
	Bikes Allowed		🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	
10	Wickford Junction	🕒	-	-	4:45	-	-	-	5:45	-	6:35	-	-	-	7:45	-	9:20	-	-	-	-	1:25	-	-	-	4:08	-	5:20	-	6:00	-	7:25	-	8:15	9:23	-	10:30	-	-	-	
9	TF Green Airport	🕒	-	-	5:00	-	-	-	6:00	-	6:50	-	-	-	8:00	-	9:34	-	-	-	1:39	-	-	-	4:20	-	5:29	-	6:09	-	7:34	-	8:24	9:34	-	10:39	-	-	-		
8	Providence	🕒	5:00	5:25	-	6:00	-	6:25	-	7:15	-	7:30	7:50	-	8:25	-	9:50	-	11:10	1:05	-	1:55	3:02	-	4:08	-	5:20	-	6:00	-	7:25	-	8:15	9:23	-	10:30	-	-	-		
7	South Attleboro	🕒	5:09	5:34	-	6:09	-	6:34	-	7:25	-	7:39	7:59	-	8:34	-	9:59	-	11:19	1:16	-	2:06	3:13	-	4:20	-	5:29	-	6:09	-	7:34	-	8:24	9:34	-	10:39	-	-	-		
6	Mansfield	🕒	5:19	5:44	-	6:19	-	6:44	7:12	7:35	-	7:49	8:09	-	8:44	-	10:09	-	11:29	1:26	-	2:16	3:23	-	4:30	-	5:39	-	6:19	-	7:44	-	8:34	9:44	-	10:49	-	-	-		
4	Sharon	🕒	5:29	5:54	-	6:29	-	6:54	7:22	7:45	-	7:59	8:19	-	8:54	-	10:19	-	11:39	1:36	-	2:26	3:33	-	4:40	-	5:48	-	6:28	-	7:54	-	8:44	9:54	-	10:59	-	-	-		
4	Stoughton	🕒	5:38	6:03	-	6:39	-	7:04	7:33	-	8:08	8:28	-	9:03	-	10:28	-	11:48	1:45	-	2:35	3:42	-	4:49	-	5:55	-	6:37	-	8:03	-	8:53	10:03	-	11:08	-	-	-			
3	Canton Center	🕒	-	-	6:28	-	6:53	-	-	-	7:58	-	-	8:38	-	9:23	-	10:48	-	-	2:23	-	-	4:38	-	5:15	-	6:14	-	7:20	7:40	-	8:35	-	10:35	-	11:35	-			
3	Canton Junction	🕒	5:45	6:10	6:31	-	6:56	-	7:40	-	8:01	-	-	8:41	9:10	9:26	-	10:51	11:55	1:53	2:26	-	3:50	-	4:56	5:26	6:24	-	7:32	-	8:10	8:46	9:00	10:10	10:46	11:15	11:46	-	-		
2	Route 128	🕒	5:50	6:15	6:37	6:47	7:02	7:12	7:45	-	8:06	8:16	8:36	8:46	9:15	9:31	10:37	10:56	12:00	1:58	2:31	2:43	3:55	4:47	5:01	5:31	6:03	6:29	6:45	7:37	-	8:15	8:51	9:05	10:15	10:51	11:20	11:51	-		
1A	Hyde Park	🕒	5:55	6:20	6:43	-	7:08	-	7:51	-	8:21	-	8:51	9:20	9:36	-	11:01	12:05	2:03	-	-	2:48	4:00	-	5:06	5:36	6:34	-	7:42	-	8:20	-	9:10	10:20	10:56	11:25	11:56	-	-		
1A	Ruggles	🕒	L 6:04	L 6:30	-	-	-	L 7:26	-	-	-	L 8:20	-	-	L 9:29	-	L 10:50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1A	Back Bay	🕒	L 6:08	L 6:34	L 6:52	L 6:59	L 7:17	L 7:30	L 8:00	L 8:10	L 8:24	L 8:30	L 8:49	L 9:00	L 9:33	L 9:45	L 10:54	L 11:12	L 12:18	L 2:12	L 2:44	L 2:57	L 4:10	L 5:02	L 5:17	L 5:45	L 6:17	L 6:43	L 6:55	L 7:51	L 8:10	L 8:29	L 9:03	L 9:19	L 10:29	L 11:05	L 11:34	L 12:05	-		
1A	SOUTH STATION	🕒	L 6:14	6:40	6:58	7:05	7:23	7:36	8:06	8:16	8:30	8:36	8:55	9:06	9:39	9:51	10:59	11:17	12:23	2:17	2:49	3:02	4:15	5:07	5:22	5:50	6:22	6:48	7:00	7:56	8:15	8:34	9:08	9:24	10:34	11:10	11:39	12:10	-		

Trains in purple box indicate peak period trains.

Keep in Mind:

This schedule will be effective from May 22, 2017 and will replace the schedule of November 21, 2016.

Presidents' Day and 4th of July operate on a **Saturday service schedule**.

New Year's Day, Memorial Day, Labor Day, Thanksgiving Day, and Christmas Day operate on a **Sunday service schedule**.

For all other holiday schedules, please check MBTA.com or call 617-222-3200.

For additional service to Ruggles Station, refer to the Needham and Franklin Line schedules for particular trains.

For additional service to Hyde Park Station, refer to the Franklin Line schedule for particular trains.

Monday to Friday

Outbound from Boston		AM													PM																											
ZONE	STATION	TRAIN #	8801	8803	901	801	8805	843	803	903	805	905	907	807	909	809	811	911	813	815	817	913	819	915	821	823	917	825	919	827	921	829	923	831	833	925	835	927	837	839		
	Bikes Allowed		🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲
1A	SOUTH STATION	🕒	-	-	5:20	5:30	-	6:18	6:31	6:59	7:25	7:35	8:23	9:35	9:45	10:25	11:25	1:20	1:43	2:30	3:25	3:35	3:55	4:20	4:30	4:55	5:12	5:40	5:50	6:10	6:30	6:50	7:20	7:30	8:30	9:40	10:00	10:40	11:00	11:59	-	-
1A	Back Bay	🕒	-	-	5:25	5:35	-	6:23	6:36	7:04	7:30	7:40	8:28	9:40	9:50	10:30	11:30	1:25	1:48	2:35	3:30	3:40	4:00	4:25	4:35	5:00	5:17	5:45	5:55	6:15	6:35	6:55	7:25	7:35	8:35	9:45	10:05	10:45	11:05	12:04	-	-
1A	Ruggles	🕒	-	-	-	-	-	6:39	-	7:33	-	-	9:44	9:53	10:33	11:33	1:28	1:52	2:38	3:34	3:43	4:04	4:29	4:39	5:04	5:21	5:49	5:59	6:19	6:39	6:58	7:28	7:38	8:38	9:48	10:08	10:48	11:08	12:07	-	-	
1	Hyde Park	🕒	-	-	-	-	-	-	-	-	-	10:01	10:43	-	1:38	-	-	3:58	-	-	-	5:32	-	6:10	-	6:49	7:08	7:38	-	8:46	-	10:18	10:58	11:18	12:17	-	-	-	-	-	-	
2	Route 128	🕒	-	-	5:37	5:49	-	6:37	6:51	7:19	7:45	7:55	8:43	9:56	10:08	10:48	11:45	1:43	2:04	2:51	-	3:58	-	4:42	4:53	5:18	5:43	6:16	-	6:54	7:13	7:43	7:52	8:51	10:02	10:23	11:03	11:23	12:22	-	-	
3	Canton Junction	🕒	-	-	-	-	-	6:56	7:25	7:51	8:01	8:49	10:02	10:14	10:54	-	1:49	-	2:57	-	4:04	-	4:48	-	5:49	-	6:23	-	7:00	7:19	7:49	7:58	8:57	10:08	10:29	11:09	11:29	12:28	-	-		
3	Canton Center	🕒	-	-	5:45	-	-	-	7:28	-	8:04	8:52	-	10:17	-	-	1:52	-	-	-	4:07	-	4:51	-	5:52	-	6:28	-	7:03	-	7:52	-	10:11	-	11:12	-	-	-	-	-	-	
4	Stoughton	🕒	-	-	5:53	-	-	-	7:36	-	8:12	9:00	-	10:25	-	-	2:00	-	-	-	4:15	-	4:59	-	6:00	-	6:36	-	7:11	-	8:00	-	10:19	-	11:20	-	-	-	-	-	-	
4	Sharon	🕒	-	-	-	5:57	-	-	7:02	-	7:57	-	-	10:08	-	11:00	11:53	-	2:12	3:03	3:51	-	4:22	-	5:01	5:26	-	6:07	-	6:37	-	7:25	-	8:04	9:03	-	10:35	-	11:35	12:34	-	
6	Mansfield	🕒	-	-	-	6:04	-	-	7:09	-	8:05	-	10:16	-	11:08	12:00	-	2:20	3:11	3:59	-	4:30	-	5:09	5:34	-	6:15	-	6:45	-	7:33	-	8:12	9:11	-	10:43	-	11:43	12:42	-		
7	Attleboro	🕒	-	-	-	6:12	-	6:55	7:17	-	8:13	-	10:24	-	11:16	12:08	-	2:28	3:19	4:07	-	4:38	-	5:17	5:44	-	6:23	-	6:53	-	7:41	-	8:20	9:19	-	10:51	-	11:51	12:50	-		
7	South Attleboro	🕒	-	-	-	6:21	-	-	7:26	-	8:20	-	-	10:34	-	11:26	12:17	-	2:35	3:29	4:17	-	4:48	-	5:27	5:57	-	6:33	-	7:03	-	7:51	-	8:30	9:29	-	11:01	-	12:01	1:00	-	
8	Providence	🕒	4:58	5:49	-	6:30	6:55	-	7:35	-	8:29	-	10:44	-	11:36	12:26	-	2:45	3:39	4:27	-	4:58	-	5:37	6:07	-	6:43	-	7:13	-	8:01	-	8:40	9:39	-	11:11	-	12:11	1:10	-		
9	TF Green Airport	🕒	5:14	6:07	-	-	7:11	-	-	-	8:45	-	-	-	-	12:42	-	-	-	-	4:43	-	-	5:53	-	-	6:59	-	-	-	8:17	-	-	-	-	11:27	-	-	-	-	-	
10	Wickford Junction	🕒	5:30	6:21	-	-	7:27	-	-	-	9:01	-	-	-	-	12:58	-	-	-	4:59	-	-	6:09	-	-	7:15	-	-	-	8:33	-	-	-	-	11:43	-	-	-	-	-	-	

Trains in purple box indicate peak period trains.

Times in purple with "f" indicate a flag stop: Passengers must tell the conductor that they wish to leave. Passengers waiting to board must be visible on the platform for the train to stop.

Times in blue indicate an early departure (L stop): The train may leave ahead of schedule at these stops.

Bikes: Bicycles are allowed on trains with the bicycle symbol shown below the train number.

Saturday & Sunday

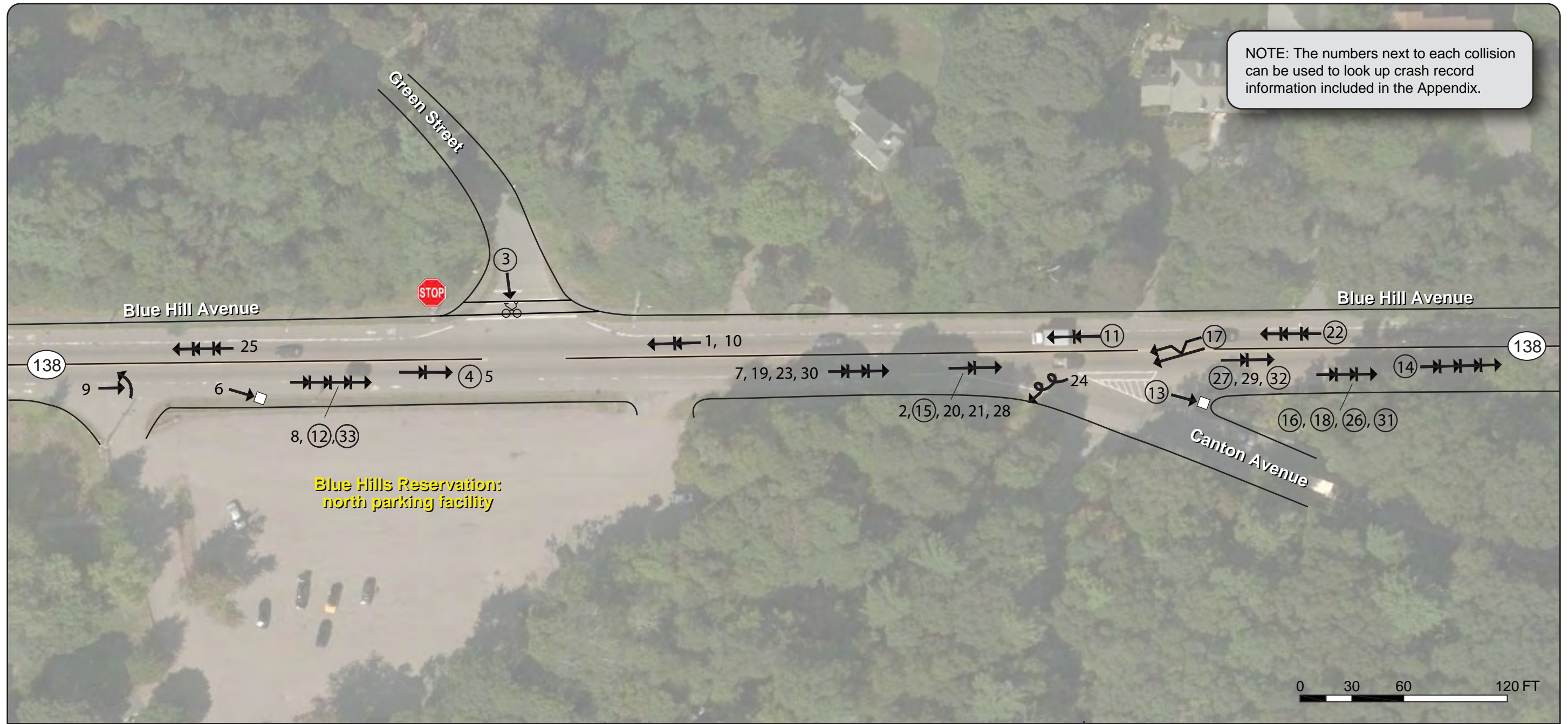
Inbound to Boston		AM								PM												
ZONE	STATION	SATURDAY TRAIN #	SUNDAY TRAIN #	1802	1804	1806	2808	2810	2812	2814	2816	2818	1801	1803	1805	2807	2809	2811	2813	2815	2817	
	Bikes Allowed			🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲
8	Providence	🕒	🕒	6:35	8:35	11:20	12:55	2:56	4:56	7:05	8:52	10:00	6:45	10:05	11:05	1:05	2:25	4:35	6:45	8:45	11:10	-
7	South Attleboro	🕒	🕒	6:45	8:45																	

Appendix E: Traffic Safety Data

1. Collision Diagrams
2. Expected Crashes Analysis

Part 1: Collision Diagrams

NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.


















Symbols		Types of Crash		Severity	
	Moving Vehicle		Head On		Injury Accident
	Backing Vehicle		Angle		Fatal Accident
	Non-Involved Vehicle		Rear End		
	Pedestrian		Parked Vehicle		
	Fixed Object		Bicycle		
	Animal		Sideswipe		
			Out of Control		



Figure E-1
Collision Diagram 2011-15
Route 138 at Green Street and Canton Avenue

**Table E-1
Route 138 at Green Street and Canton Avenue
Route 138 in Milton**

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	2792473	5:11 PM	2011-10-07	Blue Hill Avenue Rte 138 S / Green Street Rte 138 S	Property damage only (no 2		Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Can't see
2	3452138	9:17 AM	2013-05-29	Blue Hill Avenue Rte 138 N / Green Street	Property damage only (no 2		Rear-end	Wet	Daylight	Rain/Rain		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	Distracted
3	3714615	8:54 AM	2013-11-13	Blue Hill Avenue Rte 138 / Green Street / Rte 138	Non-fatal injury	1	Angle	Dry	Daylight	Clear	cyc	V1:Eastbound	V1: Slowing or stopped in traffic	Wrong way
4	3739832	2:56 PM	2013-12-19	Green Street / Canton Avenue Rte 138 N	Not Reported	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Turning left	
5	3801600	8:44 AM	2014-04-17	Canton Avenue / Green Street	Property damage only (no 2		Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
6	3867884	7:55 AM	2014-06-20	Green Street / Blue Hill Avenue Rte 138 N	Property damage only (no 1		Single vehicle crash	Dry	Daylight	Clear		V1:Northbound	V1: Leaving traffic lane	Object in road
7	3881075	8:12 AM	2014-07-09	Blue Hill Avenue Rte Sr138 N / Green Street	Property damage only (no 3		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Travelling straight ahead / V2:Slowing or stopped in tr	Inattention
8	3950292	6:53 AM	2014-09-22	Blue Hill Avenue Rte Sr138 N / Green Street	Non-fatal injury	5	Angle	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Sc	V1: Travelling straight ahead / V2:Slowing or stopped in tr	Tailgating
9	4030462	9:03 PM	2015-02-27	1900 Blue Hill Avenue	Property damage only (no 2		Angle	Dry	Dark - lighted r	Clear/Clear		V1:Southbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	Disregarding signs
10	4100400	3:27 PM	2015-06-19	Blue Hill Avenue Rte Sr138 N / Green Street	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Inattention
11	2712795	3:18 PM	2011-02-21	Blue Hill Avenue Rte 138 S / Canton Avenue	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	
12	2718234	3:51 PM	2011-04-15	Blue Hill Avenue / Canton Avenue	Property damage only (no 4		Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
13	2760086	6:31 PM	2011-08-22	Rte 138 / Blue Hill Avenue / Canton Avenue	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	Clear/Clear		V1:Northbound	V1: Changing lanes	Reckless
14	3108532	10:24 AM	2012-05-12	Blue Hill Avenue / Canton Avenue	Non-fatal injury	5	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
15	3233106	6:41 AM	2012-07-31	Blue Hill Avenue / Canton Avenue	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
16	3372335	5:07 PM	2013-02-05	Blue Hill Avenue Rte 138 / Canton Avenue Rte 138	Property damage only (no 3		Rear-end	Dry	Dusk	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
17	4003513	1:05 PM	2014-12-21	Blue Hill Avenue / Canton Avenue	Property damage only (no 2		Sideswipe, same directic	Wet	Daylight	Clear		V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	Fail to yield
18	4113690	4:44 PM	2015-06-07	Canton Avenue / Blue Hill Avenue	Non-fatal injury	4	Rear-end	Dry	Daylight	Clear/Clear		V1:Not reported / V2:Northbound / V3:N	V1: Not reported / V2:Travelling straight ahead / V3:Trave	
19	4117529	12:34 PM	2015-09-26	Blue Hill Avenue / Canton Avenue	Property damage only (no 3		Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Travelling straight ahead / V2:Travelling straight ahead	
20	4130814	8:02 AM	2015-12-15	Blue Hill Avenue Rte 138 N / Canton Avenue	Property damage only (no 2		Rear-end	Wet	Daylight	Other/Rain		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
21	4130808	8:17 AM	2015-12-15	Blue Hill Avenue Rte 138 N / Canton Avenue	Property damage only (no 2		Rear-end	Wet	Daylight	Cloudy/Cloudy		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
22	4162330	8:19 AM	2015-12-15	Blue Hill Avenue / Canton Avenue	Property damage only (no 3		Rear-end	Wet	Daylight	Clear/Clear		V1:Southbound / V2:Southbound / V3:Sc	V1: Travelling straight ahead / V2:Slowing or stopped in tr	Inattention
23	2955664	6:53 AM	2011-12-09	Blue Hill Avenue / Canton Avenue	Property damage only (no 3		Rear-end	Dry	Daylight	Cloudy		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
24	2995291	5:10 PM	2012-01-19	Canton Avenue / Blue Hill Avenue	Property damage only (no 1		Single vehicle crash	Dry	Dark - lighted r	Clear/Clear		V1:Westbound	V1: Travelling straight ahead	
25	4048687	3:35 PM	2015-04-17	Near Canton Line	Property damage only (no 3		Rear-end	Dry	Daylight	Cloudy/Cloudy		V1:Southbound / V2:Southbound / V3:Sc	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
26	3728108	8:02 AM	2013-11-18	1433 Blue Hill Avenue	Non-fatal injury	3	Rear-end	Wet	Daylight	Rain		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
27	2792465	11:49 AM	2011-10-13	1433 Blue Hill Avenue	Non-fatal injury	2	Rear-end	Wet	Daylight	Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Tailgating
28	3974992	9:14 AM	2014-11-14	100 Feet S From Intersection Blue Hill Avenue Rte 138 N / Canton Aver	Property damage only (no 2		Rear-end	Wet	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
29	2789099	2:08 PM	2011-09-23	1434 Blue Hill Avenue	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Tailgating
30	3057933	2:53 PM	2012-04-25	150 Feet S From Intersection Blue Hill Avenue / Canton Avenue	Property damage only (no 3		Rear-end	Unknown	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
31	3427633	1:27 PM	2013-04-27	100 Feet N From Intersection 1433 Blue Hill Avenue Rte 138 N / Cantor	Non-fatal injury	3	Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Tailgating
32	3049855	5:30 PM	2012-02-05	Rte 138 N Milemarker 40.4	Non-fatal injury	2	Rear-end	Dry	Dark - roadway	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
33	3292260	8:35 AM	2012-10-10	400 Feet S From Intersection 1425 Blue Hill Avenue Rte 138 N / Green	Non-fatal injury	5	Rear-end	Wet	Daylight	Rain		V1:Northbound / V2:Northbound / V3:Nc	V1: Travelling straight ahead / V2:Slowing or stopped in tr	



NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.











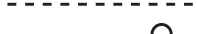




Symbols		Types of Crash		Severity	
 Moving Vehicle	 Parked Vehicle	 Head On	 Sideswipe	 Injury Accident	 Fatal Accident
 Backing Vehicle	 Fixed Object	 Angle	 Out of Control		
 Non-Involved Vehicle	 Bicycle	 Rear End			
 Pedestrian	 Animal				

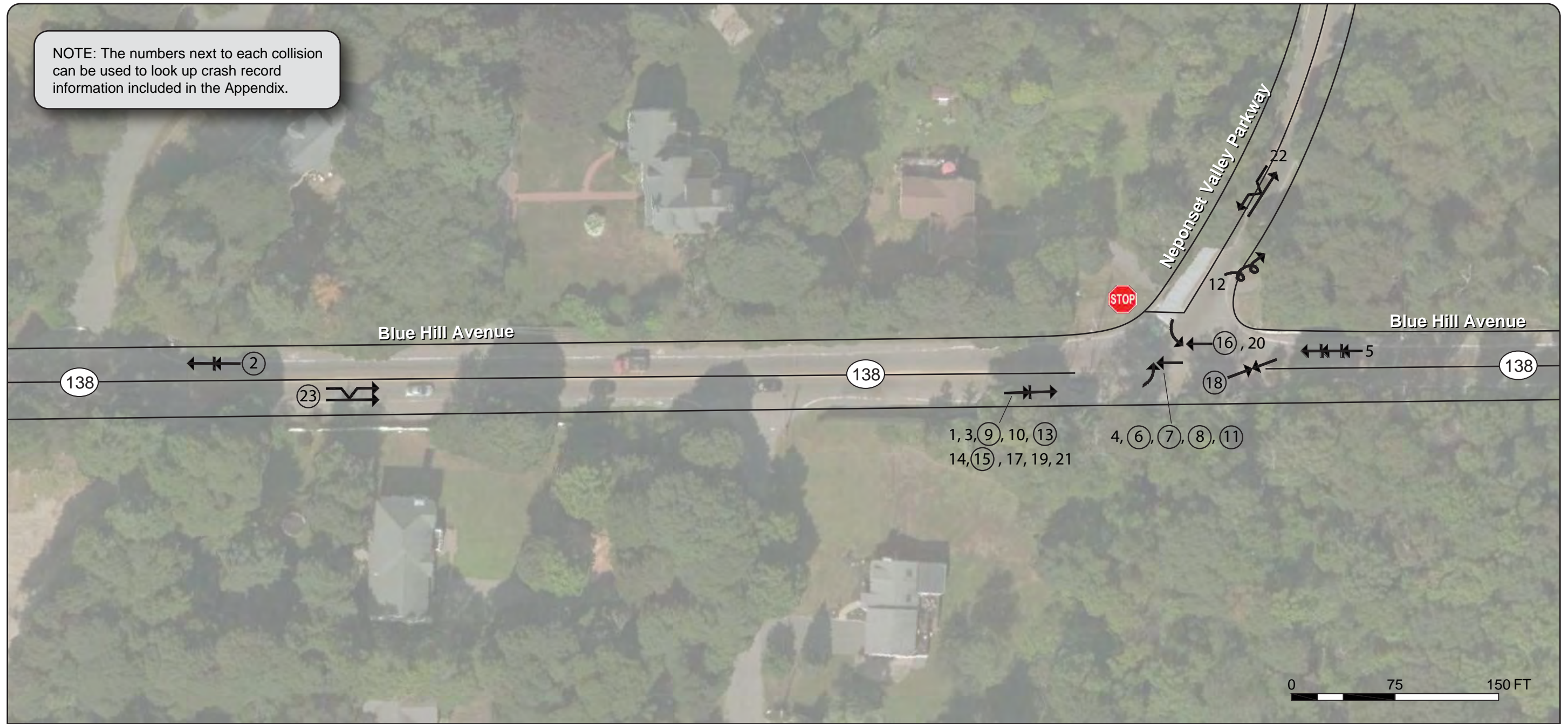


Figure E-2
Collision Diagram 2011-15
Route 138 at Brush Hill Road

**Table E-2
Route 138 at Brush Hill Road
Route 138 in Milton**

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	3728098	1:34 PM	2013-11-22	Blue Hill Avenue / Canton Avenue Rte 138 N	Property damage only (no 2		Rear-end	Wet	Daylight	Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
2	4066116	3:16 PM	2015-07-09	Blue Hill Avenue / Canton Avenue / Brush Hill Road	Property damage only (no 3		Rear-end	Dry	Daylight	Clear/Clear		V1:Westbound / V2:Westbound / V3:We	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
3	3936933	3:07 PM	2014-08-09	Canton Avenue Rte 138 / Blue Hill Avenue	Property damage only (no 1		Single vehicle crash	Dry	Daylight	Clear/Clear		V1:Westbound	V1: Not reported	
4	2712788	5:11 PM	2011-03-09	1396 Blue Hill Avenue	Non-fatal injury	3	Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound / V3:Si	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
5	3527031	10:22 AM	2013-07-01	300 Feet S From Intersection 1434 Blue Hill Avenue / Brush Hill Road R	Property damage only (no 2		Rear-end	Dry	Daylight	Cloudy		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Tailgating	
6	4009891	2:43 PM	2015-01-24	250 Feet S From Intersection 1425 Blue Hill Avenue / Brush Hill Road	Property damage only (no 2		Rear-end	Wet	Daylight	Cloudy/Snow		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Tailgating	
7	4149577	3:07 PM	2015-11-26	200 Feet S From Intersection Blue Hill Avenue Rte 138 S / Brush Hill Rc	Property damage only (no 3		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
8	4132326	4:31 PM	2015-10-24	1425 Blue Hill Avenue Rte 138 S / Brush Hill Road	Property damage only (no 2		Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
9	3058836	12:47 PM	2012-03-28	100 Feet S From Intersection 1425 Blue Hill Avenue Rte 138 / Brush Hil	Property damage only (no 2		Rear-end	Wet	Daylight	Rain/Cloudy		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Tailgating	
10	3235294	7:15 PM	2012-07-24	1399 Blue Hill Avenue / Brush Hill Road	Property damage only (no 2		Rear-end	Wet	Daylight	Rain		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
11	3282193	3:35 PM	2012-08-11	1425 Blue Hill Avenue / Brush Hill Road	Non-fatal injury	2	Sideswipe, opposite dire	Dry	Dark - lighted r	Clear/Clear		V1:Southbound / V2:Northbound	V1: Other / V2:Travelling straight ahead	Reckless
12	3401946	12:00 AM	2013-04-26	Brush Hill Road / Blue Hill Avenue Rte 138 S	Property damage only (no 1		Single vehicle crash	Dry	Dark - lighted r	Clear		V1:Northbound	V1: Travelling straight ahead	
13	3927834	2:21 PM	2014-09-02	1399 Blue Hill Avenue Rte 138 S / Brush Hill Road	Property damage only (no 2		Rear-end	Dry	Daylight	Cloudy		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
14	3983025	6:45 PM	2014-10-31	1425 Blue Hill Avenue / Brush Hill Road	Property damage only (no 3		Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Travelling straight ahead / V2:Travelling straight ahead	
15	3983031	10:43 AM	2014-11-08	1431 Blue Hill Avenue Rte 138 N / Brush Hill Road	Non-fatal injury	3	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
16	4033161	7:16 AM	2015-04-08	1433 Blue Hill Avenue / Rte 138	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead Inattention	
17	2829506	9:09 AM	2011-11-04	Blue Hill Avenue Rte 138 S / Brush Hill Road	Property damage only (no 2		Rear-end	Dry	Daylight	Cloudy		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Inattention	
18	2976531	8:48 AM	2012-03-09	1425 Blue Hill Avenue / Brush Hill Road	Property damage only (no 3		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
19	2742092	10:27 PM	2011-07-08	1425 Blue Hill Avenue	Property damage only (no 2		Rear-end	Wet	Dark - lighted r	Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
20	3336270	9:02 PM	2012-09-02	1425 Blue Hill Avenue	Non-fatal injury	2	Rear-end	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
21	3297115	3:43 PM	2012-10-18	1425 Blue Hill Avenue	Property damage only (no 2		Angle	Dry	Daylight	Clear		V1:Westbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	
22	3389819	6:07 PM	2013-03-03	1425 Blue Hill Avenue	Non-fatal injury	2	Rear-end	Wet	Dark - lighted r	Cloudy/Rain		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
23	3602794	2:46 PM	2013-09-12	Blue Hill Brush	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
24	4033165	7:32 AM	2015-04-08	1425 Blue Hill Avenue	Non-fatal injury	3	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
25	4125339	3:30 PM	2015-10-16	1425 Blue Hill Avenue	Property damage only (no 3		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
26	3342530	2:05 PM	2012-11-22	200 Feet N From Intersection 1399 Blue Hill Avenue Rte 138 S / Brush I	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
27	2760735	9:59 AM	2011-08-07	250 Feet N From Intersection 1396 Blue Hill Avenue Rte 138 / Brush Hil	Non-fatal injury	3	Rear-end	Wet	Daylight	Rain		V1:Southbound / V2:Southbound / V3:N	V1: Travelling straight ahead / V2:Travelling straight ahead Illness	
28	3125993	12:00 AM	2011-03-06	1396 Blue Hill Avenue	Non-fatal injury	2	Single vehicle crash	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Southbound	V1: Turning right / V2:Travelling straight ahead	
29	3392809	11:37 AM	2013-02-13	1399 Blue Hill Avenue	Not Reported	1	Single vehicle crash	Dry	Daylight	Clear/Clear		V1:Southbound	V1: Travelling straight ahead	
30	3451832	2:27 PM	2013-06-01	400 Feet N From Intersection 1399 Blue Hill Avenue Rte 138 S / Bush I	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Tailgating	
31	3801605	4:49 PM	2014-04-12	1399 Blue Hill Avenue	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	Tailgating
32	3805539	3:05 PM	2014-05-02	1399 Blue Hill Avenue	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Inattention	
33	4033163	1:32 PM	2015-04-14	1399 Blue Hill Avenue	Property damage only (no 2		Rear-end	Wet	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
34	4170427	12:42 PM	2015-12-05	1399 Blue Hill Avenue	Property damage only (no 2		Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Glare	
35	3950620	2:41 PM	2014-09-10	Blue Hill Bushes	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
36	3588718	1:56 PM	2013-09-07	500 Feet N From Intersection 1399 Blue Hill Avenue Rte 138 S / Brush I	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	Tailgating
37	3998257	3:16 PM	2015-01-15	1338 Blue Hill Avenue	Non-fatal injury	2	Sideswipe, opposite dire	Dry	Daylight	Clear		V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Unknown	
38	2789104	10:45 AM	2011-09-28	Blue Hill Avenue Rte 138 N / Caroline Drive	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
39	3282198	1:29 PM	2012-08-08	Blue Hill Avenue / Caroline Drive	Not Reported	4	Rear-end	Unknown	Daylight	Clear		V1:Not reported / V2:Not reported / V3:V	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
40	3288057	5:52 PM	2012-09-20	Blue Hill Avenue / Caroline Drive	Not Reported	2	Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
41	3981148	1:43 PM	2014-11-25	Blue Hill Avenue Rte 138 / Caroline Drive Rte 138	Property damage only (no 2		Rear-end	Dry	Daylight	Cloudy		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Distracted	
42	4035198	4:12 AM	2015-02-07	Blue Hill Avenue Rte Sr138 N / Caroline Drive	Non-fatal injury	2	Sideswipe, opposite dire	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
43	3950294	1:21 PM	2014-08-25	1300 Blue Hill Avenue	Property damage only (no 2		Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound	V1: Not reported / V2:Not reported	Tailgating
44	3393018	12:08 PM	2013-02-11	78 Blue Hill Avenue	Non-fatal injury	2	Sideswipe, same directic	Wet	Daylight	Sleet, hail (freezi		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	

NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.













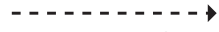




Symbols		Types of Crash		Severity	
 Moving Vehicle	 Parked Vehicle	 Head On	 Sideswipe	 Injury Accident	 Fatal Accident
 Backing Vehicle	 Fixed Object	 Angle	 Out of Control		
 Non-Involved Vehicle	 Bicycle	 Rear End			
 Pedestrian	 Animal				

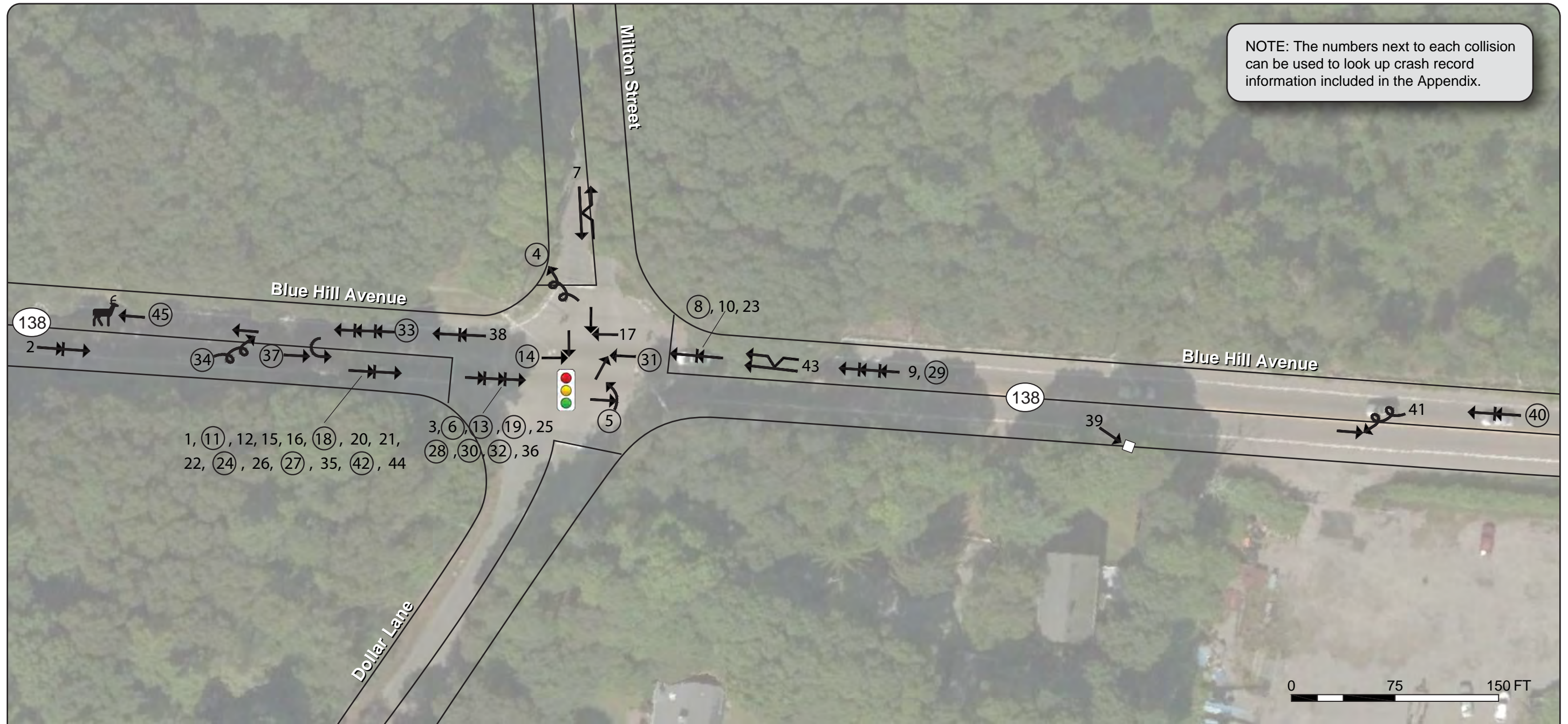


Figure E-3
Collision Diagram 2011-15
Route 138 at Neponset Valley Parkway

**Table E-3
Route 138 at Neponset Valley Parkway
Route 138 in Milton**

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	3372344	8:53 PM	2013-02-04	Blue Hill Avenue Rte 138 / Surrey Lane	Property damage only (no	2	Rear-end	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
2	3148834	4:10 PM	2012-06-14	Blue Hill Avenue / Surrey Lane	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
3	4128264	9:42 AM	2015-10-05	Blue Hill Avenue Rte 138 N / Surrey Lane	Property damage only (no	2	Rear-end	Dry	Daylight	Cloudy		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
4	2732045	4:48 PM	2011-06-08	Blue Hill Avenue / Neponset Valley Parkway	Property damage only (no	2	Sideswipe, opposite dire	Dry	Daylight	Clear		V1:Westbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	
5	2703346	9:42 AM	2011-02-08	Blue Hill Avenue Rte 138 S / Neponset Valley Parkway	Property damage only (no	3	Rear-end	Wet	Daylight	Sleet, hail (freezi		V1:Southbound / V2:Southbound / V3:Si	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir Tailgating	
6	2792452	4:40 PM	2011-10-14	Blue Hill Avenue Rte 138 S / Blue Hill Avenue Rte 138 / Neponset Valle	Non-fatal injury	2	Angle	Wet	Daylight	Rain/Cloudy		V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	
7	2792462	10:54 PM	2011-10-14	Neponset Valley Parkway Rte 138 / Blue Hill Avenue Rte 138 / Neponse	Non-fatal injury	2	Angle	Wet	Dark - lighted r	Rain		V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	Fail to yield
8	2869265	10:59 PM	2011-12-29	Blue Hill Avenue Rte 138 / Neponset Valley Parkway	Non-fatal injury	2	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	Fail to yield
9	3069349	4:47 PM	2012-04-20	Blue Hill Avenue / Neponset Valley Parkway	Unknown	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
10	3195932	10:20 PM	2012-05-22	Blue Hill Avenue / Neponset Valley Parkway	Property damage only (no	2	Rear-end	Wet	Dark - lighted r	Rain		V1:Northbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	
11	3728237	6:08 PM	2013-11-22	Blue Hill Avenue / Neponset Valley Parkway	Non-fatal injury	2	Head-on	Wet	Dark - lighted r	Rain/Rain		V1:Northbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	
12	3743362	2:39 PM	2014-02-18	Neponset Valley Parkway Rte Unknow / Blue Hill Avenue	Property damage only (no	2	Rear-End	Snow/Ice	Daylight	Snow		V1:Westbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
13	3801603	2:23 PM	2014-04-14	Blue Hill Avenue / Neponset Valley Parkway / Blue Hill Avenue	Non-fatal injury	1	Rear-end	Dry	Daylight	Clear		V1:Northbound	V1: Turning left	
14	3827609	10:06 PM	2014-05-09	Blue Hill Avenue Rte 138 N / Neponset Valley Parkway	Property damage only (no	2	Rear-end	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Inattention
15	3867860	9:41 PM	2014-06-10	Neponset Valley Parkway / Blue Hill Avenue	Non-fatal injury	2	Rear-end	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	
16	3950628	11:27 PM	2014-09-07	Neponset Valley Parkway / Blue Hill Avenue Rte Sr138 N	Non-fatal injury	2	Angle	Dry	Dark - lighted r	Clear/Clear		V1:Eastbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	Fail to yield
17	4067233	3:04 PM	2015-05-10	Blue Hill Avenue Rte 138 N / Neponset Valley Parkway	Property damage only (no	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Distracted
18	4117517	7:24 PM	2015-09-29	Blue Hill Avenue Rte 138 / Neponset Valley Parkway	Non-fatal injury	4	Head-on	Wet	Dark - lighted r	Rain/Rain		V1:Southbound / V2:Northbound / V3:Sc	V1: Travelling straight ahead / V2:Travelling straight ahead	Leaving lane
19	4159133	2:44 PM	2015-12-29	Blue Hill Avenue / Neponset Valley Parkway	Property damage only (no	2	Rear-end	Wet	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Inattention
20	2937814	5:58 PM	2011-11-15	Neponset Valley Parkway / Blue Hill Avenue	Property damage only (no	2	Angle	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	
21	2937130	5:52 PM	2011-11-17	Neponset Valley Parkway / Blue Hill Avenue	Property damage only (no	2	Rear-end	Wet	Dark - lighted r	Rain		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Turning left	
22	4069892	3:45 PM	2015-08-03	Neponset Valley Parkway Rte Unknow / Blue Hill Avenue	Property damage only (no	2	Sideswipe, opposite dire	Dry	Daylight	Clear		V1:Westbound / V2:Eastbound	V1: Travelling straight ahead / V2:Entering traffic lane	Wrong way
23	3292235	11:39 AM	2012-10-12	20 Feet S From Intersection 1034 Blue Hill Avenue	Non-fatal injury	2	Sideswipe, same directic	Wet	Daylight	Rain/Cloudy		V1:Northbound / V2:Northbound	V1: Overtaking/passing / V2:Travelling straight ahead	Inattention

NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.










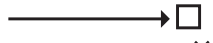


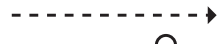


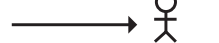

Symbols		Types of Crash		Severity	
 Moving Vehicle	 Parked Vehicle	 Head On	 Sideswipe	 Injury Accident	 Fatal Accident
 Backing Vehicle	 Fixed Object	 Angle	 Out of Control		
 Non-Involved Vehicle	 Bicycle	 Rear End			
 Pedestrian	 Animal				

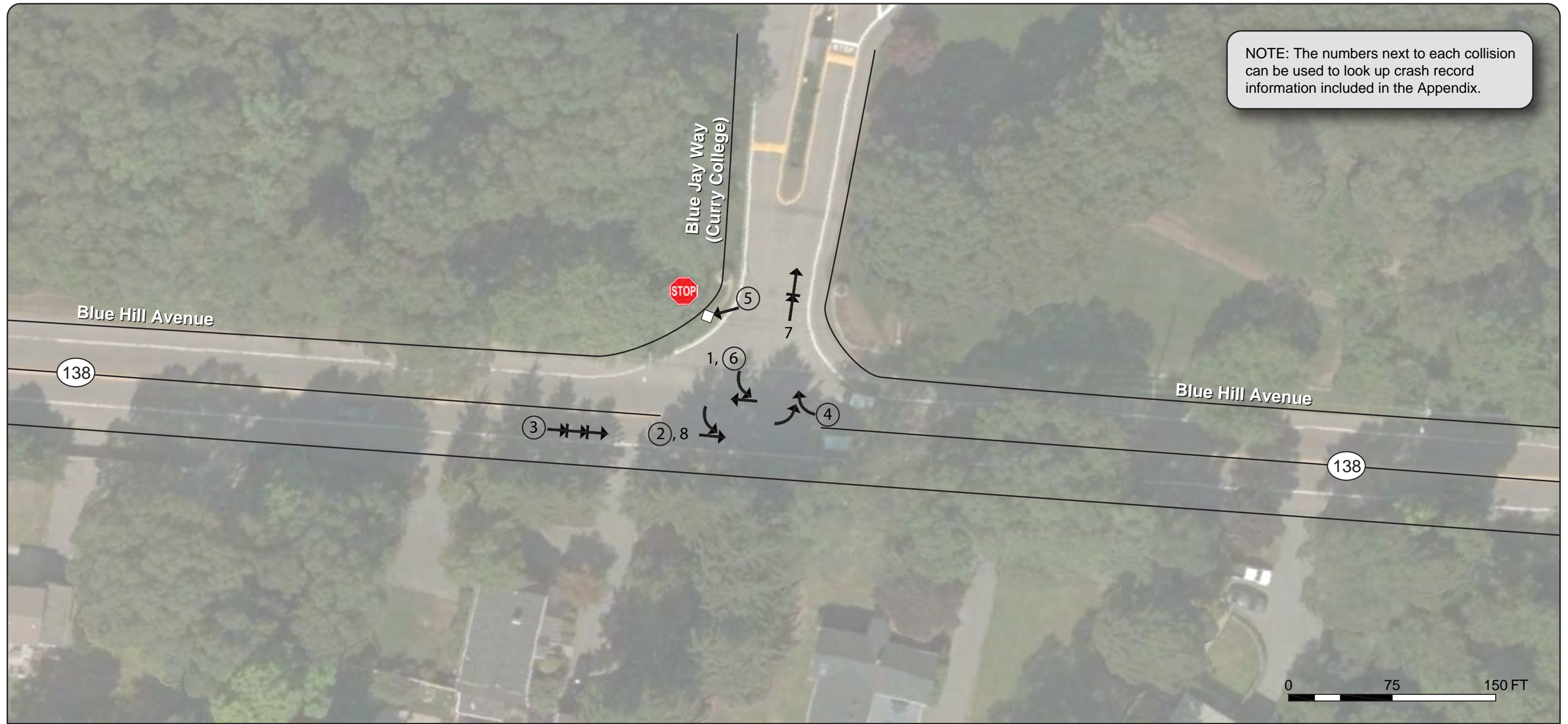


Figure E-4
Collision Diagram 2011-15
Route 138 at Milton Street/Dollar Lane

**Table E-4
Route 138 at Milton Street and Dollar Street
Route 138 in Milton**

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	2743323	9:30 AM	2011-07-06	Blue Hill Avenue Rte 138 / Dollar Lane	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Inattention
2	3374276	2:29 PM	2013-01-26	300 Feet S From Intersection Blue Hill Avenue Rte 138 / Milton Street	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	Tailgating
3	3668031	8:25 AM	2013-10-23	300 Feet S From Intersection Blue Hill Avenue Rte 138 N / Dollar Lane	Property damage only (no 3		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
4	3735102	8:10 AM	2013-12-09	Dollar Lane / Blue Hill Avenue	Non-fatal injury	1	Single vehicle crash	Wet	Daylight	Rain/Sleet, hail (V1:Westbound	V1: Turning right	Speeding
5	2711751	9:52 AM	2011-03-30	Blue Hill Avenue / Dollar Lane	Non-fatal injury	2	Angle	Dry	Daylight	Clear		V1:Eastbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	
6	2718246	7:27 PM	2011-04-19	Blue Hill Avenue / Dollar Lane	Non-fatal injury	3	Rear-to-rear	Wet	Dark - lighted r	Rain		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
7	2731934	7:51 PM	2011-05-29	Milton Street / Blue Hill Avenue	Property damage only (no 2		Sideswipe, opposite dire	Dry	Daylight	Clear		V1:Southbound / V2:Eastbound	V1: Turning right / V2:Slowing or stopped in traffic	Inattention
8	2868516	7:58 PM	2011-12-27	Blue Hill Avenue / Dollar Lane	Non-fatal injury	2	Rear-end	Wet	Dark - lighted r	Rain		V1:Northbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
9	3058630	8:09 PM	2012-04-06	Blue Hill Avenue Rte 138 S / Dollar Lane / Milton Street	Property damage only (no 4		Rear-end	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Southbound / V3:Si	V1: Travelling straight ahead / V2:Slowing or stopped in tr	Inattention
10	3408340	1:28 PM	2013-04-02	Rte 138 / Blue Hill Avenue / Milton Street	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Inattention
11	3388608	5:10 PM	2013-04-07	Blue Hill Avenue / Dollar Lane	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
12	3587383	8:21 PM	2013-07-26	Blue Hill Avenue / Dollar Lane	Property damage only (no 2		Rear-end	Wet	Dark - lighted r	Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
13	3612379	11:09 AM	2013-10-10	Blue Hill Avenue / Dollar Lane / Milton Street	Non-fatal injury	3	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
14	3714648	3:50 PM	2013-11-07	Blue Hill Avenue Rte 138 / Dollar Lane	Non-fatal injury	2	Angle	Wet	Dusk	Rain/Rain		V1:Eastbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
15	3824837	9:10 AM	2014-03-20	Dollar Lane / Blue Hill Avenue Rte 138 S	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
16	3969059	1:03 PM	2014-10-19	Blue Hill Avenue / Dollar Lane	Property damage only (no 2		Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
17	3969775	8:03 AM	2014-10-31	Blue Hill Avenue Rte 138 S / Milton Street	Property damage only (no 2		Angle	Dry	Daylight	Cloudy		V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Disregarding signs
18	3974986	6:16 AM	2014-11-07	Blue Hill Avenue / Dollar Lane	Non-fatal injury	2	Rear-end	Wet	Daylight	Cloudy/Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
19	3982392	4:01 PM	2014-12-03	Blue Hill Avenue Rte 138 / Dollar Lane Rte 138 N / Rte 138	Non-fatal injury	3	Rear-end	Wet	Dark - unknow	Cloudy/Rain		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
20	4032177	10:00 PM	2015-03-14	Blue Hill Avenue / Dollar Lane	Property damage only (no 2		Rear-end	Wet	Dark - lighted r	Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
21	4117530	4:37 PM	2015-10-02	Blue Hill Avenue / Dollar Lane	Property damage only (no 2		Rear-end	Wet	Daylight	Rain/Cloudy		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Object in road
22	4117534	7:25 PM	2015-10-02	Blue Hill Avenue / Milton Street	Property damage only (no 2		Rear-end	Wet	Dark - lighted r	Cloudy/Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
23	4117542	3:38 PM	2015-10-04	Blue Hill Avenue / Milton Street	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
24	4125341	10:08 PM	2015-10-12	Blue Hill Avenue / Milton Street	Non-fatal injury	2	Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
25	4131777	9:39 PM	2015-10-28	Blue Hill Avenue / Milton Street	Property damage only (no 3		Rear-end	Wet	Dark - lighted r	Rain		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
26	4130805	6:42 PM	2015-12-11	Blue Hill Avenue Rte 138 N / Dollar Lane	Property damage only (no 2		Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
27	4130801	11:33 PM	2015-12-22	Blue Hill Avenue Rte 138 / Dollar Lane	Non-fatal injury	2	Rear-end	Wet	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Not reported	V1: Slowing or stopped in traffic / V2:Not reported	
28	2798636	12:31 PM	2011-11-10	Blue Hill Avenue Rte 138 N / Milton Street	Non-fatal injury	3	Rear-end	Wet	Daylight	Rain		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
29	3015357	3:55 PM	2012-03-21	Blue Hill Avenue / Dollar Lane	Not Reported	3	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound / V3:Si	V1: Travelling straight ahead / V2:Travelling straight ahead	
30	3288054	5:19 PM	2012-09-20	100 Feet S From Cury College	Non-fatal injury	3	Rear-end	Unknown	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
31	3297108	1:34 PM	2012-10-27	Blue Hill Avenue / Milton Street	Non-fatal injury	2	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
32	3299995	8:08 AM	2012-11-01	Blue Hill Avenue / Dollar Lane	Non-fatal injury	3	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
33	3372355	6:04 PM	2013-01-28	Blue Hill Avenue Rte 138 S / Milton Street Rte 138	Non-fatal injury	3	Rear-end	Wet	Dusk	Clear/Clear		V1:Southbound / V2:Southbound / V3:N	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
34	3727459	10:59 PM	2013-12-14	Blue Hill Avenue / Milton Street	Non-fatal injury	2	Angle	Snow/Ice	Dark - lighted r	Snow/Sleet, hail		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
35	3827607	6:20 PM	2014-05-22	Blue Hill Avenue Rte 138 / Dollar Lane	Property damage only (no 2		Rear-end	Wet	Daylight	Rain/Cloudy		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Object in road
36	3936932	5:32 PM	2014-08-14	Blue Hill Avenue / Milton Street	Property damage only (no 3		Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Not reported / V2:Not reported / V3:Travelling straight	
37	4003505	3:52 PM	2014-12-23	Blue Hill Avenue / Dollar Lane	Non-fatal injury	2	Angle	Wet	Dusk	Cloudy/Rain		V1:Southbound / V2:Northbound	V1: Making U-turn / V2:Travelling straight ahead	Improper turn
38	3956121	3:42 PM	2014-09-20	By Curry	Property damage only (no 2		Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
39	3735111	1:46 PM	2013-12-07	100 Feet N From Intersection Blue Hill Avenue Rte 138 S / Milton Street	Property damage only (no 2		Single vehicle crash	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
40	3374308	8:04 AM	2013-01-16	500 Feet N From Intersection 1086 Blue Hill Avenue Rte 138 S / Milton St	Non-fatal injury	2	Rear-end	Snow/Ice	Daylight	Snow		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Tailgating
41	3393021	3:21 PM	2013-02-08	500 Feet N From Intersection 1072 Blue Hill Avenue Rte 138 / Milton St	Property damage only (no 2		Angle	Snow/Ice	Daylight	Snow/Snow		V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Object in road
42	3211376	2:36 PM	2012-05-24	1071 Blue Hill Avenue	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
43	3714664	1:35 PM	2013-11-05	Curry College	Property damage only (no 2		Sideswipe, same directi	Dry	Daylight	Clear		V1:Northbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Overtaking/passing	
44	4040835	4:06 PM	2015-04-24	1000 Blue Hill Avenue Rte 138	Property damage only (no 2		Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
45	4130803	8:15 AM	2015-12-22	1000 Blue Hill Avenue Rte 138 S	Not Reported	1	Angle	Wet	Daylight	Cloudy/Rain		V1:Southbound	V1: Travelling straight ahead	Defective equipment

NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.
















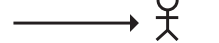

Symbols		Types of Crash		Severity	
 Moving Vehicle	 Parked Vehicle	 Head On	 Sideswipe	 Injury Accident	 Fatal Accident
 Backing Vehicle	 Fixed Object	 Angle	 Out of Control		
 Non-Involved Vehicle	 Bicycle	 Rear End			
 Pedestrian	 Animal				

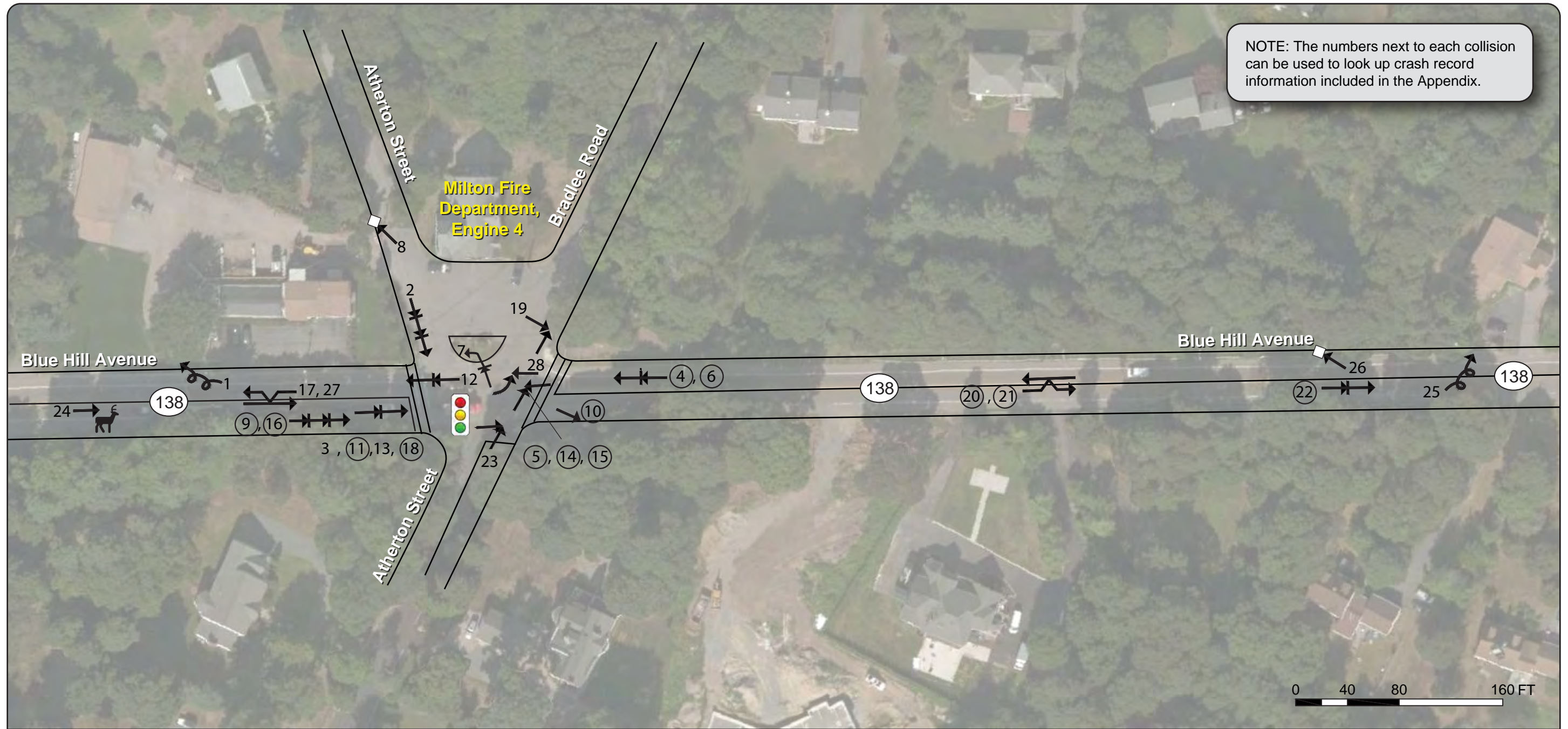


Figure E-5
Collision Diagram 2011-15
Route 138 at Blue Jay Way

**Table E-5
Route 138 at Blue Jay Way
Route 138 in Milton**

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	3343331	11:54 AM	2012-11-08	1070 Blue Hill Avenue	Property damage only (no	3	Angle	Wet	Daylight	Cloudy/Rain		V1:Southbound / V2:Eastbound / V3:No	V1: Travelling straight ahead / V2:Turning left / V3:Slowing	Fail to yield
2	3786416	8:41 PM	2014-02-19	1071 Blue Hill Avenue Rte 138 S	Non-fatal injury	2	Angle	Wet	Dark - lighted r	Sleet, hail (freezi		V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	Fail to yield
3	2705958	9:52 PM	2011-01-29	1071 Blue Hill Avenue	Non-fatal injury	3	Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
4	3176330	7:49 PM	2012-05-08	1071 Blue Hill Avenue	Non-fatal injury	3	Angle	Wet	Dark - unknow	Rain		V1:Southbound / V2:Southbound / V3:Et	V1: Travelling straight ahead / V2:Turning left / V3:Slowing	Fail to yield
5	3297116	6:29 AM	2012-10-18	1071 Blue Hill Avenue	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	Clear		V1:Southbound	V1: Turning right	
6	3983023	9:51 AM	2014-11-04	Curry College	Non-fatal injury	2	Angle	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	
7	4038196	4:35 AM	2015-01-24	1071 Blue Hill Avenue	Property damage only (no	2	Rear-end	Wet	Dark - lighted r	Snow/Sleet, hail		V1:Westbound / V2:Westbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	Distracted
8	4025266	4:06 PM	2015-01-26	1071 Blue Hill Avenue Rte 138	Property damage only (no	2	Angle	Wet	Daylight	Snow		V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	

NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.



Symbols		Types of Crash		Severity	
Moving Vehicle	Parked Vehicle	Head On	Sideswipe	Injury Accident	Fatal Accident
Backing Vehicle	Fixed Object	Angle	Out of Control		
Non-Involved Vehicle	Bicycle	Rear End			
Pedestrian	Animal				

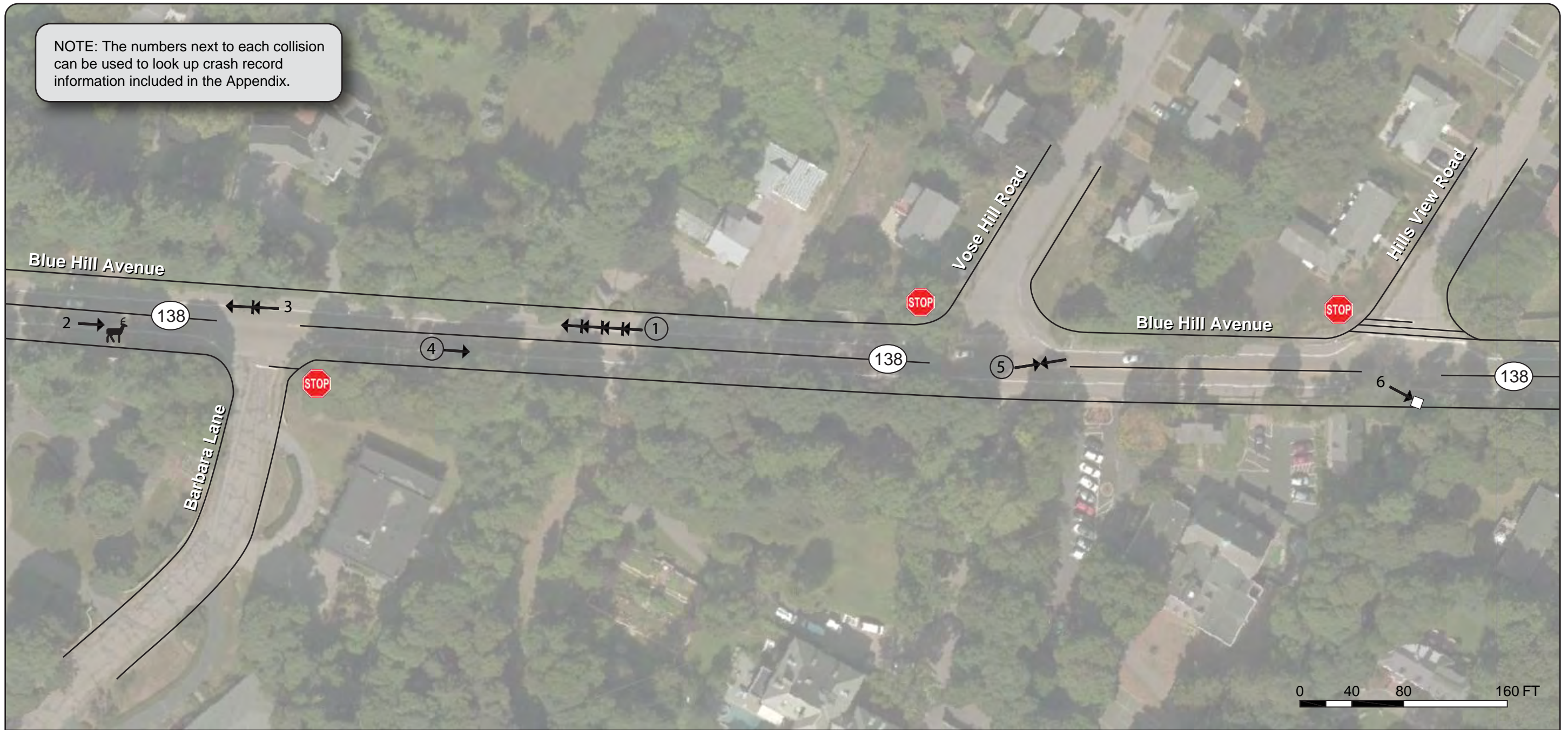


Figure E-6
Collision Diagram 2011-15
Route 138 at Atherton Street and Bradlee Road

**Table E-6
Route 138 at Atherton Street and Bradlee Road
Route 138 in Milton**

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	4139833	4:04 PM	2015-11-03	957 Blue Hill Avenue	Property damage only (no 1		Single vehicle crash	Dry	Daylight	Clear		V1:Southbound	V1: Travelling straight ahead	
2	2743252	3:39 PM	2011-07-02	Blue Hill Avenue / Atherton Street	Property damage only (no 3		Rear-end	Dry	Daylight	Clear		V1:Eastbound / V2:Eastbound / V3:East	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
3	2743324	1:47 PM	2011-07-04	Blue Hill Avenue / Atherton Street	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
4	2869035	8:57 AM	2011-11-02	Blue Hill Avenue / Bradlee Road	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead Fatigue	
5	4128339	10:48 AM	2015-10-15	Atherton Street / Blue Hill Avenue	Non-fatal injury	2	Angle	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
6	2711344	12:37 PM	2011-03-14	Blue Hill Avenue Rte 138 / Blue Hill Avenue Rte 138 / Bradlee Road	Non-fatal injury	2	Rear-end	Dry	Daylight	Cloudy		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Inattention	
7	2792466	12:34 PM	2011-10-12	Blue Hill Avenue / Blue Hill Avenue / Atherton Street	Property damage only (no 2		Rear-end	Dry	Daylight	Cloudy		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Turning left	
8	3049107	5:09 PM	2012-04-10	Atherton Street / Blue Hill Avenue Rte 138	Property damage only (no 1		Single vehicle crash	Dry	Daylight	Clear		V1:Westbound	V1: Backing	
9	3247840	9:22 PM	2012-07-01	Blue Hill Avenue / Atherton Street	Non-fatal injury	3	Rear-end	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
10	3282177	6:34 PM	2012-08-16	Blue Hill Avenue / Atherton Street	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	Clear/Clear		V1:Northbound	V1: Travelling straight ahead	
11	3288053	7:25 AM	2012-09-21	Blue Hill Avenue / Atherton Street	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
12	3388606	2:40 PM	2013-04-04	Rte 138 N / Blue Hill Avenue / Atherton Street	Property damage only (no 2		Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Tailgating	
13	3403022	1:51 PM	2013-04-12	Bradlee Road / Blue Hill Avenue / Robbins Street	Property damage only (no 2		Rear-end	Wet	Daylight	Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
14	3862378	12:54 PM	2014-06-05	Blue Hill Avenue Rte 138 / Atherton Street / Bradlee Road	Non-fatal injury	2	Angle	Wet	Daylight	Rain		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Travelling straight ahead Disregarding signs	
15	3896431	6:27 PM	2014-07-26	Blue Hill Avenue Rte 138 W / Atherton Street	Non-fatal injury	2	Angle	Dry	Daylight	Clear/Clear		V1:Westbound / V2:Southbound	V1: Not reported / V2:Not reported Inattention	
16	4067762	4:15 PM	2015-07-11	Blue Hill Avenue / Atherton Street	Non-fatal injury	3	Rear-end	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Northbound / V3:Nc	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
17	3049098	4:27 PM	2012-04-13	Blue Hill Avenue / Bradlee Road	Property damage only (no 1		Sideswipe, opposite dire	Dry	Daylight	Clear		V1:Northbound	V1: Travelling straight ahead	
18	3282226	1:52 AM	2012-08-05	Blue Hill Avenue / Atherton Street	Non-fatal injury	2	Rear-end	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
19	4022546	9:58 AM	2015-02-25	Blue Hill Avenue / Bradlee Road	Property damage only (no 2		Sideswipe, opposite dire	Dry	Daylight	Clear/Clear		V1:Westbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead Speeding (weather)	
20	3739632	1:31 PM	2013-12-29	764 Blue Hill Avenue	Non-fatal injury	2	Sideswipe, opposite dire	Wet	Daylight	Rain		V1:Southbound / V2:Northbound	V1: Travelling straight ahead / V2:Leaving traffic lane Leaving lane	
21	2696976	10:25 AM	2011-01-15	764 Blue Hill Avenue	Non-fatal injury	3	Sideswipe, opposite dire	Dry	Daylight	Clear		V1:Northbound / V2:Southbound / V3:Sc	V1: Leaving traffic lane / V2:Travelling straight ahead / V3: Leaving lane	
22	2829453	8:53 AM	2011-11-06	700 Feet N From Intersection 753 Blue Hill Avenue Rte 138 N / Atherton	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah Inattention	
23	4151241	6:09 PM	2015-12-16	815 Blue Hill Avenue	Property damage only (no 2		Angle	Dry	Dark - lighted r	Clear		V1:Westbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
24	4139845	4:45 PM	2015-11-15	805 Blue Hill Avenue	Property damage only (no 1		Single vehicle crash	Dry	Daylight	Clear		V1:Northbound	V1: Travelling straight ahead	
25	2739541	7:40 AM	2011-06-17	753 Blue Hill Avenue	Property damage only (no 1		Single vehicle crash	Dry	Daylight	Clear		V1:Northbound	V1: Travelling straight ahead	
26	2716451	8:12 AM	2011-04-01	400 Feet N From Intersection 731 Blue Hill Avenue Rte 138 S	Property damage only (no 1		Single vehicle crash	Snow/Ice	Daylight	Sleet, hail (freezi		V1:Southbound	V1: Travelling straight ahead Over-correcting	
27	3389886	10:28 PM	2013-02-25	Blue Hill Avenue / Concord Avenue	Property damage only (no 2		Sideswipe, opposite dire	Dry	Dark - lighted r	Cloudy/Cloudy		V1:Southbound / V2:Not reported	V1: Travelling straight ahead / V2:Not reported	
28	3391456	9:29 AM	2013-02-18	Blue Hill Avenue Rte Sr138 S / Bradlee Road / Atherton Street	Property damage only (no 2		Head-on	Wet	Daylight	Clear		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	

NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.



Symbols		Types of Crash		Severity	
Moving Vehicle	Parked Vehicle	Head On	Sideswipe	Injury Accident	Fatal Accident
Backing Vehicle	Fixed Object	Angle	Out of Control		
Non-Involved Vehicle	Bicycle	Rear End			
Pedestrian	Animal				

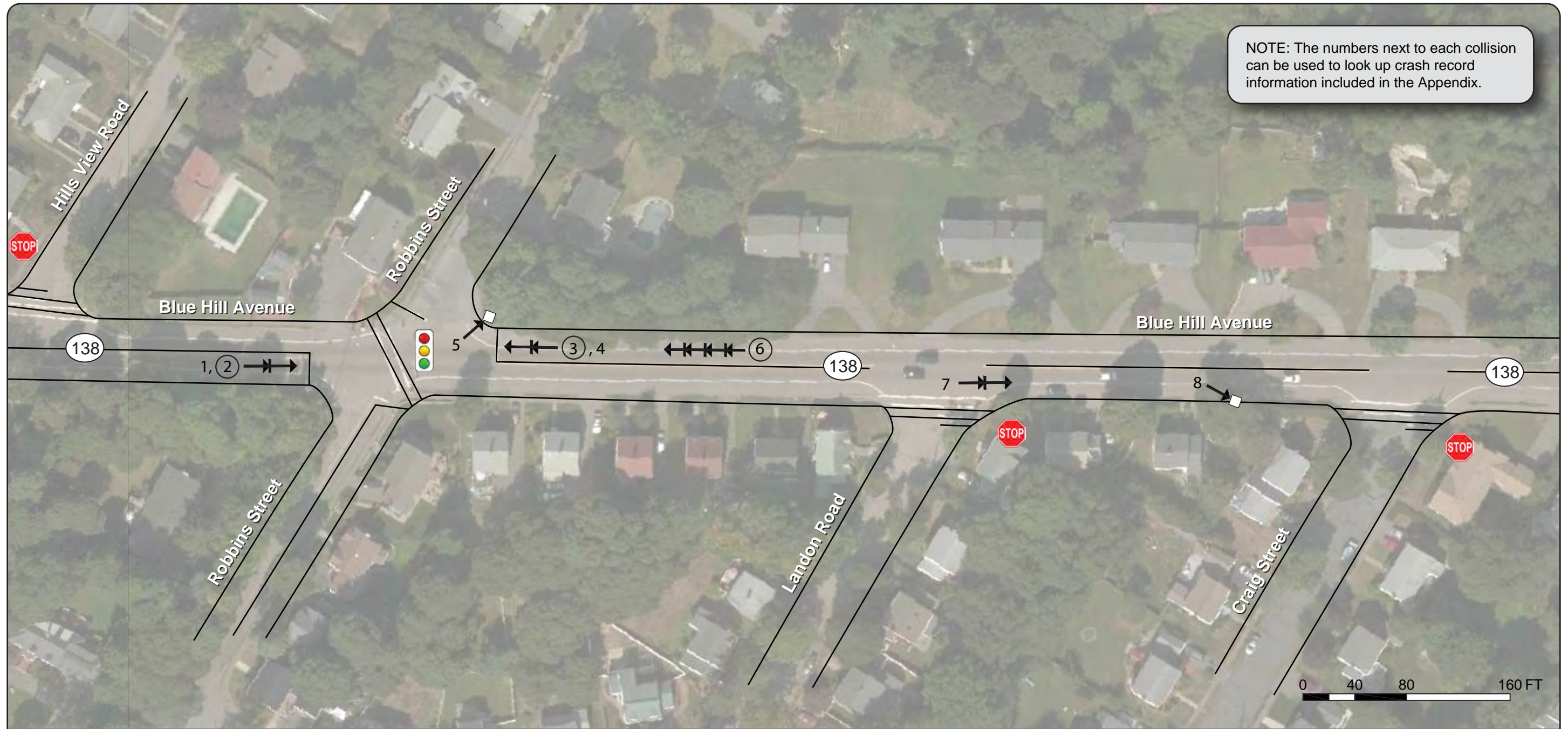


Figure E-7
Collision Diagram 2011-15
Route 138 Between Bradlee Road and Robbins Street

Table E-7
Route 138 between Bradlee Road and Robbins Street
Route 138 in Milton

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	3292976	6:40 AM	2012-11-13	Canton Avenue Rte 138 S / Blue Hill Avenue	Non-fatal injury	4	Rear-end	Wet	Dawn	Rain		V1:Southbound / V2:Southbound / V3:Si	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
2	3392140	5:44 PM	2013-02-21	680 Blue Hill Avenue	Property damage only (no 1		Single vehicle crash	Dry	Dark - lighted r	Clear		V1:Northbound	V1: Travelling straight ahead	
3	3342732	1:18 AM	2012-11-11	Blue Hill Avenue / Barbara Lane	Property damage only (no 2		Rear-end	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Southbound	V1: Other / V2:Travelling straight ahead	
4	3288052	7:10 PM	2012-09-23	1000 Feet S From Intersection Blue Hill Avenue / Robbins Street	Non-fatal injury	1	Single vehicle crash	Dry	Dark - lighted r	Clear/Clear		V1:Northbound	V1: Travelling straight ahead	
5	3408342	6:28 AM	2013-03-29	Blue Hill Avenue / Vose Hill Road	Non-fatal injury	2	Head-on	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead Reckless	
6	4132328	4:42 PM	2015-10-24	Hills View Road / Blue Hill Avenue	Property damage only (no 1		Single vehicle crash	Dry	Dark - lighted r	Clear/Clear		V1:Northbound	V1: Travelling straight ahead	Object in road

NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.













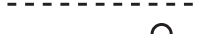




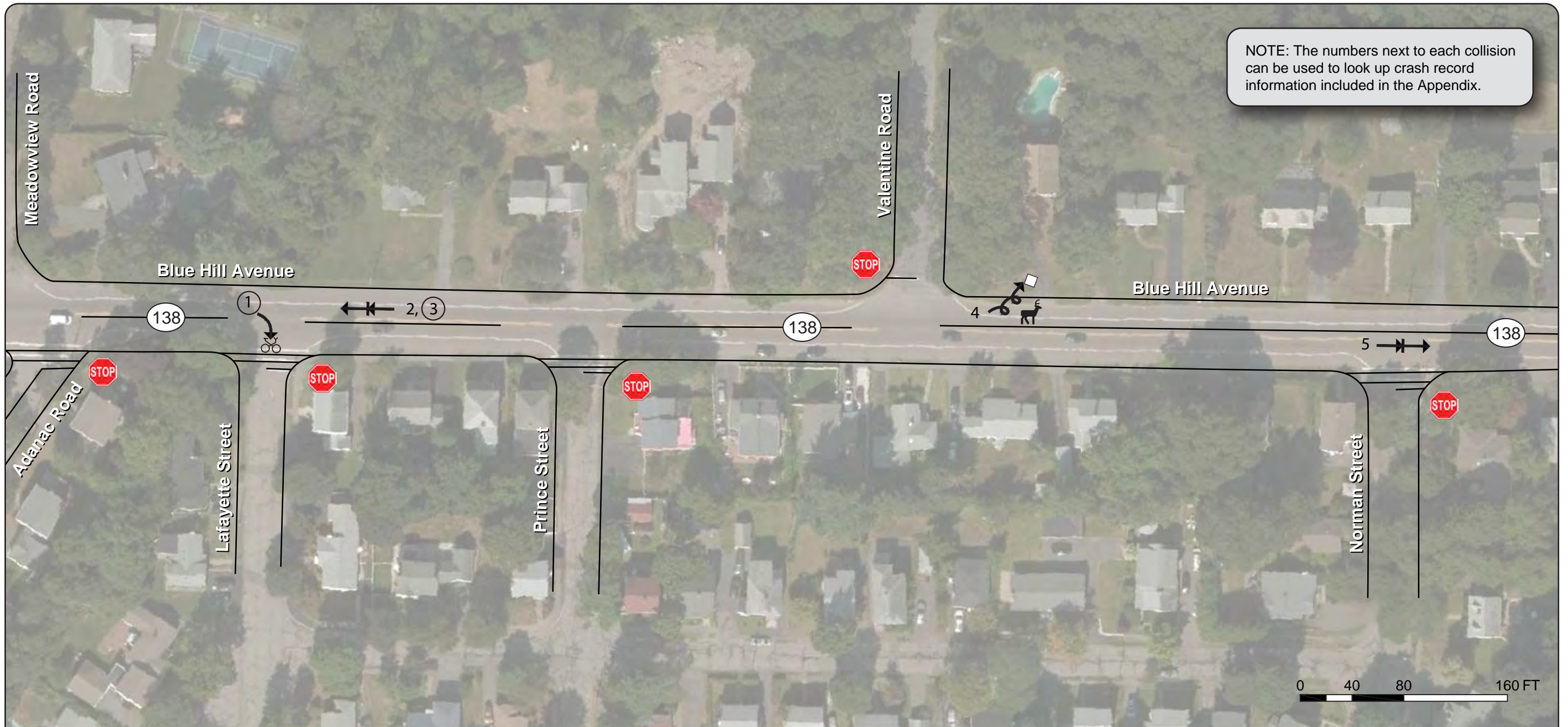
Symbols		Types of Crash		Severity	
 Moving Vehicle	 Parked Vehicle	 Head On	 Sideswipe	 Injury Accident	 Fatal Accident
 Backing Vehicle	 Fixed Object	 Angle	 Out of Control		
 Non-Involved Vehicle	 Bicycle	 Rear End			
 Pedestrian	 Animal				



Figure E-8
Collision Diagram 2011-15
Route 138 at Robbins Street

**Table E-8
Route 138 at Robbins Street
Route 138 in Milton**

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	2703339	6:15 PM	2011-02-16	Blue Hill Avenue Rte 138 N / Robbins Street	Non-fatal injury	2	Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Tailgating
2	2732053	3:44 PM	2011-06-03	Blue Hill Avenue / Robbins Street	Property damage only (no 1		Rear-end	Dry	Daylight	Clear		V1:Northbound	V1: Slowing or stopped in traffic	Inattention
3	3336240	10:22 PM	2012-09-08	Robbins Street / Blue Hill Avenue / Robbins Street	Non-fatal injury	2	Rear-end	Wet	Dark - lighted r	Rain		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
4	3588717	6:18 PM	2013-09-09	Blue Hill Avenue / Robbins Street	Property damage only (no 2		Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	Inattention
5	4117103	2:54 AM	2015-09-21	Robbins Street / Blue Hill Avenue	Property damage only (no 1		Single vehicle crash	Dry	Dark - lighted r	Clear/Clear		V1:Northbound	V1: Leaving traffic lane	Object in road
6	4107509	3:37 PM	2015-10-28	Blue Hill Avenue / Robbins Street	Non-fatal injury	4	Rear-end	Wet	Dusk	Rain/Cloudy		V1:Southbound / V2:Southbound / V3:Si	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
7	3392142	9:40 PM	2013-02-20	520 Blue Hill Avenue Rte 138 N	Property damage only (no 2		Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound	V1: Leaving traffic lane / V2:Parked	
8	4078505	10:03 AM	2015-06-09	Blue Hill Avenue / Landon Road / Craig Street	Property damage only (no 2		Single vehicle crash	Dry	Daylight	Clear/Clear		V1:Not reported / V2:Northbound	V1: Entering traffic lane / V2:Travelling straight ahead	Inattention



NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.

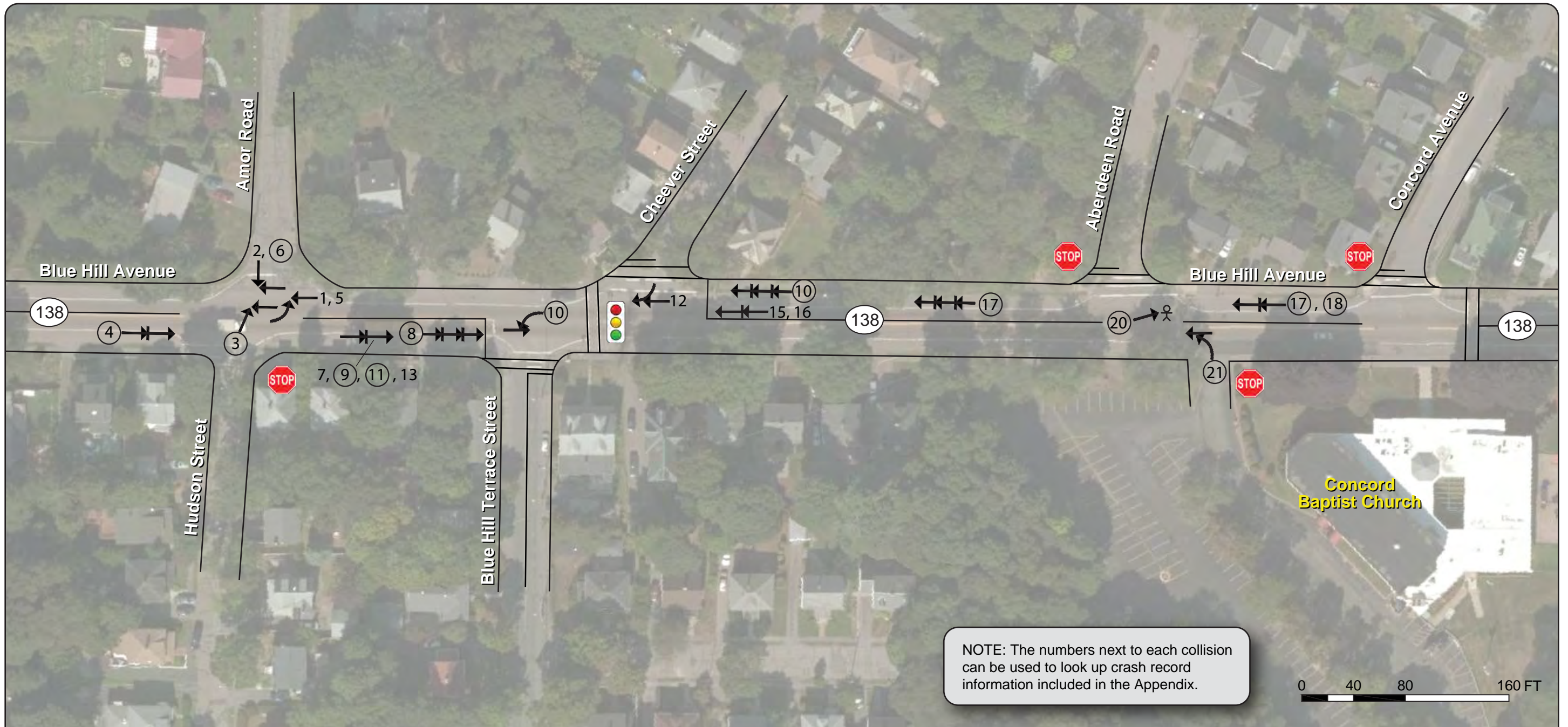
Symbols		Types of Crash		Severity	
Moving Vehicle	Parked Vehicle	Head On	Sideswipe	Injury Accident	Fatal Accident
Backing Vehicle	Fixed Object	Angle	Out of Control		
Non-Involved Vehicle	Bicycle	Rear End			
Pedestrian	Animal				



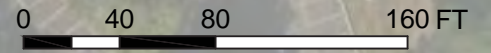
Figure E-9
Collision Diagram 2011-15
Route 138 Segment Between Robbins Street and Cheever Street

Table E-9
Route 138 Between Robbins Street and Cheever Street
Route 138 in Milton

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	3288267	11:21 AM	2012-09-16	Blue Hill Lafayette	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	Clear	cyc	V1:Northbound	V1: Turning right	Fail to yield
2	3510904	8:16 PM	2013-07-03	Blue Hill Avenue / Lafayette Street	Property damage only (no 2		Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Eastbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	Cellphone
3	3928313	4:49 PM	2014-08-22	Blue Hill Avenue / Lafayette Street	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Not reported	Tailgating
4	3229872	3:07 AM	2012-06-16	351 Blue Hill Avenue	Property damage only (no 1		Single vehicle crash	Dry	Dark - lighted r	Clear		V1:Northbound	V1: Travelling straight ahead	
5	4131785	5:36 PM	2015-10-28	Blue Hill Avenue / Norman Street	Property damage only (no 2		Rear-end	Wet	Dark - lighted r	Rain/Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	



NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.



Symbols		Types of Crash		Severity	
Moving Vehicle	Parked Vehicle	Head On	Sideswipe	Injury Accident	Fatal Accident
Backing Vehicle	Fixed Object	Angle	Out of Control		
Non-Involved Vehicle	Bicycle	Rear End			
Pedestrian	Animal				

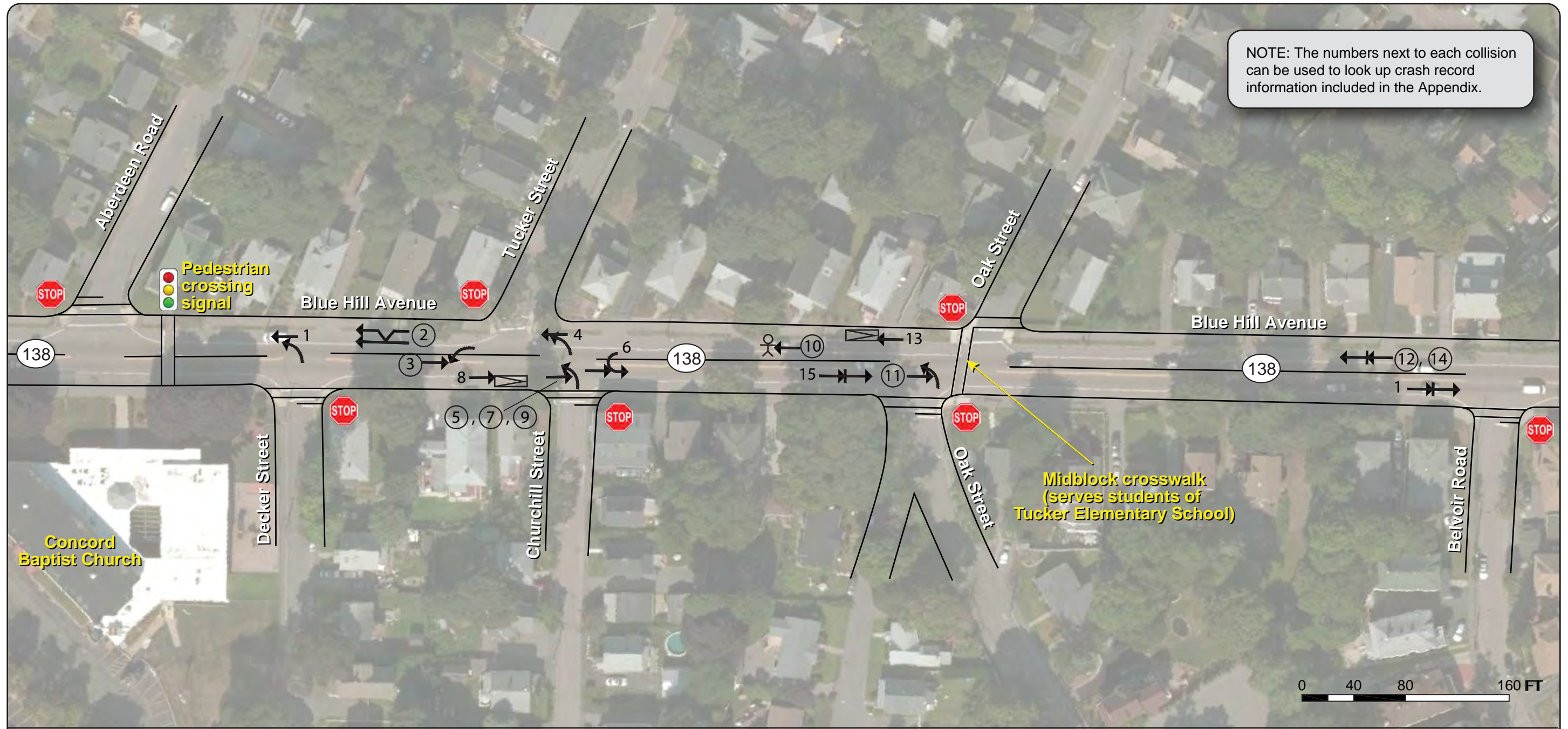


Figure E-10
Collision Diagram 2011-15
Route 138 at Cheever Street and Blue Hill Terrace Street

Table E-10
Route 138 at Cheever Street and Blue Hill Terrace
Route 138 in Milton

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	3427631	11:38 PM	2013-04-19	Blue Hill Avenue / Amor Road	Property damage only (no	2	Sideswipe, opposite dire	Wet	Dark - lighted r	Rain/Rain		V1:Northbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	
2	3811331	3:22 AM	2014-04-26	Blue Hill Avenue Rte 138 S / Hudson Street / Amor Road	Property damage only (no	3	Sideswipe, opposite dire	Dry	Dark - lighted r	Clear/Clear		V1:Southbound / V2:Northbound / V3:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
3	2725481	6:57 AM	2011-05-06	Blue Hill Avenue / Amor Road Rte 138 S	Non-fatal injury	3	Angle	Unknown	Daylight	Clear		V1:Westbound / V2:Southbound / V3:Eastbound	V1: Travelling straight ahead / V2:Travelling straight ahead	Fail to yield
4	2725489	7:29 AM	2011-05-06	Blue Hill Avenue Rte 138 N / Amor Road / Hudson Street	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	
5	3612378	8:48 AM	2013-10-11	Blue Hill Avenue Rte 138 / Amor Road / Rte 138	Property damage only (no	2	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	Fail to yield
6	4139819	12:20 PM	2015-11-08	Amor Road / Amor Road / Blue Hill Avenue	Not Reported	2	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning left	
7	3868562	10:51 PM	2014-06-15	248 Blue Hill Avenue	Property damage only (no	2	Rear-end	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Distracted
8	2958031	5:15 AM	2012-03-11	Blue Hill Avenue / Blue Hill Terrace Street	Non-fatal injury	3	Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound / V3:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	
9	3794971	10:16 AM	2014-03-12	Blue Hill Avenue Rte 138 N / Blue Hill Avenue Rte 138 N / Blue Hill Terrace Street	Non-fatal injury	2	Rear-end	Dry	Daylight	Cloudy		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Inattention
10	4053466	7:20 PM	2015-03-24	Blue Hill Terrace Street / Blue Hill Avenue / Blue Hill Terrace Street	Not Reported	2	Angle	Dry	Dark - lighted r	Clear		V1:Northbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	
11	3229885	6:07 PM	2012-06-02	240 Blue Hill Avenue	Non-fatal injury	2	Rear-end	Wet	Dark - lighted r	Rain/Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	
12	2693776	3:20 PM	2011-02-07	Blue Hill Avenue Rte 138 S / Cheever Street	Property damage only (no	2	Angle	Dry	Daylight	Cloudy		V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
13	4139852	2:14 PM	2015-11-14	Blue Hill Avenue Rte 138 N / Cheever Street	Property damage only (no	2	Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	Inattention
14	4093765	2:36 PM	2015-09-26	Cheever Street / Blue Hill Avenue	Non-fatal injury	3	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound / V3:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
15	3063149	10:27 AM	2012-03-05	Blue Hill Avenue / Cheever Street	Property damage only (no	2	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	
16	3297106	6:20 PM	2012-10-30	Blue Hill Avenue / Cheever Street	Property damage only (no	2	Rear-end	Wet	Dark - lighted r	Rain/Cloudy		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	
17	2955657	1:04 PM	2011-12-18	230 Blue Hill Avenue	Non-fatal injury	3	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound / V3:Southbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	
18	3336297	9:21 PM	2012-08-21	Blue Hill Avenue / Blue Hill Avenue Rte 138 / Concord Avenue	Non-fatal injury	2	Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Tailgating
19	3901474	12:18 PM	2014-07-22	Blue Hill Avenue / Concord Avenue	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Not reported / V2:Not reported	
20	3247671	12:58 PM	2012-06-27	10 Feet N From Intersection 180 Blue Hill Avenue / Concord Avenue	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	Clear/Clear	ped	V1:Northbound	V1: Overtaking/passing	Can't see
21	3965485	1:17 PM	2014-10-05	180 Blue Hill Avenue	Non-fatal injury	2	Sideswipe, same direction	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning left	

NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.













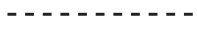




Symbols		Types of Crash		Severity	
 Moving Vehicle	 Parked Vehicle	 Head On	 Sideswipe	 Injury Accident	 Fatal Accident
 Backing Vehicle	 Fixed Object	 Angle	 Out of Control		
 Non-Involved Vehicle	 Bicycle	 Rear End			
 Pedestrian	 Animal				



Figure E-11
Collision Diagram 2011-15
Route 138 Oak Street

**Table E-11
Route 138 at Oak Street
Route 138 in Milton**

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	2712717	8:06 PM	2011-03-11	Blue Hill Avenue / Decker Street	Property damage only (no	2	Angle	Dry	Dark - lighted r	Clear/Clear		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	
2	3202030	2:03 AM	2012-05-11	Blue Hill Avenue / Blue Hill Avenue / Decker Street	Unknown	2	Sideswipe, same directio	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Southbound	V1: Turning left / V2:Travelling straight ahead	
3	3937033	3:40 PM	2014-08-03	163 Blue Hill Avenue / Rte 138	Non-fatal injury	2	Angle	Dry	Daylight	Clear		V1:Northbound / V2:Southbound	V1: Not reported / V2:Not reported	
4	2703348	8:08 PM	2011-02-08	Blue Hill Avenue / Churchill Street	Property damage only (no	2	Angle	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Entering traffic lane	Reckless
5	2739637	6:26 PM	2011-06-26	Churchill Street / Blue Hill Avenue Rte 138 S	Non-fatal injury	3	Angle	Dry	Daylight	Cloudy		V1:Northbound / V2:Southbound / V3:Eastbound	V1: Travelling straight ahead / V2:Parked / V3:Turning left	
6	3602797	3:52 PM	2013-09-12	Blue Hill Avenue / Churchill Street / Rte Z	Property damage only (no	2	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Northbound	V1: Making U-turn / V2:Travelling straight ahead	
7	3767843	3:11 PM	2014-01-17	Blue Hill Avenue Rte 138 N / Churchill Street	Non-fatal injury	2	Angle	Dry	Daylight	Clear/Clear		V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Entering traffic lane	Can't see
8	4053899	10:56 PM	2015-03-29	Blue Hill Avenue / Churchill Street	Property damage only (no	3	Single vehicle crash	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound / V3:Northbound	V1: Travelling straight ahead / V2:Parked / V3:Parked	
9	3336298	5:15 PM	2012-08-18	Blue Hill Avenue / Blue Hill Avenue / Churchill Street	Non-fatal injury	2	Sideswipe, opposite dire	Wet	Daylight	Rain		V1:Westbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	
10	2709440	5:25 PM	2011-01-10	Area Of Union Avenue	Non-fatal injury	1	Single vehicle crash	Dry	Dark - lighted r	Clear/Clear	ped	V1:Southbound	V1: Not reported	
11	3584834	9:35 PM	2013-08-17	Blue Hill Avenue / Blue Hill Avenue / Oak Street	Non-fatal injury	2	Angle	Dry	Dark - lighted r	Clear		V1:Westbound / V2:Northbound	V1: Turning left / V2:Travelling straight ahead	
12	3937034	8:15 AM	2014-07-30	Belvoir	Not Reported	2	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Not reported / V2:Not reported	
13	4106614	1:08 AM	2015-08-30	Blue Hill Avenue / Oak Street	Property damage only (no	3	Single vehicle crash	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Southbound / V3:Southbound	V1: Travelling straight ahead / V2:Parked / V3:Parked	Reckless
14	3950629	3:28 PM	2014-09-04	116 Feet S From Intersection Belvoir Road	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	
15	4078624	12:04 PM	2015-06-23	Blue Hill Avenue / Blue Hill Avenue Rte 138 N / Belvoir Road	Property damage only (no	2	Rear-end	Wet	Daylight	Cloudy/Rain		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	Inattention

NOTE: The numbers next to each collision can be used to look up crash record information included in the Appendix.













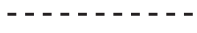




Symbols		Types of Crash		Severity	
 Moving Vehicle	 Parked Vehicle	 Head On	 Sideswipe	 Injury Accident	 Fatal Accident
 Backing Vehicle	 Fixed Object	 Angle	 Out of Control		
 Non-Involved Vehicle	 Bicycle	 Rear End			
 Pedestrian	 Animal				



Figure E-12
Collision Diagram 2011-15
Route 138 at Brook Road

**Table E-12
Route 138 at Brook Road
Route 138 in Milton**

Index	Crash Number	Crash Time	Crash Date	Street Address	Crash Severity	# of Vehicles	Manner of Collision	Road Surface Condition	Ambient Light Condition	Weather Condition	Bike/Ped	Vehicle Traveled Direction	Vehicle Action	Driver Contributing Code
1	2743322	3:50 PM	2011-07-06	Blue Hill Avenue / Belvoir Road	Property damage only (no	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
2	2760767	8:49 PM	2011-08-05	Brook Road / Blue Hill Avenue Rte 138 S	Property damage only (no	2	Single vehicle crash	Dry	Dark - lighted r	Clear	ped	V1:Northbound / V2:Eastbound	V1: Travelling straight ahead / V2:Not reported	
3	3176131	7:04 PM	2012-05-10	Brook Road / Blue Hill Avenue	Non-fatal injury	2	Angle	Dry	Daylight	Clear		V1:Eastbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead Reckless	
4	3288045	12:00 AM	2012-09-29	Blue Hill Avenue Rte 138 / Brook Road	Non-fatal injury	3	Angle	Dry	Daylight	Cloudy		V1:Westbound / V2:Northbound / V3:So	V1: Travelling straight ahead / V2:Travelling straight ahead Disregarding signs	
5	3368166	6:32 AM	2013-01-07	Blue Hill Avenue / Brook Road	Property damage only (no	2	Rear-end	Dry	Dawn	Clear/Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Travelling straight ahead	
6	3470434	10:05 AM	2013-06-08	Blue Hill Avenue / Brook Road	Property damage only (no	2	Rear-end	Wet	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
7	3510905	5:20 PM	2013-07-03	Blue Hill Avenue / Brook Road	Property damage only (no	2	Sideswipe, same directio	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Turning right	
8	3584839	2:58 PM	2013-08-12	Blue Hill Avenue / Blue Hill Avenue Rte 138 S / Brook Road	Property damage only (no	3	Rear-end	Dry	Daylight	Clear		V1:Not reported / V2:Southbound / V3:S	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
9	3771952	7:24 PM	2014-01-01	Blue Hill Avenue / Brook Road	Non-fatal injury	2	Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Fail to yield
10	4055154	6:19 AM	2015-05-28	Brook Road / Blue Hill Avenue Rte 138 N	Property damage only (no	2	Sideswipe, same directio	Dry	Daylight	Clear/Clear		V1:Eastbound / V2:Eastbound	V1: Travelling straight ahead / V2:Turning right	Inattention
11	4139837	5:49 PM	2015-11-03	Blue Hill Avenue / Brook Road	Non-fatal injury	2	Rear-end	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
12	4139870	2:27 PM	2015-11-14	Blue Hill Avenue / Brook Road	Non-fatal injury	2	Rear-end	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Inattention
13	4148978	8:28 AM	2015-12-03	Blue Hill Avenue Rte 138 / Brook Road	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy		V1:Northbound	V1: Other	
14	2766073	2:57 PM	2011-09-16	80 Blue Hill Avenue	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Slowing or stopped ir	
15	3015364	5:18 AM	2012-03-16	74 Blue Hill Avenue	Property damage only (no	2	Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Parked	Distracted
16	3827583	2:44 PM	2014-05-19	10 Feet S From Intersection Blue Hill Avenue / Austin Street	Non-fatal injury	2	Rear-end	Dry	Daylight	Clear/Clear		V1:Southbound / V2:Southbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	
17	3292240	9:29 AM	2012-10-13	300 Feet N From Intersection 36 Blue Hill Avenue Rte 138 N / Brook Ro	Property damage only (no	2	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Slowing or stopped in tr	
18	2725478	3:49 AM	2011-05-07	Blue Hill Avenue / Austin Street	Not Reported	2	Rear-end	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Not reported	V1: Travelling straight ahead / V2:Parked	
19	3211383	8:09 AM	2012-05-24	Blue Hill Avenue / Austin Street	Non-fatal injury	2	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Travelling straight ahead / V2:Entering traffic lane	
20	3667931	9:19 PM	2013-10-16	77 Blue Hill Avenue / Austin Street	Property damage only (no	2	Single vehicle crash	Dry	Dark - lighted r	Clear		V1:Southbound / V2:Not reported	V1: Leaving traffic lane / V2:Parked	
21	3801615	9:27 PM	2014-03-31	Blue Hill Avenue / Austin Street	Property damage only (no	2	Sideswipe, opposite dire	Wet	Dark - lighted r	Rain/Rain		V1:Northbound / V2:Westbound	V1: Travelling straight ahead / V2:Turning left	Fail to yield
22	3811239	8:09 PM	2014-04-26	Blue Hill Avenue Rte 138 N / Austin Street	Property damage only (no	2	Rear-end	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound	V1: Slowing or stopped in traffic / V2:Travelling straight ah	Inattention
23	4094633	7:59 AM	2015-07-21	Blue Hill Avenue Rte 138 S / Austin Street	Property damage only (no	2	Angle	Dry	Daylight	Cloudy		V1:Southbound / V2:Westbound	V1: Travelling straight ahead / V2:Not reported	Fail to yield
24	4149466	6:29 AM	2015-09-30	Blue Hill Avenue / Austin Street	Non-fatal injury	1	Single vehicle crash	Wet	Dawn	Rain/Rain		V1:Southbound	V1: Travelling straight ahead	Object in road
25	3928311	5:41 PM	2014-08-23	Blue Hill Avenue / Austin Street	Non-fatal injury	2	Angle	Dry	Daylight	Cloudy/Cloudy		V1:Southbound / V2:Westbound	V1: Not reported / V2:Not reported	
26	4132363	6:50 PM	2015-10-24	56 Blue Hill Avenue	Property damage only (no	2	Sideswipe, same directio	Dry	Dark - lighted r	Clear/Clear		V1:Northbound / V2:Northbound	V1: Travelling straight ahead / V2:Travelling straight ahead	

Part 2: Expected Crashes Analysis

Figure E-13

2011-2015 Observed Crashes

Severity



Peak vs. Off-Peak



Manner of Collision



At or Between Intersections



0

50

100

150

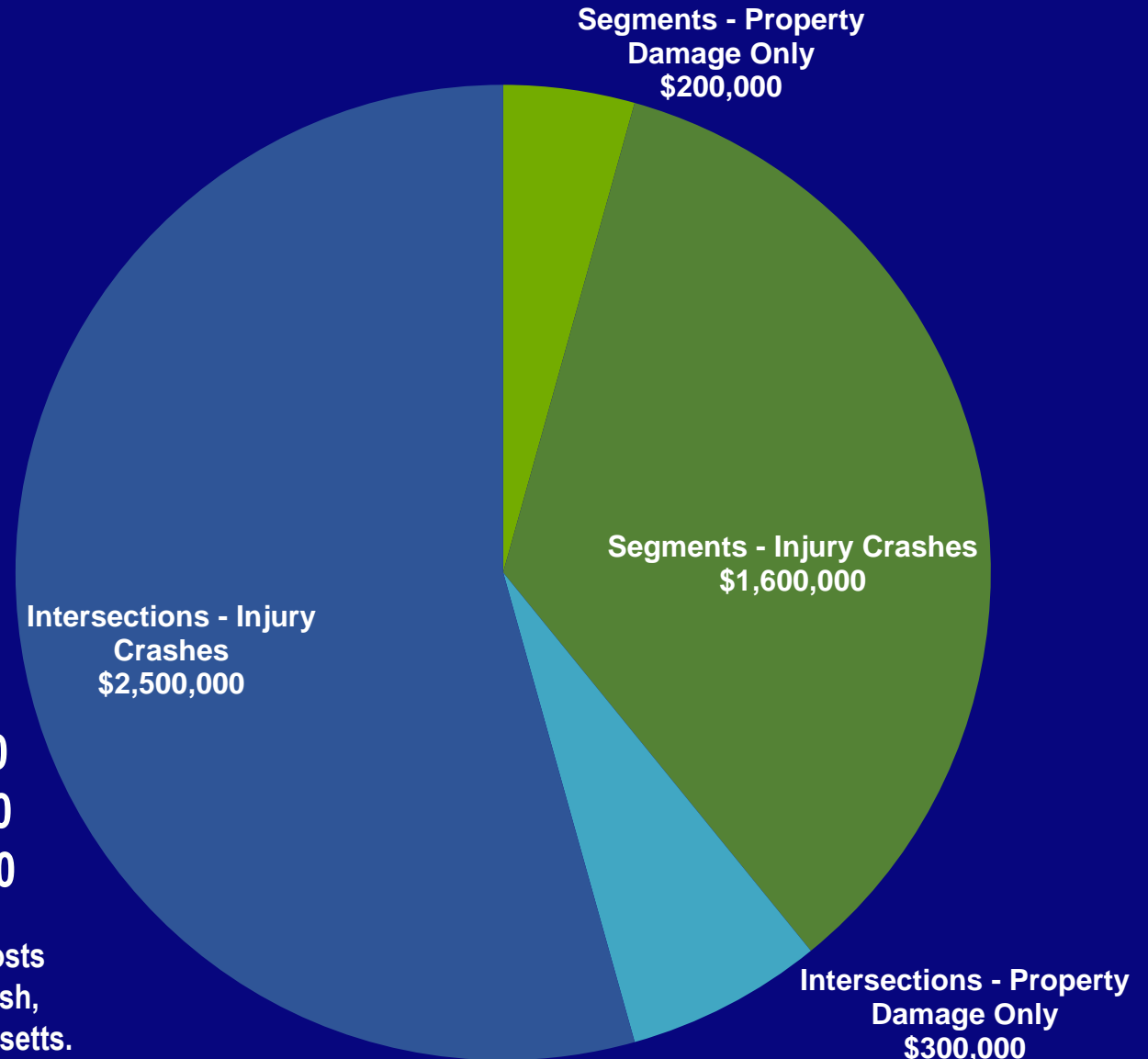
200

250

Number of Collisions

Figure E-14

Annual Comprehensive Cost Estimate: Existing Conditions



Annual Crash Cost:

Fatal and Injury = \$4,100,000

Property Damage Only = \$500,000

Total Cost = \$4,600,000

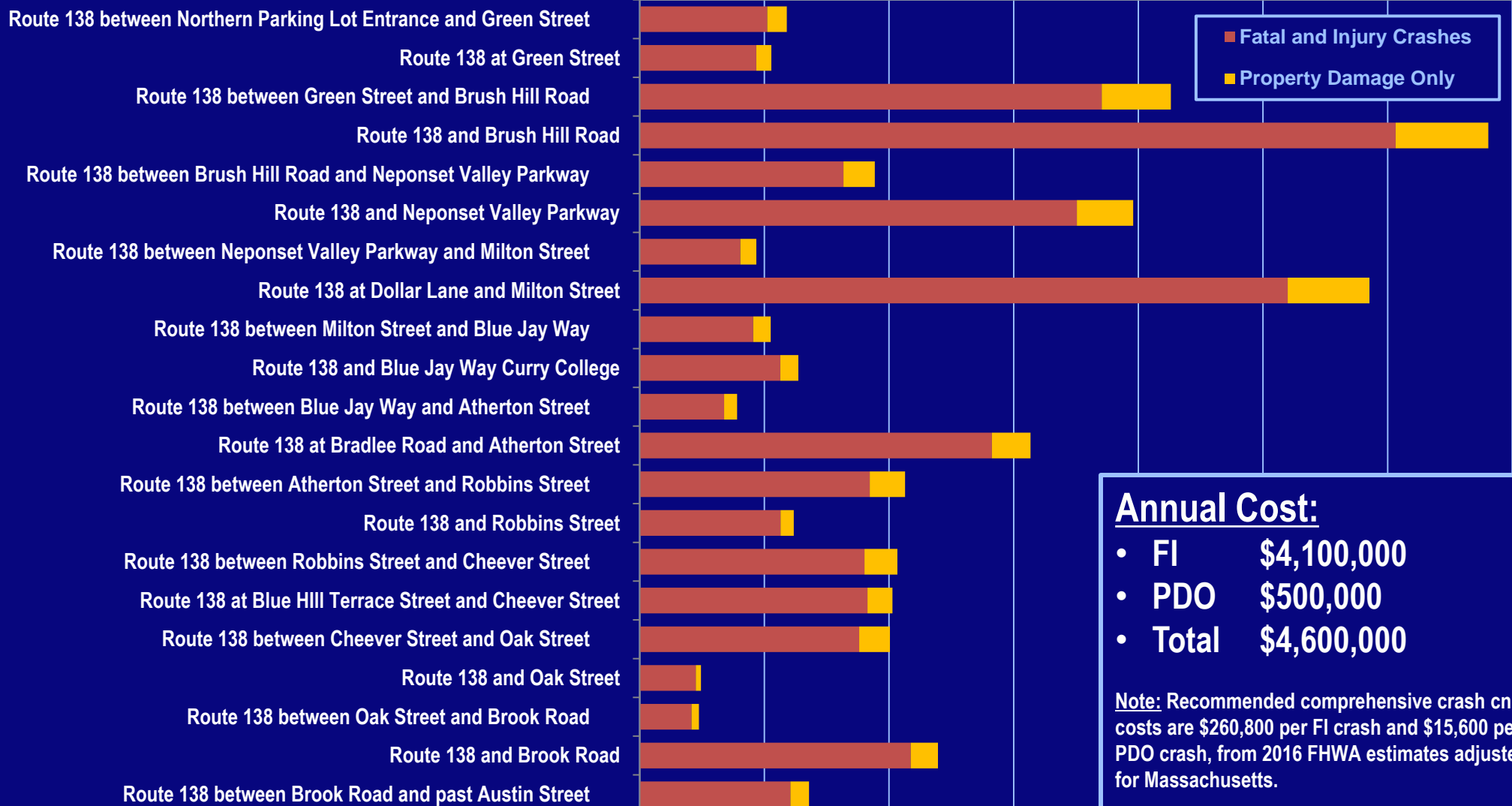
Note: Recommended comprehensive crash unit costs are \$260,800 per FI crash and \$15,600 per PDO crash, from 2016 FHWA estimates adjusted for Massachusetts.

Figure E-15

Annual Comprehensive Cost Estimate By Facility

Annual Cost

\$0 \$100,000 \$200,000 \$300,000 \$400,000 \$500,000 \$600,000 \$700,000



Annual Cost:

- FI \$4,100,000
- PDO \$500,000
- Total \$4,600,000

Note: Recommended comprehensive crash unit costs are \$260,800 per FI crash and \$15,600 per PDO crash, from 2016 FHWA estimates adjusted for Massachusetts.

Table E-1
Summary of Expected Crashes Analysis for Existing Conditions
Route 138 in Milton

Site ID	Location	Analysis Type	Total observed crashes	Average observed crashes	Average predicted crashes	Total expected crashes	Average expected crashes	Potential for Safety Improvement (PSI)	High-Risk Site	Observed crashes > Expected Crashes	FI Crash Rate	PDO Crash Rate	FI Cost	PDO Cost	Total Cost
S1	Route 138 between Northern Parking Lot Entrance and Green Street	Segment	7	1.4	1.72	7.0	1.40	-0.32	-	N	0.39	1.01	\$102,289	\$15,768	\$118,100
11	Route 138 at Green Street	Intersection	3	0.6	2.39	5.7	1.13	-1.26	N	N	0.36	0.77	\$93,589	\$12,035	\$105,600
S2	Route 138 between Green Street and Brush Hill Road	Segment	27	5.4	3.03	24.9	4.97	1.94	-	Y	1.42	3.55	\$370,652	\$55,392	\$426,000
14	Route 138 and Brush Hill Road	Intersection	32	6.4	7.57	35.4	7.09	-0.48	N	N	2.33	4.76	\$606,398	\$74,291	\$680,700
S3	Route 138 between Brush Hill Road and Neponset Valley Parkway	Segment	10	2.0	3.00	11.2	2.24	-0.76	-	N	0.63	1.61	\$163,497	\$25,086	\$188,600
16	Route 138 and Neponset Valley Parkway	Intersection	21	4.2	3.04	21.2	4.24	1.19	Y	N	1.34	2.89	\$350,710	\$45,098	\$395,800
S4	Route 138 between Neponset Valley Parkway and Milton Street	Segment	6	1.2	0.80	5.7	1.13	0.33	-	Y	0.31	0.82	\$80,765	\$12,828	\$93,600
17	Route 138 at Dollar Lane and Milton Street	Intersection	33	6.6	4.46	31.0	6.19	1.74	Y	Y	1.99	4.20	\$519,812	\$65,535	\$585,300
S5	Route 138 between Milton Street and Blue Jay Way	Segment	6	1.2	1.27	6.3	1.25	-0.02	-	N	0.35	0.90	\$91,065	\$14,068	\$105,100
18	Route 138 and Blue Jay Way Curry College	Intersection	9	1.8	1.00	6.8	1.36	0.36	Y	Y	0.43	0.93	\$112,798	\$14,505	\$127,300
S6	Route 138 between Blue Jay Way and Atherton Street	Segment	4	0.8	1.25	4.6	0.93	-0.32	-	N	0.26	0.67	\$67,756	\$10,408	\$78,200
19	Route 138 at Bradlee Road and Atherton Street	Intersection	17	3.4	2.50	15.4	3.07	0.58	Y	Y	1.08	1.99	\$282,477	\$31,025	\$313,500
S7	Route 138 between Atherton Street and Robbins Street	Segment	13	2.6	2.23	12.6	2.52	0.28	-	Y	0.71	1.81	\$184,596	\$28,255	\$212,900
20	Route 138 and Robbins Street	Intersection	5	1.0	1.02	5.6	1.11	0.09	Y	N	0.43	0.68	\$113,023	\$10,576	\$123,600
S8	Route 138 between Robbins Street and Cheever Street	Segment	13	2.6	2.14	11.9	2.38	0.25	-	Y	0.69	1.69	\$180,289	\$26,391	\$206,700
21	Route 138 at Blue Hill Terrace Street and Cheever Street	Intersection	10	2.0	1.79	9.9	1.99	0.20	Y	Y	0.70	1.29	\$182,736	\$20,070	\$202,800
S9	Route 138 between Cheever Street and Oak Street	Segment	16	3.2	0.98	11.3	2.25	1.27	-	Y	0.68	1.58	\$176,109	\$24,613	\$200,700
23	Route 138 and Oak Street	Intersection	2	0.4	0.41	2.2	0.44	0.04	Y	N	0.17	0.27	\$44,985	\$4,210	\$49,200
S10	Route 138 between Oak Street and Brook Road	Segment	3	0.6	0.46	2.7	0.54	0.08	-	Y	0.16	0.38	\$41,569	\$5,922	\$47,500
24	Route 138 and Brook Road	Intersection	12	2.4	1.67	11.2	2.23	0.56	Y	Y	0.83	1.40	\$217,390	\$21,852	\$239,200
S11	Route 138 between Brook Road and past Austin Street	Segment	13	2.6	0.55	7.1	1.42	0.87	-	Y	0.46	0.96	\$120,873	\$14,969	\$135,800
Total Entire Route 138 Corridor			262	52.4	43.28	249.5	49.89	15 of 21	8 of 10	12 of 21	15.7	34.2	\$4,103,377	\$532,896	\$4,636,200

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 138 at Green Street
Agency or Company	CTPS	Intersection Type	3ST
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	0	0	2.07	2.46	1.00
2014	1	1	2.05	2.43	1.00
2013	2	2	2.02	2.39	1.00
2012	0	0	1.98	2.35	1.00
2011	0	0	1.95	2.31	1.00

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
3.00	0.60	10.07	2.39	0.06	0.29	5.07	1.16	1.13	N	-1.26	N
							1.15				
							1.13				
							1.11				
							1.09				

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Green Street
Date Performed	05/01/18	Jurisdiction	MassDOT Highwat District 6
Input Data		Analysis Year	2015
		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	35,500
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	400
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.319	0.053	0.089	2.462

ADDITIONAL COMMENTS

(This area is intentionally left blank for additional comments.)

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-20.02	1.66	0.54	0.24	1.836	1.000	1.836	1.00	1.13	2.075
Fatal and Injury (FI)	--	--	--	--	0.510	--	0.510	1.00	1.13	0.576
Property Damage Only (PDO)	--	--	--	--	1.327	--	1.327	1.00	1.13	1.499

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.576	1.000	1.499	2.075
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.237	0.337	0.505	0.742
Head-on collision	0.014	0.008	0.011	0.016	0.024
Angle collision	0.562	0.323	0.579	0.868	1.191
Sideswipe	0.014	0.008	0.074	0.110	0.118
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.118	0.216	1.000	0.216	1.00	1.13	0.245
Fatal and Injury (FI)	--	--	--	0.258	0.056	--	0.056	1.00	1.13	0.063
Property Damage Only (PDO)	--	--	--	0.742	0.161	--	0.161	1.00	1.13	0.181

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(This area is intentionally left blank for Worksheet 2F content.)

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.063	1.000	0.181	0.245
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.008	0.008
Collision with animal	0.000	0.000	0.043	0.008	0.008
Collision with fixed object	0.625	0.039	0.870	0.158	0.197
Collision with other object	0.125	0.008	0.043	0.008	0.016
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.016	0.000	0.000	0.016

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	2.075	0.245	2.319	0.020	1.13	0.053
Fatal and injury (FI)	--	--	--	--	1.13	0.053

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.075	0.245	2.319	0.034	1.13	0.089
Fatal and injury (FI)	--	--	--	--	1.13	0.089

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.237		0.742
Head-on collisions (from Worksheet 2D)	0.008		0.024
Angle collisions (from Worksheet 2D)	0.323		1.191
Sideswipe (from Worksheet 2D)	0.008		0.118
Other multiple-vehicle collision (from Worksheet 2D)	0.000		0.000
Subtotal	0.576		2.075
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.008	0.008
Collision with animal (from Worksheet 2F)	0.000	0.008	0.008
Collision with fixed object (from Worksheet 2F)	0.039	0.158	0.197
Collision with other object (from Worksheet 2F)	0.008	0.008	0.016
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.016	0.000	0.016
Collision with pedestrian (from Worksheet 2G or 2I)	0.053	0.000	0.053
Collision with bicycle (from Worksheet 2J)	0.089	0.000	0.089
Subtotal	0.206	0.181	0.387
Total	0.782	1.680	2.462

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	2.462
Fatal and injury (FI)	0.782
Property damage only (PDO)	1.680

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Green Street
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2014
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	35,200
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	400
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.287	0.053	0.088	2.428

ADDITIONAL COMMENTS

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Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-20.02	1.66	0.54	0.24	1.810	1.000	1.810	1.00	1.13	2.046
Fatal and Injury (FI)	--	--	--	--	0.503	--	0.503	1.00	1.13	0.568
Property Damage Only (PDO)	--	--	--	--	1.308	--	1.308	1.00	1.13	1.478

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.568	1.000	1.478	2.046
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.233	0.337	0.498	0.731
Head-on collision	0.014	0.008	0.011	0.016	0.023
Angle collision	0.562	0.319	0.579	0.856	1.175
Sideswipe	0.014	0.008	0.074	0.109	0.117
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.118	0.213	1.000	0.213	1.00	1.13	0.241
Fatal and Injury (FI)	--	--	--	0.258	0.055	--	0.055	1.00	1.13	0.062
Property Damage Only (PDO)	--	--	--	0.742	0.158	--	0.158	1.00	1.13	0.179

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

--

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.062	1.000	0.179	0.241
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.008	0.008
Collision with animal	0.000	0.000	0.043	0.008	0.008
Collision with fixed object	0.625	0.039	0.870	0.156	0.194
Collision with other object	0.125	0.008	0.043	0.008	0.016
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.016	0.000	0.000	0.016

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	2.046	0.241	2.287	0.020	1.13	0.053
Fatal and injury (FI)	--	--	--	--	1.13	0.053

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.046	0.241	2.287	0.034	1.13	0.088
Fatal and injury (FI)	--	--	--	--	1.13	0.088

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.233	0.498	0.731
Head-on collisions (from Worksheet 2D)	0.008	0.016	0.023
Angle collisions (from Worksheet 2D)	0.319	0.856	1.175
Sideswipe (from Worksheet 2D)	0.008	0.109	0.117
Other multiple-vehicle collision (from Worksheet 2D)	0.000	0.000	0.000
Subtotal	0.568	1.478	2.046
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.008	0.008
Collision with animal (from Worksheet 2F)	0.000	0.008	0.008
Collision with fixed object (from Worksheet 2F)	0.039	0.156	0.194
Collision with other object (from Worksheet 2F)	0.008	0.008	0.016
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.016	0.000	0.016
Collision with pedestrian (from Worksheet 2G or 2I)	0.053	0.000	0.053
Collision with bicycle (from Worksheet 2J)	0.088	0.000	0.088
Subtotal	0.203	0.179	0.382
Total	0.771	1.657	2.428

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	2.428
Fatal and injury (FI)	0.771
Property damage only (PDO)	1.657

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Green Street
Date Performed	05/01/18	Jurisdiction	MassDOT Highwat District 6
		Analysis Year	2013
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	34,900
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	400
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.255	0.052	0.087	2.393

ADDITIONAL COMMENTS

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Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-20.02	1.66	0.54	0.24	1.785	1.000	1.785	1.00	1.13	2.017
Fatal and Injury (FI)	--	--	--	--	0.495	--	0.495	1.00	1.13	0.560
Property Damage Only (PDO)	--	--	--	--	1.290	--	1.290	1.00	1.13	1.457

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.560	1.000	1.457	2.017
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.230	0.337	0.491	0.721
Head-on collision	0.014	0.008	0.011	0.015	0.023
Angle collision	0.562	0.314	0.579	0.844	1.158
Sideswipe	0.014	0.008	0.074	0.107	0.115
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.118	0.210	1.000	0.210	1.00	1.13	0.238
Fatal and Injury (FI)	--	--	--	0.258	0.054	--	0.054	1.00	1.13	0.061
Property Damage Only (PDO)	--	--	--	0.742	0.156	--	0.156	1.00	1.13	0.176

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

--

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.061	1.000	0.176	0.238
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.008	0.008
Collision with animal	0.000	0.000	0.043	0.008	0.008
Collision with fixed object	0.625	0.038	0.870	0.153	0.192
Collision with other object	0.125	0.008	0.043	0.008	0.015
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.015	0.000	0.000	0.015

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	2.017	0.238	2.255	0.020	1.13	0.052
Fatal and injury (FI)	--	--	--	--	1.13	0.052

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.017	0.238	2.255	0.034	1.13	0.087
Fatal and injury (FI)	--	--	--	--	1.13	0.087

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.230	0.491	0.721
Head-on collisions (from Worksheet 2D)	0.008	0.015	0.023
Angle collisions (from Worksheet 2D)	0.314	0.844	1.158
Sideswipe (from Worksheet 2D)	0.008	0.107	0.115
Other multiple-vehicle collision (from Worksheet 2D)	0.000	0.000	0.000
Subtotal	0.560	1.457	2.017
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.008	0.008
Collision with animal (from Worksheet 2F)	0.000	0.008	0.008
Collision with fixed object (from Worksheet 2F)	0.038	0.153	0.192
Collision with other object (from Worksheet 2F)	0.008	0.008	0.015
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.015	0.000	0.015
Collision with pedestrian (from Worksheet 2G or 2I)	0.052	0.000	0.052
Collision with bicycle (from Worksheet 2J)	0.087	0.000	0.087
Subtotal	0.200	0.176	0.376
Total	0.760	1.634	2.393

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	2.393
Fatal and injury (FI)	0.760
Property damage only (PDO)	1.634

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Green Street
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2012
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	34,550
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	400
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.217	0.051	0.085	2.354

ADDITIONAL COMMENTS

--

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-20.02	1.66	0.54	0.24	1.755	1.000	1.755	1.00	1.13	1.984
Fatal and Injury (FI)	--	--	--	--	0.487	--	0.487	1.00	1.13	0.551
Property Damage Only (PDO)	--	--	--	--	1.268	--	1.268	1.00	1.13	1.433

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.551	1.000	1.433	1.984
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.226	0.337	0.483	0.709
Head-on collision	0.014	0.008	0.011	0.015	0.023
Angle collision	0.562	0.309	0.579	0.830	1.139
Sideswipe	0.014	0.008	0.074	0.106	0.113
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.118	0.207	1.000	0.207	1.00	1.13	0.234
Fatal and Injury (FI)	--	--	--	0.258	0.053	--	0.053	1.00	1.13	0.060
Property Damage Only (PDO)	--	--	--	0.742	0.154	--	0.154	1.00	1.13	0.173

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

--

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
Total	1.000	0.060	1.000	0.173	0.234
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.008	0.008
Collision with animal	0.000	0.000	0.043	0.008	0.008
Collision with fixed object	0.625	0.038	0.870	0.151	0.189
Collision with other object	0.125	0.008	0.043	0.008	0.015
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.015	0.000	0.000	0.015

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	1.984	0.234	2.217	0.020	1.13	0.051
Fatal and injury (FI)	--	--	--	--	1.13	0.051

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.984	0.234	2.217	0.034	1.13	0.085
Fatal and injury (FI)	--	--	--	--	1.13	0.085

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.226	0.483	0.709
Head-on collisions (from Worksheet 2D)	0.008	0.015	0.023
Angle collisions (from Worksheet 2D)	0.309	0.830	1.139
Sideswipe (from Worksheet 2D)	0.008	0.106	0.113
Other multiple-vehicle collision (from Worksheet 2D)	0.000	0.000	0.000
Subtotal	0.551	1.433	1.984
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.008	0.008
Collision with animal (from Worksheet 2F)	0.000	0.008	0.008
Collision with fixed object (from Worksheet 2F)	0.038	0.151	0.189
Collision with other object (from Worksheet 2F)	0.008	0.008	0.015
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.015	0.000	0.015
Collision with pedestrian (from Worksheet 2G or 2I)	0.051	0.000	0.051
Collision with bicycle (from Worksheet 2J)	0.085	0.000	0.085
Subtotal	0.197	0.173	0.370
Total	0.747	1.606	2.354

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	2.354
Fatal and injury (FI)	0.747
Property damage only (PDO)	1.606

Legend		
Required Manual Input	Select from Drop-Down List	Optional Input

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Green Street
Date Performed	05/01/18	Jurisdiction	MassDOT Highwat District 6
		Analysis Year	2011
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	34,200
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	400
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:			
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.180	0.050	0.084	2.314

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections											
(1) Crash Severity Level	(2) SPF Coefficients			(3) Overdispersion Parameter, k	(4) Initial N _{bimv}	(5) Proportion of Total Crashes	(6) Adjusted N _{bimv}	(7) Combined CMFs	(8) Calibration Factor, C _i	(9) Adjusted N _{bimv}	
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B	(6)*(7)*(8)
	a	b	c								
Total	-20.02	1.66	0.54	0.24	1.726	1.000	1.726	1.00	1.13	1.950	
Fatal and Injury (FI)	--	--	--	--	0.479	--	0.479	1.00	1.13	0.541	
Property Damage Only (PDO)	--	--	--	--	1.247	--	1.247	1.00	1.13	1.409	

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1) Collision Type	(2) Proportion of Collision Type _(FI)	(3) Adjusted N _{bimv (FI)} (crashes/year)	(4) Proportion of Collision Type _(PDO)	(5) Adjusted N _{bimv (PDO)} (crashes/year)	(6) Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{N_{bimv}} from Worksheet 2C
Total	1.000	0.541	1.000	1.409	1.950
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.222	0.337	0.475	0.697
Head-on collision	0.014	0.007	0.011	0.015	0.022
Angle collision	0.562	0.304	0.579	0.816	1.120
Sideswipe	0.014	0.007	0.074	0.104	0.111
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections											
(1) Crash Severity Level	(2) SPF Coefficients			(3) Historical Data	(4) Initial N _{bisv}	(5) Proportion of Total Crashes	(6) Adjusted N _{bimv}	(7) Combined CMFs	(8) Calibration Factor, C _i	(9) Predicted N _{bisv}	
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B	(6)*(7)*(8)
	a	b	c								
Total	--	--	--	0.118	0.203	1.000	0.203	1.00	1.13	0.230	
Fatal and Injury (FI)	--	--	--	0.258	0.052	--	0.052	1.00	1.13	0.059	
Property Damage Only (PDO)	--	--	--	0.742	0.151	--	0.151	1.00	1.13	0.171	

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.059	1.000	0.171	0.230
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.007	0.007
Collision with animal	0.000	0.000	0.043	0.007	0.007
Collision with fixed object	0.625	0.037	0.870	0.148	0.185
Collision with other object	0.125	0.007	0.043	0.007	0.015
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.015	0.000	0.000	0.015

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	1.950	0.230	2.180	0.020	1.13	0.050
Fatal and injury (FI)	--	--	--	--	1.13	0.050

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.950	0.230	2.180	0.034	1.13	0.084
Fatal and injury (FI)	--	--	--	--	1.13	0.084

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
Total			
(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J			
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.222	0.475	0.697
Head-on collisions (from Worksheet 2D)	0.007	0.015	0.022
Angle collisions (from Worksheet 2D)	0.304	0.816	1.120
Sideswipe (from Worksheet 2D)	0.007	0.104	0.111
Other multiple-vehicle collision (from Worksheet 2D)	0.000	0.000	0.000
Subtotal	0.541	1.409	1.950
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.007	0.007
Collision with animal (from Worksheet 2F)	0.000	0.007	0.007
Collision with fixed object (from Worksheet 2F)	0.037	0.148	0.185
Collision with other object (from Worksheet 2F)	0.007	0.007	0.015
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.015	0.000	0.015
Collision with pedestrian (from Worksheet 2G or 2I)	0.050	0.000	0.050
Collision with bicycle (from Worksheet 2J)	0.084	0.000	0.084
Subtotal	0.193	0.171	0.364
Total	0.735	1.580	2.314

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	2.314
Fatal and injury (FI)	0.735
Property damage only (PDO)	1.580

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 138 and Brush Hill Road
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	9	9	6.86	7.78	1.35
2014	7	8	6.78	7.69	1.35
2013	7	7	6.67	7.57	1.35
2012	4	4	6.58	7.46	1.35
2011	4	4	6.49	7.36	1.35

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
31.00	6.40	33.38	7.57	0.17	0.24	31.57	7.28	7.09	N	-0.48	N
							7.20				
							7.08				
							6.98				
							6.89				

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brush Hill Road
Date Performed	5/1/2018	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2015
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67,700 (veh/day)	--	24,600
AADT _{minor} (veh/day)	AADT _{MAX} = 33,400 (veh/day)	--	6,050
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.00
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	1
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
0.900	1.000	1.000	1.000	1.000	1.000	1.350	1.000	7.198	0.278	0.305	7.781

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.90	1.00	1.00	1.00	1.00	1.00	0.90

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-11.79	0.92	0.52	0.10	7.62	1.00	7.62	0.90	1.00	6.86
Fatal and Injury (FI)	--	--	--	--	2.12	--	2.12	0.90	1.00	1.91
Property Damage Only (PDO)	--	--	--	--	5.50	--	5.50	0.90	1.00	4.95

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.00	1.91	1.00	4.95	6.86
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.45	0.86	0.42	2.09	2.95
Head-on collision	0.04	0.07	0.04	0.19	0.26
Angle collision	0.49	0.94	0.43	2.11	3.05
Sideswipe	0.02	0.04	0.11	0.56	0.60
Other multiple-vehicle collision	0.00	0.00	0.00	0.01	0.01

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.05	0.37	1.00	0.37	0.90	1.00	0.34
Fatal and Injury (FI)	--	--	--	0.18	0.07	--	0.07	0.90	1.00	0.06
Property Damage Only (PDO)	--	--	--	0.82	0.31	--	0.31	0.90	1.00	0.27

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.06	1.00	0.27	0.34
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.01	0.01
Collision with animal	0.00	0.00	0.03	0.01	0.01
Collision with fixed object	0.63	0.04	0.86	0.24	0.27
Collision with other object	0.00	0.00	0.06	0.02	0.02
Other single-vehicle collision	0.13	0.01	0.03	0.01	0.02
Single-vehicle noncollision	0.25	0.02	0.00	0.00	0.02

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.35	1.00	1.35

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	6.86	0.34	7.20	0.03	0.21	1.00	0.28
Fatal and injury (FI)	--	--	--	--	--	1.00	0.28

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	6.86	0.34	7.20	0.04	1.00	0.31
Fatal and injury (FI)	--	--	--	--	1.00	0.31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F (6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.86	2.09	2.95
Head-on collisions (from Worksheet 2D)	0.07	0.19	0.26
Angle collisions (from Worksheet 2D)	0.94	2.11	3.05
Sideswipe (from Worksheet 2D)	0.04	0.56	0.60
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.01	0.01
Subtotal	1.91	4.95	6.86
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.01	0.01
Collision with animal (from Worksheet 2F)	0.00	0.01	0.01
Collision with fixed object (from Worksheet 2F)	0.04	0.24	0.27
Collision with other object (from Worksheet 2F)	0.00	0.02	0.02
Other single-vehicle collision (from Worksheet 2F)	0.01	0.01	0.02
Single-vehicle noncollision (from Worksheet 2F)	0.02	0.00	0.02
Collision with pedestrian (from Worksheet 2G or 2I)	0.28	0.00	0.28
Collision with bicycle (from Worksheet 2J)	0.31	0.00	0.31
Subtotal	0.64	0.27	0.92
Total	2.55	5.23	7.78

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	7.78
Fatal and injury (FI)	2.55
Property damage only (PDO)	5.23

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brush Hill Road
Date Performed	5/1/2018	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2014
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67,700 (veh/day)	--	24,400
AADT _{minor} (veh/day)	AADT _{MAX} = 33,400 (veh/day)	--	6,000
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.00
Data for signalized intersections only:			
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	1
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
0.900	1.000	1.000	1.000	1.000	1.000	1.350	1.000	7.113	0.275	0.302	7.690

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.90	1.00	1.00	1.00	1.00	1.00	0.90

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	7.53	1.00	7.53	0.90	1.00	6.78
Fatal and Injury (FI)	--	--	--	--	2.10	--	2.10	0.90	1.00	1.89
Property Damage Only (PDO)	--	--	--	--	5.44	--	5.44	0.90	1.00	4.90

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.00	1.89	1.00	4.90	6.78
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.45	0.85	0.42	2.07	2.92
Head-on collision	0.04	0.07	0.04	0.19	0.26
Angle collision	0.49	0.93	0.43	2.08	3.01
Sideswipe	0.02	0.04	0.11	0.55	0.59
Other multiple-vehicle collision	0.00	0.00	0.00	0.01	0.01

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.37	1.00	0.37	0.90	1.00	0.33
Fatal and Injury (FI)	--	--	--	0.18	0.07	--	0.07	0.90	1.00	0.06
Property Damage Only (PDO)	--	--	--	0.82	0.30	--	0.30	0.90	1.00	0.27

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.06	1.00	0.27	0.33
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.01	0.01
Collision with animal	0.00	0.00	0.03	0.01	0.01
Collision with fixed object	0.63	0.04	0.86	0.23	0.27
Collision with other object	0.00	0.00	0.06	0.02	0.02
Other single-vehicle collision	0.13	0.01	0.03	0.01	0.02
Single-vehicle noncollision	0.25	0.02	0.00	0.00	0.02

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.35	1.00	1.35

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	6.78	0.33	7.11	0.03	0.20	1.00	0.27
Fatal and injury (FI)	--	--	--	--	--	1.00	0.27

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	6.78	0.33	7.11	0.04	1.00	0.30
Fatal and injury (FI)	--	--	--	--	1.00	0.30

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F (6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.85		2.92
Head-on collisions (from Worksheet 2D)	0.07		0.26
Angle collisions (from Worksheet 2D)	0.93		3.01
Sideswipe (from Worksheet 2D)	0.04		0.59
Other multiple-vehicle collision (from Worksheet 2D)	0.00		0.01
Subtotal	1.89		6.78
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00		0.01
Collision with animal (from Worksheet 2F)	0.00		0.01
Collision with fixed object (from Worksheet 2F)	0.04		0.27
Collision with other object (from Worksheet 2F)	0.00		0.02
Other single-vehicle collision (from Worksheet 2F)	0.01		0.02
Single-vehicle noncollision (from Worksheet 2F)	0.02		0.02
Collision with pedestrian (from Worksheet 2G or 2I)	0.27		0.27
Collision with bicycle (from Worksheet 2J)	0.30		0.30
Subtotal	0.64		0.91
Total	2.52		7.69

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	7.69
Fatal and injury (FI)	2.52
Property damage only (PDO)	5.17

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brush Hill Road
Date Performed	5/1/2018	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2013
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67,700 (veh/day)	--	24,200
AADT _{minor} (veh/day)	AADT _{MAX} = 33,400 (veh/day)	--	5,900
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.00
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	1
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
0.900	1.000	1.000	1.000	1.000	1.000	1.350	1.000	6.998	0.271	0.297	7.566

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.90	1.00	1.00	1.00	1.00	1.00	0.90

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-11.79	0.92	0.52	0.10	7.41	1.00	7.41	0.90	1.00	6.67
Fatal and Injury (FI)	--	--	--	--	2.06	--	2.06	0.90	1.00	1.86
Property Damage Only (PDO)	--	--	--	--	5.35	--	5.35	0.90	1.00	4.82

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.00	1.86	1.00	4.82	6.67
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.45	0.84	0.42	2.03	2.87
Head-on collision	0.04	0.07	0.04	0.19	0.25
Angle collision	0.49	0.91	0.43	2.05	2.96
Sideswipe	0.02	0.04	0.11	0.54	0.58
Other multiple-vehicle collision	0.00	0.00	0.00	0.01	0.01

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.05	0.36	1.00	0.36	0.90	1.00	0.33
Fatal and Injury (FI)	--	--	--	0.18	0.07	--	0.07	0.90	1.00	0.06
Property Damage Only (PDO)	--	--	--	0.82	0.30	--	0.30	0.90	1.00	0.27

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.06	1.00	0.27	0.33
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.01	0.01
Collision with animal	0.00	0.00	0.03	0.01	0.01
Collision with fixed object	0.63	0.04	0.86	0.23	0.27
Collision with other object	0.00	0.00	0.06	0.01	0.01
Other single-vehicle collision	0.13	0.01	0.03	0.01	0.01
Single-vehicle noncollision	0.25	0.01	0.00	0.00	0.01

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.35	1.00	1.35

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	6.67	0.33	7.00	0.03	0.20	1.00	0.27
Fatal and injury (FI)	--	--	--	--	--	1.00	0.27

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	6.67	0.33	7.00	0.04	1.00	0.30
Fatal and injury (FI)	--	--	--	--	1.00	0.30

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F
(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J			
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.84		2.03
Head-on collisions (from Worksheet 2D)	0.07		0.19
Angle collisions (from Worksheet 2D)	0.91		2.05
Sideswipe (from Worksheet 2D)	0.04		0.54
Other multiple-vehicle collision (from Worksheet 2D)	0.00		0.01
Subtotal	1.86		4.82
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00		0.01
Collision with animal (from Worksheet 2F)	0.00		0.01
Collision with fixed object (from Worksheet 2F)	0.04		0.23
Collision with other object (from Worksheet 2F)	0.00		0.01
Other single-vehicle collision (from Worksheet 2F)	0.01		0.01
Single-vehicle noncollision (from Worksheet 2F)	0.01		0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.27		0.00
Collision with bicycle (from Worksheet 2J)	0.30		0.00
Subtotal	0.63		0.27
Total	2.48		5.08

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	7.57
Fatal and injury (FI)	2.48
Property damage only (PDO)	5.08

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brush Hill Road
Date Performed	5/1/2018	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2012
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67,700 (veh/day)	--	23,950
AADT _{minor} (veh/day)	AADT _{MAX} = 33,400 (veh/day)	--	5,850
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.00
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	1
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
0.900	1.000	1.000	1.000	1.000	1.000	1.350	1.000	6.901	0.267	0.293	7.461

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.90	1.00	1.00	1.00	1.00	1.00	0.90

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	7.31	1.00	7.31	0.90	1.00	6.58
Fatal and Injury (FI)	--	--	--	--	2.03	--	2.03	0.90	1.00	1.83
Property Damage Only (PDO)	--	--	--	--	5.28	--	5.28	0.90	1.00	4.75

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	1.83	1.00	4.75	6.58
Rear-end collision	0.45	0.83	0.42	2.01	2.83
Head-on collision	0.04	0.07	0.04	0.18	0.25
Angle collision	0.49	0.90	0.43	2.02	2.92
Sideswipe	0.02	0.04	0.11	0.53	0.57
Other multiple-vehicle collision	0.00	0.00	0.00	0.01	0.01

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.36	1.00	0.36	0.90	1.00	0.32
Fatal and Injury (FI)	--	--	--	0.18	0.07	--	0.07	0.90	1.00	0.06
Property Damage Only (PDO)	--	--	--	0.82	0.29	--	0.29	0.90	1.00	0.26

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.06	1.00	0.26	0.32
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.01	0.01
Collision with animal	0.00	0.00	0.03	0.01	0.01
Collision with fixed object	0.63	0.04	0.86	0.23	0.26
Collision with other object	0.00	0.00	0.06	0.01	0.01
Other single-vehicle collision	0.13	0.01	0.03	0.01	0.01
Single-vehicle noncollision	0.25	0.01	0.00	0.00	0.01

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.35	1.00	1.35

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	6.58	0.32	6.90	0.03	0.20	1.00	0.27
Fatal and injury (FI)	--	--	--	--	--	1.00	0.27

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	6.58	0.32	6.90	0.04	1.00	0.29
Fatal and injury (FI)	--	--	--	--	1.00	0.29

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.83	2.01	2.83
Head-on collisions (from Worksheet 2D)	0.07	0.18	0.25
Angle collisions (from Worksheet 2D)	0.90	2.02	2.92
Sideswipe (from Worksheet 2D)	0.04	0.53	0.57
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.01	0.01
Subtotal	1.83	4.75	6.58
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.01	0.01
Collision with animal (from Worksheet 2F)	0.00	0.01	0.01
Collision with fixed object (from Worksheet 2F)	0.04	0.23	0.26
Collision with other object (from Worksheet 2F)	0.00	0.01	0.01
Other single-vehicle collision (from Worksheet 2F)	0.01	0.01	0.01
Single-vehicle noncollision (from Worksheet 2F)	0.01	0.00	0.01
Collision with pedestrian (from Worksheet 2G or 2I)	0.27	0.00	0.27
Collision with bicycle (from Worksheet 2J)	0.29	0.00	0.29
Subtotal	0.62	0.26	0.88
Total	2.45	5.01	7.46

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	7.46
Fatal and injury (FI)	2.45
Property damage only (PDO)	5.01

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brush Hill Road
Date Performed	5/1/2018	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2011
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67,700 (veh/day)	--	23,700
AADT _{minor} (veh/day)	AADT _{MAX} = 33,400 (veh/day)	--	5,800
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.00
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	1
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
0.900	1.000	1.000	1.000	1.000	1.000	1.350	1.000	6.804	0.263	0.289	7.356

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.90	1.00	1.00	1.00	1.00	1.00	0.90

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-11.79	0.92	0.52	0.10	7.21	1.00	7.21	0.90	1.00	6.49
Fatal and Injury (FI)	--	--	--	--	2.00	--	2.00	0.90	1.00	1.80
Property Damage Only (PDO)	--	--	--	--	5.20	--	5.20	0.90	1.00	4.68

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	1.80	1.00	4.68	6.49
Rear-end collision	0.45	0.82	0.42	1.98	2.79
Head-on collision	0.04	0.06	0.04	0.18	0.25
Angle collision	0.49	0.89	0.43	1.99	2.88
Sideswipe	0.02	0.04	0.11	0.53	0.56
Other multiple-vehicle collision	0.00	0.00	0.00	0.01	0.01

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.05	0.35	1.00	0.35	0.90	1.00	0.32
Fatal and Injury (FI)	--	--	--	0.18	0.06	--	0.06	0.90	1.00	0.06
Property Damage Only (PDO)	--	--	--	0.82	0.29	--	0.29	0.90	1.00	0.26

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.06	1.00	0.26	0.32
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.01	0.01
Collision with animal	0.00	0.00	0.03	0.01	0.01
Collision with fixed object	0.63	0.04	0.86	0.22	0.26
Collision with other object	0.00	0.00	0.06	0.01	0.01
Other single-vehicle collision	0.13	0.01	0.03	0.01	0.01
Single-vehicle noncollision	0.25	0.01	0.00	0.00	0.01

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.35	1.00	1.35

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	6.49	0.32	6.80	0.03	0.19	1.00	0.26
Fatal and injury (FI)	--	--	--	--	--	1.00	0.26

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	6.49	0.32	6.80	0.04	1.00	0.29
Fatal and injury (FI)	--	--	--	--	1.00	0.29

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.82	1.98	2.79
Head-on collisions (from Worksheet 2D)	0.06	0.18	0.25
Angle collisions (from Worksheet 2D)	0.89	1.99	2.88
Sideswipe (from Worksheet 2D)	0.04	0.53	0.56
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.01	0.01
Subtotal	1.80	4.68	6.49
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.01	0.01
Collision with animal (from Worksheet 2F)	0.00	0.01	0.01
Collision with fixed object (from Worksheet 2F)	0.04	0.22	0.26
Collision with other object (from Worksheet 2F)	0.00	0.01	0.01
Other single-vehicle collision (from Worksheet 2F)	0.01	0.01	0.01
Single-vehicle noncollision (from Worksheet 2F)	0.01	0.00	0.01
Collision with pedestrian (from Worksheet 2G or 2I)	0.26	0.00	0.26
Collision with bicycle (from Worksheet 2J)	0.29	0.00	0.29
Subtotal	0.61	0.26	0.87
Total	2.41	4.94	7.36

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	7.36
Fatal and injury (FI)	2.41
Property damage only (PDO)	4.94

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 138 and Neponset Valley Parkway
Agency or Company	CTPS	Intersection Type	3ST
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	5	5	2.68	3.17	1.00
2014	5	5	2.60	3.09	1.00
2013	2	2	2.56	3.04	1.00
2012	2	2	2.52	2.99	1.00
2011	7	7	2.47	2.93	1.00

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
21.00	4.20	12.83	3.04	0.09	0.25	19.00	4.42	4.24	Y	1.19	N
							4.29				
							4.23				
							4.16				
							4.08				

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Neponset Valley Parkway
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2015
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	15,000
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	9,050
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.991	0.069	0.115	3.175

ADDITIONAL COMMENTS

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Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-20.02	1.66	0.54	0.24	2.368	1.000	2.368	1.00	1.13	2.675
Fatal and Injury (FI)	--	--	--	--	0.657	--	0.657	1.00	1.13	0.743
Property Damage Only (PDO)	--	--	--	--	1.711	--	1.711	1.00	1.13	1.933

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.743	1.000	1.933	2.675
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.305	0.337	0.651	0.956
Head-on collision	0.014	0.010	0.011	0.020	0.031
Angle collision	0.562	0.417	0.579	1.119	1.536
Sideswipe	0.014	0.010	0.074	0.142	0.153
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.118	0.279	1.000	0.279	1.00	1.13	0.315
Fatal and Injury (FI)	--	--	--	0.258	0.072	--	0.072	1.00	1.13	0.081
Property Damage Only (PDO)	--	--	--	0.742	0.207	--	0.207	1.00	1.13	0.234

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

--

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.081	1.000	0.234	0.315
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.010	0.010
Collision with animal	0.000	0.000	0.043	0.010	0.010
Collision with fixed object	0.625	0.051	0.870	0.203	0.254
Collision with other object	0.125	0.010	0.043	0.010	0.020
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.020	0.000	0.000	0.020

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	2.675	0.315	2.991	0.020	1.13	0.069
Fatal and injury (FI)	--	--	--	--	1.13	0.069

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.675	0.315	2.991	0.034	1.13	0.115
Fatal and injury (FI)	--	--	--	--	1.13	0.115

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.305		0.956
Head-on collisions (from Worksheet 2D)	0.010		0.031
Angle collisions (from Worksheet 2D)	0.417		1.536
Sideswipe (from Worksheet 2D)	0.010		0.153
Other multiple-vehicle collision (from Worksheet 2D)	0.000		0.000
Subtotal	0.743		2.675
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.010	0.010
Collision with animal (from Worksheet 2F)	0.000	0.010	0.010
Collision with fixed object (from Worksheet 2F)	0.051	0.203	0.254
Collision with other object (from Worksheet 2F)	0.010	0.010	0.020
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.020	0.000	0.020
Collision with pedestrian (from Worksheet 2G or 2I)	0.069	0.000	0.069
Collision with bicycle (from Worksheet 2J)	0.115	0.000	0.115
Subtotal	0.265	0.234	0.499
Total	1.008	2.167	3.175

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	3.175
Fatal and injury (FI)	1.008
Property damage only (PDO)	2.167

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Neponset Valley Parkway
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2014
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	14,800
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	8,950
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.907	0.067	0.112	3.086

ADDITIONAL COMMENTS

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Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-20.02	1.66	0.54	0.24	2.302	1.000	2.302	1.00	1.13	2.601
Fatal and Injury (FI)	--	--	--	--	0.639	--	0.639	1.00	1.13	0.722
Property Damage Only (PDO)	--	--	--	--	1.663	--	1.663	1.00	1.13	1.879

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.722	1.000	1.879	2.601
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.297	0.337	0.633	0.930
Head-on collision	0.014	0.010	0.011	0.020	0.030
Angle collision	0.562	0.405	0.579	1.088	1.493
Sideswipe	0.014	0.010	0.074	0.138	0.148
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.118	0.271	1.000	0.271	1.00	1.13	0.307
Fatal and Injury (FI)	--	--	--	0.258	0.070	--	0.070	1.00	1.13	0.079
Property Damage Only (PDO)	--	--	--	0.742	0.201	--	0.201	1.00	1.13	0.227

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

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(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.079	1.000	0.227	0.307
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.010	0.010
Collision with animal	0.000	0.000	0.043	0.010	0.010
Collision with fixed object	0.625	0.049	0.870	0.198	0.247
Collision with other object	0.125	0.010	0.043	0.010	0.020
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.020	0.000	0.000	0.020

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	2.601	0.307	2.907	0.020	1.13	0.067
Fatal and injury (FI)	--	--	--	--	1.13	0.067

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.601	0.307	2.907	0.034	1.13	0.112
Fatal and injury (FI)	--	--	--	--	1.13	0.112

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.297	0.633	0.930
Head-on collisions (from Worksheet 2D)	0.010	0.020	0.030
Angle collisions (from Worksheet 2D)	0.405	1.088	1.493
Sideswipe (from Worksheet 2D)	0.010	0.138	0.148
Other multiple-vehicle collision (from Worksheet 2D)	0.000	0.000	0.000
Subtotal	0.722	1.879	2.601
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.010	0.010
Collision with animal (from Worksheet 2F)	0.000	0.010	0.010
Collision with fixed object (from Worksheet 2F)	0.049	0.198	0.247
Collision with other object (from Worksheet 2F)	0.010	0.010	0.020
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.020	0.000	0.020
Collision with pedestrian (from Worksheet 2G or 2I)	0.067	0.000	0.067
Collision with bicycle (from Worksheet 2J)	0.112	0.000	0.112
Subtotal	0.258	0.227	0.485
Total	0.980	2.106	3.086

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	3.086
Fatal and injury (FI)	0.980
Property damage only (PDO)	2.106

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Neponset Valley Parkway
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2013
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	14,700
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	8,900
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.866	0.066	0.110	3.042

ADDITIONAL COMMENTS

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Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-20.02	1.66	0.54	0.24	2.269	1.000	2.269	1.00	1.13	2.564
Fatal and Injury (FI)	--	--	--	--	0.630	--	0.630	1.00	1.13	0.712
Property Damage Only (PDO)	--	--	--	--	1.639	--	1.639	1.00	1.13	1.852

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.712	1.000	1.852	2.564
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.292	0.337	0.624	0.916
Head-on collision	0.014	0.010	0.011	0.019	0.029
Angle collision	0.562	0.400	0.579	1.072	1.472
Sideswipe	0.014	0.010	0.074	0.136	0.146
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.118	0.267	1.000	0.267	1.00	1.13	0.302
Fatal and Injury (FI)	--	--	--	0.258	0.069	--	0.069	1.00	1.13	0.078
Property Damage Only (PDO)	--	--	--	0.742	0.198	--	0.198	1.00	1.13	0.224

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

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(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.078	1.000	0.224	0.302
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.010	0.010
Collision with animal	0.000	0.000	0.043	0.010	0.010
Collision with fixed object	0.625	0.049	0.870	0.195	0.244
Collision with other object	0.125	0.010	0.043	0.010	0.019
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.019	0.000	0.000	0.019

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	2.564	0.302	2.866	0.020	1.13	0.066
Fatal and injury (FI)	--	--	--	--	1.13	0.066

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.564	0.302	2.866	0.034	1.13	0.110
Fatal and injury (FI)	--	--	--	--	1.13	0.110

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.292	0.624	0.916
Head-on collisions (from Worksheet 2D)	0.010	0.019	0.029
Angle collisions (from Worksheet 2D)	0.400	1.072	1.472
Sideswipe (from Worksheet 2D)	0.010	0.136	0.146
Other multiple-vehicle collision (from Worksheet 2D)	0.000	0.000	0.000
Subtotal	0.712	1.852	2.564
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.010	0.010
Collision with animal (from Worksheet 2F)	0.000	0.010	0.010
Collision with fixed object (from Worksheet 2F)	0.049	0.195	0.244
Collision with other object (from Worksheet 2F)	0.010	0.010	0.019
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.019	0.000	0.019
Collision with pedestrian (from Worksheet 2G or 2I)	0.066	0.000	0.066
Collision with bicycle (from Worksheet 2J)	0.110	0.000	0.110
Subtotal	0.254	0.224	0.478
Total	0.966	2.077	3.042

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	3.042
Fatal and injury (FI)	0.966
Property damage only (PDO)	2.077

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Neponset Valley Parkway
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2012
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	14,600
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	8,800
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.817	0.065	0.108	2.990

ADDITIONAL COMMENTS

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Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-20.02	1.66	0.54	0.24	2.230	1.000	2.230	1.00	1.13	2.520
Fatal and Injury (FI)	--	--	--	--	0.619	--	0.619	1.00	1.13	0.699
Property Damage Only (PDO)	--	--	--	--	1.611	--	1.611	1.00	1.13	1.820

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.699	1.000	1.820	2.520
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.287	0.337	0.613	0.901
Head-on collision	0.014	0.010	0.011	0.019	0.029
Angle collision	0.562	0.393	0.579	1.054	1.447
Sideswipe	0.014	0.010	0.074	0.134	0.144
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.118	0.263	1.000	0.263	1.00	1.13	0.297
Fatal and Injury (FI)	--	--	--	0.258	0.068	--	0.068	1.00	1.13	0.077
Property Damage Only (PDO)	--	--	--	0.742	0.195	--	0.195	1.00	1.13	0.220

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

--

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.077	1.000	0.220	0.297
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.010	0.010
Collision with animal	0.000	0.000	0.043	0.010	0.010
Collision with fixed object	0.625	0.048	0.870	0.192	0.240
Collision with other object	0.125	0.010	0.043	0.010	0.019
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.019	0.000	0.000	0.019

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	2.520	0.297	2.817	0.020	1.13	0.065
Fatal and injury (FI)	--	--	--	--	1.13	0.065

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.520	0.297	2.817	0.034	1.13	0.108
Fatal and injury (FI)	--	--	--	--	1.13	0.108

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.287	0.613	0.901
Head-on collisions (from Worksheet 2D)	0.010	0.019	0.029
Angle collisions (from Worksheet 2D)	0.393	1.054	1.447
Sideswipe (from Worksheet 2D)	0.010	0.134	0.144
Other multiple-vehicle collision (from Worksheet 2D)	0.000	0.000	0.000
Subtotal	0.699	1.820	2.520
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.010	0.010
Collision with animal (from Worksheet 2F)	0.000	0.010	0.010
Collision with fixed object (from Worksheet 2F)	0.048	0.192	0.240
Collision with other object (from Worksheet 2F)	0.010	0.010	0.019
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.019	0.000	0.019
Collision with pedestrian (from Worksheet 2G or 2I)	0.065	0.000	0.065
Collision with bicycle (from Worksheet 2J)	0.108	0.000	0.108
Subtotal	0.250	0.220	0.470
Total	0.949	2.041	2.990

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	2.990
Fatal and injury (FI)	0.949
Property damage only (PDO)	2.041

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Neponset Valley Parkway
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2011
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	14,450
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	8,750
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	2.760	0.064	0.106	2.930

ADDITIONAL COMMENTS

(This area is intentionally left blank for additional comments.)

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-20.02	1.66	0.54	0.24	2.185	1.000	2.185	1.00	1.13	2.469
Fatal and Injury (FI)	--	--	--	--	0.607	--	0.607	1.00	1.13	0.685
Property Damage Only (PDO)	--	--	--	--	1.579	--	1.579	1.00	1.13	1.784

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.685	1.000	1.784	2.469
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.282	0.337	0.601	0.883
Head-on collision	0.014	0.009	0.011	0.019	0.028
Angle collision	0.562	0.385	0.579	1.033	1.418
Sideswipe	0.014	0.009	0.074	0.131	0.141
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.118	0.258	1.000	0.258	1.00	1.13	0.291
Fatal and Injury (FI)	--	--	--	0.258	0.066	--	0.066	1.00	1.13	0.075
Property Damage Only (PDO)	--	--	--	0.742	0.191	--	0.191	1.00	1.13	0.216

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(This area is intentionally left blank for Worksheet 2F.)

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.075	1.000	0.216	0.291
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.009	0.009
Collision with animal	0.000	0.000	0.043	0.009	0.009
Collision with fixed object	0.625	0.047	0.870	0.188	0.235
Collision with other object	0.125	0.009	0.043	0.009	0.019
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.019	0.000	0.000	0.019

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	2.469	0.291	2.760	0.020	1.13	0.064
Fatal and injury (FI)	--	--	--	--	1.13	0.064

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.469	0.291	2.760	0.034	1.13	0.106
Fatal and injury (FI)	--	--	--	--	1.13	0.106

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.282	0.601	0.883
Head-on collisions (from Worksheet 2D)	0.009	0.019	0.028
Angle collisions (from Worksheet 2D)	0.385	1.033	1.418
Sideswipe (from Worksheet 2D)	0.009	0.131	0.141
Other multiple-vehicle collision (from Worksheet 2D)	0.000	0.000	0.000
Subtotal	0.685	1.784	2.469
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.009	0.009
Collision with animal (from Worksheet 2F)	0.000	0.009	0.009
Collision with fixed object (from Worksheet 2F)	0.047	0.188	0.235
Collision with other object (from Worksheet 2F)	0.009	0.009	0.019
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.019	0.000	0.019
Collision with pedestrian (from Worksheet 2G or 2I)	0.064	0.000	0.064
Collision with bicycle (from Worksheet 2J)	0.106	0.000	0.106
Subtotal	0.245	0.216	0.461
Total	0.930	2.000	2.930

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	2.930
Fatal and injury (FI)	0.930
Property damage only (PDO)	2.000

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 138 at Dollar Lane and Milton Street
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	9	9	4.08	4.58	1.00
2014	7	7	4.03	4.52	1.00
2013	6	7	3.95	4.44	1.00
2012	4	4	3.93	4.41	1.00
2011	6	6	3.84	4.32	1.00

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
32.00	6.60	19.83	4.46	0.10	0.35	27.78	6.37	6.19	Y	1.74	Y
							6.29				
							6.17				
							6.14				
							6.00				

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Dollar Lane and Milton Street
Date Performed	43221	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2015
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67700 (veh/day)	--	15,000
AADT _{minor} (veh/day)	AADT _{MAX} = 33400 (veh/day)	--	4,350
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			6
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	4.276	0.122	0.181	4.580

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-11.79	0.92	0.52	0.10	4.08	1.00	4.08	1.00	1.00	4.08
Fatal and Injury (FI)	--	--	--	--	1.13	--	1.13	1.00	1.00	1.13
Property Damage Only (PDO)	--	--	--	--	2.94	--	2.94	1.00	1.00	2.94

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	1.13	1.00	2.94	4.08
Rear-end collision	0.45	0.51	0.42	1.24	1.75
Head-on collision	0.04	0.04	0.04	0.11	0.15
Angle collision	0.49	0.56	0.43	1.25	1.81
Sideswipe	0.02	0.02	0.11	0.33	0.35
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.05	0.20	1.00	0.20	1.00	1.00	0.20
Fatal and Injury (FI)	--	--	--	0.18	0.04	--	0.04	1.00	1.00	0.04
Property Damage Only (PDO)	--	--	--	0.82	0.16	--	0.16	1.00	1.00	0.16

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.04	1.00	0.16	0.20
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.02	0.86	0.14	0.16
Collision with other object	0.00	0.00	0.06	0.01	0.01
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.01
Single-vehicle noncollision	0.25	0.01	0.00	0.00	0.01

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	4.08	0.20	4.28	0.03	0.12	1.00	0.12
Fatal and injury (FI)	--	--	--	--	--	1.00	0.12

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	4.08	0.20	4.28	0.04	1.00	0.18
Fatal and injury (FI)	--	--	--	--	1.00	0.18

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections				
(1)	(2)	(3)	(4)	
Collision type	Fatal and injury (FI)		Property damage only (PDO)	
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F (6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	
MULTIPLE-VEHICLE				
Rear-end collisions (from Worksheet 2D)	0.51	1.24	1.75	
Head-on collisions (from Worksheet 2D)	0.04	0.11	0.15	
Angle collisions (from Worksheet 2D)	0.56	1.25	1.81	
Sideswipe (from Worksheet 2D)	0.02	0.33	0.35	
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00	
Subtotal	1.13	2.94	4.08	
SINGLE-VEHICLE				
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00	
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00	
Collision with fixed object (from Worksheet 2F)	0.02	0.14	0.16	
Collision with other object (from Worksheet 2F)	0.00	0.01	0.01	
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.01	
Single-vehicle noncollision (from Worksheet 2F)	0.01	0.00	0.01	
Collision with pedestrian (from Worksheet 2G or 2I)	0.12	0.00	0.12	
Collision with bicycle (from Worksheet 2J)	0.18	0.00	0.18	
Subtotal	0.34	0.16	0.50	
Total	1.47	3.11	4.58	

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	4.58
Fatal and injury (FI)	1.47
Property damage only (PDO)	3.11

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Dollar Lane and Milton Street
Date Performed	43221	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2014
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67700 (veh/day)	--	14,800
AADT _{minor} (veh/day)	AADT _{MAX} = 33400 (veh/day)	--	4,350
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1	1
Data for signalized intersections only:			
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			6
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	4.224	0.121	0.179	4.524

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	4.03	1.00	4.03	1.00	1.00	4.03
Fatal and Injury (FI)	--	--	--	--	1.12	--	1.12	1.00	1.00	1.12
Property Damage Only (PDO)	--	--	--	--	2.91	--	2.91	1.00	1.00	2.91

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	1.12	1.00	2.91	4.03
Rear-end collision	0.45	0.51	0.42	1.23	1.73
Head-on collision	0.04	0.04	0.04	0.11	0.15
Angle collision	0.49	0.55	0.43	1.24	1.79
Sideswipe	0.02	0.02	0.11	0.33	0.35
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.20	1.00	0.20	1.00	1.00	0.20
Fatal and Injury (FI)	--	--	--	0.18	0.04	--	0.04	1.00	1.00	0.04
Property Damage Only (PDO)	--	--	--	0.82	0.16	--	0.16	1.00	1.00	0.16

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
Total	1.00	0.04	1.00	0.16	0.20
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.02	0.86	0.14	0.16
Collision with other object	0.00	0.00	0.06	0.01	0.01
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.01
Single-vehicle noncollision	0.25	0.01	0.00	0.00	0.01

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	4.03	0.20	4.22	0.03	0.12	1.00	0.12
Fatal and injury (FI)	--	--	--	--		1.00	0.12

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	4.03	0.20	4.22	0.04	1.00	0.18
Fatal and injury (FI)	--	--	--	--	1.00	0.18

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F
Total			
(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J			
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.51	1.23	1.73
Head-on collisions (from Worksheet 2D)	0.04	0.11	0.15
Angle collisions (from Worksheet 2D)	0.55	1.24	1.79
Sideswipe (from Worksheet 2D)	0.02	0.33	0.35
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	1.12	2.91	4.03
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.02	0.14	0.16
Collision with other object (from Worksheet 2F)	0.00	0.01	0.01
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.01
Single-vehicle noncollision (from Worksheet 2F)	0.01	0.00	0.01
Collision with pedestrian (from Worksheet 2G or 2I)	0.12	0.00	0.12
Collision with bicycle (from Worksheet 2J)	0.18	0.00	0.18
Subtotal	0.34	0.16	0.50
Total	1.46	3.07	4.52

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	4.52
Fatal and injury (FI)	1.46
Property damage only (PDO)	3.07

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Dollar Lane and Milton Street
Date Performed	43221	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2013
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67700 (veh/day)	--	14,700
AADT _{minor} (veh/day)	AADT _{MAX} = 33400 (veh/day)	--	4,250
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			6
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	4.147	0.119	0.176	4.442

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	3.95	1.00	3.95	1.00	1.00	3.95
Fatal and Injury (FI)	--	--	--	--	1.10	--	1.10	1.00	1.00	1.10
Property Damage Only (PDO)	--	--	--	--	2.85	--	2.85	1.00	1.00	2.85

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	1.10	1.00	2.85	3.95
Rear-end collision	0.45	0.50	0.42	1.20	1.70
Head-on collision	0.04	0.04	0.04	0.11	0.15
Angle collision	0.49	0.54	0.43	1.21	1.75
Sideswipe	0.02	0.02	0.11	0.32	0.34
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.19	1.00	0.19	1.00	1.00	0.19
Fatal and Injury (FI)	--	--	--	0.18	0.04	--	0.04	1.00	1.00	0.04
Property Damage Only (PDO)	--	--	--	0.82	0.16	--	0.16	1.00	1.00	0.16

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.04	1.00	0.16	0.19
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.02	0.86	0.14	0.16
Collision with other object	0.00	0.00	0.06	0.01	0.01
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.01
Single-vehicle noncollision	0.25	0.01	0.00	0.00	0.01

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	3.95	0.19	4.15	0.03	0.12	1.00	0.12
Fatal and injury (FI)	--	--	--	--	--	1.00	0.12

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	3.95	0.19	4.15	0.04	1.00	0.18
Fatal and injury (FI)	--	--	--	--	1.00	0.18

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.50	1.20	1.70
Head-on collisions (from Worksheet 2D)	0.04	0.11	0.15
Angle collisions (from Worksheet 2D)	0.54	1.21	1.75
Sideswipe (from Worksheet 2D)	0.02	0.32	0.34
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	1.10	2.85	3.95
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.02	0.14	0.16
Collision with other object (from Worksheet 2F)	0.00	0.01	0.01
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.01
Single-vehicle noncollision (from Worksheet 2F)	0.01	0.00	0.01
Collision with pedestrian (from Worksheet 2G or 2I)	0.12	0.00	0.12
Collision with bicycle (from Worksheet 2J)	0.18	0.00	0.18
Subtotal	0.33	0.16	0.49
Total	1.43	3.01	4.44

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	4.44
Fatal and injury (FI)	1.43
Property damage only (PDO)	3.01

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Dollar Lane and Milton Street
Date Performed	43221	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2012
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67700 (veh/day)	--	14,600
AADT _{minor} (veh/day)	AADT _{MAX} = 33400 (veh/day)	--	4,250
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1	1
Data for signalized intersections only:			
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			6
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	4.121	0.118	0.175	4.414

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	3.93	1.00	3.93	1.00	1.00	3.93
Fatal and Injury (FI)	--	--	--	--	1.09	--	1.09	1.00	1.00	1.09
Property Damage Only (PDO)	--	--	--	--	2.84	--	2.84	1.00	1.00	2.84

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	1.09	1.00	2.84	3.93
Rear-end collision	0.45	0.49	0.42	1.20	1.69
Head-on collision	0.04	0.04	0.04	0.11	0.15
Angle collision	0.49	0.54	0.43	1.21	1.74
Sideswipe	0.02	0.02	0.11	0.32	0.34
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.19	1.00	0.19	1.00	1.00	0.19
Fatal and Injury (FI)	--	--	--	0.18	0.03	--	0.03	1.00	1.00	0.03
Property Damage Only (PDO)	--	--	--	0.82	0.16	--	0.16	1.00	1.00	0.16

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.03	1.00	0.16	0.19
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.02	0.86	0.14	0.16
Collision with other object	0.00	0.00	0.06	0.01	0.01
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.01
Single-vehicle noncollision	0.25	0.01	0.00	0.00	0.01

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	3.93	0.19	4.12	0.03	0.12	1.00	0.12
Fatal and injury (FI)	--	--	--	--	--	1.00	0.12

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	3.93	0.19	4.12	0.04	1.00	0.17
Fatal and injury (FI)	--	--	--	--	1.00	0.17

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F
(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J			
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.49	1.20	1.69
Head-on collisions (from Worksheet 2D)	0.04	0.11	0.15
Angle collisions (from Worksheet 2D)	0.54	1.21	1.74
Sideswipe (from Worksheet 2D)	0.02	0.32	0.34
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	1.09	2.84	3.93
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.02	0.14	0.16
Collision with other object (from Worksheet 2F)	0.00	0.01	0.01
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.01
Single-vehicle noncollision (from Worksheet 2F)	0.01	0.00	0.01
Collision with pedestrian (from Worksheet 2G or 2I)	0.12	0.00	0.12
Collision with bicycle (from Worksheet 2J)	0.17	0.00	0.17
Subtotal	0.33	0.16	0.49
Total	1.42	2.99	4.41

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	4.41
Fatal and injury (FI)	1.42
Property damage only (PDO)	2.99

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Dollar Lane and Milton Street
Date Performed	43221	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2011
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67700 (veh/day)	--	14,450
AADT _{minor} (veh/day)	AADT _{MAX} = 33400 (veh/day)	--	4,150
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1	1
Data for signalized intersections only:			
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			6
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	4.032	0.115	0.171	4.318

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	3.84	1.00	3.84	1.00	1.00	3.84
Fatal and Injury (FI)	--	--	--	--	1.07	--	1.07	1.00	1.00	1.07
Property Damage Only (PDO)	--	--	--	--	2.77	--	2.77	1.00	1.00	2.77

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	1.07	1.00	2.77	3.84
Rear-end collision	0.45	0.48	0.42	1.17	1.65
Head-on collision	0.04	0.04	0.04	0.11	0.15
Angle collision	0.49	0.53	0.43	1.18	1.71
Sideswipe	0.02	0.02	0.11	0.31	0.33
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.19	1.00	0.19	1.00	1.00	0.19
Fatal and Injury (FI)	--	--	--	0.18	0.03	--	0.03	1.00	1.00	0.03
Property Damage Only (PDO)	--	--	--	0.82	0.15	--	0.15	1.00	1.00	0.15

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.03	1.00	0.15	0.19
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.02	0.86	0.13	0.15
Collision with other object	0.00	0.00	0.06	0.01	0.01
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.01
Single-vehicle noncollision	0.25	0.01	0.00	0.00	0.01

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	3.84	0.19	4.03	0.03	0.12	1.00	0.12
Fatal and injury (FI)	--	--	--	--	--	1.00	0.12

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	3.84	0.19	4.03	0.04	1.00	0.17
Fatal and injury (FI)	--	--	--	--	1.00	0.17

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.48	1.17	1.65
Head-on collisions (from Worksheet 2D)	0.04	0.11	0.15
Angle collisions (from Worksheet 2D)	0.53	1.18	1.71
Sideswipe (from Worksheet 2D)	0.02	0.31	0.33
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	1.07	2.77	3.84
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.02	0.13	0.15
Collision with other object (from Worksheet 2F)	0.00	0.01	0.01
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.01
Single-vehicle noncollision (from Worksheet 2F)	0.01	0.00	0.01
Collision with pedestrian (from Worksheet 2G or 2I)	0.12	0.00	0.12
Collision with bicycle (from Worksheet 2J)	0.17	0.00	0.17
Subtotal	0.32	0.15	0.47
Total	1.39	2.93	4.32

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	4.32
Fatal and injury (FI)	1.39
Property damage only (PDO)	2.93

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 138 and Blue Jay Way Curry College
Agency or Company	CTPS	Intersection Type	3ST
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	2	2	0.87	1.03	1.00
2014	2	2	0.85	1.01	1.00
2013	0	0	0.84	1.00	1.00
2012	2	3	0.83	0.98	1.00
2011	2	2	0.81	0.96	1.00

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
8.00	1.80	4.20	1.00	0.03	0.50	6.11	1.41	1.35	Y	0.36	Y
							1.38				
							1.36				
							1.34				
							1.32				

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Blue Jay Way Curry College
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2015
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	16,750
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	800
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	0.969	0.022	0.037	1.029

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-20.02	1.66	0.54	0.24	0.767	1.000	0.767	1.00	1.13	0.867
Fatal and Injury (FI)	--	--	--	--	0.213	--	0.213	1.00	1.13	0.241
Property Damage Only (PDO)	--	--	--	--	0.554	--	0.554	1.00	1.13	0.626

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.241	1.000	0.626	0.867
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.099	0.337	0.211	0.310
Head-on collision	0.014	0.003	0.011	0.007	0.010
Angle collision	0.562	0.135	0.579	0.363	0.498
Sideswipe	0.014	0.003	0.074	0.046	0.049
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.118	0.090	1.000	0.090	1.00	1.13	0.102
Fatal and Injury (FI)	--	--	--	0.258	0.023	--	0.023	1.00	1.13	0.026
Property Damage Only (PDO)	--	--	--	0.742	0.067	--	0.067	1.00	1.13	0.076

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.026	1.000	0.076	0.102
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.003	0.003
Collision with animal	0.000	0.000	0.043	0.003	0.003
Collision with fixed object	0.625	0.016	0.870	0.066	0.082
Collision with other object	0.125	0.003	0.043	0.003	0.007
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.007	0.000	0.000	0.007

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.867	0.102	0.969	0.020	1.13	0.022
Fatal and injury (FI)	--	--	--	--	1.13	0.022

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	0.867	0.102	0.969	0.034	1.13	0.037
Fatal and injury (FI)	--	--	--	--	1.13	0.037

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
	Total		(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.099		0.310
Head-on collisions (from Worksheet 2D)	0.003		0.010
Angle collisions (from Worksheet 2D)	0.135		0.498
Sideswipe (from Worksheet 2D)	0.003		0.049
Other multiple-vehicle collision (from Worksheet 2D)	0.000		0.000
Subtotal	0.241		0.867
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.003	0.003
Collision with animal (from Worksheet 2F)	0.000	0.003	0.003
Collision with fixed object (from Worksheet 2F)	0.016	0.066	0.082
Collision with other object (from Worksheet 2F)	0.003	0.003	0.007
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.007	0.000	0.007
Collision with pedestrian (from Worksheet 2G or 2I)	0.022	0.000	0.022
Collision with bicycle (from Worksheet 2J)	0.037	0.000	0.037
Subtotal	0.086	0.076	0.162
Total	0.327	0.702	1.029

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	1.029
Fatal and injury (FI)	0.327
Property damage only (PDO)	0.702

Legend		
Required Manual Input	Select from Drop-Down List	Optional Input

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Blue Jay Way Curry College
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2014
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	16,600
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	800
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	0.955	0.022	0.037	1.014

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
<i>CMF_{1i}</i>	<i>CMF_{2i}</i>	<i>CMF_{3i}</i>	<i>CMF_{4i}</i>	<i>CMF_{5i}</i>	<i>CMF_{6i}</i>	<i>CMF_{COMB}</i>
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-20.02	1.66	0.54	0.24	0.756	1.000	0.756	1.00	1.13	0.854
Fatal and Injury (FI)	--	--	--	--	0.210	--	0.210	1.00	1.13	0.237
Property Damage Only (PDO)	--	--	--	--	0.546	--	0.546	1.00	1.13	0.617

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.000	0.237	1.000	0.617	0.854
Rear-end collision	0.411	0.097	0.337	0.208	0.305
Head-on collision	0.014	0.003	0.011	0.006	0.010
Angle collision	0.562	0.133	0.579	0.357	0.490
Sideswipe	0.014	0.003	0.074	0.045	0.049
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.118	0.089	1.000	0.089	1.00	1.13	0.101
Fatal and Injury (FI)	--	--	--	0.258	0.023	--	0.023	1.00	1.13	0.026
Property Damage Only (PDO)	--	--	--	0.742	0.066	--	0.066	1.00	1.13	0.075

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
---	--	--	--	--	--

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.026	1.000	0.075	0.101
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.003	0.003
Collision with animal	0.000	0.000	0.043	0.003	0.003
Collision with fixed object	0.625	0.016	0.870	0.065	0.081
Collision with other object	0.125	0.003	0.043	0.003	0.006
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.006	0.000	0.000	0.006

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.854	0.101	0.955	0.020	1.13	0.022
Fatal and injury (FI)	--	--	--	--	1.13	0.022

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	0.854	0.101	0.955	0.034	1.13	0.037
Fatal and injury (FI)	--	--	--	--	1.13	0.037

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
	Total		(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.097		0.305
Head-on collisions (from Worksheet 2D)	0.003		0.010
Angle collisions (from Worksheet 2D)	0.133		0.490
Sideswipe (from Worksheet 2D)	0.003		0.049
Other multiple-vehicle collision (from Worksheet 2D)	0.000		0.000
Subtotal	0.237		0.854
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.003	0.003
Collision with animal (from Worksheet 2F)	0.000	0.003	0.003
Collision with fixed object (from Worksheet 2F)	0.016	0.065	0.081
Collision with other object (from Worksheet 2F)	0.003	0.003	0.006
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.006	0.000	0.006
Collision with pedestrian (from Worksheet 2G or 2I)	0.022	0.000	0.022
Collision with bicycle (from Worksheet 2J)	0.037	0.000	0.037
Subtotal	0.085	0.075	0.159
Total	0.322	0.692	1.014

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	1.014
Fatal and injury (FI)	0.322
Property damage only (PDO)	0.692

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Blue Jay Way Curry College
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2013
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	16,450
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	800
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	0.941	0.022	0.036	0.998

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-20.02	1.66	0.54	0.24	0.745	1.000	0.745	1.00	1.13	0.841
Fatal and Injury (FI)	--	--	--	--	0.207	--	0.207	1.00	1.13	0.234
Property Damage Only (PDO)	--	--	--	--	0.538	--	0.538	1.00	1.13	0.608

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.000	0.234	1.000	0.608	0.841
Rear-end collision	0.411	0.096	0.337	0.205	0.301
Head-on collision	0.014	0.003	0.011	0.006	0.010
Angle collision	0.562	0.131	0.579	0.352	0.483
Sideswipe	0.014	0.003	0.074	0.045	0.048
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.118	0.088	1.000	0.088	1.00	1.13	0.099
Fatal and Injury (FI)	--	--	--	0.258	0.023	--	0.023	1.00	1.13	0.026
Property Damage Only (PDO)	--	--	--	0.742	0.065	--	0.065	1.00	1.13	0.074

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
---	--	--	--	--	--

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.026	1.000	0.074	0.099
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.003	0.003
Collision with animal	0.000	0.000	0.043	0.003	0.003
Collision with fixed object	0.625	0.016	0.870	0.064	0.080
Collision with other object	0.125	0.003	0.043	0.003	0.006
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.006	0.000	0.000	0.006

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.841	0.099	0.941	0.020	1.13	0.022
Fatal and injury (FI)	--	--	--	--	1.13	0.022

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	0.841	0.099	0.941	0.034	1.13	0.036
Fatal and injury (FI)	--	--	--	--	1.13	0.036

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
			Total
			(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.096		0.301
Head-on collisions (from Worksheet 2D)	0.003		0.010
Angle collisions (from Worksheet 2D)	0.131		0.483
Sideswipe (from Worksheet 2D)	0.003		0.048
Other multiple-vehicle collision (from Worksheet 2D)	0.000		0.000
Subtotal	0.234		0.841
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.003	0.003
Collision with animal (from Worksheet 2F)	0.000	0.003	0.003
Collision with fixed object (from Worksheet 2F)	0.016	0.064	0.080
Collision with other object (from Worksheet 2F)	0.003	0.003	0.006
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.006	0.000	0.006
Collision with pedestrian (from Worksheet 2G or 2I)	0.022	0.000	0.022
Collision with bicycle (from Worksheet 2J)	0.036	0.000	0.036
Subtotal	0.083	0.074	0.157
Total	0.317	0.681	0.998

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	0.998
Fatal and injury (FI)	0.317
Property damage only (PDO)	0.681

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
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Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Blue Jay Way Curry College
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2012
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	16,300
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	800
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	0.926	0.021	0.036	0.983

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Adjusted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-20.02	1.66	0.54	0.24	0.733	1.000	0.733	1.00	1.13	0.829
Fatal and Injury (FI)	--	--	--	--	0.204	--	0.204	1.00	1.13	0.230
Property Damage Only (PDO)	--	--	--	--	0.530	--	0.530	1.00	1.13	0.599

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.000	0.230	1.000	0.599	0.829
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.095	0.337	0.202	0.296
Head-on collision	0.014	0.003	0.011	0.006	0.009
Angle collision	0.562	0.129	0.579	0.347	0.476
Sideswipe	0.014	0.003	0.074	0.044	0.047
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.118	0.086	1.000	0.086	1.00	1.13	0.098
Fatal and Injury (FI)	--	--	--	0.258	0.022	--	0.022	1.00	1.13	0.025
Property Damage Only (PDO)	--	--	--	0.742	0.064	--	0.064	1.00	1.13	0.072

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
-----	-----	-----	-----	-----	-----

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.025	1.000	0.072	0.098
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.003	0.003
Collision with animal	0.000	0.000	0.043	0.003	0.003
Collision with fixed object	0.625	0.016	0.870	0.063	0.079
Collision with other object	0.125	0.003	0.043	0.003	0.006
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.006	0.000	0.000	0.006

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.829	0.098	0.926	0.020	1.13	0.021
Fatal and injury (FI)	--	--	--	--	1.13	0.021

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	0.829	0.098	0.926	0.034	1.13	0.036
Fatal and injury (FI)	--	--	--	--	1.13	0.036

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
	Total		(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.095	0.202	0.296
Head-on collisions (from Worksheet 2D)	0.003	0.006	0.009
Angle collisions (from Worksheet 2D)	0.129	0.347	0.476
Sideswipe (from Worksheet 2D)	0.003	0.044	0.047
Other multiple-vehicle collision (from Worksheet 2D)	0.000	0.000	0.000
Subtotal	0.230	0.599	0.829
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.003	0.003
Collision with animal (from Worksheet 2F)	0.000	0.003	0.003
Collision with fixed object (from Worksheet 2F)	0.016	0.063	0.079
Collision with other object (from Worksheet 2F)	0.003	0.003	0.006
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.000
Single-vehicle noncollision (from Worksheet 2F)	0.006	0.000	0.006
Collision with pedestrian (from Worksheet 2G or 2I)	0.021	0.000	0.021
Collision with bicycle (from Worksheet 2J)	0.036	0.000	0.036
Subtotal	0.082	0.072	0.155
Total	0.312	0.671	0.983

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	0.983
Fatal and injury (FI)	0.312
Property damage only (PDO)	0.671

Legend

Required Manual Input	Select from Drop-Down List	Optional Input
-----------------------	----------------------------	----------------

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Blue Jay Way Curry College
Date Performed	05/01/18	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2011
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT _{major} (veh/day)	AADT _{MAX} = 45,700 (veh/day)	--	16,100
AADT _{minor} (veh/day)	AADT _{MAX} = 9,300 (veh/day)	--	800
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.13
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		--	0
Number of major-road approaches with right-turn lanes (0,1,2)		--	0

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi_total}	N _{pedi_total}	N _{bikei_total}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	0.908	0.021	0.035	0.963

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections											
(1) Crash Severity Level	(2) SPF Coefficients			(3) Overdispersion Parameter, k	(4) Initial N _{bimv}	(5) Proportion of Total Crashes	(6) Adjusted N _{bimv}	(7) Combined CMFs	(8) Calibration Factor, C _i	(9) Adjusted N _{bimv}	
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B	(6)*(7)*(8)
	a	b	c								
Total	-20.02	1.66	0.54	0.24	0.718	1.000	0.718	1.00	1.13	0.812	
Fatal and Injury (FI)	--	--	--	--	0.199	--	0.199	1.00	1.13	0.225	
Property Damage Only (PDO)	--	--	--	--	0.519	--	0.519	1.00	1.13	0.587	

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1) Collision Type	(2) Proportion of Collision Type _(FI)	(3) Adjusted N _{bimv (FI)} (crashes/year)	(4) Proportion of Collision Type _(PDO)	(5) Adjusted N _{bimv (PDO)} (crashes/year)	(6) Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{N_{bimv}} from Worksheet 2C
Total	1.000	0.225	1.000	0.587	0.812
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.411	0.093	0.337	0.198	0.290
Head-on collision	0.014	0.003	0.011	0.006	0.009
Angle collision	0.562	0.127	0.579	0.340	0.466
Sideswipe	0.014	0.003	0.074	0.043	0.046
Other multiple-vehicle collision	0.000	0.000	0.000	0.000	0.000

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections											
(1) Crash Severity Level	(2) SPF Coefficients			(3) Historical Data	(4) Initial N _{bisv}	(5) Proportion of Total Crashes	(6) Adjusted N _{bimv}	(7) Combined CMFs	(8) Calibration Factor, C _i	(9) Predicted N _{bisv}	
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B	(6)*(7)*(8)
	a	b	c								
Total	--	--	--	0.118	0.085	1.000	0.085	1.00	1.13	0.096	
Fatal and Injury (FI)	--	--	--	0.258	0.022	--	0.022	1.00	1.13	0.025	
Property Damage Only (PDO)	--	--	--	0.742	0.063	--	0.063	1.00	1.13	0.071	

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
---	--	--	--	--	--

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.000	0.025	1.000	0.071	0.096
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.043	0.003	0.003
Collision with animal	0.000	0.000	0.043	0.003	0.003
Collision with fixed object	0.625	0.015	0.870	0.062	0.077
Collision with other object	0.125	0.003	0.043	0.003	0.006
Other single-vehicle collision	0.000	0.000	0.000	0.000	0.000
Single-vehicle noncollision	0.250	0.006	0.000	0.000	0.006

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh- Ped ω	Calibration factor, C _i	Predicted N ^{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.812	0.096	0.908	0.020	1.13	0.021
Fatal and injury (FI)	--	--	--	--	1.13	0.021

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N ^{bimv}	Predicted N ^{bisv}	Predicted N ^{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N ^{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	0.812	0.096	0.908	0.034	1.13	0.035
Fatal and injury (FI)	--	--	--	--	1.13	0.035

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J		(5) from Worksheet 2D and 2F
Total			
(6) from Worksheet 2D and 2F; (7) from Worksheet 2H and 2J			
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.093		0.198
Head-on collisions (from Worksheet 2D)	0.003		0.006
Angle collisions (from Worksheet 2D)	0.127		0.340
Sideswipe (from Worksheet 2D)	0.003		0.043
Other multiple-vehicle collision (from Worksheet 2D)	0.000		0.000
Subtotal	0.225		0.587
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000		0.003
Collision with animal (from Worksheet 2F)	0.000		0.003
Collision with fixed object (from Worksheet 2F)	0.015		0.062
Collision with other object (from Worksheet 2F)	0.003		0.003
Other single-vehicle collision (from Worksheet 2F)	0.000		0.000
Single-vehicle noncollision (from Worksheet 2F)	0.006		0.000
Collision with pedestrian (from Worksheet 2G or 2I)	0.021		0.000
Collision with bicycle (from Worksheet 2J)	0.035		0.000
Subtotal	0.081		0.071
Total	0.306		0.658

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N ^{predicted int} (crashes/year)
	(Total) from Worksheet 2K
Total	0.963
Fatal and injury (FI)	0.306
Property damage only (PDO)	0.658

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	oute 138 at Bradlee Road and Atherton Stre
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	4	4	2.19	2.57	2.78
2014	2	2	2.16	2.55	2.78
2013	3	3	2.12	2.49	2.78
2012	3	4	2.08	2.44	2.78
2011	4	4	2.06	2.42	2.78

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
16.00	3.40	10.61	2.50	0.06	0.50	13.31	3.17	3.07	Y	0.58	Y
							3.13				
							3.07				
							3.01				
							2.98				

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections				
General Information			Location Information	
Analyst	Ben Erban		City	Milton
Agency or Company	CTPS		Intersection	Route 138 at Bradlee Road and Atherton Street
Date Performed	5/1/2018		Jurisdiction	MassDOT Highway District 6
			Analysis Year	2015
Input Data			Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)			--	4SG
AADT _{major} (veh/day)			AADT _{MAX} = 67700 (veh/day)	12,850
AADT _{minor} (veh/day)			AADT _{MAX} = 33400 (veh/day)	1,950
Intersection lighting (present/not present)			Not Present	Not Present
Calibration factor, C _i			1	1
Data for signalized intersections only:			--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]			--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]			--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]			--	1
Type of left-turn signal phasing for Leg #1			Permissive	Protected
Type of left-turn signal phasing for Leg #2			--	Permissive
Type of left-turn signal phasing for Leg #3			--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)			--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]			0	0
Intersection red light cameras (present/not present)			Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only				14
Maximum number of lanes crossed by a pedestrian (n _{lanesx})			--	2
Number of bus stops within 300 m (1,000 ft) of the intersection			0	2
Schools within 300 m (1,000 ft) of the intersection (present/not present)			Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection			0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	2.780	1.000	1.000	2.295	0.183	0.097	2.575

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.94	1.00	1.00	1.00	1.00	0.94

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-11.79	0.92	0.52	0.10	2.33	1.00	2.33	0.94	1.00	2.19
Fatal and Injury (FI)	--	--	--	--	0.65	--	0.65	0.94	1.00	0.61
Property Damage Only (PDO)	--	--	--	--	1.68	--	1.68	0.94	1.00	1.58

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.61	1.00	1.58	2.19
Rear-end collision	0.45	0.27	0.42	0.67	0.94
Head-on collision	0.04	0.02	0.04	0.06	0.08
Angle collision	0.49	0.30	0.43	0.67	0.97
Sideswipe	0.02	0.01	0.11	0.18	0.19
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.05	0.11	1.00	0.11	0.94	1.00	0.11
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.94	1.00	0.02
Property Damage Only (PDO)	--	--	--	0.82	0.09	--	0.09	0.94	1.00	0.09

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.02	1.00	0.09	0.11
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.08	0.09
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	2.19	0.11	2.29	0.03	0.07	1.00	0.18
Fatal and injury (FI)	--	--	--	--	--	1.00	0.18

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.19	0.11	2.29	0.04	1.00	0.10
Fatal and injury (FI)	--	--	--	--	1.00	0.10

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.27	0.67	0.94
Head-on collisions (from Worksheet 2D)	0.02	0.06	0.08
Angle collisions (from Worksheet 2D)	0.30	0.67	0.97
Sideswipe (from Worksheet 2D)	0.01	0.18	0.19
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.61	1.58	2.19
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.01	0.08	0.09
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.18	0.00	0.18
Collision with bicycle (from Worksheet 2J)	0.10	0.00	0.10
Subtotal	0.30	0.09	0.39
Total	0.91	1.67	2.57

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	2.57
Fatal and injury (FI)	0.91
Property damage only (PDO)	1.67

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information				Location Information		
Analyst	Ben Erban			City	Milton	
Agency or Company	CTPS			Intersection	Route 138 at Bradlee Road and Atherton Street	
Date Performed	43221			Jurisdiction	MassDOT Highway District 6	
				Analysis Year	2014	
Input Data				Base Conditions		Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)				--		4SG
AADT _{major} (veh/day)		AADT _{MAX} = 67700 (veh/day)		--		12,700
AADT _{minor} (veh/day)		AADT _{MAX} = 33400 (veh/day)		--		1,950
Intersection lighting (present/not present)				Not Present		Not Present
Calibration factor, C _i				1		1
Data for signalized intersections only:				--		--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]				--		0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]				--		0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]				--		1
Type of left-turn signal phasing for Leg #1				Permissive		Protected
Type of left-turn signal phasing for Leg #2				--		Permissive
Type of left-turn signal phasing for Leg #3				--		Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)				--		Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]				0		0
Intersection red light cameras (present/not present)				Not Present		Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only						14
Maximum number of lanes crossed by a pedestrian (n _{lanesx})				--		2
Number of bus stops within 300 m (1,000 ft) of the intersection				0		2
Schools within 300 m (1,000 ft) of the intersection (present/not present)				Not Present		Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection				0		0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	2.780	1.000	1.000	2.270	0.181	0.096	2.547

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.94	1.00	1.00	1.00	1.00	0.94

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	2.30	1.00	2.30	0.94	1.00	2.16
Fatal and Injury (FI)	--	--	--	--	0.64	--	0.64	0.94	1.00	0.60
Property Damage Only (PDO)	--	--	--	--	1.66	--	1.66	0.94	1.00	1.56

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.60	1.00	1.56	2.16
Rear-end collision	0.45	0.27	0.42	0.66	0.93
Head-on collision	0.04	0.02	0.04	0.06	0.08
Angle collision	0.49	0.30	0.43	0.66	0.96
Sideswipe	0.02	0.01	0.11	0.18	0.19
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.11	1.00	0.11	0.94	1.00	0.11
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.94	1.00	0.02
Property Damage Only (PDO)	--	--	--	0.82	0.09	--	0.09	0.94	1.00	0.09

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
Total	1.00	0.02	1.00	0.09	0.11
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.07	0.09
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	2.16	0.11	2.27	0.03	0.07	1.00	0.18
Fatal and injury (FI)	--	--	--	--	--	1.00	0.18

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.16	0.11	2.27	0.04	1.00	0.10
Fatal and injury (FI)	--	--	--	--	1.00	0.10

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.27	0.66	0.93
Head-on collisions (from Worksheet 2D)	0.02	0.06	0.08
Angle collisions (from Worksheet 2D)	0.30	0.66	0.96
Sideswipe (from Worksheet 2D)	0.01	0.18	0.19
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.60	1.56	2.16
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.01	0.07	0.09
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.18	0.00	0.18
Collision with bicycle (from Worksheet 2J)	0.10	0.00	0.10
Subtotal	0.30	0.09	0.38
Total	0.90	1.65	2.55

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	2.55
Fatal and injury (FI)	0.90
Property damage only (PDO)	1.65

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Bradlee Road and Atherton Street
Date Performed	43221	Jurisdiction	MassDOT Highwat District 6
		Analysis Year	2013
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67700 (veh/day)	--	12,600
AADT _{minor} (veh/day)	AADT _{MAX} = 33400 (veh/day)	--	1,900
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	1
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			14
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	2
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	2.780	1.000	1.000	2.223	0.177	0.094	2.495

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.94	1.00	1.00	1.00	1.00	0.94

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	2.26	1.00	2.26	0.94	1.00	2.12
Fatal and Injury (FI)	--	--	--	--	0.63	--	0.63	0.94	1.00	0.59
Property Damage Only (PDO)	--	--	--	--	1.63	--	1.63	0.94	1.00	1.53

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{N_{bimv}} from Worksheet 2C
Total	1.00	0.59	1.00	1.53	2.12
Rear-end collision	0.45	0.27	0.42	0.65	0.91
Head-on collision	0.04	0.02	0.04	0.06	0.08
Angle collision	0.49	0.29	0.43	0.65	0.94
Sideswipe	0.02	0.01	0.11	0.17	0.18
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.11	1.00	0.11	0.94	1.00	0.10
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.94	1.00	0.02
Property Damage Only (PDO)	--	--	--	0.82	0.09	--	0.09	0.94	1.00	0.08

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.02	1.00	0.08	0.10
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.07	0.08
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	2.12	0.10	2.22	0.03	0.06	1.00	0.18
Fatal and injury (FI)	--	--	--	--	--	1.00	0.18

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.12	0.10	2.22	0.04	1.00	0.09
Fatal and injury (FI)	--	--	--	--	1.00	0.09

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.27	0.65	0.91
Head-on collisions (from Worksheet 2D)	0.02	0.06	0.08
Angle collisions (from Worksheet 2D)	0.29	0.65	0.94
Sideswipe (from Worksheet 2D)	0.01	0.17	0.18
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.59	1.53	2.12
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.01	0.07	0.08
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.18	0.00	0.18
Collision with bicycle (from Worksheet 2J)	0.09	0.00	0.09
Subtotal	0.29	0.08	0.38
Total	0.88	1.62	2.49

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	2.49
Fatal and injury (FI)	0.88
Property damage only (PDO)	1.62

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Bradlee Road and Atherton Street
Date Performed	43221	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2012
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67700 (veh/day)	--	12,500
AADT _{minor} (veh/day)	AADT _{MAX} = 33400 (veh/day)	--	1,850
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1	1
Data for signalized intersections only:			
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	1
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			14
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	2
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	2.780	1.000	1.000	2.177	0.173	0.092	2.442

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.94	1.00	1.00	1.00	1.00	0.94

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	2.21	1.00	2.21	0.94	1.00	2.08
Fatal and Injury (FI)	--	--	--	--	0.61	--	0.61	0.94	1.00	0.58
Property Damage Only (PDO)	--	--	--	--	1.59	--	1.59	0.94	1.00	1.50

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.58	1.00	1.50	2.08
Rear-end collision	0.45	0.26	0.42	0.63	0.89
Head-on collision	0.04	0.02	0.04	0.06	0.08
Angle collision	0.49	0.28	0.43	0.64	0.92
Sideswipe	0.02	0.01	0.11	0.17	0.18
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.11	1.00	0.11	0.94	1.00	0.10
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.94	1.00	0.02
Property Damage Only (PDO)	--	--	--	0.82	0.09	--	0.09	0.94	1.00	0.08

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.02	1.00	0.08	0.10
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.07	0.08
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	2.08	0.10	2.18	0.03	0.06	1.00	0.17
Fatal and injury (FI)	--	--	--	--	--	1.00	0.17

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.08	0.10	2.18	0.04	1.00	0.09
Fatal and injury (FI)	--	--	--	--	1.00	0.09

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections				
(1)	(2)	(3)	(4)	
Collision type	Fatal and injury (FI)		Property damage only (PDO)	
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F (6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	
MULTIPLE-VEHICLE				
Rear-end collisions (from Worksheet 2D)	0.26	0.63	0.89	
Head-on collisions (from Worksheet 2D)	0.02	0.06	0.08	
Angle collisions (from Worksheet 2D)	0.28	0.64	0.92	
Sideswipe (from Worksheet 2D)	0.01	0.17	0.18	
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00	
Subtotal	0.58	1.50	2.08	
SINGLE-VEHICLE				
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00	
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00	
Collision with fixed object (from Worksheet 2F)	0.01	0.07	0.08	
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00	
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00	
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00	
Collision with pedestrian (from Worksheet 2G or 2I)	0.17	0.00	0.17	
Collision with bicycle (from Worksheet 2J)	0.09	0.00	0.09	
Subtotal	0.28	0.08	0.37	
Total	0.86	1.58	2.44	

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	2.44
Fatal and injury (FI)	0.86
Property damage only (PDO)	1.58

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information				Location Information		
Analyst	Ben Erban			City	Milton	
Agency or Company	CTPS			Intersection	Route 138 at Bradlee Road and Atherton Street	
Date Performed	43221			Jurisdiction	MassDOT Highway District 6	
				Analysis Year	2011	
Input Data			Base Conditions		Site Conditions	
Intersection type (3ST, 3SG, 4ST, 4SG)			--		4SG	
AADT _{major} (veh/day)		AADT _{MAX} = 67700 (veh/day)	--		12,400	
AADT _{minor} (veh/day)		AADT _{MAX} = 33400 (veh/day)	--		1,850	
Intersection lighting (present/not present)			Not Present		Not Present	
Calibration factor, C _i			1		1	
Data for signalized intersections only:			--		--	
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]			--		0	
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]			--		0	
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]			--		1	
Type of left-turn signal phasing for Leg #1			Permissive		Protected	
Type of left-turn signal phasing for Leg #2			--		Permissive	
Type of left-turn signal phasing for Leg #3			--		Permissive	
Type of left-turn signal phasing for Leg #4 (if applicable)			--		Permissive	
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]			0		0	
Intersection red light cameras (present/not present)			Not Present		Not Present	
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only					14	
Maximum number of lanes crossed by a pedestrian (n _{lanesx})			--		2	
Number of bus stops within 300 m (1,000 ft) of the intersection			0		2	
Schools within 300 m (1,000 ft) of the intersection (present/not present)			Not Present		Not Present	
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection			0		0	

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	2.780	1.000	1.000	2.161	0.172	0.092	2.424

ADDITIONAL COMMENTS											

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.94	1.00	1.00	1.00	1.00	0.94

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-11.79	0.92	0.52	0.10	2.19	1.00	2.19	0.94	1.00	2.06
Fatal and Injury (FI)	--	--	--	--	0.61	--	0.61	0.94	1.00	0.57
Property Damage Only (PDO)	--	--	--	--	1.58	--	1.58	0.94	1.00	1.49

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
Total	1.00	0.57	1.00	1.49	2.06
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.45	0.26	0.42	0.63	0.89
Head-on collision	0.04	0.02	0.04	0.06	0.08
Angle collision	0.49	0.28	0.43	0.63	0.91
Sideswipe	0.02	0.01	0.11	0.17	0.18
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.05	0.11	1.00	0.11	0.94	1.00	0.10
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.94	1.00	0.02
Property Damage Only (PDO)	--	--	--	0.82	0.09	--	0.09	0.94	1.00	0.08

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.02	1.00	0.08	0.10
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.07	0.08
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	2.06	0.10	2.16	0.03	0.06	1.00	0.17
Fatal and injury (FI)	--	--	--	--	--	1.00	0.17

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	2.06	0.10	2.16	0.04	1.00	0.09
Fatal and injury (FI)	--	--	--	--	1.00	0.09

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.26	0.63	0.89
Head-on collisions (from Worksheet 2D)	0.02	0.06	0.08
Angle collisions (from Worksheet 2D)	0.28	0.63	0.91
Sideswipe (from Worksheet 2D)	0.01	0.17	0.18
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.57	1.49	2.06
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.01	0.07	0.08
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.17	0.00	0.17
Collision with bicycle (from Worksheet 2J)	0.09	0.00	0.09
Subtotal	0.28	0.08	0.36
Total	0.85	1.57	2.42

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	2.42
Fatal and injury (FI)	0.85
Property damage only (PDO)	1.57

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 138 and Robbins Street
Agency or Company	CTPS	Intersection Type	4ST
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	1	1	1.02	1.05	1.00
2014	0	0	1.01	1.04	1.00
2013	1	1	1.01	1.04	1.00
2012	1	1	0.96	0.99	1.00
2011	2	2	0.96	0.99	1.00

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
5.00	1.00	4.96	1.02	0.03	0.36	4.98	1.14	1.11	Y	0.09	N
							1.14				
							1.13				
							1.08				
							1.07				

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information				Location Information		
Analyst	Ben Erban			City	Route 138 and Robbins Street	
Agency or Company	CTPS			Intersection	Route 138 and Robbins Street	
Date Performed	5/1/2018			Jurisdiction		
				Analysis Year	2015	
Input Data			Base Conditions		Site Conditions	
Intersection type (3ST, 3SG, 4ST, 4SG)			--		4ST	
AADT _{major} (veh/day)		AADT _{MAX} = 46800.00 (veh/day)		--		10,250
AADT _{minor} (veh/day)		AADT _{MAX} = 5900.00 (veh/day)		--		900
Intersection lighting (present/not present)			Not Present		Not Present	
Calibration factor, C _i			1.00		1.04	
Data for unsignalized intersections only:			--		--	
Number of major-road approaches with left-turn lanes (0,1,2)			--		0	
Number of major-road approaches with right-turn lanes (0,1,2)			--		0	

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi total}	N _{peditotal}	N _{biketotal}	N _{predictedint}
1.00	1.00	1.00	1.00	1.00	1.05	0.02	0.01	1.07

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.98	1.00	0.98	1.00	1.04	1.02
Fatal and Injury (FI)	--	--	--	--	0.37	--	0.37	1.00	1.04	0.38
Property Damage Only (PDO)	--	--	--	--	0.61	--	0.61	1.00	1.04	0.63

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.38	1.00	0.63	1.02
Rear-end collision	0.16	0.06	0.19	0.12	0.18
Head-on collision	0.01	0.00	0.02	0.01	0.01
Angle collision	0.82	0.31	0.72	0.46	0.77
Sideswipe	0.02	0.01	0.08	0.05	0.06
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.03	0.03	1.00	0.03	1.00	1.04	0.03
Fatal and Injury (FI)	--	--	--	0.30	0.01	--	0.01	1.00	1.04	0.01
Property Damage Only (PDO)	--	--	--	0.70	0.02	--	0.02	1.00	1.04	0.02

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.01	1.00	0.02	0.03
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.01	0.01
Collision with fixed object	0.68	0.01	0.57	0.01	0.02
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	1.02	0.03	1.05	0.02	1.04	0.02
Fatal and injury (FI)	--	--	--	--	1.04	0.02

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	1.02	0.03	1.05	0.01	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.06	0.12	0.18
Head-on collisions (from Worksheet 2D)	0.00	0.01	0.01
Angle collisions (from Worksheet 2D)	0.31	0.46	0.77
Sideswipe (from Worksheet 2D)	0.01	0.05	0.06
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.38	0.63	1.02
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.01	0.01
Collision with fixed object (from Worksheet 2F)	0.01	0.01	0.02
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.02	0.00	0.02
Collision with bicycle (from Worksheet 2J)	0.01	0.00	0.01
Subtotal	0.04	0.02	0.06
Total	0.42	0.66	1.07

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	1.07
Fatal and injury (FI)	0.42
Property damage only (PDO)	0.66

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information				Location Information		
Analyst	Ben Erban			City	Route 138 and Robbins Street	
Agency or Company	CTPS			Intersection	Route 138 and Robbins Street	
Date Performed	5/1/2018			Jurisdiction		
				Analysis Year	2014	
Input Data			Base Conditions		Site Conditions	
Intersection type (3ST, 3SG, 4ST, 4SG)			--		4ST	
AADT _{major} (veh/day)		AADT _{MAX} = 46800.00 (veh/day)	--		10,150	
AADT _{minor} (veh/day)		AADT _{MAX} = 5900.00 (veh/day)	--		900	
Intersection lighting (present/not present)			Not Present		Not Present	
Calibration factor, C _i			1.00		1.04	
Data for unsignalized intersections only:						
Number of major-road approaches with left-turn lanes (0,1,2)			--		--	
Number of major-road approaches with right-turn lanes (0,1,2)			--		0	

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bl total}	N _{pedi total}	N _{bikel total}	N _{predictedInt}
1.00	1.00	1.00	1.00	1.00	1.04	0.02	0.01	1.07

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1) Crash Severity Level	(2) SPF Coefficients			(3) Overdispersion Parameter, k	(4) Initial N _{bimv}	(5) Proportion of Total Crashes	(6) Adjusted N _{bimv}	(7) Combined CMFs	(8) Calibration Factor, C _i	(9) Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} * (5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.97	1.00	0.97	1.00	1.04	1.01
Fatal and Injury (FI)	--	--	--	--	0.37	--	0.37	1.00	1.04	0.38
Property Damage Only (PDO)	--	--	--	--	0.61	--	0.61	1.00	1.04	0.63

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1) Collision Type	(2) Proportion of Collision Type(FI)	(3) Adjusted N _{bimv} (FI) (crashes/year)	(4) Proportion of Collision Type (PDO)	(5) Adjusted N _{bimv} (PDO) (crashes/year)	(6) Adjusted N _{bimv} (TOTAL) (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.00	0.38	1.00	0.63	1.01
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.16	0.06	0.19	0.12	0.18
Head-on collision	0.01	0.00	0.02	0.01	0.01
Angle collision	0.82	0.31	0.72	0.45	0.77
Sideswipe	0.02	0.01	0.08	0.05	0.06
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1) Crash Severity Level	(2) SPF Coefficients			(3) Historical Data	(4) Initial N _{bisv}	(5) Proportion of Total Crashes	(6) Adjusted N _{bimv}	(7) Combined CMFs	(8) Calibration Factor, C _i	(9) Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} * (5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.03	0.03	1.00	0.03	1.00	1.04	0.03
Fatal and Injury (FI)	--	--	--	0.30	0.01	--	0.01	1.00	1.04	0.01
Property Damage Only (PDO)	--	--	--	0.70	0.02	--	0.02	1.00	1.04	0.02

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1) Collision Type	(2) Proportion of Collision Type(FI)	(3) Predicted N _{bisv} (FI) (crashes/year)	(4) Proportion of Collision Type (PDO)	(5) Predicted N _{bisv} (PDO) (crashes/year)	(6) Predicted N _{bisv} (TOTAL) (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
Total	1.00	0.01	1.00	0.02	0.03
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.01	0.01
Collision with fixed object	0.68	0.01	0.57	0.01	0.02
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_1	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	1.01	0.03	1.04	0.02	1.04	0.02
Fatal and injury (FI)	--	--	--	--	1.04	0.02

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_1	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	1.01	0.03	1.04	0.01	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.06	0.12	0.18
Head-on collisions (from Worksheet 2D)	0.00	0.01	0.01
Angle collisions (from Worksheet 2D)	0.31	0.45	0.77
Sideswipe (from Worksheet 2D)	0.01	0.05	0.06
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.38	0.63	1.01
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.01	0.01
Collision with fixed object (from Worksheet 2F)	0.01	0.01	0.02
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.02	0.00	0.02
Collision with bicycle (from Worksheet 2J)	0.01	0.00	0.01
Subtotal	0.04	0.02	0.06
Total	0.42	0.65	1.07

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	1.07
Fatal and injury (FI)	0.42
Property damage only (PDO)	0.65

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information			Location Information			
Analyst	Ben Erban		City	Route 138 and Robbins Street		
Agency or Company	CTPS		Intersection	Route 138 and Robbins Street		
Date Performed	5/1/2018		Jurisdiction			
			Analysis Year	2013		
Input Data			Base Conditions		Site Conditions	
Intersection type (3ST, 3SG, 4ST, 4SG)			--		4ST	
AADT _{major} (veh/day)		AADT _{MAX} = 46800.00 (veh/day)	--		10,050	
AADT _{minor} (veh/day)		AADT _{MAX} = 5900.00 (veh/day)	--		900	
Intersection lighting (present/not present)			Not Present		Not Present	
Calibration factor, C _i			1.00		1.04	
Data for unsignalized intersections only:			--		--	
Number of major-road approaches with left-turn lanes (0,1,2)			--		0	
Number of major-road approaches with right-turn lanes (0,1,2)			--		0	

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi total}	N _{pedi total}	N _{bikel total}	N _{predictedInt}
1.00	1.00	1.00	1.00	1.00	1.04	0.02	0.01	1.07

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.97	1.00	0.97	1.00	1.04	1.01
Fatal and Injury (FI)	--	--	--	--	0.37	--	0.37	1.00	1.04	0.38
Property Damage Only (PDO)	--	--	--	--	0.61	--	0.61	1.00	1.04	0.63

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.00	0.38	1.00	0.63	1.01
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.16	0.06	0.19	0.12	0.18
Head-on collision	0.01	0.00	0.02	0.01	0.01
Angle collision	0.82	0.31	0.72	0.45	0.76
Sideswipe	0.02	0.01	0.08	0.05	0.06
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.03	0.03	1.00	0.03	1.00	1.04	0.03
Fatal and Injury (FI)	--	--	--	0.30	0.01	--	0.01	1.00	1.04	0.01
Property Damage Only (PDO)	--	--	--	0.70	0.02	--	0.02	1.00	1.04	0.02

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
Total	1.00	0.01	1.00	0.02	0.03
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.01	0.01
Collision with fixed object	0.68	0.01	0.57	0.01	0.02
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	1.01	0.03	1.04	0.02	1.04	0.02
Fatal and injury (FI)	--	--	--	--	1.04	0.02

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	1.01	0.03	1.04	0.01	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.06	0.12	0.18
Head-on collisions (from Worksheet 2D)	0.00	0.01	0.01
Angle collisions (from Worksheet 2D)	0.31	0.45	0.76
Sideswipe (from Worksheet 2D)	0.01	0.05	0.06
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.38	0.63	1.01
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.01	0.01
Collision with fixed object (from Worksheet 2F)	0.01	0.01	0.02
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.02	0.00	0.02
Collision with bicycle (from Worksheet 2J)	0.01	0.00	0.01
Subtotal	0.04	0.02	0.06
Total	0.42	0.65	1.07

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	1.07
Fatal and injury (FI)	0.42
Property damage only (PDO)	0.65

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information			Location Information			
Analyst	Ben Erban		City	Route 138 and Robbins Street		
Agency or Company	CTPS		Intersection	Route 138 and Robbins Street		
Date Performed	5/1/2018		Jurisdiction			
			Analysis Year	2012		
Input Data			Base Conditions		Site Conditions	
Intersection type (3ST, 3SG, 4ST, 4SG)			--		4ST	
AADT _{major} (veh/day)	AADT _{MAX} = 46800.00 (veh/day)		--		10,000	
AADT _{minor} (veh/day)	AADT _{MAX} = 5900.00 (veh/day)		--		850	
Intersection lighting (present/not present)			Not Present		Not Present	
Calibration factor, C _i			1.00		1.04	
Data for unsignalized intersections only:			--		--	
Number of major-road approaches with left-turn lanes (0,1,2)			--		0	
Number of major-road approaches with right-turn lanes (0,1,2)			--		0	

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi total}	N _{pedi total}	N _{bikel total}	N _{predictedInt}
1.00	1.00	1.00	1.00	1.00	0.99	0.02	0.01	1.02

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} * (5)			(7) from Worksheet 2B
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.92	1.00	0.92	1.00	1.04	0.96
Fatal and Injury (FI)	--	--	--	--	0.35	--	0.35	1.00	1.04	0.36
Property Damage Only (PDO)	--	--	--	--	0.58	--	0.58	1.00	1.04	0.60

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.36	1.00	0.60	0.96
Rear-end collision	0.16	0.06	0.19	0.11	0.17
Head-on collision	0.01	0.00	0.02	0.01	0.01
Angle collision	0.82	0.30	0.72	0.43	0.73
Sideswipe	0.02	0.01	0.08	0.05	0.05
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} * (5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.03	0.03	1.00	0.03	1.00	1.04	0.03
Fatal and Injury (FI)	--	--	--	0.30	0.01	--	0.01	1.00	1.04	0.01
Property Damage Only (PDO)	--	--	--	0.70	0.02	--	0.02	1.00	1.04	0.02

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.01	1.00	0.02	0.03
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.01	0.01
Collision with fixed object	0.68	0.01	0.57	0.01	0.02
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.96	0.03	0.99	0.02	1.04	0.02
Fatal and injury (FI)	--	--	--	--	1.04	0.02

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	0.96	0.03	0.99	0.01	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.06	0.11	0.17
Head-on collisions (from Worksheet 2D)	0.00	0.01	0.01
Angle collisions (from Worksheet 2D)	0.30	0.43	0.73
Sideswipe (from Worksheet 2D)	0.01	0.05	0.05
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.36	0.60	0.96
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.01	0.01
Collision with fixed object (from Worksheet 2F)	0.01	0.01	0.02
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.02	0.00	0.02
Collision with bicycle (from Worksheet 2J)	0.01	0.00	0.01
Subtotal	0.03	0.02	0.05
Total	0.40	0.62	1.02

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	1.02
Fatal and injury (FI)	0.40
Property damage only (PDO)	0.62

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information				Location Information		
Analyst	Ben Erban			City	Route 138 and Robbins Street	
Agency or Company	CTPS			Intersection	Route 138 and Robbins Street	
Date Performed	5/1/2018			Jurisdiction		
				Analysis Year	2011	
Input Data			Base Conditions		Site Conditions	
Intersection type (3ST, 3SG, 4ST, 4SG)			--		4ST	
AADT _{major} (veh/day)	AADT _{MAX} = 46800.00 (veh/day)		--		9,850	
AADT _{minor} (veh/day)	AADT _{MAX} = 5900.00 (veh/day)		--		850	
Intersection lighting (present/not present)			Not Present		Not Present	
Calibration factor, C _i			1.00		1.04	
Data for unsignalized intersections only:			--		--	
Number of major-road approaches with left-turn lanes (0,1,2)			--		0	
Number of major-road approaches with right-turn lanes (0,1,2)			--		0	

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bl total}	N _{pedi total}	N _{bikel total}	N _{predictedInt}
1.00	1.00	1.00	1.00	1.00	0.99	0.02	0.01	1.01

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.92	1.00	0.92	1.00	1.04	0.96
Fatal and Injury (FI)	--	--	--	--	0.35	--	0.35	1.00	1.04	0.36
Property Damage Only (PDO)	--	--	--	--	0.57	--	0.57	1.00	1.04	0.60

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.36	1.00	0.60	0.96
Rear-end collision	0.16	0.06	0.19	0.11	0.17
Head-on collision	0.01	0.00	0.02	0.01	0.01
Angle collision	0.82	0.29	0.72	0.43	0.72
Sideswipe	0.02	0.01	0.08	0.05	0.05
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.03	0.03	1.00	0.03	1.00	1.04	0.03
Fatal and Injury (FI)	--	--	--	0.30	0.01	--	0.01	1.00	1.04	0.01
Property Damage Only (PDO)	--	--	--	0.70	0.02	--	0.02	1.00	1.04	0.02

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.01	1.00	0.02	0.03
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.01	0.01
Collision with fixed object	0.68	0.01	0.57	0.01	0.02
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.96	0.03	0.99	0.02	1.04	0.02
Fatal and injury (FI)	--	--	--	--	1.04	0.02

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	0.96	0.03	0.99	0.01	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.06	0.11	0.17
Head-on collisions (from Worksheet 2D)	0.00	0.01	0.01
Angle collisions (from Worksheet 2D)	0.29	0.43	0.72
Sideswipe (from Worksheet 2D)	0.01	0.05	0.05
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.36	0.60	0.96
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.01	0.01
Collision with fixed object (from Worksheet 2F)	0.01	0.01	0.02
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.02	0.00	0.02
Collision with bicycle (from Worksheet 2J)	0.01	0.00	0.01
Subtotal	0.03	0.02	0.05
Total	0.39	0.62	1.01

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	1.01
Fatal and injury (FI)	0.39
Property damage only (PDO)	0.62

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	138 at Blue Hill Terrace Street and Cheever
Agency or Company	CTPS	Intersection Type	4SG
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	3	3	1.56	1.84	2.78
2014	2	2	1.55	1.82	2.78
2013	0	0	1.53	1.80	2.78
2012	4	4	1.50	1.77	2.78
2011	1	1	1.46	1.72	2.78

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
10.00	2.00	7.61	1.79	0.05	0.58	8.61	2.04	1.99	Y	0.20	Y
							2.02				
							2.00				
							1.96				
							1.91				

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Blue Hill Terrace Street and Cheever Street
Date Performed	5/1/2018	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2015
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67,700 (veh/day)	--	10,250
AADT _{minor} (veh/day)	AADT _{MAX} = 33,400 (veh/day)	--	1,850
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.00
Data for signalized intersections only:			
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	2
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	2
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only		--	0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	2
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.884	1.000	0.960	1.000	2.780	1.000	1.000	1.638	0.130	0.069	1.838

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.88	1.00	0.96	1.00	1.00	0.85

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-11.79	0.92	0.52	0.10	1.84	1.00	1.84	0.85	1.00	1.56
Fatal and Injury (FI)	--	--	--	--	0.51	--	0.51	0.85	1.00	0.43
Property Damage Only (PDO)	--	--	--	--	1.33	--	1.33	0.85	1.00	1.13

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.43	1.00	1.13	1.56
Rear-end collision	0.45	0.20	0.42	0.48	0.67
Head-on collision	0.04	0.02	0.04	0.04	0.06
Angle collision	0.49	0.21	0.43	0.48	0.69
Sideswipe	0.02	0.01	0.11	0.13	0.14
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.05	0.09	1.00	0.09	0.85	1.00	0.08
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.85	1.00	0.01
Property Damage Only (PDO)	--	--	--	0.82	0.07	--	0.07	0.85	1.00	0.06

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
Total	1.00	0.01	1.00	0.06	0.08
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.05	0.06
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.56	0.08	1.64	0.03	0.05	1.00	0.13
Fatal and injury (FI)	--	--	--	--	--	1.00	0.13

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.56	0.08	1.64	0.04	1.00	0.07
Fatal and injury (FI)	--	--	--	--	1.00	0.07

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F (6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.20	0.48	0.67
Head-on collisions (from Worksheet 2D)	0.02	0.04	0.06
Angle collisions (from Worksheet 2D)	0.21	0.48	0.69
Sideswipe (from Worksheet 2D)	0.01	0.13	0.14
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.43	1.13	1.56
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.01	0.05	0.06
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.13	0.00	0.13
Collision with bicycle (from Worksheet 2J)	0.07	0.00	0.07
Subtotal	0.21	0.06	0.28
Total	0.65	1.19	1.84

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.84
Fatal and injury (FI)	0.65
Property damage only (PDO)	1.19

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections				
General Information			Location Information	
Analyst	Ben Erban		City	Milton
Agency or Company	CTPS		Intersection	Route 138 at Blue Hill Terrace Street and Cheever Street
Date Performed	5/1/2018		Jurisdiction	MassDOT Highway District 6
			Analysis Year	2014
Input Data			Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)			--	4SG
AADT _{major} (veh/day)			AADT _{MAX} = 67,700 (veh/day)	10,150
AADT _{minor} (veh/day)			AADT _{MAX} = 33,400 (veh/day)	1,850
Intersection lighting (present/not present)			Not Present	Not Present
Calibration factor, C _i			1.00	1.00
Data for signalized intersections only:				
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]			--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]			--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]			--	2
Type of left-turn signal phasing for Leg #1			Permissive	Permissive
Type of left-turn signal phasing for Leg #2			--	Permissive
Type of left-turn signal phasing for Leg #3			--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)			--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]			0	2
Intersection red light cameras (present/not present)			Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			--	0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})			--	2
Number of bus stops within 300 m (1,000 ft) of the intersection			0	2
Schools within 300 m (1,000 ft) of the intersection (present/not present)			Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection			0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.884	1.000	0.960	1.000	2.780	1.000	1.000	1.623	0.129	0.069	1.821

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.88	1.00	0.96	1.00	1.00	0.85

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-11.79	0.92	0.52	0.10	1.82	1.00	1.82	0.85	1.00	1.55
Fatal and Injury (FI)	--	--	--	--	0.51	--	0.51	0.85	1.00	0.43
Property Damage Only (PDO)	--	--	--	--	1.32	--	1.32	0.85	1.00	1.12

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.43	1.00	1.12	1.55
Rear-end collision	0.45	0.19	0.42	0.47	0.67
Head-on collision	0.04	0.02	0.04	0.04	0.06
Angle collision	0.49	0.21	0.43	0.48	0.69
Sideswipe	0.02	0.01	0.11	0.13	0.13
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.05	0.09	1.00	0.09	0.85	1.00	0.08
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.85	1.00	0.01
Property Damage Only (PDO)	--	--	--	0.82	0.07	--	0.07	0.85	1.00	0.06

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.01	1.00	0.06	0.08
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.05	0.06
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.55	0.08	1.62	0.03	0.05	1.00	0.13
Fatal and injury (FI)	--	--	--	--	--	1.00	0.13

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.55	0.08	1.62	0.04	1.00	0.07
Fatal and injury (FI)	--	--	--	--	1.00	0.07

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.19	0.47	0.67
Head-on collisions (from Worksheet 2D)	0.02	0.04	0.06
Angle collisions (from Worksheet 2D)	0.21	0.48	0.69
Sideswipe (from Worksheet 2D)	0.01	0.13	0.13
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.43	1.12	1.55
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.01	0.05	0.06
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.13	0.00	0.13
Collision with bicycle (from Worksheet 2J)	0.07	0.00	0.07
Subtotal	0.21	0.06	0.27
Total	0.64	1.18	1.82

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.82
Fatal and injury (FI)	0.64
Property damage only (PDO)	1.18

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Blue Hill Terrace Street and Cheever Street
Date Performed	5/1/2018	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2013
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67,700 (veh/day)	--	10,050
AADT _{minor} (veh/day)	AADT _{MAX} = 33,400 (veh/day)	--	1,850
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.00
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	2
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	2
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only		--	0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	2
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.884	1.000	0.960	1.000	2.780	1.000	1.000	1.609	0.128	0.068	1.805

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.88	1.00	0.96	1.00	1.00	0.85

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-11.79	0.92	0.52	0.10	1.81	1.00	1.81	0.85	1.00	1.53
Fatal and Injury (FI)	--	--	--	--	0.50	--	0.50	0.85	1.00	0.43
Property Damage Only (PDO)	--	--	--	--	1.30	--	1.30	0.85	1.00	1.11

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.00	0.43	1.00	1.11	1.53
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.45	0.19	0.42	0.47	0.66
Head-on collision	0.04	0.02	0.04	0.04	0.06
Angle collision	0.49	0.21	0.43	0.47	0.68
Sideswipe	0.02	0.01	0.11	0.12	0.13
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} *(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	--	--	--	0.05	0.09	1.00	0.09	0.85	1.00	0.08
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.85	1.00	0.01
Property Damage Only (PDO)	--	--	--	0.82	0.07	--	0.07	0.85	1.00	0.06

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.01	1.00	0.06	0.08
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.05	0.06
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.53	0.08	1.61	0.03	0.05	1.00	0.13
Fatal and injury (FI)	--	--	--	--	--	1.00	0.13

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.53	0.08	1.61	0.04	1.00	0.07
Fatal and injury (FI)	--	--	--	--	1.00	0.07

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F (6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.19		0.47
Head-on collisions (from Worksheet 2D)	0.02		0.04
Angle collisions (from Worksheet 2D)	0.21		0.47
Sideswipe (from Worksheet 2D)	0.01		0.12
Other multiple-vehicle collision (from Worksheet 2D)	0.00		0.00
Subtotal	0.43		1.11
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00		0.00
Collision with animal (from Worksheet 2F)	0.00		0.00
Collision with fixed object (from Worksheet 2F)	0.01		0.05
Collision with other object (from Worksheet 2F)	0.00		0.00
Other single-vehicle collision (from Worksheet 2F)	0.00		0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00		0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.13		0.00
Collision with bicycle (from Worksheet 2J)	0.07		0.00
Subtotal	0.21		0.06
Total	0.64		1.17

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.80
Fatal and injury (FI)	0.64
Property damage only (PDO)	1.17

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information				Location Information		
Analyst	Ben Erban			City	Milton	
Agency or Company	CTPS			Intersection	Route 138 at Blue Hill Terrace Street and Cheever Street	
Date Performed	5/1/2018			Jurisdiction	MassDOT Highway District 6	
				Analysis Year	2012	
Input Data				Base Conditions		Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)				--		4SG
AADT _{major} (veh/day)		AADT _{MAX} = 67,700 (veh/day)		--		10,000
AADT _{minor} (veh/day)		AADT _{MAX} = 33,400 (veh/day)		--		1,800
Intersection lighting (present/not present)				Not Present		Not Present
Calibration factor, C _i				1.00		1.00
Data for signalized intersections only:				--		--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]				--		0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]				--		0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]				--		2
Type of left-turn signal phasing for Leg #1				Permissive		Permissive
Type of left-turn signal phasing for Leg #2				--		Permissive
Type of left-turn signal phasing for Leg #3				--		Protected
Type of left-turn signal phasing for Leg #4 (if applicable)				--		Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]				0		2
Intersection red light cameras (present/not present)				Not Present		Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only						0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})				--		2
Number of bus stops within 300 m (1,000 ft) of the intersection				0		2
Schools within 300 m (1,000 ft) of the intersection (present/not present)				Not Present		Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection				0		0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.884	1.000	0.960	1.000	2.780	1.000	1.000	1.579	0.126	0.067	1.771

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.88	1.00	0.96	1.00	1.00	0.85

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections															
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)					
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}					
	from Table 12-10										from Table 12-10	from Equation 12-21	(4) _{TOTAL} *(5)	(7) from Worksheet 2B	(6)*(7)*(8)
	a	b	c												
Total	-11.79	0.92	0.52	0.10	1.77	1.00	1.77	0.85	1.00	1.50					
Fatal and Injury (FI)	--	--	--	--	0.49	--	0.49	0.85	1.00	0.42					
Property Damage Only (PDO)	--	--	--	--	1.28	--	1.28	0.85	1.00	1.09					

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.00	0.42	1.00	1.09	1.50
Rear-end collision	0.45	0.19	0.42	0.46	0.65
Head-on collision	0.04	0.02	0.04	0.04	0.06
Angle collision	0.49	0.21	0.43	0.46	0.67
Sideswipe	0.02	0.01	0.11	0.12	0.13
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections															
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)					
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}					
	from Table 12-12										from Table 1A	(3) * (4) From Worksheet 2C	(4) _{TOTAL} *(5)	(7) from Worksheet 2B	(6)*(7)*(8)
	a	b	c												
Total	--	--	--	0.05	0.09	1.00	0.09	0.85	1.00	0.07					
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.85	1.00	0.01					
Property Damage Only (PDO)	--	--	--	0.82	0.07	--	0.07	0.85	1.00	0.06					

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
Total	1.00	0.01	1.00	0.06	0.07
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.05	0.06
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.50	0.07	1.58	0.03	0.05	1.00	0.13
Fatal and injury (FI)	--	--	--	--	--	1.00	0.13

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.50	0.07	1.58	0.04	1.00	0.07
Fatal and injury (FI)	--	--	--	--	1.00	0.07

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.19	0.46	0.65
Head-on collisions (from Worksheet 2D)	0.02	0.04	0.06
Angle collisions (from Worksheet 2D)	0.21	0.46	0.67
Sideswipe (from Worksheet 2D)	0.01	0.12	0.13
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.42	1.09	1.50
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.01	0.05	0.06
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.13	0.00	0.13
Collision with bicycle (from Worksheet 2J)	0.07	0.00	0.07
Subtotal	0.21	0.06	0.27
Total	0.62	1.15	1.77

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.77
Fatal and injury (FI)	0.62
Property damage only (PDO)	1.15

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 at Blue Hill Terrace Street and Cheever Street
Date Performed	5/1/2018	Jurisdiction	MassDOT Highway District 6
		Analysis Year	2011
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT _{major} (veh/day)	AADT _{MAX} = 67,700 (veh/day)	--	9,850
AADT _{minor} (veh/day)	AADT _{MAX} = 33,400 (veh/day)	--	1,750
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	1.00
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	2
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	2
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	2
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.884	1.000	0.960	1.000	2.780	1.000	1.000	1.534	0.122	0.065	1.721

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.88	1.00	0.96	1.00	1.00	0.85

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-11.79	0.92	0.52	0.10	1.72	1.00	1.72	0.85	1.00	1.46
Fatal and Injury (FI)	--	--	--	--	0.48	--	0.48	0.85	1.00	0.41
Property Damage Only (PDO)	--	--	--	--	1.24	--	1.24	0.85	1.00	1.06

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.00	0.41	1.00	1.06	1.46
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.45	0.18	0.42	0.45	0.63
Head-on collision	0.04	0.01	0.04	0.04	0.06
Angle collision	0.49	0.20	0.43	0.45	0.65
Sideswipe	0.02	0.01	0.11	0.12	0.13
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.05	0.08	1.00	0.08	0.85	1.00	0.07
Fatal and Injury (FI)	--	--	--	0.18	0.02	--	0.02	0.85	1.00	0.01
Property Damage Only (PDO)	--	--	--	0.82	0.07	--	0.07	0.85	1.00	0.06

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type ^(FI)	Predicted N ^{bisv (FI)} (crashes/year)	Proportion of Collision Type (PDO)	Predicted N ^{bisv (PDO)} (crashes/year)	Predicted N ^{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) ^{FI} from Worksheet 2E	from Table 12-13	(9) ^{PDO} from Worksheet 2E	(9) ^{PDO} from Worksheet 2E
Total	1.00	0.01	1.00	0.06	0.07
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.03	0.00	0.00
Collision with animal	0.00	0.00	0.03	0.00	0.00
Collision with fixed object	0.63	0.01	0.86	0.05	0.06
Collision with other object	0.00	0.00	0.06	0.00	0.00
Other single-vehicle collision	0.13	0.00	0.03	0.00	0.00
Single-vehicle noncollision	0.25	0.00	0.00	0.00	0.00

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p}	CMF _{2p}	CMF _{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.00	2.78

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.46	0.07	1.53	0.03	0.04	1.00	0.12
Fatal and injury (FI)	--	--	--	--	--	1.00	0.12

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.46	0.07	1.53	0.04	1.00	0.07
Fatal and injury (FI)	--	--	--	--	1.00	0.07

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Property damage only (PDO)
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F
			(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.18		0.45
Head-on collisions (from Worksheet 2D)	0.01		0.04
Angle collisions (from Worksheet 2D)	0.20		0.45
Sideswipe (from Worksheet 2D)	0.01		0.12
Other multiple-vehicle collision (from Worksheet 2D)	0.00		0.00
Subtotal	0.41		1.06
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00		0.00
Collision with animal (from Worksheet 2F)	0.00		0.00
Collision with fixed object (from Worksheet 2F)	0.01		0.05
Collision with other object (from Worksheet 2F)	0.00		0.00
Other single-vehicle collision (from Worksheet 2F)	0.00		0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00		0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.12		0.00
Collision with bicycle (from Worksheet 2J)	0.07		0.00
Subtotal	0.20		0.06
Total	0.61		1.11

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.72
Fatal and injury (FI)	0.61
Property damage only (PDO)	1.11

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 138 and Oak Street
Agency or Company	CTPS	Intersection Type	4ST
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	1	1	0.40	0.41	1.00
2014	0	0	0.40	0.41	1.00
2013	1	1	0.39	0.41	1.00
2012	0	0	0.39	0.41	1.00
2011	0	0	0.39	0.40	1.00

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
2.00	0.40	1.97	0.41	0.00	0.58	1.98	0.44	0.44	Y	0.04	N
							0.44				
							0.44				
							0.44				
							0.44				

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information				Location Information		
Analyst	Ben Erban			City	Milton	
Agency or Company	CTPS			Intersection	Route 138 and Oak Street	
Date Performed	5/1/2018			Jurisdiction	MassDOT District 6	
Input Data				Analysis Year	2015	
Intersection type (3ST, 3SG, 4ST, 4SG)				Base Conditions	Site Conditions	
AADT _{major} (veh/day)				--	4ST	
AADT _{major} (veh/day)		AADT _{MAX} = 46800.00 (veh/day)		--	10,250	
AADT _{minor} (veh/day)		AADT _{MAX} = 5900.00 (veh/day)		--	300	
Intersection lighting (present/not present)				Not Present	Not Present	
Calibration factor, C _i				1.00	1.04	
Data for unsignalized intersections only:						
Number of major-road approaches with left-turn lanes (0,1,2)				--	--	
Number of major-road approaches with right-turn lanes (0,1,2)				--	0	
				--	0	

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi total}	N _{pedi total}	N _{bikel total}	N _{predictedInt}
1.00	1.00	1.00	1.00	1.00	0.41	0.01	0.00	0.42

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} * (5)			(7) from Worksheet 2B
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.38	1.00	0.38	1.00	1.04	0.40
Fatal and Injury (FI)	--	--	--	--	0.14	--	0.14	1.00	1.04	0.15
Property Damage Only (PDO)	--	--	--	--	0.24	--	0.24	1.00	1.04	0.25

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.15	1.00	0.25	0.40
Rear-end collision	0.16	0.02	0.19	0.05	0.07
Head-on collision	0.01	0.00	0.02	0.00	0.00
Angle collision	0.82	0.12	0.72	0.18	0.30
Sideswipe	0.02	0.00	0.08	0.02	0.02
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} * (5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.03	0.01	1.00	0.01	1.00	1.04	0.01
Fatal and Injury (FI)	--	--	--	0.30	0.00	--	0.00	1.00	1.04	0.00
Property Damage Only (PDO)	--	--	--	0.70	0.01	--	0.01	1.00	1.04	0.01

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.00	1.00	0.01	0.01
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.00	0.00
Collision with fixed object	0.68	0.00	0.57	0.00	0.01
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.40	0.01	0.41	0.02	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	0.40	0.01	0.41	0.01	1.04	0.00
Fatal and injury (FI)	--	--	--	--	1.04	0.00

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.02	0.05	0.07
Head-on collisions (from Worksheet 2D)	0.00	0.00	0.00
Angle collisions (from Worksheet 2D)	0.12	0.18	0.30
Sideswipe (from Worksheet 2D)	0.00	0.02	0.02
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.15	0.25	0.40
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.00	0.00	0.01
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.01	0.00	0.01
Collision with bicycle (from Worksheet 2J)	0.00	0.00	0.00
Subtotal	0.01	0.01	0.02
Total	0.16	0.26	0.42

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.42
Fatal and injury (FI)	0.16
Property damage only (PDO)	0.26

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information				Location Information		
Analyst	Ben Erban			City	Milton	
Agency or Company	CTPS			Intersection	Route 138 and Oak Street	
Date Performed	5/1/2018			Jurisdiction	MassDOT District 6	
				Analysis Year	2014	
Input Data			Base Conditions		Site Conditions	
Intersection type (3ST, 3SG, 4ST, 4SG)			--		4ST	
AADT _{major} (veh/day)		AADT _{MAX} = 46800.00 (veh/day)	--		10,150	
AADT _{minor} (veh/day)		AADT _{MAX} = 5900.00 (veh/day)	--		300	
Intersection lighting (present/not present)			Not Present		Not Present	
Calibration factor, C _i			1.00		1.04	
Data for unsignalized intersections only:			--		--	
Number of major-road approaches with left-turn lanes (0,1,2)			--		0	
Number of major-road approaches with right-turn lanes (0,1,2)			--		0	

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi total}	N _{pedi total}	N _{bikel total}	N _{predictedInt}
1.00	1.00	1.00	1.00	1.00	0.41	0.01	0.00	0.42

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.38	1.00	0.38	1.00	1.04	0.40
Fatal and Injury (FI)	--	--	--	--	0.14	--	0.14	1.00	1.04	0.15
Property Damage Only (PDO)	--	--	--	--	0.24	--	0.24	1.00	1.04	0.25

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
Total	1.00	0.15	1.00	0.25	0.40
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Rear-end collision	0.16	0.02	0.19	0.05	0.07
Head-on collision	0.01	0.00	0.02	0.00	0.00
Angle collision	0.82	0.12	0.72	0.18	0.30
Sideswipe	0.02	0.00	0.08	0.02	0.02
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.03	0.01	1.00	0.01	1.00	1.04	0.01
Fatal and Injury (FI)	--	--	--	0.30	0.00	--	0.00	1.00	1.04	0.00
Property Damage Only (PDO)	--	--	--	0.70	0.01	--	0.01	1.00	1.04	0.01

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
Total	1.00	0.00	1.00	0.01	0.01
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.00	0.00
Collision with fixed object	0.68	0.00	0.57	0.00	0.01
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.40	0.01	0.41	0.02	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	0.40	0.01	0.41	0.01	1.04	0.00
Fatal and injury (FI)	--	--	--	--	1.04	0.00

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.02	0.05	0.07
Head-on collisions (from Worksheet 2D)	0.00	0.00	0.00
Angle collisions (from Worksheet 2D)	0.12	0.18	0.30
Sideswipe (from Worksheet 2D)	0.00	0.02	0.02
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.15	0.25	0.40
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.00	0.00	0.01
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.01	0.00	0.01
Collision with bicycle (from Worksheet 2J)	0.00	0.00	0.00
Subtotal	0.01	0.01	0.02
Total	0.16	0.26	0.42

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.42
Fatal and injury (FI)	0.16
Property damage only (PDO)	0.26

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information			Location Information			
Analyst	Ben Erban		City	Milton		
Agency or Company	CTPS		Intersection	Route 138 and Oak Street		
Date Performed	5/1/2018		Jurisdiction	MassDOT District 6		
Input Data			Base Conditions		Site Conditions	
Intersection type (3ST, 3SG, 4ST, 4SG)			--		4ST	
AADT _{major} (veh/day)		AADT _{MAX} = 46800.00 (veh/day)	--		10,050	
AADT _{minor} (veh/day)		AADT _{MAX} = 5900.00 (veh/day)	--		300	
Intersection lighting (present/not present)			Not Present		Not Present	
Calibration factor, C _i			1.00		1.04	
Data for unsignalized intersections only:						
Number of major-road approaches with left-turn lanes (0,1,2)			--		0	
Number of major-road approaches with right-turn lanes (0,1,2)			--		0	

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi total}	N _{pedi total}	N _{bikel total}	N _{predictedInt}
1.00	1.00	1.00	1.00	1.00	0.41	0.01	0.00	0.42

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.38	1.00	0.38	1.00	1.04	0.39
Fatal and Injury (FI)	--	--	--	--	0.14	--	0.14	1.00	1.04	0.15
Property Damage Only (PDO)	--	--	--	--	0.24	--	0.24	1.00	1.04	0.25

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.15	1.00	0.25	0.39
Rear-end collision	0.16	0.02	0.19	0.05	0.07
Head-on collision	0.01	0.00	0.02	0.00	0.00
Angle collision	0.82	0.12	0.72	0.18	0.30
Sideswipe	0.02	0.00	0.08	0.02	0.02
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.03	0.01	1.00	0.01	1.00	1.04	0.01
Fatal and Injury (FI)	--	--	--	0.30	0.00	--	0.00	1.00	1.04	0.00
Property Damage Only (PDO)	--	--	--	0.70	0.01	--	0.01	1.00	1.04	0.01

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.00	1.00	0.01	0.01
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.00	0.00
Collision with fixed object	0.68	0.00	0.57	0.00	0.01
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.39	0.01	0.41	0.02	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	0.39	0.01	0.41	0.01	1.04	0.00
Fatal and injury (FI)	--	--	--	--	1.04	0.00

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.02	0.05	0.07
Head-on collisions (from Worksheet 2D)	0.00	0.00	0.00
Angle collisions (from Worksheet 2D)	0.12	0.18	0.30
Sideswipe (from Worksheet 2D)	0.00	0.02	0.02
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.15	0.25	0.39
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.00	0.00	0.01
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.01	0.00	0.01
Collision with bicycle (from Worksheet 2J)	0.00	0.00	0.00
Subtotal	0.01	0.01	0.02
Total	0.16	0.25	0.42

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.42
Fatal and injury (FI)	0.16
Property damage only (PDO)	0.25

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information			Location Information			
Analyst	Ben Erban		City	Milton		
Agency or Company	CTPS		Intersection	Route 138 and Oak Street		
Date Performed	5/1/2018		Jurisdiction	MassDOT District 6		
Input Data			Analysis Year	2012		
Intersection type (3ST, 3SG, 4ST, 4SG)			Base Conditions	Site Conditions		
AADT _{major} (veh/day)			--	4ST		
AADT _{minor} (veh/day)			--	10,000		
Intersection lighting (present/not present)			Not Present	Not Present		
Calibration factor, C _i			1.00	1.04		
Data for unsignalized intersections only:						
Number of major-road approaches with left-turn lanes (0,1,2)			--	--		
Number of major-road approaches with right-turn lanes (0,1,2)			--	0		
			--	0		

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi total}	N _{pedi total}	N _{bikel total}	N _{predictedInt}
1.00	1.00	1.00	1.00	1.00	0.41	0.01	0.00	0.42

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.38	1.00	0.38	1.00	1.04	0.39
Fatal and Injury (FI)	--	--	--	--	0.14	--	0.14	1.00	1.04	0.15
Property Damage Only (PDO)	--	--	--	--	0.24	--	0.24	1.00	1.04	0.25

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.15	1.00	0.25	0.39
Rear-end collision	0.16	0.02	0.19	0.05	0.07
Head-on collision	0.01	0.00	0.02	0.00	0.00
Angle collision	0.82	0.12	0.72	0.18	0.30
Sideswipe	0.02	0.00	0.08	0.02	0.02
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.03	0.01	1.00	0.01	1.00	1.04	0.01
Fatal and Injury (FI)	--	--	--	0.30	0.00	--	0.00	1.00	1.04	0.00
Property Damage Only (PDO)	--	--	--	0.70	0.01	--	0.01	1.00	1.04	0.01

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.00	1.00	0.01	0.01
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.00	0.00
Collision with fixed object	0.68	0.00	0.57	0.00	0.01
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.39	0.01	0.41	0.02	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	0.39	0.01	0.41	0.01	1.04	0.00
Fatal and injury (FI)	--	--	--	--	1.04	0.00

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.02	0.05	0.07
Head-on collisions (from Worksheet 2D)	0.00	0.00	0.00
Angle collisions (from Worksheet 2D)	0.12	0.18	0.30
Sideswipe (from Worksheet 2D)	0.00	0.02	0.02
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.15	0.25	0.39
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.00	0.00	0.01
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.01	0.00	0.01
Collision with bicycle (from Worksheet 2J)	0.00	0.00	0.00
Subtotal	0.01	0.01	0.02
Total	0.16	0.25	0.42

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.42
Fatal and injury (FI)	0.16
Property damage only (PDO)	0.25

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections						
General Information			Location Information			
Analyst	Ben Erban		City	Milton		
Agency or Company	CTPS		Intersection	Route 138 and Oak Street		
Date Performed	5/1/2018		Jurisdiction	MassDOT District 6		
Input Data			Base Conditions		Site Conditions	
Intersection type (3ST, 3SG, 4ST, 4SG)			--		4ST	
AADT _{major} (veh/day)		AADT _{MAX} = 46800.00 (veh/day)	--		9,850	
AADT _{minor} (veh/day)		AADT _{MAX} = 5900.00 (veh/day)	--		300	
Intersection lighting (present/not present)			Not Present		Not Present	
Calibration factor, C _i			1.00		1.04	
Data for unsignalized intersections only:			--		--	
Number of major-road approaches with left-turn lanes (0,1,2)			--		0	
Number of major-road approaches with right-turn lanes (0,1,2)			--		0	

SUMMARY OF INTERSECTION & CRASHES								
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	N _{bi total}	N _{pedi total}	N _{bikel total}	N _{predictedInt}
1.00	1.00	1.00	1.00	1.00	0.40	0.01	0.00	0.41

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		(4) _{TOTAL} * (5)			(7) from Worksheet 2B
	a	b	c							
Total	-8.70	0.31	0.86	0.36	0.38	1.00	0.38	1.00	1.04	0.39
Fatal and Injury (FI)	--	--	--	--	0.14	--	0.14	1.00	1.04	0.15
Property Damage Only (PDO)	--	--	--	--	0.23	--	0.23	1.00	1.04	0.24

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.15	1.00	0.24	0.39
Rear-end collision	0.16	0.02	0.19	0.05	0.07
Head-on collision	0.01	0.00	0.02	0.00	0.00
Angle collision	0.82	0.12	0.72	0.18	0.30
Sideswipe	0.02	0.00	0.08	0.02	0.02
Other multiple-vehicle collision	0.00	0.00	0.00	0.00	0.00

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-12			from Table 1A	(3) * (4) From Worksheet 2C		(4) _{TOTAL} * (5)			(7) from Worksheet 2B
	a	b	c							
Total	--	--	--	0.03	0.01	1.00	0.01	1.00	1.04	0.01
Fatal and Injury (FI)	--	--	--	0.30	0.00	--	0.00	1.00	1.04	0.00
Property Damage Only (PDO)	--	--	--	0.70	0.01	--	0.01	1.00	1.04	0.01

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{PDO} from Worksheet 2E
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.00	0.00	1.00	0.01	0.01
Collision with parked vehicle	0.00	0.00	0.14	0.00	0.00
Collision with animal	0.00	0.00	0.29	0.00	0.00
Collision with fixed object	0.68	0.00	0.57	0.00	0.01
Collision with other object	0.09	0.00	0.00	0.00	0.00
Other single-vehicle collision	0.05	0.00	0.00	0.00	0.00
Single-vehicle noncollision	0.18	0.00	0.00	0.00	0.00

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh- Ped ω	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 1B		(4)*(5)*(6)
Total	0.39	0.01	0.40	0.02	1.04	0.01
Fatal and injury (FI)	--	--	--	--	1.04	0.01

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{bisv}	Predicted N_{bi}	Veh-Bike ω	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	(4) * (5)		(4)*(5)*(6)
Total	0.39	0.01	0.40	0.01	1.04	0.00
Fatal and injury (FI)	--	--	--	--	1.04	0.00

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from Worksheet 2G and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.02	0.05	0.07
Head-on collisions (from Worksheet 2D)	0.00	0.00	0.00
Angle collisions (from Worksheet 2D)	0.12	0.18	0.30
Sideswipe (from Worksheet 2D)	0.00	0.02	0.02
Other multiple-vehicle collision (from Worksheet 2D)	0.00	0.00	0.00
Subtotal	0.15	0.24	0.39
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.00	0.00	0.00
Collision with animal (from Worksheet 2F)	0.00	0.00	0.00
Collision with fixed object (from Worksheet 2F)	0.00	0.00	0.01
Collision with other object (from Worksheet 2F)	0.00	0.00	0.00
Other single-vehicle collision (from Worksheet 2F)	0.00	0.00	0.00
Single-vehicle noncollision (from Worksheet 2F)	0.00	0.00	0.00
Collision with pedestrian (from Worksheet 2G or 2I)	0.01	0.00	0.01
Collision with bicycle (from Worksheet 2J)	0.00	0.00	0.00
Subtotal	0.01	0.01	0.02
Total	0.16	0.25	0.41

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.41
Fatal and injury (FI)	0.16
Property damage only (PDO)	0.25

MassDOT Urban and Suburban Intersection High-Risk Site Method

General Information		Location Information	
Analyst	Ben Erban	Intersection	Route 138 and Brook Road
Agency or Company	CTPS	Intersection Type	3SG
Date Performed	May-18	Jurisdiction	MassDOT Highwat District 6
City	Milton	Analysis Year	2018

Input Information					
Year	Oserved MV crashes	Observed total crashes	Predicted MV crashes	Predicted total crashes	Combined CMF for veh-ped crashes
2015	3	4	1.41	1.70	5.60
2014	1	1	1.40	1.69	5.60
2013	3	3	1.39	1.67	5.60
2012	2	2	1.37	1.65	5.60
2011	1	2	1.35	1.63	5.60

Output Information											
Observed MV crashes	Average observed total crashes	Total predicted MV crashes	Average predicted total crashes	Standard deviation of predicted total crashes	Weight	Total expected MV crashes	No of expected total crashes	Average expected total crashes	High-risk Intersection (Y/N)	Potential for Safety Improvement (PSI)	If avg observed total crashes > avg expected crashes
10.00	2.40	6.92	1.67	0.03	0.26	9.19	2.28	2.23	Y	0.56	Y
							2.26				
							2.24				
							2.21				
							2.18				

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brook Road
Date Performed	5/1/2018	Jurisdiction	MassDOT District 6
		Analysis Year	2015
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT _{major} (veh/day)	AADT _{MAX} = 58,100 (veh/day)	--	6,400
AADT _{minor} (veh/day)	AADT _{MAX} = 16,400 (veh/day)	--	2,250
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	0.95
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only		--	0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	4
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	4.150	1.350	1.000	1.509	0.164	0.031	1.704

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.000	0.940	1.000	1.000	1.000	1.000	0.940

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.299	0.812	0.212	0.407	1.580	1.000	1.580	0.940	0.950	1.411
Fatal and Injury (FI)	--	--	--	--	0.471	--	0.471	0.940	0.950	0.420
Property Damage Only (PDO)	--	--	--	--	1.109	--	1.109	0.940	0.950	0.990

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.000	0.420	1.000	0.990	1.411
Rear-end collision	0.580	0.244	0.605	0.599	0.843
Head-on collision	0.034	0.014	0.014	0.014	0.029
Angle collision	0.341	0.144	0.265	0.262	0.406
Sideswipe	0.039	0.016	0.116	0.115	0.131
Other multiple-vehicle collision	0.005	0.002	0.000	0.000	0.002

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.070	0.110	1.000	0.110	0.940	0.950	0.098
Fatal and Injury (FI)	--	--	--	0.208	0.023	--	0.023	0.940	0.950	0.021
Property Damage Only (PDO)	--	--	--	0.792	0.087	--	0.087	0.940	0.950	0.078

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{Nbisv} from Worksheet 2E

	from Table 12-13	(2) ^{FI} from Worksheet 2L	from Table 12-13	(2) ^{PDO} from Worksheet 2L	(2) ^{PDO} from Worksheet 2L
Total	1.000	0.021	1.000	0.078	0.098
		(2) ^{FI}		(4) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.053	0.004	0.004
Collision with animal	0.000	0.000	0.000	0.000	0.000
Collision with fixed object	0.900	0.018	0.895	0.070	0.088
Collision with other object	0.000	0.000	0.026	0.002	0.002
Other single-vehicle collision	0.000	0.000	0.026	0.002	0.002
Single-vehicle noncollision	0.100	0.002	0.000	0.000	0.002

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections				
(1)	(2)	(3)	(4)	(5)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF	
CMF _{1p} from Table 12-28	CMF _{2p} from Table 12-29	CMF _{3p} from Table 12-30		
4.150	1.350	1.000	(1)*(2)*(3)	5.603

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.411	0.098	1.509	0.020	0.031	0.950	0.164
Fatal and injury (FI)	--	--	--	--	--	0.950	0.164

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.411	0.098	1.509	0.022	0.950	0.031
Fatal and injury (FI)	--	--	--	--	0.950	0.031

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.244	0.599	0.843
Head-on collisions (from Worksheet 2D)	0.014	0.014	0.029
Angle collisions (from Worksheet 2D)	0.144	0.262	0.406
Sideswipe (from Worksheet 2D)	0.016	0.115	0.131
Other multiple-vehicle collision (from Worksheet 2D)	0.002	0.000	0.002
Subtotal	0.420	0.990	1.411
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.004	0.004
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.018	0.070	0.088
Collision with other object (from Worksheet 2F)	0.000	0.002	0.002
Other single-vehicle collision (from Worksheet 2F)	0.000	0.002	0.002
Single-vehicle noncollision (from Worksheet 2F)	0.002	0.000	0.002
Collision with pedestrian (from Worksheet 2G or 2I)	0.164	0.000	0.164
Collision with bicycle (from Worksheet 2J)	0.031	0.000	0.031
Subtotal	0.215	0.078	0.293
Total	0.636	1.068	1.704

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.704
Fatal and injury (FI)	0.636
Property damage only (PDO)	1.068

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brook Road
Date Performed	5/1/2018	Jurisdiction	MassDOT District 6
		Analysis Year	2014
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT _{major} (veh/day)	AADT _{MAX} = 58,100 (veh/day)	--	6,350
AADT _{minor} (veh/day)	AADT _{MAX} = 16,400 (veh/day)	--	2,250
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	0.95
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	4
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES											
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	4.150	1.350	1.000	1.500	0.163	0.031	1.693

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.000	0.940	1.000	1.000	1.000	1.000	0.940

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.299	0.812	0.212	0.407	1.570	1.000	1.570	0.940	0.950	1.402
Fatal and Injury (FI)	--	--	--	--	0.468	--	0.468	0.940	0.950	0.418
Property Damage Only (PDO)	--	--	--	--	1.102	--	1.102	0.940	0.950	0.984

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.000	0.418	1.000	0.984	1.402
Rear-end collision	0.580	0.242	0.605	0.595	0.837
Head-on collision	0.034	0.014	0.014	0.014	0.029
Angle collision	0.341	0.143	0.265	0.261	0.403
Sideswipe	0.039	0.016	0.116	0.114	0.130
Other multiple-vehicle collision	0.005	0.002	0.000	0.000	0.002

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.070	0.110	1.000	0.110	0.940	0.950	0.098
Fatal and Injury (FI)	--	--	--	0.208	0.023	--	0.023	0.940	0.950	0.020
Property Damage Only (PDO)	--	--	--	0.792	0.087	--	0.087	0.940	0.950	0.077

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{Nbisv} from Worksheet 2E

	from Table 12-13	(2) ^{FI} from Worksheet 2L	from Table 12-13	(2) ^{PDO} from Worksheet 2L	(2) ^{PDO} from Worksheet 2L
Total	1.000	0.020	1.000	0.077	0.098
		(2) ^{FI} (3) _{FI}		(4) ^{PDO} (5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.053	0.004	0.004
Collision with animal	0.000	0.000	0.000	0.000	0.000
Collision with fixed object	0.900	0.018	0.895	0.069	0.088
Collision with other object	0.000	0.000	0.026	0.002	0.002
Other single-vehicle collision	0.000	0.000	0.026	0.002	0.002
Single-vehicle noncollision	0.100	0.002	0.000	0.000	0.002

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections				
(1)	(2)	(3)	(4)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF	
CMF _{1p}	CMF _{2p}	CMF _{3p}		
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)	
4.150	1.350	1.000	5.603	

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.402	0.098	1.500	0.020	0.031	0.950	0.163
Fatal and injury (FI)	--	--	--	--	--	0.950	0.163

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.402	0.098	1.500	0.022	0.950	0.031
Fatal and injury (FI)	--	--	--	--	0.950	0.031

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.242	0.595	0.837
Head-on collisions (from Worksheet 2D)	0.014	0.014	0.029
Angle collisions (from Worksheet 2D)	0.143	0.261	0.403
Sideswipe (from Worksheet 2D)	0.016	0.114	0.130
Other multiple-vehicle collision (from Worksheet 2D)	0.002	0.000	0.002
Subtotal	0.418	0.984	1.402
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.004	0.004
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.018	0.069	0.088
Collision with other object (from Worksheet 2F)	0.000	0.002	0.002
Other single-vehicle collision (from Worksheet 2F)	0.000	0.002	0.002
Single-vehicle noncollision (from Worksheet 2F)	0.002	0.000	0.002
Collision with pedestrian (from Worksheet 2G or 2I)	0.163	0.000	0.163
Collision with bicycle (from Worksheet 2J)	0.031	0.000	0.031
Subtotal	0.214	0.077	0.291
Total	0.632	1.062	1.693

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.693
Fatal and injury (FI)	0.632
Property damage only (PDO)	1.062

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brook Road
Date Performed	5/1/2018	Jurisdiction	MassDOT District 6
		Analysis Year	2013
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT _{major} (veh/day)	AADT _{MAX} = 58,100 (veh/day)	--	6,300
AADT _{minor} (veh/day)	AADT _{MAX} = 16,400 (veh/day)	--	2,200
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	0.95
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only		--	0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	4
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	4.150	1.350	1.000	1.483	0.161	0.031	1.675

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.000	0.940	1.000	1.000	1.000	1.000	0.940

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.299	0.812	0.212	0.407	1.552	1.000	1.552	0.940	0.950	1.386
Fatal and Injury (FI)	--	--	--	--	0.463	--	0.463	0.940	0.950	0.413
Property Damage Only (PDO)	--	--	--	--	1.090	--	1.090	0.940	0.950	0.973

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.000	0.413	1.000	0.973	1.386
Rear-end collision	0.580	0.240	0.605	0.588	0.828
Head-on collision	0.034	0.014	0.014	0.014	0.028
Angle collision	0.341	0.141	0.265	0.258	0.399
Sideswipe	0.039	0.016	0.116	0.113	0.129
Other multiple-vehicle collision	0.005	0.002	0.000	0.000	0.002

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.070	0.108	1.000	0.108	0.940	0.950	0.097
Fatal and Injury (FI)	--	--	--	0.208	0.023	--	0.023	0.940	0.950	0.020
Property Damage Only (PDO)	--	--	--	0.792	0.086	--	0.086	0.940	0.950	0.077

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{Nbisv} from Worksheet 2E

	from Table 12-13	(2) ^{FI} from Worksheet 2L	from Table 12-13	(3) ^{PDO} from Worksheet 2L	(3) ^{PDO} from Worksheet 2L
Total	1.000	0.020	1.000	0.077	0.097
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.053	0.004	0.004
Collision with animal	0.000	0.000	0.000	0.000	0.000
Collision with fixed object	0.900	0.018	0.895	0.069	0.087
Collision with other object	0.000	0.000	0.026	0.002	0.002
Other single-vehicle collision	0.000	0.000	0.026	0.002	0.002
Single-vehicle noncollision	0.100	0.002	0.000	0.000	0.002

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p} from Table 12-28	CMF _{2p} from Table 12-29	CMF _{3p} from Table 12-30	
4.150	1.350	1.000	(1)*(2)*(3) 5.603

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.386	0.097	1.483	0.020	0.030	0.950	0.161
Fatal and injury (FI)	--	--	--	--	--	0.950	0.161

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.386	0.097	1.483	0.022	0.950	0.031
Fatal and injury (FI)	--	--	--	--	0.950	0.031

(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.240	0.588	0.828
Head-on collisions (from Worksheet 2D)	0.014	0.014	0.028
Angle collisions (from Worksheet 2D)	0.141	0.258	0.399
Sideswipe (from Worksheet 2D)	0.016	0.113	0.129
Other multiple-vehicle collision (from Worksheet 2D)	0.002	0.000	0.002
Subtotal	0.413	0.973	1.386
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.004	0.004
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.018	0.069	0.087
Collision with other object (from Worksheet 2F)	0.000	0.002	0.002
Other single-vehicle collision (from Worksheet 2F)	0.000	0.002	0.002
Single-vehicle noncollision (from Worksheet 2F)	0.002	0.000	0.002
Collision with pedestrian (from Worksheet 2G or 2I)	0.161	0.000	0.161
Collision with bicycle (from Worksheet 2J)	0.031	0.000	0.031
Subtotal	0.212	0.077	0.288
Total	0.625	1.050	1.675

(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.675
Fatal and injury (FI)	0.625
Property damage only (PDO)	1.050

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brook Road
Date Performed	5/1/2018	Jurisdiction	MassDOT District 6
		Analysis Year	2012
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT _{major} (veh/day)	AADT _{MAX} = 58,100 (veh/day)	--	6,200
AADT _{minor} (veh/day)	AADT _{MAX} = 16,400 (veh/day)	--	2,200
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	0.95
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only		--	0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	4
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pdi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	4.150	1.350	1.000	1.464	0.159	0.030	1.653

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.000	0.940	1.000	1.000	1.000	1.000	0.940

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.299	0.812	0.212	0.407	1.532	1.000	1.532	0.940	0.950	1.368
Fatal and Injury (FI)	--	--	--	--	0.457	--	0.457	0.940	0.950	0.408
Property Damage Only (PDO)	--	--	--	--	1.076	--	1.076	0.940	0.950	0.961

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.000	0.408	1.000	0.961	1.368
Rear-end collision	0.580	0.237	0.605	0.581	0.817
Head-on collision	0.034	0.014	0.014	0.014	0.028
Angle collision	0.341	0.139	0.265	0.255	0.394
Sideswipe	0.039	0.016	0.116	0.111	0.127
Other multiple-vehicle collision	0.005	0.002	0.000	0.000	0.002

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.070	0.107	1.000	0.107	0.940	0.950	0.095
Fatal and Injury (FI)	--	--	--	0.208	0.022	--	0.022	0.940	0.950	0.020
Property Damage Only (PDO)	--	--	--	0.792	0.085	--	0.085	0.940	0.950	0.076

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{Nbisv} from Worksheet 2E

	from Table 12-13	(2) ^{FI} from Worksheet 2L	from Table 12-13	(5) ^{PDO} from Worksheet 2L	(5) ^{PDO} from Worksheet 2L
Total	1.000	0.020	1.000	0.076	0.095
		(2)*(3) ^{FI}		(4)*(5) ^{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.053	0.004	0.004
Collision with animal	0.000	0.000	0.000	0.000	0.000
Collision with fixed object	0.900	0.018	0.895	0.068	0.086
Collision with other object	0.000	0.000	0.026	0.002	0.002
Other single-vehicle collision	0.000	0.000	0.026	0.002	0.002
Single-vehicle noncollision	0.100	0.002	0.000	0.000	0.002

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF _{1p} from Table 12-28	CMF _{2p} from Table 12-29	CMF _{3p} from Table 12-30	
4.150	1.350	1.000	(1)*(2)*(3) 5.603

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.368	0.095	1.464	0.020	0.030	0.950	0.159
Fatal and injury (FI)	--	--	--	--	--	0.950	0.159

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.368	0.095	1.464	0.022	0.950	0.030
Fatal and injury (FI)	--	--	--	--	0.950	0.030

(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)		Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J		(5) from Worksheet 2D and 2F (6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.237	0.581	0.817
Head-on collisions (from Worksheet 2D)	0.014	0.014	0.028
Angle collisions (from Worksheet 2D)	0.139	0.255	0.394
Sideswipe (from Worksheet 2D)	0.016	0.111	0.127
Other multiple-vehicle collision (from Worksheet 2D)	0.002	0.000	0.002
Subtotal	0.408	0.961	1.368
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.004	0.004
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.018	0.068	0.086
Collision with other object (from Worksheet 2F)	0.000	0.002	0.002
Other single-vehicle collision (from Worksheet 2F)	0.000	0.002	0.002
Single-vehicle noncollision (from Worksheet 2F)	0.002	0.000	0.002
Collision with pedestrian (from Worksheet 2G or 2I)	0.159	0.000	0.159
Collision with bicycle (from Worksheet 2J)	0.030	0.000	0.030
Subtotal	0.209	0.076	0.284
Total	0.617	1.036	1.653

(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.653
Fatal and injury (FI)	0.617
Property damage only (PDO)	1.036

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Ben Erban	City	Milton
Agency or Company	CTPS	Intersection	Route 138 and Brook Road
Date Performed	5/1/2018	Jurisdiction	MassDOT District 6
		Analysis Year	2011
Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT _{major} (veh/day)	AADT _{MAX} = 58,100 (veh/day)	--	6,150
AADT _{minor} (veh/day)	AADT _{MAX} = 16,400 (veh/day)	--	2,150
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C _i		1.00	0.95
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		--	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only		--	0
Maximum number of lanes crossed by a pedestrian (n _{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	4
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

SUMMARY OF INTERSECTION & CRASHES

CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{1p}	CMF _{2p}	CMF _{3p}	N _{bi total}	N _{pedi total}	N _{bikei total}	N _{predictedint}
1.000	0.940	1.000	1.000	1.000	4.150	1.350	1.000	1.447	0.157	0.030	1.634

ADDITIONAL COMMENTS

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF _{1i}	CMF _{2i}	CMF _{3i}	CMF _{4i}	CMF _{5i}	CMF _{6i}	CMF _{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.000	0.940	1.000	1.000	1.000	1.000	0.940

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N _{bimv}	Proportion of Total Crashes	Adjusted N _{bimv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bimv}
	from Table 12-10									
	a	b	c							
Total	-8.299	0.812	0.212	0.407	1.515	1.000	1.515	0.940	0.950	1.353
Fatal and Injury (FI)	--	--	--	--	0.451	--	0.451	0.940	0.950	0.403
Property Damage Only (PDO)	--	--	--	--	1.064	--	1.064	0.940	0.950	0.950

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Adjusted N _{bimv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Adjusted N _{bimv (PDO)} (crashes/year)	Adjusted N _{bimv (TOTAL)} (crashes/year)
	from Table 12-11	(9) _{FI} from Worksheet 2C	from Table 12-11	(9) _{PDO} from Worksheet 2C	(9) _{Nbimv} from Worksheet 2C
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Total	1.000	0.403	1.000	0.950	1.353
Rear-end collision	0.580	0.234	0.605	0.574	0.808
Head-on collision	0.034	0.014	0.014	0.014	0.028
Angle collision	0.341	0.138	0.265	0.252	0.389
Sideswipe	0.039	0.016	0.116	0.110	0.126
Other multiple-vehicle collision	0.005	0.002	0.000	0.000	0.002

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Historical Data	Initial N _{bisv}	Proportion of Total Crashes	Adjusted N _{bisv}	Combined CMFs	Calibration Factor, C _i	Predicted N _{bisv}
	from Table 12-12									
	a	b	c							
Total	--	--	--	0.070	0.106	1.000	0.106	0.940	0.950	0.094
Fatal and Injury (FI)	--	--	--	0.208	0.022	--	0.022	0.940	0.950	0.020
Property Damage Only (PDO)	--	--	--	0.792	0.084	--	0.084	0.940	0.950	0.075

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type _(FI)	Predicted N _{bisv (FI)} (crashes/year)	Proportion of Collision Type _(PDO)	Predicted N _{bisv (PDO)} (crashes/year)	Predicted N _{bisv (TOTAL)} (crashes/year)
	from Table 12-13	(9) _{FI} from Worksheet 2E	from Table 12-13	(9) _{PDO} from Worksheet 2E	(9) _{Nbisv} from Worksheet 2E

	from Table 12-13	(2) from Worksheet 2L	from Table 12-13	(3) from Worksheet 2L	(3) from Worksheet 2L
Total	1.000	0.020	1.000	0.075	0.094
		(2)*(3) _{FI}		(4)*(5) _{PDO}	(3)+(5)
Collision with parked vehicle	0.000	0.000	0.053	0.004	0.004
Collision with animal	0.000	0.000	0.000	0.000	0.000
Collision with fixed object	0.900	0.018	0.895	0.067	0.085
Collision with other object	0.000	0.000	0.026	0.002	0.002
Other single-vehicle collision	0.000	0.000	0.026	0.002	0.002
Single-vehicle noncollision	0.100	0.002	0.000	0.000	0.002

Worksheet 2G-1 -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections				
(1)	(2)	(3)	(4)	(5)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF	
CMF _{1p}	CMF _{2p}	CMF _{3p}	(1)*(2)*(3)	
from Table 12-28	from Table 12-29	from Table 12-30		
4.150	1.350	1.000	5.603	

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Intersections							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Ped ω	N _{pedbase}	Calibration factor, C _i	Predicted N _{pedi}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)				(4) from Worksheet 2H*(6)*(7)
Total	1.353	0.094	1.447	0.020	0.029	0.950	0.157
Fatal and injury (FI)	--	--	--	--	--	0.950	0.157

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N _{bimv}	Predicted N _{bisv}	Predicted N _{bi}	Veh-Bike ω	Calibration factor, C _i	Predicted N _{bikei}
	(9) from Worksheet 2C	(4) from Worksheet 2E	(2) + (3)			(4)*(5)*(6)
Total	1.353	0.094	1.447	0.022	0.950	0.030
Fatal and injury (FI)	--	--	--	--	0.950	0.030

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (8) from Worksheet 2G and (7) from 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.234	0.574	0.808
Head-on collisions (from Worksheet 2D)	0.014	0.014	0.028
Angle collisions (from Worksheet 2D)	0.138	0.252	0.389
Sideswipe (from Worksheet 2D)	0.016	0.110	0.126
Other multiple-vehicle collision (from Worksheet 2D)	0.002	0.000	0.002
Subtotal	0.403	0.950	1.353
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.004	0.004
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.018	0.067	0.085
Collision with other object (from Worksheet 2F)	0.000	0.002	0.002
Other single-vehicle collision (from Worksheet 2F)	0.000	0.002	0.002
Single-vehicle noncollision (from Worksheet 2F)	0.002	0.000	0.002
Collision with pedestrian (from Worksheet 2G or 2I)	0.157	0.000	0.157
Collision with bicycle (from Worksheet 2J)	0.030	0.000	0.030
Subtotal	0.207	0.075	0.281
Total	0.610	1.024	1.634

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	Predicted average crash frequency, N _{predicted int} (crashes/year)
	Total
Total	1.634
Fatal and injury (FI)	0.610
Property damage only (PDO)	1.024

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.13	AADT (veh/day)	33950
Median Width (ft)	2	Lighting	No
Type of On-street Parking	None	Proportion w/On-street Parking	0.00
Automated Speed Enforcement	No	Posted Speed (mph)	45
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	15
# Major Commercial Driveways	0	# Minor Commercial Driveways	1
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	0
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.061	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.061

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.481	3.702
Property Damage Only (PDO)	1.240	9.539
Total	1.721	13.241

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.392	3.017
Property Damage Only (PDO)	1.011	7.775
Total	1.403	10.792

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.392	\$62,048.26
Property Damage Only (PDO)	\$7,400.00	1.011	\$7,479.82
Total	-	1.403	\$69,528.07

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.20	AADT (veh/day)	33950
Median Width (ft)	2	Lighting	No
Type of On-street Parking	None	Proportion w/On-street Parking	0.00
Automated Speed Enforcement	No	Posted Speed (mph)	45
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	15
# Major Commercial Driveways	0	# Minor Commercial Driveways	1
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	1
# Major Residential Driveways	1	# Minor Residential Driveways	5
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.061	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.061

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.867	4.336
Property Damage Only (PDO)	2.167	10.833
Total	3.034	15.169

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	1.421	7.106
Property Damage Only (PDO)	3.551	17.754
Total	4.972	24.860

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	1.421	\$224,835.70
Property Damage Only (PDO)	\$7,400.00	3.551	\$26,275.83
Total	-	4.972	\$251,111.53

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.44	AADT (veh/day)	21000
Median Width (ft)	2	Lighting	No
Type of On-street Parking	None	Proportion w/On-street Parking	0.00
Automated Speed Enforcement	No	Posted Speed (mph)	45
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	15
# Major Commercial Driveways	0	# Minor Commercial Driveways	0
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	1	# Minor Residential Driveways	10
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.061	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.061

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.841	1.911
Property Damage Only (PDO)	2.157	4.903
Total	2.998	6.814

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.627	1.425
Property Damage Only (PDO)	1.608	3.655
Total	2.235	5.080

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.627	\$99,176.52
Property Damage Only (PDO)	\$7,400.00	1.608	\$11,899.90
Total	-	2.235	\$111,076.42

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.23	AADT (veh/day)	14300
Median Width (ft)	2	Lighting	No
Type of On-street Parking	None	Proportion w/On-street Parking	0.00
Automated Speed Enforcement	No	Posted Speed (mph)	35
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	15
# Major Commercial Driveways	0	# Minor Commercial Driveways	0
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	0
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.061	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.061

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.219	0.950
Property Damage Only (PDO)	0.580	2.523
Total	0.799	3.474

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.310	1.346
Property Damage Only (PDO)	0.822	3.575
Total	1.132	4.922

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.310	\$48,991.62
Property Damage Only (PDO)	\$7,400.00	0.822	\$6,085.16
Total	-	1.132	\$55,076.78

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.28	AADT (veh/day)	16000
Median Width (ft)	2	Lighting	No
Type of On-street Parking	None	Proportion w/On-street Parking	0.00
Automated Speed Enforcement	No	Posted Speed (mph)	45
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	15
# Major Commercial Driveways	0	# Minor Commercial Driveways	1
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	4
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.061	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.061

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.354	1.263
Property Damage Only (PDO)	0.913	3.261
Total	1.267	4.524

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.349	1.247
Property Damage Only (PDO)	0.902	3.221
Total	1.251	4.468

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.349	\$55,239.39
Property Damage Only (PDO)	\$7,400.00	0.902	\$6,673.51
Total	-	1.251	\$61,912.90

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.27	AADT (veh/day)	16000
Median Width (ft)	2	Lighting	No
Type of On-street Parking	None	Proportion w/On-street Parking	0.00
Automated Speed Enforcement	No	Posted Speed (mph)	45
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	15
# Major Commercial Driveways	0	# Minor Commercial Driveways	0
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	1
# Major Residential Driveways	0	# Minor Residential Driveways	7
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.061	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.061

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.350	1.298
Property Damage Only (PDO)	0.900	3.332
Total	1.250	4.630

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.260	0.962
Property Damage Only (PDO)	0.667	2.471
Total	0.927	3.433

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.260	\$41,100.52
Property Damage Only (PDO)	\$7,400.00	0.667	\$4,937.27
Total	-	0.927	\$46,037.79

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.67	AADT (veh/day)	12300
Median Width (ft)	2	Lighting	No
Type of On-street Parking	None	Proportion w/On-street Parking	0.00
Automated Speed Enforcement	No	Posted Speed (mph)	40
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	10
# Major Commercial Driveways	0	# Minor Commercial Driveways	0
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	19
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.000	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.095	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.095

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.628	0.937
Property Damage Only (PDO)	1.606	2.398
Total	2.234	3.334

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.708	1.056
Property Damage Only (PDO)	1.811	2.703
Total	2.519	3.760

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.708	\$111,975.28
Property Damage Only (PDO)	\$7,400.00	1.811	\$13,402.82
Total	-	2.519	\$125,378.10

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.68	AADT (veh/day)	9800
Median Width (ft)	2	Lighting	No
Type of On-street Parking	Parallel Parking	Proportion w/On-street Parking	0.20
Automated Speed Enforcement	No	Posted Speed (mph)	45
Roadside Fixed Object Density	30	Offset to Roadside Fixed Obj. (ft)	10
# Major Commercial Driveways	0	# Minor Commercial Driveways	0
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	45
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.068	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.095	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.170

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.620	0.911
Property Damage Only (PDO)	1.516	2.230
Total	2.136	3.141

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.691	1.017
Property Damage Only (PDO)	1.692	2.488
Total	2.383	3.504

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.691	\$109,362.22
Property Damage Only (PDO)	\$7,400.00	1.692	\$12,518.65
Total	-	2.383	\$121,880.87

Highway Safety Software Text Report

File Name: 9.xhz
 Analyst: Ben Erban
 Agency: CTPS
 Jurisdiction: MassDOT Hwy District 6
 Date: 5/21/2018
 Analysis Year: 2018
 Project Description: Priority Corridors - Route 138 in Milton
 Units: U.S. Customary

The total number of predicted crashes is: 0.981 crashes/year

Section 01:

Facility Type Urban
 Section Type Segment
 Model Type Two-Lane Undivided Segment (2U)

Input

AADT	9800	veh/day
Length	0.24	mi
Number of Major Commercial Driveways	0	
Number of Minor Commercial Driveways	0	
Number of Major Industrial/Institutional Driveways	1	
Number of Minor Industrial/Institutional Driveways	0	
Number of Major Residential Driveways	1	
Number of Minor Residential Driveways	0	
Number of Other Driveways	0	
Roadside Fixed Objects	Yes	
Fixed-Object Offset	10	ft
Fixed-Object Density	40	fixed objects/mile
Median Berries	No	
Lighting	No	
Automated Speed Enforcement	No	
Posted Speed	35	mi/h

Observed Crashes

Number of Observed Crashes 0

Output

SPF

N(SPF, fi)	0.249
N(SPF, pdo)	0.599
N(pedi)	0.005
N(bikei)	0.004

CMFs

CMF1 (On-Street Parking)	1.000
CMF2 (Roadside Fixed Objects)	1.146
CMF3 (Median Width)	1.000
CMF4 (Lighting)	1.000
CMF5 (Automated Speed Enforcement)	1.000
CMF Combined	1.146

Predicted Crashes

Predicted Crashes (pdo)	0.687	crashes/year
Predicted Crashes (fi)	0.294	crashes/year

Total Predicted Crashes 0.981 crashes/year

----- Expected Crashes -----

Expected Crashes(mv, Driveway)	1.174	crashes/year
Expected Crashes(mv, Non-Driveway)	0.612	crashes/year
Expected Crashes(sv)	0.467	crashes/year
Total Expected Crashes	2.253	crashes/year

----- Economic Analysis -----

*Based on Expected Crash Frequency	
Annual Societal Crash Cost (FI)	\$106,827.04
Annual Societal Crash Cost (PDO)	\$11,675.23
Total Annual Societal Crash Cost	\$118,502.27

This Highway Safety Software text report was created in HSS™ Version 7.5 on 5/23/2018 11:59:14

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.11	AADT (veh/day)	9800
Median Width (ft)	2	Lighting	No
Type of On-street Parking	Parallel Parking	Proportion w/On-street Parking	0.08
Automated Speed Enforcement	No	Posted Speed (mph)	35
Roadside Fixed Object Density	40	Offset to Roadside Fixed Obj. (ft)	10
# Major Commercial Driveways	0	# Minor Commercial Driveways	0
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	12
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.169	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.146	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.340

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.137	1.243
Property Damage Only (PDO)	0.326	2.961
Total	0.462	4.204

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.159	1.449
Property Damage Only (PDO)	0.380	3.451
Total	0.539	4.900

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.159	\$25,215.27
Property Damage Only (PDO)	\$7,400.00	0.380	\$2,809.12
Total	-	0.539	\$28,024.40

Highway Safety Software Urban Segment Report

Project Information

Analyst	Ben Erban	Date	5/21/2018
Jurisdiction	MassDOT Hwy District 6	Analysis Year	2018
Project Description	Priority Corridors - Route 138 in Milton		

Input Data

Segment Type	Two-Lane Undivided Segment (2U)		
Length of Segment (mi)	0.12	AADT (veh/day)	9800
Median Width (ft)	2	Lighting	No
Type of On-street Parking	Parallel Parking	Proportion w/On-street Parking	0.12
Automated Speed Enforcement	No	Posted Speed (mph)	30
Roadside Fixed Object Density	40	Offset to Roadside Fixed Obj. (ft)	10
# Major Commercial Driveways	0	# Minor Commercial Driveways	0
# Major Industrial/Insti. Driveways	0	# Minor Industrial/Insti. Driveways	0
# Major Residential Driveways	0	# Minor Residential Driveways	13
# Other Driveways	0	Calibration Factor	1.00

Crash Modification Factors

On-Street Parking - CMF1	1.233	Lighting - CMF4	1.000
Roadside Fixed Objects - CMF2	1.146	Automated Speed Enforcement - CMF5	1.000
Median Width - CMF3	1.000	Combined CMF	1.413

Predicted Roadway Section Crashes

Crash Severity	Predicted Crash Frequency	Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.181	1.504
Property Damage Only (PDO)	0.374	3.114
Total	0.554	4.618

Expected Roadway Section Crashes

Crash Severity	Expected Crash Frequency	Expected Crash Rate (crashes/mi/year)
Fatal and Injury (FI)	0.463	3.862
Property Damage Only (PDO)	0.960	7.996
Total	1.423	11.858

Economic Analysis (Expected Crashes)

Crash Severity	Per Crash Societal Crash Cost	Expected Annual Crashes	Total Societal Crash Cost
Fatal and Injury (FI)	\$158,200.00	0.463	\$73,321.00
Property Damage Only (PDO)	\$7,400.00	0.960	\$7,100.52
Total	-	1.423	\$80,421.52

Appendix F:

Level of Service Analysis

Part 1: Existing and Future Pedestrian Report Card Assessment

Part 2: Existing Intersection Levels of Service

Part 3: Future Intersection Levels of Service

Part 1: Existing and Future Pedestrian Report Card Assessment

Pedestrian Report Card Assessment (PRCA): Roadway Segment



Roadway Segment Location		
Route 138 – Milton, MA		

Grading Categories	Score	Rating
Safety	2.8	Good
System Preservation	N/A	Fair
Capacity Management and Mobility	1.5	Poor
Economic Vitality	1.5	Poor

Transportation Equity	
High Priority Area	✓
Moderate Priority Area	
Not a 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/livability | 857.702.3707 | cclaude@ctps.org

Category Ratings

Good: Score of 2.3 or more (maximum 3.0)

Fair: Score is between 1.7 and 2.3

Poor: Score is 1.7 or less (minimum 0)

Grading Categories: Scoring Breakdown Roadway Segment

Capacity Management and Mobility			
Performance Measure	Weight	Rating	Weighted Score
Sidewalk Presence	3	Fair	6
Crossing Opportunities	2	Poor	2
Walkway Width	1	Poor	1
Total	6		9

Economic Vitality			
Performance Measure	Weight	Rating	Weighted Score
Pedestrian Volumes	1	Fair	2
Adjacent Bicycle Accommodations	1	Poor	1
Total	2		3

Category rating = total rating/total weight
 Rating Score:
 Good = 3
 Fair = 2
 Poor = 1

Safety			
Performance Measure	Weight	Rating	Weighted Score
Pedestrian Crashes	3	Good	9
Pedestrian-Vehicle Buffer	1	Good	3
Vehicle Travel Speed	1	Fair	2
Total	5		14

System Preservation	
Performance Measure	Rating
Sidewalk Condition	Fair

Transportation Equity Priority	
Area Condition	Yes/No
Environmental Justice zone?	✓
School or college within one-quarter mile?	✓
More than 8.9% of population older than 75 years?	✓
More than 27.5% of households do not own a vehicle?	

Category Ratings
 Good: Score of 2.3 or more (maximum 3.0)
 Fair: Score is between 1.7 and 2.3
 Poor: Score is 1.7 or less (minimum 0)

Detailed Performance Measure Information: Roadway Segment

Goal	Performance Measure	Features of Analyzed Locations
Mobility	Sidewalk Presence	Sidewalks are present on one side of the street
	Crossing Opportunities	9 crosswalks/ 3.6 miles = 2.5 crosswalks per mile
	Walkway Width	4 foot sidewalks
Economic Vitality	Pedestrian Volumes	Estimated 5 to 60 pedestrians
Safety	Adjacent Bicycle Accommodations	Some bike lanes are present at the southern portion of the corridor but the bike lanes are inconsistent
	Pedestrian Crashes	Not in HSIP cluster
	Pedestrian-Vehicle Buffer	13 feet
	Vehicle Travel Speed	32 MPH
System Preservation	Sidewalk Condition	Fair

Pedestrian Report Card Assessment with Improvements



Pedestrian Report Card Assessment (PRCA): Roadway Segment



Roadway Segment Location

Route 138 – Milton, MA

Grading Categories	Score	Rating
Safety	2.8	Good
System Preservation	3.0	Good
Capacity Management and Mobility	2.7	Good
Economic Vitality	2.5	Good

Transportation Equity	
High Priority Area	✓
Moderate Priority Area	
Not a Priority Area	

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

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Category Ratings
 Good: Score of 2.3 or more (maximum 3.0)
 Fair: Score is between 1.7 and 2.3
 Poor: Score is 1.7 or less (minimum 0)

Grading Categories: Scoring Breakdown Roadway Segment

Capacity Management and Mobility			
Performance Measure	Weight	Rating	Weighted Score
Sidewalk Presence	3	Good	9
Crossing Opportunities	2	Fair	4
Walkway Width	1	Good	3
Total	6		16

Economic Vitality			
Performance Measure	Weight	Rating	Weighted Score
Pedestrian Volumes	1	Fair	2
Adjacent Bicycle Accommodations	1	Good	3
Total	2		5

Category rating = total rating/total weight
 Rating Score:
 Good = 3
 Fair = 2
 Poor = 1

Safety			
Performance Measure	Weight	Rating	Weighted Score
Pedestrian Crashes	3	Good	9
Pedestrian-Vehicle Buffer	1	Good	3
Vehicle Travel Speed	1	Fair	2
Total	5		14

System Preservation	
Performance Measure	Rating
Sidewalk Condition	Good

Transportation Equity Priority	
Area Condition	Yes/No
Environmental Justice zone?	✓
School or college within one-quarter mile?	✓
More than 8.9% of population older than 75 years?	✓
More than 27.5% of households do not own a vehicle?	

Category Ratings
 Good: Score of 2.3 or more (maximum 3.0)
 Fair: Score is between 1.7 and 2.3
 Poor: Score is 1.7 or less (minimum 0)

Detailed Performance Measure Information: Roadway Segment

Goal	Performance Measure	Features of Analyzed Locations
Mobility	Sidewalk Presence	Sidewalks are present at least on one side of the street
	Crossing Opportunities	16 crosswalks/ 3.5 miles = 5.1 crosswalks per mile
	Walkway Width	5.5 foot sidewalks
Economic Vitality	Pedestrian Volumes	Estimated 5 to 60 pedestrians
Safety	Adjacent Bicycle Accommodations	Bike lanes or multi-use path are present in the corridor
	Pedestrian Crashes	Not in HSIP cluster
	Pedestrian-Vehicle Buffer	10 feet
	Vehicle Travel Speed	32 MPH
System Preservation	Sidewalk Condition	Good

Part 2: Existing Intersection Levels of Service

**Table F-1
Summary of Intersection Capacity Analysis**

Analysis Period		AM Peak Hour						PM Peak Hour						Weekend Peak Hour					
Scenario		Existing Conditions			With Improvements			Existing Conditions			With Improvements			Existing Conditions			With Improvements		
Intersection	Move-ment	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue
Route 138 at Green Street																			
Route 138 Northbound	LTR	A	0.0	0	A	0.0	0	A	0.1	3	A	0.1	3	A	0.0	0	A	0.0	0
Route 138 Southbound	TR	A	0.0	0	A	0.0	0	A	0.0	0	A	0.0	0	A	0.0	0	A	0.0	0
Green Street	LR	F	272.8	45	F	272.8	45	F	69.4	13	F	69.4	13	F	138.5	33	F	138.5	33
Parking Lot Exit	LTR	D	34.4	8	D	34.4	8	C	21.3	8	C	21.3	8	F	65.9	75	F	65.9	75
Intersection Average		A	1.6		A	1.6		A	0.5		A	0.5		A	2.7		A	2.7	
Route 138 at Brush Hill Road																			
Route 138 Northbound	TR	F	116.1	#779	F	118.3	#779	E	62.3	#606	E	62.4	#606	D	41.6	#652	D	41.6	#652
Route 138 Southbound	LTR	C	21.1	378	C	21.3	378	F	181.9	#589	F	182.0	#589	D	51.7	#573	D	51.7	#570
Brush Hill Road Eastbound	LR	E	59.7	#259	D	48.6	235	F	290.7	#323	F	290.9	#323	F	207.7	166	F	207.7	#297
Brush Hill Road Westbound	L	F	127.2	#181	F	135.2	#186	F	119.8	#151	F	121.5	#151	F	179.5	#205	F	180.3	#205
	TR	C	25.7	92	C	25.7	92	C	21.3	57	C	21.2	57	C	21.7	87	C	21.7	87
Intersection Average		E	75.5		E	75.6		F	147.7		F	147.9		E	79.1		E	79.2	
Route 138 at Neponset Valley Parkway																			
Route 138 Northbound	L	D	32.3	193	B	16.8	#299	C	19.7	90	D	54.1	#203	B	11.2	50	E	74.1	#319
	T	A	0.0	0	A	6.4	199	A	0.0	0	B	10.1	181	A	0.0	0	A	8.9	172
Route 138 Southbound	TR	A	0.0	0	C	24.4	#390	A	0.0	0	D	51.2	#438	A	0.0	0	E	58.9	#520
Neponset Valley Parkway	LR	E	44.2	113	C	30.2	145	F	293.0	390	D	38.3	#235	C	23.8	75	D	42.3	#232
Intersection Average		B	13.2		B	17.0		E	48.1		D	37.0		A	5.6		D	45.6	
Route 138 at Milton St. and Dollar Ln.																			
Route 138 Northbound	L	B	13.3	263	A	5.5	7	B	11.2	227	A	5.4	11	A	7.9	199	A	5.4	10
	TR	B	13.3	263	B	13.6	237	B	11.2	227	B	11.3	214	A	7.9	199	B	10.9	195
Route 138 Southbound	LTR	A	9.9	222	A	9.7	207	D	40.3	262	D	52.7	263	B	14.4	250	C	30.9	261
Milton Street	LTR	C	23.5	77	C	23.9	78	E	71.8	114	E	78.5	123	E	58.8	98	E	72.8	100
Dollar Lane	LTR	D	35.6	134	D	37.0	136	D	41.7	101	D	43.6	109	C	29.8	76	D	39.1	78
Intersection Average		B	16.9		B	17.2		C	33.6		D	39.6		B	17.9		C	28.5	
Route 138 at Blue Jay Way																			
Route 138 Northbound	LT	A	3.3	30	A	3.3	30	A	2.1	15	A	2.1	15						
Route 138 Southbound	TR	A	0.0	0	A	0.0	0	A	0.0	0	A	0.0	0						
Blue Jay Way	LR	D	32.9	15	D	32.9	15	E	43.4	102	E	43.4	102						
Intersection Average		A	2.4		A	2.4		A	6.6		A	6.6							
Route 138 at Atherton St./Bradlee Rd.																			
Route 138 Northbound	LTR	B	15.8	#429	B	16.5	#456	B	10.8	#299	A	9.3	255						
Route 138 Southbound	LTR	B	14.3	354	B	15.0	#382	A	8.9	217	A	7.9	188						
Atherton Street Eastbound	LTR	C	30.6	18	C	31.4	18	C	25.2	10	C	27.0	11						
Atherton Street Westbound	LTR	C	25.8	127	C	24.5	126	C	21.0	71	C	21.6	78						
Bradlee Road	LTR	C	22.8	63	C	22.1	63	B	19.5	48	C	20.6	53						
Intersection Average		B	16.7		B	17.1		B	11.3		B	10.3							

**Table F-1
Summary of Intersection Capacity Analysis**

Analysis Period		AM Peak Hour						PM Peak Hour						Weekend Peak Hour					
Scenario		Existing Conditions			With Improvements			Existing Conditions			With Improvements			Existing Conditions			With Improvements		
Intersection	Move-ment	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue
Route 138 at Robbins St.																			
Route 138 Northbound	LTR	A	8.4	163	A	8.6	221	A	8.4	298	A	7.5	267						
Route 138 Southbound	LTR	A	8.1	149	A	8.0	201	A	8.0	259	A	7.1	233						
Robbins Street Eastbound	LTR	B	12.8	24	B	13.1	25	C	21.8	52	C	21.7	53						
Robbins Street Westbound	LTR	B	13.5	50	B	13.9	52	C	22.1	56	C	21.7	57						
Intersection Average		A	8.7		A	8.8		A	9.5		A	8.6							
Route 138 at Blue Hill Terrace/Cheever St.																			
Route 138 Northbound	LTR	D	42.9	#402	B	19.7	#626	B	15.4	#324	B	11.1	287						
Route 138 Southbound	LTR	D	42.9	#402	B	19.7	#626	B	15.4	#324	B	11.1	287						
Blue Hill Terrace	LTR	D	43.6	#136	C	34.4	156	D	39.3	#47	D	47.6	61						
Cheever Street	LTR	D	35.1	24	D	43.2	35	D	51.4	15	E	55.7	21						
Intersection Average		C	32.7		B	19.2		B	16.2		B	13.4							
Route 138 at Aberdeen Road																			
Route 138 Northbound	LT	A	0.1	0	A	0.1	0	A	0.2	3	A	0.2	3	A	0.1	0	A	0.1	0
Route 138 Southbound	TR	A	0.0	0	A	0.0	0	A	0.0	0	A	0.0	0	A	0.0	0	A	0.0	0
Aberdeen Road	LTR	C	20.3	5	C	20.3	5	D	26.1	5	D	26.1	5	B	11.6	0	B	11.6	0
Intersection Average		A	0.3		A	0.3		A	0.4		A	0.4		A	0.1		A	0.1	
Route 138 at Oak Street																			
Route 138 Northbound	LTR	A	0.0	0	A	0.0	0	A	0.4	3	A	0.4	3						
Route 138 Southbound	LTR	A	0.2	0	A	0.2	0	A	0.3	3	A	0.3	3						
Oak Street Eastbound	LTR	C	23.5	5	C	23.5	5	D	34.1	10	D	34.1	10						
Oak Street Westbound	LTR	A	0.0	0	A	0.0	0	A	0.4	3	A	0.4	3						
Intersection Average		A	0.7		A	0.7		A	1.2		A	1.2							
Route 138 at Brook Road																			
Route 138 Northbound	LTR	B	11.3	281	B	10.8	272	B	10.2	177	A	9.9	188						
Route 138 Southbound	LTR	A	9.4	194	A	9.2	189	B	11.1	197	B	10.6	210						
Brook Road	LTR	D	37.8	124	D	40.6	144	D	46.2	96	D	44.4	99						
Intersection Average		B	15.2		B	15.3		B	16.2		B	15.6							

= 95th percentile volume exceeds capacity, queue shown is after two cycles but may be longer. 95th Queue = 95th percentile queue length (feet). Delay = Average vehicle delay (seconds per vehicle). Err = Value exceeds constraints of HCM 2000 formulas. L = Left turning traffic. LOS = Level of Service. LT = Left and through traffic. LTR = Left, through, and right traffic. m = Volume for 95th percentile queue is metered by upstream signal. R = Right turning traffic. TR = Through and right traffic.

Note:

- Shaded cells indicate intersections with no available count data.
- Analysis uses Highway Capacity Manual (HCM) 2010 formulas.

**Table F-2
Intersection Capacity Analysis with Left Turn Bay at Brush Hill Road**

Analysis Period		AM Peak Hour						PM Peak Hour						Weekend Peak Hour						
Scenario		With Improvements			With Left Turn Bay			With Improvements			With Left Turn Bay			With Improvements			With Left Turn Bay			
Intersection	Move-ment	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	LOS	Delay	95th Queue	
Route 138 at Brush Hill Road																				
Route 138 Northbound	L				C	22.8	60				C	25.1	41				F	191.8	#191	
	T	F	118.3	#779	D	49.3	#787	E	62.4	#606	C	28.4	#639	D	41.6	#652	C	28.2	#719	
Route 138 Southbound	TR	C	21.3	378	C	35.0	#492	F	182.0	#589	F	222.5	#717	D	51.7	#570	F	141.8	#727	
Brush Hill Road Eastbound	LR	D	48.6	235	F	188.5	#321	F	290.9	#323	F	407.1	#406	F	207.7	#297	F	233.1	#352	
Brush Hill Road Westbound	L	F	135.2	#186	E	70.7	#178	F	121.5	#151	F	280.2	#199	F	180.3	#205	F	261.9	#250	
	TR	C	25.7	92	C	29.5	17	C	21.2	57	C	27.4	16	C	21.7	87	C	25.2	22	
Intersection Average		E	75.6		E	63.8		F	147.9		F	179.4		E	79.2		F	125.0		

= 95th percentile volume exceeds capacity, queue shown is after two cycles but may be longer. 95th Queue = 95th percentile queue length (feet). Delay = Average vehicle delay (seconds per vehicle). Err = Value exceeds constraints of HCM 2000 formulas. L = Left turning traffic. LOS = Level of Service. LT = Left and through traffic. LTR = Left, through, and right traffic. m = Volume for 95th percentile queue is metered by upstream signal. R = Right turning traffic.

TR = Through and right traffic.

Note:

- Shaded cells indicate intersections with no available count data.
- Analysis uses Highway Capacity Manual (HCM) 2010 formulas.

Volume

8: Route 138 & South Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (vph)	0	0	1490	1	1	1070
Future Volume (vph)	0	0	1490	1	1	1070
Satd. Flow (prot)	0	0	1749	0	0	1733
Flt Permitted						
Satd. Flow (perm)	0	0	1749	0	0	1733
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	5%	0%	0%	6%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1569	0	0	1127
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 81.8% ICU Level of Service D

Analysis Period (min) 15

Volume

9: Route 138 & South Parking Lot Exit

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1	1490	0	0	1080
Future Volume (vph)	0	1	1490	0	0	1080
Satd. Flow (prot)	1589	0	1749	0	0	1733
Flt Permitted						
Satd. Flow (perm)	1589	0	1749	0	0	1733
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	5%	2%	2%	6%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	1568	0	0	1137
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 88.4% ICU Level of Service E

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑			↑
Traffic Vol, veh/h	0	1	1490	0	0	1080
Future Vol, veh/h	0	1	1490	0	0	1080
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	5	2	2	6
Mvmt Flow	0	1	1568	0	0	1137

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2705	1568	0	-	-	-
Stage 1	1568	-	-	-	-	-
Stage 2	1137	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	24	138	-	0	0	-
Stage 1	191	-	-	0	0	-
Stage 2	309	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	24	138	-	-	-	-
Mov Cap-2 Maneuver	24	-	-	-	-	-
Stage 1	191	-	-	-	-	-
Stage 2	309	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.3	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBTWBLn1	SBT
Capacity (veh/h)	- 138	-
HCM Lane V/C Ratio	- 0.008	-
HCM Control Delay (s)	- 31.3	-
HCM Lane LOS	- D	-
HCM 95th %tile Q(veh)	- 0	-

Volume

10: Route 138 & North Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (vph)	0	0	1490	7	6	1090
Future Volume (vph)	0	0	1490	7	6	1090
Satd. Flow (prot)	0	0	1746	0	0	1733
Flt Permitted						
Satd. Flow (perm)	0	0	1746	0	0	1733
Peak Hour Factor	0.92	0.92	0.96	0.58	0.75	0.94
Heavy Vehicles (%)	2%	2%	5%	14%	0%	6%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1564	0	0	1168
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 82.2% ICU Level of Service E

Analysis Period (min) 15

Volume

11: Route 138 & Green Street/North Parking Lot Exit

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	0	7	0	0	10	1	1480	0	0	1090	7
Future Volume (vph)	7	0	7	0	0	10	1	1480	0	0	1090	7
Satd. Flow (prot)	0	1671	0	0	1444	0	0	1766	0	0	1732	0
Flt Permitted		0.976										
Satd. Flow (perm)	0	1671	0	0	1444	0	0	1766	0	0	1732	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	2%	2%	10%	0%	4%	0%	2%	6%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	0	0	11	0	0	1559	0	0	1154	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 92.5%

ICU Level of Service F

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	7	0	0	10	1	1480	0	0	1090	7
Future Vol, veh/h	7	0	7	0	0	10	1	1480	0	0	1090	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	2	0	2	2	10	0	4	0	2	6	0
Mvmt Flow	7	0	7	0	0	11	1	1558	0	0	1147	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2716	2711	1151	2715	2715	1558	1155	0	-	-	-	0
Stage 1	1151	1151	-	1560	1560	-	-	-	-	-	-	-
Stage 2	1565	1560	-	1155	1155	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.12	6.52	6.3	4.1	-	-	-	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.518	4.018	3.39	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	14	21	243	14	21	133	612	-	0	0	-	-
Stage 1	243	272	-	141	173	-	-	-	0	0	-	-
Stage 2	141	173	-	240	271	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	13	21	243	13	21	133	612	-	-	-	-	-
Mov Cap-2 Maneuver	13	21	-	13	21	-	-	-	-	-	-	-
Stage 1	240	272	-	139	171	-	-	-	-	-	-	-
Stage 2	128	171	-	233	271	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB				
HCM Control Delay, s	272.8		34.4		0		0				
HCM LOS	F		D								

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	612	-	25	133	-
HCM Lane V/C Ratio	0.002	-	0.589	0.079	-
HCM Control Delay (s)	10.9	0	272.8	34.4	-
HCM Lane LOS	B	A	F	D	-
HCM 95th %tile Q(veh)	0	-	1.8	0.3	-

Volume

12: Route 138 & Summit Rd.

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1	970	550	7	1090
Future Volume (vph)	0	1	970	550	7	1090
Satd. Flow (prot)	1558	0	1672	0	0	1717
Flt Permitted						
Satd. Flow (perm)	1558	0	1672	0	0	1717
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	7%	0%	2%	7%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	1600	0	0	1154
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 94.6% ICU Level of Service F

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑			↔
Traffic Vol, veh/h	0	1	970	550	7	1090
Future Vol, veh/h	0	1	970	550	7	1090
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	2	7	0	2	7
Mvmt Flow	0	1	1021	579	7	1147

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2473	1311	0	0	1600
Stage 1	1311	-	-	-	-
Stage 2	1162	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218
Pot Cap-1 Maneuver	33	194	-	-	409
Stage 1	255	-	-	-	-
Stage 2	300	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	31	194	-	-	409
Mov Cap-2 Maneuver	31	-	-	-	-
Stage 1	255	-	-	-	-
Stage 2	286	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	194	409
HCM Lane V/C Ratio	-	-	0.005	0.018
HCM Control Delay (s)	-	-	23.7	14
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0	0.1

Volume

13: Route 138 & Thacher Montessori School

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	9	3	960	1080	45
Future Volume (vph)	0	9	3	960	1080	45
Satd. Flow (prot)	1589	0	0	1733	1728	0
Flt Permitted						
Satd. Flow (perm)	1589	0	0	1733	1728	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	0%	6%	6%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	0	0	1024	1197	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 69.6% ICU Level of Service C

Analysis Period (min) 15

HCM 2010 TWSC
 13: Route 138 & Thacher Montessori School

08/20/2018

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	3	960	1080	45
Future Vol, veh/h	0	9	3	960	1080	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	0	0	6	6	0
Mvmt Flow	0	10	3	1021	1149	48

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2201	1173	1197	0	-	0
Stage 1	1173	-	-	-	-	-
Stage 2	1028	-	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	49	*109	*327	-	-	-
Stage 1	294	-	-	-	-	-
Stage 2	345	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	48	*109	*327	-	-	-
Mov Cap-2 Maneuver	48	-	-	-	-	-
Stage 1	294	-	-	-	-	-
Stage 2	338	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	41.2	0.1	0
HCM LOS	E		

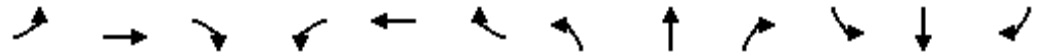
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 327	-	109	-	-
HCM Lane V/C Ratio	0.01	-	0.088	-	-
HCM Control Delay (s)	16.1	0	41.2	-	-
HCM Lane LOS	C	A	E	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↗	↘			↑			↖	↙
Traffic Volume (vph)	6	0	310	160	110	15	0	970	0	0	660	7
Future Volume (vph)	6	0	310	160	110	15	0	970	0	0	660	7
Satd. Flow (prot)	0	1545	0	1728	1760	0	0	1733	0	0	1683	0
Flt Permitted		0.995		0.396								
Satd. Flow (perm)	0	1539	0	720	1760	0	0	1733	0	0	1683	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	3%	1%	1%	13%	0%	6%	2%	2%	9%	14%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	329	0	167	131	0	0	1010	0	0	695	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8								
Detector Phase	4	4		8	8			2				6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0			10.0				10.0
Minimum Split (s)	16.0	16.0		20.0	20.0			45.0				45.0
Total Split (s)	30.0	30.0		30.0	30.0			50.0				50.0
Total Split (%)	37.5%	37.5%		37.5%	37.5%			62.5%				62.5%
Yellow Time (s)	5.0	5.0		5.0	5.0			4.0				4.0
All-Red Time (s)	1.0	1.0		1.0	1.0			1.0				1.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)		6.0		6.0	6.0			5.0				5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			None				None
Act Effect Green (s)		20.2		20.2	20.2			45.1				45.1
Actuated g/C Ratio		0.26		0.26	0.26			0.59				0.59
v/c Ratio		0.81		0.88	0.28			0.99				0.70
Control Delay		42.6		68.7	23.6			44.2				16.7
Queue Delay		0.0		0.0	0.0			0.0				0.0
Total Delay		42.6		68.7	23.6			44.2				16.7
LOS		D		E	C			D				B
Approach Delay		42.6			48.9			44.2				16.7
Approach LOS		D			D			D				B
Queue Length 50th (ft)		145		76	49			~495				230
Queue Length 95th (ft)		#259		#181	92			#779				378
Internal Link Dist (ft)		906			198			187				2213
Turn Bay Length (ft)												
Base Capacity (vph)		484		227	554			1023				994
Starvation Cap Reductn		0		0	0			0				0
Spillback Cap Reductn		0		0	0			0				0
Storage Cap Reductn		0		0	0			0				0
Reduced v/c Ratio		0.68		0.74	0.24			0.99				0.70

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 76.4

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 36.4

Intersection LOS: D

Intersection Capacity Utilization 93.6%

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: 14: Route 138 & Brush Hill Rd.



HCM 2010 Signalized Intersection Summary

14: Route 138 & Brush Hill Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	310	160	110	15	0	970	0	0	660	7
Future Volume (veh/h)	6	0	310	160	110	15	0	970	0	0	660	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	10	0	5	10	0	0	20	0	0	15	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1846	1900	1881	1854	1900	0	1792	0	0	1742	1900
Adj Flow Rate, veh/h	6	0	323	167	115	16	0	1010	0	0	688	7
Adj No. of Lanes	0	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	1	1	1	0	6	0	0	9	9
Cap, veh/h	46	6	370	179	518	59	0	1008	0	0	978	9
Arrive On Green	0.29	0.00	0.29	0.29	0.29	0.29	0.00	0.57	0.00	0.00	0.57	0.57
Sat Flow, veh/h	9	20	1541	1063	1593	222	0	1792	0	0	1722	18
Grp Volume(v), veh/h	329	0	0	167	0	131	0	1010	0	0	0	695
Grp Sat Flow(s),veh/h/ln	1570	0	0	1063	0	1815	0	1792	0	0	0	1739
Q Serve(g_s), s	0.0	0.0	0.0	5.4	0.0	4.4	0.0	43.7	0.0	0.0	0.0	22.6
Cycle Q Clear(g_c), s	14.8	0.0	0.0	20.2	0.0	4.4	0.0	43.7	0.0	0.0	0.0	22.6
Prop In Lane	0.02		0.98	1.00		0.12	0.00		0.00	0.00		0.01
Lane Grp Cap(c), veh/h	398	0	0	179	0	529	0	1008	0	0	0	989
V/C Ratio(X)	0.83	0.00	0.00	0.93	0.00	0.25	0.00	1.00	0.00	0.00	0.00	0.70
Avail Cap(c_a), veh/h	524	0	0	303	0	552	0	1022	0	0	0	992
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	25.1	0.0	0.0	34.0	0.0	22.0	0.0	17.5	0.0	0.0	0.0	13.3
Incr Delay (d2), s/veh	8.2	0.0	0.0	23.2	0.0	0.2	0.0	28.5	0.0	0.0	0.0	2.2
Initial Q Delay(d3),s/veh	26.4	0.0	0.0	70.0	0.0	3.4	0.0	70.1	0.0	0.0	0.0	5.6
%ile BackOfQ(50%),veh/ln	10.2	0.0	0.0	8.6	0.0	3.7	0.0	49.8	0.0	0.0	0.0	15.0
LnGrp Delay(d),s/veh	59.7	0.0	0.0	127.2	0.0	25.7	0.0	116.1	0.0	0.0	0.0	21.1
LnGrp LOS	E			F		C		F				C
Approach Vol, veh/h		329			298			1010				695
Approach Delay, s/veh		59.7			82.6			116.1				21.1
Approach LOS		E			F			F				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.0		28.9		50.0		28.9				
Change Period (Y+Rc), s		5.0		6.0		5.0		6.0				
Max Green Setting (Gmax), s		45.0		24.0		45.0		24.0				
Max Q Clear Time (g_c+I1), s		45.7		16.8		24.6		22.2				
Green Ext Time (p_c), s		0.0		2.2		13.4		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				75.5								
HCM 2010 LOS				E								

Volume

15: Canton Ave. & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	160	390	0	130
Future Volume (vph)	0	0	160	390	0	130
Satd. Flow (prot)	0	0	1711	1801	0	1573
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	1711	1801	0	1573
Peak Hour Factor	0.92	0.92	0.84	0.86	0.92	0.85
Heavy Vehicles (%)	2%	2%	2%	2%	2%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	190	453	0	153
Sign Control	Free			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 23.9% ICU Level of Service A

Analysis Period (min) 15

Volume

16: Route 138 & Neponset Valley Pkwy.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	170	440	550	490	3
Future Volume (vph)	4	170	440	550	490	3
Satd. Flow (prot)	1348	0	0	1693	1745	0
Flt Permitted	0.999			0.978		
Satd. Flow (perm)	1348	0	0	1693	1745	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	25%	18%	5%	7%	5%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	177	0	0	1010	503	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 100.0% ICU Level of Service G

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	13.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	4	170	440	550	490	3
Future Vol, veh/h	4	170	440	550	490	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	25	18	5	7	5	33
Mvmt Flow	4	173	449	561	500	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1961	502	503	0	-	0
Stage 1	502	-	-	-	-	-
Stage 2	1459	-	-	-	-	-
Critical Hdwy	6.65	6.38	4.15	-	-	-
Critical Hdwy Stg 1	5.65	-	-	-	-	-
Critical Hdwy Stg 2	5.65	-	-	-	-	-
Follow-up Hdwy	3.725	3.462	2.245	-	-	-
Pot Cap-1 Maneuver	60	*260	*561	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	190	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	0	*260	*561	-	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	0	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	44.2	14.4	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	*561	-	260	-	-
HCM Lane V/C Ratio	0.8	-	0.683	-	-
HCM Control Delay (s)	32.3	0	44.2	-	-
HCM Lane LOS	D	A	E	-	-
HCM 95th %tile Q(veh)	7.7	-	4.5	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	30	90	15	30	180	35	9	540	5	1	460	35
Future Volume (vph)	30	90	15	30	180	35	9	540	5	1	460	35
Satd. Flow (prot)	0	1731	0	0	1758	0	0	1716	0	0	1719	0
Flt Permitted		0.907			0.949			0.991			0.999	
Satd. Flow (perm)	0	1588	0	0	1678	0	0	1702	0	0	1717	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	4%	0%	0%	2%	3%	0%	7%	0%	0%	6%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	139	0	0	253	0	0	571	0	0	511	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		37.0	37.0		37.0	37.0	
Total Split (s)	25.0	25.0		25.0	25.0		37.0	37.0		37.0	37.0	
Total Split (%)	40.3%	40.3%		40.3%	40.3%		59.7%	59.7%		59.7%	59.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		14.7			15.1			30.1			30.1	
Actuated g/C Ratio		0.26			0.26			0.53			0.53	
v/c Ratio		0.34			0.57			0.64			0.57	
Control Delay		19.2			23.6			14.7			13.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		19.2			23.6			14.7			13.2	
LOS		B			C			B			B	
Approach Delay		19.2			23.6			14.7			13.2	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		38			75			127			108	
Queue Length 95th (ft)		77			134			263			222	
Internal Link Dist (ft)		1017			791			1154			1181	
Turn Bay Length (ft)												
Base Capacity (vph)		556			588			894			902	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.25			0.43			0.64			0.57	

Intersection Summary

Cycle Length: 62

Actuated Cycle Length: 57.3

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 16.1

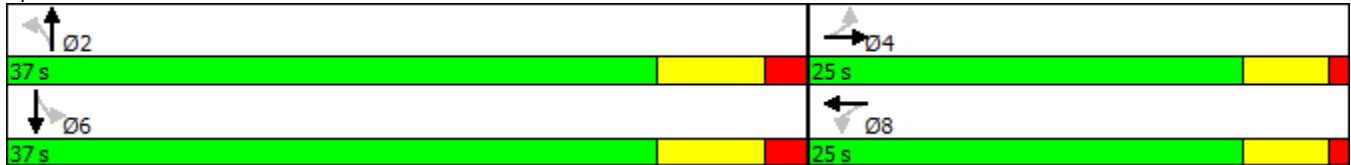
Intersection LOS: B

Intersection Capacity Utilization 60.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 17: Route 138 & Milton St./Dollar Ln.



HCM 2010 Signalized Intersection Summary
 17: Route 138 & Milton St./Dollar Ln.

08/20/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	90	15	30	180	35	9	540	5	1	460	35
Future Volume (veh/h)	30	90	15	30	180	35	9	540	5	1	460	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	10	0	0	15	0	0	15	0	0	10	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1838	1900	1900	1865	1900	1900	1779	1900	1900	1796	1900
Adj Flow Rate, veh/h	31	93	15	31	186	36	9	557	5	1	474	36
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	4	4	4	2	2	2	7	7	7	6	6	6
Cap, veh/h	124	321	36	96	335	49	70	961	8	67	913	63
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.56	0.56	0.56	0.56	0.56	0.56
Sat Flow, veh/h	216	1319	186	123	1390	251	8	1744	15	0	1648	125
Grp Volume(v), veh/h	139	0	0	253	0	0	571	0	0	511	0	0
Grp Sat Flow(s),veh/h/ln	1720	0	0	1764	0	0	1767	0	0	1774	0	0
Q Serve(g_s), s	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.5	0.0	0.0	6.9	0.0	0.0	11.2	0.0	0.0	9.5	0.0	0.0
Prop In Lane	0.22		0.11	0.12		0.14	0.02		0.01	0.00		0.07
Lane Grp Cap(c), veh/h	469	0	0	486	0	0	1033	0	0	1047	0	0
V/C Ratio(X)	0.30	0.00	0.00	0.52	0.00	0.00	0.55	0.00	0.00	0.49	0.00	0.00
Avail Cap(c_a), veh/h	704	0	0	727	0	0	1057	0	0	1060	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.1	0.0	0.0	19.5	0.0	0.0	9.3	0.0	0.0	8.2	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.0	1.8	0.0	0.0	0.6	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	4.6	0.0	0.0	14.3	0.0	0.0	3.4	0.0	0.0	1.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.0	6.7	0.0	0.0	8.3	0.0	0.0	6.1	0.0	0.0
LnGrp Delay(d),s/veh	23.5	0.0	0.0	35.6	0.0	0.0	13.3	0.0	0.0	9.9	0.0	0.0
LnGrp LOS	C			D			B			A		
Approach Vol, veh/h		139			253			571			511	
Approach Delay, s/veh		23.5			35.6			13.3			9.9	
Approach LOS		C			D			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		16.6		37.0		16.6				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		30.0		20.0		30.0		20.0				
Max Q Clear Time (g_c+I1), s		13.2		5.5		11.5		8.9				
Green Ext Time (p_c), s		6.8		3.5		7.2		3.0				
Intersection Summary												
HCM 2010 Ctrl Delay				16.9								
HCM 2010 LOS				B								

Volume
18: Route 138 & Blue Jay Way (Curry College)

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	15	130	480	480	60
Future Volume (vph)	5	15	130	480	480	60
Satd. Flow (prot)	1596	0	0	1705	1717	0
Flt Permitted	0.979			0.989		
Satd. Flow (perm)	1596	0	0	1705	1717	0
Confl. Peds. (#/hr)	1		16			16
Peak Hour Factor	0.42	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	7%	1%	8%	6%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	0	0	663	587	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 74.9%

ICU Level of Service D

Analysis Period (min) 15

HCM 2010 TWSC
 18: Route 138 & Blue Jay Way (Curry College)

08/20/2018

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	5	15	130	480	480	60
Future Vol, veh/h	5	15	130	480	480	60
Conflicting Peds, #/hr	1	0	16	0	0	16
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	92	92	92	92	92
Heavy Vehicles, %	0	7	1	8	6	0
Mvmt Flow	12	16	141	522	522	65

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1375	570	603	0	-	0
Stage 1	570	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Critical Hdwy	6.4	6.27	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.363	2.209	-	-	-
Pot Cap-1 Maneuver	162	*321	*488	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	93	*316	*488	-	-	-
Mov Cap-2 Maneuver	93	-	-	-	-	-
Stage 1	562	-	-	-	-	-
Stage 2	259	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.9	3.3	0
HCM LOS	D		

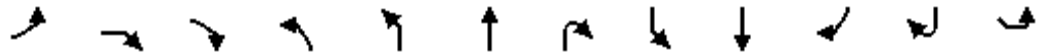
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 488	-	157	-	-
HCM Lane V/C Ratio	0.29	-	0.18	-	-
HCM Control Delay (s)	15.4	0	32.9	-	-
HCM Lane LOS	C	A	D	-	-
HCM 95th %tile Q(veh)	1.2	-	0.6	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018



Lane Group	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2	SEL
Lane Configurations	✘					✘			✘			
Traffic Volume (vph)	2	2	3	2	25	450	9	2	460	1	1	5
Future Volume (vph)	2	2	3	2	25	450	9	2	460	1	1	5
Satd. Flow (prot)	1432	0	0	0	0	1689	0	0	1732	0	0	0
Flt Permitted	0.986					0.960		0.998				
Satd. Flow (perm)	1432	0	0	0	0	1627	0	0	1728	0	0	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	50%	0%	0%	50%	7%	8%	11%	0%	6%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	0	0	0	0	506	0	0	483	0	0	0
Turn Type	Prot			Perm		Perm		NA		Perm		NA
Protected Phases	10					2				6		
Permitted Phases				2		2				6		4
Detector Phase	10			2		2		2		6		6
Switch Phase												
Minimum Initial (s)	4.0			22.0		22.0		22.0		22.0		10.0
Minimum Split (s)	9.0			28.0		28.0		28.0		28.0		15.0
Total Split (s)	10.0			40.0		40.0		40.0		40.0		20.0
Total Split (%)	11.1%			44.4%		44.4%		44.4%		44.4%		22.2%
Yellow Time (s)	4.0			5.0		5.0		5.0		5.0		4.0
All-Red Time (s)	1.0			1.0		1.0		1.0		1.0		1.0
Lost Time Adjust (s)	0.0					0.0				0.0		
Total Lost Time (s)	5.0					6.0				6.0		
Lead/Lag	Lead											
Lead-Lag Optimize?												
Recall Mode	None			Min		Min		Min		Min		Min
Act Effect Green (s)	5.4							31.0				31.0
Actuated g/C Ratio	0.10							0.58				0.58
v/c Ratio	0.05							0.53				0.48
Control Delay	30.6							15.8				14.3
Queue Delay	0.0							0.0				0.0
Total Delay	30.6							15.8				14.3
LOS	C							B				B
Approach Delay	30.6							15.8				14.3
Approach LOS	C							B				B
Queue Length 50th (ft)	2							76				70
Queue Length 95th (ft)	18							#429				354
Internal Link Dist (ft)	1228							1586				2667
Turn Bay Length (ft)												
Base Capacity (vph)	146							1201				1276
Starvation Cap Reductn	0							0				0
Spillback Cap Reductn	0							0				0
Storage Cap Reductn	0							0				0
Reduced v/c Ratio	0.05							0.42				0.38

Intersection Summary

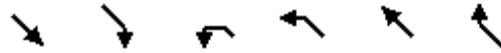
Cycle Length: 90

Actuated Cycle Length: 53.1

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018



Lane Group	SET	SER	NWL2	NWL	NWT	NWR	Ø9
Lane Configurations	↕				↕		
Traffic Volume (vph)	20	30	45	1	50	30	
Future Volume (vph)	20	30	45	1	50	30	
Satd. Flow (prot)	1639	0	0	0	1734	0	
Flt Permitted	0.966				0.855		
Satd. Flow (perm)	1589	0	0	0	1509	0	
Satd. Flow (RTOR)							
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	
Heavy Vehicles (%)	5%	3%	0%	0%	0%	3%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	57	0	0	0	131	0	
Turn Type	NA		Perm	Perm	NA		
Protected Phases	4				8		9
Permitted Phases			8	8			
Detector Phase	4		8	8	8		
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	10.0		1.0
Minimum Split (s)	15.0		15.0	15.0	15.0		20.0
Total Split (s)	20.0		20.0	20.0	20.0		20.0
Total Split (%)	22.2%		22.2%	22.2%	22.2%		22%
Yellow Time (s)	4.0		4.0	4.0	4.0		2.0
All-Red Time (s)	1.0		1.0	1.0	1.0		0.0
Lost Time Adjust (s)	0.0				0.0		
Total Lost Time (s)	5.0				5.0		
Lead/Lag							Lag
Lead-Lag Optimize?							
Recall Mode	None		None	None	None		None
Act Effct Green (s)	11.8				11.8		
Actuated g/C Ratio	0.22				0.22		
v/c Ratio	0.16				0.39		
Control Delay	22.8				25.8		
Queue Delay	0.0				0.0		
Total Delay	22.8				25.8		
LOS	C				C		
Approach Delay	22.8				25.8		
Approach LOS	C				C		
Queue Length 50th (ft)	11				27		
Queue Length 95th (ft)	63				127		
Internal Link Dist (ft)	689				1410		
Turn Bay Length (ft)							
Base Capacity (vph)	488				463		
Starvation Cap Reductn	0				0		
Spillback Cap Reductn	0				0		
Storage Cap Reductn	0				0		
Reduced v/c Ratio	0.12				0.28		
Intersection Summary							

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 16.7

Intersection LOS: B

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.

Splits and Phases: 19: Route 138 & Atherton St. & Bradlee Rd.

 Ø2	 Ø4	 Ø10	 Ø9
40 s	20 s	10 s	20 s
 Ø6	 Ø8		
40 s	20 s		

Volume
20: Route 138 & Robbins St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	10	15	3	30	30	15	4	490	10	0	470	7
Future Volume (vph)	10	15	3	30	30	15	4	490	10	0	470	7
Satd. Flow (prot)	0	1778	0	0	1690	0	0	1696	0	0	1715	0
Flt Permitted		0.845			0.855			0.997				
Satd. Flow (perm)	0	1530	0	0	1474	0	0	1691	0	0	1715	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	3%	0%	13%	0%	8%	8%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	82	0	0	548	0	0	519	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Total Split (%)	30.8%	30.8%		30.8%	30.8%		69.2%	69.2%		69.2%	69.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		8.3			8.3			27.9			27.9	
Actuated g/C Ratio		0.22			0.22			0.72			0.72	
v/c Ratio		0.09			0.26			0.45			0.42	
Control Delay		15.3			17.1			7.1			6.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.3			17.1			7.1			6.7	
LOS		B			B			A			A	
Approach Delay		15.3			17.1			7.1			6.7	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		6			16			71			65	
Queue Length 95th (ft)		24			50			163			149	
Internal Link Dist (ft)		939			647			711			3441	
Turn Bay Length (ft)												
Base Capacity (vph)		615			592			1592			1615	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.05			0.14			0.34			0.32	

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 38.6

Volume

20: Route 138 & Robbins St.

08/20/2018

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 7.8

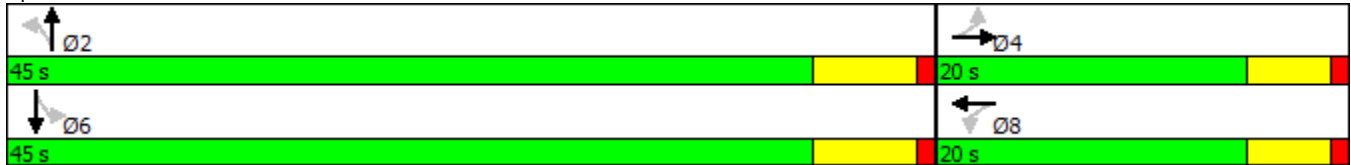
Intersection LOS: A

Intersection Capacity Utilization 44.6%

ICU Level of Service A

















Analysis Period (min) 15

Splits and Phases: 20: Route 138 & Robbins St.



HCM 2010 Signalized Intersection Summary
20: Route 138 & Robbins St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	15	3	30	30	15	4	490	10	0	470	7
Future Volume (veh/h)	10	15	3	30	30	15	4	490	10	0	470	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	2	0	0	2	0	0	10	0	0	10	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1831	1900	1900	1760	1900	1900	1777	1900
Adj Flow Rate, veh/h	11	16	3	33	33	16	4	533	11	0	511	8
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	8	8	8	7	7	7
Cap, veh/h	201	176	22	219	127	41	107	894	18	0	923	14
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.52	0.52	0.52	0.00	0.52	0.52
Sat Flow, veh/h	380	1172	173	490	804	314	3	1713	35	0	1745	27
Grp Volume(v), veh/h	30	0	0	82	0	0	548	0	0	0	0	519
Grp Sat Flow(s),veh/h/ln	1725	0	0	1608	0	0	1751	0	0	0	0	1773
Q Serve(g_s), s	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4
Cycle Q Clear(g_c), s	0.5	0.0	0.0	1.4	0.0	0.0	7.0	0.0	0.0	0.0	0.0	6.4
Prop In Lane	0.37		0.10	0.40		0.20	0.01		0.02	0.00		0.02
Lane Grp Cap(c), veh/h	390	0	0	378	0	0	1014	0	0	0	0	939
V/C Ratio(X)	0.08	0.00	0.00	0.22	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.55
Avail Cap(c_a), veh/h	922	0	0	884	0	0	2208	0	0	0	0	2130
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	12.5	0.0	0.0	12.9	0.0	0.0	6.4	0.0	0.0	0.0	0.0	5.8
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.2	0.0	0.0	0.3	0.0	0.0	1.5	0.0	0.0	0.0	0.0	1.8
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.9	0.0	0.0	5.2	0.0	0.0	0.0	0.0	4.8
LnGrp Delay(d),s/veh	12.8	0.0	0.0	13.5	0.0	0.0	8.4	0.0	0.0	0.0	0.0	8.1
LnGrp LOS	B			B			A					A
Approach Vol, veh/h		30			82			548				519
Approach Delay, s/veh		12.8			13.5			8.4				8.1
Approach LOS		B			B			A				A
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		9.4		23.0		9.4				
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0				
Max Green Setting (Gmax), s		39.0		15.0		39.0		15.0				
Max Q Clear Time (g_c+I1), s		9.0		2.5		8.4		3.4				
Green Ext Time (p_c), s		8.0		0.4		8.0		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			8.7									
HCM 2010 LOS			A									

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	15	3	100	30	15	1	530	50	8	410	8
Future Volume (vph)	4	15	3	100	30	15	1	530	50	8	410	8
Satd. Flow (prot)	0	1777	0	0	1735	0	0	1519	0	0	1525	0
Flt Permitted		0.991			0.967			0.999			0.983	
Satd. Flow (perm)	0	1776	0	0	1730	0	0	1518	0	0	1501	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	1		1	1		1			2	2		
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	8%	0%	13%	8%	0%
Parking (#/hr)							0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	177	0	0	708	0	0	520	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		13.0	13.0		13.0	13.0	
Total Split (s)	13.0	13.0		13.0	13.0		28.0	28.0		28.0	28.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%		51.9%	51.9%		51.9%	51.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		7.0			7.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		5.9			6.1			24.8			24.8	
Actuated g/C Ratio		0.12			0.13			0.52			0.52	
v/c Ratio		0.12			0.80			0.89			0.66	
Control Delay		19.9			49.8			30.8			17.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		19.9			49.8			30.8			17.1	
LOS		B			D			C			B	
Approach Delay		19.9			49.8			30.8			17.1	
Approach LOS		B			D			C			B	
Queue Length 50th (ft)		6			40			129			78	
Queue Length 95th (ft)		24			#136			#402			#268	
Internal Link Dist (ft)		838			877			3441			407	
Turn Bay Length (ft)												
Base Capacity (vph)		228			222			793			784	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			0.80			0.89			0.66	

Intersection Summary

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

Cycle Length: 54

Actuated Cycle Length: 47.5

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 27.9

Intersection LOS: C

Intersection Capacity Utilization 57.8%

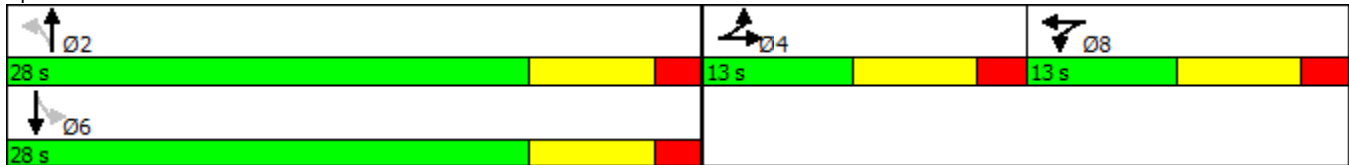
ICU Level of Service B

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

















Queue shown is maximum after two cycles.

Splits and Phases: 21: Route 138 & Cheever St./Blue Hill Terrace St.



HCM 2010 Signalized Intersection Summary
 21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	15	3	100	30	15	1	530	50	8	410	8
Future Volume (veh/h)	4	15	3	100	30	15	1	530	50	8	410	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	2	0	0	5	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1887	1900	1900	1771	1900	1900	1760	1900
Adj Flow Rate, veh/h	5	18	4	122	37	18	1	646	61	10	500	10
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	0	0	0	0	0	8	8	8	8	8	8
Cap, veh/h	9	31	7	130	99	16	73	625	46	79	654	13
Arrive On Green	0.03	0.03	0.03	0.12	0.12	0.12	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	339	1222	272	1235	375	182	0	1434	135	9	1533	30
Grp Volume(v), veh/h	27	0	0	177	0	0	708	0	0	520	0	0
Grp Sat Flow(s),veh/h/ln	1833	0	0	1792	0	0	1569	0	0	1573	0	0
Q Serve(g_s), s	0.7	0.0	0.0	4.7	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0	4.7	0.0	0.0	21.0	0.0	0.0	13.9	0.0	0.0
Prop In Lane	0.19		0.15	0.69		0.10	0.00		0.09	0.02		0.02
Lane Grp Cap(c), veh/h	46	0	0	220	0	0	746	0	0	745	0	0
V/C Ratio(X)	0.59	0.00	0.00	0.80	0.00	0.00	0.95	0.00	0.00	0.70	0.00	0.00
Avail Cap(c_a), veh/h	223	0	0	218	0	0	742	0	0	745	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	23.7	0.0	0.0	21.1	0.0	0.0	14.9	0.0	0.0	12.1	0.0	0.0
Incr Delay (d2), s/veh	11.3	0.0	0.0	19.4	0.0	0.0	21.6	0.0	0.0	2.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	3.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	3.8	0.0	0.0	15.5	0.0	0.0	6.5	0.0	0.0
LnGrp Delay(d),s/veh	35.1	0.0	0.0	43.6	0.0	0.0	42.9	0.0	0.0	14.9	0.0	0.0
LnGrp LOS	D			D			D			B		
Approach Vol, veh/h		27			177			708			520	
Approach Delay, s/veh		35.1			43.6			42.9			14.9	
Approach LOS		D			D			D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		28.0		8.2		28.0		13.0				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		21.0		6.0		21.0		6.0				
Max Q Clear Time (g_c+I1), s		23.0		2.7		15.9		6.7				
Green Ext Time (p_c), s		0.0		0.0		3.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				32.7								
HCM 2010 LOS				C								

Volume

22: Route 138 & Aberdeen Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	4	4	540	410	30
Future Volume (vph)	10	4	4	540	410	30
Satd. Flow (prot)	1701	0	0	1546	1638	0
Flt Permitted	0.967					
Satd. Flow (perm)	1701	0	0	1546	1638	0
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	7%	0%	0%
Parking (#/hr)			0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	16	0	0	619	500	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 41.6% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	10	4	4	540	410	30
Future Vol, veh/h	10	4	4	540	410	30
Conflicting Peds, #/hr	2	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	7	0	0
Mvmt Flow	11	5	5	614	466	34

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1108	483	500	0	0
Stage 1	483	-	-	-	-
Stage 2	625	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	234	*327	*491	-	-
Stage 1	625	-	-	-	-
Stage 2	537	-	-	-	-
Platoon blocked, %		1	1	-	-
Mov Cap-1 Maneuver	230	*327	*491	-	-
Mov Cap-2 Maneuver	230	-	-	-	-
Stage 1	625	-	-	-	-
Stage 2	529	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.3	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 491	-	251	-	-
HCM Lane V/C Ratio	0.009	-	0.063	-	-
HCM Control Delay (s)	12.4	0	20.3	-	-
HCM Lane LOS	B	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

23: Route 138 & Oak St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	2	6	2	4	6	7	3	540	35	10	400	1
Future Volume (vph)	2	6	2	4	6	7	3	540	35	10	400	1
Satd. Flow (prot)	0	1775	0	0	1616	0	0	1710	0	0	1702	0
Flt Permitted		0.991			0.988						0.999	
Satd. Flow (perm)	0	1775	0	0	1616	0	0	1710	0	0	1702	0
Confl. Peds. (#/hr)	7					7	1		16	16		1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	0%	7%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	0	0	20	0	0	664	0	0	472	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 44.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	6	2	4	6	7	3	540	35	10	400	1
Future Vol, veh/h	2	6	2	4	6	7	3	540	35	10	400	1
Conflicting Peds, #/hr	7	0	0	0	0	7	1	0	16	16	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	25	0	0	0	7	0	0	8	0
Mvmt Flow	2	7	2	5	7	8	3	621	40	11	460	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1146	1168	461	1152	1149	664	462	0	0	677	0	0
Stage 1	484	484	-	664	664	-	-	-	-	-	-	-
Stage 2	662	684	-	488	485	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.35	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.725	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	178	195	*436	157	200	*436	1110	-	-	924	-	-
Stage 1	568	555	-	414	461	-	-	-	-	-	-	-
Stage 2	454	452	-	520	555	-	-	-	-	-	-	-
Platoon blocked, %			1			1		-	-	-	-	-
Mov Cap-1 Maneuver	166	188	*436	147	193	*427	1110	-	-	918	-	-
Mov Cap-2 Maneuver	166	188	-	147	193	-	-	-	-	-	-	-
Stage 1	565	546	-	407	453	-	-	-	-	-	-	-
Stage 2	434	444	-	503	546	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.5	22.3	0	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1110	-	-	206	228	918	-
HCM Lane V/C Ratio	0.003	-	-	0.056	0.086	0.013	-
HCM Control Delay (s)	8.3	0	-	23.5	22.3	9	0
HCM Lane LOS	A	A	-	C	C	A	A
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

24: Route 138 & Brook Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Volume (vph)	8	190	4	0	0	0	5	500	45	9	400	20
Future Volume (vph)	8	190	4	0	0	0	5	500	45	9	400	20
Satd. Flow (prot)	0	1802	0	0	0	0	0	1689	0	0	1695	0
Flt Permitted		0.998						0.996			0.986	
Satd. Flow (perm)	0	1802	0	0	0	0	0	1682	0	0	1673	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	1		1				1		7	7		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	13%	1%	0%	2%	2%	2%	20%	7%	9%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	224	0	0	0	0	0	612	0	0	476	0
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0					30.0	30.0		30.0	30.0	
Minimum Split (s)	23.0	23.0					36.0	36.0		36.0	36.0	
Total Split (s)	25.0	25.0					40.0	40.0		40.0	40.0	
Total Split (%)	38.5%	38.5%					61.5%	61.5%		61.5%	61.5%	
Yellow Time (s)	4.0	4.0					5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.0						6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None					Min	Min		Min	Min	
Act Effct Green (s)		14.0						30.9			30.9	
Actuated g/C Ratio		0.25						0.55			0.55	
v/c Ratio		0.50						0.66			0.52	
Control Delay		22.1						14.0			11.1	
Queue Delay		0.0						0.0			0.0	
Total Delay		22.1						14.0			11.1	
LOS		C						B			B	
Approach Delay		22.1						14.0			11.1	
Approach LOS		C						B			B	
Queue Length 50th (ft)		62						124			86	
Queue Length 95th (ft)		124						281			194	
Internal Link Dist (ft)		967			1001			519			1021	
Turn Bay Length (ft)												
Base Capacity (vph)		648						1029			1023	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.35						0.59			0.47	

Intersection Summary

Cycle Length: 65

Volume

24: Route 138 & Brook Rd.

08/20/2018

Actuated Cycle Length: 56

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 14.3

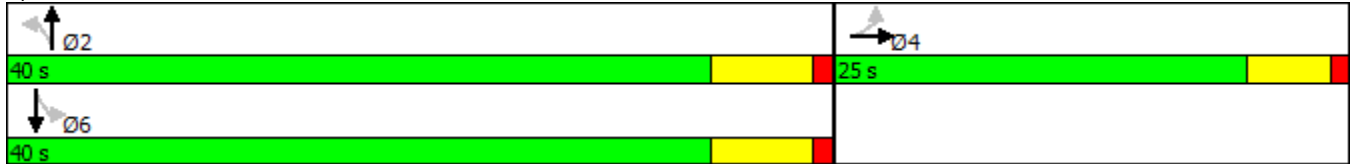
Intersection LOS: B

Intersection Capacity Utilization 51.6%

ICU Level of Service A
















Analysis Period (min) 15

Splits and Phases: 24: Route 138 & Brook Rd.



HCM 2010 Signalized Intersection Summary
 24: Route 138 & Brook Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	190	4	0	0	0	5	500	45	9	400	20
Future Volume (veh/h)	8	190	4	0	0	0	5	500	45	9	400	20
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	10	0				0	15	0	0	15	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1873	1900				1900	1771	1900	1900	1768	1900
Adj Flow Rate, veh/h	9	211	4				6	556	50	10	444	22
Adj No. of Lanes	0	1	0				0	1	0	0	1	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	1	0				7	7	7	8	8	8
Cap, veh/h	12	348	5				72	950	77	77	980	43
Arrive On Green	0.18	0.18	0.18				0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	75	1755	33				4	1595	142	10	1649	80
Grp Volume(v), veh/h	224	0	0				612	0	0	476	0	0
Grp Sat Flow(s),veh/h/ln	1863	0	0				1741	0	0	1740	0	0
Q Serve(g_s), s	5.6	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.6	0.0	0.0				10.8	0.0	0.0	7.4	0.0	0.0
Prop In Lane	0.04		0.02				0.01		0.08	0.02		0.05
Lane Grp Cap(c), veh/h	361	0	0				1096	0	0	1102	0	0
V/C Ratio(X)	0.62	0.00	0.00				0.56	0.00	0.00	0.43	0.00	0.00
Avail Cap(c_a), veh/h	746	0	0				1257	0	0	1256	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.5	0.0	0.0				7.8	0.0	0.0	6.8	0.0	0.0
Incr Delay (d2), s/veh	3.7	0.0	0.0				0.4	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	14.6	0.0	0.0				3.1	0.0	0.0	2.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	0.0				8.2	0.0	0.0	6.0	0.0	0.0
LnGrp Delay(d),s/veh	37.8	0.0	0.0				11.3	0.0	0.0	9.4	0.0	0.0
LnGrp LOS	D						B			A		
Approach Vol, veh/h		224						612			476	
Approach Delay, s/veh		37.8						11.3			9.4	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		36.0		13.9		36.0						
Change Period (Y+Rc), s		6.0		5.0		6.0						
Max Green Setting (Gmax), s		34.0		20.0		34.0						
Max Q Clear Time (g_c+I1), s		12.8		7.6		9.4						
Green Ext Time (p_c), s		7.4		1.7		7.9						
Intersection Summary												
HCM 2010 Ctrl Delay			15.2									
HCM 2010 LOS			B									

Volume

102: Route 138 & Concord Baptist Church

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	550	3	3	410
Future Volume (vph)	0	0	550	3	3	410
Satd. Flow (prot)	1837	0	1831	0	0	1835
Flt Permitted						0.999
Satd. Flow (perm)	1837	0	1831	0	0	1835
Confl. Peds. (#/hr)				4	4	
Peak Hour Factor	0.92	0.92	0.86	0.75	0.38	0.89
Heavy Vehicles (%)	0%	0%	0%	33%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	644	0	0	469
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 32.5%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	0	550	3	3	410
Future Vol, veh/h	0	0	550	3	3	410
Conflicting Peds, #/hr	0	0	0	4	4	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	86	75	38	89
Heavy Vehicles, %	0	0	0	33	0	0
Mvmt Flow	0	0	640	4	8	461

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1122	646	0	0	648	0
Stage 1	646	-	-	-	-	-
Stage 2	476	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	230	475	-	-	947	-
Stage 1	526	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	227	473	-	-	947	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	524	-	-	-	-	-
Stage 2	622	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	947	-
HCM Lane V/C Ratio	-	-	0.008	-
HCM Control Delay (s)	-	-	0	8.8
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Volume

8: Route 138 & South Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	1120	15	2	1270
Future Volume (vph)	0	0	1120	15	2	1270
Satd. Flow (prot)	0	0	1576	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	0	1576	0	0	1580
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	4%	8%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1220	0	0	1368
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 79.8% ICU Level of Service D

Analysis Period (min) 15

Volume

9: Route 138 & South Parking Lot Exit

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	10	1130	0	0	1270
Future Volume (vph)	3	10	1130	0	0	1270
Satd. Flow (prot)	1453	0	1580	0	0	1595
Flt Permitted	0.989					
Satd. Flow (perm)	1453	0	1580	0	0	1595
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	4%	2%	2%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	1215	0	0	1366
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 84.7% ICU Level of Service E

Analysis Period (min) 15

HCM 2010 TWSC
 9: Route 138 & South Parking Lot Exit

08/20/2018

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑			↑
Traffic Vol, veh/h	3	10	1130	0	0	1270
Future Vol, veh/h	3	10	1130	0	0	1270
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	2	2	3
Mvmt Flow	3	11	1215	0	0	1366

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2581	1215	0	-	-	-
Stage 1	1215	-	-	-	-	-
Stage 2	1366	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	29	223	-	0	0	-
Stage 1	283	-	-	0	0	-
Stage 2	239	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	29	223	-	-	-	-
Mov Cap-2 Maneuver	29	-	-	-	-	-
Stage 1	283	-	-	-	-	-
Stage 2	239	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	53.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBTWBLn1	SBT
Capacity (veh/h)	- 88	-
HCM Lane V/C Ratio	- 0.159	-
HCM Control Delay (s)	- 53.5	-
HCM Lane LOS	- F	-
HCM 95th %tile Q(veh)	- 0.5	-

Volume

10: Route 138 & North Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	1120	9	6	1270
Future Volume (vph)	0	0	1120	9	6	1270
Satd. Flow (prot)	0	0	1593	0	0	1581
Flt Permitted						
Satd. Flow (perm)	0	0	1593	0	0	1581
Peak Hour Factor	0.92	0.92	0.98	0.45	0.50	0.97
Heavy Vehicles (%)	2%	2%	3%	0%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1163	0	0	1321
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 83.4% ICU Level of Service E

Analysis Period (min) 15

Volume

11: Route 138 & Green Street/North Parking Lot Exit

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	2	0	8	0	0	20	8	1120	0	0	1270	5
Future Volume (vph)	2	0	8	0	0	20	8	1120	0	0	1270	5
Satd. Flow (prot)	0	1451	0	0	1421	0	0	1593	0	0	1579	0
Flt Permitted		0.990										
Satd. Flow (perm)	0	1451	0	0	1421	0	0	1593	0	0	1579	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	0%	2%	2%	0%	25%	3%	0%	2%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	21	0	0	1163	0	0	1314	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 85.0%

ICU Level of Service E

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	8	0	0	20	8	1120	0	0	1270	5
Future Vol, veh/h	2	0	8	0	0	20	8	1120	0	0	1270	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	2	0	2	2	0	25	3	0	2	4	0
Mvmt Flow	2	0	8	0	0	21	8	1155	0	0	1309	5

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2493	2483	1312	2487	2485	1155	1314	0	-	-	-	0
Stage 1	1312	1312	-	1171	1171	-	-	-	-	-	-	-
Stage 2	1181	1171	-	1316	1314	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.12	6.52	6.2	4.35	-	-	-	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.518	4.018	3.3	2.425	-	-	-	-	-
Pot Cap-1 Maneuver	20	30	196	20	29	242	457	-	0	0	-	-
Stage 1	197	228	-	235	267	-	-	-	0	0	-	-
Stage 2	234	267	-	194	228	-	-	-	0	0	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	18	29	196	18	28	242	457	-	-	-	-	-
Mov Cap-2 Maneuver	18	29	-	18	28	-	-	-	-	-	-	-
Stage 1	187	228	-	223	254	-	-	-	-	-	-	-
Stage 2	204	254	-	186	228	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	69.4		21.3		0.1		0	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	457	-	66	242	-
HCM Lane V/C Ratio	0.018	-	0.156	0.085	-
HCM Control Delay (s)	13	0	69.4	21.3	-
HCM Lane LOS	B	A	F	C	-
HCM 95th %tile Q(veh)	0.1	-	0.5	0.3	-

Volume

12: Route 138 & Summit Rd.

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	790	340	10	1270
Future Volume (vph)	1	1	790	340	10	1270
Satd. Flow (prot)	1480	0	1523	0	0	1580
Flt Permitted	0.976					
Satd. Flow (perm)	1480	0	1523	0	0	1580
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	5%	0%	2%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1165	0	0	1319
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 93.6%	ICU Level of Service F
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	1	1	790	340	10	1270
Future Vol, veh/h	1	1	790	340	10	1270
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	2	5	0	2	4
Mvmt Flow	1	1	814	351	10	1309

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2321	991	0	0	1166
Stage 1	991	-	-	-	-
Stage 2	1330	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218
Pot Cap-1 Maneuver	42	299	-	-	599
Stage 1	362	-	-	-	-
Stage 2	249	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	39	299	-	-	599
Mov Cap-2 Maneuver	39	-	-	-	-
Stage 1	362	-	-	-	-
Stage 2	234	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	58.8	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	69	599
HCM Lane V/C Ratio	-	-	0.03	0.017
HCM Control Delay (s)	-	-	58.8	11.1
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	0.1	0.1

Volume

13: Route 138 & Thacher Montessori School

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	35	1	790	1260	3
Future Volume (vph)	0	35	1	790	1260	3
Satd. Flow (prot)	1421	0	0	1580	1579	0
Flt Permitted						
Satd. Flow (perm)	1421	0	0	1580	1579	0
Peak Hour Factor	0.92	0.39	0.25	0.96	0.97	0.38
Heavy Vehicles (%)	2%	0%	0%	4%	4%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	0	0	827	1307	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 84.3% ICU Level of Service E

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	35	1	790	1260	3
Future Vol, veh/h	0	35	1	790	1260	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	39	25	96	97	38
Heavy Vehicles, %	2	0	0	4	4	0
Mvmt Flow	0	90	4	823	1299	8

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2134	1303	1307	0	-	0
Stage 1	1303	-	-	-	-	-
Stage 2	831	-	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	54	198	536	-	-	-
Stage 1	254	-	-	-	-	-
Stage 2	428	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	53	198	536	-	-	-
Mov Cap-2 Maneuver	53	-	-	-	-	-
Stage 1	254	-	-	-	-	-
Stage 2	422	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	37.4	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	536	-	198	-	-
HCM Lane V/C Ratio	0.007	-	0.453	-	-
HCM Control Delay (s)	11.8	0	37.4	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0	-	2.1	-	-

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘			↑			↑	
Traffic Volume (vph)	15	0	370	140	70	10	0	790	0	0	770	0
Future Volume (vph)	15	0	370	140	70	10	0	790	0	0	770	0
Satd. Flow (prot)	0	1413	0	1546	1558	0	0	1580	0	0	1565	0
Flt Permitted		0.990		0.367								
Satd. Flow (perm)	0	1402	0	597	1558	0	0	1580	0	0	1565	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	1%	1%	3%	8%	0%	4%	2%	2%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	396	0	144	82	0	0	814	0	0	794	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8			2			6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0			10.0			10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0			45.0			45.0	
Total Split (s)	30.0	30.0		30.0	30.0			45.0			45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%			60.0%			60.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0			5.0			5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0			1.0			1.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			Min			Min	
Act Effect Green (s)		23.1		23.1	23.1			39.1			39.1	
Actuated g/C Ratio		0.32		0.32	0.32			0.53			0.53	
v/c Ratio		0.90		0.77	0.17			0.97			0.95	
Control Delay		49.0		50.9	18.8			43.5			40.8	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		49.0		50.9	18.8			43.5			40.8	
LOS		D		D	B			D			D	
Approach Delay		49.0			39.3			43.5			40.8	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)		169		58	26			350			336	
Queue Length 95th (ft)		#323		#151	57			#606			#589	
Internal Link Dist (ft)		906			198			187			2213	
Turn Bay Length (ft)												
Base Capacity (vph)		479		204	532			843			834	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.83		0.71	0.15			0.97			0.95	

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 73.2

Volume

14: Route 138 & Brush Hill Rd.

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Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 43.1

Intersection LOS: D

Intersection Capacity Utilization 95.0%

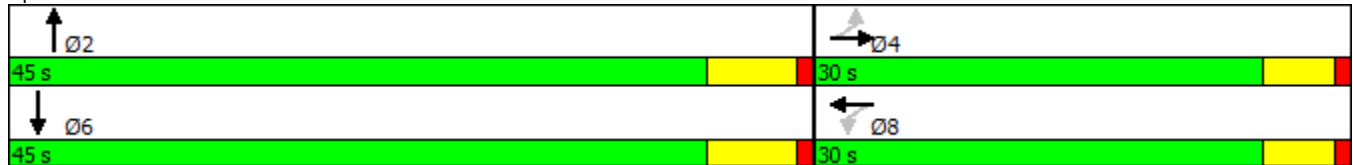
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.


















Queue shown is maximum after two cycles.

Splits and Phases: 14: Route 138 & Brush Hill Rd.



HCM 2010 Signalized Intersection Capacity Analysis
 14: Route 138 & Brush Hill Rd.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	370	140	70	10	0	790	0	0	770	0
Future Volume (veh/h)	15	0	370	140	70	10	0	790	0	0	770	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	20	0	10	10	0	0	10	0	0	40	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1684	1700	1683	1641	1700	0	1635	0	0	1619	0
Adj Flow Rate, veh/h	15	0	381	144	72	10	0	814	0	0	794	0
Adj No. of Lanes	0	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	1	3	3	0	4	0	0	5	0
Opposing Right Turn Influence	No			No			No			No		
Cap, veh/h	50	11	305	191	529	60	0	850	0	0	842	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.33	0.00	0.33	0.33	0.33	0.33	0.00	0.52	0.00	0.00	0.52	0.00
Ln Grp Delay, s/veh	290.7	0.0	0.0	119.8	0.0	21.3	0.0	62.3	0.0	0.0	181.9	0.0
Ln Grp LOS	F			F		C		E			F	
Approach Vol, veh/h		396			226			814			794	
Approach Delay, s/veh		290.7			84.1			62.3			181.9	
Approach LOS		F			F			E			F	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4			6			8	
Case No			8.0		8.0			8.0			6.0	
Phs Duration (G+Y+Rc), s			44.7		29.6			44.7			29.6	
Change Period (Y+Rc), s			6.0		5.0			6.0			5.0	
Max Green (Gmax), s			39.0		25.0			39.0			25.0	
Max Allow Headway (MAH), s			5.2		5.4			5.2			5.4	
Max Q Clear (g_c+I1), s			37.4		20.9			36.3			24.8	
Green Ext Time (g_e), s			1.4		1.5			2.2			0.1	
Prob of Phs Call (p_c)			1.00		1.00			1.00			0.99	
Prob of Max Out (p_x)			1.00		1.00			1.00			1.00	
Left-Turn Movement Data												
Assigned Mvmt			5		7			1			3	
Mvmt Sat Flow, veh/h			0		23			0			1008	
Through Movement Data												
Assigned Mvmt			2		4			6			8	
Mvmt Sat Flow, veh/h			1635		32			1619			1410	
Right-Turn Movement Data												
Assigned Mvmt			12		14			16			18	
Mvmt Sat Flow, veh/h			0		1380			0			196	
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			
Lane Assignment					L+T+R							

HCM 2010 Signalized Intersection Capacity Analysis

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Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	396	0	0	0	144
Grp Sat Flow (s), veh/h/ln	0	0	0	1434	0	0	0	1008
Q Serve Time (g_s), s	0.0	0.0	0.0	4.6	0.0	0.0	0.0	3.8
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	18.9	0.0	0.0	0.0	22.8
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1337	0	0	0	1008
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	347
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	24.6	0.0	0.0	0.0	24.6
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	22.0	0.0	0.0	0.0	5.7
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	4.6	0.0	0.0	0.0	3.8
Time to First Blk (g_f), s	0.0	38.7	0.0	14.3	0.0	38.7	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.00	0.00	0.04	0.00	0.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	0	0	329	0	0	0	191
V/C Ratio (X)	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.76
Avail Cap (c_a), veh/h	0	0	0	532	0	0	0	267
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	22.5	0.0	0.0	0.0	31.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	108.6	0.0	0.0	0.0	7.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	159.7	0.0	0.0	0.0	81.1
Control Delay (d), s/veh	0.0	0.0	0.0	290.7	0.0	0.0	0.0	119.8
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	6.8	0.0	0.0	0.0	3.8
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	9.9	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	20.0	0.0	0.0	0.0	4.3
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	36.7	0.0	0.0	0.0	8.5
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.98	0.00	0.00	0.00	1.20
Initial Q (Qb), veh	0.0	0.0	0.0	20.0	0.0	0.0	0.0	10.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	36.8	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	22.5	0.0	0.0	0.0	31.4
Sat Q (Qs), veh	0.0	0.0	0.0	6.8	0.0	0.0	0.0	3.8
Sat Cap (cs), veh/h	0	0	0	329	0	0	0	186
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.2
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T			T				
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	814	0	0	0	794	0	0
Grp Sat Flow (s), veh/h/ln	0	1635	0	0	0	1619	0	0
Q Serve Time (g_s), s	0.0	35.4	0.0	0.0	0.0	34.3	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	35.4	0.0	0.0	0.0	34.3	0.0	0.0
Lane Grp Cap (c), veh/h	0	850	0	0	0	842	0	0
V/C Ratio (X)	0.00	0.96	0.00	0.00	0.00	0.94	0.00	0.00
Avail Cap (c_a), veh/h	0	857	0	0	0	849	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	18.0	0.0	0.0	0.0	18.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	21.0	0.0	0.0	0.0	18.5	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	23.3	0.0	0.0	0.0	145.4	0.0	0.0
Control Delay (d), s/veh	0.0	62.3	0.0	0.0	0.0	181.9	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	17.2	0.0	0.0	0.0	17.1	0.0	0.0

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2nd-Term Q (Q2), veh/ln	0.0	5.0	0.0	0.0	0.0	4.3	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	5.5	0.0	0.0	0.0	34.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	27.7	0.0	0.0	0.0	55.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	4.44	0.00	0.00	0.00	0.64	0.00	0.00
Initial Q (Qb), veh	0.0	10.0	0.0	0.0	0.0	40.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	1.0	0.0	0.0	0.0	28.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	18.0	0.0	0.0	0.0	18.0	0.0	0.0
Sat Q (Qs), veh	0.0	17.2	0.0	0.0	0.0	17.1	0.0	0.0
Sat Cap (cs), veh/h	0	850	0	0	0	842	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment								T+R
Lanes in Grp	0	0	0	0	0	0	0	1
Grp Vol (v), veh/h	0	0	0	0	0	0	0	82
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	1606
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.12
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	533
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	540
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.3
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	546
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	147.7
HCM 2010 LOS	F

Volume

15: Canton Ave. & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	90	270	0	140
Future Volume (vph)	0	0	90	270	0	140
Satd. Flow (prot)	0	0	1546	1627	0	1394
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	1546	1627	0	1394
Peak Hour Factor	0.92	0.92	0.96	0.93	0.92	0.82
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	94	290	0	171
Sign Control	Free			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 21.9% ICU Level of Service A

Analysis Period (min) 15

Volume

16: Route 138 & Neponset Valley Pkwy.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	7	230	310	490	530	3
Future Volume (vph)	7	230	310	490	530	3
Satd. Flow (prot)	1343	0	0	1548	1564	0
Flt Permitted	0.999			0.981		
Satd. Flow (perm)	1343	0	0	1548	1564	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	14%	6%	6%	3%	5%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	244	0	0	825	549	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 105.7% ICU Level of Service G

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	48.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	7	230	310	490	530	3
Future Vol, veh/h	7	230	310	490	530	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	14	6	6	3	5	0
Mvmt Flow	7	237	320	505	546	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1692	548	549	0	-	0
Stage 1	548	-	-	-	-	-
Stage 2	1144	-	-	-	-	-
Critical Hdwy	6.54	6.26	4.16	-	-	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.354	2.254	-	-	-
Pot Cap-1 Maneuver	96 *~ 214	*559		-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	288	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	20 *~ 214	*559		-	-	-
Mov Cap-2 Maneuver	20	-	-	-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	59	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	293	7.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 559	-	166	-	-
HCM Lane V/C Ratio	0.572	-	1.472	-	-
HCM Control Delay (s)	19.7	0	293	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	3.6	-	15.6	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	30	120	15	10	110	25	15	470	10	8	510	25
Future Volume (vph)	30	120	15	10	110	25	15	470	10	8	510	25
Satd. Flow (prot)	0	1574	0	0	1526	0	0	1587	0	0	1556	0
Flt Permitted		0.927			0.974			0.978			0.992	
Satd. Flow (perm)	0	1472	0	0	1492	0	0	1555	0	0	1545	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	1		1			1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	1%	0%	9%	5%	0%	0%	3%	10%	0%	5%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	174	0	0	153	0	0	522	0	0	571	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		37.0	37.0		37.0	37.0	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
Act Effect Green (s)		11.8			11.8			34.5			34.5	
Actuated g/C Ratio		0.22			0.22			0.65			0.65	
v/c Ratio		0.53			0.47			0.52			0.57	
Control Delay		26.2			24.4			10.7			11.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		26.2			24.4			10.7			11.7	
LOS		C			C			B			B	
Approach Delay		26.2			24.4			10.7			11.7	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)		49			43			95			110	
Queue Length 95th (ft)		114			101			227			262	
Internal Link Dist (ft)		1017			791			1154			1181	
Turn Bay Length (ft)												
Base Capacity (vph)		575			582			1145			1138	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.30			0.26			0.46			0.50	

Intersection Summary

Cycle Length: 70

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018

Actuated Cycle Length: 53.3

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 14.4

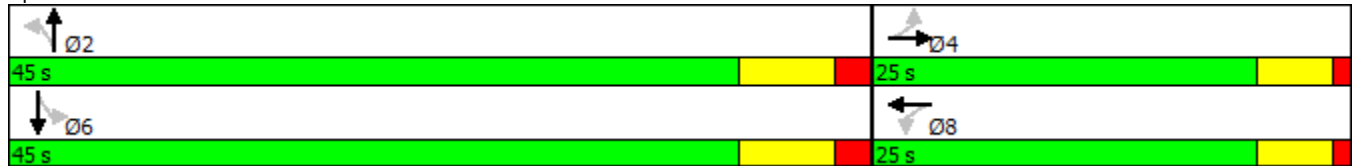
Intersection LOS: B

Intersection Capacity Utilization 66.6%

ICU Level of Service C

















Analysis Period (min) 15

Splits and Phases: 17: Route 138 & Milton St./Dollar Ln.



HCM 2010 Signalized Intersection Capacity Analysis
 17: Route 138 & Milton St./Dollar Ln.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	120	15	10	110	25	15	470	10	8	510	25
Future Volume (veh/h)	30	120	15	10	110	25	15	470	10	8	510	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	25	0	0	15	0	0	15	0	0	40	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1666	1700	1700	1628	1700	1700	1650	1700	1700	1621	1700
Adj Flow Rate, veh/h	32	126	16	11	116	26	16	495	11	8	537	26
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	5	5	5	3	3	3	5	5	5
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	99	276	19	80	274	35	80	921	16	65	895	35
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.59	0.59	0.59	0.59	0.59	0.59
Ln Grp Delay, s/veh	71.8	0.0	0.0	41.7	0.0	0.0	11.2	0.0	0.0	40.3	0.0	0.0
Ln Grp LOS	E			D			B			D		
Approach Vol, veh/h		174			153			522			571	
Approach Delay, s/veh		71.8			41.7			11.2			40.3	
Approach LOS		E			D			B			D	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			8.0		8.0		8.0		8.0			
Phs Duration (G+Y+Rc), s			37.0		13.5		37.0		13.5			
Change Period (Y+Rc), s			7.0		5.0		7.0		5.0			
Max Green (Gmax), s			38.0		20.0		38.0		20.0			
Max Allow Headway (MAH), s			5.2		5.3		5.2		5.3			
Max Q Clear (g_c+I1), s			11.5		7.0		13.3		6.5			
Green Ext Time (g_e), s			8.0		1.5		7.9		1.6			
Prob of Phs Call (p_c)			1.00		0.99		1.00		0.99			
Prob of Max Out (p_x)			0.13		0.07		0.15		0.06			
Left-Turn Movement Data												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			17		186		6		52			
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			1575		1264		1524		1248			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			34		147		73		266			
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			
Lane Assignment			L+T+R		L+T+R		L+T+R		L+T+R			

HCM 2010 Signalized Intersection Capacity Analysis
 17: Route 138 & Milton St./Dollar Ln.

08/20/2018

Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	522	0	174	0	571	0	153
Grp Sat Flow (s), veh/h/ln	0	1627	0	1596	0	1603	0	1567
Q Serve Time (g_s), s	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	9.5	0.0	5.0	0.0	11.3	0.0	4.5
Perm LT Sat Flow (s_l), veh/h/ln	0	861	0	1264	0	907	0	1264
Shared LT Sat Flow (s_sh), veh/h/ln	0	1647	0	1651	0	1620	0	1622
Perm LT Eff Green (g_p), s	0.0	30.0	0.0	8.5	0.0	30.0	0.0	8.5
Perm LT Serve Time (g_u), s	0.0	18.7	0.0	3.9	0.0	20.5	0.0	3.4
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	19.4	0.0	3.0	0.0	22.1	0.0	4.5
Serve Time pre Blk (g_fs), s	0.0	9.5	0.0	3.0	0.0	11.3	0.0	4.5
Prop LT Inside Lane (P_L)	0.00	0.03	0.00	0.18	0.00	0.01	0.00	0.07
Lane Grp Cap (c), veh/h	0	1026	0	400	0	982	0	368
V/C Ratio (X)	0.00	0.51	0.00	0.43	0.00	0.58	0.00	0.42
Avail Cap (c_a), veh/h	0	1294	0	705	0	1277	0	692
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	7.6	0.0	21.4	0.0	11.2	0.0	20.5
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.7	0.0	0.5	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	3.1	0.0	49.7	0.0	28.6	0.0	20.4
Control Delay (d), s/veh	0.0	11.2	0.0	71.8	0.0	40.3	0.0	41.7
1st-Term Q (Q1), veh/ln	0.0	6.2	0.0	4.5	0.0	10.7	0.0	3.3
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.9	0.0	5.5	0.0	7.8	0.0	2.1
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	7.2	0.0	10.1	0.0	18.6	0.0	5.4
%ile Storage Ratio (RQ%)	0.00	0.16	0.00	0.24	0.00	0.40	0.00	0.17
Initial Q (Qb), veh	0.0	15.0	0.0	25.0	0.0	40.0	0.0	15.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	16.9	0.0	25.9	0.0	17.0	0.0	26.0
Sat Q (Qs), veh	0.0	18.0	0.0	9.9	0.0	17.8	0.0	9.9
Sat Cap (cs), veh/h	0	938	0	518	0	928	0	515
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis
 17: Route 138 & Milton St./Dollar Ln.

08/20/2018

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.02	0.00	0.09	0.00	0.05	0.00	0.17
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	33.6
HCM 2010 LOS	C

Volume

18: Route 138 & Blue Jay Way (Curry College)

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	50	100	80	460	440	25
Future Volume (vph)	50	100	80	460	440	25
Satd. Flow (prot)	1472	0	0	1589	1544	0
Flt Permitted	0.984			0.993		
Satd. Flow (perm)	1472	0	0	1589	1544	0
Confl. Peds. (#/hr)			1			1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	1%	3%	6%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	162	0	0	581	500	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	6.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	50	100	80	460	440	25
Future Vol, veh/h	50	100	80	460	440	25
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	1	3	6	0
Mvmt Flow	54	108	86	495	473	27

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1155	488	501	0	0
Stage 1	488	-	-	-	-
Stage 2	667	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-
Pot Cap-1 Maneuver	220	*327	*488	-	-
Stage 1	621	-	-	-	-
Stage 2	514	-	-	-	-
Platoon blocked, %		1	1	-	-
Mov Cap-1 Maneuver	166	*327	*488	-	-
Mov Cap-2 Maneuver	166	-	-	-	-
Stage 1	620	-	-	-	-
Stage 2	389	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	43.4	2.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 488	-	247	-	-
HCM Lane V/C Ratio	0.176	-	0.653	-	-
HCM Control Delay (s)	13.9	0	43.4	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.6	-	4.1	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018



Lane Group	EBL	EBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR2	SEL	SET	SER
Lane Configurations												
Traffic Volume (vph)	2	2	2	35	440	35	7	410	6	6	30	15
Future Volume (vph)	2	2	2	35	440	35	7	410	6	6	30	15
Satd. Flow (prot)	1495	0	0	0	1578	0	0	1544	0	0	1514	0
Flt Permitted	0.976				0.947		0.990				0.955	
Satd. Flow (perm)	1495	0	0	0	1500	0	0	1530	0	0	1455	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)					1				1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	3%	3%	14%	6%	0%	0%	6%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	0	0	0	551	0	0	455	0	0	54	0
Turn Type	Prot		Perm		NA		Perm		NA		Perm	
Protected Phases	10				2				6			
Permitted Phases					2		2		6		4	
Detector Phase	10		2		2		2		6		6	
Switch Phase												
Minimum Initial (s)	4.0		22.0		22.0		22.0		22.0		22.0	
Minimum Split (s)	9.0		28.0		28.0		28.0		28.0		28.0	
Total Split (s)	10.0		40.0		40.0		40.0		40.0		40.0	
Total Split (%)	14.3%		57.1%		57.1%		57.1%		57.1%		57.1%	
Yellow Time (s)	4.0		5.0		5.0		5.0		5.0		5.0	
All-Red Time (s)	1.0		1.0		1.0		1.0		1.0		1.0	
Lost Time Adjust (s)	0.0				0.0				0.0			
Total Lost Time (s)	5.0				6.0				6.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None		Min		Min		Min		Min		Min	
Act Effct Green (s)	5.2						34.0		34.0		10.9	
Actuated g/C Ratio	0.11						0.71		0.71		0.23	
v/c Ratio	0.02						0.52		0.42		0.16	
Control Delay	25.2						10.8		8.9		19.5	
Queue Delay	0.0						0.0		0.0		0.0	
Total Delay	25.2						10.8		8.9		19.5	
LOS	C						B		A		B	
Approach Delay	25.3						10.8		8.9		19.5	
Approach LOS	C						B		A		B	
Queue Length 50th (ft)	1						91		67		11	
Queue Length 95th (ft)	10						#299		217		48	
Internal Link Dist (ft)	1290						1586		2667		689	
Turn Bay Length (ft)												
Base Capacity (vph)	163				1179				1203			
Starvation Cap Reductn	0				0				0			
Spillback Cap Reductn	0				0				0			
Storage Cap Reductn	0				0				0			
Reduced v/c Ratio	0.02				0.47				0.38			

Intersection Summary

Cycle Length: 70

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018



Lane Group	NWL2	NWL	NWT	NWR
Lane Configurations			↔	
Traffic Volume (vph)	25	2	45	10
Future Volume (vph)	25	2	45	10
Satd. Flow (prot)	0	0	1547	0
Flt Permitted			0.869	
Satd. Flow (perm)	0	0	1367	0
Satd. Flow (RTOR)				
Confl. Peds. (#/hr)				
Peak Hour Factor	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	5%	0%
Shared Lane Traffic (%)				
Lane Group Flow (vph)	0	0	88	0
Turn Type	Perm	Perm	NA	
Protected Phases			8	
Permitted Phases	8	8		
Detector Phase	8	8	8	
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	
Minimum Split (s)	15.0	15.0	15.0	
Total Split (s)	20.0	20.0	20.0	
Total Split (%)	28.6%	28.6%	28.6%	
Yellow Time (s)	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	
Lost Time Adjust (s)			0.0	
Total Lost Time (s)			5.0	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	
Act Effct Green (s)			10.9	
Actuated g/C Ratio			0.23	
v/c Ratio			0.28	
Control Delay			21.0	
Queue Delay			0.0	
Total Delay			21.0	
LOS			C	
Approach Delay			21.0	
Approach LOS			C	
Queue Length 50th (ft)			18	
Queue Length 95th (ft)			71	
Internal Link Dist (ft)			1410	
Turn Bay Length (ft)				
Base Capacity (vph)			448	
Starvation Cap Reductn			0	
Spillback Cap Reductn			0	
Storage Cap Reductn			0	
Reduced v/c Ratio			0.20	

Intersection Summary

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018

Actuated Cycle Length: 47.7

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 11.3

Intersection LOS: B

Intersection Capacity Utilization 79.3%

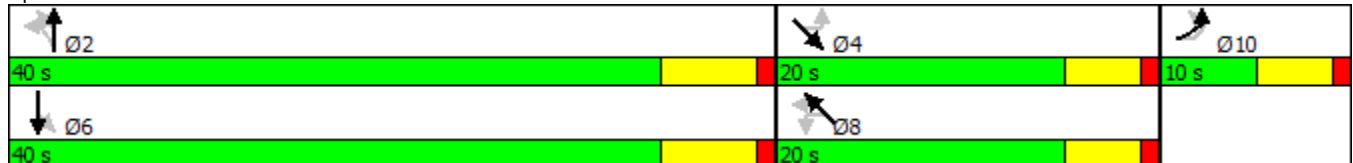
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 19: Route 138 & Atherton St. & Bradlee Rd.



Volume

20: Route 138 & Robbins St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	35	3	7	35	5	1	450	20	5	410	9
Future Volume (vph)	5	35	3	7	35	5	1	450	20	5	410	9
Satd. Flow (prot)	0	1581	0	0	1574	0	0	1587	0	0	1561	0
Flt Permitted		0.953			0.935			0.999			0.995	
Satd. Flow (perm)	0	1514	0	0	1483	0	0	1585	0	0	1554	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)							2		1	1		2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	3%	0%	0%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	46	0	0	51	0	0	507	0	0	456	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		20.0	20.0		20.0	20.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		45.0	45.0		45.0	45.0	
Total Split (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Total Split (%)	23.5%	23.5%		23.5%	23.5%		52.9%	52.9%		52.9%	52.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		8.5			8.5			37.0			37.0	
Actuated g/C Ratio		0.18			0.18			0.80			0.80	
v/c Ratio		0.17			0.19			0.40			0.37	
Control Delay		21.8			22.1			8.4			8.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.8			22.1			8.4			8.0	
LOS		C			C			A			A	
Approach Delay		21.8			22.1			8.4			8.0	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		5			6			0			0	
Queue Length 95th (ft)		52			56			298			259	
Internal Link Dist (ft)		939			647			711			3441	
Turn Bay Length (ft)												
Base Capacity (vph)		549			538			1389			1362	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.08			0.09			0.37			0.33	

Intersection Summary

Cycle Length: 85

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	2.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	24%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Volume

20: Route 138 & Robbins St.

08/20/2018

Actuated Cycle Length: 46.3

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 9.5






Intersection LOS: A

Intersection Capacity Utilization 43.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 20: Route 138 & Robbins St.

 45 s	 20 s	 20 s
 45 s	 20 s	

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	3	6	3	35	9	15	3	450	45	15	420	7
Future Volume (vph)	3	6	3	35	9	15	3	450	45	15	420	7
Satd. Flow (prot)	0	1440	0	0	1426	0	0	1375	0	0	1354	0
Flt Permitted		0.988			0.971			0.997			0.975	
Satd. Flow (perm)	0	1431	0	0	1422	0	0	1371	0	0	1323	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	6		1	1		6	3		5	5		3
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	33%	9%	0%	6%	0%	3%	4%	0%	6%	0%
Parking (#/hr)								5			5	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	63	0	0	530	0	0	470	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		20.0	20.0		20.0	20.0	
Total Split (s)	12.0	12.0		12.0	12.0		23.0	23.0		23.0	23.0	
Total Split (%)	25.5%	25.5%		25.5%	25.5%		48.9%	48.9%		48.9%	48.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		7.0			7.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		5.1			5.1			29.2			29.2	
Actuated g/C Ratio		0.12			0.12			0.69			0.69	
v/c Ratio		0.07			0.37			0.56			0.51	
Control Delay		18.8			25.1			15.8			15.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.8			25.1			15.8			15.0	
LOS		B			C			B			B	
Approach Delay		18.8			25.1			15.8			15.0	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		3			18			78			66	
Queue Length 95th (ft)		15			#47			#324			#286	
Internal Link Dist (ft)		838			877			3441			407	
Turn Bay Length (ft)												
Base Capacity (vph)		173			171			949			916	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.07			0.37			0.56			0.51	

Intersection Summary

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

Cycle Length: 47

Actuated Cycle Length: 42.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 16.1

Intersection LOS: B

Intersection Capacity Utilization 56.4%

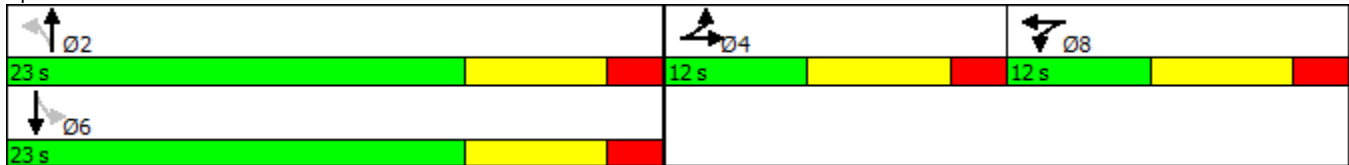
ICU Level of Service B

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

















Queue shown is maximum after two cycles.

Splits and Phases: 21: Route 138 & Cheever St./Blue Hill Terrace St.



HCM 2010 Signalized Intersection Capacity Analysis
 21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	6	3	35	9	15	3	450	45	15	420	7
Future Volume (veh/h)	3	6	3	35	9	15	3	450	45	15	420	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	5	0	0	5	0
Ped-Bike Adj (A_pbT)	1.00		0.97	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1570	1700	1700	1592	1700	1700	1649	1700	1700	1608	1700
Adj Flow Rate, veh/h	3	6	3	37	10	16	3	479	48	16	447	7
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	3	3	3	6	6	6
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	5	9	5	44	12	19	95	578	54	104	606	9
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.01	0.01	0.01	0.05	0.05	0.05	0.39	0.39	0.39	0.39	0.39	0.39
Ln Grp Delay, s/veh	51.4	0.0	0.0	39.3	0.0	0.0	15.4	0.0	0.0	13.2	0.0	0.0
Ln Grp LOS	D			D			B			B		
Approach Vol, veh/h		12			63			530			470	
Approach Delay, s/veh		51.4			39.3			15.4			13.2	
Approach LOS		D			D			B			B	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2	8	4		6					
Case No			8.0	12.0	12.0		8.0					
Phs Duration (G+Y+Rc), s			21.9	9.0	7.5		21.9					
Change Period (Y+Rc), s			7.0	7.0	7.0		7.0					
Max Green (Gmax), s			16.0	5.0	5.0		16.0					
Max Allow Headway (MAH), s			5.2	5.4	5.4		5.2					
Max Q Clear (g_c+I1), s			13.4	3.6	2.3		11.7					
Green Ext Time (g_e), s			1.5	0.0	0.0		2.4					
Prob of Phs Call (p_c)			1.00	0.51	0.15		1.00					
Prob of Max Out (p_x)			1.00	1.00	1.00		1.00					
Left-Turn Movement Data												
Assigned Mvmt			5	3	7		1					
Mvmt Sat Flow, veh/h			2	863	369		20					
Through Movement Data												
Assigned Mvmt			2	8	4		6					
Mvmt Sat Flow, veh/h			1472	233	737		1549					
Right-Turn Movement Data												
Assigned Mvmt			12	18	14		16					
Mvmt Sat Flow, veh/h			147	373	369		24					
Left Lane Group Data												
Assigned Mvmt		0	5	3	7	0	1	0	0			
Lane Assignment			L+T+R	L+T+R	L+T+R		L+T+R					

HCM 2010 Signalized Intersection Capacity Analysis
 21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

Lanes in Grp	0	1	1	1	0	1	0	0
Grp Vol (v), veh/h	0	530	63	12	0	470	0	0
Grp Sat Flow (s), veh/h/ln	0	1621	1470	1474	0	1593	0	0
Q Serve Time (g_s), s	0.0	0.0	1.6	0.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	11.4	1.6	0.3	0.0	9.7	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	950	0	0	0	888	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1649	0	0	0	1605	0	0
Perm LT Eff Green (g_p), s	0.0	14.9	0.0	0.0	0.0	14.9	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	5.2	0.0	0.0	0.0	3.5	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	11.5	0.0	0.0	0.0	9.2	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	11.4	0.0	0.0	0.0	9.2	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.01	0.59	0.25	0.00	0.03	0.00	0.00
Lane Grp Cap (c), veh/h	0	727	75	18	0	718	0	0
V/C Ratio (X)	0.00	0.73	0.84	0.65	0.00	0.65	0.00	0.00
Avail Cap (c_a), veh/h	0	771	192	192	0	761	0	0
Upstream Filter (I)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	10.8	18.1	18.9	0.0	10.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.3	21.2	32.5	0.0	1.9	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	1.3	0.0	0.0	0.0	1.0	0.0	0.0
Control Delay (d), s/veh	0.0	15.4	39.3	51.4	0.0	13.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	5.3	0.6	0.1	0.0	4.4	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.7	0.4	0.2	0.0	0.4	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.3	0.0	0.0	0.0	0.2	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	6.2	1.1	0.3	0.0	5.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.05	0.04	0.01	0.00	0.36	0.00	0.00
Initial Q (Qb), veh	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	12.7	18.6	19.4	0.0	12.7	0.0	0.0
Sat Q (Qs), veh	0.0	8.0	0.7	0.1	0.0	7.8	0.0	0.0
Sat Cap (cs), veh/h	0	757	74	18	0	742	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	8	4	0	6	0	0
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis
 21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	18	14	0	16	0	0
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.09	0.25	0.25	0.00	0.01	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Volume

22: Route 138 & Aberdeen Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	3	4	460	450	15
Future Volume (vph)	9	3	4	460	450	15
Satd. Flow (prot)	1414	0	0	1581	1576	0
Flt Permitted	0.963					
Satd. Flow (perm)	1414	0	0	1581	1576	0
Confl. Peds. (#/hr)	3	11	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	11%	0%	0%	4%	4%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	504	505	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 43.7%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	9	3	4	460	450	15
Future Vol, veh/h	9	3	4	460	450	15
Conflicting Peds, #/hr	3	11	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	11	0	0	4	4	0
Mvmt Flow	10	3	4	500	489	16

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1014	513	510	0	-	0
Stage 1	502	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Critical Hdwy	6.51	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	254	*109	*163	-	-	-
Stage 1	590	-	-	-	-	-
Stage 2	584	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	243	*107	*162	-	-	-
Mov Cap-2 Maneuver	243	-	-	-	-	-
Stage 1	587	-	-	-	-	-
Stage 2	562	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.1	0.2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 162	-	184	-	-
HCM Lane V/C Ratio	0.027	-	0.071	-	-
HCM Control Delay (s)	27.8	0	26.1	-	-
HCM Lane LOS	D	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

23: Route 138 & Oak St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	3	3	10	3	1	5	10	460	9	7	440	1
Future Volume (vph)	3	3	10	3	1	5	10	460	9	7	440	1
Satd. Flow (prot)	0	1412	0	0	1496	0	0	1592	0	0	1565	0
Flt Permitted		0.991			0.984			0.999			0.999	
Satd. Flow (perm)	0	1412	0	0	1496	0	0	1592	0	0	1565	0
Confl. Peds. (#/hr)	66					66	23		66	66		23
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	9%	0%	0%	0%	0%	3%	0%	0%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	9	0	0	493	0	0	462	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 52.9%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	3	10	3	1	5	10	460	9	7	440	1
Future Vol, veh/h	3	3	10	3	1	5	10	460	9	7	440	1
Conflicting Peds, #/hr	66	0	0	0	0	66	23	0	66	66	0	23
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	9	0	0	0	0	3	0	0	5	0
Mvmt Flow	3	3	10	3	1	5	10	474	9	7	454	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1061	1062	477	1040	1057	611	478	0	0	550	0	0
Stage 1	492	492	-	565	565	-	-	-	-	-	-	-
Stage 2	569	570	-	475	492	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.29	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.381	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	203	225	*128	210	227	*131	*245	-	-	*245	-	-
Stage 1	562	551	-	513	511	-	-	-	-	-	-	-
Stage 2	511	509	-	574	551	-	-	-	-	-	-	-
Platoon blocked, %			1			1	1	-	-	1	-	-
Mov Cap-1 Maneuver	165	188	*125	166	190	*116	*245	-	-	*231	-	-
Mov Cap-2 Maneuver	165	188	-	166	190	-	-	-	-	-	-	-
Stage 1	520	518	-	456	455	-	-	-	-	-	-	-
Stage 2	433	453	-	502	518	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	34.1		33.6		0.4		0.3			
HCM LOS	D		D							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 245	-	-	140	135	* 231	-	-
HCM Lane V/C Ratio	0.042	-	-	0.118	0.069	0.031	-	-
HCM Control Delay (s)	20.3	0	-	34.1	33.6	21.1	0	-
HCM Lane LOS	C	A	-	D	D	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.2	0.1	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

24: Route 138 & Brook Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Volume (vph)	5	160	9	0	0	0	2	410	40	10	450	20
Future Volume (vph)	5	160	9	0	0	0	2	410	40	10	450	20
Satd. Flow (prot)	0	1562	0	0	0	0	0	1578	0	0	1549	0
Flt Permitted		0.999						0.998			0.990	
Satd. Flow (perm)	0	1562	0	0	0	0	0	1574	0	0	1535	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	4		4	2		2	2		2	1		6
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	11%	2%	2%	2%	0%	3%	0%	17%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	181	0	0	0	0	0	471	0	0	500	0
Turn Type	Perm	NA						Perm	NA		Perm	NA
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0					24.0	24.0		24.0	24.0	
Minimum Split (s)	12.0	12.0					30.0	30.0		30.0	30.0	
Total Split (s)	25.0	25.0					35.0	35.0		35.0	35.0	
Total Split (%)	41.7%	41.7%					58.3%	58.3%		58.3%	58.3%	
Yellow Time (s)	4.0	4.0					5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.0						6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None					Min	Min		Min	Min	
Act Effct Green (s)		10.8						29.5			29.5	
Actuated g/C Ratio		0.23						0.62			0.62	
v/c Ratio		0.51						0.48			0.53	
Control Delay		21.4						9.9			10.6	
Queue Delay		0.0						0.0			0.0	
Total Delay		21.4						9.9			10.6	
LOS		C						A			B	
Approach Delay		21.4						9.9			10.6	
Approach LOS		C						A			B	
Queue Length 50th (ft)		41						72			79	
Queue Length 95th (ft)		96						177			197	
Internal Link Dist (ft)		967			1001			519			1021	
Turn Bay Length (ft)												
Base Capacity (vph)		661						1078			1052	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.27						0.44			0.48	

Intersection Summary

Cycle Length: 60

Volume

24: Route 138 & Brook Rd.

08/20/2018

Actuated Cycle Length: 47.6

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 12.0

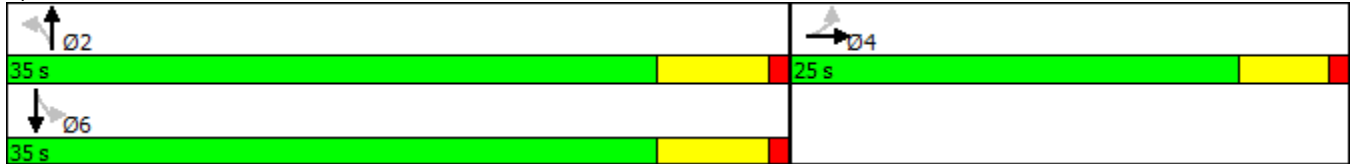
Intersection LOS: B

Intersection Capacity Utilization 59.6%

ICU Level of Service B
















Analysis Period (min) 15

Splits and Phases: 24: Route 138 & Brook Rd.



HCM 2010 Signalized Intersection Capacity Analysis
 24: Route 138 & Brook Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	160	9	0	0	0	2	410	40	10	450	20
Future Volume (veh/h)	5	160	9	0	0	0	2	410	40	10	450	20
Number	7	4	14				5	2	12	1	6	16
Initial Q, veh	0	10	0				0	15	0	0	15	0
Ped-Bike Adj (A_pbT)	1.00		0.99				1.00		1.00	1.00		0.99
Parking Bus Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1631	1700				1700	1655	1700	1700	1615	1700
Adj Flow Rate, veh/h	5	167	9				2	427	42	10	469	21
Adj No. of Lanes	0	1	0				0	1	0	0	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	0				3	3	3	5	5	5
Opposing Right Turn Influence	Yes						Yes			Yes		
Cap, veh/h	6	273	11				84	849	75	88	867	35
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.15	0.15	0.15				0.58	0.58	0.58	0.58	0.58	0.58
Ln Grp Delay, s/veh	46.2	0.0	0.0				10.2	0.0	0.0	11.1	0.0	0.0
Ln Grp LOS	D						B			B		
Approach Vol, veh/h		181						471			500	
Approach Delay, s/veh		46.2						10.2			11.1	
Approach LOS		D						B			B	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6					
Case No			8.0		12.0		8.0					
Phs Duration (G+Y+Rc), s			30.0		11.3		30.0					
Change Period (Y+Rc), s			6.0		5.0		6.0					
Max Green (Gmax), s			29.0		20.0		29.0					
Max Allow Headway (MAH), s			5.2		5.3		5.2					
Max Q Clear (g_c+I1), s			9.0		6.4		9.8					
Green Ext Time (g_e), s			6.2		0.8		6.1					
Prob of Phs Call (p_c)			1.00		0.88		1.00					
Prob of Max Out (p_x)			0.17		0.01		0.19					
Left-Turn Movement Data												
Assigned Mvmt			5		7		1					
Mvmt Sat Flow, veh/h			1		45		9					
Through Movement Data												
Assigned Mvmt			2		4		6					
Mvmt Sat Flow, veh/h			1482		1489		1520					
Right-Turn Movement Data												
Assigned Mvmt			12		14		16					
Mvmt Sat Flow, veh/h			145		80		67					
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	0			
Lane Assignment		L+T+R		L+T+R		L+T+R						

HCM 2010 Signalized Intersection Capacity Analysis
 24: Route 138 & Brook Rd.

08/20/2018

Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	471	0	181	0	500	0	0
Grp Sat Flow (s), veh/h/ln	0	1628	0	1613	0	1596	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	7.0	0.0	4.4	0.0	7.8	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	919	0	0	0	938	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1655	0	0	0	1614	0	0
Perm LT Eff Green (g_p), s	0.0	24.0	0.0	0.0	0.0	24.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	16.2	0.0	0.0	0.0	17.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	20.2	0.0	0.0	0.0	17.3	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	7.0	0.0	0.0	0.0	7.8	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.00
Lane Grp Cap (c), veh/h	0	1007	0	278	0	985	0	0
V/C Ratio (X)	0.00	0.47	0.00	0.65	0.00	0.51	0.00	0.00
Avail Cap (c_a), veh/h	0	1231	0	782	0	1208	0	0
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	6.9	0.0	17.1	0.0	7.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	2.6	0.0	0.4	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	3.0	0.0	26.6	0.0	3.4	0.0	0.0
Control Delay (d), s/veh	0.0	10.2	0.0	46.2	0.0	11.1	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	4.7	0.0	2.7	0.0	5.2	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.2	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.8	0.0	2.1	0.0	0.9	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	5.7	0.0	5.0	0.0	6.2	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.30	0.00	0.13	0.00	0.15	0.00	0.00
Initial Q (Qb), veh	0.0	15.0	0.0	10.0	0.0	15.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	16.5	0.0	20.0	0.0	16.5	0.0	0.0
Sat Q (Qs), veh	0.0	14.0	0.0	8.9	0.0	13.7	0.0	0.0
Sat Cap (cs), veh/h	0	857	0	543	0	838	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	0
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis
 24: Route 138 & Brook Rd.

08/20/2018

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	0
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.09	0.00	0.05	0.00	0.04	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Volume

102: Route 138 & Concord Baptist Church

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	460	1	5	450
Future Volume (vph)	1	1	460	1	5	450
Satd. Flow (prot)	1495	0	1642	0	0	1642
Flt Permitted	0.976					0.999
Satd. Flow (perm)	1495	0	1642	0	0	1642
Confl. Peds. (#/hr)	3			11	11	
Peak Hour Factor	0.25	0.25	0.92	0.25	0.63	0.88
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	504	0	0	519
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	460	1	5	450
Future Vol, veh/h	1	1	460	1	5	450
Conflicting Peds, #/hr	3	0	0	11	11	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	92	25	63	88
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	4	500	4	8	511

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1043	513	0	0	515
Stage 1	513	-	-	-	-
Stage 2	530	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	256	565	-	-	1061
Stage 1	605	-	-	-	-
Stage 2	594	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	250	560	-	-	1061
Mov Cap-2 Maneuver	250	-	-	-	-
Stage 1	599	-	-	-	-
Stage 2	586	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	346	1061
HCM Lane V/C Ratio	-	-	0.023	0.007
HCM Control Delay (s)	-	-	15.7	8.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Volume

8: Route 138 & South Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↕			↕
Traffic Volume (vph)	0	0	1210	50	8	1260
Future Volume (vph)	0	0	1210	50	8	1260
Satd. Flow (prot)	0	0	1791	0	0	1819
Flt Permitted						
Satd. Flow (perm)	0	0	1791	0	0	1819
Confl. Peds. (#/hr)				6	6	
Peak Hour Factor	0.92	0.92	0.91	0.78	0.67	0.97
Heavy Vehicles (%)	2%	2%	2%	0%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1394	0	0	1311
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 76.0%	ICU Level of Service D
Analysis Period (min) 15	

Volume

9: Route 138 & South Parking Lot Exit

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	70	1200	0	0	1260
Future Volume (vph)	10	70	1200	0	0	1260
Satd. Flow (prot)	1610	0	1818	0	0	1818
Flt Permitted	0.994					
Satd. Flow (perm)	1610	0	1818	0	0	1818
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	1%	2%	2%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	0	1290	0	0	1355
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 77.9% ICU Level of Service D

Analysis Period (min) 15

HCM 2010 TWSC
 9: Route 138 & South Parking Lot Exit

08/20/2018

Intersection						
Int Delay, s/veh	3.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑			↑
Traffic Vol, veh/h	10	70	1200	0	0	1260
Future Vol, veh/h	10	70	1200	0	0	1260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	1	2	2	1
Mvmt Flow	11	75	1290	0	0	1355

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2645	1290	0	-	-	-
Stage 1	1290	-	-	-	-	-
Stage 2	1355	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	26	202	-	0	0	-
Stage 1	261	-	-	0	0	-
Stage 2	242	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	26	202	-	-	-	-
Mov Cap-2 Maneuver	26	-	-	-	-	-
Stage 1	261	-	-	-	-	-
Stage 2	242	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	108.8	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBTWBLn1	SBT
Capacity (veh/h)	- 109	-
HCM Lane V/C Ratio	- 0.789	-
HCM Control Delay (s)	- 108.8	-
HCM Lane LOS	- F	-
HCM 95th %tile Q(veh)	- 4.4	-

Volume

10: Route 138 & North Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (vph)	0	0	1230	25	25	1250
Future Volume (vph)	0	0	1230	25	25	1250
Satd. Flow (prot)	0	0	1810	0	0	1817
Flt Permitted						0.999
Satd. Flow (perm)	0	0	1810	0	0	1817
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.89	0.50	0.72	0.96
Heavy Vehicles (%)	2%	2%	1%	0%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1432	0	0	1337
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 89.2%	ICU Level of Service E
Analysis Period (min) 15	

Volume

11: Route 138 & Green Street/North Parking Lot Exit

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	0	10	6	0	70	4	1220	0	0	1260	7
Future Volume (vph)	5	0	10	6	0	70	4	1220	0	0	1260	7
Satd. Flow (prot)	0	1645	0	0	1601	0	0	1819	0	0	1817	0
Flt Permitted		0.984			0.996							
Satd. Flow (perm)	0	1645	0	0	1601	0	0	1819	0	0	1817	0
Confl. Peds. (#/hr)	5					5						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	1%	0%	2%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	15	0	0	78	0	0	1262	0	0	1306	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 80.6%

ICU Level of Service D

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	10	6	0	70	4	1220	0	0	1260	7
Future Vol, veh/h	5	0	10	6	0	70	4	1220	0	0	1260	7
Conflicting Peds, #/hr	5	0	0	0	0	5	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	2	0	0	2	0	0	1	0	2	1	0
Mvmt Flow	5	0	10	6	0	72	4	1258	0	0	1299	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2610	2569	1303	2574	2572	1263	1306	0	-	-	-	0
Stage 1	1303	1303	-	1266	1266	-	-	-	-	-	-	-
Stage 2	1307	1266	-	1308	1306	-	-	-	-	-	-	-
Critical Hdwy	6.5	6.52	6.2	6.5	10	6.2	4.1	-	-	-	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4.018	3.3	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	25	26	198	27	2	209	537	-	0	0	-	-
Stage 1	199	231	-	209	240	-	-	-	0	0	-	-
Stage 2	198	240	-	198	230	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	16	25	198	25	2	208	537	-	-	-	-	-
Mov Cap-2 Maneuver	16	25	-	25	2	-	-	-	-	-	-	-
Stage 1	194	231	-	204	234	-	-	-	-	-	-	-
Stage 2	126	234	-	188	230	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB				
HCM Control Delay, s	138.5		65.9		0		0				
HCM LOS	F		F								

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	537	-	41	132	-
HCM Lane V/C Ratio	0.008	-	0.377	0.594	-
HCM Control Delay (s)	11.8	0	138.5	65.9	-
HCM Lane LOS	B	A	F	F	-
HCM 95th %tile Q(veh)	0	-	1.3	3	-

Volume

12: Route 138 & Summit Rd. & Canton Ave.

08/20/2018



Lane Group	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	0	1	1	850	450	9	2	0	1260	0	0
Future Volume (vph)	0	1	1	850	450	9	2	0	1260	0	0
Satd. Flow (prot)	1589	0	0	1722	0	0	0	0	1819	0	0
Flt Permitted											
Satd. Flow (perm)	1589	0	0	1722	0	0	0	0	1819	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	0%	2%	1%	2%	2%
Shared Lane Traffic (%)											
Lane Group Flow (vph)	2	0	0	1349	0	0	0	0	1301	0	0
Sign Control	Stop			Free					Free	Stop	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 82.7%

ICU Level of Service E

Analysis Period (min) 15

Intersection								
Int Delay, s/veh	0							
Movement	WBL	WBR	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	W		T			T		
Traffic Vol, veh/h	0	1	850	450	0	1260	0	0
Future Vol, veh/h	0	1	850	450	0	1260	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	-	-	-	None	-	None
Storage Length	0	-	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0	-	-
Grade, %	0	-	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	1	2	1	2	2
Mvmt Flow	0	1	876	464	0	1299	0	0

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	0	0	0
Stage 1	0	-	-
Stage 2	0	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s			
HCM LOS	-		

Minor Lane/Major Mvmt	NBT	NBR	NBR2WBLn1	SBL2	SBL	SBT
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	-	-	-	-	-	-
HCM Lane LOS	-	-	-	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-	-

Volume

13: Route 138 & Thacher Montessori School

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	6	6	850	1270	0
Future Volume (vph)	0	6	6	850	1270	0
Satd. Flow (prot)	1589	0	0	1801	1818	0
Flt Permitted						
Satd. Flow (perm)	1589	0	0	1801	1818	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	2%	1%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	891	1323	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 76.8% ICU Level of Service D

Analysis Period (min) 15

HCM 2010 TWSC
 13: Route 138 & Thacher Montessori School

08/20/2018

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	6	6	850	1270	0
Future Vol, veh/h	0	6	6	850	1270	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	0	0	2	1	0
Mvmt Flow	0	6	6	885	1323	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2221	1323	1323	0	-	0
Stage 1	1323	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	48	193	529	-	-	-
Stage 1	249	-	-	-	-	-
Stage 2	398	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	47	193	529	-	-	-
Mov Cap-2 Maneuver	47	-	-	-	-	-
Stage 1	249	-	-	-	-	-
Stage 2	389	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.3	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	529	-	193	-	-
HCM Lane V/C Ratio	0.012	-	0.032	-	-
HCM Control Delay (s)	11.9	0	24.3	-	-
HCM Lane LOS	B	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↗	
Traffic Volume (vph)	5	0	330	170	120	0	1	850	0	0	770	5
Future Volume (vph)	5	0	330	170	120	0	1	850	0	0	770	5
Satd. Flow (prot)	0	1591	0	1728	1837	0	0	1801	0	0	1799	0
Flt Permitted		0.997		0.393				0.999				
Satd. Flow (perm)	0	1588	0	715	1837	0	0	1799	0	0	1799	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	0%	13%	0%	2%	2%	2%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	352	0	179	126	0	0	896	0	0	816	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2				6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0				10.0
Minimum Split (s)	20.0	20.0		20.0	20.0		45.0	45.0				45.0
Total Split (s)	30.0	30.0		30.0	30.0		45.0	45.0				45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%				60.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0				5.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0				1.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)		5.0		5.0	5.0			6.0				6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None				None
Act Effect Green (s)		20.1		20.1	20.1			37.1				37.1
Actuated g/C Ratio		0.29		0.29	0.29			0.54				0.54
v/c Ratio		0.75		0.85	0.23			0.92				0.84
Control Delay		33.4		59.3	19.7			32.6				24.3
Queue Delay		0.0		0.0	0.0			0.0				0.0
Total Delay		33.4		59.3	19.7			32.6				24.3
LOS		C		E	B			C				C
Approach Delay		33.4			42.9			32.6				24.3
Approach LOS		C			D			C				C
Queue Length 50th (ft)		138		73	41			346				290
Queue Length 95th (ft)		229		#176	80			#637				#553
Internal Link Dist (ft)		906			198			187				2213
Turn Bay Length (ft)												
Base Capacity (vph)		592		266	685			1046				1046
Starvation Cap Reductn		0		0	0			0				0
Spillback Cap Reductn		0		0	0			0				0
Storage Cap Reductn		0		0	0			0				0
Reduced v/c Ratio		0.59		0.67	0.18			0.86				0.78

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 68.4

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 31.2

Intersection LOS: C

Intersection Capacity Utilization 89.0%

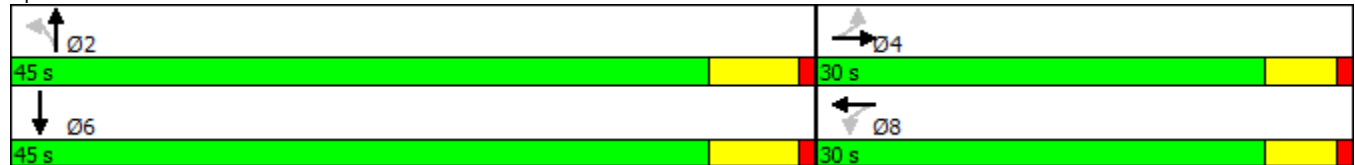
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.


















Queue shown is maximum after two cycles.

Splits and Phases: 14: Route 138 & Brush Hill Rd.



HCM 2010 Signalized Intersection Summary
 14: Route 138 & Brush Hill Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	330	170	120	0	1	850	0	0	770	5
Future Volume (veh/h)	5	0	330	170	120	0	1	850	0	0	770	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	15	0	5	5	0	0	5	0	0	20	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1881	1900	1900	1900	1863	0	0	1863	1900
Adj Flow Rate, veh/h	5	0	347	179	126	0	1	895	0	0	811	5
Adj No. of Lanes	0	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	0	0	2	2	0	0	2	2
Cap, veh/h	50	5	427	190	590	0	48	901	0	0	973	4
Arrive On Green	0.31	0.00	0.31	0.31	0.31	0.00	0.53	0.53	0.00	0.00	0.53	0.53
Sat Flow, veh/h	6	17	1593	1098	1900	0	0	1862	0	0	1850	11
Grp Volume(v), veh/h	352	0	0	179	126	0	896	0	0	0	0	816
Grp Sat Flow(s),veh/h/ln	1616	0	0	1098	1900	0	1862	0	0	0	0	1861
Q Serve(g_s), s	0.0	0.0	0.0	4.6	3.5	0.0	0.0	0.0	0.0	0.0	0.0	25.6
Cycle Q Clear(g_c), s	13.5	0.0	0.0	18.1	3.5	0.0	30.4	0.0	0.0	0.0	0.0	25.6
Prop In Lane	0.01		0.99	1.00		0.00	0.00		0.00	0.00		0.01
Lane Grp Cap(c), veh/h	482	0	0	190	590	0	897	0	0	0	0	980
V/C Ratio(X)	0.73	0.00	0.00	0.94	0.21	0.00	1.00	0.00	0.00	0.00	0.00	0.83
Avail Cap(c_a), veh/h	625	0	0	379	674	0	1082	0	0	0	0	1030
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	0.0	0.0	31.3	18.2	0.0	17.6	0.0	0.0	0.0	0.0	15.9
Incr Delay (d2), s/veh	3.1	0.0	0.0	19.0	0.2	0.0	25.5	0.0	0.0	0.0	0.0	5.7
Initial Q Delay(d3),s/veh	25.9	0.0	0.0	68.2	0.7	0.0	19.7	0.0	0.0	0.0	0.0	17.9
%ile BackOfQ(50%),veh/ln	10.0	0.0	0.0	8.5	2.4	0.0	28.4	0.0	0.0	0.0	0.0	22.9
LnGrp Delay(d),s/veh	50.6	0.0	0.0	118.5	19.1	0.0	62.8	0.0	0.0	0.0	0.0	39.5
LnGrp LOS	D			F	B		E					D
Approach Vol, veh/h		352			305			896				816
Approach Delay, s/veh		50.6			77.4			62.8				39.5
Approach LOS		D			E			E				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		43.6		26.8		43.6		26.8				
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0				
Max Green Setting (Gmax), s		39.0		25.0		39.0		25.0				
Max Q Clear Time (g_c+I1), s		32.4		15.5		27.6		20.1				
Green Ext Time (p_c), s		5.2		2.7		8.2		1.7				
Intersection Summary												
HCM 2010 Ctrl Delay				54.8								
HCM 2010 LOS				D								

Volume

15: Canton Ave. & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	170	280	0	140
Future Volume (vph)	0	0	170	280	0	140
Satd. Flow (prot)	0	0	1745	1818	0	1573
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	1745	1818	0	1573
Peak Hour Factor	0.92	0.92	0.86	0.79	0.92	0.94
Heavy Vehicles (%)	2%	2%	0%	1%	2%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	198	354	0	149
Sign Control	Free			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 24.8% ICU Level of Service A

Analysis Period (min) 15

Volume

16: Route 138 & Neponset Valley Pkwy.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	200	390	490	570	1
Future Volume (vph)	4	200	390	490	570	1
Satd. Flow (prot)	1562	0	0	1755	1801	0
Flt Permitted	0.999			0.978		
Satd. Flow (perm)	1562	0	0	1755	1801	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	4%	1%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	210	0	0	907	589	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 100.0% ICU Level of Service G

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	5.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	4	200	390	490	570	1
Future Vol, veh/h	4	200	390	490	570	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	2	4	1	2	0
Mvmt Flow	4	206	402	505	588	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1897	588	589	0	-	0
Stage 1	588	-	-	-	-	-
Stage 2	1309	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.236	-	-	-
Pot Cap-1 Maneuver	77	509	977	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	255	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	33	509	977	-	-	-
Mov Cap-2 Maneuver	33	-	-	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	109	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.8	5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	977	-	397	-	-
HCM Lane V/C Ratio	0.412	-	0.53	-	-
HCM Control Delay (s)	11.2	0	23.8	-	-
HCM Lane LOS	B	A	C	-	-
HCM 95th %tile Q(veh)	2	-	3	-	-

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	30	100	8	15	70	20	15	460	9	1	540	25
Future Volume (vph)	30	100	8	15	70	20	15	460	9	1	540	25
Satd. Flow (prot)	0	1751	0	0	1776	0	0	1812	0	0	1808	0
Flt Permitted		0.919			0.950			0.977			0.999	
Satd. Flow (perm)	0	1627	0	0	1699	0	0	1774	0	0	1807	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	4%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	145	0	0	111	0	0	509	0	0	595	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		37.0	37.0		37.0	37.0	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		10.2			10.2			35.0			35.0	
Actuated g/C Ratio		0.19			0.19			0.66			0.66	
v/c Ratio		0.47			0.34			0.44			0.50	
Control Delay		24.1			21.4			8.2			9.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.1			21.4			8.2			9.0	
LOS		C			C			A			A	
Approach Delay		24.1			21.4			8.2			9.0	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		40			30			78			98	
Queue Length 95th (ft)		86			67			175			216	
Internal Link Dist (ft)		1017			791			1154			1181	
Turn Bay Length (ft)												
Base Capacity (vph)		612			639			1364			1389	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.24			0.17			0.37			0.43	

Intersection Summary

Cycle Length: 70

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018

Actuated Cycle Length: 53.3

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 11.3

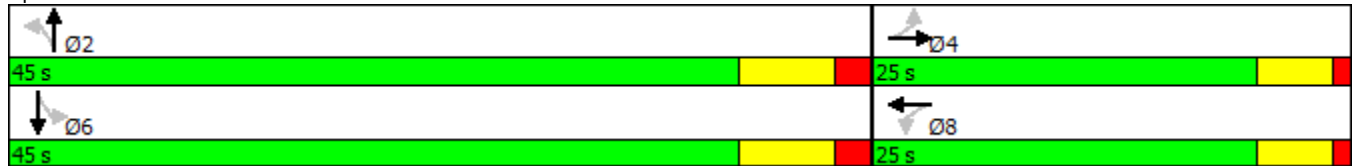
Intersection LOS: B

Intersection Capacity Utilization 57.9%

ICU Level of Service B

















Analysis Period (min) 15

Splits and Phases: 17: Route 138 & Milton St./Dollar Ln.



HCM 2010 Signalized Intersection Summary
 17: Route 138 & Milton St./Dollar Ln.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	100	8	15	70	20	15	460	9	1	540	25
Future Volume (veh/h)	30	100	8	15	70	20	15	460	9	1	540	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	20	0	0	10	0	0	10	0	0	20	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1847	1900	1900	1900	1900	1900	1882	1900	1900	1882	1900
Adj Flow Rate, veh/h	32	105	8	16	74	21	16	484	9	1	568	26
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	0	0	0	1	1	1	1	1	1
Cap, veh/h	113	234	12	101	227	42	86	1094	18	70	1086	46
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	262	1388	96	147	1313	341	20	1801	33	0	1785	82
Grp Volume(v), veh/h	145	0	0	111	0	0	509	0	0	595	0	0
Grp Sat Flow(s),veh/h/ln	1747	0	0	1800	0	0	1854	0	0	1867	0	0
Q Serve(g_s), s	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.7	0.0	0.0	2.7	0.0	0.0	7.0	0.0	0.0	8.8	0.0	0.0
Prop In Lane	0.22		0.06	0.14		0.19	0.03		0.02	0.00		0.04
Lane Grp Cap(c), veh/h	377	0	0	356	0	0	1205	0	0	1197	0	0
V/C Ratio(X)	0.38	0.00	0.00	0.31	0.00	0.00	0.42	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	792	0	0	807	0	0	1513	0	0	1528	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.8	0.0	0.0	19.8	0.0	0.0	5.8	0.0	0.0	7.3	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.5	0.0	0.0	0.2	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	32.8	0.0	0.0	8.3	0.0	0.0	0.9	0.0	0.0	4.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	0.0	0.0	3.1	0.0	0.0	5.1	0.0	0.0	8.6	0.0	0.0
LnGrp Delay(d),s/veh	54.3	0.0	0.0	28.5	0.0	0.0	6.9	0.0	0.0	11.6	0.0	0.0
LnGrp LOS	D			C			A			B		
Approach Vol, veh/h		145			111			509			595	
Approach Delay, s/veh		54.3			28.5			6.9			11.6	
Approach LOS		D			C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		11.8		37.0		11.8				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		38.0		20.0		38.0		20.0				
Max Q Clear Time (g_c+I1), s		9.0		5.7		10.8		4.7				
Green Ext Time (p_c), s		8.3		1.2		8.2		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				15.8								
HCM 2010 LOS				B								

Volume

18: Route 138 & Blue Jay Way (Curry College)

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Satd. Flow (prot)	1837	0	0	1701	1733	0
Flt Permitted						
Satd. Flow (perm)	1837	0	0	1701	1733	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	7%	1%	8%	6%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 0.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	7	1	8	6	0
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.4	6.27	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.363	2.209	-	-	-
Pot Cap-1 Maneuver	1027	1069	1628	-	-	-
Stage 1	1028	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1027	1069	1628	-	-	-
Mov Cap-2 Maneuver	1027	-	-	-	-	-
Stage 1	1028	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1628	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Volume

19: Route 138 & Atherton St. & Bradley Rd.

08/20/2018



Lane Group	EBT	WBT	NBT	SBT	SEL
Lane Configurations					
Traffic Volume (vph)	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0
Satd. Flow (prot)	1837	1837	1701	1733	1749
Flt Permitted					
Satd. Flow (perm)	1837	1837	1701	1733	1749
Satd. Flow (RTOR)					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	8%	6%	5%
Shared Lane Traffic (%)					
Lane Group Flow (vph)	0	0	0	0	0
Turn Type					Prot
Protected Phases	4		2	6	5
Permitted Phases		8			
Detector Phase	4	8	2	6	5
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag				Lag	Lead
Lead-Lag Optimize?				Yes	Yes
Recall Mode	None	None	Min	Min	None
Act Effect Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					
Queue Length 95th (ft)					
Internal Link Dist (ft)	1290	1410	1586	2667	689
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 20

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0

Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 19: Route 138 & Atherton St. & Bradlee Rd.



Volume
20: Route 138 & Robbins St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1837	0	0	1837	0	0	1701	0	0	1717	0
Flt Permitted												
Satd. Flow (perm)	0	1837	0	0	1837	0	0	1701	0	0	1717	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	3%	0%	13%	0%	8%	8%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay												
Queue Delay												
Total Delay												
LOS												
Approach Delay												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		939			647			711			3441	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												

Intersection Summary												
Cycle Length: 40												
Actuated Cycle Length: 25												

Volume

20: Route 138 & Robbins St.

08/20/2018

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0

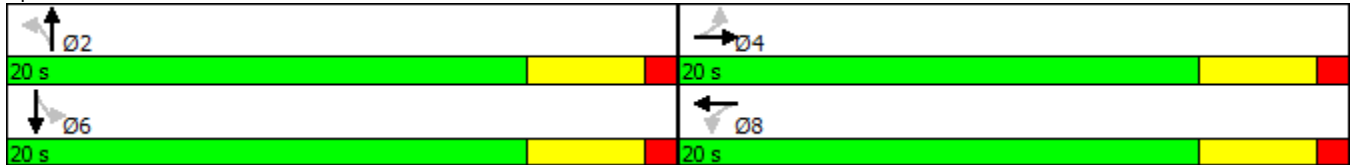
Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A

















Analysis Period (min) 15

Splits and Phases: 20: Route 138 & Robbins St.



HCM 2010 Signalized Intersection Summary
 20: Route 138 & Robbins St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1759	1900	1900	1776	1900
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	8	8	8	7	7	7
Cap, veh/h	0	9999	0	0	9999	0	0	9999	0	0	9999	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	-85500	0	0	-85500	0	0	-79167	0	0	-79907	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	0	1900	0	0	1759	0	0	1776	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	816004378624		0	816004378624		0	75539608320		0	76265775104		0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	12648678686720		0	12648678686720		0	117117039330560		0	11821194936320		0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS												
Approach Vol, veh/h		0			0			0			0	
Approach Delay, s/veh		0.0			0.0			0.0			0.0	
Approach LOS												
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		0.0		0.0		0.0		0.0			0.0	
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5			4.5	
Max Green Setting (Gmax), s		15.5		15.5		15.5		15.5			15.5	
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0		0.0			0.0	
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0			0.0	
Intersection Summary												
HCM 2010 Ctrl Delay			0.0									
HCM 2010 LOS			A									

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1837	0	0	1837	0	0	1701	0	0	1701	0
Flt Permitted												
Satd. Flow (perm)	0	1837	0	0	1837	0	0	1701	0	0	1701	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	8%	0%	13%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay												
Queue Delay												
Total Delay												
LOS												
Approach Delay												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		838			877			3441			407	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												

Intersection Summary

Cycle Length: 40
Actuated Cycle Length: 40
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Pretimed
Maximum v/c Ratio: 0.00

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

Intersection Signal Delay: 0.0

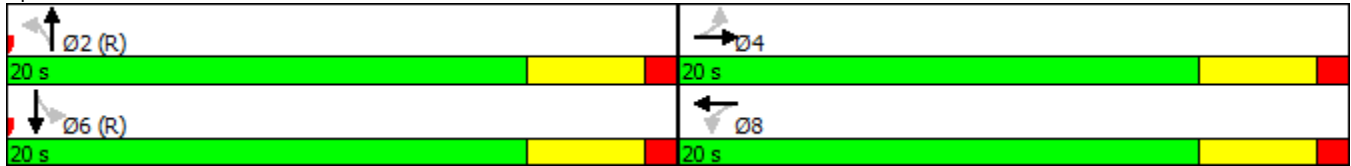
Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A

















Analysis Period (min) 15

Splits and Phases: 21: Route 138 & Cheever St./Blue Hill Terrace St.



HCM 2010 Signalized Intersection Summary
 21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1759	1900	1900	1759	1900
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	8	8	8	8	8	8
Cap, veh/h	0	9999	0	0	9999	0	0	9999	0	0	9999	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	-85500	0	0	-85500	0	0	-79167	0	0	-79167	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	0	1900	0	0	1759	0	0	1759	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	8160	4378624	0	8160	4378624	0	7555	9608320	0	7555	9608320	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	126486	78686720	0	126486	78686720	0	117117	39330560	0	117117	39330560	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS												
Approach Vol, veh/h		0			0			0			0	
Approach Delay, s/veh		0.0			0.0			0.0			0.0	
Approach LOS												
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		0.0		0.0		0.0		0.0			0.0	
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5			4.5	
Max Green Setting (Gmax), s		15.5		15.5		15.5		15.5			15.5	
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0		0.0			0.0	
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0			0.0	
Intersection Summary												
HCM 2010 Ctrl Delay			0.0									
HCM 2010 LOS			A									

Volume

22: Route 138 & Aberdeen Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1	2	2	270	350	15
Future Volume (vph)	1	2	2	270	350	15
Satd. Flow (prot)	1645	0	0	1801	1808	0
Flt Permitted	0.984					
Satd. Flow (perm)	1645	0	0	1801	1808	0
Confl. Peds. (#/hr)	8		5			5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	0	0	292	392	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 29.4%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	1	2	2	270	350	15
Future Vol, veh/h	1	2	2	270	350	15
Conflicting Peds, #/hr	8	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	2	1	0
Mvmt Flow	1	2	2	290	376	16

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	692	389	397	0	-	0
Stage 1	389	-	-	-	-	-
Stage 2	303	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	413	664	1173	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	409	661	1173	-	-	-
Mov Cap-2 Maneuver	409	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	749	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1173	-	548	-	-
HCM Lane V/C Ratio	0.002	-	0.006	-	-
HCM Control Delay (s)	8.1	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Volume

23: Route 138 & Oak St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1837	0	0	1837	0	0	1717	0	0	1701	0
Flt Permitted												
Satd. Flow (perm)	0	1837	0	0	1837	0	0	1717	0	0	1701	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	0%	7%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 0.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	25	0	0	0	7	0	0	8	0
Mvmt Flow	0	0	0	0	0	0	0	0	0	0	0	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1	1	1	1	1	0	1	0	0	0	0	0
Stage 1	1	1	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	1	1	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.35	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.725	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	1027	899	1090	965	899	-	1635	-	-	-	-	-
Stage 1	1027	899	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	965	899	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	899	1090	965	899	-	1635	-	-	-	-	-
Mov Cap-2 Maneuver	-	899	-	965	899	-	-	-	-	-	-	-
Stage 1	1027	899	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	965	899	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1635	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	0	-
HCM Lane LOS	A	-	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	-

Volume

24: Route 138 & Brook Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1818	0	0	0	0	0	1717	0	0	1701	0
Flt Permitted												
Satd. Flow (perm)	0	1818	0	0	0	0	0	1717	0	0	1701	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	1%	0%	2%	2%	2%	20%	7%	9%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0					5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0					20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0					20.0	20.0		20.0	20.0	
Total Split (%)	50.0%	50.0%					50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5					3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		4.5						4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None					Min	Min		Min	Min	
Act Effect Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay												
Queue Delay												
Total Delay												
LOS												
Approach Delay												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		967			1001			519			1021	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												

Intersection Summary

Cycle Length: 40
 Actuated Cycle Length: 25

Volume

24: Route 138 & Brook Rd.

08/20/2018

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0

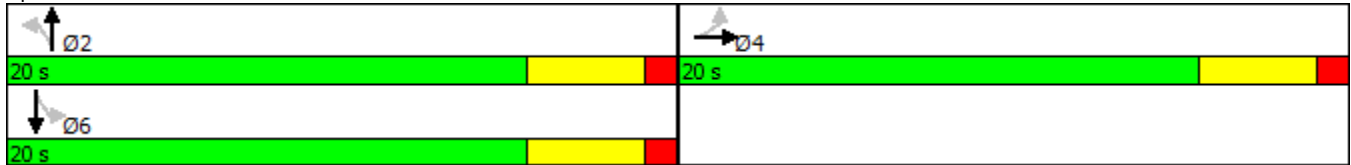
Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A
















Analysis Period (min) 15

Splits and Phases: 24: Route 138 & Brook Rd.



HCM 2010 Signalized Intersection Summary
 24: Route 138 & Brook Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900				1900	1776	1900	1900	1759	1900
Adj Flow Rate, veh/h	0	0	0				0	0	0	0	0	0
Adj No. of Lanes	0	1	0				0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	1	0				7	7	7	8	8	8
Cap, veh/h	0	9999	0				0	9999	0	0	9999	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1881	0				0	-79907	0	0	-79167	0
Grp Volume(v), veh/h	0	0	0				0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1881	0				0	1776	0	0	1759	0
Q Serve(g_s), s	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00				0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	8079	6418	048				7626	5775	104	0	7555	9608
V/C Ratio(X)	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	12523	4110	9312				11821	10493	6320	0	11711	73933
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS												
Approach Vol, veh/h		0						0			0	
Approach Delay, s/veh		0.0						0.0			0.0	
Approach LOS												
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		0.0		0.0		0.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		15.5		15.5		15.5						
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0						
Green Ext Time (p_c), s		0.0		0.0		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			0.0									
HCM 2010 LOS			A									

Volume

102: Route 138 & Concord Baptist Church

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	270	30	100	250
Future Volume (vph)	0	0	270	30	100	250
Satd. Flow (prot)	1837	0	1813	0	0	1806
Flt Permitted						0.986
Satd. Flow (perm)	1837	0	1813	0	0	1806
Confl. Peds. (#/hr)	19			53	53	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	322	0	0	377
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 41.8%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	0	270	30	100	250
Future Vol, veh/h	0	0	270	30	100	250
Conflicting Peds, #/hr	19	0	0	53	53	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	1	0
Mvmt Flow	0	0	290	32	108	269

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	862	359	0	0	376
Stage 1	359	-	-	-	-
Stage 2	503	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209
Pot Cap-1 Maneuver	328	690	-	-	1188
Stage 1	711	-	-	-	-
Stage 2	612	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	275	658	-	-	1188
Mov Cap-2 Maneuver	275	-	-	-	-
Stage 1	678	-	-	-	-
Stage 2	537	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	2.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1188
HCM Lane V/C Ratio	-	-	-	0.091
HCM Control Delay (s)	-	-	0	8.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.3

Part 3: Future Intersection Levels of Service

Volume

8: Route 138 & South Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	1490	1	1	1070
Future Volume (vph)	0	0	1490	1	1	1070
Satd. Flow (prot)	0	0	1749	0	0	1733
Flt Permitted						
Satd. Flow (perm)	0	0	1749	0	0	1733
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	5%	0%	0%	6%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1569	0	0	1127
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 81.8% ICU Level of Service D

Analysis Period (min) 15

Volume

9: Route 138 & South Parking Lot Exit

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1	1490	0	0	1080
Future Volume (vph)	0	1	1490	0	0	1080
Satd. Flow (prot)	1589	0	1749	0	0	1733
Flt Permitted						
Satd. Flow (perm)	1589	0	1749	0	0	1733
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	5%	2%	2%	6%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	1568	0	0	1137
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 88.4% ICU Level of Service E

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑			↑
Traffic Vol, veh/h	0	1	1490	0	0	1080
Future Vol, veh/h	0	1	1490	0	0	1080
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	5	2	2	6
Mvmt Flow	0	1	1568	0	0	1137

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2705	1568	0	-	-	-
Stage 1	1568	-	-	-	-	-
Stage 2	1137	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	24	138	-	0	0	-
Stage 1	191	-	-	0	0	-
Stage 2	309	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	24	138	-	-	-	-
Mov Cap-2 Maneuver	24	-	-	-	-	-
Stage 1	191	-	-	-	-	-
Stage 2	309	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.3	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBTWBLn1	SBT
Capacity (veh/h)	- 138	-
HCM Lane V/C Ratio	- 0.008	-
HCM Control Delay (s)	- 31.3	-
HCM Lane LOS	- D	-
HCM 95th %tile Q(veh)	- 0	-

Volume

10: Route 138 & North Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	1490	7	6	1090
Future Volume (vph)	0	0	1490	7	6	1090
Satd. Flow (prot)	0	0	1746	0	0	1733
Flt Permitted						
Satd. Flow (perm)	0	0	1746	0	0	1733
Peak Hour Factor	0.92	0.92	0.96	0.58	0.75	0.94
Heavy Vehicles (%)	2%	2%	5%	14%	0%	6%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1564	0	0	1168
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 82.2% ICU Level of Service E

Analysis Period (min) 15

Volume

11: Route 138 & Green Street/North Parking Lot Exit

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	0	7	0	0	10	1	1480	0	0	1090	7
Future Volume (vph)	7	0	7	0	0	10	1	1480	0	0	1090	7
Satd. Flow (prot)	0	1671	0	0	1444	0	0	1766	0	0	1732	0
Flt Permitted		0.976										
Satd. Flow (perm)	0	1671	0	0	1444	0	0	1766	0	0	1732	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	2%	2%	10%	0%	4%	0%	2%	6%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	0	0	11	0	0	1559	0	0	1154	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 92.5%

ICU Level of Service F

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	7	0	0	10	1	1480	0	0	1090	7
Future Vol, veh/h	7	0	7	0	0	10	1	1480	0	0	1090	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	2	0	2	2	10	0	4	0	2	6	0
Mvmt Flow	7	0	7	0	0	11	1	1558	0	0	1147	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2716	2711	1151	2715	2715	1558	1155	0	-	-	-	0
Stage 1	1151	1151	-	1560	1560	-	-	-	-	-	-	-
Stage 2	1565	1560	-	1155	1155	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.12	6.52	6.3	4.1	-	-	-	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.518	4.018	3.39	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	14	21	243	14	21	133	612	-	0	0	-	-
Stage 1	243	272	-	141	173	-	-	-	0	0	-	-
Stage 2	141	173	-	240	271	-	-	-	0	0	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	13	21	243	13	21	133	612	-	-	-	-	-
Mov Cap-2 Maneuver	13	21	-	13	21	-	-	-	-	-	-	-
Stage 1	240	272	-	139	171	-	-	-	-	-	-	-
Stage 2	128	171	-	233	271	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB				
HCM Control Delay, s	272.8		34.4		0		0				
HCM LOS	F		D								

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	612	-	25	133	-
HCM Lane V/C Ratio	0.002	-	0.589	0.079	-
HCM Control Delay (s)	10.9	0	272.8	34.4	-
HCM Lane LOS	B	A	F	D	-
HCM 95th %tile Q(veh)	0	-	1.8	0.3	-

Volume

12: Route 138 & Summit Rd.

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1	970	550	7	1090
Future Volume (vph)	0	1	970	550	7	1090
Satd. Flow (prot)	1558	0	1672	0	0	1717
Flt Permitted						
Satd. Flow (perm)	1558	0	1672	0	0	1717
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	7%	0%	2%	7%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	1600	0	0	1154
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 94.6% ICU Level of Service F

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑			↔
Traffic Vol, veh/h	0	1	970	550	7	1090
Future Vol, veh/h	0	1	970	550	7	1090
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	2	7	0	2	7
Mvmt Flow	0	1	1021	579	7	1147

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2473	1311	0	0	1600
Stage 1	1311	-	-	-	-
Stage 2	1162	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218
Pot Cap-1 Maneuver	33	194	-	-	409
Stage 1	255	-	-	-	-
Stage 2	300	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	31	194	-	-	409
Mov Cap-2 Maneuver	31	-	-	-	-
Stage 1	255	-	-	-	-
Stage 2	286	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	194	409
HCM Lane V/C Ratio	-	-	0.005	0.018
HCM Control Delay (s)	-	-	23.7	14
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0	0.1

Volume

13: Route 138 & Thacher Montessori School

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	9	3	960	1080	45
Future Volume (vph)	0	9	3	960	1080	45
Satd. Flow (prot)	1589	0	0	1733	1728	0
Flt Permitted						
Satd. Flow (perm)	1589	0	0	1733	1728	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	0%	6%	6%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	0	0	1024	1197	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 69.6% ICU Level of Service C

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	0	9	3	960	1080	45
Future Vol, veh/h	0	9	3	960	1080	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	0	0	6	6	0
Mvmt Flow	0	10	3	1021	1149	48

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2201	1173	1197	0	-	0
Stage 1	1173	-	-	-	-	-
Stage 2	1028	-	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	49	*109	*327	-	-	-
Stage 1	294	-	-	-	-	-
Stage 2	345	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	48	*109	*327	-	-	-
Mov Cap-2 Maneuver	48	-	-	-	-	-
Stage 1	294	-	-	-	-	-
Stage 2	338	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	41.2	0.1	0
HCM LOS	E		

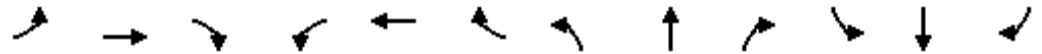
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 327	-	109	-	-
HCM Lane V/C Ratio	0.01	-	0.088	-	-
HCM Control Delay (s)	16.1	0	41.2	-	-
HCM Lane LOS	C	A	E	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↑			↘	↙
Traffic Volume (vph)	6	0	310	160	110	15	0	970	0	0	660	7
Future Volume (vph)	6	0	310	160	110	15	0	970	0	0	660	7
Satd. Flow (prot)	0	1545	0	1728	1760	0	0	1733	0	0	1683	0
Flt Permitted		0.995		0.377								
Satd. Flow (perm)	0	1539	0	686	1760	0	0	1733	0	0	1683	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	3%	1%	1%	13%	0%	6%	2%	2%	9%	14%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	329	0	167	131	0	0	1010	0	0	695	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8								
Detector Phase	4	4		8	8			2				6
Switch Phase												
Minimum Initial (s)	5.0	5.0		10.0	10.0			10.0				10.0
Minimum Split (s)	23.0	23.0		24.0	24.0			45.0				45.0
Total Split (s)	30.0	30.0		30.0	30.0			50.0				50.0
Total Split (%)	37.5%	37.5%		37.5%	37.5%			62.5%				62.5%
Yellow Time (s)	4.0	4.0		5.0	5.0			4.0				4.0
All-Red Time (s)	1.0	1.0		1.0	1.0			1.0				1.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)		5.0		6.0	6.0			5.0				5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			None				None
Act Effect Green (s)		21.3		20.3	20.3			45.2				45.2
Actuated g/C Ratio		0.28		0.27	0.27			0.59				0.59
v/c Ratio		0.77		0.92	0.28			0.99				0.70
Control Delay		38.2		79.1	23.5			44.4				16.8
Queue Delay		0.0		0.0	0.0			0.0				0.0
Total Delay		38.2		79.1	23.5			44.4				16.8
LOS		D		E	C			D				B
Approach Delay		38.2			54.6			44.4				16.8
Approach LOS		D			D			D				B
Queue Length 50th (ft)		142		77	49			~552				239
Queue Length 95th (ft)		235		#186	92			#779				378
Internal Link Dist (ft)		906			198			187				2213
Turn Bay Length (ft)												
Base Capacity (vph)		504		215	554			1023				994
Starvation Cap Reductn		0		0	0			0				0
Spillback Cap Reductn		0		0	0			0				0
Storage Cap Reductn		0		0	0			0				0
Reduced v/c Ratio		0.65		0.78	0.24			0.99				0.70

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 76.5

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 36.6

Intersection LOS: D

Intersection Capacity Utilization 92.8%

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: 14: Route 138 & Brush Hill Rd.



HCM 2010 Signalized Intersection Summary

14: Route 138 & Brush Hill Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	310	160	110	15	0	970	0	0	660	7
Future Volume (veh/h)	6	0	310	160	110	15	0	970	0	0	660	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	10	0	5	10	0	0	20	0	0	15	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1846	1900	1881	1854	1900	0	1792	0	0	1742	1900
Adj Flow Rate, veh/h	6	0	323	167	115	16	0	1010	0	0	688	7
Adj No. of Lanes	0	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	1	1	1	0	6	0	0	9	9
Cap, veh/h	46	6	380	177	525	59	0	996	0	0	971	9
Arrive On Green	0.29	0.00	0.29	0.29	0.29	0.29	0.00	0.57	0.00	0.00	0.57	0.57
Sat Flow, veh/h	9	20	1541	1063	1593	222	0	1792	0	0	1722	18
Grp Volume(v), veh/h	329	0	0	167	0	131	0	1010	0	0	0	695
Grp Sat Flow(s),veh/h/ln	1570	0	0	1063	0	1815	0	1792	0	0	0	1739
Q Serve(g_s), s	0.0	0.0	0.0	5.4	0.0	4.4	0.0	43.7	0.0	0.0	0.0	22.6
Cycle Q Clear(g_c), s	14.8	0.0	0.0	20.2	0.0	4.4	0.0	43.7	0.0	0.0	0.0	22.6
Prop In Lane	0.02		0.98	1.00		0.12	0.00		0.00	0.00		0.01
Lane Grp Cap(c), veh/h	422	0	0	177	0	531	0	996	0	0	0	987
V/C Ratio(X)	0.78	0.00	0.00	0.94	0.00	0.25	0.00	1.01	0.00	0.00	0.00	0.70
Avail Cap(c_a), veh/h	544	0	0	303	0	552	0	1022	0	0	0	992
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	0.0	34.3	0.0	22.0	0.0	18.0	0.0	0.0	0.0	13.4
Incr Delay (d2), s/veh	5.4	0.0	0.0	25.0	0.0	0.2	0.0	31.8	0.0	0.0	0.0	2.3
Initial Q Delay(d3),s/veh	18.3	0.0	0.0	75.9	0.0	3.4	0.0	68.4	0.0	0.0	0.0	5.6
%ile BackOfQ(50%),veh/ln	9.2	0.0	0.0	8.9	0.0	3.7	0.0	50.7	0.0	0.0	0.0	15.1
LnGrp Delay(d),s/veh	48.6	0.0	0.0	135.2	0.0	25.7	0.0	118.3	0.0	0.0	0.0	21.3
LnGrp LOS	D			F		C		F				C
Approach Vol, veh/h		329			298			1010				695
Approach Delay, s/veh		48.6			87.0			118.3				21.3
Approach LOS		D			F			F				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.0		28.9		50.0		28.9				
Change Period (Y+Rc), s		5.0		* 6		5.0		6.0				
Max Green Setting (Gmax), s		45.0		* 25		45.0		24.0				
Max Q Clear Time (g_c+I1), s		45.7		16.8		24.6		22.2				
Green Ext Time (p_c), s		0.0		2.4		13.4		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				75.6								
HCM 2010 LOS				E								
Notes												

Volume

15: Canton Ave. & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	160	390	0	130
Future Volume (vph)	0	0	160	390	0	130
Satd. Flow (prot)	0	0	1711	1801	0	1573
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	1711	1801	0	1573
Peak Hour Factor	0.92	0.92	0.84	0.86	0.92	0.85
Heavy Vehicles (%)	2%	2%	2%	2%	2%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	190	453	0	153
Sign Control	Free			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 23.9% ICU Level of Service A

Analysis Period (min) 15

Volume

16: Route 138 & Neponset Valley Pkwy.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	170	440	550	490	3
Future Volume (vph)	4	170	440	550	490	3
Satd. Flow (prot)	1348	0	1662	1717	1745	0
Flt Permitted	0.999		0.178			
Satd. Flow (perm)	1348	0	311	1717	1745	0
Satd. Flow (RTOR)						
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	25%	18%	5%	7%	5%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	177	0	449	561	503	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.0		9.5	20.0	23.0	
Total Split (s)	23.0		24.0	57.0	33.0	
Total Split (%)	28.8%		30.0%	71.3%	41.3%	
Yellow Time (s)	4.0		3.5	4.0	4.0	
All-Red Time (s)	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.5	5.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	None	None	
Act Effect Green (s)	13.8		47.6	47.1	23.7	
Actuated g/C Ratio	0.19		0.67	0.66	0.33	
v/c Ratio	0.68		0.80	0.49	0.87	
Control Delay	41.7		26.0	8.3	40.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	41.7		26.0	8.3	40.1	
LOS	D		C	A	D	
Approach Delay	41.7			16.2	40.1	
Approach LOS	D			B	D	
Queue Length 50th (ft)	79		123	111	212	
Queue Length 95th (ft)	145		#299	199	#390	
Internal Link Dist (ft)	1200			2213	1154	
Turn Bay Length (ft)			200			
Base Capacity (vph)	350		588	1288	704	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.51		0.76	0.44	0.71	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 71.2

Volume

16: Route 138 & Neponset Valley Pkwy.

08/20/2018

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 26.0

Intersection LOS: C

Intersection Capacity Utilization 73.2%

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: 16: Route 138 & Neponset Valley Pkwy.



HCM 2010 Signalized Intersection Summary
 16: Route 138 & Neponset Valley Pkwy.

08/20/2018

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	4	170	440	550	490	3		
Future Volume (veh/h)	4	170	440	550	490	3		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	5	0	5	10	10	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1608	1900	1810	1776	1807	1900		
Adj Flow Rate, veh/h	4	173	449	561	500	3		
Adj No. of Lanes	0	0	1	1	1	0		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98		
Percent Heavy Veh, %	0	0	5	7	5	5		
Cap, veh/h	12	208	579	1172	682	3		
Arrive On Green	0.16	0.16	0.19	0.66	0.38	0.38		
Sat Flow, veh/h	31	1333	1723	1776	1794	11		
Grp Volume(v), veh/h	178	0	449	561	0	503		
Grp Sat Flow(s),veh/h/ln	1371	0	1723	1776	0	1805		
Q Serve(g_s), s	6.8	0.0	7.4	8.6	0.0	13.0		
Cycle Q Clear(g_c), s	6.8	0.0	7.4	8.6	0.0	13.0		
Prop In Lane	0.02	0.97	1.00			0.01		
Lane Grp Cap(c), veh/h	222	0	579	1172	0	685		
V/C Ratio(X)	0.80	0.00	0.77	0.48	0.00	0.73		
Avail Cap(c_a), veh/h	455	0	875	1700	0	931		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	23.5	0.0	11.9	5.1	0.0	16.6		
Incr Delay (d2), s/veh	6.7	0.0	2.5	0.3	0.0	2.0		
Initial Q Delay(d3),s/veh	0.0	0.0	2.4	1.0	0.0	5.8		
%ile BackOfQ(50%),veh/ln	3.3	0.0	5.8	5.7	0.0	9.7		
LnGrp Delay(d),s/veh	30.2	0.0	16.8	6.4	0.0	24.4		
LnGrp LOS	C		B	A		C		
Approach Vol, veh/h	178			1010	503			
Approach Delay, s/veh	30.2			11.0	24.4			
Approach LOS	C			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		40.7		13.6	15.0	25.7		
Change Period (Y+Rc), s		5.0		5.0	4.5	5.0		
Max Green Setting (Gmax), s		52.0		18.0	19.5	28.0		
Max Q Clear Time (g_c+I1), s		10.6		8.8	9.4	15.0		
Green Ext Time (p_c), s		8.9		0.4	1.1	5.8		
Intersection Summary								
HCM 2010 Ctrl Delay			17.0					
HCM 2010 LOS			B					
Notes								

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘			↕	
Traffic Volume (vph)	30	90	15	30	180	35	9	540	5	1	460	35
Future Volume (vph)	30	90	15	30	180	35	9	540	5	1	460	35
Satd. Flow (prot)	0	1731	0	0	1758	0	1745	1716	0	0	1719	0
Flt Permitted		0.906			0.948		0.480				0.999	
Satd. Flow (perm)	0	1586	0	0	1676	0	882	1716	0	0	1717	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	4%	0%	0%	2%	3%	0%	7%	0%	0%	6%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	139	0	0	253	0	9	562	0	0	511	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		37.0	37.0		37.0	37.0	
Total Split (s)	23.0	23.0		23.0	23.0		37.0	37.0		37.0	37.0	
Total Split (%)	38.3%	38.3%		38.3%	38.3%		61.7%	61.7%		61.7%	61.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		7.0	7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
Act Effect Green (s)		14.3			14.7		30.1	30.1			30.1	
Actuated g/C Ratio		0.25			0.26		0.53	0.53			0.53	
v/c Ratio		0.35			0.58		0.02	0.62			0.56	
Control Delay		19.5			24.2		7.7	13.9			12.7	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		19.5			24.2		7.7	13.9			12.7	
LOS		B			C		A	B			B	
Approach Delay		19.5			24.2			13.8			12.7	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		38			75		1	124			108	
Queue Length 95th (ft)		78			136		7	237			207	
Internal Link Dist (ft)		1017			791			1154			1181	
Turn Bay Length (ft)							200					
Base Capacity (vph)		503			532		466	908			908	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.28			0.48		0.02	0.62			0.56	

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 56.8

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 15.7

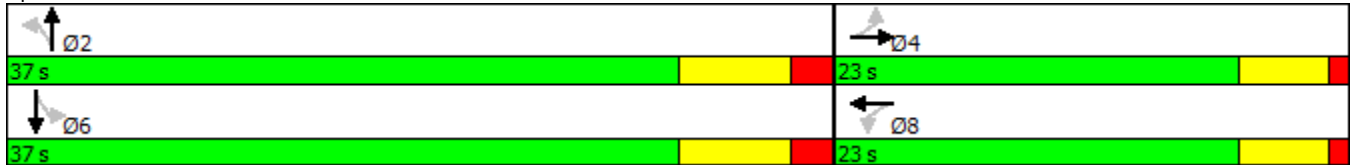
Intersection LOS: B

Intersection Capacity Utilization 54.1%

ICU Level of Service A


















Analysis Period (min) 15

Splits and Phases: 17: Route 138 & Milton St./Dollar Ln.



HCM 2010 Signalized Intersection Summary
 17: Route 138 & Milton St./Dollar Ln.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	90	15	30	180	35	9	540	5	1	460	35
Future Volume (veh/h)	30	90	15	30	180	35	9	540	5	1	460	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	10	0	0	15	0	0	15	0	0	10	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1838	1900	1900	1865	1900	1900	1777	1900	1900	1796	1900
Adj Flow Rate, veh/h	31	93	15	31	186	36	9	557	5	1	474	36
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	4	4	4	2	2	2	0	7	7	6	6	6
Cap, veh/h	123	314	34	96	327	47	561	976	8	67	906	63
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.56	0.56	0.56	0.56	0.56	0.56
Sat Flow, veh/h	219	1320	186	124	1389	251	904	1758	16	0	1648	125
Grp Volume(v), veh/h	139	0	0	253	0	0	9	0	562	511	0	0
Grp Sat Flow(s),veh/h/ln	1725	0	0	1764	0	0	904	0	1774	1774	0	0
Q Serve(g_s), s	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	10.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.5	0.0	0.0	6.9	0.0	0.0	0.3	0.0	10.8	9.4	0.0	0.0
Prop In Lane	0.22		0.11	0.12		0.14	1.00		0.01	0.00		0.07
Lane Grp Cap(c), veh/h	460	0	0	476	0	0	561	0	979	1039	0	0
V/C Ratio(X)	0.30	0.00	0.00	0.53	0.00	0.00	0.02	0.00	0.57	0.49	0.00	0.00
Avail Cap(c_a), veh/h	649	0	0	667	0	0	614	0	1000	1067	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.3	0.0	0.0	19.7	0.0	0.0	5.5	0.0	8.8	8.0	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.8	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	4.9	0.0	0.0	15.3	0.0	0.0	0.0	0.0	4.0	1.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.0	6.8	0.0	0.0	0.1	0.0	8.2	6.0	0.0	0.0
LnGrp Delay(d),s/veh	23.9	0.0	0.0	37.0	0.0	0.0	5.5	0.0	13.6	9.7	0.0	0.0
LnGrp LOS	C			D			A		B	A		
Approach Vol, veh/h		139			253			571			511	
Approach Delay, s/veh		23.9			37.0			13.4			9.7	
Approach LOS		C			D			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		16.2		37.0		16.2				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		30.0		18.0		30.0		18.0				
Max Q Clear Time (g_c+I1), s		12.8		5.5		11.4		8.9				
Green Ext Time (p_c), s		6.9		3.2		7.1		2.6				
Intersection Summary												
HCM 2010 Ctrl Delay				17.2								
HCM 2010 LOS				B								

Volume
18: Route 138 & Blue Jay Way (Curry College)

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	15	130	480	480	60
Future Volume (vph)	5	15	130	480	480	60
Satd. Flow (prot)	1596	0	0	1705	1717	0
Flt Permitted	0.979			0.989		
Satd. Flow (perm)	1596	0	0	1705	1717	0
Confl. Peds. (#/hr)	1		16			16
Peak Hour Factor	0.42	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	7%	1%	8%	6%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	0	0	663	587	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 74.9% ICU Level of Service D

Analysis Period (min) 15

HCM 2010 TWSC
 18: Route 138 & Blue Jay Way (Curry College)

08/20/2018

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	5	15	130	480	480	60
Future Vol, veh/h	5	15	130	480	480	60
Conflicting Peds, #/hr	1	0	16	0	0	16
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	92	92	92	92	92
Heavy Vehicles, %	0	7	1	8	6	0
Mvmt Flow	12	16	141	522	522	65

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1375	570	603	0	-	0
Stage 1	570	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Critical Hdwy	6.4	6.27	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.363	2.209	-	-	-
Pot Cap-1 Maneuver	162	*321	*488	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	93	*316	*488	-	-	-
Mov Cap-2 Maneuver	93	-	-	-	-	-
Stage 1	562	-	-	-	-	-
Stage 2	259	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.9	3.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 488	-	157	-	-
HCM Lane V/C Ratio	0.29	-	0.18	-	-
HCM Control Delay (s)	15.4	0	32.9	-	-
HCM Lane LOS	C	A	D	-	-
HCM 95th %tile Q(veh)	1.2	-	0.6	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018



Lane Group	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2	SEL
Lane Configurations												
Traffic Volume (vph)	2	2	3	2	25	450	9	2	460	1	1	5
Future Volume (vph)	2	2	3	2	25	450	9	2	460	1	1	5
Satd. Flow (prot)	1432	0	0	0	0	1689	0	0	1732	0	0	0
Flt Permitted	0.986					0.959			0.998			
Satd. Flow (perm)	1432	0	0	0	0	1625	0	0	1728	0	0	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	50%	0%	0%	50%	7%	8%	11%	0%	6%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	0	0	0	0	506	0	0	483	0	0	0
Turn Type	Prot			Perm	Perm	NA		Perm	NA			Perm
Protected Phases	10					2			6			
Permitted Phases				2	2			6				4
Detector Phase	10			2	2	2		6	6			4
Switch Phase												
Minimum Initial (s)	4.0			22.0	22.0	22.0		22.0	22.0			10.0
Minimum Split (s)	9.0			28.0	28.0	28.0		28.0	28.0			24.0
Total Split (s)	10.0			40.0	40.0	40.0		40.0	40.0			24.0
Total Split (%)	10.6%			42.6%	42.6%	42.6%		42.6%	42.6%			25.5%
Yellow Time (s)	4.0			5.0	5.0	5.0		5.0	5.0			4.0
All-Red Time (s)	1.0			1.0	1.0	1.0		1.0	1.0			1.0
Lost Time Adjust (s)	0.0					0.0			0.0			
Total Lost Time (s)	5.0					6.0			6.0			
Lead/Lag	Lag											
Lead-Lag Optimize?												
Recall Mode	None			None	None	None		None	None			None
Act Effect Green (s)	5.8					29.6			29.6			
Actuated g/C Ratio	0.11					0.58			0.58			
v/c Ratio	0.04					0.54			0.48			
Control Delay	31.4					16.5			15.0			
Queue Delay	0.0					0.0			0.0			
Total Delay	31.4					16.5			15.0			
LOS	C					B			B			
Approach Delay	31.4					16.5			15.0			
Approach LOS	C					B			B			
Queue Length 50th (ft)	2					76			70			
Queue Length 95th (ft)	18					#456			#382			
Internal Link Dist (ft)	1228					1586			2667			
Turn Bay Length (ft)												
Base Capacity (vph)	163					1193			1269			
Starvation Cap Reductn	0					0			0			
Spillback Cap Reductn	0					0			0			
Storage Cap Reductn	0					0			0			
Reduced v/c Ratio	0.04					0.42			0.38			

Intersection Summary

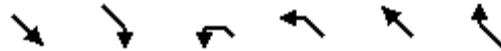
Cycle Length: 94

Actuated Cycle Length: 50.9

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018



Lane Group	SET	SER	NWL2	NWL	NWT	NWR	Ø9
Lane Configurations	↕				↕		
Traffic Volume (vph)	20	30	45	1	50	30	
Future Volume (vph)	20	30	45	1	50	30	
Satd. Flow (prot)	1639	0	0	0	1734	0	
Flt Permitted	0.966				0.855		
Satd. Flow (perm)	1589	0	0	0	1509	0	
Satd. Flow (RTOR)							
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	
Heavy Vehicles (%)	5%	3%	0%	0%	0%	3%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	57	0	0	0	131	0	
Turn Type	NA		Perm	Perm	NA		
Protected Phases	4				8		9
Permitted Phases			8	8			
Detector Phase	4		8	8	8		
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	10.0		1.0
Minimum Split (s)	24.0		24.0	24.0	24.0		20.0
Total Split (s)	24.0		24.0	24.0	24.0		20.0
Total Split (%)	25.5%		25.5%	25.5%	25.5%		21%
Yellow Time (s)	4.0		4.0	4.0	4.0		2.0
All-Red Time (s)	1.0		1.0	1.0	1.0		0.0
Lost Time Adjust (s)	0.0				0.0		
Total Lost Time (s)	5.0				5.0		
Lead/Lag							Lead
Lead-Lag Optimize?							
Recall Mode	None		None	None	None		None
Act Effct Green (s)	12.8				12.8		
Actuated g/C Ratio	0.25				0.25		
v/c Ratio	0.14				0.34		
Control Delay	22.1				24.5		
Queue Delay	0.0				0.0		
Total Delay	22.1				24.5		
LOS	C				C		
Approach Delay	22.1				24.5		
Approach LOS	C				C		
Queue Length 50th (ft)	11				27		
Queue Length 95th (ft)	63				126		
Internal Link Dist (ft)	689				1410		
Turn Bay Length (ft)							
Base Capacity (vph)	690				655		
Starvation Cap Reductn	0				0		
Spillback Cap Reductn	0				0		
Storage Cap Reductn	0				0		
Reduced v/c Ratio	0.08				0.20		

Intersection Summary

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018

Natural Cycle: 85

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 17.1

Intersection LOS: B

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.

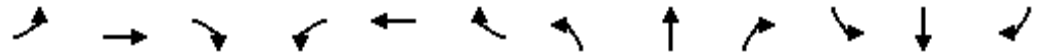
Splits and Phases: 19: Route 138 & Atherton St. & Bradlee Rd.

 Ø2 40 s	 Ø4 24 s	 Ø9 20 s	 Ø10 10 s
 Ø6 40 s	 Ø8 24 s		

Volume

20: Route 138 & Robbins St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	10	15	3	30	30	15	4	490	10	0	470	7
Future Volume (vph)	10	15	3	30	30	15	4	490	10	0	470	7
Satd. Flow (prot)	0	1778	0	0	1690	0	0	1696	0	0	1715	0
Flt Permitted		0.845			0.855			0.996				
Satd. Flow (perm)	0	1530	0	0	1474	0	0	1690	0	0	1715	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	3%	0%	13%	0%	8%	8%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	82	0	0	548	0	0	519	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		24.0	24.0		24.0	24.0	
Total Split (s)	24.0	24.0		24.0	24.0		56.0	56.0		56.0	56.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
Act Effect Green (s)		10.5			10.5			24.4			24.4	
Actuated g/C Ratio		0.30			0.30			0.71			0.71	
v/c Ratio		0.06			0.18			0.46			0.43	
Control Delay		14.4			14.9			8.3			7.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.4			14.9			8.3			7.9	
LOS		B			B			A			A	
Approach Delay		14.4			14.9			8.3			7.9	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5			13			71			65	
Queue Length 95th (ft)		25			52			221			201	
Internal Link Dist (ft)		939			647			711			3441	
Turn Bay Length (ft)												
Base Capacity (vph)		1005			968			1627			1651	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.03			0.08			0.34			0.31	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 34.6

Volume

20: Route 138 & Robbins St.

08/20/2018

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 8.8

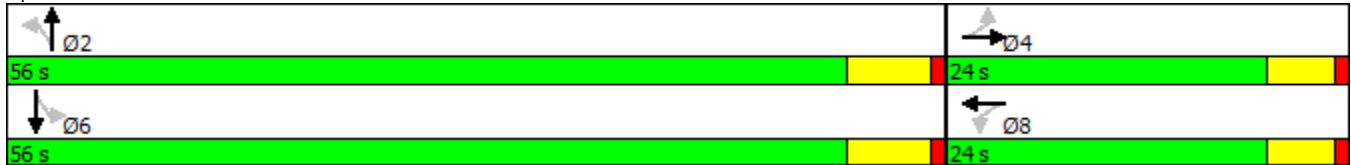
Intersection LOS: A

Intersection Capacity Utilization 44.6%

ICU Level of Service A

















Analysis Period (min) 15

Splits and Phases: 20: Route 138 & Robbins St.



HCM 2010 Signalized Intersection Summary
 20: Route 138 & Robbins St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	15	3	30	30	15	4	490	10	0	470	7
Future Volume (veh/h)	10	15	3	30	30	15	4	490	10	0	470	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	2	0	0	2	0	0	10	0	0	10	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1831	1900	1900	1760	1900	1900	1777	1900
Adj Flow Rate, veh/h	11	16	3	33	33	16	4	533	11	0	511	8
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	8	8	8	7	7	7
Cap, veh/h	198	175	22	216	126	41	104	907	18	0	936	14
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.53	0.53	0.53	0.00	0.53	0.53
Sat Flow, veh/h	379	1175	173	489	805	314	3	1713	35	0	1745	27
Grp Volume(v), veh/h	30	0	0	82	0	0	548	0	0	0	0	519
Grp Sat Flow(s),veh/h/ln	1726	0	0	1609	0	0	1751	0	0	0	0	1773
Q Serve(g_s), s	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4
Cycle Q Clear(g_c), s	0.5	0.0	0.0	1.4	0.0	0.0	7.0	0.0	0.0	0.0	0.0	6.4
Prop In Lane	0.37		0.10	0.40		0.20	0.01		0.02	0.00		0.02
Lane Grp Cap(c), veh/h	386	0	0	374	0	0	1025	0	0	0	0	953
V/C Ratio(X)	0.08	0.00	0.00	0.22	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.54
Avail Cap(c_a), veh/h	1105	0	0	1058	0	0	2749	0	0	0	0	2683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	12.9	0.0	0.0	13.3	0.0	0.0	6.7	0.0	0.0	0.0	0.0	5.8
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.2	0.0	0.0	0.3	0.0	0.0	1.5	0.0	0.0	0.0	0.0	1.7
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.9	0.0	0.0	5.6	0.0	0.0	0.0	0.0	5.0
LnGrp Delay(d),s/veh	13.1	0.0	0.0	13.9	0.0	0.0	8.6	0.0	0.0	0.0	0.0	8.0
LnGrp LOS	B			B			A					A
Approach Vol, veh/h		30			82			548				519
Approach Delay, s/veh		13.1			13.9			8.6				8.0
Approach LOS		B			B			A				A
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.5		9.5		23.5		9.5				
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0				
Max Green Setting (Gmax), s		50.0		19.0		50.0		19.0				
Max Q Clear Time (g_c+I1), s		9.0		2.5		8.4		3.4				
Green Ext Time (p_c), s		8.5		0.5		8.5		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			8.8									
HCM 2010 LOS			A									

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	15	3	100	30	15	1	530	50	8	410	8
Future Volume (vph)	4	15	3	100	30	15	1	530	50	8	410	8
Satd. Flow (prot)	0	1778	0	0	1735	0	0	1519	0	0	1525	0
Flt Permitted		0.991			0.967						0.985	
Satd. Flow (perm)	0	1777	0	0	1732	0	0	1519	0	0	1504	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	1		1	1		1			2	2		
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	8%	0%	13%	8%	0%
Parking (#/hr)							0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	177	0	0	708	0	0	520	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0		50.0	50.0		50.0	50.0	
Total Split (%)	25.0%	25.0%		25.0%	25.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		7.0			7.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
Act Effct Green (s)		8.4			13.1			44.1			44.1	
Actuated g/C Ratio		0.10			0.16			0.55			0.55	
v/c Ratio		0.15			0.63			0.86			0.63	
Control Delay		37.4			44.4			32.4			21.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		37.4			44.4			32.4			21.3	
LOS		D			D			C			C	
Approach Delay		37.4			44.4			32.4			21.3	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)		14			89			327			196	
Queue Length 95th (ft)		35			156			#626			365	
Internal Link Dist (ft)		838			877			3441			407	
Turn Bay Length (ft)												
Base Capacity (vph)		406			396			828			820	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.07			0.45			0.86			0.63	

Intersection Summary

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

Cycle Length: 100

Actuated Cycle Length: 80.9

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 29.9

Intersection LOS: C

Intersection Capacity Utilization 57.8%





ICU Level of Service B

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

















Queue shown is maximum after two cycles.

Splits and Phases: 21: Route 138 & Cheever St./Blue Hill Terrace St.

 50 s	 25 s	 25 s
 50 s		

HCM 2010 Signalized Intersection Summary
 21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	15	3	100	30	15	1	530	50	8	410	8
Future Volume (veh/h)	4	15	3	100	30	15	1	530	50	8	410	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	2	0	0	5	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1887	1900	1900	1771	1900	1900	1760	1900
Adj Flow Rate, veh/h	5	18	4	122	37	18	1	646	61	10	500	10
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	0	0	0	0	0	8	8	8	8	8	8
Cap, veh/h	9	32	7	157	77	22	53	759	67	59	803	16
Arrive On Green	0.03	0.03	0.03	0.13	0.13	0.13	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	339	1222	271	1235	375	182	0	1434	135	9	1528	30
Grp Volume(v), veh/h	27	0	0	177	0	0	708	0	0	520	0	0
Grp Sat Flow(s),veh/h/ln	1832	0	0	1792	0	0	1569	0	0	1567	0	0
Q Serve(g_s), s	1.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.0	6.3	0.0	0.0	25.8	0.0	0.0	15.4	0.0	0.0
Prop In Lane	0.19		0.15	0.69		0.10	0.00		0.09	0.02		0.02
Lane Grp Cap(c), veh/h	47	0	0	240	0	0	878	0	0	878	0	0
V/C Ratio(X)	0.57	0.00	0.00	0.74	0.00	0.00	0.81	0.00	0.00	0.59	0.00	0.00
Avail Cap(c_a), veh/h	496	0	0	485	0	0	1068	0	0	1064	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.8	0.0	0.0	28.1	0.0	0.0	14.6	0.0	0.0	11.4	0.0	0.0
Incr Delay (d2), s/veh	10.4	0.0	0.0	4.4	0.0	0.0	3.8	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	1.9	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	3.8	0.0	0.0	13.4	0.0	0.0	7.0	0.0	0.0
LnGrp Delay(d),s/veh	43.2	0.0	0.0	34.4	0.0	0.0	19.7	0.0	0.0	12.0	0.0	0.0
LnGrp LOS	D			C			B			B		
Approach Vol, veh/h		27			177			708			520	
Approach Delay, s/veh		43.2			34.4			19.7			12.0	
Approach LOS		D			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		42.1		8.7		42.1		15.7				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		43.0		18.0		43.0		18.0				
Max Q Clear Time (g_c+I1), s		27.8		3.0		17.4		8.3				
Green Ext Time (p_c), s		7.3		0.1		9.4		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay				19.2								
HCM 2010 LOS				B								

Volume

22: Route 138 & Aberdeen Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	4	4	540	410	30
Future Volume (vph)	10	4	4	540	410	30
Satd. Flow (prot)	1701	0	0	1546	1638	0
Flt Permitted	0.967					
Satd. Flow (perm)	1701	0	0	1546	1638	0
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	7%	0%	0%
Parking (#/hr)			0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	16	0	0	619	500	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 41.6% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	10	4	4	540	410	30
Future Vol, veh/h	10	4	4	540	410	30
Conflicting Peds, #/hr	2	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	7	0	0
Mvmt Flow	11	5	5	614	466	34

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1108	483	500	0	-	0
Stage 1	483	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	234	*327	*491	-	-	-
Stage 1	625	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	230	*327	*491	-	-	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	625	-	-	-	-	-
Stage 2	529	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.3	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 491	-	251	-	-
HCM Lane V/C Ratio	0.009	-	0.063	-	-
HCM Control Delay (s)	12.4	0	20.3	-	-
HCM Lane LOS	B	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

23: Route 138 & Oak St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	2	6	2	4	6	7	3	540	35	10	400	1
Future Volume (vph)	2	6	2	4	6	7	3	540	35	10	400	1
Satd. Flow (prot)	0	1775	0	0	1616	0	0	1710	0	0	1702	0
Flt Permitted		0.991			0.988						0.999	
Satd. Flow (perm)	0	1775	0	0	1616	0	0	1710	0	0	1702	0
Confl. Peds. (#/hr)	7					7	1		16	16		1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	0%	7%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	0	0	20	0	0	664	0	0	472	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 44.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	6	2	4	6	7	3	540	35	10	400	1
Future Vol, veh/h	2	6	2	4	6	7	3	540	35	10	400	1
Conflicting Peds, #/hr	7	0	0	0	0	7	1	0	16	16	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	25	0	0	0	7	0	0	8	0
Mvmt Flow	2	7	2	5	7	8	3	621	40	11	460	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1146	1168	461	1152	1149	664	462	0	0	677	0	0
Stage 1	484	484	-	664	664	-	-	-	-	-	-	-
Stage 2	662	684	-	488	485	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.35	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.725	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	178	195	*436	157	200	*436	1110	-	-	924	-	-
Stage 1	568	555	-	414	461	-	-	-	-	-	-	-
Stage 2	454	452	-	520	555	-	-	-	-	-	-	-
Platoon blocked, %			1			1		-	-		-	-
Mov Cap-1 Maneuver	166	188	*436	147	193	*427	1110	-	-	918	-	-
Mov Cap-2 Maneuver	166	188	-	147	193	-	-	-	-	-	-	-
Stage 1	565	546	-	407	453	-	-	-	-	-	-	-
Stage 2	434	444	-	503	546	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.5		22.3		0		0.2	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1110	-	-	206	228	918	-	-
HCM Lane V/C Ratio	0.003	-	-	0.056	0.086	0.013	-	-
HCM Control Delay (s)	8.3	0	-	23.5	22.3	9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

24: Route 138 & Brook Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Volume (vph)	8	190	4	0	0	0	5	500	45	9	400	20
Future Volume (vph)	8	190	4	0	0	0	5	500	45	9	400	20
Satd. Flow (prot)	0	1802	0	0	0	0	0	1688	0	0	1695	0
Flt Permitted		0.998						0.996			0.987	
Satd. Flow (perm)	0	1802	0	0	0	0	0	1681	0	0	1675	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	1		1				1		7	7		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	13%	1%	0%	2%	2%	2%	20%	7%	9%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	224	0	0	0	0	0	612	0	0	476	0
Turn Type	Perm	NA						Perm	NA		Perm	NA
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0					30.0	30.0		30.0	30.0	
Minimum Split (s)	23.0	23.0					36.0	36.0		36.0	36.0	
Total Split (s)	29.0	29.0					71.0	71.0		71.0	71.0	
Total Split (%)	29.0%	29.0%					71.0%	71.0%		71.0%	71.0%	
Yellow Time (s)	4.0	4.0					5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.0						6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None					Min	Min		Min	Min	
Act Effct Green (s)		14.3						32.7			32.7	
Actuated g/C Ratio		0.25						0.56			0.56	
v/c Ratio		0.51						0.65			0.51	
Control Delay		23.9						13.2			10.6	
Queue Delay		0.0						0.0			0.0	
Total Delay		23.9						13.2			10.6	
LOS		C						B			B	
Approach Delay		23.9						13.2			10.6	
Approach LOS		C						B			B	
Queue Length 50th (ft)		62						124			86	
Queue Length 95th (ft)		144						272			189	
Internal Link Dist (ft)		967			1001			519			1021	
Turn Bay Length (ft)												
Base Capacity (vph)		756						1644			1639	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.30						0.37			0.29	

Intersection Summary

Cycle Length: 100

Volume

24: Route 138 & Brook Rd.

08/20/2018

Actuated Cycle Length: 58.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 14.1

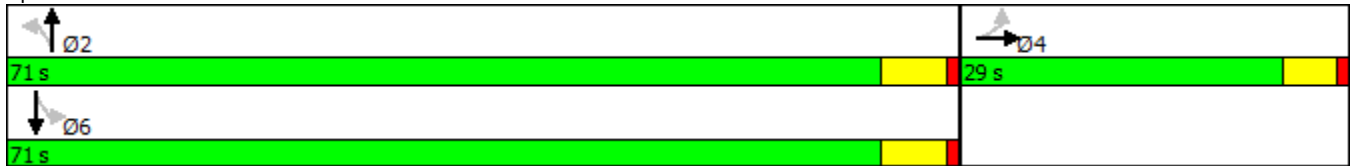
Intersection LOS: B

Intersection Capacity Utilization 51.6%

ICU Level of Service A
















Analysis Period (min) 15

Splits and Phases: 24: Route 138 & Brook Rd.



HCM 2010 Signalized Intersection Summary
 24: Route 138 & Brook Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	190	4	0	0	0	5	500	45	9	400	20
Future Volume (veh/h)	8	190	4	0	0	0	5	500	45	9	400	20
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	10	0				0	15	0	0	15	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1873	1900				1900	1771	1900	1900	1768	1900
Adj Flow Rate, veh/h	9	211	4				6	556	50	10	444	22
Adj No. of Lanes	0	1	0				0	1	0	0	1	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	1	0				7	7	7	8	8	8
Cap, veh/h	12	337	5				71	972	78	76	1002	44
Arrive On Green	0.18	0.18	0.18				0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	75	1755	33				4	1595	142	10	1649	80
Grp Volume(v), veh/h	224	0	0				612	0	0	476	0	0
Grp Sat Flow(s),veh/h/ln	1863	0	0				1741	0	0	1740	0	0
Q Serve(g_s), s	5.6	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.6	0.0	0.0				10.9	0.0	0.0	7.5	0.0	0.0
Prop In Lane	0.04		0.02				0.01		0.08	0.02		0.05
Lane Grp Cap(c), veh/h	361	0	0				1119	0	0	1118	0	0
V/C Ratio(X)	0.62	0.00	0.00				0.55	0.00	0.00	0.43	0.00	0.00
Avail Cap(c_a), veh/h	890	0	0				2316	0	0	2302	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.4	0.0	0.0				7.6	0.0	0.0	6.7	0.0	0.0
Incr Delay (d2), s/veh	3.7	0.0	0.0				0.4	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	14.5	0.0	0.0				2.9	0.0	0.0	2.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	0.0				9.0	0.0	0.0	6.8	0.0	0.0
LnGrp Delay(d),s/veh	40.6	0.0	0.0				10.8	0.0	0.0	9.2	0.0	0.0
LnGrp LOS	D						B			A		
Approach Vol, veh/h		224						612			476	
Approach Delay, s/veh		40.6						10.8			9.2	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		36.0		14.2		36.0						
Change Period (Y+Rc), s		6.0		5.0		6.0						
Max Green Setting (Gmax), s		65.0		24.0		65.0						
Max Q Clear Time (g_c+I1), s		12.9		7.6		9.5						
Green Ext Time (p_c), s		9.2		2.0		9.3						
Intersection Summary												
HCM 2010 Ctrl Delay			15.3									
HCM 2010 LOS			B									

Volume

102: Route 138 & Concord Baptist Church

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	550	3	3	410
Future Volume (vph)	0	0	550	3	3	410
Satd. Flow (prot)	1837	0	1831	0	0	1835
Flt Permitted						0.999
Satd. Flow (perm)	1837	0	1831	0	0	1835
Confl. Peds. (#/hr)				4	4	
Peak Hour Factor	0.92	0.92	0.86	0.75	0.38	0.89
Heavy Vehicles (%)	0%	0%	0%	33%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	644	0	0	469
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 32.5%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	0	550	3	3	410
Future Vol, veh/h	0	0	550	3	3	410
Conflicting Peds, #/hr	0	0	0	4	4	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	86	75	38	89
Heavy Vehicles, %	0	0	0	33	0	0
Mvmt Flow	0	0	640	4	8	461

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1122	646	0	0	648	0
Stage 1	646	-	-	-	-	-
Stage 2	476	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	230	475	-	-	947	-
Stage 1	526	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	227	473	-	-	947	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	524	-	-	-	-	-
Stage 2	622	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	947
HCM Lane V/C Ratio	-	-	-	0.008
HCM Control Delay (s)	-	-	0	8.8
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

Volume

8: Route 138 & South Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	1120	15	2	1270
Future Volume (vph)	0	0	1120	15	2	1270
Satd. Flow (prot)	0	0	1576	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	0	1576	0	0	1580
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	4%	8%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1220	0	0	1368
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 79.8% ICU Level of Service D

Analysis Period (min) 15

Volume

9: Route 138 & South Parking Lot Exit

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	10	1130	0	0	1270
Future Volume (vph)	3	10	1130	0	0	1270
Satd. Flow (prot)	1453	0	1580	0	0	1595
Flt Permitted	0.989					
Satd. Flow (perm)	1453	0	1580	0	0	1595
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	4%	2%	2%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	1215	0	0	1366
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 84.7% ICU Level of Service E

Analysis Period (min) 15

HCM 2010 TWSC
 9: Route 138 & South Parking Lot Exit

08/20/2018

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑			↑
Traffic Vol, veh/h	3	10	1130	0	0	1270
Future Vol, veh/h	3	10	1130	0	0	1270
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	2	2	3
Mvmt Flow	3	11	1215	0	0	1366

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2581	1215	0	-	-	-
Stage 1	1215	-	-	-	-	-
Stage 2	1366	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	29	223	-	0	0	-
Stage 1	283	-	-	0	0	-
Stage 2	239	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	29	223	-	-	-	-
Mov Cap-2 Maneuver	29	-	-	-	-	-
Stage 1	283	-	-	-	-	-
Stage 2	239	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	53.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBTWBLn1	SBT
Capacity (veh/h)	- 88	-
HCM Lane V/C Ratio	- 0.159	-
HCM Control Delay (s)	- 53.5	-
HCM Lane LOS	- F	-
HCM 95th %tile Q(veh)	- 0.5	-

Volume

10: Route 138 & North Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	1120	9	6	1270
Future Volume (vph)	0	0	1120	9	6	1270
Satd. Flow (prot)	0	0	1593	0	0	1581
Flt Permitted						
Satd. Flow (perm)	0	0	1593	0	0	1581
Peak Hour Factor	0.92	0.92	0.98	0.45	0.50	0.97
Heavy Vehicles (%)	2%	2%	3%	0%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1163	0	0	1321
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 83.4% ICU Level of Service E

Analysis Period (min) 15

Volume

11: Route 138 & Green Street/North Parking Lot Exit

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	2	0	8	0	0	20	8	1120	0	0	1270	5
Future Volume (vph)	2	0	8	0	0	20	8	1120	0	0	1270	5
Satd. Flow (prot)	0	1451	0	0	1421	0	0	1593	0	0	1579	0
Flt Permitted		0.990										
Satd. Flow (perm)	0	1451	0	0	1421	0	0	1593	0	0	1579	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	0%	2%	2%	0%	25%	3%	0%	2%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	21	0	0	1163	0	0	1314	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 85.0%

ICU Level of Service E

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	8	0	0	20	8	1120	0	0	1270	5
Future Vol, veh/h	2	0	8	0	0	20	8	1120	0	0	1270	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	2	0	2	2	0	25	3	0	2	4	0
Mvmt Flow	2	0	8	0	0	21	8	1155	0	0	1309	5

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2493	2483	1312	2487	2485	1155	1314	0	-	-	-	0
Stage 1	1312	1312	-	1171	1171	-	-	-	-	-	-	-
Stage 2	1181	1171	-	1316	1314	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.12	6.52	6.2	4.35	-	-	-	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.518	4.018	3.3	2.425	-	-	-	-	-
Pot Cap-1 Maneuver	20	30	196	20	29	242	457	-	0	0	-	-
Stage 1	197	228	-	235	267	-	-	-	0	0	-	-
Stage 2	234	267	-	194	228	-	-	-	0	0	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	18	29	196	18	28	242	457	-	-	-	-	-
Mov Cap-2 Maneuver	18	29	-	18	28	-	-	-	-	-	-	-
Stage 1	187	228	-	223	254	-	-	-	-	-	-	-
Stage 2	204	254	-	186	228	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB				
HCM Control Delay, s	69.4		21.3		0.1		0				
HCM LOS	F		C								

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	457	-	66	242	-	-
HCM Lane V/C Ratio	0.018	-	0.156	0.085	-	-
HCM Control Delay (s)	13	0	69.4	21.3	-	-
HCM Lane LOS	B	A	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	0.3	-	-

Volume

12: Route 138 & Summit Rd.

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	790	340	10	1270
Future Volume (vph)	1	1	790	340	10	1270
Satd. Flow (prot)	1480	0	1523	0	0	1580
Flt Permitted	0.976					
Satd. Flow (perm)	1480	0	1523	0	0	1580
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	5%	0%	2%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1165	0	0	1319
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 93.6%	ICU Level of Service F
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	1	1	790	340	10	1270
Future Vol, veh/h	1	1	790	340	10	1270
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	2	5	0	2	4
Mvmt Flow	1	1	814	351	10	1309

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2321	991	0	0	1166
Stage 1	991	-	-	-	-
Stage 2	1330	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218
Pot Cap-1 Maneuver	42	299	-	-	599
Stage 1	362	-	-	-	-
Stage 2	249	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	39	299	-	-	599
Mov Cap-2 Maneuver	39	-	-	-	-
Stage 1	362	-	-	-	-
Stage 2	234	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	58.8	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	69	599
HCM Lane V/C Ratio	-	-	0.03	0.017
HCM Control Delay (s)	-	-	58.8	11.1
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	0.1	0.1

Volume

13: Route 138 & Thacher Montessori School

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	35	1	790	1260	3
Future Volume (vph)	0	35	1	790	1260	3
Satd. Flow (prot)	1421	0	0	1580	1579	0
Flt Permitted						
Satd. Flow (perm)	1421	0	0	1580	1579	0
Peak Hour Factor	0.92	0.39	0.25	0.96	0.97	0.38
Heavy Vehicles (%)	2%	0%	0%	4%	4%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	0	0	827	1307	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 84.3% ICU Level of Service E

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	0	35	1	790	1260	3
Future Vol, veh/h	0	35	1	790	1260	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	39	25	96	97	38
Heavy Vehicles, %	2	0	0	4	4	0
Mvmt Flow	0	90	4	823	1299	8

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2134	1303	1307	0	-	0
Stage 1	1303	-	-	-	-	-
Stage 2	831	-	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	54	198	536	-	-	-
Stage 1	254	-	-	-	-	-
Stage 2	428	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	53	198	536	-	-	-
Mov Cap-2 Maneuver	53	-	-	-	-	-
Stage 1	254	-	-	-	-	-
Stage 2	422	-	-	-	-	-

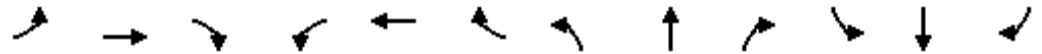
Approach	EB	NB	SB
HCM Control Delay, s	37.4	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	536	-	198	-	-
HCM Lane V/C Ratio	0.007	-	0.453	-	-
HCM Control Delay (s)	11.8	0	37.4	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0	-	2.1	-	-

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↗	↘			↑			↖	↙
Traffic Volume (vph)	15	0	370	140	70	10	0	790	0	0	770	0
Future Volume (vph)	15	0	370	140	70	10	0	790	0	0	770	0
Satd. Flow (prot)	0	1413	0	1546	1558	0	0	1580	0	0	1565	0
Flt Permitted		0.990		0.367								
Satd. Flow (perm)	0	1402	0	597	1558	0	0	1580	0	0	1565	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	1%	1%	3%	8%	0%	4%	2%	2%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	396	0	144	82	0	0	814	0	0	794	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8								
Detector Phase	4	4		8	8			2				6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0			10.0				10.0
Minimum Split (s)	23.0	23.0		23.0	23.0			45.0				45.0
Total Split (s)	30.0	30.0		30.0	30.0			45.0				45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%			60.0%				60.0%
Yellow Time (s)	4.0	4.0		4.0	4.0			5.0				5.0
All-Red Time (s)	1.0	1.0		1.0	1.0			1.0				1.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)		5.0		5.0	5.0			6.0				6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			None				None
Act Effect Green (s)		23.1		23.1	23.1			39.1				39.1
Actuated g/C Ratio		0.32		0.32	0.32			0.53				0.53
v/c Ratio		0.90		0.77	0.17			0.97				0.95
Control Delay		49.0		50.9	18.8			43.5				40.8
Queue Delay		0.0		0.0	0.0			0.0				0.0
Total Delay		49.0		50.9	18.8			43.5				40.8
LOS		D		D	B			D				D
Approach Delay		49.0			39.3			43.5				40.8
Approach LOS		D			D			D				D
Queue Length 50th (ft)		169		58	26			350				336
Queue Length 95th (ft)		#323		#151	57			#606				#589
Internal Link Dist (ft)		906			198			187				2213
Turn Bay Length (ft)												
Base Capacity (vph)		479		204	532			843				834
Starvation Cap Reductn		0		0	0			0				0
Spillback Cap Reductn		0		0	0			0				0
Storage Cap Reductn		0		0	0			0				0
Reduced v/c Ratio		0.83		0.71	0.15			0.97				0.95

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 73.2

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 43.1

Intersection LOS: D

Intersection Capacity Utilization 95.0%

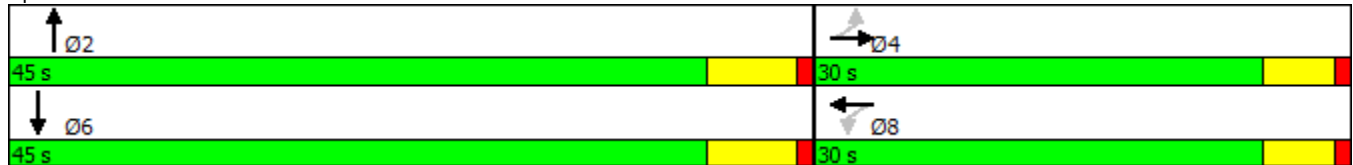
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.


















Queue shown is maximum after two cycles.

Splits and Phases: 14: Route 138 & Brush Hill Rd.



HCM 2010 Signalized Intersection Summary
 14: Route 138 & Brush Hill Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	370	140	70	10	0	790	0	0	770	0
Future Volume (veh/h)	15	0	370	140	70	10	0	790	0	0	770	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	20	0	10	10	0	0	10	0	0	40	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1684	1700	1683	1641	1700	0	1635	0	0	1619	1700
Adj Flow Rate, veh/h	15	0	381	144	72	10	0	814	0	0	794	0
Adj No. of Lanes	0	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	1	3	3	0	4	0	0	5	5
Cap, veh/h	50	11	306	190	529	60	0	850	0	0	842	0
Arrive On Green	0.33	0.00	0.33	0.33	0.33	0.33	0.00	0.52	0.00	0.00	0.52	0.00
Sat Flow, veh/h	23	32	1377	902	1410	196	0	1635	0	0	1619	0
Grp Volume(v), veh/h	396	0	0	144	0	82	0	814	0	0	794	0
Grp Sat Flow(s),veh/h/ln	1431	0	0	902	0	1606	0	1635	0	0	1619	0
Q Serve(g_s), s	4.4	0.0	0.0	4.4	0.0	2.7	0.0	35.7	0.0	0.0	34.6	0.0
Cycle Q Clear(g_c), s	19.0	0.0	0.0	23.4	0.0	2.7	0.0	35.7	0.0	0.0	34.6	0.0
Prop In Lane	0.04		0.96	1.00		0.12	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	329	0	0	190	0	538	0	850	0	0	842	0
V/C Ratio(X)	1.20	0.00	0.00	0.76	0.00	0.15	0.00	0.96	0.00	0.00	0.94	0.00
Avail Cap(c_a), veh/h	528	0	0	257	0	537	0	852	0	0	844	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	22.5	0.0	0.0	31.2	0.0	18.1	0.0	18.0	0.0	0.0	18.0	0.0
Incr Delay (d2), s/veh	108.8	0.0	0.0	8.5	0.0	0.1	0.0	21.1	0.0	0.0	18.6	0.0
Initial Q Delay(d3),s/veh	159.7	0.0	0.0	81.8	0.0	2.9	0.0	23.3	0.0	0.0	145.4	0.0
%ile BackOfQ(50%),veh/ln	36.7	0.0	0.0	8.6	0.0	2.5	0.0	27.7	0.0	0.0	55.4	0.0
LnGrp Delay(d),s/veh	290.9	0.0	0.0	121.5	0.0	21.2	0.0	62.4	0.0	0.0	182.0	0.0
LnGrp LOS	F			F		C		E			F	
Approach Vol, veh/h		396			226			814			794	
Approach Delay, s/veh		290.9			85.1			62.4			182.0	
Approach LOS		F			F			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		44.8		30.0		44.8		30.0				
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0				
Max Green Setting (Gmax), s		39.0		25.0		39.0		25.0				
Max Q Clear Time (g_c+I1), s		37.7		21.0		36.6		25.4				
Green Ext Time (p_c), s		1.1		1.5		1.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				147.9								
HCM 2010 LOS				F								
Notes												

Volume

15: Canton Ave. & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	90	270	0	140
Future Volume (vph)	0	0	90	270	0	140
Satd. Flow (prot)	0	0	1546	1627	0	1394
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	1546	1627	0	1394
Peak Hour Factor	0.92	0.92	0.96	0.93	0.92	0.82
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	94	290	0	171
Sign Control	Free			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 21.9% ICU Level of Service A

Analysis Period (min) 15

Volume

16: Route 138 & Neponset Valley Pkwy.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	7	230	310	490	530	3
Future Volume (vph)	7	230	310	490	530	3
Satd. Flow (prot)	1343	0	1473	1595	1564	0
Flt Permitted	0.999		0.185			
Satd. Flow (perm)	1343	0	287	1595	1564	0
Satd. Flow (RTOR)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	14%	6%	6%	3%	5%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	244	0	320	505	549	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.0		10.0	23.0	23.0	
Total Split (s)	23.0		20.0	57.0	37.0	
Total Split (%)	28.8%		25.0%	71.3%	46.3%	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	5.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	None	None	
Act Effect Green (s)	16.4		48.4	48.4	28.7	
Actuated g/C Ratio	0.22		0.65	0.65	0.38	
v/c Ratio	0.83		0.77	0.49	0.92	
Control Delay	54.2		25.6	9.0	45.0	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	54.2		25.6	9.0	45.0	
LOS	D		C	A	D	
Approach Delay	54.2			15.5	45.0	
Approach LOS	D			B	D	
Queue Length 50th (ft)	116		74	113	247	
Queue Length 95th (ft)	#235		#203	181	#438	
Internal Link Dist (ft)	1200			2213	1154	
Turn Bay Length (ft)			200			
Base Capacity (vph)	327		426	1123	677	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.75		0.75	0.45	0.81	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 74.9

Volume

16: Route 138 & Neponset Valley Pkwy.

08/20/2018

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 31.3

Intersection LOS: C

Intersection Capacity Utilization 79.4%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.











Queue shown is maximum after two cycles.

Splits and Phases: 16: Route 138 & Neponset Valley Pkwy.



HCM 2010 Signalized Intersection Summary
 16: Route 138 & Neponset Valley Pkwy.

08/20/2018

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	7	230	310	490	530	3		
Future Volume (veh/h)	7	230	310	490	530	3		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	5	0	10	15	15	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1600	1700	1604	1650	1619	1700		
Adj Flow Rate, veh/h	7	237	320	505	546	3		
Adj No. of Lanes	0	0	1	1	1	0		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Percent Heavy Veh, %	0	0	6	3	5	5		
Cap, veh/h	31	265	388	1053	655	2		
Arrive On Green	0.21	0.21	0.15	0.64	0.41	0.41		
Sat Flow, veh/h	39	1321	1527	1650	1609	9		
Grp Volume(v), veh/h	245	0	320	505	0	549		
Grp Sat Flow(s),veh/h/ln	1365	0	1527	1650	0	1618		
Q Serve(g_s), s	11.1	0.0	7.0	10.3	0.0	19.4		
Cycle Q Clear(g_c), s	11.1	0.0	7.0	10.3	0.0	19.4		
Prop In Lane	0.03	0.97	1.00			0.01		
Lane Grp Cap(c), veh/h	297	0	388	1053	0	655		
V/C Ratio(X)	0.83	0.00	0.82	0.48	0.00	0.84		
Avail Cap(c_a), veh/h	383	0	549	1337	0	807		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	27.3	0.0	20.1	6.9	0.0	21.2		
Incr Delay (d2), s/veh	10.9	0.0	6.9	0.3	0.0	6.5		
Initial Q Delay(d3),s/veh	0.0	0.0	27.1	2.8	0.0	23.4		
%ile BackOfQ(50%),veh/ln	6.1	0.0	10.4	7.5	0.0	17.4		
LnGrp Delay(d),s/veh	38.3	0.0	54.1	10.1	0.0	51.2		
LnGrp LOS	D		D	B		D		
Approach Vol, veh/h	245			825	549			
Approach Delay, s/veh	38.3			27.1	51.2			
Approach LOS	D			C	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		45.9		18.3	14.5	31.4		
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0		
Max Green Setting (Gmax), s		52.0		18.0	15.0	32.0		
Max Q Clear Time (g_c+I1), s		12.3		13.1	9.0	21.4		
Green Ext Time (p_c), s		8.7		0.4	0.5	5.0		
Intersection Summary								
HCM 2010 Ctrl Delay			37.0					
HCM 2010 LOS			D					
Notes								

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Volume (vph)	30	120	15	10	110	25	15	470	10	8	510	25
Future Volume (vph)	30	120	15	10	110	25	15	470	10	8	510	25
Satd. Flow (prot)	0	1574	0	0	1525	0	1561	1588	0	0	1556	0
Flt Permitted		0.926			0.970		0.462				0.992	
Satd. Flow (perm)	0	1470	0	0	1486	0	759	1588	0	0	1545	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	1		1			1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	1%	0%	9%	5%	0%	0%	3%	10%	0%	5%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	174	0	0	153	0	16	506	0	0	571	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		37.0	37.0		37.0	37.0	
Total Split (s)	25.0	25.0		25.0	25.0		55.0	55.0		55.0	55.0	
Total Split (%)	31.3%	31.3%		31.3%	31.3%		68.8%	68.8%		68.8%	68.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		7.0	7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
Act Effct Green (s)		12.0			12.0		32.5	32.5			32.5	
Actuated g/C Ratio		0.21			0.21		0.57	0.57			0.57	
v/c Ratio		0.56			0.49		0.04	0.56			0.65	
Control Delay		28.0			25.8		6.7	11.2			13.2	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		28.0			25.8		6.7	11.2			13.2	
LOS		C			C		A	B			B	
Approach Delay		28.0			25.8			11.0			13.2	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)		49			43		2	90			110	
Queue Length 95th (ft)		123			109		11	214			263	
Internal Link Dist (ft)		1017			791			1154			1181	
Turn Bay Length (ft)							200					
Base Capacity (vph)		528			534		655	1370			1333	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.33			0.29		0.02	0.37			0.43	

Intersection Summary

Cycle Length: 80

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018

Actuated Cycle Length: 56.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 15.6

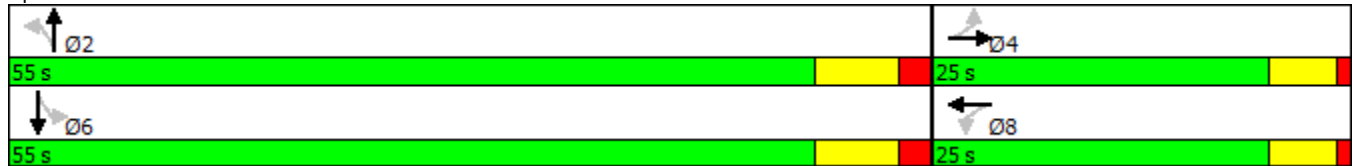
Intersection LOS: B

Intersection Capacity Utilization 67.6%

ICU Level of Service C


















Analysis Period (min) 15

Splits and Phases: 17: Route 138 & Milton St./Dollar Ln.



HCM 2010 Signalized Intersection Summary
 17: Route 138 & Milton St./Dollar Ln.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	120	15	10	110	25	15	470	10	8	510	25
Future Volume (veh/h)	30	120	15	10	110	25	15	470	10	8	510	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	25	0	0	15	0	0	15	0	0	30	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1666	1700	1700	1628	1700	1700	1648	1700	1700	1621	1700
Adj Flow Rate, veh/h	32	126	16	11	116	26	16	495	11	8	537	26
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	5	5	5	0	3	3	5	5	5
Cap, veh/h	92	280	17	77	279	31	412	963	19	53	821	31
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	181	1250	145	51	1243	265	770	1606	36	6	1523	73
Grp Volume(v), veh/h	174	0	0	153	0	0	16	0	506	571	0	0
Grp Sat Flow(s),veh/h/ln	1576	0	0	1559	0	0	770	0	1642	1602	0	0
Q Serve(g_s), s	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.0	0.0	0.0	4.5	0.0	0.0	0.6	0.0	9.2	11.3	0.0	0.0
Prop In Lane	0.18		0.09	0.07		0.17	1.00		0.02	0.01		0.05
Lane Grp Cap(c), veh/h	388	0	0	363	0	0	412	0	975	803	0	0
V/C Ratio(X)	0.45	0.00	0.00	0.42	0.00	0.00	0.04	0.00	0.52	0.71	0.00	0.00
Avail Cap(c_a), veh/h	691	0	0	685	0	0	823	0	1557	1585	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	23.6	0.0	0.0	21.7	0.0	0.0	5.4	0.0	7.3	16.7	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.4	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	54.1	0.0	0.0	21.2	0.0	0.0	0.0	0.0	3.5	34.9	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	0.0	0.0	5.8	0.0	0.0	0.1	0.0	7.3	20.6	0.0	0.0
LnGrp Delay(d),s/veh	78.5	0.0	0.0	43.6	0.0	0.0	5.4	0.0	11.3	52.7	0.0	0.0
LnGrp LOS	E			D			A		B	D		
Approach Vol, veh/h		174			153			522			571	
Approach Delay, s/veh		78.5			43.6			11.1			52.7	
Approach LOS		E			D			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		13.6		37.0		13.6				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		48.0		20.0		48.0		20.0				
Max Q Clear Time (g_c+I1), s		11.2		7.0		13.3		6.5				
Green Ext Time (p_c), s		8.6		1.5		8.5		1.6				
Intersection Summary												
HCM 2010 Ctrl Delay				39.6								
HCM 2010 LOS				D								

Volume

18: Route 138 & Blue Jay Way (Curry College)

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	50	100	80	460	440	25
Future Volume (vph)	50	100	80	460	440	25
Satd. Flow (prot)	1472	0	0	1589	1544	0
Flt Permitted	0.984			0.993		
Satd. Flow (perm)	1472	0	0	1589	1544	0
Confl. Peds. (#/hr)			1			1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	1%	3%	6%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	162	0	0	581	500	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 79.6%

ICU Level of Service D

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	6.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	50	100	80	460	440	25
Future Vol, veh/h	50	100	80	460	440	25
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	1	3	6	0
Mvmt Flow	54	108	86	495	473	27

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1155	488	501	0	0
Stage 1	488	-	-	-	-
Stage 2	667	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-
Pot Cap-1 Maneuver	220	*327	*488	-	-
Stage 1	621	-	-	-	-
Stage 2	514	-	-	-	-
Platoon blocked, %		1	1	-	-
Mov Cap-1 Maneuver	166	*327	*488	-	-
Mov Cap-2 Maneuver	166	-	-	-	-
Stage 1	620	-	-	-	-
Stage 2	389	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	43.4	2.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 488	-	247	-	-
HCM Lane V/C Ratio	0.176	-	0.653	-	-
HCM Control Delay (s)	13.9	0	43.4	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.6	-	4.1	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018



Lane Group	EBL	EBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR2	SEL	SET	SER
Lane Configurations												
Traffic Volume (vph)	2	2	2	35	440	35	7	410	6	6	30	15
Future Volume (vph)	2	2	2	35	440	35	7	410	6	6	30	15
Satd. Flow (prot)	1495	0	0	0	1578	0	0	1544	0	0	1514	0
Flt Permitted	0.976				0.947		0.990				0.949	
Satd. Flow (perm)	1495	0	0	0	1500	0	0	1530	0	0	1446	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)					1				1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	3%	3%	14%	6%	0%	0%	6%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	0	0	0	551	0	0	455	0	0	54	0
Turn Type	Prot		Perm		NA		Perm		NA		Perm	
Protected Phases	10				2		6				4	
Permitted Phases			2		2		6				4	
Detector Phase	10		2		2		6		6		4	
Switch Phase												
Minimum Initial (s)	4.0		22.0		22.0		22.0		22.0		10.0	
Minimum Split (s)	9.0		28.0		28.0		28.0		28.0		15.0	
Total Split (s)	9.0		55.0		55.0		55.0		55.0		16.0	
Total Split (%)	11.3%		68.8%		68.8%		68.8%		68.8%		20.0%	
Yellow Time (s)	4.0		5.0		5.0		5.0		5.0		4.0	
All-Red Time (s)	1.0		1.0		1.0		1.0		1.0		1.0	
Lost Time Adjust (s)	0.0				0.0				0.0			
Total Lost Time (s)	5.0				6.0				6.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None		None		None		None		None		None	
Act Effect Green (s)	4.5				31.6				31.6		11.4	
Actuated g/C Ratio	0.10				0.73				0.73		0.26	
v/c Ratio	0.03				0.51				0.41		0.14	
Control Delay	27.0				9.3				7.9		20.6	
Queue Delay	0.0				0.0				0.0		0.0	
Total Delay	27.0				9.3				7.9		20.6	
LOS	C				A				A		C	
Approach Delay	27.0				9.3				7.9		20.6	
Approach LOS	C				A				A		C	
Queue Length 50th (ft)	1				91				67		11	
Queue Length 95th (ft)	11				255				188		53	
Internal Link Dist (ft)	1290				1586				2667		689	
Turn Bay Length (ft)												
Base Capacity (vph)	155				1403				1431			
Starvation Cap Reductn	0				0				0			
Spillback Cap Reductn	0				0				0			
Storage Cap Reductn	0				0				0			
Reduced v/c Ratio	0.03				0.39				0.32			

Intersection Summary

Cycle Length: 80

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018



Lane Group	NWL2	NWL	NWT	NWR
Lane Configurations			↔	
Traffic Volume (vph)	25	2	45	10
Future Volume (vph)	25	2	45	10
Satd. Flow (prot)	0	0	1547	0
Flt Permitted			0.869	
Satd. Flow (perm)	0	0	1367	0
Satd. Flow (RTOR)				
Confl. Peds. (#/hr)				
Peak Hour Factor	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	5%	0%
Shared Lane Traffic (%)				
Lane Group Flow (vph)	0	0	88	0
Turn Type	Perm	Perm	NA	
Protected Phases			8	
Permitted Phases	8	8		
Detector Phase	8	8	8	
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	
Minimum Split (s)	15.0	15.0	15.0	
Total Split (s)	16.0	16.0	16.0	
Total Split (%)	20.0%	20.0%	20.0%	
Yellow Time (s)	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	
Lost Time Adjust (s)			0.0	
Total Lost Time (s)			5.0	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	
Act Effect Green (s)			11.4	
Actuated g/C Ratio			0.26	
v/c Ratio			0.25	
Control Delay			21.6	
Queue Delay			0.0	
Total Delay			21.6	
LOS			C	
Approach Delay			21.6	
Approach LOS			C	
Queue Length 50th (ft)			18	
Queue Length 95th (ft)			78	
Internal Link Dist (ft)			1410	
Turn Bay Length (ft)				
Base Capacity (vph)			391	
Starvation Cap Reductn			0	
Spillback Cap Reductn			0	
Storage Cap Reductn			0	
Reduced v/c Ratio			0.23	
Intersection Summary				

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018

Actuated Cycle Length: 43.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 10.3





Intersection LOS: B

Intersection Capacity Utilization 79.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 19: Route 138 & Atherton St. & Bradlee Rd.

 Ø2	 Ø4	 Ø10
55 s	16 s	9 s
 Ø6	 Ø8	
55 s	16 s	

Volume

20: Route 138 & Robbins St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	35	3	7	35	5	1	450	20	5	410	9
Future Volume (vph)	5	35	3	7	35	5	1	450	20	5	410	9
Satd. Flow (prot)	0	1581	0	0	1574	0	0	1587	0	0	1561	0
Flt Permitted								0.999			0.995	
Satd. Flow (perm)	0	1589	0	0	1587	0	0	1585	0	0	1554	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)							2		1	1		2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	3%	0%	0%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	46	0	0	51	0	0	507	0	0	456	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		20.0	20.0		20.0	20.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		45.0	45.0		45.0	45.0	
Total Split (s)	12.0	12.0		12.0	12.0		48.0	48.0		48.0	48.0	
Total Split (%)	15.0%	15.0%		15.0%	15.0%		60.0%	60.0%		60.0%	60.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
Act Effect Green (s)		8.4			8.4			31.2			31.2	
Actuated g/C Ratio		0.22			0.22			0.81			0.81	
v/c Ratio		0.13			0.15			0.40			0.36	
Control Delay		21.7			21.7			7.5			7.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.7			21.7			7.5			7.1	
LOS		C			C			A			A	
Approach Delay		21.7			21.7			7.5			7.1	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		4			5			0			0	
Queue Length 95th (ft)		53			57			267			233	
Internal Link Dist (ft)		939			647			711			3441	
Turn Bay Length (ft)												
Base Capacity (vph)		343			343			1439			1411	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.13			0.15			0.35			0.32	

Intersection Summary

Cycle Length: 80

Volume

20: Route 138 & Robbins St.

08/20/2018

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	2.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	25%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Volume

20: Route 138 & Robbins St.

08/20/2018

Actuated Cycle Length: 38.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 8.6






Intersection LOS: A

Intersection Capacity Utilization 43.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 20: Route 138 & Robbins St.

 Ø2	 Ø4	 Ø9
48 s	12 s	20 s
 Ø6	 Ø8	
48 s	12 s	

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	3	6	3	35	9	15	3	450	45	15	420	7
Future Volume (vph)	3	6	3	35	9	15	3	450	45	15	420	7
Satd. Flow (prot)	0	1439	0	0	1426	0	0	1375	0	0	1354	0
Flt Permitted		0.988			0.971			0.997			0.973	
Satd. Flow (perm)	0	1421	0	0	1423	0	0	1370	0	0	1320	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	6		1	1		6	3		5	5		3
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	33%	9%	0%	6%	0%	3%	4%	0%	6%	0%
Parking (#/hr)								5			5	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	63	0	0	530	0	0	470	0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		25.0	25.0		25.0	25.0	
Total Split (s)	11.0	11.0		15.0	15.0		44.0	44.0		44.0	44.0	
Total Split (%)	15.7%	15.7%		21.4%	21.4%		62.9%	62.9%		62.9%	62.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		7.0			7.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
Act Effct Green (s)		5.6			8.9			28.2			28.2	
Actuated g/C Ratio		0.14			0.23			0.72			0.72	
v/c Ratio		0.06			0.20			0.54			0.50	
Control Delay		26.9			23.2			11.2			10.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		26.9			23.2			11.2			10.4	
LOS		C			C			B			B	
Approach Delay		26.9			23.2			11.2			10.4	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)		3			14			94			79	
Queue Length 95th (ft)		21			61			287			243	
Internal Link Dist (ft)		838			877			3441			407	
Turn Bay Length (ft)												
Base Capacity (vph)		203			402			1131			1090	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.06			0.16			0.47			0.43	

Intersection Summary

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

Cycle Length: 70

Actuated Cycle Length: 39.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 11.7

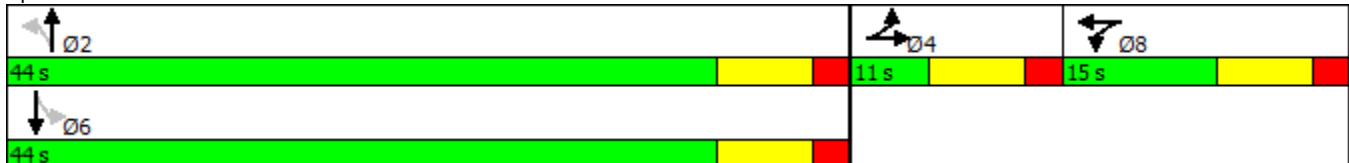
Intersection LOS: B

Intersection Capacity Utilization 56.4%

ICU Level of Service B

















Analysis Period (min) 15

Splits and Phases: 21: Route 138 & Cheever St./Blue Hill Terrace St.



HCM 2010 Signalized Intersection Summary
 21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	6	3	35	9	15	3	450	45	15	420	7
Future Volume (veh/h)	3	6	3	35	9	15	3	450	45	15	420	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	5	0	0	5	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1570	1700	1700	1592	1700	1700	1649	1700	1700	1608	1700
Adj Flow Rate, veh/h	3	6	3	37	10	16	3	479	48	16	447	7
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	3	3	3	6	6	6
Cap, veh/h	5	9	5	42	11	18	82	691	66	92	721	11
Arrive On Green	0.01	0.01	0.01	0.05	0.05	0.05	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	368	736	368	862	233	373	2	1472	147	19	1539	24
Grp Volume(v), veh/h	12	0	0	63	0	0	530	0	0	470	0	0
Grp Sat Flow(s),veh/h/ln	1472	0	0	1468	0	0	1621	0	0	1582	0	0
Q Serve(g_s), s	0.4	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.0	1.9	0.0	0.0	11.5	0.0	0.0	9.8	0.0	0.0
Prop In Lane	0.25		0.25	0.59		0.25	0.01		0.09	0.03		0.01
Lane Grp Cap(c), veh/h	18	0	0	72	0	0	840	0	0	823	0	0
V/C Ratio(X)	0.66	0.00	0.00	0.88	0.00	0.00	0.63	0.00	0.00	0.57	0.00	0.00
Avail Cap(c_a), veh/h	134	0	0	266	0	0	1440	0	0	1399	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.0	0.0	0.0	21.1	0.0	0.0	9.6	0.0	0.0	9.2	0.0	0.0
Incr Delay (d2), s/veh	33.7	0.0	0.0	26.5	0.0	0.0	0.8	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.3	0.0	0.0	5.8	0.0	0.0	5.1	0.0	0.0
LnGrp Delay(d),s/veh	55.7	0.0	0.0	47.6	0.0	0.0	11.1	0.0	0.0	10.4	0.0	0.0
LnGrp LOS	E			D			B			B		
Approach Vol, veh/h		12			63			530			470	
Approach Delay, s/veh		55.7			47.6			11.1			10.4	
Approach LOS		E			D			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.4		7.5		27.4		9.2				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		37.0		4.0		37.0		8.0				
Max Q Clear Time (g_c+I1), s		13.5		2.4		11.8		3.9				
Green Ext Time (p_c), s		6.9		0.0		7.0		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				13.4								
HCM 2010 LOS				B								

Volume

22: Route 138 & Aberdeen Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	3	4	460	450	15
Future Volume (vph)	9	3	4	460	450	15
Satd. Flow (prot)	1414	0	0	1581	1576	0
Flt Permitted	0.963					
Satd. Flow (perm)	1414	0	0	1581	1576	0
Confl. Peds. (#/hr)	3	11	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	11%	0%	0%	4%	4%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	504	505	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 43.7%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	9	3	4	460	450	15
Future Vol, veh/h	9	3	4	460	450	15
Conflicting Peds, #/hr	3	11	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	11	0	0	4	4	0
Mvmt Flow	10	3	4	500	489	16

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1014	513	510	0	-	0
Stage 1	502	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Critical Hdwy	6.51	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	254	*109	*163	-	-	-
Stage 1	590	-	-	-	-	-
Stage 2	584	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	243	*107	*162	-	-	-
Mov Cap-2 Maneuver	243	-	-	-	-	-
Stage 1	587	-	-	-	-	-
Stage 2	562	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.1	0.2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 162	-	184	-	-
HCM Lane V/C Ratio	0.027	-	0.071	-	-
HCM Control Delay (s)	27.8	0	26.1	-	-
HCM Lane LOS	D	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

23: Route 138 & Oak St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	3	3	10	3	1	5	10	460	9	7	440	1
Future Volume (vph)	3	3	10	3	1	5	10	460	9	7	440	1
Satd. Flow (prot)	0	1412	0	0	1496	0	0	1592	0	0	1565	0
Flt Permitted		0.991			0.984			0.999			0.999	
Satd. Flow (perm)	0	1412	0	0	1496	0	0	1592	0	0	1565	0
Confl. Peds. (#/hr)	66					66	23		66	66		23
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	9%	0%	0%	0%	0%	3%	0%	0%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	9	0	0	493	0	0	462	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 52.9%	ICU Level of Service A
Analysis Period (min) 15	

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	3	10	3	1	5	10	460	9	7	440	1
Future Vol, veh/h	3	3	10	3	1	5	10	460	9	7	440	1
Conflicting Peds, #/hr	66	0	0	0	0	66	23	0	66	66	0	23
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	9	0	0	0	0	3	0	0	5	0
Mvmt Flow	3	3	10	3	1	5	10	474	9	7	454	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1061	1062	477	1040	1057	611	478	0	0	550	0	0
Stage 1	492	492	-	565	565	-	-	-	-	-	-	-
Stage 2	569	570	-	475	492	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.29	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.381	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	203	225	*128	210	227	*131	*245	-	-	*245	-	-
Stage 1	562	551	-	513	511	-	-	-	-	-	-	-
Stage 2	511	509	-	574	551	-	-	-	-	-	-	-
Platoon blocked, %			1			1	1	-	-	1	-	-
Mov Cap-1 Maneuver	165	188	*125	166	190	*116	*245	-	-	*231	-	-
Mov Cap-2 Maneuver	165	188	-	166	190	-	-	-	-	-	-	-
Stage 1	520	518	-	456	455	-	-	-	-	-	-	-
Stage 2	433	453	-	502	518	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	34.1		33.6		0.4		0.3	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 245	-	-	140	135	* 231	-	-
HCM Lane V/C Ratio	0.042	-	-	0.118	0.069	0.031	-	-
HCM Control Delay (s)	20.3	0	-	34.1	33.6	21.1	0	-
HCM Lane LOS	C	A	-	D	D	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.2	0.1	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Volume

24: Route 138 & Brook Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Volume (vph)	5	160	9	0	0	0	2	410	40	10	450	20
Future Volume (vph)	5	160	9	0	0	0	2	410	40	10	450	20
Satd. Flow (prot)	0	1562	0	0	0	0	0	1577	0	0	1549	0
Flt Permitted		0.999						0.998			0.987	
Satd. Flow (perm)	0	1562	0	0	0	0	0	1574	0	0	1530	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)	4		4	2		2	2		2	1		6
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	11%	2%	2%	2%	0%	3%	0%	17%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	181	0	0	0	0	0	471	0	0	500	0
Turn Type	Perm	NA						Perm	NA		Perm	NA
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0					24.0	24.0		24.0	24.0	
Minimum Split (s)	23.0	23.0					30.0	30.0		30.0	30.0	
Total Split (s)	23.0	23.0					37.0	37.0		37.0	37.0	
Total Split (%)	38.3%	38.3%					61.7%	61.7%		61.7%	61.7%	
Yellow Time (s)	4.0	4.0					5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.0						6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None					None	None		None	None	
Act Effct Green (s)		14.0						25.6			25.6	
Actuated g/C Ratio		0.34						0.62			0.62	
v/c Ratio		0.34						0.48			0.53	
Control Delay		17.9						10.1			10.9	
Queue Delay		0.0						0.0			0.0	
Total Delay		17.9						10.1			10.9	
LOS		B						B			B	
Approach Delay		17.9						10.1			10.9	
Approach LOS		B						B			B	
Queue Length 50th (ft)		41						72			79	
Queue Length 95th (ft)		99						188			210	
Internal Link Dist (ft)		967			1001			519			1021	
Turn Bay Length (ft)												
Base Capacity (vph)		777						1121			1089	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.23						0.42			0.46	

Intersection Summary

Cycle Length: 60

Volume

24: Route 138 & Brook Rd.

08/20/2018

Actuated Cycle Length: 41.3

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 11.6

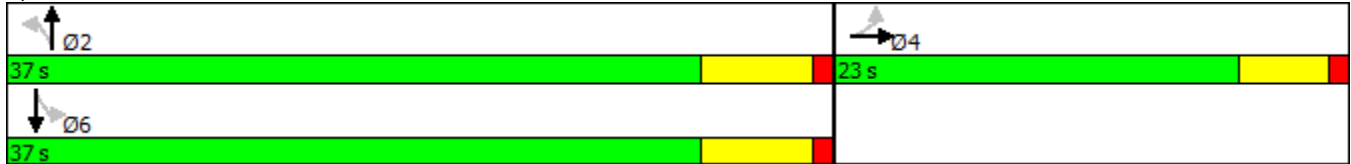
Intersection LOS: B

Intersection Capacity Utilization 59.6%

ICU Level of Service B
















Analysis Period (min) 15

Splits and Phases: 24: Route 138 & Brook Rd.



HCM 2010 Signalized Intersection Summary
 24: Route 138 & Brook Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	160	9	0	0	0	2	410	40	10	450	20
Future Volume (veh/h)	5	160	9	0	0	0	2	410	40	10	450	20
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	10	0				0	15	0	0	15	0
Ped-Bike Adj(A_pbT)	1.00		0.99				1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1631	1700				1700	1655	1700	1700	1615	1700
Adj Flow Rate, veh/h	5	167	9				2	427	42	10	469	21
Adj No. of Lanes	0	1	0				0	1	0	0	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	0				3	3	3	5	5	5
Cap, veh/h	6	268	11				84	853	75	89	870	35
Arrive On Green	0.16	0.16	0.16				0.58	0.58	0.58	0.58	0.58	0.58
Sat Flow, veh/h	45	1489	80				1	1482	145	9	1518	67
Grp Volume(v), veh/h	181	0	0				471	0	0	500	0	0
Grp Sat Flow(s),veh/h/ln	1613	0	0				1628	0	0	1594	0	0
Q Serve(g_s), s	4.4	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.4	0.0	0.0				7.1	0.0	0.0	7.9	0.0	0.0
Prop In Lane	0.03		0.05				0.00		0.09	0.02		0.04
Lane Grp Cap(c), veh/h	283	0	0				1013	0	0	992	0	0
V/C Ratio(X)	0.64	0.00	0.00				0.47	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	700	0	0				1302	0	0	1275	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.2	0.0	0.0				6.6	0.0	0.0	6.9	0.0	0.0
Incr Delay (d2), s/veh	2.4	0.0	0.0				0.3	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	24.8	0.0	0.0				3.0	0.0	0.0	3.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	0.0				5.7	0.0	0.0	6.2	0.0	0.0
LnGrp Delay(d),s/veh	44.4	0.0	0.0				9.9	0.0	0.0	10.6	0.0	0.0
LnGrp LOS	D						A			B		
Approach Vol, veh/h		181						471			500	
Approach Delay, s/veh		44.4						9.9			10.6	
Approach LOS		D						A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.0		11.5		30.0						
Change Period (Y+Rc), s		6.0		5.0		6.0						
Max Green Setting (Gmax), s		31.0		18.0		31.0						
Max Q Clear Time (g_c+I1), s		9.1		6.4		9.9						
Green Ext Time (p_c), s		6.4		0.7		6.3						
Intersection Summary												
HCM 2010 Ctrl Delay			15.6									
HCM 2010 LOS			B									

Volume

102: Route 138 & Concord Baptist Church

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	460	1	5	450
Future Volume (vph)	1	1	460	1	5	450
Satd. Flow (prot)	1495	0	1642	0	0	1642
Flt Permitted	0.976					0.999
Satd. Flow (perm)	1495	0	1642	0	0	1642
Confl. Peds. (#/hr)	3			11	11	
Peak Hour Factor	0.25	0.25	0.92	0.25	0.63	0.88
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	504	0	0	519
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	460	1	5	450
Future Vol, veh/h	1	1	460	1	5	450
Conflicting Peds, #/hr	3	0	0	11	11	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	92	25	63	88
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	4	500	4	8	511

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1043	513	0	0	515
Stage 1	513	-	-	-	-
Stage 2	530	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	256	565	-	-	1061
Stage 1	605	-	-	-	-
Stage 2	594	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	250	560	-	-	1061
Mov Cap-2 Maneuver	250	-	-	-	-
Stage 1	599	-	-	-	-
Stage 2	586	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	346	1061
HCM Lane V/C Ratio	-	-	0.023	0.007
HCM Control Delay (s)	-	-	15.7	8.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Volume

8: Route 138 & South Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↕			↕
Traffic Volume (vph)	0	0	1210	50	8	1260
Future Volume (vph)	0	0	1210	50	8	1260
Satd. Flow (prot)	0	0	1791	0	0	1819
Flt Permitted						
Satd. Flow (perm)	0	0	1791	0	0	1819
Confl. Peds. (#/hr)				6	6	
Peak Hour Factor	0.92	0.92	0.91	0.78	0.67	0.97
Heavy Vehicles (%)	2%	2%	2%	0%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1394	0	0	1311
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 76.0%	ICU Level of Service D
Analysis Period (min) 15	

Volume

9: Route 138 & South Parking Lot Exit

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	70	1200	0	0	1260
Future Volume (vph)	10	70	1200	0	0	1260
Satd. Flow (prot)	1610	0	1818	0	0	1818
Flt Permitted	0.994					
Satd. Flow (perm)	1610	0	1818	0	0	1818
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	1%	2%	2%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	0	1290	0	0	1355
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 77.9% ICU Level of Service D

Analysis Period (min) 15

HCM 2010 TWSC
 9: Route 138 & South Parking Lot Exit

08/20/2018

Intersection						
Int Delay, s/veh	3.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑			↑
Traffic Vol, veh/h	10	70	1200	0	0	1260
Future Vol, veh/h	10	70	1200	0	0	1260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	1	2	2	1
Mvmt Flow	11	75	1290	0	0	1355

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2645	1290	0	-	-	-
Stage 1	1290	-	-	-	-	-
Stage 2	1355	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	26	202	-	0	0	-
Stage 1	261	-	-	0	0	-
Stage 2	242	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	26	202	-	-	-	-
Mov Cap-2 Maneuver	26	-	-	-	-	-
Stage 1	261	-	-	-	-	-
Stage 2	242	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	108.8	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBTWBLn1	SBT
Capacity (veh/h)	- 109	-
HCM Lane V/C Ratio	- 0.789	-
HCM Control Delay (s)	- 108.8	-
HCM Lane LOS	- F	-
HCM 95th %tile Q(veh)	- 4.4	-

Volume
10: Route 138 & North Parking Lot Entrance

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (vph)	0	0	1230	25	25	1250
Future Volume (vph)	0	0	1230	25	25	1250
Satd. Flow (prot)	0	0	1810	0	0	1817
Flt Permitted						0.999
Satd. Flow (perm)	0	0	1810	0	0	1817
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.89	0.50	0.72	0.96
Heavy Vehicles (%)	2%	2%	1%	0%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1432	0	0	1337
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 89.2%	ICU Level of Service E
Analysis Period (min) 15	

Volume

11: Route 138 & Green Street/North Parking Lot Exit

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	0	10	6	0	70	4	1220	0	0	1260	7
Future Volume (vph)	5	0	10	6	0	70	4	1220	0	0	1260	7
Satd. Flow (prot)	0	1645	0	0	1601	0	0	1819	0	0	1817	0
Flt Permitted		0.984			0.996							
Satd. Flow (perm)	0	1645	0	0	1601	0	0	1819	0	0	1817	0
Confl. Peds. (#/hr)	5					5						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	1%	0%	2%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	15	0	0	78	0	0	1262	0	0	1306	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 80.6%	ICU Level of Service D
Analysis Period (min) 15	

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	10	6	0	70	4	1220	0	0	1260	7
Future Vol, veh/h	5	0	10	6	0	70	4	1220	0	0	1260	7
Conflicting Peds, #/hr	5	0	0	0	0	5	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	2	0	0	2	0	0	1	0	2	1	0
Mvmt Flow	5	0	10	6	0	72	4	1258	0	0	1299	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2610	2569	1303	2574	2572	1263	1306	0	-	-	-	0
Stage 1	1303	1303	-	1266	1266	-	-	-	-	-	-	-
Stage 2	1307	1266	-	1308	1306	-	-	-	-	-	-	-
Critical Hdwy	6.5	6.52	6.2	6.5	10	6.2	4.1	-	-	-	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4.018	3.3	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	25	26	198	27	2	209	537	-	0	0	-	-
Stage 1	199	231	-	209	240	-	-	-	0	0	-	-
Stage 2	198	240	-	198	230	-	-	-	0	0	-	-
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	16	25	198	25	2	208	537	-	-	-	-	-
Mov Cap-2 Maneuver	16	25	-	25	2	-	-	-	-	-	-	-
Stage 1	194	231	-	204	234	-	-	-	-	-	-	-
Stage 2	126	234	-	188	230	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB				
HCM Control Delay, s	138.5		65.9		0		0				
HCM LOS	F		F								

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	537	-	41	132	-
HCM Lane V/C Ratio	0.008	-	0.377	0.594	-
HCM Control Delay (s)	11.8	0	138.5	65.9	-
HCM Lane LOS	B	A	F	F	-
HCM 95th %tile Q(veh)	0	-	1.3	3	-

Volume

12: Route 138 & Summit Rd. & Canton Ave.

08/20/2018



Lane Group	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	0	1	1	850	450	9	2	0	1260	0	0
Future Volume (vph)	0	1	1	850	450	9	2	0	1260	0	0
Satd. Flow (prot)	1589	0	0	1722	0	0	0	0	1819	0	0
Flt Permitted											
Satd. Flow (perm)	1589	0	0	1722	0	0	0	0	1819	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	0%	2%	1%	2%	2%
Shared Lane Traffic (%)											
Lane Group Flow (vph)	2	0	0	1349	0	0	0	0	1301	0	0
Sign Control	Stop			Free					Free	Stop	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 82.7%

ICU Level of Service E

Analysis Period (min) 15

Intersection								
Int Delay, s/veh	0							
Movement	WBL	WBR	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	W		T			T		
Traffic Vol, veh/h	0	1	850	450	0	1260	0	0
Future Vol, veh/h	0	1	850	450	0	1260	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	-	-	-	None	-	None
Storage Length	0	-	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0	-	-
Grade, %	0	-	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	1	2	1	2	2
Mvmt Flow	0	1	876	464	0	1299	0	0

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	0	0	0
Stage 1	0	-	-
Stage 2	0	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s			
HCM LOS	-		

Minor Lane/Major Mvmt	NBT	NBR	NBR2WBLn1	SBL2	SBL	SBT
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	-	-	-	-	-	-
HCM Lane LOS	-	-	-	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-	-

Volume

13: Route 138 & Thacher Montessori School

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	6	6	850	1270	0
Future Volume (vph)	0	6	6	850	1270	0
Satd. Flow (prot)	1589	0	0	1801	1818	0
Flt Permitted						
Satd. Flow (perm)	1589	0	0	1801	1818	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	2%	1%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	891	1323	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 76.8% ICU Level of Service D

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	6	6	850	1270	0
Future Vol, veh/h	0	6	6	850	1270	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	0	0	2	1	0
Mvmt Flow	0	6	6	885	1323	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2221	1323	1323	0	-	0
Stage 1	1323	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	48	193	529	-	-	-
Stage 1	249	-	-	-	-	-
Stage 2	398	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	47	193	529	-	-	-
Mov Cap-2 Maneuver	47	-	-	-	-	-
Stage 1	249	-	-	-	-	-
Stage 2	389	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.3	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	529	-	193	-	-
HCM Lane V/C Ratio	0.012	-	0.032	-	-
HCM Control Delay (s)	11.9	0	24.3	-	-
HCM Lane LOS	B	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↗	↘			↑			↖	↙
Traffic Volume (vph)	5	0	330	170	120	0	0	850	0	0	770	5
Future Volume (vph)	5	0	330	170	120	0	0	850	0	0	770	5
Satd. Flow (prot)	0	1423	0	1546	1643	0	0	1611	0	0	1610	0
Flt Permitted		0.997		0.395								
Satd. Flow (perm)	0	1420	0	643	1643	0	0	1611	0	0	1610	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	0%	13%	0%	2%	2%	2%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	352	0	179	126	0	0	895	0	0	816	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8								
Detector Phase	4	4		8	8			2				6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0			10.0				10.0
Minimum Split (s)	20.0	20.0		20.0	20.0			45.0				45.0
Total Split (s)	30.0	30.0		30.0	30.0			45.0				45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%			60.0%				60.0%
Yellow Time (s)	4.0	4.0		4.0	4.0			5.0				5.0
All-Red Time (s)	1.0	1.0		1.0	1.0			1.0				1.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)		5.0		5.0	5.0			6.0				6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			None				None
Act Effect Green (s)		21.8		21.8	21.8			39.1				39.1
Actuated g/C Ratio		0.30		0.30	0.30			0.54				0.54
v/c Ratio		0.82		0.92	0.25			1.02				0.93
Control Delay		40.1		74.4	20.0			56.9				36.7
Queue Delay		0.0		0.0	0.0			0.0				0.0
Total Delay		40.1		74.4	20.0			56.9				36.7
LOS		D		E	B			E				D
Approach Delay		40.1			51.9			56.9				36.7
Approach LOS		D			D			E				D
Queue Length 50th (ft)		143		76	42			~470				345
Queue Length 95th (ft)		#269		#188	81			#684				#601
Internal Link Dist (ft)		906			198			187				2213
Turn Bay Length (ft)												
Base Capacity (vph)		495		224	572			875				875
Starvation Cap Reductn		0		0	0			0				0
Spillback Cap Reductn		0		0	0			0				0
Storage Cap Reductn		0		0	0			0				0
Reduced v/c Ratio		0.71		0.80	0.22			1.02				0.93

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 72

Volume

14: Route 138 & Brush Hill Rd.

08/20/2018

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 46.8

Intersection LOS: D

Intersection Capacity Utilization 97.0%

ICU Level of Service F

Analysis Period (min) 15

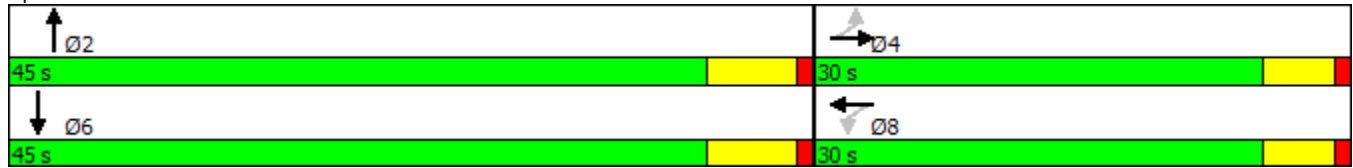
~ Volume exceeds capacity, queue is theoretically infinite.

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: 14: Route 138 & Brush Hill Rd.



HCM 2010 Signalized Intersection Summary
 14: Route 138 & Brush Hill Rd.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	330	170	120	0	0	850	0	0	770	5
Future Volume (veh/h)	5	0	330	170	120	0	0	850	0	0	770	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	20	0	10	10	0	0	10	0	0	40	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1700	1700	1683	1700	1700	0	1667	0	0	1667	1700
Adj Flow Rate, veh/h	5	0	347	179	126	0	0	895	0	0	811	5
Adj No. of Lanes	0	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	0	0	0	2	0	0	2	2
Cap, veh/h	49	5	372	180	567	0	0	867	0	0	863	2
Arrive On Green	0.33	0.00	0.33	0.33	0.33	0.00	0.00	0.52	0.00	0.00	0.52	0.52
Sat Flow, veh/h	5	15	1426	982	1700	0	0	1667	0	0	1655	10
Grp Volume(v), veh/h	352	0	0	179	126	0	0	895	0	0	0	816
Grp Sat Flow(s),veh/h/ln	1446	0	0	982	1700	0	0	1667	0	0	0	1665
Q Serve(g_s), s	0.0	0.0	0.0	7.0	4.0	0.0	0.0	39.0	0.0	0.0	0.0	34.6
Cycle Q Clear(g_c), s	16.1	0.0	0.0	23.0	4.0	0.0	0.0	39.0	0.0	0.0	0.0	34.6
Prop In Lane	0.01		0.99	1.00		0.00	0.00		0.00	0.00		0.01
Lane Grp Cap(c), veh/h	402	0	0	180	567	0	0	867	0	0	0	866
V/C Ratio(X)	0.87	0.00	0.00	0.99	0.22	0.00	0.00	1.03	0.00	0.00	0.00	0.94
Avail Cap(c_a), veh/h	531	0	0	296	567	0	0	867	0	0	0	866
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	22.3	0.0	0.0	31.7	18.6	0.0	0.0	18.0	0.0	0.0	0.0	18.0
Incr Delay (d2), s/veh	12.1	0.0	0.0	39.7	0.2	0.0	0.0	39.3	0.0	0.0	0.0	18.1
Initial Q Delay(d3),s/veh	122.6	0.0	0.0	196.5	2.9	0.0	0.0	39.3	0.0	0.0	0.0	140.1
%ile BackOfQ(50%),veh/ln	21.4	0.0	0.0	15.5	3.2	0.0	0.0	37.0	0.0	0.0	0.0	55.6
LnGrp Delay(d),s/veh	157.0	0.0	0.0	267.9	21.7	0.0	0.0	96.6	0.0	0.0	0.0	176.2
LnGrp LOS	F			F	C			F				F
Approach Vol, veh/h		352			305			895				816
Approach Delay, s/veh		157.0			166.2			96.6				176.2
Approach LOS		F			F			F				F
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		30.0		45.0		30.0				
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0				
Max Green Setting (Gmax), s		39.0		25.0		39.0		25.0				
Max Q Clear Time (g_c+I1), s		41.0		18.1		36.6		25.0				
Green Ext Time (p_c), s		0.0		2.3		2.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			142.0									
HCM 2010 LOS			F									

Volume

15: Canton Ave. & Brush Hill Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	170	280	0	140
Future Volume (vph)	0	0	170	280	0	140
Satd. Flow (prot)	0	0	1745	1818	0	1573
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	1745	1818	0	1573
Peak Hour Factor	0.92	0.92	0.86	0.79	0.92	0.94
Heavy Vehicles (%)	2%	2%	0%	1%	2%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	198	354	0	149
Sign Control	Free			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 24.8% ICU Level of Service A

Analysis Period (min) 15

Volume

16: Route 138 & Neponset Valley Pkwy.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	200	390	490	570	1
Future Volume (vph)	4	200	390	490	570	1
Satd. Flow (prot)	1312	0	1501	1627	1611	0
Flt Permitted	0.999		0.150			
Satd. Flow (perm)	1312	0	237	1627	1611	0
Satd. Flow (RTOR)						
Confl. Peds. (#/hr)		10				10
Confl. Bikes (#/hr)		10				10
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	4%	1%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	210	0	402	505	589	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.0		10.0	23.0	23.0	
Total Split (s)	23.0		26.0	67.0	41.0	
Total Split (%)	25.6%		28.9%	74.4%	45.6%	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	5.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	None	None	
Act Effct Green (s)	16.4		59.1	59.1	33.3	
Actuated g/C Ratio	0.19		0.69	0.69	0.39	
v/c Ratio	0.84		0.86	0.45	0.94	
Control Delay	62.6		37.3	7.7	50.8	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	62.6		37.3	7.7	50.8	
LOS	E		D	A	D	
Approach Delay	62.6			20.8	50.8	
Approach LOS	E			C	D	
Queue Length 50th (ft)	115		148	112	310	
Queue Length 95th (ft)	#232		#319	172	#520	
Internal Link Dist (ft)	1200			2213	1154	
Turn Bay Length (ft)			200			
Base Capacity (vph)	279		477	1191	685	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.75		0.84	0.42	0.86	

Intersection Summary

Volume

16: Route 138 & Neponset Valley Pkwy.

08/20/2018

Cycle Length: 90

Actuated Cycle Length: 85.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 36.3

Intersection LOS: D

Intersection Capacity Utilization 85.3%

ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 16: Route 138 & Neponset Valley Pkwy.



HCM 2010 Signalized Intersection Summary
 16: Route 138 & Neponset Valley Pkwy.

08/20/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	4	200	390	490	570	1		
Future Volume (veh/h)	4	200	390	490	570	1		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	5	0	10	15	15	0		
Ped-Bike Adj(A_pbT)	1.00	0.94	1.00			0.96		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1667	1700	1635	1683	1667	1700		
Adj Flow Rate, veh/h	4	206	402	505	588	1		
Adj No. of Lanes	0	0	1	1	1	0		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Percent Heavy Veh, %	0	0	4	1	2	2		
Cap, veh/h	24	236	446	1127	684	1		
Arrive On Green	0.19	0.19	0.17	0.67	0.42	0.42		
Sat Flow, veh/h	25	1299	1557	1683	1663	3		
Grp Volume(v), veh/h	211	0	402	505	0	589		
Grp Sat Flow(s),veh/h/ln	1331	0	1557	1683	0	1666		
Q Serve(g_s), s	10.7	0.0	9.2	10.0	0.0	22.1		
Cycle Q Clear(g_c), s	10.7	0.0	9.2	10.0	0.0	22.1		
Prop In Lane	0.02	0.98	1.00			0.00		
Lane Grp Cap(c), veh/h	261	0	446	1127	0	679		
V/C Ratio(X)	0.81	0.00	0.90	0.45	0.00	0.87		
Avail Cap(c_a), veh/h	342	0	652	1489	0	856		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	31.9	0.0	25.8	6.3	0.0	24.5		
Incr Delay (d2), s/veh	10.4	0.0	11.6	0.3	0.0	7.8		
Initial Q Delay(d3),s/veh	0.0	0.0	36.6	2.3	0.0	26.5		
%ile BackOfQ(50%),veh/ln	5.8	0.0	16.3	7.6	0.0	21.2		
LnGrp Delay(d),s/veh	42.3	0.0	74.1	8.9	0.0	58.9		
LnGrp LOS	D		E	A		E		
Approach Vol, veh/h	211			907	589			
Approach Delay, s/veh	42.3			37.8	58.9			
Approach LOS	D			D	E			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		51.8		18.3	17.1	34.7		
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0		
Max Green Setting (Gmax), s		62.0		18.0	21.0	36.0		
Max Q Clear Time (g_c+I1), s		12.0		12.7	11.2	24.1		
Green Ext Time (p_c), s		9.5		0.3	0.9	5.6		
Intersection Summary								
HCM 2010 Ctrl Delay			45.6					
HCM 2010 LOS			D					
Notes								

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Volume (vph)	30	100	8	15	70	20	15	460	9	1	540	25
Future Volume (vph)	30	100	8	15	70	20	15	460	9	1	540	25
Satd. Flow (prot)	0	1567	0	0	1589	0	1561	1622	0	0	1618	0
Flt Permitted		0.916			0.948		0.465				0.999	
Satd. Flow (perm)	0	1451	0	0	1517	0	764	1622	0	0	1616	0
Satd. Flow (RTOR)												
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	4%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	145	0	0	111	0	16	493	0	0	595	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		37.0	37.0		37.0	37.0	
Total Split (s)	30.0	30.0		30.0	30.0		50.0	50.0		50.0	50.0	
Total Split (%)	37.5%	37.5%		37.5%	37.5%		62.5%	62.5%		62.5%	62.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		7.0	7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
Act Effct Green (s)		11.1			11.1		34.7	34.7			34.7	
Actuated g/C Ratio		0.21			0.21		0.66	0.66			0.66	
v/c Ratio		0.48			0.35		0.03	0.46			0.56	
Control Delay		25.6			22.7		6.3	9.2			10.8	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		25.6			22.7		6.3	9.2			10.8	
LOS		C			C		A	A			B	
Approach Delay		25.6			22.7			9.1			10.8	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		40			30		2	80			107	
Queue Length 95th (ft)		100			78		10	195			261	
Internal Link Dist (ft)		1017			791			1154			1181	
Turn Bay Length (ft)							200					
Base Capacity (vph)		714			747		622	1320			1315	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.20			0.15		0.03	0.37			0.45	

Intersection Summary

Cycle Length: 80

Volume

17: Route 138 & Milton St./Dollar Ln.

08/20/2018

Actuated Cycle Length: 52.9

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 12.7

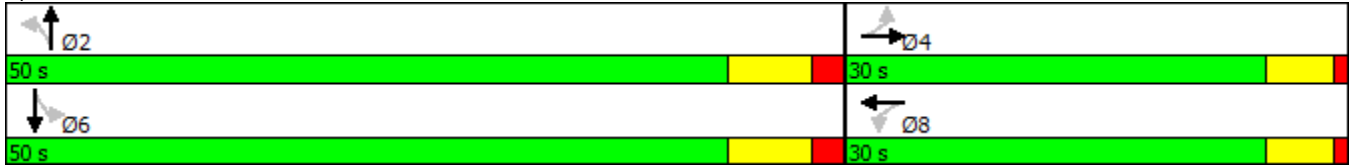
Intersection LOS: B

Intersection Capacity Utilization 57.4%

ICU Level of Service B


















Analysis Period (min) 15

Splits and Phases: 17: Route 138 & Milton St./Dollar Ln.



HCM 2010 Signalized Intersection Summary
 17: Route 138 & Milton St./Dollar Ln.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	100	8	15	70	20	15	460	9	1	540	25
Future Volume (veh/h)	30	100	8	15	70	20	15	460	9	1	540	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	25	0	0	15	0	0	15	0	0	30	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1652	1700	1700	1700	1700	1700	1683	1700	1700	1684	1700
Adj Flow Rate, veh/h	32	105	8	16	74	21	16	484	9	1	568	26
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	0	0	0	0	1	1	1	1	1
Cap, veh/h	105	267	10	95	265	36	472	974	17	59	921	36
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	226	1252	86	126	1181	305	790	1647	31	0	1597	73
Grp Volume(v), veh/h	145	0	0	111	0	0	16	0	493	595	0	0
Grp Sat Flow(s),veh/h/ln	1564	0	0	1612	0	0	790	0	1678	1671	0	0
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.2	0.0	0.0	3.0	0.0	0.0	0.6	0.0	8.1	10.8	0.0	0.0
Prop In Lane	0.22		0.06	0.14		0.19	1.00		0.02	0.00		0.04
Lane Grp Cap(c), veh/h	380	0	0	358	0	0	472	0	1001	964	0	0
V/C Ratio(X)	0.38	0.00	0.00	0.31	0.00	0.00	0.03	0.00	0.49	0.62	0.00	0.00
Avail Cap(c_a), veh/h	862	0	0	880	0	0	785	0	1459	1525	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.8	0.0	0.0	20.3	0.0	0.0	5.4	0.0	7.3	12.0	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.4	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	50.4	0.0	0.0	18.3	0.0	0.0	0.0	0.0	3.2	18.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	0.0	0.0	4.7	0.0	0.0	0.1	0.0	7.0	15.9	0.0	0.0
LnGrp Delay(d),s/veh	72.8	0.0	0.0	39.1	0.0	0.0	5.4	0.0	10.9	30.9	0.0	0.0
LnGrp LOS	E			D			A		B	C		
Approach Vol, veh/h		145			111			509			595	
Approach Delay, s/veh		72.8			39.1			10.7			30.9	
Approach LOS		E			D			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		12.5		37.0		12.5				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		43.0		25.0		43.0		25.0				
Max Q Clear Time (g_c+I1), s		10.1		6.2		12.8		5.0				
Green Ext Time (p_c), s		8.5		1.3		8.3		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay				28.5								
HCM 2010 LOS				C								

Volume

18: Route 138 & Blue Jay Way (Curry College)

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Satd. Flow (prot)	1837	0	0	1701	1733	0
Flt Permitted						
Satd. Flow (perm)	1837	0	0	1701	1733	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	7%	1%	8%	6%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 0.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	7	1	8	6	0
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.4	6.27	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.363	2.209	-	-	-
Pot Cap-1 Maneuver	1027	1069	1628	-	-	-
Stage 1	1028	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1027	1069	1628	-	-	-
Mov Cap-2 Maneuver	1027	-	-	-	-	-
Stage 1	1028	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1628	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Volume

19: Route 138 & Atherton St. & Bradley Rd.

08/20/2018



Lane Group	EBT	WBT	NBT	SBT	SEL
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0
Satd. Flow (prot)	1837	1837	1701	1733	1749
Flt Permitted					
Satd. Flow (perm)	1837	1837	1701	1733	1749
Satd. Flow (RTOR)					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	8%	6%	5%
Shared Lane Traffic (%)					
Lane Group Flow (vph)	0	0	0	0	0
Turn Type					Prot
Protected Phases	4		2	6	5
Permitted Phases		8			
Detector Phase	4	8	2	6	5
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag				Lag	Lead
Lead-Lag Optimize?				Yes	Yes
Recall Mode	None	None	Min	Min	None
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					
Queue Length 95th (ft)					
Internal Link Dist (ft)	1290	1410	1586	2667	689
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 20

Volume

19: Route 138 & Atherton St. & Bradlee Rd.

08/20/2018

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0

Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 19: Route 138 & Atherton St. & Bradlee Rd.



Volume
20: Route 138 & Robbins St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1837	0	0	1837	0	0	1701	0	0	1717	0
Flt Permitted												
Satd. Flow (perm)	0	1837	0	0	1837	0	0	1701	0	0	1717	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	3%	0%	13%	0%	8%	8%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay												
Queue Delay												
Total Delay												
LOS												
Approach Delay												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		939			647			711			3441	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												

Intersection Summary

Cycle Length: 40
Actuated Cycle Length: 25

Volume

20: Route 138 & Robbins St.

08/20/2018

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0

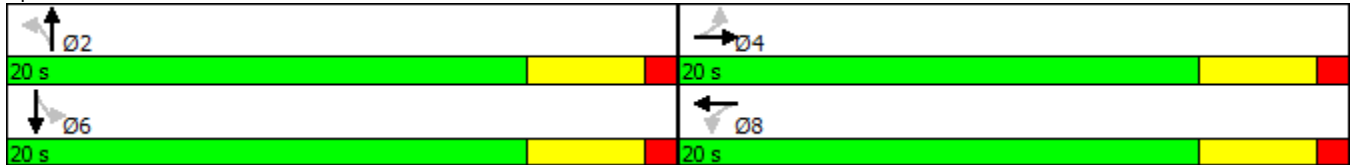
Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A

















Analysis Period (min) 15

Splits and Phases: 20: Route 138 & Robbins St.



HCM 2010 Signalized Intersection Summary
 20: Route 138 & Robbins St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1759	1900	1900	1776	1900
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	8	8	8	7	7	7
Cap, veh/h	0	9999	0	0	9999	0	0	9999	0	0	9999	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	-85500	0	0	-85500	0	0	-79167	0	0	-79907	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	0	1900	0	0	1759	0	0	1776	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	816004378624		0	816004378624		0	75539608320		0	76265775104		0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	12648678686720		0	12648678686720		0	117117039330560		0	11821194936320		0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS												
Approach Vol, veh/h		0			0			0			0	
Approach Delay, s/veh		0.0			0.0			0.0			0.0	
Approach LOS												
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		0.0		0.0		0.0		0.0			0.0	
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5			4.5	
Max Green Setting (Gmax), s		15.5		15.5		15.5		15.5			15.5	
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0		0.0			0.0	
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0			0.0	
Intersection Summary												
HCM 2010 Ctrl Delay				0.0								
HCM 2010 LOS				A								

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1837	0	0	1837	0	0	1701	0	0	1701	0
Flt Permitted												
Satd. Flow (perm)	0	1837	0	0	1837	0	0	1701	0	0	1701	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	8%	0%	13%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay												
Queue Delay												
Total Delay												
LOS												
Approach Delay												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		838			877			3441			407	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												

Intersection Summary

Cycle Length: 40
Actuated Cycle Length: 40
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Pretimed
Maximum v/c Ratio: 0.00

Volume

21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

Intersection Signal Delay: 0.0

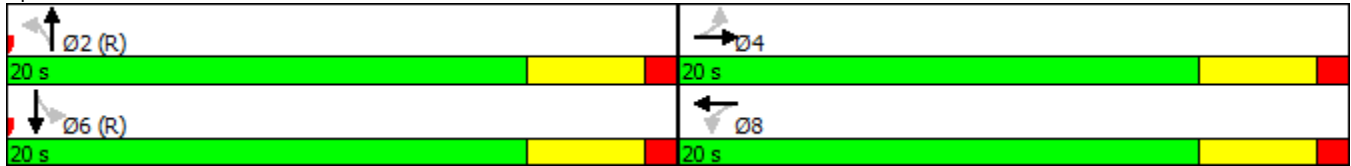
Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A

















Analysis Period (min) 15

Splits and Phases: 21: Route 138 & Cheever St./Blue Hill Terrace St.



HCM 2010 Signalized Intersection Summary
 21: Route 138 & Cheever St./Blue Hill Terrace St.

08/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1759	1900	1900	1759	1900
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	8	8	8	8	8	8
Cap, veh/h	0	9999	0	0	9999	0	0	9999	0	0	9999	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	-85500	0	0	-85500	0	0	-79167	0	0	-79167	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	0	1900	0	0	1759	0	0	1759	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	816004378624		0	816004378624		0	75559608320		0	75559608320		0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	12648678686720		0	12648678686720		0	11711739330560		0	11711739330560		0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS												
Approach Vol, veh/h		0			0			0			0	
Approach Delay, s/veh		0.0			0.0			0.0			0.0	
Approach LOS												
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		0.0		0.0		0.0		0.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		15.5		15.5		15.5		15.5				
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0		0.0				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			0.0									
HCM 2010 LOS			A									

Volume

22: Route 138 & Aberdeen Rd.

08/20/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1	2	2	270	350	15
Future Volume (vph)	1	2	2	270	350	15
Satd. Flow (prot)	1645	0	0	1801	1808	0
Flt Permitted	0.984					
Satd. Flow (perm)	1645	0	0	1801	1808	0
Confl. Peds. (#/hr)	8		5			5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	0	0	292	392	0
Sign Control	Stop			Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 29.4%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	1	2	2	270	350	15
Future Vol, veh/h	1	2	2	270	350	15
Conflicting Peds, #/hr	8	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	2	1	0
Mvmt Flow	1	2	2	290	376	16

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	692	389	397	0	-	0
Stage 1	389	-	-	-	-	-
Stage 2	303	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	413	664	1173	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	409	661	1173	-	-	-
Mov Cap-2 Maneuver	409	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	749	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1173	-	548	-	-
HCM Lane V/C Ratio	0.002	-	0.006	-	-
HCM Control Delay (s)	8.1	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Volume

23: Route 138 & Oak St.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1837	0	0	1837	0	0	1717	0	0	1701	0
Flt Permitted												
Satd. Flow (perm)	0	1837	0	0	1837	0	0	1717	0	0	1701	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	0%	7%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 0.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	25	0	0	0	7	0	0	8	0
Mvmt Flow	0	0	0	0	0	0	0	0	0	0	0	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1	1	1	1	1	0	1	0	0	0	0	0
Stage 1	1	1	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	1	1	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.35	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.725	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	1027	899	1090	965	899	-	1635	-	-	-	-	-
Stage 1	1027	899	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	965	899	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	899	1090	965	899	-	1635	-	-	-	-	-
Mov Cap-2 Maneuver	-	899	-	965	899	-	-	-	-	-	-	-
Stage 1	1027	899	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	965	899	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1635	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	0	-
HCM Lane LOS	A	-	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	-

Volume

24: Route 138 & Brook Rd.

08/20/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1818	0	0	0	0	0	1717	0	0	1701	0
Flt Permitted												
Satd. Flow (perm)	0	1818	0	0	0	0	0	1717	0	0	1701	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	1%	0%	2%	2%	2%	20%	7%	9%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0					5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0					20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0					20.0	20.0		20.0	20.0	
Total Split (%)	50.0%	50.0%					50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5					3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		4.5						4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None					Min	Min		Min	Min	
Act Effect Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay												
Queue Delay												
Total Delay												
LOS												
Approach Delay												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		967			1001			519			1021	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												

Intersection Summary

Cycle Length: 40
 Actuated Cycle Length: 25

Volume

24: Route 138 & Brook Rd.

08/20/2018

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0

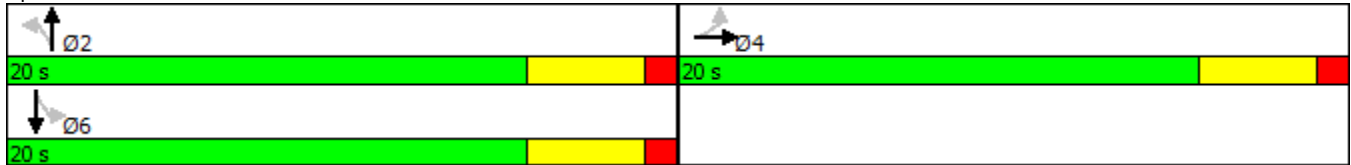
Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A
















Analysis Period (min) 15

Splits and Phases: 24: Route 138 & Brook Rd.



HCM 2010 Signalized Intersection Summary
 24: Route 138 & Brook Rd.

08/20/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0	
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0	
Number	7	4	14				5	2	12	1	6	16	
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln	1900	1881	1900				1900	1776	1900	1900	1759	1900	
Adj Flow Rate, veh/h	0	0	0				0	0	0	0	0	0	
Adj No. of Lanes	0	1	0				0	1	0	0	1	0	
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	0	1	0				7	7	7	8	8	8	
Cap, veh/h	0	9999	0				0	9999	0	0	9999	0	
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00	
Sat Flow, veh/h	0	1881	0				0	-79907	0	0	-79167	0	
Grp Volume(v), veh/h	0	0	0				0	0	0	0	0	0	
Grp Sat Flow(s),veh/h/ln	0	1881	0				0	1776	0	0	1759	0	
Q Serve(g_s), s	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	
Cycle Q Clear(g_c), s	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	
Prop In Lane	0.00		0.00				0.00		0.00	0.00		0.00	
Lane Grp Cap(c), veh/h	8079	6418	048				7626	5775	104	0	7555	9608	320
V/C Ratio(X)	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00	
Avail Cap(c_a), veh/h	12523	4110	9312				11821	10493	6320	0	11711	73933	0560
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	
LnGrp Delay(d),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	
LnGrp LOS													
Approach Vol, veh/h		0						0			0		
Approach Delay, s/veh		0.0						0.0			0.0		
Approach LOS													
Timer	1	2	3	4	5	6	7	8					
Assigned Phs		2		4		6							
Phs Duration (G+Y+Rc), s		0.0		0.0		0.0							
Change Period (Y+Rc), s		4.5		4.5		4.5							
Max Green Setting (Gmax), s		15.5		15.5		15.5							
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0							
Green Ext Time (p_c), s		0.0		0.0		0.0							
Intersection Summary													
HCM 2010 Ctrl Delay			0.0										
HCM 2010 LOS			A										

Volume

102: Route 138 & Concord Baptist Church

08/20/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	270	30	100	250
Future Volume (vph)	0	0	270	30	100	250
Satd. Flow (prot)	1837	0	1813	0	0	1806
Flt Permitted						0.986
Satd. Flow (perm)	1837	0	1813	0	0	1806
Confl. Peds. (#/hr)	19			53	53	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	322	0	0	377
Sign Control	Stop		Free			Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 41.8%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	0	270	30	100	250
Future Vol, veh/h	0	0	270	30	100	250
Conflicting Peds, #/hr	19	0	0	53	53	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	1	0
Mvmt Flow	0	0	290	32	108	269



















Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	862	359	0	0	376	0
Stage 1	359	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	328	690	-	-	1188	-
Stage 1	711	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	275	658	-	-	1188	-
Mov Cap-2 Maneuver	275	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	537	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	2.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1188
HCM Lane V/C Ratio	-	-	-	0.091
HCM Control Delay (s)	-	-	0	8.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.3

Lanes, Volumes, Timings
14: Route 138 & Brush Hill Rd.

10/03/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	310	125	5	5	160	970	0	0	660	7
Future Volume (vph)	6	0	310	125	5	5	160	970	0	0	660	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	0		0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (ft)	0			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.867			0.925							0.999
Flt Protected		0.999		0.950			0.950					
Satd. Flow (prot)	0	1545	0	1728	1588	0	1745	1733	0	0	1683	0
Flt Permitted		0.997		0.339			0.167					
Satd. Flow (perm)	0	1542	0	616	1588	0	307	1733	0	0	1683	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30				30
Link Distance (ft)		986			278			267				2293
Travel Time (s)		22.4			6.3			6.1				52.1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	3%	1%	1%	13%	0%	6%	2%	2%	9%	14%
Adj. Flow (vph)	6	0	323	130	5	5	167	1010	0	0	688	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	329	0	130	10	0	167	1010	0	0	695	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			11				11
Link Offset(ft)		-3			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2				2
Detector Template	Left	Thru		Left	Thru		Left	Thru				Thru
Leading Detector (ft)	20	100		20	100		20	100				100
Trailing Detector (ft)	0	0		0	0		0	0				0
Detector 1 Position(ft)	0	0		0	0		0	0				0
Detector 1 Size(ft)	20	6		20	6		20	6				6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA				NA
Protected Phases		4			8		5	2				6

Lanes, Volumes, Timings
 14: Route 138 & Brush Hill Rd.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		5	2				6
Switch Phase												
Minimum Initial (s)	5.0	5.0		10.0	10.0		5.0	10.0				10.0
Minimum Split (s)	23.0	23.0		24.0	24.0		10.0	45.0				45.0
Total Split (s)	28.0	28.0		28.0	28.0		11.0	62.0				51.0
Total Split (%)	31.1%	31.1%		31.1%	31.1%		12.2%	68.9%				56.7%
Maximum Green (s)	23.0	23.0		22.0	22.0		6.0	57.0				46.0
Yellow Time (s)	4.0	4.0		5.0	5.0		4.0	4.0				4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0				1.0
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0				0.0
Total Lost Time (s)		5.0		6.0	6.0		5.0	5.0				5.0
Lead/Lag							Lead					Lag
Lead-Lag Optimize?							Yes					Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0
Recall Mode	None	None		None	None		None	None				None
Walk Time (s)	7.0	7.0		7.0	7.0			7.0				7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0				11.0
Pedestrian Calls (#/hr)	10	10		10	10			10				10
Act Effct Green (s)		21.9		20.9	20.9		52.4	52.4				41.2
Actuated g/C Ratio		0.26		0.25	0.25		0.62	0.62				0.49
v/c Ratio		0.82		0.86	0.03		0.57	0.94				0.85
Control Delay		49.5		78.5	26.2		14.6	32.5				30.2
Queue Delay		0.0		0.0	0.0		0.0	0.0				0.0
Total Delay		49.5		78.5	26.2		14.6	32.5				30.2
LOS		D		E	C		B	C				C
Approach Delay		49.5			74.8			30.0				30.2
Approach LOS		D			E			C				C
90th %ile Green (s)	23.0	23.0		22.0	22.0		6.0	57.0				46.0
90th %ile Term Code	Max	Max		Max	Max		Max	Max				Max
70th %ile Green (s)	23.0	23.0		22.0	22.0		6.0	57.0				46.0
70th %ile Term Code	Max	Max		Max	Max		Max	Max				Max
50th %ile Green (s)	23.0	23.0		22.0	22.0		6.0	57.0				46.0
50th %ile Term Code	Max	Max		Max	Max		Max	Max				Hold
30th %ile Green (s)	23.0	23.0		22.0	22.0		6.0	55.0				44.0
30th %ile Term Code	Hold	Hold		Max	Max		Max	Gap				Hold
10th %ile Green (s)	17.3	17.3		16.3	16.3		6.0	37.0				26.0
10th %ile Term Code	Hold	Hold		Gap	Gap		Max	Gap				Hold
Stops (vph)		271		99	9		60	759				538
Fuel Used(gal)		7		3	0		1	13				19
CO Emissions (g/hr)		497		197	9		80	883				1328
NOx Emissions (g/hr)		97		38	2		16	172				258
VOC Emissions (g/hr)		115		46	2		18	205				308
Dilemma Vehicles (#)		0		0	0		0	0				0
Queue Length 50th (ft)		177		71	4		35	455				313
Queue Length 95th (ft)		#321		#178	17		60	#787				#492
Internal Link Dist (ft)		906			198			187				2213
Turn Bay Length (ft)							200					
Base Capacity (vph)		427		163	421		294	1190				933

Lanes, Volumes, Timings
 14: Route 138 & Brush Hill Rd.

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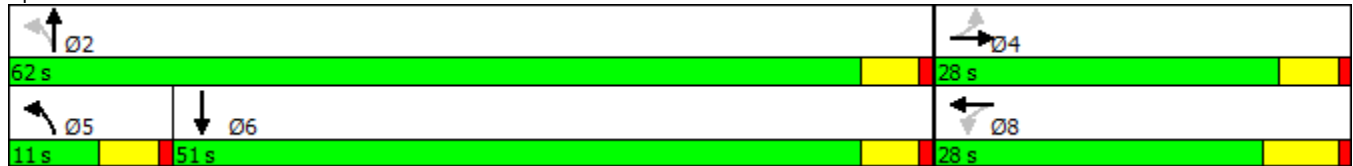


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	
Reduced v/c Ratio		0.77		0.80	0.02		0.57	0.85			0.74	

Intersection Summary



















Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	84.5
Natural Cycle:	90
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	35.5
Intersection LOS:	D
Intersection Capacity Utilization:	92.2%
ICU Level of Service:	F
Analysis Period (min):	15
90th %ile Actuated Cycle:	90
70th %ile Actuated Cycle:	90
50th %ile Actuated Cycle:	90
30th %ile Actuated Cycle:	88
10th %ile Actuated Cycle:	64.3
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 14: Route 138 & Brush Hill Rd.





















HCM 2010 Signalized Intersection Summary
 14: Route 138 & Brush Hill Rd.

10/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	310	125	5	5	160	970	0	0	660	7
Future Volume (veh/h)	6	0	310	125	5	5	160	970	0	0	660	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	10	0	5	10	0	0	20	0	0	15	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1846	1900	1881	1776	1900	1900	1792	0	0	1742	1900
Adj Flow Rate, veh/h	6	0	323	130	5	5	167	1010	0	0	688	7
Adj No. of Lanes	0	1	0	1	1	0	1	1	0	0	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	1	1	1	0	6	0	0	9	9
Cap, veh/h	40	5	320	175	344	188	252	1119	0	0	868	7
Arrive On Green	0.25	0.00	0.25	0.25	0.25	0.25	0.06	0.62	0.00	0.00	0.50	0.50
Sat Flow, veh/h	9	20	1542	1063	816	816	1810	1792	0	0	1722	18
Grp Volume(v), veh/h	329	0	0	130	0	10	167	1010	0	0	0	695
Grp Sat Flow(s),veh/h/ln	1571	0	0	1063	0	1632	1810	1792	0	0	0	1739
Q Serve(g_s), s	2.1	0.0	0.0	3.9	0.0	0.4	3.7	42.6	0.0	0.0	0.0	29.0
Cycle Q Clear(g_c), s	17.1	0.0	0.0	21.0	0.0	0.4	3.7	42.6	0.0	0.0	0.0	29.0
Prop In Lane	0.02		0.98	1.00		0.50	1.00		0.00	0.00		0.01
Lane Grp Cap(c), veh/h	311	0	0	175	0	417	252	1119	0	0	0	870
V/C Ratio(X)	1.06	0.00	0.00	0.74	0.00	0.02	0.66	0.90	0.00	0.00	0.00	0.80
Avail Cap(c_a), veh/h	458	0	0	223	0	414	333	1177	0	0	0	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	32.3	0.0	0.0	38.2	0.0	25.2	19.8	16.2	0.0	0.0	0.0	19.6
Incr Delay (d2), s/veh	53.8	0.0	0.0	9.5	0.0	0.0	3.0	9.5	0.0	0.0	0.0	4.8
Initial Q Delay(d3),s/veh	102.4	0.0	0.0	22.9	0.0	4.2	0.0	23.6	0.0	0.0	0.0	10.6
%ile BackOfQ(50%),veh/ln	22.4	0.0	0.0	5.3	0.0	1.7	3.3	36.0	0.0	0.0	0.0	20.0
LnGrp Delay(d),s/veh	188.5	0.0	0.0	70.7	0.0	29.5	22.8	49.3	0.0	0.0	0.0	35.0
LnGrp LOS	F			E		C	C	D				C
Approach Vol, veh/h		329			140			1177				695
Approach Delay, s/veh		188.5			67.7			45.5				35.0
Approach LOS		F			E			D				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		58.8		28.0	10.6	48.2		28.0				
Change Period (Y+Rc), s		5.0		* 6	5.0	5.0		6.0				
Max Green Setting (Gmax), s		57.0		* 23	6.0	46.0		22.0				
Max Q Clear Time (g_c+I1), s		44.6		19.1	5.7	31.0		23.0				
Green Ext Time (p_c), s		9.2		1.0	0.0	10.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				63.8								
HCM 2010 LOS				E								
Notes												

Lanes, Volumes, Timings
14: Route 138 & Brush Hill Rd.

10/03/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	370	140	5	5	90	790	0	0	770	0
Future Volume (vph)	15	0	370	140	5	5	90	790	0	0	770	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.870			0.925							
Flt Protected		0.998		0.950			0.950					
Satd. Flow (prot)	0	1413	0	1546	1441	0	1561	1580	0	0	1565	0
Flt Permitted		0.992		0.321			0.104					
Satd. Flow (perm)	0	1405	0	522	1441	0	171	1580	0	0	1565	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		986			278			267			2293	
Travel Time (s)		22.4			6.3			5.2			44.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	1%	1%	3%	8%	0%	4%	2%	2%	5%	0%
Adj. Flow (vph)	15	0	381	144	5	5	93	814	0	0	794	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	396	0	144	10	0	93	814	0	0	794	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			11			11	
Link Offset(ft)		-3			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2				2
Detector Template	Left	Thru		Left	Thru		Left	Thru				Thru
Leading Detector (ft)	20	100		20	100		20	100				100
Trailing Detector (ft)	0	0		0	0		0	0				0
Detector 1 Position(ft)	0	0		0	0		0	0				0
Detector 1 Size(ft)	20	6		20	6		20	6				6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA				NA
Protected Phases		4			8		5	2				6
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		5	2				6
Switch Phase												

Lanes, Volumes, Timings
14: Route 138 & Brush Hill Rd.

10/03/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		9.5	45.0			45.0	
Total Split (s)	31.0	31.0		31.0	31.0		9.5	59.0			49.5	
Total Split (%)	34.4%	34.4%		34.4%	34.4%		10.6%	65.6%			55.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		5.0	53.0			43.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.5	5.0			5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0		4.5	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Recall Mode	None	None		None	None		None	None			None	
Act Effct Green (s)		26.1		26.1	26.1		52.5	51.0			43.6	
Actuated g/C Ratio		0.30		0.30	0.30		0.60	0.58			0.49	
v/c Ratio		0.95		0.94	0.02		0.52	0.89			1.03	
Control Delay		67.6		93.2	23.3		17.8	30.1			64.1	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		67.6		93.2	23.3		17.8	30.1			64.1	
LOS		E		F	C		B	C			E	
Approach Delay		67.6			88.6			28.8			64.1	
Approach LOS		E			F			C			E	
90th %ile Green (s)	26.0	26.0		26.0	26.0		5.0	53.0			43.5	
90th %ile Term Code	Max	Max		Max	Max		Max	Max			Max	
70th %ile Green (s)	26.0	26.0		26.0	26.0		5.0	53.0			43.5	
70th %ile Term Code	Max	Max		Max	Max		Max	Max			Max	
50th %ile Green (s)	26.0	26.0		26.0	26.0		5.0	53.0			43.5	
50th %ile Term Code	Max	Max		Max	Max		Max	Max			Max	
30th %ile Green (s)	26.0	26.0		26.0	26.0		5.0	53.0			43.5	
30th %ile Term Code	Max	Max		Max	Max		Max	Hold			Max	
10th %ile Green (s)	26.0	26.0		26.0	26.0		0.0	43.5			43.5	
10th %ile Term Code	Max	Max		Max	Max		Skip	Hold			Max	
Stops (vph)		320		110	9		36	622			618	
Fuel Used(gal)		10		4	0		1	11			27	
CO Emissions (g/hr)		700		249	8		54	772			1919	
NOx Emissions (g/hr)		136		49	2		10	150			373	
VOC Emissions (g/hr)		162		58	2		12	179			445	
Dilemma Vehicles (#)		0		0	0		0	39			39	
Queue Length 50th (ft)		222		80	4		20	362			~497	
Queue Length 95th (ft)		#406		#199	16		41	#639			#717	
Internal Link Dist (ft)		906			198			187			2213	
Turn Bay Length (ft)												
Base Capacity (vph)		415		154	426		180	952			774	
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		0.95		0.94	0.02		0.52	0.86			1.03	

Intersection Summary

Lanes, Volumes, Timings
 14: Route 138 & Brush Hill Rd.

10/03/2018



















Area Type:	Other		
Cycle Length:	90		
Actuated Cycle Length:	88.1		
Natural Cycle:	100		
Control Type:	Actuated-Uncoordinated		
Maximum v/c Ratio:	1.03		
Intersection Signal Delay:	52.2	Intersection LOS:	D
Intersection Capacity Utilization	103.1%	ICU Level of Service	G
Analysis Period (min)	15		
90th %ile Actuated Cycle:	90		
70th %ile Actuated Cycle:	90		
50th %ile Actuated Cycle:	90		
30th %ile Actuated Cycle:	90		
10th %ile Actuated Cycle:	80.5		
~ 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: 14: Route 138 & Brush Hill Rd.





















HCM 2010 Signalized Intersection Summary
 14: Route 138 & Brush Hill Rd.

10/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	370	140	5	5	90	790	0	0	770	0
Future Volume (veh/h)	15	0	370	140	5	5	90	790	0	0	770	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	20	0	10	10	0	0	10	0	0	40	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1684	1700	1683	1611	1700	1700	1635	0	0	1619	1700
Adj Flow Rate, veh/h	15	0	381	144	5	5	93	814	0	0	794	0
Adj No. of Lanes	0	1	0	1	1	0	1	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	1	3	3	0	4	0	0	5	5
Cap, veh/h	42	9	280	156	382	196	161	960	0	0	791	0
Arrive On Green	0.29	0.00	0.29	0.29	0.29	0.29	0.05	0.59	0.00	0.00	0.49	0.00
Sat Flow, veh/h	24	30	1381	1008	740	740	1619	1635	0	0	1619	0
Grp Volume(v), veh/h	396	0	0	144	0	10	93	814	0	0	794	0
Grp Sat Flow(s),veh/h/ln	1435	0	0	1008	0	1481	1619	1635	0	0	1619	0
Q Serve(g_s), s	9.8	0.0	0.0	1.8	0.0	0.4	2.4	36.7	0.0	0.0	43.5	0.0
Cycle Q Clear(g_c), s	24.2	0.0	0.0	26.0	0.0	0.4	2.4	36.7	0.0	0.0	43.5	0.0
Prop In Lane	0.04		0.96	1.00		0.50	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	271	0	0	156	0	433	161	960	0	0	791	0
V/C Ratio(X)	1.46	0.00	0.00	0.92	0.00	0.02	0.58	0.85	0.00	0.00	1.00	0.00
Avail Cap(c_a), veh/h	459	0	0	176	0	430	171	968	0	0	787	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	29.1	0.0	0.0	38.7	0.0	23.5	20.9	16.1	0.0	0.0	23.0	0.0
Incr Delay (d2), s/veh	223.0	0.0	0.0	44.1	0.0	0.0	4.2	7.1	0.0	0.0	32.8	0.0
Initial Q Delay(d3),s/veh	155.0	0.0	0.0	197.5	0.0	3.9	0.0	5.1	0.0	0.0	166.7	0.0
%ile BackOfQ(50%),veh/ln	43.5	0.0	0.0	14.3	0.0	1.6	1.4	21.5	0.0	0.0	66.8	0.0
LnGrp Delay(d),s/veh	407.1	0.0	0.0	280.2	0.0	27.4	25.1	28.4	0.0	0.0	222.5	0.0
LnGrp LOS	F			F		C	C	C			F	
Approach Vol, veh/h		396			154			907			794	
Approach Delay, s/veh		407.1			263.8			28.0			222.5	
Approach LOS		F			F			C			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		58.5		31.0	9.0	49.5		31.0				
Change Period (Y+Rc), s		6.0		5.0	4.5	6.0		5.0				
Max Green Setting (Gmax), s		53.0		26.0	5.0	43.5		26.0				
Max Q Clear Time (g_c+I1), s		38.7		26.2	4.4	45.5		28.0				
Green Ext Time (p_c), s		9.3		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			179.4									
HCM 2010 LOS			F									
Notes												

Lanes, Volumes, Timings
14: Route 138 & Brush Hill Rd.

10/03/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	330	170	10	5	170	850	0	0	770	5
Future Volume (vph)	5	0	330	170	10	5	170	850	0	0	770	5
Ideal Flow (vphp)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Storage Length (ft)	0		0	0		0	200		0	0		0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (ft)	0			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.867			0.953							0.999
Flt Protected		0.999		0.950			0.950					
Satd. Flow (prot)	0	1423	0	1546	1505	0	1561	1611	0	0	1610	0
Flt Permitted		0.998		0.340			0.087					
Satd. Flow (perm)	0	1422	0	553	1505	0	143	1611	0	0	1610	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35				35
Link Distance (ft)		986			278			267				2293
Travel Time (s)		22.4			6.3			5.2				44.7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	0%	13%	0%	2%	2%	2%	2%	0%
Adj. Flow (vph)	5	0	347	179	11	5	179	895	0	0	811	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	352	0	179	16	0	179	895	0	0	816	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			11				11
Link Offset(ft)		-3			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2				2
Detector Template	Left	Thru		Left	Thru		Left	Thru				Thru
Leading Detector (ft)	20	100		20	100		20	100				100
Trailing Detector (ft)	0	0		0	0		0	0				0
Detector 1 Position(ft)	0	0		0	0		0	0				0
Detector 1 Size(ft)	20	6		20	6		20	6				6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA				NA
Protected Phases		4			8		5	2				6

Lanes, Volumes, Timings
 14: Route 138 & Brush Hill Rd.

10/03/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		5	2				6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0				10.0
Minimum Split (s)	20.0	20.0		20.0	20.0		9.5	45.0				45.0
Total Split (s)	30.0	30.0		30.0	30.0		10.0	60.0				50.0
Total Split (%)	33.3%	33.3%		33.3%	33.3%		11.1%	66.7%				55.6%
Maximum Green (s)	25.0	25.0		25.0	25.0		5.5	54.0				44.0
Yellow Time (s)	4.0	4.0		4.0	4.0		3.5	5.0				5.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0				1.0
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0				0.0
Total Lost Time (s)		5.0		5.0	5.0		4.5	6.0				6.0
Lead/Lag							Lead					Lag
Lead-Lag Optimize?							Yes					Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0
Recall Mode	None	None		None	None		None	None				None
Act Effect Green (s)		25.0		25.0	25.0		55.5	54.0				44.0
Actuated g/C Ratio		0.28		0.28	0.28		0.62	0.60				0.49
v/c Ratio		0.89		1.17	0.04		1.03	0.93				1.04
Control Delay		57.9		158.9	24.2		96.3	33.8				66.9
Queue Delay		0.0		0.0	0.0		0.0	0.0				0.0
Total Delay		57.9		158.9	24.2		96.3	33.8				66.9
LOS		E		F	C		F	C				E
Approach Delay		57.9			147.9			44.3				66.9
Approach LOS		E			F			D				E
90th %ile Green (s)	25.0	25.0		25.0	25.0		5.5	54.0				44.0
90th %ile Term Code	Max	Max		Max	Max		Max	Max				Max
70th %ile Green (s)	25.0	25.0		25.0	25.0		5.5	54.0				44.0
70th %ile Term Code	Max	Max		Max	Max		Max	Max				Max
50th %ile Green (s)	25.0	25.0		25.0	25.0		5.5	54.0				44.0
50th %ile Term Code	Max	Max		Max	Max		Max	Max				Max
30th %ile Green (s)	25.0	25.0		25.0	25.0		5.5	54.0				44.0
30th %ile Term Code	Max	Max		Max	Max		Max	Hold				Max
10th %ile Green (s)	25.0	25.0		25.0	25.0		5.5	54.0				44.0
10th %ile Term Code	Hold	Hold		Max	Max		Max	Hold				Max
Stops (vph)		288		127	12		72	671				639
Fuel Used(gal)		8		7	0		4	13				28
CO Emissions (g/hr)		566		459	12		294	877				1970
NOx Emissions (g/hr)		110		89	2		57	171				383
VOC Emissions (g/hr)		131		106	3		68	203				457
Dilemma Vehicles (#)		0		0	0		0	41				39
Queue Length 50th (ft)		192		~122	7		~57	421				~505
Queue Length 95th (ft)		#352		#250	22		#191	#719				#727
Internal Link Dist (ft)		906			198			187				2213
Turn Bay Length (ft)							200					
Base Capacity (vph)		395		153	418		174	966				787
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

Lanes, Volumes, Timings
 14: Route 138 & Brush Hill Rd.

10/03/2018

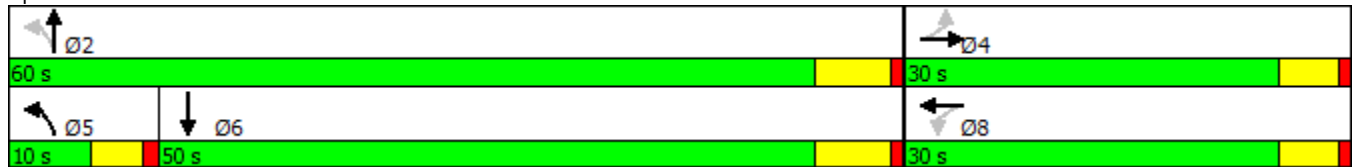


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.89		1.17	0.04		1.03	0.93			1.04	

Intersection Summary



















Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Natural Cycle:	130
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.17
Intersection Signal Delay:	62.1
Intersection LOS:	E
Intersection Capacity Utilization:	106.9%
ICU Level of Service:	G
Analysis Period (min):	15
90th %ile Actuated Cycle:	90
70th %ile Actuated Cycle:	90
50th %ile Actuated Cycle:	90
30th %ile Actuated Cycle:	90
10th %ile Actuated Cycle:	90
~ 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: 14: Route 138 & Brush Hill Rd.



HCM 2010 Signalized Intersection Summary
 14: Route 138 & Brush Hill Rd.

10/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	330	170	10	5	170	850	0	0	770	5
Future Volume (veh/h)	5	0	330	170	10	5	170	850	0	0	770	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	15	0	5	5	0	5	5	0	0	20	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1700	1700	1683	1634	1700	1700	1667	0	0	1667	1700
Adj Flow Rate, veh/h	5	0	347	179	11	5	179	895	0	0	811	5
Adj No. of Lanes	0	1	0	1	1	0	1	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	0	0	0	2	0	0	2	2
Cap, veh/h	41	4	316	150	406	128	179	1000	0	0	811	2
Arrive On Green	0.28	0.00	0.28	0.28	0.28	0.28	0.06	0.60	0.00	0.00	0.49	0.49
Sat Flow, veh/h	6	15	1427	1040	1064	484	1619	1667	0	0	1655	10
Grp Volume(v), veh/h	352	0	0	179	0	16	179	895	0	0	0	816
Grp Sat Flow(s),veh/h/ln	1447	0	0	1040	0	1548	1619	1667	0	0	0	1665
Q Serve(g_s), s	3.1	0.0	0.0	4.1	0.0	0.7	5.5	41.8	0.0	0.0	0.0	44.0
Cycle Q Clear(g_c), s	20.9	0.0	0.0	25.0	0.0	0.7	5.5	41.8	0.0	0.0	0.0	44.0
Prop In Lane	0.01		0.99	1.00		0.31	1.00		0.00	0.00		0.01
Lane Grp Cap(c), veh/h	327	0	0	150	0	431	179	1000	0	0	0	815
V/C Ratio(X)	1.08	0.00	0.00	1.19	0.00	0.04	1.00	0.89	0.00	0.00	0.00	1.00
Avail Cap(c_a), veh/h	443	0	0	197	0	430	179	1000	0	0	0	814
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	30.9	0.0	0.0	39.2	0.0	24.1	23.8	16.0	0.0	0.0	0.0	23.0
Incr Delay (d2), s/veh	62.9	0.0	0.0	128.8	0.0	0.0	67.4	10.5	0.0	0.0	0.0	32.0
Initial Q Delay(d3),s/veh	139.3	0.0	0.0	93.9	0.0	1.0	100.6	1.7	0.0	0.0	0.0	86.9
%ile BackOfQ(50%),veh/ln	28.8	0.0	0.0	14.1	0.0	0.9	12.8	23.3	0.0	0.0	0.0	47.4
LnGrp Delay(d),s/veh	233.1	0.0	0.0	261.9	0.0	25.2	191.8	28.2	0.0	0.0	0.0	141.8
LnGrp LOS	F			F		C	F	C				F
Approach Vol, veh/h		352			195			1074				816
Approach Delay, s/veh		233.1			242.4			55.5				141.8
Approach LOS		F			F			E				F
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		60.0		30.0	10.0	50.0		30.0				
Change Period (Y+Rc), s		6.0		5.0	4.5	6.0		5.0				
Max Green Setting (Gmax), s		54.0		25.0	5.5	44.0		25.0				
Max Q Clear Time (g_c+I1), s		43.8		22.9	7.5	46.0		27.0				
Green Ext Time (p_c), s		7.6		0.7	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			125.0									
HCM 2010 LOS			F									

Appendix G: Survey Comments

Part 1: Common comments encountered in the Milton Complete Streets Prioritization Plan at wikimapping.com

Part 2: Significant free-response feedback for one or more questions

**Part 1: Common Comments Encountered
in the Milton Complete Streets
Prioritization Plan at Wikimapping.com**

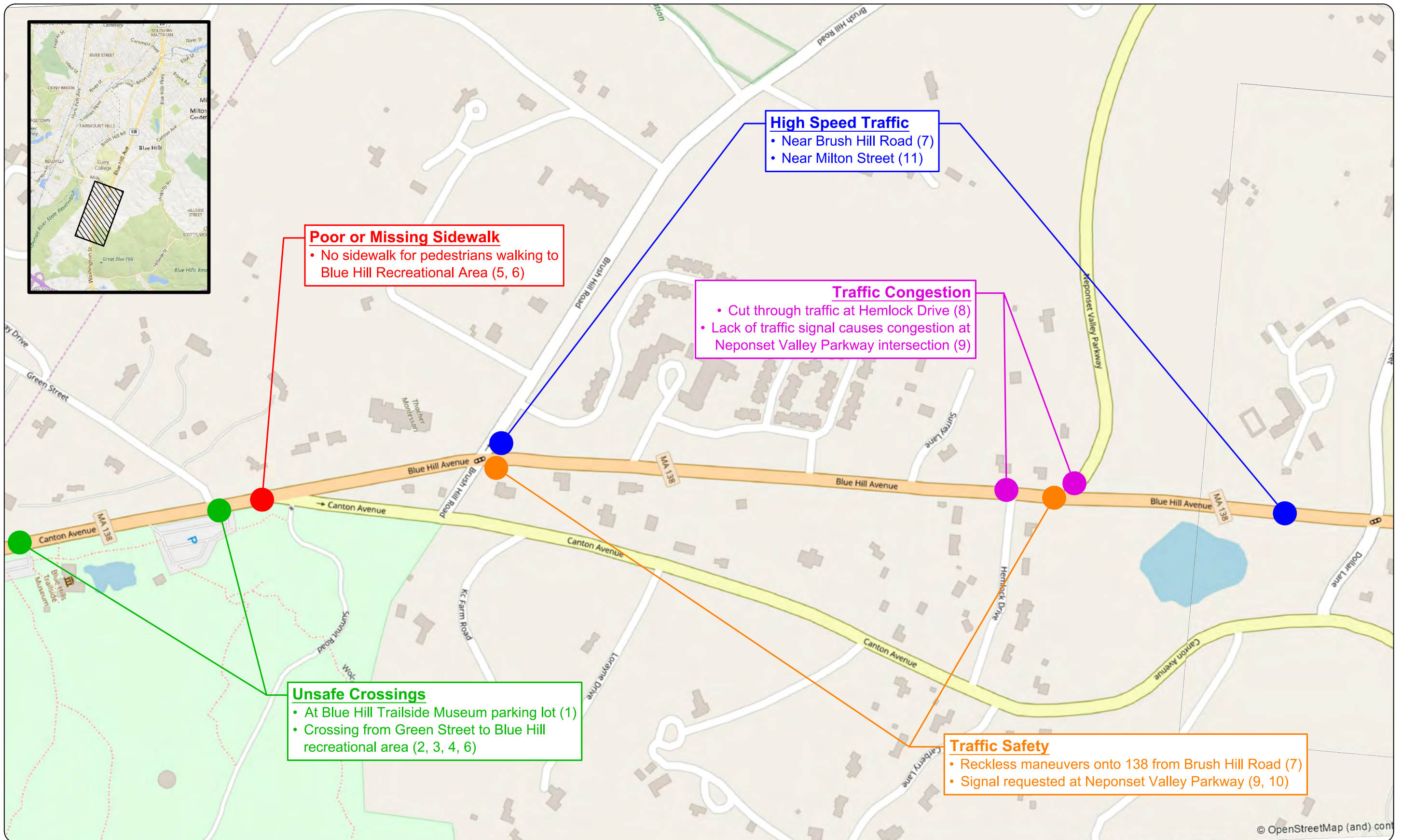


Figure G-1
Wikimap Issues
Route 138 Priority Corridor Study in Milton

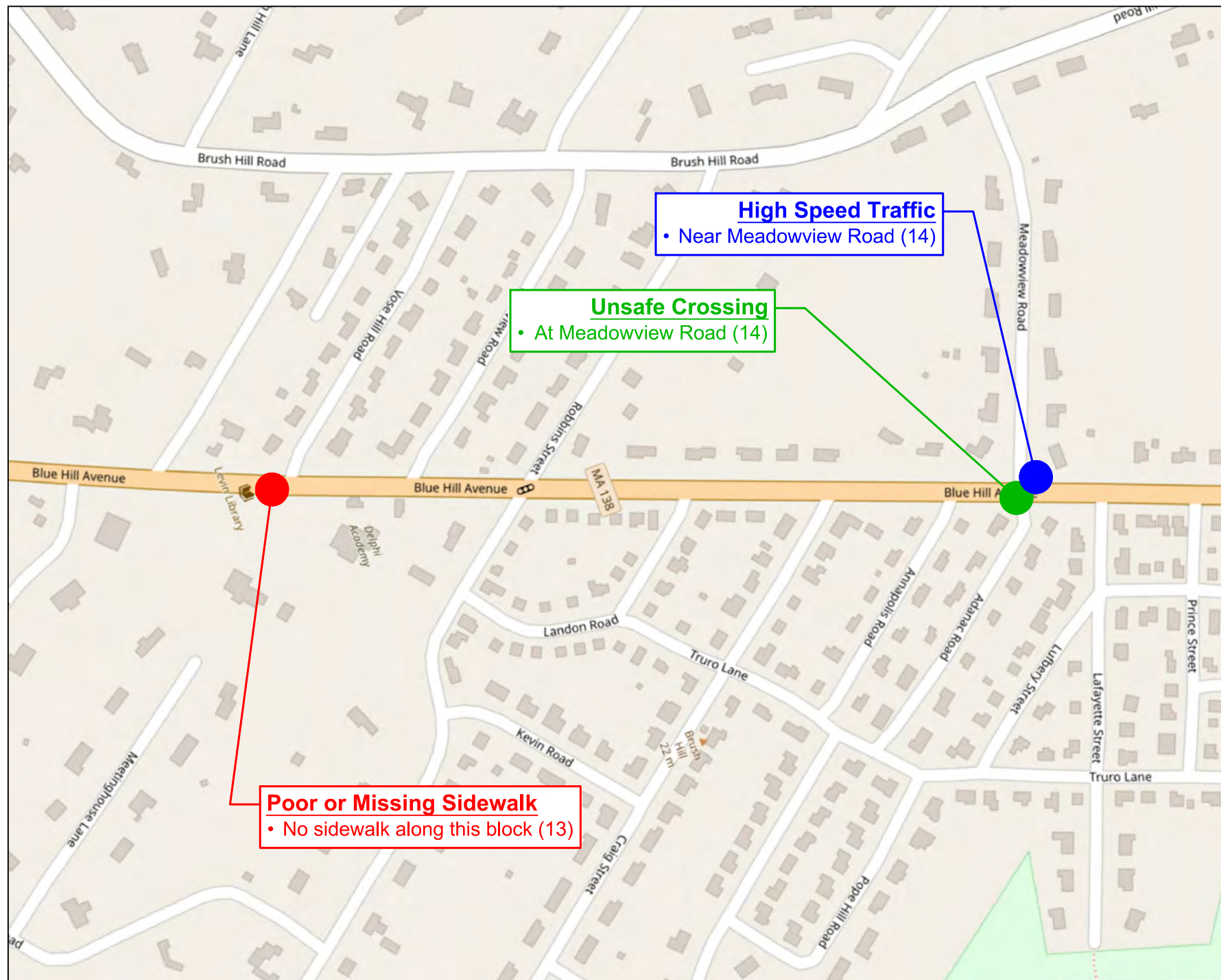
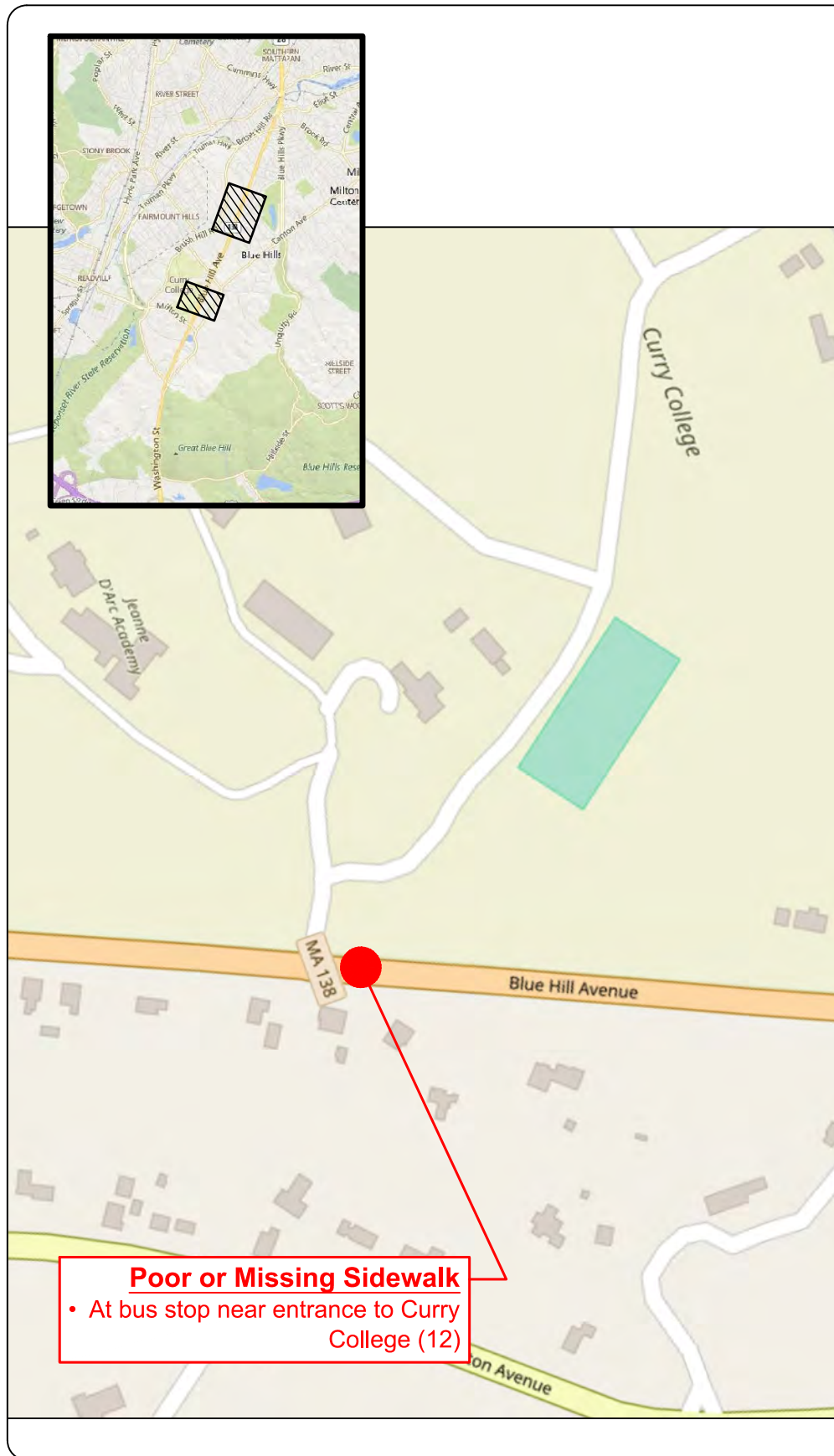


Figure G-2
Wikimap Issues
Route 138 Priority Corridor Study in Milton

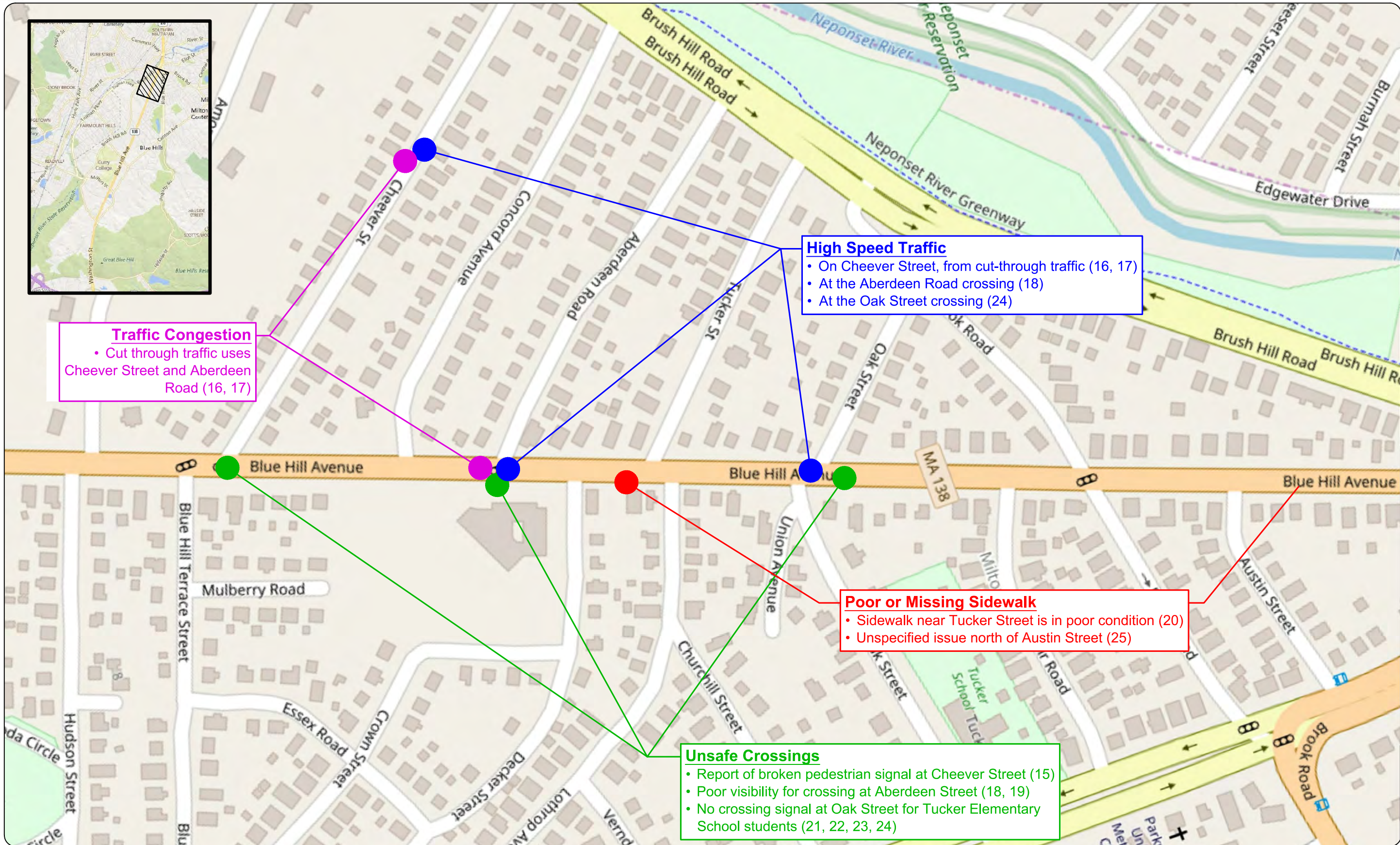


Figure G-3
Wikimap Issues
Route 138 Priority Corridor Study in Milton

Part 2: Significant Free-Response Feedback for Questions

Survey #6 (3/22/2018)
8. Mattapan square (end of new neponset river greenway trail) to southbound rt 138 is very difficult and dangerous to navigate by bike. Signals are poorly timed, and trying to use the ped crossings brings bikes in direct conflict with high speed traffic.
Survey #10 (3/22/2018)
8. Brush hill road at robbins the wait time too long at light
Survey #13 (3/22/2018)
7. More frequent/better trash collection; better enforcement of littering laws
Survey #15 (3/22/2018)
8. I would like to see the royal street traffic stop backing up rt138 southbound traffic. One royal st car can stop a line of traffic for too much time. Let royal st wait like everyone else.
Survey #16 (3/22/2018)
4. Poor street lighting definitely #1, sidewalks in poor condition #2
Survey #18 (3/22/2018)
1. I would also be a cyclist on 138 if it felt safer.
Survey #20 (3/22/2018)
3. People come up on the right and it is not even a lane 6. I feel it has become a highway. Also need to install "don't block the box". Too many cars sit in the middle of an intersection when traffic is heavy
Survey #24 (3/22/2018)
8. Protect bike lanes on the whole corridor! So many people bike down this route to get to the blue hills. It is dangerous.
Survey #29 (3/22/2018)
2. Speed is a problem. Taking a turn is hair raising and you feel like you're going to be rear ended. 3. Poorly marked, people not knowing what lanes to me on coming out of mattapan.

Survey #32 (3/22/2018)
3. Poor sight distance on the hilltops only. Aggressive drivers pass in the shoulder and the double yellow line. 4. Sidewalks are lacking in the southern area, where people walk or bike to curry college. Sidewalks would help for their runners, too. Knotweed grows and blocks the shoulder between curry college and milton st. 5. I bike on route 138, but i try to avoid the area north of churchill st because of all the parked cars and the narrow road. 6. The i-93 interchange in canton, with its high-speed ramps is most in need of complete streets improvements. Elsewhere please reduce vehicle speeds or use separated bike-ped facilities. 7. Some drivers pass in the wide shoulders, please change the road to discourage this. A left turn lane to neponset valley pkwy would be helpful, but please do not eliminate the bike lane / shoulder. 8. Please add a signalized crosswalk and curb bumpouts at oak street for children going to tucker school. Consider lowering the speed limit north of blue hill terrace street and making the speed limits consistent south of there (varies between 35 and 45). A sidewalk or shared-use path would be preferred between blue hill terrace and robbins. North of blue hill terrace, if good bike lanes are not possible, consider wayfinding signage to direct bicyclists to blue hills parkway bike lanes.
Survey #39 (3/22/2018)
3. Bicycle accommodations too meager. Need separated lanes. Also keep speed limit one speed entire stretch. Stupid to go 35, 45, 40 all in the stretch. 35 is fine with timed lights.
Survey #40 (3/22/2018)
7. Police presence at tucker school drop off and pick up. Crossing guard only responsible for crossing. Cars speed, drive on the wrong side of the road to avoid waiting for cars to turn on to oak street. 8. "oak street during tucker school drop off and pick up.
Survey #43 (3/22/2018)
6. After 4pm, it typically takes 25 minutes to travel less than 2 miles; from bradley rd to route 95!
Survey #46 (3/22/2018)
5. It's clear after living here for 35 years that milton is the cut through capital. People speed to cut through milton.

<p>Survey #66 (3/23/2018)</p> <p>1. I would like to be a bike rider but the road feels unsafe for bikes.</p>
<p>Survey #76 (3/23/2018)</p> <p>8. The traffic jams on the road start at 230pm and continue until 630pm "€making the road almost impossible to use without massive waiting time in traffic.</p>
<p>Survey #78 (3/23/2018)</p> <p>8. The section between royale and canton ave is part of a very popular bike route and should be of immediate concern. I am a member of the blue hills cycling club and ride that section several times per week and feel like a dedicated (with physical barriers) bike lane on the ski resort side of street would significantly increase safety</p>
<p>Survey #85 (3/23/2018)</p> <p>3. Congestion from poorly configured student drop off at tucker in am. Back up to valentine road some days.</p> <p>8. Regulation sidewalks the length of the road. Dedicated bike lanes the length of the road. Reduce congestion at signals due to poorly configured lights. Fix tucker school drop off so it does not have a major impact on traffic</p>
<p>Survey #89 (3/23/2018)</p> <p>8. It is extremely frustrating for all involved pedestrians cyclists and drivers alike become frustrated with each other for the above reasons it's tough to share the road when we are all lacking in space pedestrians are definitely not accommodated especially near the blue hill area</p>
<p>Survey #90 (3/23/2018)</p> <p>8. Slow down traffic. When i pull out of my street (pagoda street) cars are often traveling very fast. Fortunate to have blue hill terrace light nearby, but traffic coming inbound to boston travels very fast.</p>
<p>Survey #95 (3/23/2018)</p> <p>3. The long wait is at the signals trying to get onto 138.</p> <p>4. Cars usually drive to the right of the white line.</p> <p>7. Normally, when they say they are going to make it safer, it usually has the opposite effect. (see intersection at canton ave and brook rd.) Be sure to keep safety vehicles in mind when planning any changes.</p> <p>8. At the end of vose hill rd, there must be some kind of bend in the road where vehicles always seem to crowd the side of the road where i'm walking.</p>

<p>Survey #96 (3/23/2018)</p> <p>4. Student's safety walking to school, and crossing 138. There are guards on the parkway for high school and middle school students, but none for 138.</p> <p>6. "the study should include how traffic on brush hill/ truman hwy affect 138. Many high park residents zoom through this corridor. As a resident of cheever street i monitor this activity and have some specific suggestions to remedy some of this behavior.</p>
<p>Survey #98 (3/23/2018)</p> <p>4. I won't walk on route 138 with my children and very rarely with my dog. Also there is a ridiculous amount of trash along the side of the road.</p> <p>7. To me it is unacceptable that it is not possible to walk on that road safely.</p>
<p>Survey #113 (3/23/2018)</p> <p>8. Don't know how anyone would dare walk along here; it is far too dangerous. Cycling is possible as most of blue hill ave has pretty good width for cycle lane, but safety could be improved tremendously as noted above.</p>
<p>Survey #114 (3/23/2018)</p> <p>8. Fix left hand turn only out of parking lot at ski mountain. And left hand only lane to turn in.</p>
<p>Survey #115 (3/23/2018)</p> <p>7. Even with a bike lane, i would not bike on that road. Drivers don't comply with keeping clear of bike lanes. Would bike on wide sidewalk</p>
<p>Survey #119 (3/23/2018)</p> <p>8. Fix the lane leaving the ski mountain when you leave that you can only turn right and then on the entrance when you're trying to turn left into the parking lot make a left turn only lane.</p>
<p>Survey #121 (3/23/2018)</p> <p>7. Ban bicycles for everyone's safety. The road is too narrow with too much traffic.</p>
<p>Survey #122 (3/23/2018)</p> <p>3. Delays at blue hill ave/ brush hill rd, due to thacher montessori school start & end, blocking blue hill ave due to no access from brush hill rd, which would be safer for students & ease congestion on 138, which back traffic all the way down 138 towards mattapan sq</p>

<p>Survey #124 (3/23/2018)</p> <p>3. Cars backed up going into thatcher montessori sometimes</p>
<p>Survey #125 (3/23/2018)</p> <p>3. Drivers ignoring the yellow and red lights. And the trucks going to fast</p> <p>8. Lights at brush hill and also at robbins streets need more enforcement.</p>
<p>Survey #128 (3/23/2018)</p> <p>3. Wish we had two lines on blue hill instead of one. Kind of like randolph ave</p>
<p>Survey #129 (3/23/2018)</p> <p>3. High volume at peak traffic times only-morning and evening commutes and when day care is getting out.</p> <p>4. I do not bike or walk rte 138 because it is so dangerous for bicyclists and pedestrians. I checked the above boxes because when i see a pedestrian or bicyclist i know how insufficient the road is for them.</p>
<p>Survey #131 (3/23/2018)</p> <p>3. I actually don't experience problems on the small part i use; typically the signal at blue hill terrace, cutting across to cheever.</p>
<p>Survey #134 (3/23/2018)</p> <p>4. When making a left turn onto 138 southbound from brush hill road (canton ave side), there is no left turn arrow or concessions for bikes, so i'm often turning into traffic making a right turn from the opposite direction. Also, there are a lot of drivers that run that red light on 138 which makes pulling out dangerous.</p> <p>5. I still ride on 138, but generally its a meas to an end (better riding on canton ave, green st, hillside, etc...)</p>
<p>Survey #137 (3/23/2018)</p> <p>3. Merging from 2 lanes into one northbound from rt128 there is no merge sign. Very dangerous.</p> <p>7. Merge sign northbound going from 2 lanes into one.</p> <p>8. Needmerge sign northbound from 128 from 2 lanes into 1</p>

<p>Survey #140 (3/23/2018)</p> <p>8. Neponset valley pkwy intersection during peak times is dangerous , as those going onto or coming from neponset are very aggressive entering and exiting. Perhaps an officer directing traffic orr and onto 138? Also light at 138/canton ave/brush hill rd back up heading to 95 during afternoon commute.</p>
<p>Survey #141 (3/23/2018)</p> <p>3. Biggest problem are the intersections - congestion at them and the people turning from side streets don't abide by the turn on red rules. They think they can merge into slow moving oncoming traffic when in fact the turn on red rule is that you can stop and turn on red if nothing is coming.</p> <p>4. I've walked on 138 a few times but won't do it unless there is a side walk.</p>
<p>Survey #144 (3/23/2018)</p> <p>2. Between milton st and bradlee rd/atherton st. The curry college entrance is particularly dangerous.</p> <p>3. Safety concerns with the entering and exiting out of curry college on 138.</p> <p>6. Between milton st and bradlee rd/atherton st. The curry college entrance is particularly dangerous.</p> <p>8. Deal with the congestion, make it safer for people to walk from robbins to blue hill river rd</p>
<p>Survey #148 (3/23/2018)</p> <p>3. Coming from direction of robbins and moving towards 128, i'm always wary of the rise that happens at coulter and worry about any pedestrian/cyclist that might be just over the rise.</p> <p>8. For me it's mostly about sidewalks. Even for the areas that have a useable shoulder, i do not trust the drivers to not veer into them and feel that a sidewalk is the only way that i would let my kids ride bikes/walk on this road. Even the short sections that i run along, i'm very mindful of the speed and aggressive nature of the traffic and never trust drivers. I'm happy to hear of this study and look forward to changes.</p>
<p>Survey #150 (3/23/2018)</p> <p>4. I do a lot of running on rt. 138 between neponset and mattapan sq and to be fair find it very easy to navigate. Wide shoulders where there are no sidewalks and sidewalks where there are no shoulders.</p>

<p>Survey #153 (3/23/2018)</p> <p>1. Homeowner with a driveway that has an entrance/exit on blue hill ave/rt138</p> <p>3. Not quite congestion, but high volume northbound at morning drivetime and southbound evening drivetime, which makes drivers more aggressive and creates dangerous conditions for entering and exiting sidestreets.</p> <p>5. With lack of sidewalks or sidewalks only on one side of roadway, pedestrians are forced to either walk on roadway or make crossings. Frequency of aggressive drivers in travel lane passing slower cars by using the curbside/parking(or in many cases walking or bicycling)lane to pass illegally on the right creating a major danger for anyone who might be in that lane because of lack of sidewalks</p>
<p>Survey #155 (3/23/2018)</p> <p>8. Physical barriers separating motor vehicles from pedestrians & bicyclists would allow cars and trucks to maintain high speed and everyone to maintain safety. Painting a picture of a bicycle on a road just puts bikers in danger. There needs to be jersey barrier walls or pylons separating car lanes and bike lanes.</p>
<p>Survey #160 (3/23/2018)</p> <p>2. "pedestrian and cycling from robbins towards boston</p>
<p>Survey #162 (3/23/2018)</p> <p>8. Turns into some driveways and side streets are too sharp, this makes for some quick crazy turns or the risk of being rear-ended</p>
<p>Survey #163 (3/23/2018)</p> <p>8. I know it's not the most important thing, but it's really unpleasant to walk along 138 because of all of the trash/litter.</p>
<p>Survey #165 (3/23/2018)</p> <p>8. "1/ sidewalks between valentine and amor road on other side so kids can safely walk to school and all can walk safely to the train station in mattapan</p>
<p>Survey #168 (3/23/2018)</p> <p>8. 138 n near the blue hills is heavily congested and entering form the side streets is nearly impossible</p>
<p>Survey #171 (3/23/2018)</p> <p>8. Better lighting, traffic light coordination, sidewalks and and bike/run/walk lanes would be a huge improvement! We have many kids that use 138 to get home and many live on the other side of 138. There are no cross walks between blue hills terrace and robbins street and is virtually impossible to cross. Our children are at risk on a daily basis.</p>

<p>Survey #175 (3/23/2018)</p> <p>8. I consider 138 a highway, so i'm not sure adding bike lanes is such a good idea. Cyclists should be encouraged to take canton ave or brush hill road, which run parallel to 138. Adding turning lanes and second lanes at certain points would be a better use of resources.</p>
<p>Survey #177 (3/23/2018)</p> <p>2. Brush hill intersects 138 in 2 locations: just over the mattapan bridge & just before trailside.</p> <p>3. Poor sight distance just at the firehouse, where that firefighter was so terribly injured.</p> <p>8. "nerve-wracking to take left into trailside parking lot.</p>
<p>Survey #181 (3/23/2018)</p> <p>8. Designated bike lane markers on the existing shoulders. The road isms already wide enough. Law enforcement speed trap/write more speed tickets. I have never seen a police car positioned to monitor speed.</p>
<p>Survey #183 (3/23/2018)</p> <p>6. Cars and trucks ignore the yellow and red lights on 138</p> <p>7. More policing is needed to slow down the 18 wheelers and the cars that ignore the traffic lights and the speed limits</p>
<p>Survey #187 (3/23/2018)</p> <p>3. The 18 wheelers and other trucks. They go fast down blue hill specifically between oak street and brook road. Pot holes don't help at night it sounds like the trucks are coming into our house as they go over the pot holes/dips in the street</p> <p>8. Speeding and passing from the start of 138 after mattapan all the way up 138 pass the church. Specifically in front of our house always congested with traffic the trucks (18 wheelers) speed heavily and people are so impatient i get scared they will crash in our yard.</p>
<p>Survey #189 (3/23/2018)</p> <p>3. When trying to turn onto 138 from side streets, there are often cars parked on 138 which makes seeing oncoming vehicles very difficult.</p> <p>7. Restrict street parking to reduce blind intersections.</p>

<p>Survey #196 (3/23/2018)</p> <p>3. Milton street intersection must have a "no turn on red" sign. It used to. There is one for the opposite side of the intersection (dollar lane).</p> <p>4. The entire area around route 138 should have sidewalks. No walk light at milton street/rte 138 intersection.</p> <p>8. "1. No turn on red sign installed at milton street intersection with rte 138.</p>
<p>Survey #201 (3/23/2018)</p> <p>3. Too much development in milton leading to crowding, crime, litter</p>
<p>Survey #204 (3/23/2018)</p> <p>8. Speeding on side streets by people cutting through from brush hill to 138. Very dangerous for children and people pulling out of driveways on vose hill rd and hillside rd</p>
<p>Survey #205 (3/23/2018)</p> <p>3. I would like a bike path physically separated from cars</p>
<p>Survey #208 (3/23/2018)</p> <p>2. Only between blue hills terrace and decker street.</p> <p>3. Haven't had any problems in the short distance that i sometimes drive.</p> <p>4. I don't have any problems but i worry about the families that park on blue hill avenue to attend our school (the campbell school in the concord baptist church).</p> <p>5. I only walk to the mailbox in front of the building. No problems.</p>
<p>Survey #211 (3/23/2018)</p> <p>8. Need to accommodate or provide viable alternative routes for the many cars using the very congested road. If bike lanes are added they must not further decrease room for automobiles.</p>
<p>Survey #213 (3/23/2018)</p> <p>8. There are certain time (i.e. Pm rush hour) that the traffic is very, very heavy and other times (weekends) it is not a problem.</p>
<p>Survey #219 (3/23/2018)</p> <p>8. Very clear pedestrian crossings near tucker school. Very dangerous area and my kids walk on 138 to get home</p>

<p>Survey #222 (3/23/2018)</p> <p>5. I will continue to walk on 138. However, my husband and i are having discussions as to whether we feel comfortable letting our 11 year old daughter walk to pierce middle school (when she starts there in fall 2018) because she must cross 138 to do so.</p>
<p>Survey #223 (3/23/2018)</p> <p>1. Just did this survey, didn't i ? No acknowledgement.</p> <p>4. Sidewalks. Driving by bikers and walkers always makes me nervous that they will fall unto road.</p> <p>5. Sidewalks. Bad weather effects bikers and walkers</p>
<p>Survey #225 (3/23/2018)</p> <p>3. People go through obvious red lights at an extremely high rate of speed at the intersection of blue hill river road and route 138.</p>
<p>Survey #228 (3/23/2018)</p> <p>8. "intersection at 138 is consistently blocked by traffic at the light. Add a 'red box' to the intersection to restrict 138 traffic from blocking side road access to the roadway in all directions. Same applies to intersection at brush hill rd.</p>
<p>Survey #230 (3/23/2018)</p> <p>2. Intersection of milton st / dollar lane and 138. I am a resident of milton st and use 138 as a driver. I use that intersection as a pedestrian. It is treacherous.</p> <p>3. Drivers speeding in and out of boston as fast as they can. Commuters using this roadway to cut through to boston causing congestion, blocking the box at every intersection.</p> <p>4. No sidewalks at all where i live at the junction of 138 and milton st.</p> <p>6. Intersection of milton st and 138 and dollar lane. Need pedestrian crosswalk lights.</p> <p>8. Police presense everywhere. I think its a state rd so probably would be state police as opposed to milton police. Speed traps. Stop speeders, aggressive drivers. Give tickets. Patrol the intersection at milton st especially at rush hour which is backed up way past our intersection. People blocking the box we can't even get out of our street. You would meet your monthly quota of tickets in the first week of the month! Delay in traffic lights. Add pedestrian traffic lights at this intersection. Curry college kids jog along this area all the time. It is treacherous to all! I would venture to say that most of the drivers coming in and out of boston on 138 are not even milton residents! We should put up toll booths!</p>

Survey #233 (3/23/2018)

3. Inability to cross over rte 138 at dollar lane due to drivers consistently blocking the intersection by ignoring the changing traffic light.

7. Increased police presence to manage scofflaws (speed, obstructing intersections). Designate neighboring streets oneway at peak traffic time (2pm-7pm) to deter high speed cut through traffic.

8. "1. Intersection of rte 138 and dollar lane is obstructed daily at peak traffic times by vehicles ignoring the changing light. - signage to remind drivers not to "block the box" and enforcement.

Survey #235 (3/23/2018)

3. Occasionally there are aggressive drivers, but 138 feels safer than it 28.

Survey #238 (3/23/2018)

3. As a parent parking and walking to tucker, i have been nearly side-swiped / run over getting out of my car. I am new to milton and disturbed by the aggressive, speedy drivers in an area where children are walking. This road needs speed bumps, as it's treated as a commuter cut-through. It's also completely unkept, and i'm surprised and disappointed that the town doesn't do more to encourage pride of ownership, litter clean-up, and tree planting.

4. The tucker crossing guard stays in her car, unless she notices that someone is coming. She needs to be out of her car and off of her phone. She is a very nice person, but i've had to try to get her attention in order to cross multiple times, and that's not what she's being paid for.

7. If the road was made to discourage people from speeding, with either more traffic lights, or speed bumps, there would be less tail-gating, people would feel more comfortable biking, walking, etc. Make it friendlier for people walking and biking, less accommodating for people in their cars zooming down the road to their destination.

Survey #240 (3/23/2018)

4. Passing cars on the right when another car is stopped or taking a left turn is very dangerous for cyclists. High rate of speed is also dangerous to cyclists.

Survey #241 (3/23/2018)

8. The sidewalks stopped abruptly and there is no safe place to walk. The sidewalks built nearer to the fire station area should have a barrier from the traffic.

Survey #244 (3/23/2018)

1. Also an abutting resident. Maintaining the sides of the roads would help both drivers and pedestrians. There is little to no maintenance currently between atherton and royall, i.e., grass not cut, debris such as fallen tree limbs and animal carcasses not removed.

4. Maintaining the off road areas running along rte 138 (mowing, debris removal) between atherton and royall

Survey #246 (3/23/2018)

1. I would ride my ride, if the bike lane was more guarded

Survey #247 (3/23/2018)

3. Only if i am driving to the mattapan station at rush hour. It is much better though than it used to be with the addition of the second lane down at the intersection with blue hills pkwy and brush hill road.

4. Please, please, please do not add bike lanes to the highway. It is too dangerous and the people who live along the street use those lanes for guest parking since the houses are small and have little parking in them.

5. I do not bike and do not wish to see biking on the busy street. Sidewalks need some help, but are not too bad.

6. No bikes!! Please no bikes on this road. It is a foolish idea as it was on truman hwy. Sooner or later someone will get killed or severely injured.

7. There is no bus that goes to either mattapan or ashmont.

8. I appreciate what you did with the intersection with blue hills terrace and brush hill road. That has made both driving and walking easier and better. Taking away the second lane at the intersection will make the traffic back up again as it used to. I find the right hand lane perfect for getting over to the right turn to the station. Do not change that for bike lanes that will not be used enough to justify taking away these and the parking lanes. Better marked crossing lanes especially at blue hills terrace would be good as a lot of kids cross over there before putting making the often dangerous trek on blue hills terrace to school.

Survey #249 (3/23/2018)

8. The traffic light congestion at brushhill road/138/canton ave intersection

<p>Survey #250 (3/23/2018)</p> <p>3. Do not add a bicycle lane. Speed limit not adhered too, aggressive drivers.</p> <p>6. Sidewalks for upper blue hill avenue after robbins street not available for pedestrians on either side, making it dangerous to walk.</p> <p>7. "accommodate pedestrians only! Reduce speed in areas from 45 mph to 35 mph.</p>
<p>Survey #256 (3/23/2018)</p> <p>3. Therefore bottle necks at every intersection. Reducing lanes in an intersection will always make traffic problems.</p>
<p>Survey #260 (3/23/2018)</p> <p>4. Terrifying road on a bicycle. I would be so grateful for any improvements.</p> <p>8. Sure would be great if you could bicycle safely from blue hills to mattapan square.</p>
<p>Survey #262 (3/23/2018)</p> <p>8. "as a milton resident i drive on 138 all the time. I try to avoid using 138 in the evenings due to traffic congestion.</p>
<p>Survey #265 (3/23/2018)</p> <p>2. Tucker school area, sometimes no crossing guard for kids and parents.</p> <p>4. Need crosswalks and pedestrian activated light at 138 and brush hill road, need enforcement of no left turn going north at brush hill road or a left turn signal.</p> <p>8. "brush hill road pedestrian crossing and crosswalk.</p>
<p>Survey #269 (3/23/2018)</p> <p>7. Increase police presence to subdue aggressive driving.</p> <p>8. Blue hills ski area can be a nightmare during the winter.</p>
<p>Survey #270 (3/23/2018)</p> <p>6. None, the issue relates to safety for drivers, not bikers.</p> <p>7. The road needs to be reevaluated to reduce deadly crashes, possibly by reducing to 1 lane each way with a central turn lane (reducing multiple lanes of high speed traffic).</p>
<p>Survey #271 (3/23/2018)</p> <p>8. Shoulder road conditions can be difficult; pot holes, rain/water pooling, debris, and markings.</p>

<p>Survey #272 (3/23/2018)</p> <p>6. Specifically at brook road and 138; automotive speeding traffic to make the light, backup traffic to make left turn</p> <p>8. The only truck (heavy vehicle), and other traffic pass-through access from 138 to route 28 is at brook road. There is heavy traffic at this intersection especially with all the trucks making the turn onto this one lane, heavily congested/populated street. The traffic from brook rd (starting at blue hills parkway) often backs up onto and up route 138, especially at rush hour.</p>
<p>Survey #275 (3/23/2018)</p> <p>7. Improve timing of lights at both royal and brush hill</p>
<p>Survey #279 (3/23/2018)</p> <p>3. The largest problem is there are too many vehicles traveling at ridiculously fast speeds.</p>
<p>Survey #281 (3/23/2018)</p> <p>8. With the rise of technology and awareness, this road has become a pass through for boston to i-95... Congestion especially on fridays is brutal... I'm not sure how to solve...perhaps resident stickers? More hourly restrictions for usage</p>
<p>Survey #285 (3/23/2018)</p> <p>8. Crossing in blue hills reservation from one section to other on either side of 138</p>
<p>Survey #286 (3/23/2018)</p> <p>8. Every intersection with traffic lights needs to have a delayed green from the side streets because people run the red lights on 138 all the time</p>
<p>Survey #287 (3/23/2018)</p> <p>7. Widening the roads in milton to add left hand turns will just make milton more of a cut through town. Slow traffic down, plant trees (traffic calming measure) add safe biking and walking routes as well as more public transportation.</p> <p>8. Slow traffic down! Milton is a cut through traffic town cars need to slow down!!! Add trees etc and safe off the road walking and biking options.</p>
<p>Survey #288 (3/23/2018)</p> <p>8. There are no side walks between bradlee and robbins. Traffic especially from curry college to blue hill terrace often greatly exceeds speed limits. The congestion is so bad between 3pm and 6pm from curry college to royal st that the road is virtually unusable. Traffic coming from brush hill road onto rt 138 take right turns on red into oncoming traffic and without coming to a stop.</p>

Survey #292 (3/23/2018)
7. Need left hand turn signal at brush hill and blue hill
Survey #293 (3/23/2018)
7. Addition of sidewalks beyond robbins st (going towards canton)
Survey #294 (3/23/2018)
3. Big trucks parked at intersection totally block vision 100% when trying to get onto rt 138 from side streets; cars go too fast as well on rt 138.
4. N/a, i do not walk or bike on this crazy street, rt 138
7. Do not add left-turn lanes...it is the side streets that need to figure out access to rt 138 !
Survey #295 (3/23/2018)
6. Tucker school has kids who walk and bike to school bus 138.
Survey #296 (3/23/2018)
8. The idea that milton was ever voted as second best town to live in in america a few times was laughable. I feel trapped living in milton next to route 138 because it has no sidewalks. I would never feel comfortable walking a dog around milton street, canton street, route 138...just pick a street.
Survey #299 (3/23/2018)
8. Lighting, bike lanes, slowing the speed of traffic.
Survey #300 (3/23/2018)
3. Every morning i hesitate before venturing onto blue hill ave when the light changes to green due to aggressive drivers who run red lights. They may not value the lives they are endangering by doing so. However, i want to venture out safely without fear of being hit.
8. I feel i have addressed all concerns i can think of at the moment.

Survey #302 (3/23/2018)
4. I live at the corner of cheever st. And 138, and often cross there with my children. I find the crosswalk light responsive, however the stop line for vehicles is not clearly marked, and cars often will stop well beyond the stop line. I have also seen people run this light many times, particularly when heading southbound, coming up over the hill. I have almost been hit while carrying/strolling my children multiple times, and once returned from bringing my daughter to pre-school to find an accident scene in the crosswalk i had been in just moments before. Residents often don't shovel or rake access to ramps and crosswalk lights.
7. Better speed control (people drive like they're still on the highway) and more obviously visible crosswalks!
8. Per above, the cheever/blue hills terrace/138 intersection is especially treacherous for crossing as a pedestrian - particularly because it's an unusually shaped intersection and cars often don't stop at the proper stop line or simply run through the light. At a minimum, please re-paint the stop line in the southbound lane to make the proper stop area more obvious. Lack of sidewalks after amor road prevent me from walking along 138 without having to cross to the other side.
Survey #304 (3/23/2018)
7. Bring the boston subway closer to the center of milton.
Survey #310 (3/23/2018)
8. Left turn lane at neponset valley parkway when proceeding toward milton/mattapan and better sidewalks and crossings near the blue hills reservation and blue hills trail museum. Speed limits more clearly marked throughout.
Survey #311 (3/23/2018)
8. Southbound traffic in the evening can be very bad. Most of this traffic is headed for the i93 junction in canton.
Survey #312 (3/23/2018)
6. From mattapan to the blue hills in canton is 4 miles that i would like to access safely for walking and biking.
8. The number of semi trucks that use this route into boston should be considered when developing the area.
Survey #315 (3/23/2018)
7. Not really any destination close-by, so rarely walk. Generally used as a route to hwy. So not walking that far. Have walked to curry, about 3.5 miles rt, and some areas without sidewalks were dangerous.
8. Adding more destinations close enough to walk to would be the only reason/improvement that would get me to walk on that road.

<p>Survey #317 (3/23/2018)</p> <p>5. It's a highway no bicycles should be allowed</p> <p>8. Traffic is horrendous headed south from 3 pm until 7 pm. Perhaps a traffic study is necessary</p>
<p>Survey #319 (3/23/2018)</p> <p>3. Drivers routinely go through the red light at the corner of 138 and cheever street/blue hill terrace. It is very dangerous!</p> <p>4. The light at 138 and blue hill terrace seems to not be noticed by many drivers which creates a dangerous situation</p>
<p>Survey #320 (3/23/2018)</p> <p>2. I live on milton st., directly off of 138. I usually take canton ave., but have to cross over 138, on dollar lane that turns into milton st. Very often drivers block the intersection so that i can't cross when my light is green. It's enormously frustrating.</p>
<p>Survey #321 (3/23/2018)</p> <p>7. Add second lane south between royal and museeum. Would decrease congestion.</p>
<p>Survey #322 (3/23/2018)</p> <p>8. Aggressive drivers in speeding vehicles is a bad combination. People need to slow down, perhaps more traffice lights, reduce maximum speed and visible police presence.</p>
<p>Survey #322 (Survey #323)</p> <p>1. Blue hill pkwy to canton ave. To route 138 or blue hill ave to unquity road to route 138"</p> <p>2. Blue hill recreation for hiking or skiing traffic adds to the traffic congestion. Families trying find parking or waiting to get into the parking lots.</p> <p>3. Bicycling or walking is very dangerous on either sides of the road especially trying to cross route 138</p>
<p>Survey #326 (3/23/2018)</p> <p>1. I would be a bicyclist if i felt safe on blue hill ave, but i don't.</p> <p>3. Inadequate bike lanes and sidewalks, so safety concerns as a driver when a runner is in the road.</p>

<p>Survey #333 (3/23/2018)</p> <p>6. It's a drag strip....cars excelerate from one end to the other</p> <p>8. I have heard that there is a concern for students from tucker school who cross 138. I want it to be safe for them. I want to afford them the same safety measures that we put in place for students at the other elementary schools in milton...</p>
<p>Survey #334 (3/23/2018)</p> <p>4. Aggressive drivers and "poor bike manners" should not be combined categories. They are separate issues of separate importance with separate solutions.</p>
<p>Survey #343 (3/24/2018)</p> <p>1. I have been using 138 by bicycle for 50 years. As a young child, it was then safe to ride from my home in stoughton to my cousin's house in hyde park.</p> <p>3. Going north feels reasonably safe once you get past the ski area, due to the generous width of the shoulder. Traveling south is perilous due to the entry of vehicles and the overdevelopment on the canton stretch at royall street.</p> <p>4. If sidewalks are widened, the resultant narrowing of the shoulders and high granite curbs can make things worse for cyclists. For example, the recent sidewalk improvements on canton ave. Needs to be balanced. Curbs need to be softer so as not to cause a bicycle to crash when you get squeezed into them by a passing vehicle.</p> <p>5. High volume of trucks. Cars tend to tailgate trucks, blocking their view of the shoulder. Cars passing without sufficient space, at high speeds create potentially deadly scenarios.</p> <p>6. The canton stretch is deadly going south. The stretch from 128 to royall street needs to be divided. Going north, bicycles turning right from blue hill river road have a perilous stretch to the milton line. A protected bike lane from blue hill river road to canton ave would be a huge improvement.</p> <p>7. This stretch of 138 is obviously an important artery. Aggressive traffic enforcement could provide an immediate benefit. The goal should be a smooth flow of vehicles at a safe and calm pace. Too many drivers use milton and the dcr roads as a commuting "short cut" trying to save time by avoiding the highway. This has destroyed the recreational utility of the dcr roads during commuter hours. Aggressive enforcement would deter some of this and get the vehicles back on the newly improved highway where they belong. Milton also needs to talk some sense into canton, who have let development at royall street/blue hill river road create a perilous situation.</p>
<p>Survey #344 (3/24/2018)</p> <p>4. Crossing at oak for tucker school-very little respect by vehicles for crosswalk!</p> <p>7. Light/better marked crossing at oak for tucker school students.</p> <p>8. Sidewalks widened/improved; more monitoring of speeding and aggressive driving; improve crossing at oak st.</p>

<p>Survey #345 (3/24/2018)</p> <p>8. Traffic moves very fast with high volume and no dedicated bike lane only shoulder. A rumble strip between drivers lane and well marked bike lane would be awesome. Narrow the driver lane should help slow speed down.</p>
<p>Survey #346 (3/24/2018)</p> <p>3. Not crashes, people driving too fast, trying to inappropriately pass, being on their phones.</p> <p>4. "138 connects the city to blue hills, the region's most important "wild space" for outdoor recreation and the roadway there is virtually no way to access it by walking, running or cycling unless you want to risk your life with the insane way people drive through there. Which i have done. There needs to be a dedicated, physically protected way to move non vehicular traffic. And traffic calming "€people are driving far too fast. More public transit would also be welcome. Turning very road in mass into i-95 is shortsighted.</p>
<p>Survey #348 (3/24/2018)</p> <p>3. High volume is only encountered at commuter rush hour</p>
<p>Survey #349 (3/24/2018)</p> <p>3. Intersections of neponset valley parkway and brush hill road turning into south bound lane at these intersections slowing the traffic back on 138.</p> <p>6. See above about neponset valley road and brush hill road right hand turns onto south bound 138.</p> <p>7. Light on neponset valley and 138 road with no right on red signs, put up no right on red at brush hill road and 138</p> <p>8. Light on neponset valley and 138 road with no right on red signs, put up no right on red at brush hill road and 138</p>
<p>Survey #352 (3/24/2018)</p> <p>3. The closer you get to 95 intersecetion the worse traffic gets, but all lights are long</p> <p>7. Ban trucks coming off of 95- dangerous and cause congestion</p>

<p>Survey #354 (3/24/2018)</p> <p>2. Mostly from neponset valley parkway, into stoughton</p> <p>3. During "rush hour" times it can take about an hour to get from neponset valley parkway/rt 138, through 2 traffic lights to the highway exit</p> <p>8. The traffic congestion is getting out of control. It shouldn't take 45 min to an hour to drive a mile & a half. It's super frustrating for drivers, and i'm guessing this is leading to fender benders because of driver frustration. Also, coming back from stoughton toward hyde park, just before blue hills, where 2 lanes merge into 1 lane. This is a problem area. Nobody wants to merge and drivers get very aggressive.</p>
<p>Survey #356 (3/24/2018)</p> <p>8. Way too much congestion!...the waits along rte. 138 during late afternoon and drive home hours are horrific.</p>
<p>Survey #357 (3/24/2018)</p> <p>4. What percent of travelers on 138 are bicyclists? Less tha 1%</p> <p>8. Looks like this study is gearing up for an outcome pushing for bike lanes and sidewalks. A good and noble idea, but a small percentage of users. I suggest focusing on better lighting, signage, traffic safety enforcement</p>
<p>Survey #360 (3/24/2018)</p> <p>8. Cars on 138 very often run red lights so cross traffic lights seem very quick as cars have to hesitate before crossing 138 despite having a green light</p>
<p>Survey #362 (3/24/2018)</p> <p>3. People speed, follow too closely. They treat it as a high speed highway.</p> <p>4. Snow not cleared off sidewalks, so have to walk in road with extremely fast vehicles. Cars don't stop when i cross at a crosswalk. I think they don't think of it as a road that pedestrians use and seem surprised to see a pedestrian trying to cross.</p> <p>7. Slow down vehicle traffic and make pedestrian crossings safer.</p> <p>8. The crossing by tucker school is the one that i use the most. I see children crossing often at this and nearby pedestrian crossings in the direction away from mattapan, and cars don't seem to stop. Often 4 or 5 cars will pass me before one will stop. If there were some traffic slowing devices or enforcement of speeding laws and stopping for pedestrians or something along those lines, i think that would help. If there was some way to signal to drivers that this road is not a high speed highway that would help as well.</p>

<p>Survey #369 (3/24/2018)</p> <p>7. Lower speed limit to 40mph and to 30 mph at intersections plus strict enforcement by police including general high police visibility.</p> <p>8. State should hold contractors to a higher quality of repair when they open the road.</p>
<p>Survey #370 (3/24/2018)</p> <p>7. My daughter had a bad crash recently by someone pulling out of a gas station, crossing the double line to go toward boston. She was traveling south on 138. We have seen several of the same accidents in that area. They need a way to cross 138 from those stations safely without hitting incoming traffic.</p>
<p>Survey #371 (3/24/2018)</p> <p>8. Although there are some bike lanes, traffic on 138 goes way too fast for me to feel comfortable biking. I bike to work at umass boston, but i'm afraid of the bike commute between my house near pierce and curry college.</p>
<p>Survey #373 (3/24/2018)</p> <p>2. From milton st dedham to houghtons pond. Also driving rte 138 to other towns.</p>
<p>Survey #377 (3/24/2018)</p> <p>8. "signal at dollar lane..aggressive drivers running yellow and red lights..</p>
<p>Survey #379 (3/24/2018)</p> <p>8. Robbins street. Drivers too fast and don't respect the signals</p>
<p>Survey #384 (3/24/2018)</p> <p>3. People pulling around cars to pass when you stop to let a car pull out</p>
<p>Survey #386 (3/24/2018)</p> <p>3. I live 3 houses in from rte 138. During morning and afternoon rush i try to avoid using it, that is, if i can. Since it is party of "my neighborhood," i'll often need 45+ minutes for a 15-20 minute trip.</p> <p>4. I'll no longer walk nor bicycle on rte 138 even though i am a bicyclist and a walker and live 3 houses from rte 138. I am afraid of injury, accidents, or worse.</p> <p>5. At 66 years old, i'll no longer walk nor bicycle on rte 138 even though i am a bicyclist and a walker and live 3 houses from rte 138. I am afraid of injury, accidents, or worse.</p>

<p>Survey #387 (3/24/2018)</p> <p>8. This road has become too congested and people drive far too fast and are very reckless. It's a huge problem at rush hour and the traffic volume seems to only be increasing</p>
<p>Survey #388 (3/24/2018)</p> <p>8. Road should be widened to two lanes approaching central st. Have had many drivers tailgating as i slow to make the turn.</p>
<p>Survey #389 (3/24/2018)</p> <p>7. Shuttle service to mattapan station would be awesome.</p> <p>8. Intersection with canton. It's such a bottleneck. Please improve?</p>
<p>Survey #393 (3/24/2018)</p> <p>8. Atherton st. At the firehouse has frequent crashes. Firehouse down to the ski slopes gets all backed up to a standstill practically everyday at rush hours or if there is an accident. People use this road to cut through to the highway. Number of loud trucks is out of control especially in the wee hours of the night. I grew up right on rt 138 and parent still live there. They can't even get out of their driveway now much of the time and the dirt from the traffic and noise from trucks and motorcycles at night and early am is awful and keeps them from sleeping.</p>
<p>Survey #396 (3/24/2018)</p> <p>8. Blinded when entering rt. 138 for cars jumping the lights</p>
<p>Survey #398 (3/24/2018)</p> <p>8. I think there needs to be some sort of pedestrian crossing light or flashing light at oak st., where the kids cross for school. I've seen cars try to pass on the right when the crossing guard has traffic stopped, and almost hit a kid stepping off the sidewalk!</p>
<p>Survey #399 (3/24/2018)</p> <p>7. Balance royal st. Traffic lights so that royal st wait (backup) is same as the rte. 138 vehicles</p> <p>8. Traffic lights must favor rte.138 (the arterial) flow, even if side streets get backed up. It is wrong to phase the traffic lights to exit five or so cars from royal st. While backing 138 southbound volume to neponset valley parkway..</p>

Survey #403 (3/24/2018)

8. 1) change speed limit. Why is it 45 mph after Robbins, heading toward Mattapan? That is a very populated area with a lot of side streets. When pulling out of side streets the line of sight is reduced due to people parking on Blue Hill. 2) there should be a NB turning lane into Curry College. 3) there should be a NB turning lane into Neponset Pkwy. 4) when there is standstill traffic (primarily SB in evening) drivers block the side roads and traffic light intersections. 5) it would be nice to have defined bus stops, where cars can't park so the bus can pull aside.

Survey #404 (3/24/2018)

8. Streetlight bulb replacement in a timely fashion. As a middle-aged woman who commutes via the trolley, the walk home is treacherous in the dark of winter. Also please replace the hydrant that is in the middle of the very narrow sidewalk and forces pedestrians to choose between the street and the untrimmed hedges.

Survey #417 (3/24/2018)

8. Southbound approaching Rte 128/93 the traffic is real bad. It needs to be moved much better. The wait in both directions is bad but southbound is ridiculous. Please do something for a better, safer, easier and faster flow.

Survey #420 (3/25/2018)

3. Speed of vehicles. Also, turning in and out of Neponset Pkwy

Survey #421 (3/25/2018)

1. I would like to be a bicyclist but feel the road is too unsafe for biking

8. There are many problems along 138 for drivers, pedestrians, and bicyclists, and I hope solutions are identified that can make the experience safer for everyone. However, I also don't want 138 to become more of a highway than it is already. Sections of 138 run beside and/or through the Blue Hills Reservation and it is important to maintain the beauty of the area. For instance, no trees should be removed just to make more room for traffic. In fact, more trees should be planted as they are proven to calm traffic. Additionally, any work done should not lead to more animal deaths on the roads. Countless deer, raccoons, possums, and squirrels die along these sections of route 138. In other words, solutions that take into account the unique natural area as well as human safety should be sought.

Survey #426 (3/25/2018)

7. Signage or flashing crossing light for parent/children crossing to get to Tucker School.

8. It is very unsafe to cross at Oak Street to get to school. Someone is going to get hurt unless this crossing area gets a flashing light or something to warn drivers that there are people crossing.

Survey #427 (3/25/2018)

7. Flyovers and on/off ramps for local traffic. There should be parts that are limited access from side streets so that traffic can quickly move north/south, separately from local/pedestrians. Like parts of Route 9 in Newton

Survey #428 (3/25/2018)

8. The turn at Neponset Valley Parkway, exits of Blue Hills parking lots

Survey #430 (3/25/2018)

2. Milton St./Dollar Lane where there are many accidents.

6. Especially Milton St./Dollar Lane area. From Curry College to the Blue Hills needs to be redone.

8. Milton St./Dollar Lane continual crashes, and the massive line of traffic that forms heading to 95 from 2pm-7pm.

Survey #431 (3/25/2018)

6. Especially Milton St./Dollar Lane - Curry on past the Blue Hills.

8. Milton St./Dollar Lane from 2pm-7pm headed toward 95 is ridiculous.

Survey #434 (3/25/2018)

6. Route 138 is a congested and poorly engineered state highway. Adding accommodations for pedestrians and bicyclists is not a safe or smart idea. Traffic backs up daily for miles, beginning at the poorly timed signals at the canton gas stations.

7. Since the traffic signals were installed at the canton gas stations a few years ago, backups have increased by several miles in both directions. The deadly "climbing lane" heading north just after the gas stations was a poor decision - i travel this road at least once daily, and cannot believe the lack of merging signs, painted roadway lines, etc. That leads to the game of "chicken" with merging lanes. Whatever the reason for this lane drop, by allowing a maximum of 5 extra cars to exit the intersection and climb into this lane is offset by the road rage and inconsiderate drivers that are experienced here.

8. Having the long red light for north/south traffic at royall st intersection is infuriating for drivers stacked back for miles, while allowing multiple right/left/straight arrows allow minimum volume of traffic - sometimes one single car - to halt the majority of traffic volume through this intersection. The traffic backups for the accommodation of a few cars makes absolutely no sense here. Royall should have another exit or entrance elsewhere on 138 - not necessarily in an intersection with multiple retail and gas stations congesting this area. Has anyone ever measured the miles that 138 backs up on any given weekday for several hours each afternoon?

Survey #435 (3/25/2018)

8. The lights at 138 & royall st. Need to be adjusted to allow 138 south traffic to move more freely, easing backups along 138 although making royall st. Vehicles wait longer.

Survey #436 (3/25/2018)

3. Being passed on the left by tractor trailers, speeding, drunk drivers

7. Local law enforcement actually pulling people over

8. Between brook rd and 28 (mattapan square) is the worst part. Trucks have driven into homes, cars into fences. You can not park on the side of the road in that area - unless you want a new car.

Survey #437 (3/25/2018)

7. Reduce side street congestion on robbins street. It is a high speed cut through.

8. Lower speeds and reduce congestion approaching the blue hills area.

Survey #443 (3/25/2018)

4. Sidewalks are not available on both sides of the parkway. Poor lighting makes it dangerous to cross. High speed limits in residential areas

8. Better lighting. Reduce speed limit from 45 mph in residential areas, especially between royall and blue hills parkway. Sidewalks on both sides.

Survey #445 (3/25/2018)

1. It backs up all the way from route 128 almost to atherton for most of the afternoon."

8. Street signs over road when approaching major intersections with the name of the cross street.

Survey #447 (3/25/2018)

7. Add a "no jake brake" zone for big trucks to keep road noise at a minimum.

8. Noise and congestion, commuters using the entire corridor as a "cut thru" to get to and from boston

Survey #449 (3/25/2018)

8. My highest concern for blue hills ave is that my children and i are not able to safely cross to the tucker school. Oak street is closed at school pick up and even with a crossing guard there are aggressive drivers that place all the children and adults in danger.

Survey #451 (3/25/2018)

1. I am a recreational walker and occasionally have to cross rte. 138. Very dangerous with volume and velocity of traffic, depending on time of day.
3. I obey speed limits in the area. Aggressive drivers have passed me on rte. 138 (and canton avenue!) Several times. Curry college entrance is a problem -- turning traffic -- and excessive speeding/aggression of its commuters
4. Generally, i avoid walking routes that cross 138 bc of these issues -- sadly, accessing dcr sidewalks on neponset valley parkway is extremely hazardous!
5. I am not a cyclist but might be tempted if safe provisions were made for it.
6. Problem areas for all accessibility: thacher montessori, blue hills reservation trails (royall street to canton ave.); fuller village; curry college; atherton fire station, delphi academy, concord baptist church, neponset parkway intersection
7. I am not a traffic engineer but please consider additional traffic lights, flashing speed-limit signs, and pedestrian-activated / flashing crossing signs
8. Problem areas for all accessibility: thacher montessori school, blue hills reservation trails (royall street to canton ave.); fuller village; curry college; atherton fire station, delphi academy, concord baptist church, neponset parkway/green street/brush hill road intersections. Why is traffic congestion so toxic at p.m. Rush hour south-bound? Ned corcoran (local attorney) claims it is because traffic lights are not properly synchronized --- really?!

Survey #453 (3/25/2018)

8. Heading west on 138 toward canton is always extremely slow particularly through lights at brish hill road and lights at royall street. It's awful at afternoon rush hour.

Survey #457 (3/25/2018)

3. I actually feel like the section between royal st. And canton ave./brush hill rd. Is not bad at all.

Survey #459 (3/25/2018)

6. None. Route 138 is too narrow to accommodate a bike and pedestrian lane. Doing so could limit the ability to bypass turning vehicles and exacerbate the traffic issue.
8. Smarter traffic lights would be great to allow more traffic to pass. It may also prevent the aggressiveness of drivers trying to turn onto 138. Also, citations to drivers who block intersections would be helpful.

Survey #462 (3/26/2018)

4. I don't believe it is safe to walk or bicycle on route 138

Survey #463 (3/26/2018)

2. To the blue hills or to canton or to get on 128 to westwood
8. Cars fly and tailgate, dangerous at times...those on bikes need their own space- not safe

Survey #466 (3/26/2018)

4. Along with vehicle drivers there are also cyclists who aggravate the issues with their own inconsiderate actions.
5. Cycling less on it each year because of speed of cars but especially large trucks.

Survey #470 (3/26/2018)

4. When coming off the neponset trail, how are you supposed to go south on 138/ blue hills parkway? It's not very clear or easy transission.
5. I tend to drive more than ride a bike on 138 save for the early connector from mattapan to blue hills parkway.

Survey #472 (3/26/2018)

3. Numerous potholes and construction at inconvenient point on the road
8. Improve the general congestion that is found in blue hill road from 4-7pm, add left turn lanes, and accommodate space for bikers and pedestrians by creating better sidewalks and shoulders.

Survey #479 (3/26/2018)

4. Bicycles in the way of traffic, bad behavior of bicycle riders, probably due to insufficient space for bicycle traffic. Separate off road path should be created away from vehicle traffic.

Survey #480 (3/27/2018)

3. Bicyclists are not vehicles nor pedestrians. They need to obey the rules of the road not when it's just convenient for them

Survey #481 (3/27/2018)

8. Mail a flyer out about bicyclists obey the rules of the road. The led lights might last longer or save the town money but they are poor lighting

Survey #482 (3/27/2018)

3. In my car taking my kids to blue hills ski area - getting from canton ave. On to 138 at brush hill rd crossing. Great to have an arrow. Great if 138 cars did not go in to the intersection when the light is red!. On my bicycle, great to have bike lanes painted on the shoulder and have the shoulder swept to keep broken glass from giving my a flat tire.

4. During traffic times i cannot make a left turn from green st north bound. Probably no solution.

8. Since cars leaving blue hills ski area are supposed to go right, anyone who wants to go south on 138 needs to go to the brush hill rd. Intersection via canton ave. So, make sure that intersection works for those cars. Now they compete to turn with cars coming the other way on brush hill rd and cars on 138 block the intersection during heavy traffic red lights. It's very stressful.

Survey #484 (3/27/2018)

4. Crossing 138 from green street to go north, there should be a pedestrian crossing light.

Survey #486 (3/27/2018)

1. I have 3 children under the age of 10 who walk to school on 138

2. The sections don't all make sense to me. Our family uses the section between cheever/blue hill terrace and the intersection with blue hills parkway at the mattapan/milton line

3. My 10 year old sometimes walks to and from school by herself. She has to cross rte 138 at oak street. There are no signs warning drivers that a school is there and even when the crossing guard is present, cars don't always stop. We have been in the crosswalk and had cars pass the stopped vehicles at high speed. It's only a matter of time before a child gets hit.

4. The sidewalk on the east side of 138 is narrow and bumpy with tree roots. Some residents have overgrown landscape trees that obstruct the sidewalk. It's impossible in some places for one adult and one child to walk side by side (near churchill street)

5. There really should be a light at oak street and signaling that there is an elementary school around the corner. The other concern is that on the east side on craig street, there is a speed limit sign that says 45. So drivers speed up and have trouble slowing down when they get to the school. How is the increased speed limit ok in the middle of a town? Also, i can't recall a good sidewalk near curry college and atherton. I live close enough i could bike to the blue hills reservation but it really isn't possible safely right now.

8. I do not feel that it is safe at this time for my children to walk along rte 138 to school. Cars are accelerating as they get closer- not slowing down, there is no signaling and no crosswalk by the school. Further south, there is no sidewalk or bike lane- making access to the blue hills reservation by foot or bike impossible.

Survey #487 (3/27/2018)

4. Terribly unsafe attempting to cross 138 from green st to lot across the street. Which i do several times a week to run in the blue hills. I reside on green st.

8. Please add safe crosswalks between parking areas across 138 to access blue hill and little blue hiking areas.

Survey #488 (3/27/2018)

1. Many crashes in our yard- total one of our vehicles

Survey #491 (3/28/2018)

5. No one ploughs the snow from the sidewalks further up. Like between amor and robbins.

8. Why does 138 not have a legitimate mbta bus? There is the subsidiary bus but its not easily recognisable, not trackable on the mbta apps, only runs once an hour, there are no bus stops. With the coming blue hill ave commuter rail train it would be nice to get to mattapan on a regular, easily predictable, frequent bus.

Survey #493 (3/28/2018)

8. Would like a more frequent and legit bus that runs more than once an hour and can be tracked on apps. Would be nice to see sidewalk clearing of snow and over grown foliage.

Survey #495 (3/28/2018)

8. There really needs to be a way to cross 138 near the trailside museum. Particularly at green street. The area is supposed to be for, and promote, hiking and outdoor activities and yet doesn't allow for that in a safe way. Please add a crosswalk and slow traffic by green street!!

Survey #497 (3/28/2018)

4. Cars speeding. Cars coming into shoulder due to being on cell phone.

6. 138 and neponset valley is a particularly dangerous intersection when riding on a bike. Either direction.

Survey #500 (3/29/2018)

3. Traveling southbound in the early morning, cars routinely pass me in no-passing zones. Sometimes cars pass me on the right, endangering cyclists and pedestrians.

7. Coming from their new warehouse in hyde park, trucks from katsiroubas produce routinely park along the side of the road southbound, early mornings, with drivers picking up coffee at dunkin donuts. They are blocking the right travel lane daily.

8. Mass dot's planned intersection improvement at neponset valley parkway would impair northbound cyclists with a very narrow lane and impatient drivers swerving around left-turning traffic. Mass dot restriped the lanes here a few years ago and safety was greatly impaired when southbound travel lanes did not align with northbound lanes. My concerns were addressed to milton police who had mass dot change the lane striping.

Survey #502 (3/30/2018)

1. If there were a way to prevent drivers from cutting to the right to pass on 138, that would be great."

Survey #504 (3/30/2018)

3. People do not care for cyclists and do not give enough room on the road

Survey #506 (3/30/2018)

3. Just last week an angry driver was tailgating us on 138 and passed in front

Survey #509 (3/30/2018)

1. Would love to see this become more pedestrian and bike friendly and use some traffic calming measures.

5. Unpleasant to walk. There are no street trees. It feels very highway like, not residential. The roadway is too wide. It can be narrowed quite a bit and still get the same volume of traffic through. Need traffic calming measures.

7. We would like traffic cameras on the lights that give tickets to cars for speeding.

8. "there is a large need for a complete streets implementation from robbins street towards the blue hills parkway in mattapan, that would connect to the dcr bikeway as well as pleasant walking experiences down here as well.

Survey #512 (3/31/2018)

2. I have lived on a side street that directly connects to route 138 for 27 years and use this corridor many times per day.

3. Cars racing through red lights at crosswalk in front of the concord baptist while pedestrians are attempting to cross this main street. I was also rear-ended while stopped to turn onto my side street and nearly killed by a car going 55mph claiming he did not see me during daylight hours with no adverse weather conditions. My car was pushed across the opposite lane into oncoming traffic.

4. We were nearly hit walking on the sidewalk by a speeding car that lost control and came up over the curve. We have had multiple close calls using the crosswalk lights when cars don't stop.

7. Restrict commercial development on this already overburdened main road and the impact of more lights and heavy traffic turning on/off this busy roadway. More bus service and shuttles connecting to mattapan, hyde park and e milton enabling local residence and college students other options besides driving.

8. Absolutely a signal cross walk at the entrance to the side street for tucker school!!! Electronic speed monitoring devices that alert drivers to the speed limit and their traveling speed. Repair sidewalks. Move the signal light box higher on the pole at the crosswalk at concord baptist. The current height is a hazard for children on bicycles especially without helmets.

Survey #513 (3/31/2018)

2. I have lived on a side street off route 138 for almost 30 years and travel this corridor many times per day.

3. Cars passing moving traffic on the right especially at rush hour. Log backups preventing us from exiting our side street. I was injured when a car going 55mph rear ended me and pushed me into oncoming traffic as i waited on route 138 to turn onto my street.

4. Road grit and trash including glass that is builds up on sidewalks and to the curb.

5. We were nearly hit walking on the sidewalk by a speeding car that lost control and came up over the curve. We have had to run to avoid cars racing through the red light at the signalized cross walk.

7. Absolutely a signalized cross walk at tucker school!!! Bus & shuttle service to mattapan, hyde park and east milton accessible to local residents and college students in an effort to decrease vehicle congestion.

8. Absolutely a signalized crossing at tucker school and improved signal at the concord baptist church. Restricting commercial development on this already danderous and congested roadway.

<p>Survey #518 (4/1/2018)</p> <p>6. Intersection of blue hill ave and oak st to provide safe access to the school for crossing and turning vehicles.</p> <p>8. Safer access to tucker school at the oak street entrance to route 138</p>
<p>Survey #521 (4/1/2018)</p> <p>3. Motorists near tucker elementary school frequently drive too fast, and fail to yield to pedestrians at crosswalks. This is an especially big problem during hours when crossing guards are not present.</p>
<p>Survey #522 (4/1/2018)</p> <p>3. Making a left turn from brush hill rd (nw) onto brush hill ave (ssw) at certain times of day makes for 10 minute wait times at the light.</p> <p>8. Clearly marking the southbound lanes overhead better as you are heading into them might reduce a ton of last-minute traffic sorting that happens there.</p>
<p>Survey #524 (4/1/2018)</p> <p>8. The traffic congestion on route 138 has increased dramatically in the last year. In addition drivers speed way too much on this very residential road, which makes biking and walking along it highly dangerous. Any help from this study would be great!</p>
<p>Survey #527 (4/1/2018)</p> <p>4. I would avoid riding a bicycle on rt 138, because the road is too narrow and cars drive too fast.</p> <p>8. In general, cars drive too fast on milton roads. I would like to see traffic calming measures on most roads, especially blue hills parkway.</p>
<p>Survey #531 (4/1/2018)</p> <p>2. My children attend tucker school and we have friends at various locations on and off of route 138</p>
<p>Survey #535 (4/1/2018)</p> <p>5. Drivers not stopping for pedestrians in cross walk</p> <p>8. Stop signs at the intersection of oak and blue hill avenue</p>
<p>Survey #535 (Survey #536)</p> <p>2. Vehicle accidents from brook rd stop light to blue hill ave cars are going too fast</p> <p>7. Better lighting. And the cars go to fast!! More state police or milton police would help fast drivers slow down! Ticket them!</p>

<p>Survey #551 (4/1/2018)</p> <p>3. See people littering out their car windows - please add signs reminding of littering fines</p> <p>4. Terrible to cross with children on foot or on bikes, rude, fast drivers</p> <p>6. **138 & brook rd, ****138 & oak street/tucker elementary school entry from 138</p> <p>7. Traffic light with pedestrian crossing at 138 & oak st/tucker elementary school - signs regarding excessive littering</p> <p>8. Problems safely crossing the street with children on foot or on bikes.</p>
<p>Survey #553 (4/1/2018)</p> <p>2. Unsafe crossing over to the tucker school when crossing guards are not present. Walked from my home to open house one evening and literally almost was hit by a car while i was in the crosswalk. Car in right lane stopped for me to cross, car on left sped through!! Such a scary moment!! I do not think it's an isolated incident either.</p> <p>7. Add crossing signals or a light where the tucker is located. So dangerous for our children to cross when the crossing guards are not present.</p>
<p>Survey #556 (4/1/2018)</p> <p>3. Morning traffic, aggressive drivers are a huge safety concerns for the children</p> <p>7. Add a "school zone flash" with reduced speed. People speed to much during arrival and release time. It is not sare for the kids</p> <p>8. I think there should be a school zone on 138 and a turning line added to turn and drop off students so people on 138 can pass (with reduced speed). Or maybe add a traffic light</p>
<p>Survey #559 (4/2/2018)</p> <p>4. "thank you for this opportunity to contribute to these efforts.</p>
<p>Survey #563 (4/2/2018)</p> <p>4. Blue hill ave near blue hill parkway,very narrow sidewalk due to overgrown bushes of last house on street with hydrant. This is just where blue hill ave goes to 2 lanes. It is dangerous when there are snow banks.</p>

Survey #569 (4/2/2018)

8. I think the stretch between bradlee rd and blue hills pkw could use more clear lane markings for driving, parking and bike lanes, as well as lowering of the speed limit. This is a very residential area and there are many kids walking/crossing roads to reach milton high or tucker elementary.

Survey #576 (4/2/2018)

7. Improve access to tucker school from rt 138: the cars queuing to turn right from rt 138 onto oak st at drop-off and pick-up both blocks other traffic and makes turning left on rt 138 onto oak, union, and churchill at those times of day almost impossible.

Survey #580 (4/2/2018)

3. Picking up my daughter after school when there are no crossing guards is extremely challenging. Drivers just don't stop.

8. The sidewalks during the winter were very poorly shoveled and it was difficult to park and walk my child into school. Crossing the street is challenging as there are no cross walks, except at tucker school, and without the crossing guards, you take your life in your hands.

Survey #584 (4/2/2018)

1. We either drive or walk to drop-off our child at tucker elementary.

3. High volume during tucker elementary drop-off. Traffic backs up trying to turn onto oak street heading toward blue hills parkway.

8. My biggest concern for pedestrian and driver safety is in the area of tucker elementary (primarily at oak street), as well as the congestion in that area at school drop-off and pick-up.

Survey #591 (4/2/2018)

4. I would never bike or walk along this route. Too dangerous.

Survey #592 (4/2/2018)

8. Interested in seeing improvements for the children traveling to and from school. (i.e. More responsive crosswalks for pedestrians indicating they want to cross the street)

Survey #594 (4/2/2018)

4. Aggressive drivers do not stop even when we're in the crosswalk. I have difficulty crossing as an adult so imagine a child crossing to get to school.

5. Again, drivers refuse to stop for pedestrians in the crosswalk. Crossing 138 can be very intimidating.

8. The intersection of blue hill ave and oak st is very difficult to cross for both adults and children and since it is a school zone it would greatly benefit from some increased safety measures (flashing lights or a stop sign)!

Survey #595 (4/2/2018)

1. Route 138 is not biker/walker friendly. Too many aggressive drivers that speed down 138.

4. It is almost impossible to cross 138. Drivers just do not stop for people even though you're in a crosswalk. As an adult, i find myself having to step out into traffic before a driver decides to stop. Completely infuriating!

5. The feeling is that 138 is for drivers only with no regard for bicyclists or walkers.

8. The intersection of blue hill ave and oak st. This is a crosswalk that is used by many people most of whom are children. It is an intersection that is used by many school children for tucker elementary school. Once the crossing guard is gone it is nearly impossible to get across (using the crosswalk!) Because the drivers just do not stop. This intersection would benefit from some more safety measures like walk signals or a stop sign.

Survey #603 (4/3/2018)

3. Issues at delphi academy entrance during drop-off and pick-up times for kids.

Survey #605 (4/4/2018)

3. Inconsistent speed limits that vary back & forth too frequently. Traffic has increased exponentially now that gps has redirected drivers away from congested se expressway, i-93/i-95. 138 is now a cut thru from boston to the south, south west as drivers have realized it cuts through from expressway to rt 128 (whatever interstate it is now called) traffic regularly backs up from royall st to milton & atherton st. This is increased by stopped traffic trying to turn left at intersections, into curry, into blue hills ski area/trailside museum.

4. Don't need bike lanes where road almost needs to be a highway. Bike lanes are ridiculous to expect 5-10mph vehicles to interact with 30 - 45 mph vehicles.

5. Don't need bike lanes where road almost needs to be a highway. Bike lanes are ridiculous to expect 5-10mph vehicles to interact with 30 - 45 mph vehicles. Narrowing vehicle space for a couple dozen bikers who might use a road in the course of a year is simply a waste of time & money and unsafe for all involved.

6. Don't need bike lanes where road almost needs to be a highway. Bike lanes are ridiculous to expect 5-10mph vehicles to interact with 30 - 45 mph vehicles. Narrowing vehicle space for a couple dozen bikers who might use a road in the course of a year is simply a waste of time & money and unsafe for all involved. Bike lanes on blue hills parkway were stupid, on rt 138 would be insane.

7. Rt. 138 must be improved for vehicle traffic & adding accomodations for a handful of pedestrians & bicyclists that are infrequently in the area by altering lanes where vehicles are all the time is equivalent to narrowing sidewalks to one lane in order to widen traffic lanes.

8. Streets that intesect 138 from robbins st to parkway are often at an angle easing left turn entrance to the side street if coming out of mattapan, but also making right turns onto side streets more difficult, especially when the corners are not plowed. Theses angled streets are
Survey #607 (4/4/2018)

3. For cycling - lots of debris on the road shoulders

Survey #609 (4/5/2018)

8. Afternoon traffic delay making turn from canton ave. Onto 138 west heading for 128"€20 minutes = too long. No immediate solution comes to mind, but it's often a loooong crawl.

Survey #614 (4/5/2018)

3. For the short distance i drive, i rarely encounter problems.

Survey #617 (4/5/2018)

8. Speed limit and lights at 4-way intersections with a left turn signal

Survey #624 (4/5/2018)

8. The corner of blue hill parkway and blue hill ave is very problematic for pedestrians. There is a right lane for the cars so you can't walk in the road. The sidewalk is very narrow and the bushes in the area are overgrown. If it snows, pedestrians are really in danger.

Survey #625 (4/5/2018)

7. Focus on drop off at tucker school: both for parents/students drop off and others that are trying to go past oak but get stuck in the school traffic.

Survey #626 (4/5/2018)

8. Turning at intersection of 138 and brush hill road. Need dedicated left from canton ave and no turn on red coming from brush hill road.

Survey #627 (4/5/2018)

8. I don't think that route 138 need big improvements

Survey #629 (4/5/2018)

8. The turn from canton ave to brush hill rd there is so much congestion and turning left onto 138 is an issue. Would be nice to have a shielded arrow to make the turn

Survey #632 (4/5/2018)

2. From unquity road to tucker elementary and down to the next traffic light to return to unquity rd. At the end of the day.

3. Safety concerns regarding children and families crossing to tucker elem schoo

Survey #633 (4/6/2018)

6. At tucker elementary they don't even have school lights

8. There needs to be more safety for the children who go to school there cause it's extremely dangerous and i fear for my safety when i am dropping off and picking up

Survey #638 (4/6/2018)

5. I don't live near here so i am only driving on 138.

Survey #643 (4/6/2018)

8. "need better traffic for oak street were children cross to go to school.

Survey #645 (4/6/2018)

3. The outbound traffic (going towards canton) can be horrific depending on the day and time of day. I avoid it at all costs using this route for inbound travel (going towards mattapan sq).

4. Route 138 is a major route of traffic. Anyone who goes for a "bike ride" or a "stroll" is out of their mind!

5. I would never use this route for pleasure purposes. There is too much pollution for the constant automobile traffic. Anyone who goes for a "bike ride" or a "stroll" is out of their mind!

6. Only in neighborhoods that have houses facing the street and have existing sidewalks.

Survey #646 (4/6/2018)

4. Drivers speed all the time. No crosswalks. Aggressive drivers.

8. Add pedestrian crosswalks and bike path. Difficult crossing 138 if i am walking or biking with my kids. Sidewalks are only on one side of 138 from austin str to robbins. No sidewalks on the opposite side of the street. Only 4 to 5 pedestrian crosswalks from austin to robbins. More pedestrian crosswalks speed limit signs needed.

Survey #649 (4/7/2018)

8. It's driven on as if it were a highway. The crossing by 128 is particularly scary on a bike.

Survey #652 (4/7/2018)

8. Signal at canton ave intersection with blue hills ave

Survey #655 (4/7/2018)

1. My sons and their friends are snowboarders and they have actually snowboarded home along rt 138 and down green st/hemenway drive. Also, i have seen many people with ski gear walking along 138 on west side attempting to cross to east side where blue hill ski area located.

2. I live one street over from 138 opposite where the ski area is, so use this section of 138 multiple times each day.

8. There remain today road pedestrian crossing signs to warn drivers as they approached crossing in front of blue hill ski area. Prior to repaving of 138 several years ago covered the painted white street crossing lines. I called the mass. State highways dept and they said they would repaint the crossing lines. They never did. Nick vinke 617-407-4514

Survey #657 (4/7/2018)

7. Left turn lane at nep valley pkwy would be a good start. A left turn into the north trailside parking lot , from 138 south, can be next to impossible - even on sunday afternoon. The sight line, for traffic coming over the hill towards the parking lot is very poor.

8. The area north of blue hill river rd where 138 goes from 2 lanes to 1 lane does not provide for safe merging. Cars turning left into the park&ride lot a little further north create another dangerous situation for traffic traveling north. A left turn lane at the main curry college entrance would also increase safety for northbound traffic.

Survey #658 (4/7/2018)

8. "rte 138 and brush hill road.. Northbound motorists ignoring the no left turn. Eastbound motorists on brush hill turning onto 138 southbound ignoring the traffic light (this also applies to westbound motorists turning onto 138 southbound)

Survey #662 (4/8/2018)

8. From 4-6:30 pm, it may take 30-45 minutes to travel the rte 138 corridor.

Survey #666 (4/9/2018)

1. I use it daily to drop off kids at tucker school. Also to access route 93.

4. Pedestrian / student safety need to be enhanced at intersection of oak st., for tucker school. An extra lane, perhaps, for parents queuing up for morning drop off?

6. I don't know all the streets you list in the options. But i would request oak st. Intersection for tucker school.

7. Once again, student safety and parent drop-off lane for tucker school, at oak st. Local bus service to mattapan would be nice, too.

Survey #669 (4/10/2018)

8. Rte. 138 is unbearable due to congested traffic during particular hours - between usually 4-6pm. It can take 1/2 hour to drive distance usually taking 5-10 minutes. Stay clear during that time period.

Survey #673 (4/10/2018)

8. Turning off rt 138 to brush hill road is a big problem because of terrible road conditions (pot holes) on brush hill rd. Calls to dpw are not helping!!

<p>Survey #678 (4/10/2018)</p> <p>8. I am not a driver. I do often use the mattapan/cobb's corner van. I catch this van directly across 138 from the entrance to fuller blue hill campus. This is the best location and much safer and better than the intersection at light at brush hill. This has been confirmed by the van drivers. Because of my poor vision, i have to use extreme caution when crossing. A pedestrian crosswalk would really help.</p>
<p>Survey #682 (4/11/2018)</p> <p>7. Better timing of lights to reduce congestion in the evening hours heading south towards the highway. Coming off canton ave/dollar lane to get on 138 is a nightmare in the evenings.</p> <p>8. This isn't specifically a 138 but the major intersection where blue hill ave splits to brush hill, 138 and route 28 is a cluster. The new lights and the timing has created backupson river street coming from lower mills, mattapan square is even more gridlocked and cummins highway is starting to get the same gridlock as more and more people are using that. I know it's a mass dot, dcr and city of boston problem but if you could get together and review that intersection that would be amazing and appreciated.</p>
<p>Survey #687 (4/11/2018)</p> <p>8. Traveling along 138 at commuter hours there is lots of traffic and it is very very slow-only one lane light at corner of brush hill and 138. It only allows 3-4 cars when it turns green.</p>
<p>Survey #688 (4/11/2018)</p> <p>7. Mark road lines in the center and sides. Use same paint material they did at beginning of crossover to fuller village and brush hill ave, from canton ave.</p>
<p>Survey #694 (4/11/2018)</p> <p>8. Widen the road into a 4 lane highway-2 on each lane; also a service lane when it's possible. Get into the 21st century!</p>
<p>Survey #697 (4/11/2018)</p> <p>1. Very heavy traffic from 2-5pm-long waits on m-128 to get to fuller village.</p> <p>2. 138 to caroline area to parking at foster bldg at blue hill</p>
<p>Survey #699 (4/11/2018)</p> <p>8. Too much traffic for only 2 lanes; need to slow traffic down, lower speed limits after leaving fuller village taking right; this intersection is very bad; no lights; only a stop sign.</p>

<p>Survey #702 (4/12/2018)</p> <p>8. Canton avenue is a narrow country road winding with curves creating several hidden now dangerous driveways. 30 mph signs are ignored. Implement physical traffic bumps or rumble strips and signs (warning hidden driveway) located between southern entrance and atherton street.</p>
<p>Survey #706 (4/13/2018)</p> <p>4. Cars parked in bike lanes! Church parking along "no parking" areas/bikelane on weekends</p>
<p>Survey #708 (4/13/2018)</p> <p>8. Canton ave.. Is a winding narrow country road now being used as a speedway, alternative to 138, 30 mph signs are ignored. Driveways obscured by curves are now dangerous. Implement physical traffic calming rumble strips and "caution hidden driveway" signs between southern entrance from 138 and atherton street. Intersection of brush hill rd and neponset valley prkway is also dangerous because of curves and speeding traffic. Implement a traffic light with timing adjusted to traffic flow.</p>
<p>Survey #709 (4/13/2018)</p> <p>1. I would definitely be a pedestrian and possibly bicyclist too but it's far too dangerous where i live near the intersection with brush hill. I even drive to go across the street to the blue hills reservation. There aren't even crosswalks or sidewalks.</p> <p>4. The situation is so bad that i am essentially prevented from walking and biking.</p> <p>8. Make it possible to walk between fuller village and the blue hills reservation. Also to cross from fuller village to shuttle going towards mattapan. Reduce traffic and/or improve flow on 138 between dollar lane and 95, also on brush hill rd and canton ave coming into 138. Create noise barriers from surrey lane to brush hill. Fix brush hill rd. (it's in a state of serious deterioration).</p>
<p>Survey #711 (4/13/2018)</p> <p>3. I see way too many aggressive drivers. I have seen on many occasions cars passing other cars on the shoulder or across the double lines.</p>
<p>Survey #714 (4/15/2018)</p> <p>8. Any improvements should include enforcement of traffic rules for both motorists and bicyclist. Currently, bicyclists often travel between traffic lanes and ignore stop signs.</p>
<p>Survey #715 (4/16/2018)</p> <p>4. Bike lane/shoulder often have lots of debris (rocks, branches, trash, etc). Also, storm drains, grates, and manhole covers are often located in the shoulder/bike lane.</p>

<p>Survey #725 (4/17/2018)</p> <p>8. Extend 2 lane road going north beyond base of blue hill traffic lights to canton ave exit</p>
<p>Survey #728 (4/17/2018)</p> <p>3. High traffic from brush hill road to 138 between 3:30 pm and 6:30 pm</p>
<p>Survey #730 (4/17/2018)</p> <p>3. Traffic from canton ave to brush hill road and then taking left onto 138. Help</p>
<p>Survey #733 (4/18/2018)</p> <p>3. Today i witnessed a cyclist get hit by a car (prius) that was turning into the park & ride east of dunkin donuts, 4/13/18 around 6pm.</p> <p>8. Make it safe for cyclists or prohibit cyclists if it can't be made safe. Right now it's is too dangerous!</p>
<p>Survey #734 (4/20/2018)</p> <p>3. Difficulty safely crossing 138 on horseback. Vehicle operators do not comply with safety laws around equines.</p> <p>5. Poor connectivity between blue hills hiking area and paths to royall street equestrian workout ring.</p> <p>7. Improve safety for pedestrians and horseback riding accommodations.</p>
<p>Survey #735 (4/18/2018)</p> <p>3. Hard to cross when going from the park and ride parking lot to the hiking trails in the blue hills.</p>
<p>Survey #737 (4/23/2018)</p> <p>1. Would like to be a pedestrian from brush hill road to the blue hills reservation but there is nowhere to safely cross 138 or walk.</p> <p>3. No place to walk as pedestrian from brush hill to blue hills musuem/other hiking areas.</p> <p>8. As a pedestrian, there is no way to safely cross 138 to get to blue hills museum and hiking trails, nor is there any sidewalk to walk on. Also, there are no cross walks on brush hill/138 light (and no walking light either). We are only .4 miles from blue hills parking lot but cannot walk there!</p>

<p>Survey #738 (4/23/2018)</p> <p>3. It feels dangerous driving on, especially at the signaled intersections but also just in general. Neponset valley intersection needs traffic signals and better turn lane to make traffic move more safely and efficiently.</p> <p>8. Neponset valley prkwy intersection needs to be improved with signals and turn lanes. Visible cross walks/flashing lights near blue hills trailside museum and curry college. Speed restrictions through residential sections and a guardrail protected bike lane along more secluded portion.</p>
<p>Survey #740 (4/24/2018)</p> <p>6. "students at milton high school, pierce middle school, and tucker school (elementary school) who live west of route 138 are at great risk.</p>
<p>Survey #742 (4/26/2018)</p> <p>2. Between dollar lane and upper canton avenue. My child attends thacher montessori school at 1425 blue hill ave.</p> <p>7. Brush hill and blue hill ave intersection - it is very dangerous trying to take a left on to blue hill ave. This intersection requires cars taking a left from brush hill onto blue hill ave going toward 128 and cars taking a right toward 128 to merge. If the cars taking a left yield, they will never get through the light. Having no left arrow requires drivers to be aggressive in order to get through the intersection. Also, taking a right out of thacher montessori school (where my child goes) after this intersection, is very dangerous. I then have to take an almost immediate right onto the canton ave. There should be a wider section of road there for cars behind people taking a right to safely go around so traffic isn't backed up and to prevent stopped cars waiting to turn right from being rear-ended. Also, there should be an opening in the double yellow line on blue hill ave. Where cars can turn right onto canton ave, so it's obvious that it's legal to make a right here. Finally, there should be a light at the termination of neoponsite valley parkway to assist cars turning on from blue hill ave and those turning right onto blue hill ave from the parkway. Cars turning on to blue hill ave never stop at the stop sign and i've had to slam on my breaks even going under the speed limit to avoid an accident here.</p>
<p>Survey #743 (4/27/2018)</p> <p>8. Sidewalks along brush hill rd. Very heavy traffic volume especially near curry college and heading to truman parkway. Very dangerous to walk along!</p>

**Appendix H:
MassDOT Highway Division
Project Development Process**

Overview of the Project Development Process

Transportation decision-making is complex and can be influenced by legislative mandates, environmental regulations, financial limitations, agency programmatic commitments, and partnering opportunities. Decision-makers and reviewing agencies, when consulted early and often throughout the project development process, can ensure that all participants understand the potential impact these factors can have on project implementation. Project development is the process that takes a transportation improvement from concept through construction.

The MassDOT Highway Division has developed a comprehensive project development process which is contained in Chapter 2 of the *MassDOT Highway Division's Project Development and Design Guide*. The eight-step process covers a range of activities extending from identification of a project need, through completion of a set of finished contract plans, to construction of the project. The sequence of decisions made through the project development process progressively narrows the project focus and, ultimately, leads to a project that addresses the identified needs. The descriptions provided below are focused on the process for a highway project, but the same basic process will need to be followed for non-highway projects as well.

1. Needs Identification

For each of the locations at which an improvement is to be implemented, MassDOT leads an effort to define the problem, establishes project goals and objectives, and defines the scope of the planning needed for implementation. To that end, it has to complete a Project Need Form (PNF), which states in general terms the deficiencies or needs related to the transportation facility or location. The PNF documents the problems and explains why corrective action is needed. For this study, the information defining the need for the project will be drawn primarily, perhaps exclusively, from the present report. Also, at this point in the process, MassDOT meets with potential participants, such as the Metropolitan Planning Organization (MPO) and community members, to allow for an informal review of the project.

The PNF is reviewed by the MassDOT Highway Division district office whose jurisdiction includes the location of the proposed project. MassDOT also sends the PNF to the MPO, for informational purposes. The outcome of this step determines whether the project requires further planning, whether it is already well supported by prior planning studies, and, therefore, whether it is ready to move forward into the design phase, or whether it should be dismissed from further consideration.

2. Planning

This phase will likely not be required for the implementation of the improvements proposed in this planning study, as this planning report should constitute the outcome of this step. However, in general, the purpose of this implementation step is for the project proponent to identify issues, impacts, and approvals that may need to be obtained, so that the subsequent design and permitting processes are understood.

The level of planning needed will vary widely, based on the complexity of the project. Typical tasks include: define the existing context, confirm project need, establish goals and objectives, initiate public outreach, define the project, collect data, develop and analyze alternatives, make recommendations, and provide documentation. Likely outcomes include consensus on the project definition to enable it to move forward into environmental documentation (if needed) and design, or a recommendation to delay the project or dismiss it from further consideration.

3. Project Initiation

At this point in the process, the proponent, MassDOT Highway Division, fills out a Project Initiation Form (PIF) for each improvement, which is reviewed by its Project Review Committee (PRC) and the MPO. The PRC is composed of the Chief Engineer, each District Highway Director, and representatives of the Project Management, Environmental, Planning, Right-of-Way, Traffic, and Bridge departments, and the MassDOT Federal Aid Program Office (FAPO). The PIF documents the project type and description, summarizes the project planning process, identifies likely funding and project management responsibility, and defines a plan for interagency and public participation. First the PRC reviews and evaluates the proposed project based on the MassDOT's statewide priorities and criteria. If the result is positive, MassDOT Highway Division moves the project forward to the design phase, and to programming review by the MPO. The PRC may provide a Project Management Plan to define roles and responsibilities for subsequent steps. The MPO review includes project evaluation based on the MPO's regional priorities and criteria. The MPO may assign project evaluation criteria score, a Transportation Improvement Program (TIP) year, a tentative project category, and a tentative funding category.

4. Environmental Permitting, Design, and Right-of-Way Process

This step has four distinct but closely integrated elements: public outreach, environmental documentation and permitting (if required), design, and right-of-way acquisition (if required). The outcome of this step is a fully designed and permitted project ready for construction. However, a project does not have to be fully designed in order for the MPO to program it in the TIP. The sections below provide more detailed information on the four elements of this step of the project development process.

Public Outreach

Continued public outreach in the design and environmental process is essential to maintain public support for the project and to seek meaningful input on the design elements. The public outreach is often in the form of required public hearings, but can also include less formal dialogues with those interested in and affected by a proposed project.

Environmental Documentation and Permitting

The project proponent, in coordination with the Environmental Services section of the MassDOT Highway Division, will be responsible for identifying and complying with all applicable federal, state, and local environmental laws and requirements. This includes determining the appropriate project category for both the Massachusetts Environmental Protection Act (MEPA) and the National Environmental Protection Act (NEPA). Environmental documentation and permitting is often completed in conjunction with the **Preliminary Design** phase described below.

Design

There are three major phases of design. The first is **Preliminary Design**, which is also referred to as the 25-percent submission. The major components of this phase include full survey of the project area, preparation of base plans, development of basic geometric layout, development of preliminary cost estimates, and submission of a functional design report. Preliminary Design, although not required to, is often completed in conjunction with the Environmental Documentation and Permitting. The next phase is **Final Design**, which is also referred to as the 75-percent and 100-percent submission. The major components of this phase include preparation of a subsurface exploratory plan (if required), coordination of utility relocations, development of traffic management plans through construction zones, development of final cost estimates, and refinement and finalization of the construction plans. Once Final Design is complete, a full set of **Plans, Specifications, and Estimates (PS&E)** is developed for the project.

Right-of-Way Acquisition

A separate set of Right-of-Way plans are required for any project that requires land acquisition or easements. The plans must identify the existing and proposed layout lines, easements, property lines, names of property owners, and the dimensions and areas of estimated takings and easements.

5. Programming (Identification of Funding)

Programming, which typically begins during the design phase, can actually occur at any time during the process, from planning to design. In this step, which is distinct from project initiation, the proponent requests that the MPO place the project in the region's Transportation Improvement Program (TIP). The proponent requesting the project's listing on the TIP can be the community or it can be one of the MPO member agencies (the Regional Planning Agency, MassDOT, and the Regional Transit Authority). The MPO then considers the project in terms of state and regional needs, evaluation criteria, and compliance with the regional Transportation Plan and decides whether to place it in the draft TIP for public review and then in the final TIP.

6. Procurement

Following project design and programming of a highway project, the MassDOT Highway Division publishes a request for proposals. It then reviews the bids and awards the contract to the qualified bidder with the lowest bid.

7. Construction

After a construction contract is awarded, MassDOT Highway Division and the contractor develop a public participation plan and a management plan for the construction process.

8. Project Assessment

The purpose of this step is to receive constituents' comments on the project development process and the project's design elements. MassDOT Highway Division can apply what is learned in this process to future projects.

Project Development Schematic Timetable

Description	Schedule Influence	Typical Duration
<p>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