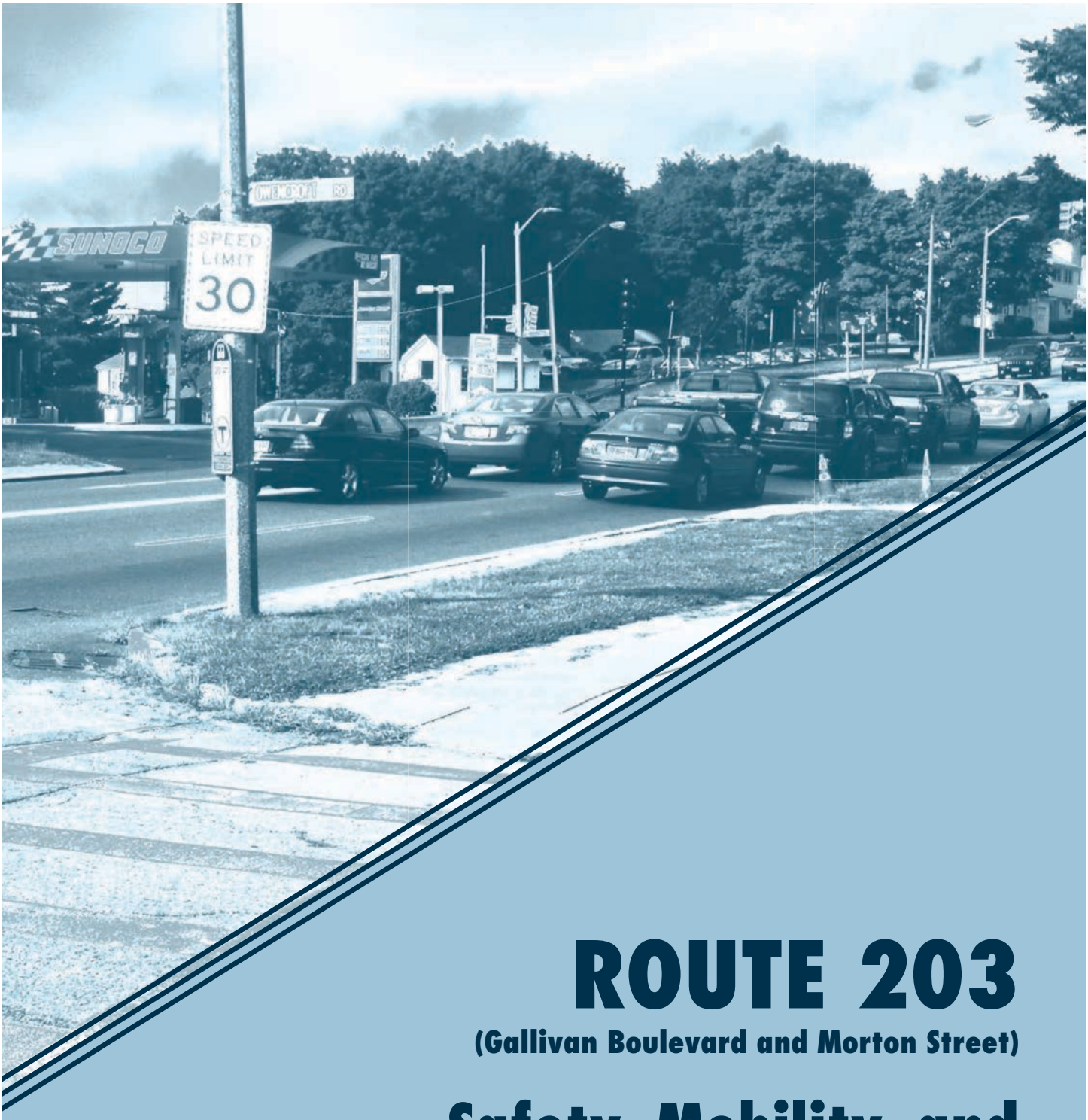

ROUTE 203

(Gallivan Boulevard and Morton Street)

Safety, Mobility, and Access Management

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management

Project Manager
Seth Asante

Project Principal
Efi Pagitsas

Data Analysts
Seth Asante
Kathy Jacob

Graphics
Kenneth Dumas
Kim Noonan
Jane Gillis

Cover Design
Kim Noonan

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Central Transportation Planning Staff
Directed by the **Boston Region Metropolitan Planning Organization**. The MPO is composed of state and regional agencies and authorities, and local governments.

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To request additional copies of this document or copies in an accessible format, contact:

Central Transportation Planning Staff
State Transportation Building
Ten Park Plaza, Suite 2150
Boston, Massachusetts 02116

(617) 973-7100
(617) 973-8855 (fax)
(617) 973-7089 (TTY)

ctps@ctps.org
www.bostonmpo.org

Abstract

The arterial segment of Route 203 between Gallivan Boulevard and Morton Street was selected for study as part of a larger study, Priority Corridors for the Long-Range Transportation Plan (LRTP) Needs Assessment. Route 203 was chosen because it is one of the MassDOT Highway Division's District 6 high-priority corridors needing improvement. The jurisdiction for this roadway was recently transferred from the Department of Conservation and Recreation to the Massachusetts Department of Transportation (MassDOT). MassDOT is working with the City of Boston and local stakeholders to try to obtain funding for a roadway improvement project.

This study identified several problems in the corridor, including safety for pedestrians, bicyclists, and motorists, noncompliance with the Americans with Disabilities Act, inadequate accommodation of bicyclists and pedestrians, poor pavement condition, outdated traffic signal equipment, outdated traffic signal timing and phase plans, and a need to make access to transit services safer.

Working with representatives from MassDOT and the City of Boston, MPO staff developed several recommendations for increasing safety, improving access, and making traffic operations more efficient. If the recommendations are implemented, the result would be an improved roadway corridor, where it is safe to cross the street and walk or cycle to shops or schools, where buses can run on time, where it is safe for people to walk to and from train stations, and where it is safer for motorists.

Acknowledgments

We wish to thank the Massachusetts Department of Transportation's Highway Division and Office of Transportation Planning and the City of Boston for participating in this study and supplying us with data and other information. We also thank all those who participated in this study through meetings, feedback, and reviews.

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pedestrian
bicyclist
motorists
crashes
bus

Executive Summary

Route 203 (Gallivan Boulevard and Morton Street) is one of the Massachusetts Department of Transportation (MassDOT) Highway Division's District 6 high-priority corridors for improvements. It was transferred to MassDOT in 2009; prior to that it was under the jurisdiction of the Department of Conservation and Recreation (DCR). The land uses in the roadway corridor include residential, commercial, and recreational. The average daily traffic ranged between 14,000 vehicles and 26,000 vehicles. This east west arterial serves local and regional traffic of all trip purposes: work and non-work.

The Boston Region Metropolitan Planning Organization (MPO) staff established an advisory task force (representatives from MassDOT and City of Boston) and work closely with the task force to identify the problems and develop improvement recommendations.

S.1 Problems

Since the transfer, MassDOT has been working with the City of Boston and local stakeholders in trying to get funding for a roadway improvement project to improve safety and accommodate all users; to make traffic operations more efficient; and to bring the roadway up to the Americans with Disabilities Act (ADA) standards. MPO staff identified the following problems in the Gallivan Boulevard and Morton Street arterial segments that were selected for study:

S.1.1 Pedestrian and Bicycle Accommodation Problems

- Need for additional crosswalks on Morton Street to make it more accessible.
- Need for crosswalks on several side streets.
- Lack of detectable warning panels on curb ramps.
- Obstructions in crosswalks and sidewalks such medians with no openings and utility and light poles and street furniture blocking sidewalks for safe passage.
- Broken and crumbled sidewalks.
- Insufficient pedestrian clearance time at many of the signalized intersections.

- Lack of countdown displays and audible signals at the signalized intersections.
- Lack of bike signs or pavement markings (sharrows)
- Need for bicycle detection equipment at the signalized intersections.

S.1.2 Signage

There is need to improve signage at intersections and between intersections throughout the corridor. New signs are needed to improvement safety for motorists, pedestrians, and bicyclists. Some of the existing signs need to be mounted at appropriate locations and height to be visible and attract attention from motorists, pedestrians, and bicyclists.

S.1.3 Pavement Condition

The pavement condition in the Morton Street segment is poor. There are longitudinal and lateral cracks and rutting in the pavement due lack of maintenance and drainage problems in this segment. In addition, sections of the Gallivan Boulevard segment have pavement in fair condition that are in need of pavement rehabilitation.

S.1.4 Speeding

There are neighborhood complaints of speeding during the off-peak hours in the Gallivan Boulevard and Morton Street segments. A spot speed survey conducted in the Gallivan Boulevard segment generally indicated that motorists were speeding, especially during off-peak periods.

S.1.5 Transit Service

There are transit services in the Gallivan Boulevard and Morton Street segments including bus, commuter rail (Fairmont Line), and subway (Red Line). In addition, Brockton Area Transit (BAT) operates bus service between the Brockton and the Ashmont MBTA station. Therefore, it is important to improve the roadway so that it would be safe for people to walk to and from bus stops and train stations and buses could run on time.

MPO staff identified that, some of the MBTA's Service Delivery Policy standards are not met, and there is room for improvement in schedule adherence, loading, and frequency on some of routes. In addition, MPO staff observed that throughout the Gallivan Boulevard and Morton

Street segments, there are no bus shelters with benches for transit users. The MBTA's policy for shelter installation suggests there should be at least 70 boardings a day at a stop for the stop to be a candidate for a shelter. A review of CTPS bus stop data collected in 2007 through 2009 shows that 10 bus stops in the two segments have daily boardings of 70 passengers or greater.

S.1.6 Traffic Signals

The post-mounted signal heads on Gallivan Boulevard and Morton Street do not provide good conspicuity and do not attract attention from motorists. In addition, motorists' line of sight of the signal heads is easily blocked by trucks in traffic. Also, the closely-spaced signalized intersections on Gallivan Boulevard and Morton Street are not put into coordination. In addition, the yellow change interval and all-red interval are insufficient at several signalized intersections on Gallivan Boulevard and Morton Street arterial segments. In addition, the existing pedestrian walk and clearance intervals appear to be insufficient. The pedestrian signal heads are not aligned at some signalized intersections so that they face the intended crosswalk directly.

S.1.7 Crashes

Due lack of left-turn bays and protected left-turn phases on Gallivan Boulevard and Morton Street, left-turn movements are involved in many crashes with the through movements at many of the major intersections. In addition, the intersection of Morton Street and Blue Hill Avenue had a high number of crashes involving pedestrians. In addition, the section of Morton Street between Wildwood Street and Lucerne Street had a high number of single-vehicle crashes due to a horizontal curve located there.

S.1.8 Traffic Congestion

There is traffic congestion in the Gallivan Boulevard and Morton Street segments. The critical intersections in the Gallivan Boulevard and Morton Street segments where traffic demands exceed capacity are:

- Gallivan Boulevard, Granite Avenue, and Adams Street intersection
- Gallivan Boulevard and Dorchester Avenue
- Morton Street and Blue Hill Avenue intersection.

Motorists experience long delays and queuing at these two intersections and they operate at LOS E or F during the AM and PM peak periods.

S.2 Proposed Improvements

Several improvements have been proposed for the Gallivan Boulevard and Morton Street arterial segments to improve safety, mobility, operations, and access management. Tables ES-1 and ES-2 summarize the proposed improvements, including key short-term improvements (highlighted in yellow) for the Gallivan Boulevard and Morton Street segments, respectively. MassDOT has jurisdiction over the Gallivan Boulevard and Morton Street segments and is responsible for implementing all of the recommendations.

S.3 Project Cost

Based on preliminary cost estimates, the improvements proposed for Gallivan Boulevard and Morton Street segments, including upgrading pedestrian and bicycle facilities, upgrading traffic signal equipment, updating the traffic signal timing, making geometric modifications, improving bus transit service, improving signage, rehabilitating pavement, implementing median and landscaping treatments, and upgrading the street lighting would cost $6-7 million for the Gallivan segment and $7-8 million for the Morton Street segment.

There are currently two MassDOT reconstruction projects proposed for Route 203: one for reconstructing Gallivan Boulevard (MassDOT Project ID #606896) and one for reconstructing Morton Street (MassDOT Project ID #606897). These two projects are described in subsections 4.1.3 and 4.1.4 of this report. Project need and initiation forms have been completed and approved by MassDOT's project review committee for these two projects. Currently the two projects are in preliminary design and planning phases and this planning study is part of these phases. There is no funding for the MassDOT projects and the likely timing of the projects is 8 to 10 years from now. The key short-term improvements with high safety payoff could be implemented with Highway Division's maintenance funds.

TABLE ES-1

Summary of Proposed Improvements for Gallivan Boulevard Segment

Safety Issue	Improvement	Time Frame
Pedestrian Accommodation	Repairing or replacing crumbled or broken sidewalks and adding detectable warning plates to curb ramps in the segment and ensuring that ramp landings are even with the road surface.	Short-term
	Providing sufficient walk and don't-walk times for pedestrians at all signalized intersections.	Short-term
	Constructing an opening in the median on the west leg of Gallivan Boulevard at Granite Avenue for pedestrians.	Short-term
	Widening the opening in the triangular island on the west leg of Gallivan Boulevard at Washington Street to accommodate pedestrians in wheelchairs.	Short-term
	Providing marked crosswalks at the approaches of Rangeley Street and Druid Street.	Short-term
	Aligning pedestrian signal heads to face crosswalks and to be free of obstructions at all signalized intersections.	Short-term
	Removing obstacles such as signal and light poles in curb ramps.	Medium-term
	Providing accessible pedestrian signals and countdown displays at all signalized intersections.	Medium-term
Bicyclist Accommodation	Providing detection for bicycles at all signalized intersections.	Medium-term
	Providing bike signs and pavement markings (sharrows) indicating bicycle facilities and use them throughout the segment.	Short-term
	Applying a road diet for the section of Gallivan Boulevard between Wilmington Avenue and Wessex Street and reconfigure roadway to add bike lanes and left-turn bays.	Medium-term

(continued)

Table ES-1 (Continued)

Safety Issue	Improvement	Time Frame
Traffic Signal Equipment Upgrade	Providing overhead signal heads with dark backplates to increase visibility, attract attention, and shield signals from sunlight and other environmental conditions at all signalized intersections.	Medium-term
	Replacing all four-section signal heads with five-section signal heads at all signalized intersections.	Medium-term
	Replacing lead-lag left-turn phasing at the intersection of Gallivan Boulevard and Dorchester Avenue with leading protected left-turn phases for Gallivan Boulevard eastbound traffic and Dorchester Avenue southbound traffic.	Medium-term
	Repairing faulty loop detectors at intersection of Gallivan Boulevard at Granite Avenue/Adams Street.	Short-term
	Upgrading the loop detector systems at signalized intersections to make traffic more demand-responsive.	Medium-term
	Providing accessible pedestrian signals and countdown displays at all signalized intersections (see the Pedestrian Accommodation section of this table).	Medium-term
Traffic Signal Timing Update	Placing closely spaced intersections into coordinated systems: four signals—Gallivan Boulevard at Granite Avenue/Adams Street, at Adams Street, at Dorchester Avenue, and at Washington Street.	Medium-term
	Retiming traffic signals to provide optimized timing for vehicles and pedestrians: • Increasing all pedestrian walk intervals to a minimum of seven seconds, as specified in MUTCD. • Increasing pedestrian clearance intervals (Don't Walk) to provide sufficient time for pedestrians to cross the street. • Increasing the yellow change interval to four seconds at all signalized intersections. • Increasing the all-red clearance interval to two seconds at all intersections.	Short-term

(continued)

Table ES-1 (Continued)

Safety Issue	Improvement	Time Frame
Geometric Improvements	Make geometric improvements at the intersection of Gallivan Boulevard and Washington Street, specifically at the Driscoll Drive approach to Washington Street. Three options were recommended: • Channelize Driscoll Drive traffic to Washington Street and restripe the Washington Street approaches to add a left-turn bay (Figure 4-6). • Tie Driscoll Drive approach into the intersection directly and provide it with a separate traffic signal phase (Figure 4-7). • Reverse the direction of Driscoll Drive to be away from the intersection.	Medium-term
Signage	Replacing missing stop signs on Kenmare Road, Driscoll Drive, Nevada Street, Ellison Avenue, Vera Street, Druid Street, Arbella Road, Milwood Street, Wessex Street, Magdala Street, Alicia Road, and Owencroft Road.	Short-term
	Replacing missing signs for one-way-street signs on Becket Street, Hutchinson Street, Oakridge Street, and Pleasant Hill Road.	Short-term
	Installing R10-11a signs (No Turn on Red) at signalized intersections that have exclusive pedestrian phases.	Short-term
	Adding R10-12 traffic signal signs (Left Turn Yield on Green, with a solid green circle) adjacent to the left-turn signal faces.	Short-term
	Installing OM1-2 object markers to mark channelized islands within the roadway at the Gallivan Boulevard and Washington Street intersection.	Short-term
Landscaping	Replacing damaged and dead trees, and planting trees in new locations that would benefit from having trees.	Short-term
Pavement and Drainage Rehabilitation	Rehabilitating pavement that is in poor condition and improving drainage by fixing damaged catch basins.	Medium-term

(continued)

Table ES-1 (Continued)

Safety Issue	Improvement	Time Frame
Bus Transit Service Improvements	Providing bus shelters with benches and trash receptacles at the two stops that meet MBTA's eligibility criteria for shelter installation: • Gallivan Boulevard at Wilmington Avenue • Morton Street at Gallivan Boulevard	Medium-term
	Placing closely spaced traffic signals into coordination and optimizing traffic signal timings to reduce traffic delays.	Medium-term
	Making accessibility enhancements for pedestrians and bicyclists in the Gallivan Boulevard segment (see the Pedestrian Accommodation and Bicyclist Accommodation sections in this table).	Medium-term
Lighting	Upgrading street lighting in the Gallivan Boulevard segment by repairing or replacing: • Lights that are not operating or are going on and off • Light fixtures that are open, have broken glass, or are missing • Damaged and/or slanted poles • Exposed wires and graffiti on streetlight poles Providing or upgrading lighting at pedestrian facilities (bus stops and commercial areas), intersections, and roadway curves throughout the segment.	Medium-term

TABLE ES-2
Summary of Proposed Improvements for Morton Street Segment

Safety Issue	Improvement	Time Frame
Pedestrian Accommodation	Repairing or replacing crumbled or broken sidewalks and adding detectable warning plates to curb ramps in the segment.	Short-term
	Providing sufficient walk and don't-walk times for pedestrians at all signalized intersections.	Short-term
	Providing marked crosswalks at the approaches of Sutton Street, Wildwood Street, Leston Street, Rhoades Street, Courtland Road, and Havelock Street.	Short-term
	Replacing the existing exclusive pedestrian phase at the intersection of Morton Street and Blue Hill Avenue with concurrent pedestrian phasing. and adding: • Leading pedestrian intervals • An R10-15 (Turning Vehicles Yield to Pedestrians) sign for Morton Street eastbound right turns	Short-term
	Providing marked crosswalks on Morton Street at the following intersections: • Lucerne Street at Leston Street • Havelock Street at Courtland Street	Short-term
	Adding bulb-outs to reduce crossing distance for pedestrians at the following locations: • Morton Street eastbound approach to West Selden Street and Corbet Street • South leg of Wildwood Street at Morton Street • Morton Street westbound approach to Lucerne Street at Leston Street • Havelock Street at Morton Street (for a new crosswalk on Morton Street)	Short-term
	Aligning pedestrian signal heads to face crosswalks directly and to free crosswalks from obstructions at intersection of Morton Street at Blue Hill Avenue.	Short-term
	Providing accessible pedestrian signals and countdown displays at all signalized intersections (see traffic signal equipment upgrade).	Medium-term

(continued)

Table ES-2 (Continued)

Safety Issue	Improvement	Time Frame
Bicyclist Accommodation	Providing bicycle detection at all signalized intersections.	Medium-term
	Providing bicycle signs and pavement markings indicating bicycle facilities and use them throughout the segment (Share the Road signs and sharrows).	Short-term
	Providing a bike lane on both sides of Morton Street between Evans Street and Norfolk Street.	Short-term
Traffic Signal Equipment Upgrade	Providing overhead signal heads with dull black backplates to increase visibility, attract attention, and shield signals from sunlight and other environmental conditions at all signalized intersections.	Medium-term
	Replacing all four-section signal heads with five-section signal heads at all signalized intersections that have protected and permitted left turns.	Medium-term
	Repairing faulty loop detectors at intersection of Morton Street at Blue Hill Avenue.	Short-term
	Upgrading the loop detector systems at signalized intersections to make traffic more demand-responsive.	Medium-term
	Providing accessible pedestrian signals and countdown displays at all signalized intersections.	Medium-term
Traffic Signal Timing Update	Placing closely spaced signalized intersections on Morton Street into coordinated systems.	Medium-term
	Providing a leading protected left-turn phase for Morton Street westbound traffic at West Selden Street, Corbet Street, and Selden Street intersection.	
	Retiming traffic signals to provide optimized timing for vehicles and pedestrians: • Increasing all pedestrian walk intervals to a minimum of seven seconds • Increasing pedestrian clearance intervals to provide sufficient time for pedestrians to cross the street • Increasing the yellow change interval to four seconds at all signalized intersections • Increasing the all-red clearance interval to two seconds at all intersections	Short-term

(continued)

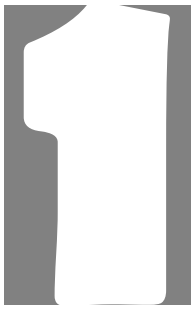
Table ES-2 (Continued)

Safety Issue	Improvement	Time Frame
Geometric Improvements	Redesigning the intersection approaches of Greendale Road and Wellington Hill Street at Morton Street to streamline traffic from the side streets, reduce crossing distances for pedestrians, and improve sight distance.	Medium-term
	Making geometric improvements at the intersection of Morton Street at Havelock Street/Courtland Road to reduce left-turn-related crashes; two options recommended are: • Adding left-turn bays on Morton Street for turning onto Havelock Street or Courtland Road to reduce the number of left-turn crashes at the intersection. This option would require taking parking spaces. • Closing median opening. Closing this median would require northbound vehicles turning left to make a left turn at Harvard Street instead and would require an exclusive left-turn bay on the westbound approach of Morton Street; therefore, this improvement should be evaluated in tandem with potential modifications at Harvard Street.	Medium-term
Signage	Replacing missing stop signs on Lorna Street, Owen Street, Fuller Street, Sutton Street, Theodore Street, Greendale Road, Baird Street, and Wilcock Street.	Short-term
	Replacing missing one-way-street signs on Wildwood Street and Courtland Road.	Short-term
	Adding R10-12 signs (Left Turn Yield on Green) adjacent to the left-turn signal faces.	Short-term
	Installing W3-3 (Signal Ahead) signs on the Morton Street eastbound approach due to the curvature of the roadway west of Blue Hill Avenue and adding a D3-2 (advance street name) sign below it.	Short-term
	Installing W1-2 or W1-2a (curve warning) signs and W1-8 (chevron) signs to provide drivers with additional information regarding the relative sharpness of the curve between Wildwood Street and Lucerne Street.	Short-term
	Installing R10-11a signs (No Turn on Red) at signalized intersections that have exclusive pedestrian phases	Short-term

(continued)

Table ES-2 (Continued)

Median and Landscaping	Extending the short median between Wildwood Street and Theodore Street about 200 feet further west to Lucerne Street and about 500 feet further east to Verrill Street to provide refuge areas for pedestrians.	Medium-term
	Extending the median on the west leg of Morton Street at Blue Hill Avenue	Medium-term
	Replacing damaged and dead trees, and planting trees in new locations that would benefit from having trees.	Short-term
Pavement and Drainage Rehabilitation	Rehabilitating pavement that is in poor condition and improving drainage by fixing damaged catch basins.	Medium-term
Bus Transit Service Improvements	Providing bus shelters with benches and trash receptacles at eight bus stops that meet the MBTA's eligibility criteria for shelter installation: • Morton Street at Blue Hill Avenue (both directions of Morton Street) • Morton Street at Selden Street (both directions of Morton Street) • Morton Street at Harvard Street (eastbound direction only) • Morton Street at Norfolk Street (both directions of Morton Street) • Morton Street at Evans Street (eastbound direction only)	Medium-term
	Making accessibility enhancements for pedestrians and bicyclists in the Morton Street segment (see the Pedestrian Accommodation and Bicyclist Accommodation sections of this table).	Medium-term



1 Introduction

1.1 Background

The arterial segment of Route 203 between Gallivan Boulevard and Morton Street was selected for study as part of a larger study, Priority Corridors for the Long-Range Transportation Plan (LRTP) Needs Assessment. The Boston Region MPO's LRTP identified several priority arterial segments in need of maintenance, modernization, safety and mobility improvements, and transit service enhancements and modernization. The arterial segments were identified based on previous and ongoing transportation planning work, including the Boston Region MPO's congestion management process (CMP), the MBTA's Program for Mass Transportation (PMT), and other MPO planning studies. To help identify solutions for addressing problems in some of these arterial segments, a priority corridor study was included in the federal fiscal year (FFY) 2012 Unified Planning Work Program (UPWP) to address mobility, safety, and preservation concerns for arterial segments. [1]

MPO staff worked closely with the MassDOT Highway Division and Office of Transportation Planning and communities in the Boston Region MPO area to identify two high-priority arterial segments for study. The selection procedure for the arterial segments to study comprised three major parts. First, MPO staff assembled data on the 31 arterial segments, located in 52 communities that were identified using the documents mentioned above, and provided the data to MassDOT, which then used the data to prioritize the segments. The types of assembled data are listed below.

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[1] Boston Region Metropolitan Planning Organization, Unified Planning Work Program, Federal Fiscal Year 2012, Endorsed by the Boston Region Metropolitan Planning Organization on August 18, 2011.

- MPO staff used ArcMap geographic information system software, and MassDOT's 2010 Road Inventory File and 2007–09 crash database to assemble the following information for each arterial segment in each community:
    - Roadway jurisdiction
    - National Highway System (NHS) status
    - Average daily traffic (ADT)
    - High-crash locations
    - Crashes per mile
- In addition, MPO staff used the MPO's Congestion Management Process arterial speed data to determine the average travel speeds and the speed index (average travel speed divided by the speed limit) on each arterial segment.
- Next, MPO staff used MBTA bus service performance and passenger load data to determine the percentage of bus trips failing schedule adherence or passenger load standards (late bus service or crowding).
- MPO staff then reviewed MassDOT's project information database, the MPO's 2012–15 Transportation Improvement Program (TIP) projects, Central Transportation Planning Staff (CTPS) planning and other studies, and municipal websites for projects, studies, and TIP projects planned or programmed for each arterial segment.

After assembling all of this information, MPO staff submitted it to MassDOT Highway District offices and MassDOT's Office of Transportation Planning for comment. Through this review process, MassDOT provided further information about problems, projects, and existing studies on some of the arterial segments. Every district office assigned to each arterial segment in its jurisdiction a high, medium, or low priority rating.

Second, MPO staff reviewed MassDOT's responses and comments. Segments that had not been given priority ratings by MassDOT because they were not under MassDOT's jurisdiction were given ratings by MPO staff. Arterial segments that had been rated medium or low priority because of projects in construction, recently completed, in design, under study, or programmed in the TIP, were excluded from further consideration for this cycle of the Priority Corridors study. In addition, arterial segments that had been recently studied by CTPS or other agencies were rated as low priority and were excluded from

further consideration. Seven arterial segments had been given a high-priority rating by MassDOT staff due to safety, mobility, and signal coordination concerns, pedestrian and bicycle accommodation issues (including ADA noncompliance), and transit issues. These seven arterial segments were selected for further review and consideration.

Third, MPO staff selected the segments to be studied. They began by examining more closely the seven high-priority arterial segments using data related to five criteria:

- *Safety Conditions:* Location experiences a high crash rate and/or has one or more statewide top-200 high-crash locations
- *Congested Conditions:* Location experiences extensive delays during peak periods
- *Transit Significance:* Location carries bus routes or is adjacent to a transit stop or station
- *Regional Significance:* Location carries a high proportion of regional traffic and/or is on the National Highway System (NHS)
- *Implementation Potential:* Location is either under MassDOT jurisdiction or has a strong commitment from the community. Locations under Department of Conservation and Recreation (DCR) jurisdiction are considered to have a lower potential for implementation.

Arterial segments scoring high in these selection criteria (meeting at least four of the five criteria) were examined more closely, and two were selected for study. The number of segments selected was determined in part by the study's budget. The arterial segments that were selected for study are:

1. Route 114 (Andover Street) in Danvers
2. Route 203 (Gallivan Boulevard and Morton Street) in Boston

The analyses and recommendations for the Route 114 arterial segment are documented separately, in a memo.

Route 203 was chosen because it is one of the MassDOT Highway Division's District 6 high-priority corridors for improvements. The road was transferred to MassDOT recently; prior to that it was under the jurisdiction of the Department of Conservation and Recreation (DCR). MassDOT is working with the City of Boston and local stakeholders in trying to get funding for a roadway improvement project that would look at the existing conditions (pavement, transit issues, ADA noncompliance, pedestrian and bicycle accommodation, and traffic

signal coordination) in a 4.3-mile section of Route 203 from the Neponset Circle to Shea Circle and to propose improvements.

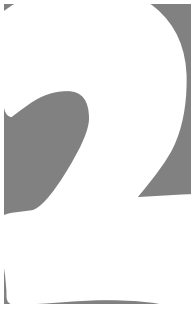
An arterial segment study is usually a logical way to address multimodal transportation needs in a corridor, as it allows a roadway corridor to be evaluated comprehensively for all modes: pedestrians, bicyclists, motorists, and public transportation users are considered using a holistic approach to the analysis of the issues and associated improvement recommendations. The results of implementing the recommendations of this report would be an improved roadway corridor, where it is safe to cross the street and walk or cycle to shops or schools, and for recreation; where buses run on time; where it is safe for people to walk to and from train stations; and where it is safer for motorists. Typically, an arterial segment study is multimodal and addresses issues, analyzes services, makes recommendations within the roadway's right-of-way, and takes into account the needs of the abutters and users.

1.1.1 Study Purpose

The purpose of this study was to inventory existing problems and develop multimodal transportation improvements to address those problems. To achieve the goals of the study, MPO staff worked closely with an advisory task force composed of representatives from MassDOT and the City of Boston. MPO staff met four times with the task force to discuss the work scope for this study, finalize the existing conditions and identification of problems, and develop improvement recommendations.

1.1.2 Organization

This report is organized into five sections: an executive summary and four chapters. Chapters 1 and 2 give a brief background of the study and the scope of analysis. Chapter 3 presents the existing conditions analyses and Chapter 4 the recommended improvements.



2 Data Collection and Scope of Analysis

2.1 Data Collection

Several types of data were collected in the field or obtained from other sources and used to evaluate the existing safety, mobility, and traffic operations conditions in the Gallivan Boulevard and Morton Street arterial segments. The data collection process and scope of the analyses are presented in this section.

2.1.1 Vehicle, Pedestrian, and Bicycle Counts

MPO staff collected turning-movement counts at the study intersections during June and July 2012 when schools were in session. The counts were conducted during the morning peak travel period (7:00 AM to 9:00 AM) and the afternoon peak travel period (4:00 PM to 6:00 PM) on weekdays. Heavy vehicles (vehicles with six or more tires), including school buses, transit buses, and trucks, were counted separately. Pedestrian counts were conducted simultaneously with the turning-movement counts at the same locations. MPO staff also took an inventory of pedestrian and bicycle amenities provided at study intersections and roadway segments, such as curb cuts for wheelchairs, crosswalks, sidewalks, pedestrian signals, and pedestrian-activated push buttons. The counts were used for an intersection capacity analysis, calculation of crash rates, and assessment of pedestrian and bicyclist mobility needs. In addition, the MassDOT Highway Division conducted automatic traffic recorder (ATR) counts at 10 locations. The ATR counts are 24-hour counts conducted at a location for two or more consecutive days. The data from the counts are in Appendix A.

2.1.2 Traffic Signal Information

The MassDOT Highway Division provided traffic signal phase sequences and the timing plans of the intersections selected for study.

They retrieved the current signal timing plans and phase sequences from the signal controllers during a field visit.

Currently, the traffic signals are not part of the real-time signal control system of the Boston Transportation and Emergency Management Center. The signal timing information was used in the intersection capacity analysis and is in Appendix B.

2.1.3 Crash Data

MPO staff used crash data obtained from the Boston Police Department (BPD) and the Massachusetts State Police (MSP) for a road safety audit conducted for a segment of Morton Street. The BPD and MSP data cover the period from January 2009 through September 2011. In addition, MPO staff used MassDOT Registry of Motor Vehicles (RMV) crash data for the intersections for which police crash reports were unavailable. The RMV crash data cover the period from January 2006 through December 2009. The crash data were used to evaluate traffic operations and safety for pedestrians, bicyclists, and motorists. The collision diagrams and crash rate worksheets of the study intersections are in Appendix C.

2.1.4 Traffic Speeds

The MassDOT Highway Division collected spot speed data for this study. Four locations were selected for speed studies but due to field conditions, the Highway Division was able to collect data for only one location. There were no medians in the other three locations; therefore it was impossible for MassDOT to collect the speed data on a four-lane undivided roadway. The speed data were collected for two consecutive days and were recorded in hourly intervals by lane and direction. In addition to the spot speed data, MPO staff used travel speed data collected on Gallivan Boulevard and Morton Street as part of the MPO's congestion management process. The speed data were used to assess congestion on Gallivan Boulevard and Morton Street during peak hours of travel, and to determine if motorists are speeding during the off-peak hours. The speed data are in Appendix D.

2.1.5 Pavement Condition

The pavement serviceability index shows the pavement condition and the extent of repairs needed. The MassDOT Highway Division collects pavement condition data and stores the information in the roadway inventory file (RIF). Based on measurements of roughness, surface distress, skid resistance, and deflection, a pavement is assigned a

score that reflects its overall condition. This score, which is based on a scale of 0 to 5, is called a pavement serviceability index (PSI). A pavement serviceability index greater than or equal to 3.0 is classified as good, while a serviceability index of less than 3.0 requires various forms of pavement maintenance or rehabilitation. Generally, maintenance and rehabilitation categories relate to the following PSI ratings:

- Total reconstruction – a PSI rating of less than 1.75
- Structural overlay – a PSI rating of 1.75 to 2.50
- Thin overlay – a PSI rating of 2.51 to 2.75
- Routine maintenance – a PSI rating of 2.76 to 3.00
- Good pavement – a PSI rating greater than 3.00

2.1.6 Transit Data

The transit data used in this study were obtained from the Massachusetts Bay Transportation Authority (MBTA). New technologies available on MBTA buses allow for enhanced service monitoring. Improved run time measurements that reflect general congestion trends in the corridor are available from GPS systems aboard the buses. Automated passenger counters available on some buses allow for monitoring of ridership and crowding. The transit data obtained from the MBTA consist of ridership, frequency, schedule adherence, and loading performance of the bus routes on or crossing Gallivan Boulevard and Morton Street. MPO staff also inventoried the facilities provided at the bus stops to assist transit users, such as benches, shelters, and bus stop signs. Analysis of transit data established the need to develop potential roadway improvements to increase bus schedule adherence, consolidate some transit stops, and reduce traffic signal delay in the corridor. It also allowed evaluation of pedestrian, bicyclist, and transit user amenities provided in the corridor in an effort to improve mobility and access to and from bus stops and transit stations.

2.2 Analysis

The analyses conducted for the study were focused on identifying and defining the problems on Gallivan Boulevard and Morton Street, as well as identifying potential improvements. The following section describes the types of analysis that were conducted for the study.

2.2.1 Traffic Operations Analysis

Based on the turning-movement counts, lane configurations, and signal timing and phasing information, intersection capacity analyses were conducted by using an intersection capacity analysis program, Synchro 8.[2] The performance of an intersection is calculated using the methodology defined in the 2010 Highway Capacity Manual.[3] The key performance measures, which are obtained through analysis, are levels of service (LOS), vehicle delay, and queue length. LOS is the term used to describe the quality of traffic flow on a roadway facility at a particular time. Operating levels of service are reported on a scale of A to F, with LOS A representing free-flow or uncongested conditions with little delay to motorists, and LOS F representing congested conditions with long delays and traffic demands exceeding roadway or intersection capacity. Table 2-1 shows the operating LOS for the intersections in this study, which is a function of vehicle delay.

TABLE 2-1
Level-of-Service Criteria for
Signalized and Unsignalized Intersections

Level of Service (LOS)	Delay per Vehicle (seconds)	
	Unsignalized	Signalized
A	≤ 10.0	≤ 10.0
B	10.1 to 15.0	10.1 to 20.0
C	15.1 to 25.0	20.1 to 35.0
D	25.1 to 35.0	35.1 to 55.0
E	35.1 to 50.0	55.1 to 80.0
F	> 50	> 80

* For approach-based and intersectionwide assessment, LOS is solely determined by control delay.

[2] Synchro Version 8 was used for these analyses. This software is developed and distributed by Trafficware Ltd. It can perform capacity analysis and traffic simulation (when combined with SimTraffic) for an individual intersection or a series of intersections.

[3] Transportation Research Board, National Research Council, Highway Capacity Manual, Fifth Edition, Washington, DC, 2010.

TABLE 2-2
MassDOT Highway Division's Average Crash Rates for Intersections: Crashes per Million Entering Vehicles*

MassDOT Highway Division District	Signalized Intersection	Unsignalized Intersection
Statewide	0.81	0.61
District 1**	0.92**	0.40*
District 2	0.83	0.67
District 3	0.90	0.66
District 4	0.78	0.59
District 5	0.77	0.60
District 6	0.77	0.57

* Crash information queried on July 7, 2011
** For District 1, statewide rates are used due to low sample size.
Note: Shading denotes the MassDOT Highway Division's district in which the study corridor is located.

2.2.2 Safety Analysis

The measures used for defining the safety problems in the Gallivan Boulevard and Morton Street segments were the crash frequency and crash rate, and the pattern of crashes obtained from collision diagrams. The safety analysis was performed for motorists, pedestrians, and bicyclists. A high number of crashes may be an indication of a safety problem. Information on characteristics of the crashes, such as the type (angle, rear-end, and sideswipe), level of severity, and ambient light conditions, provides insight into the nature of the safety problems. Another way of analyzing safety is to calculate the crash rate in order to determine if it exceeds the District 6 average crash rate (Table 2-2).

In addition, MassDOT's 2009 statewide list of the top 200 high-crash intersections was used in this study. Intersections on this list are considered to be high-crash locations warranting safety improvements. The list is generated by georeferencing the crashes in the MassDOT database to clusters around intersections and using a weighting system in which a fatal crash is weighted 10 times and an injury 5 times, and an equivalent property damage only (EPDO) rating is calculated for the intersections.

2.2.3 Transit Service Analysis

Bus transit service in the study area was evaluated using performance measures and standards in the MBTA's Service Delivery Policy. The purpose of the Service Delivery Policy is to ensure that the MBTA provides quality transit services that meet the needs of the riding public and are consistent with the MBTA's mission. The policy establishes service objectives that define the key performance characteristics of quality transit services and identifies quantifiable service standards that are used to measure whether or not the MBTA's transit services achieve the service objectives and to evaluate whether MBTA services are provided in an equitable manner (as defined by Title VI of the federal Civil Rights Act of 1964). The Service Delivery Policy standards are summarized in Table 2-3.

In addition, MPO staff used the MBTA's policy for bus shelter installation to determine candidate bus stops that qualify for bus shelters. Evaluation of bus shelter installation is carried out in two steps. The first step in the evaluation process is a determination of whether the bus stop conforms to the shelter eligibility standards listed in Table 2-4. The number of boardings at a bus stop is also a major determinant of eligibility. The second step in the evaluation process is the site suitability test, which includes the following:

- Approval of property owner
- Approval by abutters
- Compliance with the Americans with Disabilities Act requirements
- Adequate physical space and clearances
- Proximity to a bus stop zone
- Municipal approval

Table 2-3
Summary of Service Delivery Policy Standards

Service Objectives	Service Delivery Standards
Accessibility	Coverage Span of service Frequency of service
Reliability	Schedule adherence
Safety and Comfort	Vehicle load
Cost Effectiveness	Net Cost per passenger

Table 2-4
MBTA Bus Shelter Policy: Eligibility Criteria

Eligibility Criteria	**Points**
70 or more average daily boardings (ADB) – weekdays, all routes	70
25-69 ADB	50
MBTA initiative to strengthen route identity	15
Elderly, disabled, medical, social service, or key municipal facility in close proximity to stop	15
Minority and/or low income area*	15*
Bus route transfer point	10
Infrequent bus service (minimum of 30 min. peak/60 min. off peak headway)	10
Poor site conditions (extreme weather exposure etc.)	10

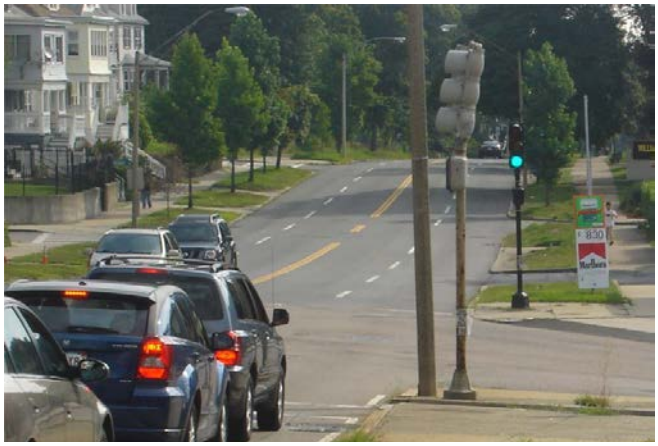
Route 203 (Gallivan Boulevard and Morton Street)

3 Existing Conditions

3.1 Project area

Route 203 (Gallivan Boulevard and Morton Street) is a state-owned principal arterial. It is a multilane roadway (two travel lanes in each direction) that runs in the east-west direction. Figure 3-1 shows the study area. The segment of Route 203 east of Fairmount Street is Gallivan Boulevard, and the segment to the west is Morton Street. The length of each of the two arterial segments (Gallivan Boulevard and Morton Street) in the study area is approximately one mile. Gallivan Boulevard crosses several north-south streets, including Granite Avenue, Dorchester Avenue, and Washington Street. Morton Street crosses West Selden Street, Norfolk Street, Blue Hill Avenue, and Harvard Street. The roadway serves commuter traffic and provides local access to businesses, institutions, and residences throughout the corridor. Both segments have different street designs and land uses.

The Gallivan Boulevard segment has a residential setting. The roadway layout for the Gallivan Boulevard segment is typically 80 feet wide, with four 10-to-11-foot-wide travel lanes, two 6-to-8-foot-wide sidewalks on both sides of the roadway, and two 10-foot-wide buffers of grass and trees (one on each side of the street, between the sidewalk and the roadway curb).



Typical cross-section of Gallivan Boulevard

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FIGURE 3-1
Study Area

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Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

There is no shoulder or median in this segment, and on-street parking is not allowed in most locations. The majority of the houses along Gallivan Boulevard have direct driveway access to Gallivan Boulevard.

Typical cross-section of Morton Street

The Morton Street segment is a mix of commercial and residential settings. The roadway layout in this segment is typically 80 feet wide, with four 10-to-11-foot-wide travel lanes, 9-foot-wide on-street parking on both sides of the street, and 6-to-8-foot–wide sidewalks on both sides of Morton Street. The segment between Rhoades Street and Harvard Street has a 6-foot-wide median, with openings at selected locations. There is no shoulder in this segment. The majority of the businesses on Morton Street use on-street parking. Many of the multifamily homes on Morton Street have direct driveway access to Morton Street and also use on-street parking.

The following sections describe traffic, pedestrian, and bicycle volumes, conditions of sidewalks, crosswalks, and roadway pavement, crashes, traffic speeds, traffic delays and queues, signage, transit service and selected intersections in the study area

3.2 Conditions in the Gallivan Boulevard and Morton Street Segments

3.2.1 Traffic, Pedestrian, and Bicycle Volumes

Figure 3-2 shows the average daily traffic (ADT) in the Gallivan Boulevard and Morton Street segments. The ADT ranged from 14,000 to 27,000 vehicles in the Gallivan Boulevard segment. In the Morton Street segment, the ADT ranged between 20,000 and 26,000 vehicles. Figure 3-2 also shows the turning-movement volumes at the intersections that were selected for study.

Table 3-1 shows the percentage of heavy vehicles at the study intersections during the peak periods when the turning movement counts were performed. On the average, the percentage of truck traffic in the peak period ranged between 2.0 and 4.0 percent.

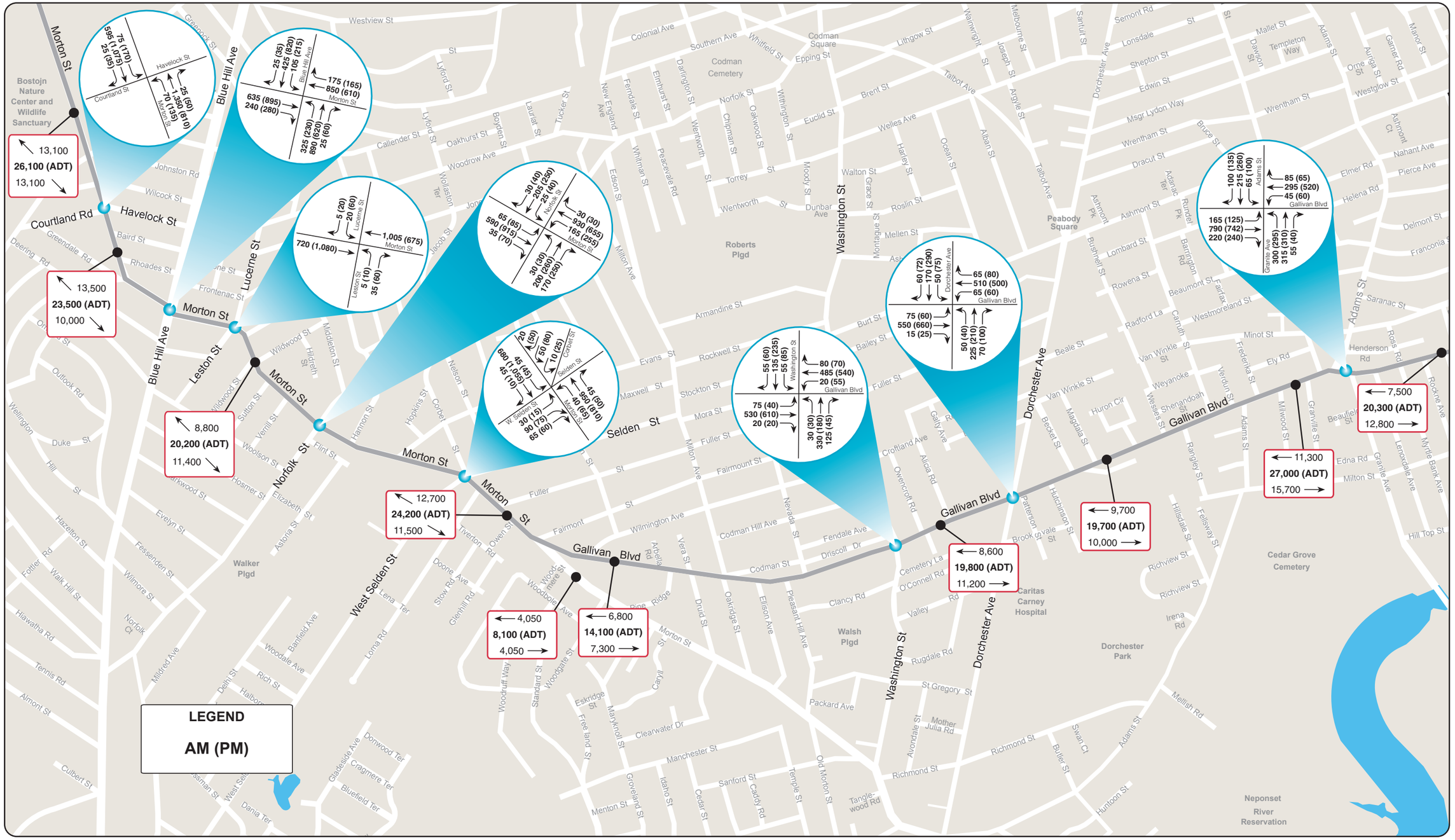

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FIGURE 3-2
Turning-Movement and Automatic Traffic Recorder Counts

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

Table 3-1
Percentage of Heavy Vehicles at Study Intersections during the AM and PM Peak Periods*

Intersection	Percent of Heavy Vehicles	Comment
Gallivan Boulevard at Granite Avenue/Adams Street		
Gallivan Boulevard EB	2.5	
Gallivan Boulevard WB	3.1	
Granite Avenue NB	2.5	
Adams Street SB	3.5	
Gallivan Boulevard at Dorchester Avenue		
Gallivan Boulevard EB	3.3	
Gallivan Boulevard WB	3.2	
Dorchester Avenue NB	6.4	High volume of MBTA bus traffic
Dorchester Avenue SB	8.9	High volume of MBTA bus traffic
Gallivan Boulevard at Washington Street		
Gallivan Boulevard EB	3.7	
Gallivan Boulevard WB	4.0	
Washington Street NB	3.9	
Washington Street SB	6.3	MBTA and school buses
Morton Street at West Selden Street/Corbet Street		
Morton Street EB	3.6	
Morton Street WB	3.9	
West Selden Street NB	3.2	
Corbet Street SB	1.2	
Morton Street at Lucerne Street/Leston Street		
Morton Street EB	3.0	
Morton Street WB	2.6	
Lucerne Street NB	5.8	Low-volume street
Leston Street SB	8.1	Low-volume street
Morton Street at Blue Hill Avenue		
Morton Street EB	3.2	
Morton Street WB	2.5	
Blue Hill Avenue NB	5.6	
Blue Hill Avenue SB	4.5	
Morton Street at Havelock Street/Courtland Road		
Morton Street EB	3.9	
Morton Street WB	3.4	
Havelock Street	3.3	
Courtland Road	3.0	

* The AM peak period is 7:00 AM to 9:00 AM, and the PM peak period is 4:00 PM to 6:00 PM.

The observed truck traffic was composed of MBTA buses, school buses, and commercial trucks.

Table 3-2 shows the pedestrian crossings and bicycle counts at the study intersections. As Table 3-2 shows, there is moderate to high pedestrian activity at all of the study intersections. In addition, there is bicycle traffic in the Gallivan Boulevard and Morton Street arterial segments.

TABLE 3-2
Pedestrian Crossings and Bicycle Counts at the Study Intersections

	Pedestrian Crossings		Bicycle Counts	
Intersection	**AM Peak Period**	**PM Peak Period**	**AM Peak Period**	**PM Peak Period**
Gallivan Blvd. and Granite Ave./Adams St.	63	158	3	11
Gallivan Blvd. and Dorchester Ave.	138	140	6	9
Gallivan Blvd. and Washington St.	45	74	2	3
Morton St. and West Selden St./Corbet St.	234	314	9	17
Morton St. and Lucerne St./Leston St.	158	280	4	16
Morton Street and Blue Hill Ave.	166	354	20	21
Morton St. and Courtland Rd./Havelock St.	64	70	7	3

* The AM peak period is 7:00 AM to 9:00 AM, and the PM peak period is 4:00 PM to 6:00 PM.

3.2.2 Sidewalks and Crosswalks

The sidewalks on Gallivan Boulevard and Morton Street are continuous and connect to residences, bus stops, side streets, businesses, and other land uses in the corridor. There is adequate separation between vehicular traffic and pedestrians on the sidewalks (10-foot buffers and 9-foot on-street parking on Gallivan Boulevard and Morton Street, respectively). The width of the sidewalks is adequate to safely accommodate pedestrians of all abilities.

The conditions of the sidewalks are generally in fair condition in the Gallivan Boulevard segment and in poor condition in the Morton Street segment. In the Gallivan Boulevard segment, especially west of Dorchester Avenue, the sidewalks are crumbled and broken at several

locations and debris and vegetation have reduced the effective width of the sidewalk.

In the Morton Street segment, sidewalks have deteriorated extensively, especially in the stretch between Norfolk Street and Havelock Street, where sidewalks are broken and crumbled.

The main connectivity problems are that some curb ramps are not aligned with crosswalks to allow pedestrians to stay within the bounds of the sidewalk and follow pedestrian desire lines. Crosswalks, sidewalks, and curb ramps are not in alignment at the following locations in the Gallivan Boulevard segment: Huron Circle, Alicia Street, Oakridge Street, Alicia Street, and Pine Ridge Road.

In addition, most of the curb ramps in the Gallivan Boulevard and Morton Street segments lack detectable warning panels for pedestrians with disabilities. Throughout the two segments, detectable warning panels have been provided only for the intersections of Gallivan Boulevard at Dorchester Avenue and at Adams Street.

Morton Street, west of Norfolk Street: Sidewalk broken and vegetation has reduced the effective width of the sidewalk

Gallivan Boulevard and Granite Street/Adams Street: Choke points that narrow the effective sidewalk width, such as mailboxes, utility poles and equipment, and landscaping.

Gallivan Boulevard at Huron Circle: Curb ramps and crosswalk are not aligned to allow pedestrians to stay within the bounds of the sidewalk and the pedestrian desire line.

In addition, there are choke points such as mailboxes, utility poles, landscaping, debris, weeds, and bushes that narrow the effective sidewalk width. On Gallivan Boulevard, there are no crosswalks at Rangeley Street and Druid Street. On Morton Street, there are no crosswalks at Verrill Street, Sutton Street, Wildwood Street, and Fairmount Street.

3.2.3 Pavement Conditions

Morton Street, west of Blue Hill Avenue: pavement is broken.

The pavement conditions for Gallivan Boulevard and Morton Street are shown Figure 3-3. The pavement condition is generally good in the Gallivan Boulevard segment, except for the stretch between Pleasant Hill Avenue and Morton Street, where the pavement condition is poor. In the Morton Street segment, the pavement condition is generally poor. In addition, recent field observations indicate that there are extensive pavement cracking and rutting in the Morton Street segment due to drainage problems and lack of maintenance over the years.

3.2.4 Crashes

There are three intersections in the Gallivan Boulevard and Morton Street segments that are on MassDOT's 2009 list of the top 200 high-crash intersections:

- Gallivan Boulevard and Granite Avenue/Adams Street ranks number 128.
- Gallivan Boulevard and Dorchester Avenue ranks number 55.
- Morton Street and Blue Hill Avenue ranks number 185.

Many of the study intersections have crash rates higher than the Highway Division District 6 average crash rate for intersections. Table 3-3 presents the crash rate at the intersections selected for study. The crash rate work sheets for the study intersections are in Appendix C. An analysis of the MassDOT crash database for the period 2007 to 2009 indicated three pedestrian and bicyclist crashes in the Gallivan Boulevard segment. In the Morton Street segment, there were 11 pedestrian and 3 bicyclist crashes in the same period, all of which involved injuries.

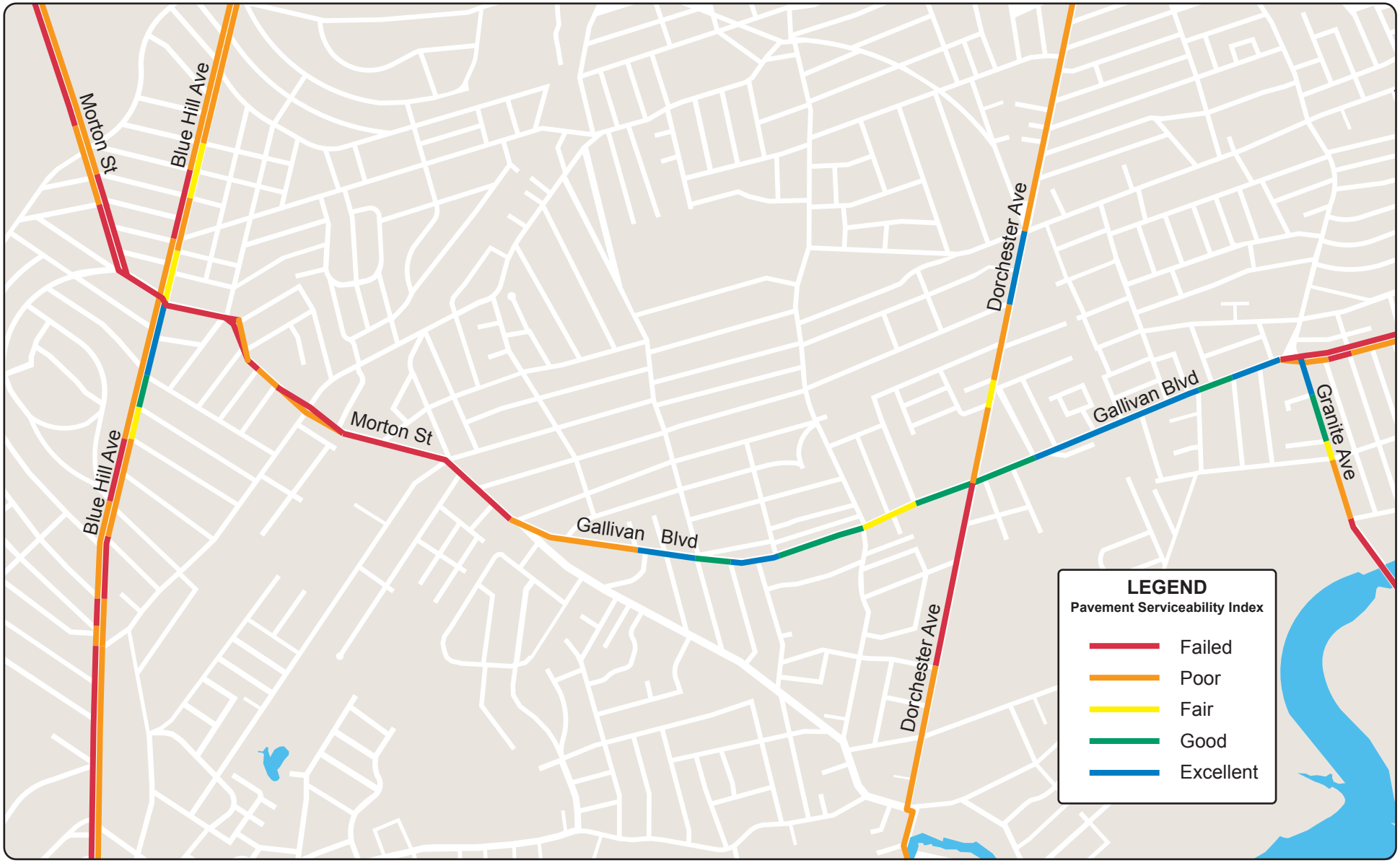

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FIGURE 3-3
Pavement Condition

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

TABLE 3-3
Crash Rates for Selected Intersections

Intersection	Total Number of Crashes	Number of Years	Total Daily Approach Traffic	Crash Rate
Gallivan Blvd. and Granite Ave./Adams St.	56	4	28,833	1.33
Gallivan Blvd. and Dorchester Ave.	66	4	24,222	1.87
Gallivan Blvd. and Washington St.	26	4	22,944	0.78
Morton St. and West Selden St./Corbet St.	29	4	26,000	0.76
Morton St. and Lucerne St./Leston St.	36	4	22,056	1.12
Morton Street and Blue Hill Ave.	33	3.5	43,778	0.59
Morton St. and Courtland Rd./Havelock St.	20	3	25,300	0.72

Note: Shading denotes intersections with crash rates higher than the MassDOT Highway Division District 6 average crash rate.

3.2.5 Speeds

Observed Travel Speeds

The posted speed limit in the Gallivan Boulevard and Morton Street segments is 30 mph. Figures 3-4 and 3-5 show the average peak-period travel speeds in the Gallivan Boulevard and Morton Street segments. The AM peak-period travel speeds were collected between 6:30 AM and 9:30 AM; the PM peak-period travel speeds were collected between 3:30 PM and 6:30 PM. The data were collected as part of the Boston Region MPO Congestion Management Process (CMP) between 2003 and 2005. Most of the traffic delays were concentrated at the signalized intersections.

Spot Speed Survey

A MassDOT spot speed survey, a two-day midweek (Tuesday through Thursday) survey, conducted on Gallivan Boulevard near Rockne Avenue in June 2012. The spot speed survey indicated the following conditions for the westbound and eastbound traffic:

- The median speed and average speed were both 34 mph eastbound and 33 mph westbound.
- The pace speed is a 10-mile-per-hour increment in speeds that encompasses the highest portion of observed speeds; it is often

the average speed plus or minus five mph. The pace speed was 30–40 mph eastbound and 28–38 mph westbound; approximately 64 percent of the motorists were traveling within the pace speed in the eastbound direction and 66 percent in the westbound direction.

- The 85th percentile speed is the speed at or below which 85 percent of motorists were traveling; this is typically used as a baseline for establishing the posted speed limit. The 85th percentile speed at this location was 38 mph eastbound and 37 mph westbound.
- Approximately 12 percent of the motorists were traveling at 40 mph or more.

The spot speed survey generally indicated that motorists were speeding in the Gallivan Boulevard segment, especially during off-peak periods. The CMP travel speeds indicate that there was congestion (delay at intersections) during peak periods. A spot speed survey was not conducted for the Morton Street segment because MassDOT could not find a suitable location for speed detectors on the four-lane undivided roadway.

3.2.6 Traffic Congestion

Traveling through the Gallivan Boulevard and Morton Street segments, motorists mostly encounter traffic delays at the signalized intersections. The critical intersections where motorists experience long delays are Morton Street at Blue Hill Avenue and Gallivan Boulevard at Granite Avenue/Adams Street. The traffic delays and subsequent queues are due to insufficient capacity at these two intersections.to handle the traffic demands of users.

3.2.7 Transit Service

Figure 3-6 shows the transit services in the study area and the locations of the bus stops. The MBTA Fairmont commuter rail line has a station at Morton Street near the Evans Street intersection. The MBTA Red Line's Cedar Grove Station is accessible from Morton Street via Rangeley Street. In addition, Brockton Area Transit (BAT) operates bus service between the Brockton and the Ashmont MBTA stations. There are many transit services and users in the Gallivan Boulevard and Morton Street segments; therefore, it is important to improve the roadway so that it would be safe for people to walk to and from bus stops and train stations and buses could run on time.

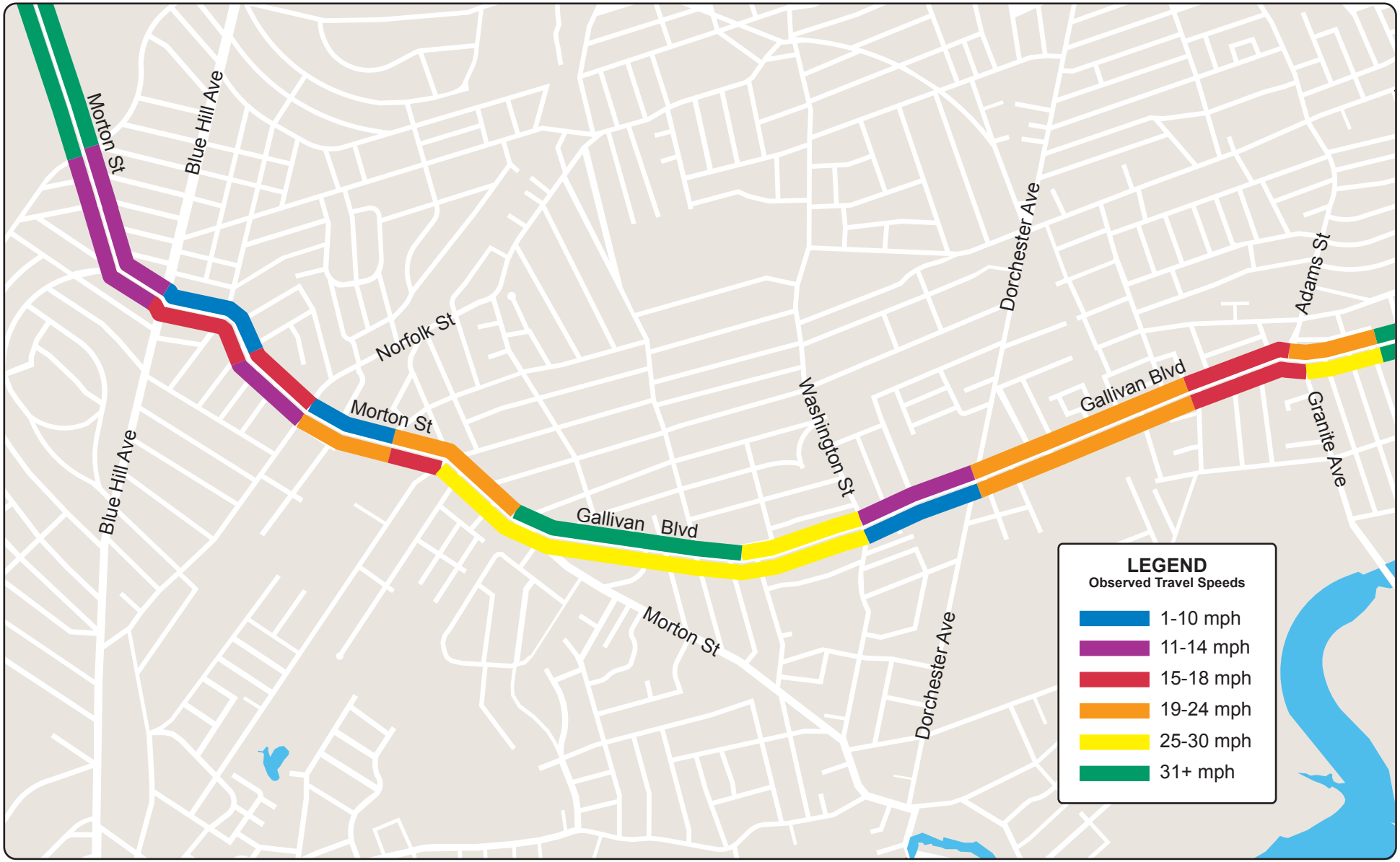

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FIGURE 3-4
Travel Speeds on Route 203, AM Peak Period

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

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FIGURE 3-5
Travel Speeds on Route 203, PM Peak Period

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

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FIGURE 3-6
Transit Services

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

Table 3-4 presents bus transit performance in the study area in terms of the MBTA's Service Delivery Policy standards for the bus routes in the study area. The purpose of the Service Delivery Policy is to ensure that the MBTA provides quality transit services that meet the needs of the riding public and are consistent with the MBTA's mission. The policy establishes service objectives that define the key performance characteristics of quality transit services and identifies quantifiable service standards that are used to measure whether or not the MBTA's transit services achieve the service objectives and to evaluate whether MBTA services are provided in an equitable manner (as defined by Title VI of the Civil Rights Act).

TABLE 3-4
Bus Service Evaluation in the Study Area

	Service Delivery Policy Standard			
	Span	**Frequency**	**Loading**	**Schedule Adherence (%)**
Bus Routes on Gallivan Boulevard and Morton Street				
Route 21: Ashmont Station – Forest Hill Station			x	70.0
Route 26: Ashmont Station – Norfolk and Morton Belt Line				61.9
Route 31: Mattapan Station – Forest Hill Station			x	77.0
Route 201 Fields Corner Station – Fields Corner Station		x		60.2
Route 215: Quincy Center – Ashmont Station		x		54.0
Bus Routes Crossing Gallivan Boulevard and Morton Street				
Route 24				69.0
Route 27 Mattapan Station – Ashmont		x		83.0
Route 28 Mattapan Station – Ruggles			x	
Route 29 Mattapan Station – Jackson Square Station			x	55.0
Route 202 Fields Corner Station – Fields Corner Station		x		60.2
Route 217 Wollaston Station – Ashmont	x	x		56.0
Route 240 Avon Line – Ashmont Station			x	63.0

x denotes failed the Service Delivery Policy standard.
Source: MBTA

The Service Delivery Policy standards are summarized in Table 2-3. Readers are encouraged to reference the MBTA Service Delivery Policy for more information on the standards for minimum coverage, span of service, and frequency of service, as well as the standards for schedule adherence and vehicle load.[4] According to Table 3-4, some of the service delivery standards are not met, and there is room for improvement in schedule adherence, loading, and frequency on some of routes.

The MBTA has already taken action to address some of the service problems presented in Table 3-4. The MBTA has added a few round-trip services on bus Route 21 to address the crowding problems and improve headways. In addition, the MBTA added trips on Route 31 as part of the interim mitigation measures for the Fairmount Line Improvement project. In addition, since 2010, the MBTA has increased the weekday capacity on Route 28 by 24% using articulated buses. On Route 29, the MBTA has added one round-trip to correct the crowding problem.

In addition, MPO staff observed that throughout the Gallivan Boulevard and Morton Street segments, there are no benches or bus shelters for transit users. The MBTA's policy for shelter installation suggests there should be at least 70 boardings a day at a stop for the stop to be a candidate for a shelter. Table 3-5 shows the total daily boardings at bus stops on Route 203 in the study area. Portions of six MBTA bus routes serve Route 203 in the segment from Gallivan Boulevard at Granite Avenue/Adams Street to Morton Street at Harvard Street. A review of CTPS bus stop data collected in 2007 through 2009 shows that 10 bus stops in this segment have daily boardings of 70 passengers or greater. Those 10 stops are indicated with shading in Table 3-5. These candidate stops must also meet the suitability test described in Chapter 2, section 2.2.3.

3.2.8 On-Street Parking

On-street parking is generally not allowed on Gallivan Boulevard. The roadway layout for the Gallivan Boulevard segment is typically 80 feet wide, with four 10-to-11-foot-wide travel lanes, a 6-to-8-foot-wide sidewalk on both sides of the roadway, and a 10-foot-wide buffers of grass and trees (between each sidewalk and the roadway curb) on both sides. There is no shoulder or median in this segment.

[4] Massachusetts Bay Transportation Authority, Service Delivery Policy, June 2, 2010 (available at the MBTA's website).

TABLE 3-5
Total Daily Boardings at Bus Stops on Route 203 in the Study Area

Route (s)	Stop ID Number	Stop Name	Total Boardings
21, 31	543	Morton Street at Blue Hill Ave	596
21, 26	540	Morton Street at Selden Street	246
21, 31	9406	Morton Street at Harvard Street	233
21	541	Morton Street at Norfolk Street	226
21	526	Morton Street at Blue Hill Ave	142
21, 26	530	Morton Street at W Selden Street	140
21	528	Morton Street at Norfolk Street	123
21, 26	10540	Morton Street at Evans Street	95
21, 26	499	Gallivan Boulevard at Wilmington Avenue	90
21, 26	507	Gallivan Boulevard at Morton Street	78
21	542	Morton Street at Wildwood Street	46
21	497	Gallivan Boulevard at Milton Avenue	43
21, 26	539	980 Morton Street at opposite Owen Street	41
21, 26	494	Gallivan Boulevard at Washington Street	40
21, 26	529	Morton Street at opposite Evans Street	38
21, 26	508	Gallivan Boulevard at opposite Arbella Road	37
21, 31	525	Morton Street at Greendale Road	37
21, 26	531	Morton Street at Owen Street	33
21	527	Morton Street at Wildwood Street	32
21, 31	524	Morton Street at Harvard Street	30
21, 26	509	Gallivan Boulevard at Oakridge Street	29
21, 26	501	Gallivan Boulevard at Nevada Street	27
21, 26	498	Gallivan Boulevard at Arbella Road	25
21	496	Gallivan Boulevard at Owencroft Road	22
26	37111	Washington Street at opposite Lithgow Street	17
21, 26	510	Gallivan Boulevard at Pleasant Hill Avenue	16
201	3078	Gallivan Boulevard at Ross Road	13
215	3370	Gallivan Boulevard at Kenmare Road	8
215	3375	Gallivan Boulevard at Hutchinson Street	7
215	33691	Granite Avenue at Gallivan Boulevard	5
21	532	Gallivan Boulevard at Stone Terrace	3
215	3372	Gallivan Boulevard at Carruth Street	1
215	3376	Gallivan Boulevard at opposite Huron Circle	0
215	33761	Gallivan Boulevard at opposite Carruth Street	0
215	3377	Gallivan Boulevard at Adams Street	0
215	3371	Gallivan Boulevard at Frederika Street	0
215	3373	Gallivan Boulevard at Huron Circle	0

On-street parking is generally allowed in the Morton Street segment and it is free; there are no parking meters installed in the segment. The roadway layout in this segment is typically 80 feet wide, with four 10-to-11-foot travel lanes, and 9-foot on-street parking and 6-to-8-foot sidewalks on both sides of Morton Street. Street cleaning and snow emergency signs are installed throughout the segment; the street cleaning signs prohibit on-street parking on Wednesdays at specific times from April 1 to November 30. Parking is prohibited at or near the major signalized intersections and signs have been installed for this purpose. On-street parking in the Morton Street segment serves both commercial and residential activities. MPO staff did not conduct a parking survey for the Morton Street segment.

3.3 Identified Problems: Arterial Segments

3.3.1 Gallivan Boulevard Segment

Pedestrian Accommodation

- The following streets do not have crosswalks: Rangeley Street and Druid Street.
- Curb ramps and corresponding crosswalks are not in alignment at the following streets: Huron Circle, Oakridge Street, and Pine Ridge Road.
- Except for the intersection of Gallivan Boulevard and Dorchester Avenue, the curb ramps in the in the segment do not have detectable warning panels.
- The general condition of sidewalks in the Gallivan segment is fair, with broken and crumbled sidewalks and vegetation growing in the sidewalk.
- The pedestrian clearance times at the signalized intersections are generally inadequate. In addition, there are no countdown or accessible pedestrian signals at the signalized intersections.

Bicycle Accommodation

- There are no bike signs or pavement markings (sharrows) in this segment.
- There is no bicycle detection equipment at the signalized intersections.

Pavement Condition

The pavement condition in the Gallivan Boulevard segment between Pleasant Hill Avenue and Morton Street is poor.

Signage

- Signage needs to be improved at intersections and between intersections in the Gallivan Boulevard segment. New signs are needed to improve safety for motorists and pedestrians. In addition, some of the existing signs need to be mounted at appropriate locations and appropriate heights to be visible and to attract the attention of motorists, pedestrians, and bicyclists.
- The following streets do not have stop signs: Kenmare Road, Milwood Street, Wessex Street, Magdala Street, Alicia Road, Owencroft Road, Driscoll Drive, Nevada Street, Ellison Avenue, Vera Street, Druid Street, and Arbella Road.
- The following one-way streets do not have one-way signs: Becket Street, Hutchinson Street, Oakridge Street, and Pleasant Hill Avenue.

Speeding

Spot speed studies indicate that there is speeding in the Gallivan Boulevard segment during the off-peak hours. The average speed was 3 to 4 mph higher than the posted speed limit of 30 mph. The 85th percentile speed was approximately 37 mph. About 66 percent of motorists were traveling between 30 and 40 mph. All of the important spot speed statistics were higher than the posted speed limit.

Transit Service

Routes 21 and 26 run along Gallivan Boulevard and meet most of the MBTA's Service Delivery Policy standards. The following bus transit problems were identified in the Gallivan Boulevard segment.

- Crowding on Route 21 that causes it to fail fails the MBTA loading standards.
- No bus shelters with benches at any of the bus stops in the Gallivan Boulevard segment, although two bus stops in the segment meet the MBTA bus shelter policy eligibility criteria.

Traffic Signals

- Post-mounted signal heads on Gallivan Boulevard do not provide good conspicuity (easily seen or readily visible, or attracting

attention). In addition, motorists' line of sight of the signal heads can be easily blocked by trucks in traffic.

- In addition, there are closely spaced signalized intersections, such as the Gallivan Boulevard intersections at Granite Avenue, Dorchester Avenue, and Washington Street, whose signals are not coordinated.
- There is no Opticom system in the Gallivan Boulevard segment to handle emergency vehicle preemption and transit signal priority.
- Left-turn movements at signalized intersections in the Gallivan Boulevard segment are also involved in many crashes with the through movements. Due to lack of left-turn bays at many of the signalized intersections on Gallivan Boulevard, left-turn movements are permitted-only or have lead-lag phases, which increase angle and rear-end collisions. In addition, the yellow change interval and the all-red interval are insufficient at the intersection of Gallivan Boulevard and Granite Avenue.
- Vehicle loop detectors on Gallivan Boulevard at Granite Avenue and Adams Street were not working during a field visit.

Traffic Congestion

The critical intersection in the Gallivan Boulevard segment, where traffic demand exceeds capacity, is the Granite Avenue/Adams Street intersection. Motorists experience long delays and queuing at this intersection. The intersection and all of its approaches operate at LOS F during the PM peak period, when there are queues and long delays at the approaches. In addition, during the AM peak period, the Gallivan Boulevard eastbound approach and Granite Avenue operate at LOS F.

3.3.2 Morton Street Segment

Pedestrian Accommodation

- The following streets do not have crosswalks: Verrill Street, Sutton Street, Wildwood Street, Leston Street, Rhoades Street, and Courtland Road.
- There is a need for additional crosswalks on Morton Street to make it more accessible, especially for the following two locations:
    - Leston Street/Lucerne Street
    - Courtland Road/Havelock Street

- Curb ramps in the Morton segment do not have detectable warning panels.
- The general condition of sidewalks in the Morton Street segment is poor, with broken and crumbled sidewalks and debris on the sidewalks.
- The pedestrian clearance times at the signalized intersections are inadequate. In addition, there are no countdown or accessible signals at many of the signalized intersections.

Bicycle Accommodation

- There are no bike signs or pavement markings (sharrows) in the Morton Street segment.
- There is no bicycle detection equipment at the signalized intersections.

Signage

- There is need to improve signage at intersections and between intersections in the Morton Street segment. New signs are needed to improve safety for motorists and pedestrians and bicyclists. Some of the existing signs need to be mounted at appropriate locations and heights to be visible and to attract the attention of motorists, pedestrians, and bicyclists.
- The following streets in the Morton Street segment do not have stop signs: Lorna Street, Owen Street, Fuller Street, Sutton Street, Theodore Street, Wellington Hill Street, Greendale Road, Baird Street, and Wilcock Street.
- The following one-way streets do not have one-way signs: Wildwood Street, Hannon Street, Verrill Street, and Courtland Road.

Pavement Condition

The pavement condition in the Morton Street segment is poor. There are longitudinal and lateral cracks and rutting in the pavement due to lack of maintenance and to drainage problems in this segment.

Speeding

There are neighborhood complaints of speeding during the off-peak hours in the Morton Street segment. Due to field conditions, the Highway Division was unable to collect spot speed data in the Morton Street segment. It was impossible for the Highway Division to find a

location in the segment where the roadway is divided and queues do not have an effect on motorists' travel speeds. However, MPO staff expect Morton Street speed conditions to be similar to those observed in the Gallivan Boulevard segment.

Transit Service

- The bus stops in the Morton Street segments lack shelters with benches, although eight of the bus stops in this segment meet the eligibility criteria for the MBTA bus shelter installation policy.
- There is crowding on bus Routes 21, 29, and 31 and they fail the MBTA loading standard.
- Pedestrian and bicyclist access to the Morton Street MBTA commuter rail station needs to be improved.

Traffic Signals

- The post-mounted signal heads on Morton Street do not provide good conspicuity. In addition, motorists' line of sight of the signal heads is easily blocked by trucks in traffic.
- In addition, closely spaced signalized intersections on Morton Street at West Selden Street/Corbet Street, Evans Street, Norfolk Street, and Blue Hill Avenue do not have coordinated signals.
- In addition, the yellow change interval and all-red interval are insufficient at the intersection of Gallivan Boulevard and Granite Avenue.
- Vehicle loop detectors on Morton Street at Blue Hill Avenue were not working during a field visit.
- There is no Opticom system in the Morton Street segment to handle emergency vehicle preemption and transit signal priority.

Crashes

- Due lack of left-turn bays on Morton Street at many of its intersections, left-turn movements are involved in many crashes with the through movements. The crashes at the intersections of Morton Street with West Selden Street/Corbet Street and Havelock Street/Courtland Road are typical example (in Appendix C for collision diagrams). At unsignalized intersections left-turn movements are permitted only; at the signalized intersections they are either permitted only or combination of

protected and permitted phases. Permitted only left-turn phases are associated with high number of angle and rear-end crashes.

- The intersection of Morton Street and Blue Hill Avenue had a high number of crashes involving pedestrians.

Traffic Congestion

The critical intersection in the segment where traffic demands exceed capacity is at Morton Street and Blue Hill Avenue. Motorists experience long delays and queuing at the intersection. The operations at this intersection fail (LOS E or F) during the AM and PM peak periods, when long queues occur on all approaches of the intersection. Other intersections on Morton Street that experience delays and queues are Morton Street at Norfolk Street and Morton Street at West Selden Street/Corbet Street.

3.3 Intersections

Three intersections in the Gallivan Boulevard segment and four intersections in the Morton Street segments were selected for study. The selection was based primarily on safety (crashes at intersections).

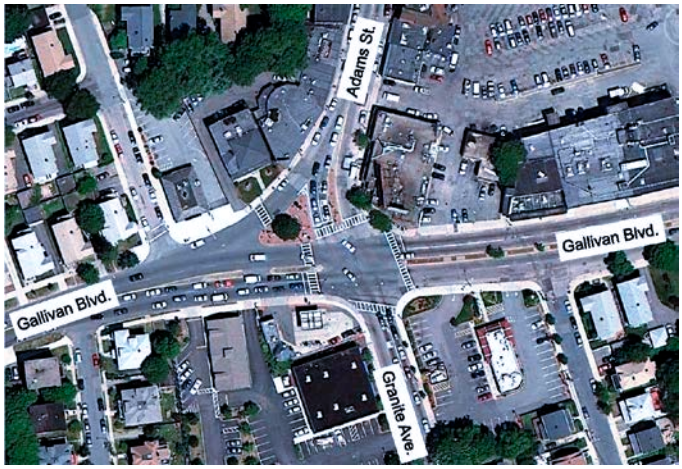
- Gallivan Boulevard and Granite Avenue/Adams Street
- Gallivan Boulevard and Dorchester Avenue
- Gallivan Boulevard and Washington Street
- Morton Street and West Selden Street/Selden Street/Corbet Street
- Morton Street and Blue Hill Avenue
- Morton Street and Lucerne Street/Leston Street
- Morton Street and Havelock Street/Courtland Road

The following section describes these seven intersections, including existing conditions and identified problems.

3.3.1 Gallivan Boulevard and Granite Avenue/Adams Street

The intersection of Gallivan Boulevard, Granite Avenue, and Adams Street is a signalized intersection under the jurisdiction of MassDOT. Granite Avenue and Adams Street are city-owned principal and urban minor arterials, respectively. The landuse in the vicinity of the intersection is primarily commercial. In the vicinity of the intersection, Gallivan Boulevard is a two-way, four-lane roadway (two lanes in each direction); no left-turn lane is provided on Gallivan Boulevard. Granite Avenue is a two-way, three-lane roadway, with two northbound lanes

and one southbound lane; one of the two northbound lanes becomes an exclusive left-turn lane approximately 150 feet from the intersection. Adams Street is a two-way, two-lane roadway with an exclusive left-turn lane and an exclusive right-turn lane at the approach to the intersection.



Gallivan Boulevard at Granite Avenue/Adams Street

Pedestrian and Bicyclist Amenities

The intersection experiences high pedestrian activity due to the presence of businesses in the vicinity. There were 221 pedestrian crossings during the two two-hour AM and PM peak periods, when MPO staff conducted turning-movement counts. All of the intersecting streets have 8-foot-wide sidewalks on both sides of each street, and marked crosswalks at each approach, with median cutouts on the approach. Each street corner has curb ramps without detectable warning panels for pedestrians. However, some of the curb ramps are not even with the road surface. In addition, there is no opening in the median on the west leg of Gallivan Boulevard for the crosswalk (see photo above). There are no bike lanes on any of the intersecting streets; bicyclists share the lanes with vehicular traffic. In addition, there are no signs or pavement markings at the intersection or in its vicinity to assist bicyclists or inform motorists to share the road. In addition, there is no detection equipment for bicycles at the intersection.


Gallivan Boulevard at Granite Avenue/Adams Street: No opening in the median to connect the crosswalks

Transit Service

The MBTA has installed bus stop signs at the stops in the vicinity of the intersection. Routes 201, 202, and 215 have stops at the intersection, but there are no benches or shelters at the bus stops and they do not meet the MBTA's policy for shelter installation. The intersection's corner radii are wide enough to accommodate buses, emergency vehicles, and trucks at the intersection. As presented in Table 3-4, Routes 201, 202, and 215 fail the MBTA's Service Delivery Policy's frequency standard.

Traffic Signal

The traffic signals at the intersection are post-mounted in the sidewalks and in the medians on Gallivan Boulevard and Adams Street, and they do not provide good conspicuity. In addition, motorists' line-of-sight to signal heads is blocked by trucks in the traffic stream. The existing signal timing and phase pattern for the intersection are in Appendix B. Gallivan Boulevard eastbound traffic has a leading protected phase during which its left-turning traffic is protected; after the protected phase, the left turns are permitted-only. The westbound Gallivan Boulevard traffic is not provided with a lagging protected phase, so its left-turning traffic is always permitted-only. Granite Avenue and Adams Street left-turning traffic is provided with a protected left-turn phase; after the protected phase, the left turns are permitted-only.

Pedestrians at the intersection have a pedestrian-activated exclusive pedestrian phase. There are no countdown pedestrian timers and no accessible signals to assist pedestrians in crossing at the intersection. The signal controller is functioning well, but during the data collection in the field it was observed that the loop detectors on Gallivan Boulevard were not working well. This malfunction causes the traffic signal to act as a pretimed signal. MPO staff did not observe any bicycle detection equipment at the intersection.

Crashes

This intersection ranks number 128 on MassDOT's 2009 statewide list of top 200 high-crash intersections, with an equivalent property damage only (EPDO) rating of 115. The ranking is based on crashes in MassDOT's Registry of Motor Vehicles (RMV) crash database for 2007 to 2009. [5]

[5] An equivalent property damage only (EPDO) rating is calculated by georeferencing the crashes in the MassDOT database to clusters around intersections and using a weighting system in which a fatal

In addition, MPO staff analyzed crash data from the RMV that were recorded at the intersection between January 2006 and December 2009 (a four-year period). Of the 56 crashes, 26 were mapped on a collision diagram, (in Appendix C).[6] Only crashes with crash diagrams produced by police were mapped on that collision diagram. According to the collision diagram, the majority of the angle and rear-end crashes involved Gallivan Boulevard's westbound traffic. Fifty percent of the mapped crashes were angle type involving left-turning motorists. Nine of the mapped crashes resulted in nonfatal injuries, and there were no fatal injuries.

In addition, using the PM peak-hour traffic volumes at the intersection, the crash rate was calculated as 1.33 crashes per million entering vehicles (MEV), which exceeds the Highway Division District 6 average crash rate of 0.77 MEV for signalized intersections.[7] Worksheets of the crash rates are in Appendix C. The details of the 56 crashes in terms of severity, manner of collision, and ambient light conditions are:

- No fatality, 26 injuries, and 27 property damage only. The severity of three of the crashes was not reported.
- Twenty-two angle, 16 rear-end, 7 sideswipe, 3 head-on, and 2 single-vehicle crashes. The manner of collision was not reported for six of the crashes.
- Thirty-one of the crashes occurred in daylight and 24 under dark-lighted roadway conditions.
- There were no pedestrian or bicycle crashes at the intersection during the four-year period.

Level of Service, Delay, and Queues

MPO staff performed intersection capacity analyses by using data collected in the field. Synchro 8 traffic operation analysis software was used.[8] Table 3-6 gives the results of the capacity analysis. The Synchro outputs of the capacity analysis are in Appendix E.

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crash is weighted 10 times, an injury 5 times, and a property-damage-only 1 times.

[6] Crashes that were mapped on collision diagrams had diagrams of crashes prepared by a State Police or Boston Police officer.

[7] MassDOT Highway Division's preference is the PM Peak hour volume, however, the AM Peak is acceptable if it is the only data available.

[8] Trafficware Inc., Synchro Studio 8, Synchro plus SimTraffic, Build 801, Version 563, Sugar Land, Texas.

TABLE 3-6
Existing AM and PM Peak-Hour Level of Service

		AM Existing			PM Existing		
Approach	**Movement**	**LOS**	**Delay[1]**	**Queue[2]**	**LOS**	**Delay**	**Queue**
Gallivan Blvd. EB	L+T+R	F	185	#908	F	267	#824
Gallivan Blvd. WB	L+T+R	D	41	#272	F	198	#497
Granite Ave. NB	L	D	46	#411	F	103	#450
Granite Ave. NB	T+R	E	70	#576	F	121	#533
Adams St. SB	L	C	27	75	D	47	126
Adams St. SB	T	D	44	263	E	66	#353
Adams St. SB	R	C	25	91	D	40	81
Gallivan Blvd. EB	L+T+R	E	58	#338	D	45	#302
Gallivan Blvd. WB	L+T+R	C	32	#262	C	32	#235
Dorchester Ave. NB	L+T+R	C	32	#329	D	42	#332
Dorchester Ave. SB	L+T+R	C	24	#260	F	132	#438
Gallivan Blvd. EB	L+T+R	C	22	246	C	21	273
Gallivan Blvd. WB	L+T+R	B	19	214	C	23	#304
Washington St. NB	L+T+R	C	29	#471	C	23	217
Washington St. SB	L+T+R	B	18	159	C	31	#316
Morton St. EB	L+T+R	C	30	321	C	33	#504
Morton St. WB	L+T+R	D	39	#443	D	37	#442
West Selden St. NB	L+T+R	D	47	135	D	38	#168
Selden St. SB	L+T+R	D	42	73	D	38	84
Morton St. EB	T	A	0	0	A	0	0
Morton St. WB	T	A	0	0	A	0	0
Leston St. NB	L+T+R	B	10	20	B	12	20
Lucerne St. SB	L+T+R	B	13	20	C	17	20
Morton St. EB	T+R	E	73	#573	F	185	#877
Morton St. WB	T+R	F	116	#722	F	170	#613
Blue Hill Ave. NB	L	F	232	#567	F	105	#387
Blue Hill Ave. NB	T+R	E	69	#446	E	57	393
Blue Hill Ave. SB	L	E	74	156	F	92	#353
Blue Hill Ave. SB	T+R	E	47	251	F	87	#580
Morton St. EB	L+T+R	A	1	20	A	3	25
Morton St. WB	L+T+R	A	3	25	A	3	20
Courtland Rd.	NA	NA	NA	NA	NA	NA	NA
Havelock St.	NA	NA	NA	NA	NA	NA	NA

[1] Delay in seconds per vehicle.
[2] 95th percentile queue length in feet
means that the 95th percentile volume exceeds capacity.
Note: Shading denotes street approaches with delay and queuing problems.

The analysis indicates that the intersection operates at LOS F during the AM and PM peak hours, when traffic demand exceeds the capacity of the intersection In the AM peak hour, the eastbound Gallivan Boulevard traffic and northbound Granite Avenue traffic operate at LOS F and LOS E, respectively. In the PM peak hour, traffic on all of the approaches operates at LOS E or worse. The longest traffic queues occur at the eastbound Gallivan Boulevard and northbound Granite Avenue approaches.

Identified Problems

The following problems were identified at the intersection through field data collection, data analysis, and discussions with representatives from MassDOT and City of Boston.

- Westbound Gallivan Boulevard traffic turning left onto Granite Avenue appears to experience a high number of angle crashes. The westbound left turn is permitted-only and low in volume, but it is opposed by a high volume of eastbound traffic, allowing for very few adequate gaps for westbound left-turning traffic (in Appendix C for the collision diagrams)..
- There is no opening (curb cut) in the median on the west leg of Gallivan Boulevard for the crosswalk.
- There are no detectable warning panels at the ends of the curb ramps and some of the curb ramps are not even with the road surface.
- There are no bike signs or pavement markings at the intersection or in its vicinity informing motorists to share the road.
- There is no loop or video detection for bicycles at the intersection.
- The post-mounted traffic signals in the sidewalks do not provide good conspicuity, and motorists' line of sight to the signal head is blocked by trucks in the traffic stream.
- The pedestrian signal in the southwest corner for crossing Granite Avenue in the westbound direction is not in alignment with the crosswalk; pedestrians have to look for it.
- The vehicle loop detectors on Gallivan Boulevard are not functioning well; the signal was operating as a pretimed during a field visit.
- The 14 seconds of clearance time for pedestrians appears to be inadequate for crossing Gallivan Boulevard or Granite Avenue.

- Signal equipment and street furniture reduce the effective width of the sidewalk for pedestrians on the triangular island in the northwest corner of the intersection.
- R4-7 (Keep Right) signs at the intersection are mounted too low on the east and west legs of Gallivan Boulevard.
- The R10-11b (No Turn on Red) sign is missing on the Granite Avenue approach.
- There are excessive traffic delays and queues at the intersection because the traffic demand exceeds the capacity of the intersection.

R4-7

R10-11b

3.3.2 Gallivan Boulevard and Dorchester Avenue

Gallivan Boulevard at Dorchester Avenue

The intersection of Gallivan Boulevard and Dorchester Avenue is a signalized intersection under the jurisdiction of MassDOT. It has a signal-controlled channelized right turn on each approach of Gallivan Boulevard. Dorchester Avenue is a two-way, two-lane, city-owned urban principal arterial. The land use in the vicinity of the intersection is mixed (residential, retail, and institutional). Carney Hospital is located about 500 feet south of the intersection on Dorchester Avenue. The Boston Home, a not-for-profit specialized care residence for adults with neurological diseases is located in the northwest corner of the intersection.

Pedestrian and Bicycle Amenities

The intersection experiences high pedestrian activity due to the businesses located in the vicinity. There were 278 crossings during the two two-hour AM and PM peak periods, when MPO staff conducted turning-movement counts. All of the intersecting streets had 6-to-8-foot-wide sidewalks on both sides of each street and a 10-foot-wide marked crosswalk on each leg of the intersection. Each street corner had curb ramps with detectable warning panels for pedestrians. Pedestrian signals with pedestrian-activated push buttons are provided for crossing

Gallivan Boulevard and Dorchester Avenue. There is a shared lane on Dorchester Avenue with sharrow markings, but not on Gallivan Boulevard. Although Dorchester Avenue is marked as shared lanes, MPO staff did not observe any bicycle detection equipment at the intersection.

Transit Service

Bus shelter on Dorchester Avenue

The MBTA bus Routes 21, 27, 215, 217, and 240 had stops at the intersection, as well as BAT's Route 12. There is a bus shelter with a bench at the bus stop on Dorchester Avenue just north of the intersection. In addition, the MBTA has installed bus stop signs at the stops. Corner radii at the intersection are wide enough to accommodate buses, trucks, and emergency vehicles. As presented in Table 3-4, Routes 21, 27, 215, 217, and 240 fail one or more of the MBTA's Service Delivery Policy standards.

Traffic Signal

Pedestrian signal not aligned with crosswalk

The traffic signals at the intersection are overhead-signal displays; they provide good conspicuity and motorists' line of sight to the signal heads is not blocked by trucks in the traffic stream. The signal timing and phase plan for the intersection are in Appendix B. Gallivan Boulevard westbound traffic has a leading protected phase and the eastbound traffic has a lagging protected phase. The same leading-lagging protected/permitted left-turn phasing is also provided on

Dorchester Avenue. Pedestrians at the intersection have a pedestrian-activated exclusive phase.

During a field visit, it was observed that the pedestrian walk phase is too short (five seconds). In addition, MPO staff observed that the pedestrian signal in the southeast corner of the intersection for crossing Gallivan Boulevard in the southbound direction is not aligned with the crosswalk; pedestrians have to search for it. In addition, there are neither countdown pedestrian timers nor accessible signals to assist pedestrians in crossing. In addition, there is no bicycle detection at the intersection.

Crashes

The intersection ranks number 55 on MassDOT's 2009 statewide list of top 200 high-crash intersections, with an equivalent property damage only (EPDO) rating of 149. The ranking is based on crashes in MassDOT's RMV crash database for 2007 to 2009. There were 49 crashes in that period (25 resulted in injuries and 24 in property damage only).

In addition, MPO staff analyzed crash data from MassDOT's RMV database that were recorded at the intersection between January 2006 and December 2009. Of the 66 crashes, 33 were mapped on a collision diagram (in Appendix C). Only crashes with crash diagrams were mapped on the collision diagram. According to the collision diagram, the majority of the angle and rear-end crashes involve Gallivan Boulevard's westbound traffic. Nineteen of the mapped crashes resulted in nonfatal injuries and there were no fatal injuries.

Using the PM peak-hour traffic volumes at the intersection, the crash rate was calculated as 1.87 crashes per million entering vehicles (MEV), which exceeds the Highway Division District 6 average crash rate of 0.77 MEV for signalized intersections. Worksheets of the crash rates are in Appendix C.

The details the 66 crashes in terms of severity, manner of collision, and ambient light conditions are:

- Thirty-one resulted in injuries and 26 in property damage only. The severity of nine of the crashes was not reported.
- There were 25 angle crashes, 20 rear-end crashes, 6 sideswipe crashes, 7 head-on crashes, and 1 single-vehicle crash. The manner of collision was not reported for seven crashes.
- Thirty-one of the crashes occurred under daylight conditions and 24 under dark-lighted roadway conditions.

- There was one pedestrian crash at the intersection during the four-year period.

Level of Service, Delay, and Queues

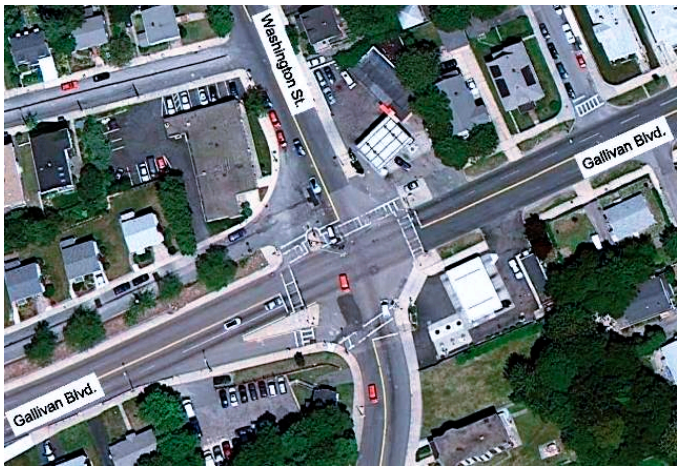
Table 3-6 presents the results of the intersection capacity analysis. Synchro 8 outputs of the capacity analysis (in Appendix E). The intersection capacity analysis indicates that the intersection operates at LOS C during the AM and PM peak hours.

Identified Problems

The following problems were identified at the intersection through field visits and data analysis and discussions with representatives from MassDOT and City of Boston:

- According to the collision diagram (in Appendix C), the intersection experiences a high number angle crashes. The westbound Gallivan Boulevard left-turning traffic onto Dorchester Avenue appears to experience a high number of angle and rear-end crashes.
- Approximately one-half of the crashes at the intersection involved injuries.
- The vertical curve on the west leg of Gallivan Boulevard reduces Gallivan Boulevard westbound motorists' sight line of the eastbound traffic.
- The pedestrian signal in the southeast corner of the intersection for crossing Gallivan Boulevard in the southbound direction is not aligned with the crosswalk; pedestrians have to search for it.
- The pedestrian walk interval at the intersection is too short: 5 second versus a minimum of 7 seconds (Manual on Uniform Traffic Control Devices [MUTCD] and Institute of Transportation Engineers [ITE] standards).
- There are no bike signs or pavement markings informing motorists to share the roadway with bicycles.
- There is no loop or video detection for bicycles at the intersection.

3.3.3 Gallivan Boulevard and Washington Street



Gallivan Boulevard at Washington Street

The intersection of Gallivan Boulevard and Washington Street is signalized; it is under the jurisdiction of MassDOT. Washington Street is a city-owned urban minor arterial. The land use in the vicinity of the intersection is primarily commercial (retail, gas station, automobile repair shop). At the intersection, Gallivan Boulevard is a two-way, four-lane roadway (two lanes in each direction) with no left-turn lane. Washington Street is a two-way, two-lane roadway. Driscoll Drive, a one-way street, intersects the north leg of Washington Street just north of the intersection of Washington Street and Gallivan Boulevard. A triangular island on Gallivan Boulevard eastbound approach separates the channelized right-turn lane from the eastbound through lanes.

Pedestrian and Bicycle Amenities

The intersection experiences moderate pedestrian activity. There were a total of 119 pedestrian crossings during the two two-hour AM and PM peak periods, when MPO staff conducted turning-movement counts. All of the intersecting streets have 6-to-8-foot-wide sidewalks on both sides of each street. There is a 10-foot-wide marked crosswalk on each leg of the intersection. Each street corner has curb ramps, but there are no detectable warning panels at the ends of the ramps.

Transit Service

MBTA bus Routes 21 and 26 have stops in the vicinity of the intersection. Bus stop signs are provided, but there is no bench or bus shelter at the bus stops. Presently, the bus stops do not meet the MBTA's standards for shelter installation. The intersection's corner radii are wide enough to accommodate buses, emergency vehicles, and trucks. As presented in Table 3-4, Route 21 fails the loading standard of the MBTA's Service Delivery Policy.

Traffic Signal

The traffic signal at the intersection is a mix of post-mounted and overhead signal heads. The post-mounted signal heads do not provide good conspicuity and are not in the motorists' line of sight. The signal controller is an Eagle-type controller, and the loop detectors were functioning well on Gallivan Boulevard during the field visit. The existing signal timings and phase sequence are included in Appendix B. All of the left turns at the intersection are permitted-only. Pedestrians at the intersection have a pedestrian-activated exclusive pedestrian phase. There are no countdown pedestrian timers and no audible cues to assist pedestrians at the intersection. Field observations indicated that the pedestrian clearance time is not adequate, and the pedestrian signal in the southeast corner for crossing Washington Street in the eastbound direction is out of alignment. The existing signal timing indicates 11 seconds of pedestrian clearance time for the intersection, which is not enough for crossing Washington Street at the north leg of the intersection.

Crashes

The intersection is not on MassDOT's 2009 statewide list of the top 200 high-crash intersections. It has an equivalent property damage only (EPDO) rating of 48 based on information from the MassDOT crash database for the period 2007–09.

MPO staff analyzed Registry of Motor Vehicles (RMV) crash data that were recorded at the intersection between January 2006 and December 2009. Of the 26 crashes, 13 were mapped on a collision diagram (in Appendix C). Only crashes that had crash diagrams provided by the police were mapped on the collision diagram. The majority of the mapped crashes were angle crashes involving left-turning motorists; the majority of the crashes resulted in property damage only. Two of the mapped crashes involved vehicles exiting the gas station in the southeast corner of the intersection.

Using the PM peak-hour traffic volumes at the intersection, the crash rate was calculated as 0.78 crashes per million entering vehicles (MEV), which barely exceeds the Highway Division District 6 average crash rate of 0.77 MEV for signalized intersections. Worksheets of the crash rates are in Appendix C. The details of the 26 crashes in terms of severity, manner of collision, and ambient light are:

- Five resulted in injuries and 17 in property damage only. The severity of four of the crashes was not reported.

- There were 9 angle crashes, 6 rear-end crashes, 3 sideswipes, and 5 single-vehicle crashes. The manner of collision was not reported for three crashes.
- Sixteen of the crashes occurred in daylight and 8 under dark-lighted roadway conditions.
- There were no pedestrian or bicycle crashes at the intersection.

Level of Service, Delay, and Queues

Table 3-6 presents the results of the intersection capacity analysis. The Synchro 8 outputs of the intersection capacity analysis are in Appendix E. The analysis indicates that the intersection operates at LOS C or better during the AM and PM peak hours.

Identified Problems

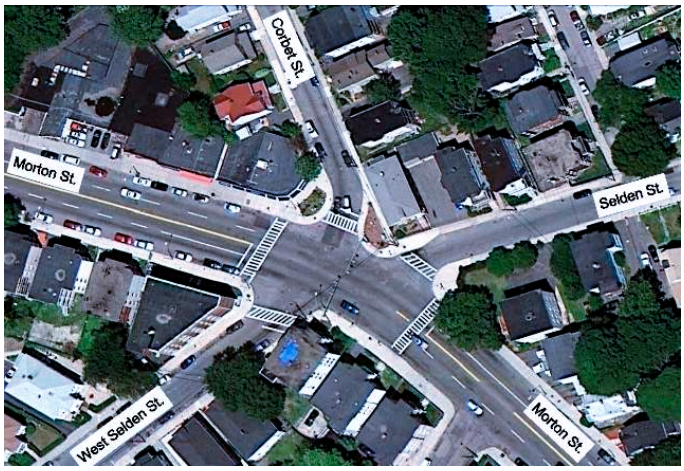
The following problems were identified at the intersection through field visits and data analysis and discussions with representatives from MassDOT and City of Boston:

- The post-mounted signal heads do not provide good conspicuity, and the single overhead signal heads on the two Gallivan Avenue approaches are inadequate for two travel lanes (not compliant with MUTCD requirements). In addition, motorists' line of sight to some of the signal post-mounted signal heads may be blocked by trucks in the traffic stream.
- The 11-second pedestrian clearance interval is inadequate for crossing the north leg of Washington Street.
- There are no detectable warning panels at the end of the curb ramps at the intersection.
- There is no OM1-2 (object marker) sign installed at the approach of the triangular island separating the eastbound Gallivan Boulevard through lanes from the channelized right-turn lane.

No object marker (OM1-2) installed at the approach of the triangular island

- There are obstacles in the path of the crosswalk on the north leg of Washington Street.
- The opening in the triangular island on the west leg of Gallivan Boulevard is too small.
- Curb ramps on the north leg of Washington Street are broken and do not provide smooth ride.
- There are no bike signs or pavement markings informing motorists to share the road.
- There is no loop or video detection for bicycles at the intersection.

3.3.4 Morton Street and West Selden Street/Selden Street/Corbet Street



Morton Street at West Selden Street/Corbet Street/Selden Street

The intersection of Morton Street, West Selden Street, Selden Street, and Corbet Street is a signalized intersection under the jurisdiction of MassDOT. West Selden is a two-way, two-lane, city-owned urban collector. Corbet Street and Selden Street are one-way, one-lane, urban collector streets; Corbet Street's traffic heads into the intersection, while Selden Street's traffic heads away from the intersection. The intersection is situated on the crest of a horizontal curve on Morton Street. The land use in the vicinity of the intersection is mixed (residential and retail).

Pedestrian and Bicycle

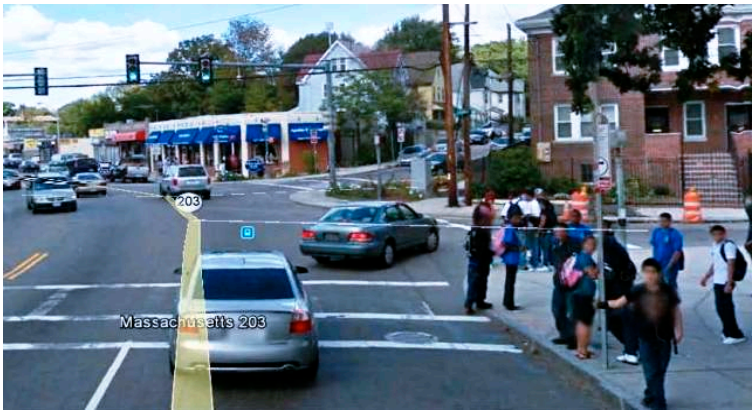
The intersection experiences high pedestrian activity due to the businesses in the vicinity. There were 575 pedestrian crossings during the two two-hour AM and PM peak periods, when MPO staff conducted turning-movement counts. All of the intersecting streets had 6-to-8-foot-wide sidewalks on both sides of each street. There is a 10-foot-wide marked crosswalk on each leg of the intersection. Each street corner

has curb ramps for pedestrians, but there are no detectable warning panels. There are no bike lanes on any of the intersecting streets; bicyclists share the lanes with motorists.

The MPO staff's Safe Access to Transit for Pedestrian and Bicyclists study recommended installing a bicycle lane on Morton Street from Evans Street to Norfolk Street.[9] In addition, MPO staff suggested that uniform pedestrian signal equipment and devices be used in upgrading traffic signal equipment in the Morton Street and Gallivan Boulevard segments to make it easier for motorists and pedestrians.

Transit Service

MBTA bus Routes 21 and 26 have stops at the intersection; the stop at Selden Street has 246 total daily boardings and the stop at West Selden Street has 140 total boardings. The MBTA has installed bus stop signs at the intersection. There are no bus shelters or benches at any of the stops in the vicinity of the intersection even though the total daily boardings meet the MBTA criteria for bus shelter installation.



Morton Street at West Selden Street and Corbet Street: Students and passengers waiting for a school bus or MBTA bus.

Traffic Signal

The traffic signal equipment at the intersection is a mix of post-mounted and overhead signal displays. Both approaches of Morton Street have overhead signal displays, which provide good conspicuity, and motorists' line of sight to the signal heads is not blocked. The signal controller is a new Eagle-type controller and is functioning well; the loop

[9] Boston Region MPO Safe Access to Transit for Pedestrians and Bicyclists study, FFY 2012.

detectors are also functioning well at the intersection. W3-3 (Signal Ahead) signs are posted in the westbound direction of Morton Street as it approaches the intersection to warn motorists of the presence of a traffic signal ahead. The signal displays on West Selden Street and Corbet Street are post-mounted in the sidewalk. The signal timing and phase plan for the intersection are in Appendix C. All left-turn movements at the intersection are permitted-only. Pedestrians at the intersection have a pedestrian-activated exclusive pedestrian phase. The pedestrian signal is assigned a 6-second walk interval and a pedestrian clearance interval of 14 seconds. Both the pedestrian walk and clearance intervals are inadequate for crossing Gallivan Boulevard. There are no countdown pedestrian timers and the accessible pedestrian signals to assist pedestrians in crossing at the intersection are not working. In addition, it appears that there is no bicycle detection equipment at the intersection.

Crashes

The intersection is not on MassDOT's 2009 statewide list of the top 200 high-crash intersections. It has an equivalent property damage only (EPDO) rating of 66. Using the PM peak-hour traffic volumes at the intersection, the crash rate was calculated as 0.76 crashes per million entering vehicles (MEV), which is slightly lower than the Highway Division District 6 average crash rate of 0.77 MEV for signalized intersections. Worksheets of the crash rates are in Appendix C.

In addition, MPO staff analyzed crash data from MassDOT's RMV database that were recorded at the intersection between January 2006 and December 2009 (a four-year period). Of the 29 crashes, 18 were mapped on a collision diagram (in Appendix C). Only crashes with crash diagrams provided by the police were mapped on the collision diagram. According to the collision diagram, eight of the mapped crashes were angle crashes involving left-turning vehicles; six were rear-end crashes, and one involved a bicyclist. The majority of the mapped crashes (16 out of 18) resulted in nonfatal injuries. The majority of the angle and rear-end crash types involved Morton Street westbound traffic.

The details of the 29 crashes in terms of severity, manner of collision, and ambient light conditions are:

- Nineteen resulted in injuries and seven in property damage only. The severity of three of the crashes was not reported.

- There were 11 angle crashes, 11 rear-end crashes, 2 head-on crashes, 1 sideswipe crash, and 1 single-vehicle crash. The manner of collision was not reported for three of the crashes.
- Twenty of the crashes occurred under daylight conditions and 9 under dark-lighted roadway conditions.
- There was one crash involving a bicyclist at the intersection during the four-year period.

Level of Service, Delay, and Queues

MPO staff performed intersection capacity analyses by using Synchro 8 traffic operation analysis software. The results of the analyses are presented in Table 3-6, and the Synchro output is in Appendix E. Based on the results, the intersection operates at LOS D or better during the AM and PM peak hours.

Identified Problems

The following problems were identified at the intersection:

- According to the collision diagram, the majority of the angle crashes involve Morton Street westbound left-turn movement. Although the volume of left turns on Morton Street westbound approach is low (40 vehicles in the AM peak hour and 65 in the PM peak hour), it is opposed by a high-volume eastbound straight-through traffic (680 vehicles in the AM peak hour and 1,065 in the PM peak hour.)
- Morton Street westbound traffic is also involved in the majority of the rear-end collisions. Although a W3-3 (Signal Ahead) sign is posted in the sidewalk on Morton Street approaching the intersection from the east, it appears to be ineffective; it is possible that motorists in the left lane do not see the sign, since their line of sight to the W3-3 sign might be blocked by traffic in the right lane.
- According to the findings of a field visit and a review of signal timing plans, the pedestrian walk phase at the intersection is too short: 6 seconds versus a minimum of the 7 seconds recommended in guidance from the MUTCD. In addition, the pedestrian clearance time of 14 seconds is inadequate for crossing Morton Street. The intersection has MBTA bus and school bus stops; therefore it has a high level of pedestrian activity.
- There are no detectable warning panels at the ends of the curb ramps.

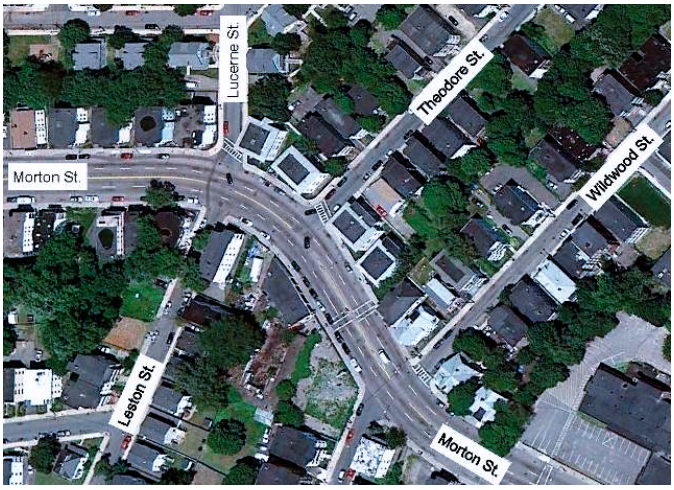
- There appears to be no bicycle detection equipment at the intersection.
- There are no bike signs or pavement markings informing motorists to share the road.

3.3.5 Morton Street Intersections at Lucerne Street/Leston Street, Theodore Street, and Wildwood Street

The intersections of Morton Street at Lucerne Street/Leston Street, Theodore Street, and Wildwood Street are unsignalized and are under the jurisdiction of MassDOT. These three intersections are situated on the crest of a horizontal curve on Morton Street. The land use in the vicinity of the intersection is mixed (residential and commercial). Lucerne Street, Leston Street, and Theodore Street are one-way, one-lane, city-owned urban collectors; they are controlled by stop signs on Morton Street. Wildwood is a one-way, one-lane urban collector that takes traffic away from Morton Street

Pedestrian and Bicycle Amenities

Morton Street in the vicinity of the three intersections experiences high pedestrian activity due to the commercial and residential land uses. There were 438 pedestrian crossings during the two two-hour AM and PM peak periods when MPO staff conducted turning-movement counts at the intersection of Morton Street and Lucerne Street/Leston Street. Forty-eight of these crossings were across Morton Street at its intersection with Lucerne and Leston streets. There is no crosswalk across Morton Street at the Lucerne Street/Leston Street intersection.



Morton Street at Lucerne Street, Theodore Street, and Wildwood Street

All of the intersecting streets had 6-to-8-foot-wide sidewalks on both sides of the streets. There are curb ramps for crossing the side streets. There is a 10-foot-wide marked crosswalk on the north legs of Lucerne Street, Theodore Street, and Wildwood Street, but not on the south legs

of Leston Street and Wildwood Street. There is a pedestrian crossing signal on Morton Street in this stretch (just west of Wildwood Street). The pedestrian crossing signal rests on flashing yellow when it is not activated. When activated by a pedestrian using a push button, the pedestrian signal displays red indications to motorists and walk indications to pedestrians. There is a 6-foot-wide median on Morton Street between Theodore Street and Wildwood Street; it is only a 150 feet long. There are no bike lanes on any of the intersecting streets; bicyclists share lanes with motorists.

Transit Service

MBTA bus Route 21 has stops at Wildwood Street, but there are no bus shelters or benches at the stops as they do not meet the eligibility criteria of the MBTA bus shelter installation policy. There are bus stop signs at the stops. Route 21 failed the MBTA loading standard.

Crashes

The crashes at the three closely spaced intersections were considered one cluster by MassDOT for its crash database; the cluster was not on its 2009 statewide list of the top 200 high-crash intersections. The cluster has an equivalent property damage only (EPDO) rating of 81. Using the PM peak-hour traffic volumes at the intersection, the crash rate was calculated as 1.16 crashes per million entering vehicles (MEV), which exceeds the Highway Division District 6 average crash rate of 0.57 MEV for unsignalized intersections.

MPO staff analyzed crash data from MassDOT's RMV database that were recorded at the cluster between January 2006 and December 2009 (a four-year period). Of the 36 crashes, 13 were mapped on a collision diagram (in Appendix C). Only the crashes for which crash diagrams had been provided by police were mapped on the collision diagram for this study. Eight of the mapped crashes were angle crashes involving left-turning vehicles; four were single-vehicle crashes; one was a head-on collision: and one was a sideswipe collision. One half of the mapped crashes resulted in nonfatal injuries and there were no fatal injuries. The majority of the angle crashes involved Morton Street westbound traffic and Lucerne Street.

The details of the 36 crashes in terms of severity, manner of collision, and ambient light conditions are:

- Sixteen resulted in injuries, 16 in property damage only, and none in fatal injuries. The severity of four of the crashes was not reported.

- Eleven were angle type crashes, 10 were rear-end crashes, 8 were single-vehicle crashes, and four were sideswipes crashes. The manner of collision was not reported for three of the crashes.
- The majority (78 percent) of the crashes occurred under daylight conditions.
- There was one crash involving a pedestrian.

Level of Service, Delay, and Queues

Table 3-6 presents the results of the intersection capacity analysis. The Synchro outputs are in Appendix E. Based on the results, the intersection operates at LOS C or better during the AM and PM peak hours.

Identified Problems

The following problems were identified in the vicinity of the three-intersection cluster:

- A high number of pedestrians cross Morton Street in the vicinity of Lucerne Street/Leston Street and Theodore Street; however, there is no crosswalk to assist pedestrians.
- Another pedestrian safety problem in the vicinity observed during field visits was that pedestrians cross Morton Street at many points in this stretch, where on-street parking and the horizontal curve affect the line of sight of motorists.
- The motorists' line of sight from the side streets to vehicles on Morton Street is affected by the roadway's horizontal curve and on-street parking on Morton Street.
- There were eight single-vehicle crashes in this stretch of Morton Street, which appears to be a very high number compared to other locations in the study corridor; again, the horizontal curve in this stretch appears to be the cause of these single-vehicle crashes.
- There is no crosswalk on Leston Street or on the south leg of Wildwood Street. In addition, there is no crosswalk across Morton Street at the Lucerne Street/Leston Street intersection.
- There is no stop sign on Theodore Street.
- There is no one-way sign on the south leg of Wildwood Street.
- There are no bike signs or pavement markings informing motorists to share the road.

3.3.6 Morton Street and Blue Hill Avenue

This intersection was the subject of a Road Safety Audit (RSA) undertaken by MassDOT in November 2011. The audit identified potential safety issues at the intersection and opportunities for improvements.[10] The reader is encouraged to read the report.

Morton Street at Blue Hill Avenue

Morton Street at Blue Hill Avenue is a signalized intersection under the jurisdiction of MassDOT. Blue Hill Avenue is a city-owned, north-south multilane principal arterial (two-way, four-lane roadway, with two lanes in each direction). A left-turn lane is provided on each approach of Blue Hill Avenue; but left turns from Morton Street are prohibited. The land uses in the vicinity of the intersection are primarily commercial, including a Mobil gas station on the southwest corner of the intersection and the Boston Police Department District B-3 office is located on the northwest corner of the intersection.

Pedestrian and Bicycle Amenities

The intersection experiences high pedestrian activity due to the commercial and institutional land uses in the vicinity. Morton Street and Blue Hill Avenue have 6-to-8-foot-wide sidewalks on both sides of each street. There is a 10-foot-wide marked crosswalk on each leg of the intersection, with median cut outs on the north, south, and west legs. Each street corner had curb ramps without detectable warning panels for pedestrians. There are pedestrian signals with pedestrian-activated push buttons for crossing Blue Hill Avenue and Morton Street. Blue Hill Avenue has a bicycle lane in each direction, marked as bike lanes; there is no bike lane on Morton Street.

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[10] Massachusetts Department of Transportation, Highway Division, Road Safety Audit, Morton Street at Blue Hill Avenue, Morton Street at Courtland Road/Havelock Street, Morton Street at Harvard Street, City of Boston (Mattapan), January 20, 2012.

Transit Service

MBTA bus Routes 21, 28, 29, and 31 have two stops on Morton Street in the vicinity of the intersection: one for the westbound direction and one for the eastbound direction. The performances of these routes are presented in Table 3-4, which indicates that; Routes 21, 29, and 31 fail the loading standard of the MBTA. The two bus stops are heavily utilized, with total daily boardings of 596 and 142 for the westbound and eastbound, respectively. The MBTA has installed bus stop signs at each of these stops, but none of the stops has a bus shelter with a bench, even though the bus stops meet the eligibility criteria of the MBTA bus shelter installation policy.

Traffic Signal

The traffic signal at the intersection is a combination of post-mounted and overhead signal displays. On Blue Hill Avenue, the overhead and post-mounted signal heads provide good conspicuity and motorists' line of sight to the signal heads is not blocked by trucks in the traffic stream. On Morton Street, the westbound signal displays are post-mounted in the sidewalks and motorists' line of sight to the signal heads may be blocked by trucks in the traffic stream.

The signal timing and phase plan for the intersection are included in Appendix B. Left turns are prohibited from Morton Street; Blue Hill Avenue left turns are protected only. Pedestrians at the intersection are serviced with pedestrian-activated exclusive pedestrian phase. A 7-second walk interval and a 15-second flash-don't-walk (pedestrian clearance time) interval are provided for crossing at the intersection. During field visits, it was observed that the pedestrians do not wait for the walk phase to cross the streets. In addition, the pedestrian clearance time is too short, especially for crossing Blue Hill Avenue. There are no countdown pedestrian timers and no accessible pedestrian signals to assist pedestrians with disabilities at the intersection.

Crashes

The intersection ranks 185 on MassDOT's 2009 statewide list of the top 200 high-crash intersections; it had an equivalent property damage only (EPDO) rating of 104. The ranking is based on crashes in the RMV's crash database for 2007 to 2009. There were 36 crashes in that period (17 injury and 19 property damage only crashes).

Data on crashes that occurred at the intersection for the period April 2008 to September 2011 were analyzed through MassDOT's Road Safety Audit Program. The crash data, which were obtained from the

Boston Police and State Police, showed 33 crashes, 22 of which were mapped on a collision diagram that is included in Appendix E. The intersection had a high number of crashes involving pedestrians; according to the RSA, three of the nine pedestrian crashes involved the same panhandler at the intersection. The RSA indicated that many pedestrians crossing at the intersection do not wait for the walk signal and many do not use the push buttons to activate the pedestrian phase. Pedestrians cross the street concurrently with traffic, which creates conflicts. According to the collision diagram, five of the crashes involved vehicles entering and exiting the Mobil gas station in the southwest corner of the intersection.

Using the PM peak-hour traffic volumes at the intersection, the crash rate was calculated as 0.57 crashes per million entering vehicles (MEV), which is below the Highway Division District 6 average crash rate of 0.77 MEV for signalized intersections. Although this intersection is on the statewide list of the top 200 high-crash intersections, its crash rate is below the District 6 average because of the high volume of vehicles that use the intersection.

Level of Service, Delay, and Queues

Table 3-6 present the results of the Intersection capacity analysis. The Synchro output is included in Appendix E. The analysis indicates that the intersection operates above capacity, vehicles and pedestrians at the intersection experience long delays and traffic queues, and the intersection operates at LOS F during the AM and PM peak hours.

Identified Problems

The following problems were identified at the intersection through the MassDOT RSA:

- R3-2 (No Left Turn) signs located in the median on the west leg of the intersection may not be visible enough to effectively enforce this restriction for both Morton Street approaches. It was also noted that a supplemental sign in the median on the south leg of the intersection is mounted too low.


R3-2

- The lack of R4-7 (Keep Right) median signs was noted as a potential safety issue. It was also noted that there is a stub for the breakaway post of a D6 guide sign in the median on the northwest corner of the intersection, indicating that a sign was knocked down and should be replaced. In addition, it was noted that the right-turn lane


R4-7

delineated by this island has a crosswalk and stop line but no stop signs are provided.

- The existing pedestrian “Don’t Walk” time may not be adequate. In addition, the existing exclusive pedestrian operation may not result in the safety benefit intended, as many pedestrians either do not push the button or do not wait for the walk signal before crossing. This may be a factor in the nine pedestrian crashes at this location.
- Pedestrians crossing concurrently with traffic may create a safety issue given the existing right-turn arrow for northbound right turns from Blue Hill Avenue to Morton Street eastbound. This right-turn arrow also creates a potential conflict with bicycles.
- The pedestrian signal on the northeast corner of the intersection is out of alignment with the crosswalk and is not clearly visible when crossing Morton Street.
- Overhead signals are provided for Blue Hill Avenue, but the majority of signal heads for Morton Street are post-mounted. There is one overhead signal head facing eastbound traffic located on the far side of the intersection, which may not be visible to all approaching traffic based on the alignment of Morton Street.
- The location of bus stops may create a safety issue due to both the impact of buses on vehicular traffic and the resultant pedestrian demands. It was noted that bus stops on the far side of the street are preferable from a traffic operations standpoint, and that the existing near-side stop on Morton Street on the northeast corner of the intersection creates conflicts between buses and queued traffic and causes pedestrians to wait in a relatively narrow sidewalk area.
- It was observed that vehicles use the Mobil gas station on the southwest corner of the intersection as a cut-through for the eastbound right turn when the signal is red, or to make the restricted left turn from Morton Street westbound to Blue Hill Avenue. Five crashes were related to vehicles entering or exiting the Mobil station.
- It was noted that the pavement is rutted on the approaches to this intersection, which may impact stopping and lane changing for approaching vehicles. It was also suggested that the width of roadway is not friendly to pedestrians because it creates long crosswalks and extended crossing times; however, it should be

noted that lane widths do not appear to be excessive at this location.

The following additional problems were observed during field visits:

- The curb ramps are not fully ADA compliant. The ramps in the northwest, southeast, or southwest corners of the intersection do not have detectable warning plates.
- No accessible pedestrian signal is provided at the intersection.
- No detection for bicycles at the intersection.

3.3.7 Morton Street at Courtland Road and Havelock Street

The intersection of Morton Street at Courtland Road and Havelock Street is unsignalized and it is under the jurisdiction of MassDOT. The land use in the vicinity of the intersection is primarily residential. Courtland Road and Havelock Street are city-owned, one-way streets that take traffic away from Morton Street. Courtland Road and Havelock Street are classified as urban collectors. On-street parking is allowed on both sides of the street.

Morton Street at Courtland Road and Havelock Street

Morton Street is a divided roadway in this stretch, and on-street parking is allowed on both sides of the street. A median opening at the intersection allows left turns from Morton Street onto Courtland Road and Havelock Street. Courtland Road and Havelock Street are cut-through routes for traffic heading to Harvard Street and Blue Hill Avenue, respectively. Courtland Road also serves traffic to the Greendale Road neighborhood.

Pedestrian and Bicycle Amenities

There are 6-to-8-foot-wide sidewalks on Morton Street, Courtland Road, and Havelock Street. There are curb ramps for pedestrians for the side streets at this intersection, but no marked crosswalks on either Courtland Road or Havelock Street. Bicyclists share the travel lanes

with motorists on Morton Street. There is no bus stop at the intersection; the closest bus stop is at the intersection of Morton Street and Harvard Road, about 200 feet to the west.

Crashes

The intersection is not on MassDOT's 2009 statewide list of the top 200 high-crash intersections. It has an equivalent property damage only (EPDO) rating of 54, based on MassDOT crash data for the period 2007 to 2009.

Crash data that occurred at the intersection for the period July 2008 to September 2011 were analyzed through MassDOT's Road Safety Audit Program. The crash data, which were obtained from the Boston Police and State Police, showed 20 crashes, 19 of which were mapped on a collision diagram that is included in Appendix C. According to the collision diagram, the majority of the crashes were angle-type collisions involving Morton Street vehicles turning left onto Courtland Road.

Using the PM peak-hour traffic volumes at the intersection, the crash rate was calculated as 0.72 crashes per million entering vehicles (MEV), which exceeds the Highway Division District 6 average crash rate of 0.57 MEV for unsignalized intersections.

Level of Service, Delay, and Queues

Table 3-6 presents the results of the intersection capacity analyses. The Synchro output of the intersection capacity analyses is included in Appendix E. Based on the results, there is no delay or queuing at the intersection; the intersection operates at LOS C or better during the AM and PM peak hours.

Identified Problems

The following problems were identified at the intersection through the RSA:

- The crash history at this intersection shows a prevalence of angle-type crashes involving left-turning vehicles traveling in both directions on Morton Street. It was suggested that westbound left-turning vehicles are using Courtland Road as a cut-through to Harvard Street. This practice occurs during peak and off-peak hours.
- It was noted that while both Courtland Road and Havelock Street are one-way away from Morton Street, there are no one-way signs indicating this operation.

- There are no marked crosswalks across either Courtland Road or Havelock Street, although there are continuous sidewalks along Morton Street.
- Curb ramps at the intersection lack detectable warning panels.
- There is no accommodation for pedestrians wishing to cross Morton Street at or near this intersection; one crash involved a pedestrian entering the travel lanes on Morton Street.

4 Proposed Improvements

4.1 Planned and Proposed Projects

There are four projects planned or proposed for the Gallivan Boulevard and Morton Street arterial segments.

4.1.1 Morton Street over the MBTA and CSX Railroad Tracks (MassDOT project #603654)

This project is programmed in the Boston Region MPO's Federal Fiscal Year 2012 Transportation Improvement Program (TIP). It is currently in the design phase, and construction is expected to begin in spring 2013. The work for this project consists of the replacement of the Morton Street bridge, which goes over the MBTA and CSX Railroad tracks. The work will include complete replacement of the superstructure and construction of new abutments in front of the existing abutments and behind the existing piers. The existing piers will be demolished. The new bridge will be a single-span, continuous composite steel stringer superstructure, with a concrete deck. The substructure will consist of full-height abutments with spread footings founded on bedrock. The approach roadways will be reconstructed approximately 200 feet on either side of the bridge.

4.1.2 Intersection Improvements at Gallivan Boulevard (Route 203) and Morton Street (MassDOT project #606318)

The proposed project would consist of traffic signal improvements and upgrades and possible lane configuration changes to better manage traffic at this intersection, which was formerly under the jurisdiction of the Department of Conservation and Recreation (DCR), until it was transferred to MassDOT's jurisdiction in 2009. In connection with this project, the intersection of Morton Street and Gallivan Boulevard was

studied by TranSystems Corporation.[11] In its intersection alternatives design report, TranSystems' recommended alternative is to signalize the existing intersection, which would meet the goals of the project and garner the most support from the public. The proposed signal is expected to reduce delay at the intersections as well as improve safety for all users.

4.1.3 Improvements on Gallivan Boulevard (Route 203) from Neponset Circle to the East Side of the Morton Street Intersection (MassDOT project #606896)

This proposed project would include improvements to Gallivan Boulevard, which was transferred from DCR to MassDOT in 2009. The project limits are from Neponset Circle to just east of the Morton Street intersection. Improvements could include resurfacing the roadway, upgrading the traffic signal system, upgrading the sidewalks, reconfiguring the roadway, bringing the intersection up to ADA accessibility standards, adding transit amenities, and implementing pedestrian and bicycle accommodations. The project is in the preliminary study and design phase; this planning study constitutes part of the planning and preliminary design phase. Project need and initiation forms were submitted in March 2012 and were approved by MassDOT's project review committee (PRC) in the same month. There is no current funding for the proposed project; therefore, the likely timing of the MassDOT project is 8 to 10 years from now.

4.1.4 Improvements on Morton Street (Route 203), from the West Side of Gallivan Boulevard to Shea Circle (MassDOT project #606897)

This proposed project would include improvements to Morton Street from west of the Gallivan Boulevard and Morton Street intersection to Shea Circle. Improvements could include resurfacing, sidewalk upgrades, ADA compliance, transit amenities, and pedestrian and bicycle facilities. The project is in preliminary study and design phase, and this planning study will be used as part of the planning and preliminary design phase. Project need and initiation forms were submitted for this study in March 2012 and were approved by the PRC in the same month. There is no current funding for the proposed

[11] Massachusetts Department of Transportation, Intersection Design Report, Intersection Improvement Project: Morton Street at Gallivan Boulevard, Boston, Massachusetts, June 2012.

corridor projects; therefore, the likely timing of the MassDOT projects is 8-10 years from now.

4.2 Future conditions

4.2.1 Methodology

To forecast, on a systematic basis, future traffic volume changes resulting from changes in the transportation network or in land use, a planning model is used. The transportation planning model used in this study is the Boston Region MPO's most-recently adopted regional travel demand model set. Its socioeconomic components are based on forecasts produced by the Metropolitan Area Planning Council. The model is calibrated at a regional level for 164 cities and towns, which include all of the 101 cities and towns in the MPO region.

For site-specific development and transportation projects, the model has to be calibrated to replicate local travel patterns in the project area before it is used to forecast the future impacts of a project. The primary tool used in model calibration is the transportation planning model set implemented in EMME software.[12] For the present study, the regional model network was customized for the study area by making several enhancements to the input data before calibration.

Table 4-1 presents the projected growth in peak-period traffic volumes for the Gallivan Boulevard and Morton Street corridors between 2009 and 2020. The volumes are three-hour peak-period volumes (6:00 AM–9:00 AM and 3:00 PM–6:00 PM). Locations with negative growth between year 2009 and year 2020 are associated with negative growth in socioeconomic data (population and employment) in the nearby transportation analysis zones.

4.2.2 Projected Traffic Volumes and Levels of Service

The projected growth factors from the regional model set were used to expand the existing peak-hour turning-movement volumes to 2020 future turning-movement volumes (Figure 4-1). MPO staff performed year 2020 intersection capacity analyses by using Synchro 8 traffic operations analysis software and the projected traffic volumes.[13]

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[12] EMME 3, Transport Modeling, INRO, Westmount, Montreal, Quebec, Canada.

[13] Trafficware Inc., Synchro Studio 8, Snychro plus SimTraffic, Build 801, Version 563, Sugar Land, Texas.

TABLE 4-1
Peak-Period Traffic Volume Changes along Route 203 between 2009 and 2020

	2009 Volume		2020 Volume		Growth	
Location	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Morton Street Eastbound						
East of Harvard Street	2,261	4,718	2,324	4,868	2.8%	3.2%
West of Blue Hill Avenue	2,267	4,418	2,333	4,545	2.9%	2.9%
East of Blue Hill Avenue	2,007	4,008	2,100	4,120	4.7%	2.8%
West of Norfolk Street	2,148	4,008	2,253	4,097	4.9%	2.2%
East of Norfolk Street	1,943	3,802	2,050	4,045	5.5%	6.4%
West of Gallivan Boulevard	2,008	3,698	2,119	3,929	5.5%	6.2%
Subtotal	12,633	24,652	13,180	25,603	4.3%	3.9%
Morton Street Westbound						
East of Harvard Street	4,784	3,387	4,781	3,682	-0.1%	8.7%
West of Blue Hill Avenue	4,466	3,322	4,447	3,598	-0.4%	8.3%
East of Blue Hill Avenue	3,795	2,590	3,709	2,913	-2.3%	12.5%
West of Norfolk Street	3,721	2,701	3,636	2,994	-2.3%	10.8%
East of Norfolk Street	3,321	2,418	3,297	2,845	-0.7%	17.7%
West of Gallivan Boulevard	3,166	2,435	3,117	2,864	-1.5%	17.6%
Subtotal	23,253	16,853	22,987	18,896	-1.1%	12.1%
Gallivan Boulevard Eastbound						
West of Washington Street	1,102	1,920	1,160	2,166	5.2%	12.8%
Between Washington Street and Dorchester Avenue	1,613	2,386	1,672	2,580	3.7%	8.1%
Between Dorchester Avenue and Adams Street	1,503	2,171	1,529	2,368	1.8%	9.1%
East of Adams Street	2,955	3,792	3,048	4,043	3.1%	6.6%
West of Granite Avenue	2,929	3,776	3,019	4,029	3.1%	6.7%
Subtotal	10,102	14,044	10,429	15,186	3.2%	8.1%
Gallivan Boulevard Westbound						
West of Washington Street	872	1,285	892	1,612	2.3%	25.4%
Between Washington Street and Dorchester Avenue	1,229	2,037	1,222	2,330	-0.5%	14.4%
Between Dorchester Avenue and Adams Street	850	2,057	842	2,297	-1.0%	11.7%
East of Adams Street	2,587	3,595	2,584	3,927	-0.1%	9.2%
West of Granite Avenue	2,577	3,581	2,573	3,908	-0.2%	9.1%
Subtotal	8,115	12,555	8,113	14,074	0.0%	12.1%

Note: Modeling results are output from model runs made for the MPO's current Long-Range Transportation Plan, *Paths to a Sustainable Region*, adopted by the MPO on September 22, 2011. The volumes are three-hour peak period volumes (6:00 AM – 9:00 AM and 3:00 PM – 6:00PM).

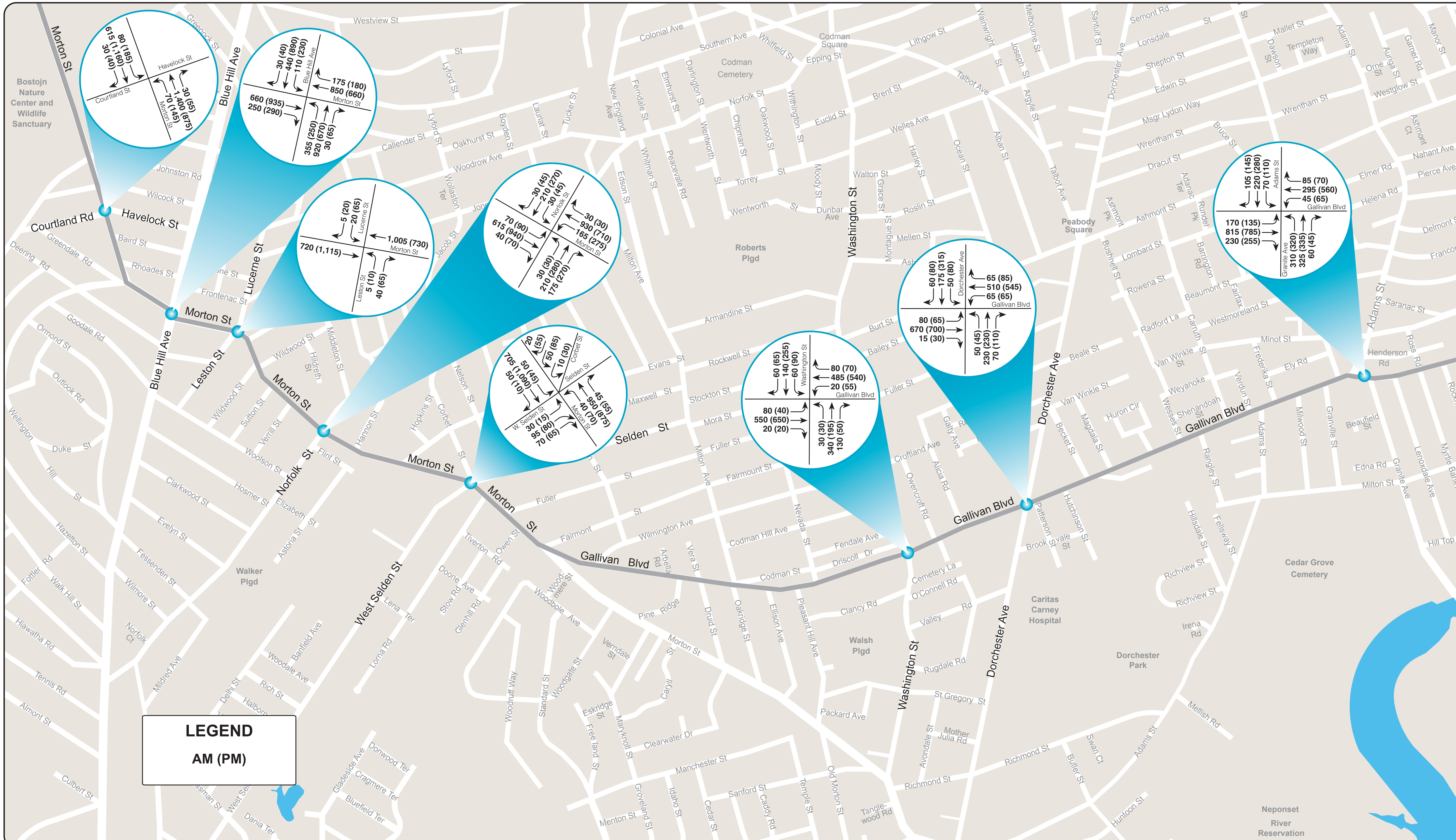

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FIGURE 4-1
Turning-Movement Volumes for 2020 Peak Hour

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

A summary of the results is provided in Tables 4-2 and 4-3. Synchro outputs of the year 2020 capacity analyses are included in Appendix E.

The anticipated future operating levels of service were estimated based on the projected 2020 traffic conditions with and without improvements. The future conditions without improvements identify how the traffic conditions along the Gallivan Boulevard and Morton Street segments of Route 203 are expected to degrade over time if no improvements are made to the infrastructure. This scenario includes the future traffic volumes using the existing roadway configuration (a four-lane cross-section) with existing traffic signal settings. The year 2020 scenario with improvements includes the future traffic volumes on a modified roadway configuration (four-lane cross-section) with geometric changes and optimized signal timings.

Tables 4-2 and 4-3 show that traffic operations at the following signalized intersections are expected to degrade over time as the traffic volume increases:

- Gallivan Boulevard and Granite Avenue/Adams Street
- Morton Street at West Selden Street/Corbet Street
- Morton Street at Blue Hill Avenue

4.3 Proposed Improvements

The improvements proposed for the Gallivan Boulevard and Morton Street arterial segments were developed from the following inputs:

- Existing traffic, safety, and operations problems in the study area
- Suggestions and guidance from an advisory task force (representatives from MassDOT and City of Boston)

Suggestions included in comments received from the neighborhood, WalkBoston, and MassBike on a Morton Street road safety audit conducted by MassDOT.[14]

[14] Road Safety Audit, Morton Street at Blue Hill Avenue, Morton Street at Courtland Road/Havelock Street, Morton Street at Harvard Street, City of Boston (Mattapan), Massachusetts Department of Transportation, Highway Division, January 20, 2012.

TABLE 4-2
2020 AM and PM Peak-Hour Level of Service without Improvements

Approach	Move-ment	2020 AM			2020 PM		
		LOS	Delay[1]	Queue[2]	LOS	Delay	Queue
Gallivan Blvd. EB	L+T+R	F	209	#943	F	321	#896
Gallivan Blvd. WB	L+T+R	D	40	#277	F	303	#560
Granite Ave. NB	L	E	59	#441	F	128	#497
Granite Ave. NB	T+R	E	78	#587	F	159	#585
Adams St. SB	L	C	30	77	D	47	135
Adams St. SB	T	D	42	270	E	72	#394
Adams St. SB	R	C	34	95	D	41	88
Gallivan Blvd. EB	L+T+R	F	87	#382	E	80	#342
Gallivan Blvd. WB	L+T+R	D	41	#288	D	55	#276
Dorchester Ave. NB	L+T+R	D	39	#369	E	71	#369
Dorchester Ave. SB	L+T+R	C	28	#294	F	207	#498
Gallivan Blvd. EB	L+T+R	C	26	#282	C	25	#331
Gallivan Blvd. WB	L+T+R	C	21	217	C	29	#367
Washington St. NB	L+T+R	C	31	#508	C	27	245
Washington St. SB	L+T+R	B	18	165	D	44	#378
Morton St. EB	L+T+R	C	29	#342	F	88	#558
Morton St. WB	L+T+R	D	36	#443	F	131	#518
West Selden St. NB	L+T+R	D	38	176	D	32	137
Selden St. SB	L+T+R	C	31	94	D	31	139
Morton St. EB	T	A	0	0	A	0	0
Morton St. WB	T	A	0	0	A	0	0
Leston St. NB	L+T+R	B	20	20	B	12	20
Lucerne St. SB	L+T+R	B	20	20	C	17	20
Morton St. EB	T+R	E	89	#619	F	212	#912
Morton St. WB	T+R	F	131	#732	F	220	#678
Blue Hill Ave. NB	L	F	264	#617	F	124	#425
Blue Hill Ave. NB	T+R	F	83	#693	E	62	#456
Blue Hill Ave. SB	L	E	66	159	F	105	#389
Blue Hill Ave. SB	T+R	E	48	261	F	116	#651
Morton St. EB	L+T+R	A	3	20	A	8	31
Morton St. WB	L+T+R	A	6	20	A	6	20
Courtland Rd.	NA	NA	NA	NA	NA	NA	NA
Havelock St.	NA	NA	NA	NA	NA	NA	NA

[1] Delay in seconds per vehicle.
[2] 95th percentile queue length in feet.
means that the 95th percentile volume exceeds capacity.
Note: Shading denotes street approaches with delay and queuing problems.

TABLE 4-3
2020 AM and PM Peak-Hour Level of Service with Improvements

Approach	Move-ment	2020 AM			2020 PM		
		LOS	Delay[1]	Queue[2]	LOS	Delay	Queue
Gallivan Blvd. EB	L+T+R	D	51	#590	E	77	#580
Gallivan Blvd. WB	L+T+R	C	22	169	D	43	#350
Granite Ave. NB	L	E	77	#311	E	79	#338
Granite Ave. NB	T+R	D	49	#424	D	48	#391
Adams St. SB	L	D	37	#56	D	43	91
Adams St. SB	T	D	48	#205	E	59	#325
Adams St. SB	R	C	34	105	C	32	131
Gallivan Blvd. EB	L+T+R	D	37	#423	E	66	#413
Gallivan Blvd. WB	L+T+R	C	29	#303	D	50	#328
Dorchester Ave. NB	L+T+R	D	51	#420	D	41	#409
Dorchester Ave. SB	L+T+R	D	38	#334	F	122	#582
Gallivan Blvd. EB	L+T+R	C	24	#305	C	21	#303
Gallivan Blvd. WB	L+T+R	B	18	#235	C	23	#356
Washington St. NB	L	B	14	35	C	26	47
Washington St. NB	T+R	C	32	#473	C	30	#228
Washington St. SB	L	C	16	76	C	27	107
Washington St. SB	T+R	B	16	#151	D	41	#333
Morton St. EB	L+T+R	C	30	#366	C	30	#567
Morton St. WB	L+T+R	C	33	#473	D	42	#540
West Selden St. NB	L+T+R	D	44	#186	D	45	169
Selden St. SB	L+T+R	D	35	#102	D	46	173
Morton St. EB	T	A	0	0	A	0	0
Morton St. WB	T	A	0	0	A	0	0
Leston St. NB	L+T+R	B	10	20	B	12	20
Lucerne St. SB	L+T+R	B	15	20	B	14	20
Morton St. EB	T+R	D	41	446	E	66	#646
Morton St. WB	T+R	D	51	#564	D	43	#440
Blue Hill Ave. NB	L	E	67	#423	E	69	#319
Blue Hill Ave. NB	T+R	D	37	#467	D	45	#354
Blue Hill Ave. SB	L	D	55	143	D	54	#278
Blue Hill Ave. SB	T+R	D	40	234	E	68	#511
Morton St. EB	L+T+R	A	3	20	A	4	25
Morton St. WB	L+T+R	A	6	20	A	4	25
Courtland Rd.	NA	NA	NA	NA	NA	NA	NA
Havelock St.	NA	NA	NA	NA	NA	NA	NA

[1] Delay in seconds per vehicle.
[2] 95th-percentile queue length in feet.
means that the 95th percentile volume exceeds capacity.
Note: Shading denotes street approaches with delay and queuing problems.

The proposed Improvements were categorized into three categories:

- Gallivan Boulevard segment
- Morton Street segment
- Selected intersection improvements

4.3.1 Gallivan Boulevard Segment

The following improvements are proposed for the Gallivan Boulevard segment (shown in Figure 4-2).

Pedestrian Facilities Improvements

- Upgrade or replace crumbled and broken sidewalks from Dorchester Avenue to Wilmington Street
- Provide detectable warning panels on curb ramps and ensure that all curb ramp landings are even with the road surface and meet ADA standards
- Align crosswalk, sidewalk, and curb ramps so that they follow pedestrian desire lines; especially at the following locations: Huron Circle, Oakridge Street, and Pine Ridge Road.
- Provide marked crosswalks across Rangeley Street and Druid Street.
- Remove obstructions or obstacles in crosswalks and sidewalks, such as medians without openings, utility and equipment poles on curb ramps, and street furniture that reduces the effective width of the sidewalk to less than four feet
- Provide sufficient “walk” and “don’t walk” times for pedestrians at signalized intersections.
- Align pedestrian signal heads at signalized intersections to face crosswalk directly
- Add a countdown display to all pedestrian signal heads; these should be displayed during flashing Don’t Walk indications
- Provide accessible pedestrian signals (APS) to communicate information on pedestrian phases in appropriate formats to pedestrians with visual and hearing disabilities.

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FIGURE 4-2
Proposed Improvements: Gallivan Boulevard Segment

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Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

Bicyclist Accommodations

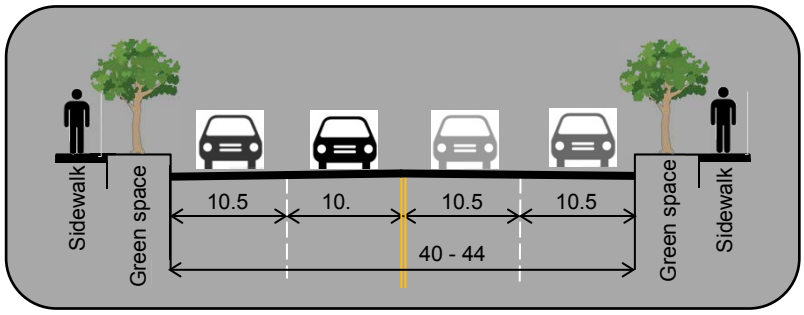
- Provide bicycle detectors and bicycle detector pavement markings at the signalized intersections.
- Provide signs and pavement marking indicating bicycle facilities and use, such as “Share the Road” signs and icons (sharrows) to inform motorists to share the roadway.

Roadway Reconfiguration (Road Diet)

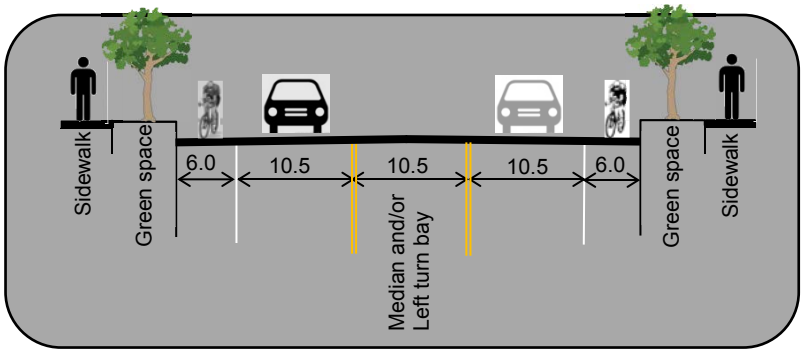
MPO staff suggest that a road diet should be considered for the section of Gallivan Boulevard between Wilmington Avenue and Wessex Street. This segment of Gallivan Boulevard has low average daily traffic (ADT) volumes (between 14,000 and 20,000 vehicles per day). Applying a road diet and reducing the number of travel lanes to two (one in each direction) on Gallivan Boulevard would allow:

- Adding a bike lane in each direction of Gallivan Boulevard between Wilmington Avenue and Wessex Street.
- Adding left-turn bays on Gallivan Boulevard at the busier intersections with a high proportion of left turns.
- Adding a median to reduce pedestrian crossing distances and create refuge areas.

Before



After



In addition, a road diet would have multiple safety and operational benefits for vehicles and pedestrians in the Gallivan Boulevard segment, such as:

- Decreasing the number of vehicle travel lanes to decrease the pedestrian crossing distances, therefore reducing the multiple-threat crash (when one vehicle stops for a pedestrian in a travel lane on a multilane road, but the motorist in the next lane does not, resulting in a crash) for pedestrians and motorists.
- Providing space for a pedestrian crossing island.
- Improving safety for bicyclists when bike lanes are added (such lanes also create a buffer space between pedestrians and vehicles).
- Reducing rear-end and side-swipe crashes.
- Improving speed limit compliance, which would decrease crash severity when crashes do occur.
- Analysis indicates that a road diet would increase delays and queues at the intersections of Gallivan Boulevard at Dorchester Avenue and at Washington Street (Table 4-4). The intersection of Gallivan Boulevard and Dorchester Avenue would operate at LOS F during the AM and PM peak hours. The primary reason for the increase in congestion is that the majority of traffic on Gallivan Boulevard heads straight through the segment or making right turns (approximately 90%), and there is very small proportion of left turns (approximately 10%).

Traffic Signal Equipment and Infrastructure Upgrade

- Upgrade old substandard traffic signal equipment with an adaptive traffic signal system that is demand-responsive. The main benefits of adaptive signal control technology over conventional signal systems are that it can:
    - Continuously distribute green time equitably for all traffic movements.
    - Improve travel time reliability by progressively moving vehicles through green lights (coordination).
    - Reduce congestion by creating smoother flow.
    - Eliminate the need for periodic signal timing updates.
- Add an Opticom system to handle emergency vehicle preemption and transit signal priority in the Gallivan Boulevard segment.

- Replace four-section signal heads with five-section signal heads.
- Repair faulty loop detectors.
- Provide overhead signal heads with black backplates to increase visibility, attract attention, and shield signal indications from sunlight and environmental conditions.
- Add a countdown display to all pedestrian signal heads.
- Provide accessible pedestrian signals (APS).

Traffic Signal Retiming and Coordination Update

- Retime traffic signals to provide optimized timing for vehicles and pedestrians.
- Increase the pedestrian walk interval at all signalized intersections to a minimum of 7 seconds, as specified in MUTCD.
- Increase pedestrian clearance intervals at the signalized intersections to provide adequate time for pedestrian crossings.
- Update yellow change intervals and all-red clearance intervals. Modifying the yellow or red clearance interval may reduce angle and left-turn collisions that occur due to through or left-turning drivers failing to clear the intersection or stop before entering the intersection at the onset of the red phase. In addition, it may reduce rear-end collisions that occur because drivers brake sharply to avoid entering the intersection at the onset of the red phase. Updating yellow and all-red intervals may also be considered where there is a high incidence of red-light violations.
- Put closely spaced signalized intersections into coordinated systems. When signalized intersections are close together (i.e., within one-half mile of each other), it is advantageous to coordinate them. Four traffic signals in the Gallivan Boulevard segment are within 0.75 -miles and would therefore benefit from InSync adaptive signal control technology.[15] The signals are located at the intersections of Gallivan Boulevard with Granite Avenue, Adams Street, Dorchester Avenue, and Washington Street.

[15] Rhythm Engineering, InSync Adaptive Signal Control System, Lenexa, Kansas 66215.

TABLE 4-4
2020 AM and PM Peak-Hour Level of Service with Road Diet

Approach	Move-ment	2020 AM			2020 PM		
		LOS	Delay[1]	Queue[2]	LOS	Delay	Queue
Gallivan Blvd. EB	L+T+R	D	51	#590	E	77	#580
Gallivan Blvd. WB	L+T+R	C	22	169	D	43	#350
Granite Ave. NB	L	E	77	#311	E	79	#338
Granite Ave. NB	T+R	D	49	#424	D	48	#391
Adams St. SB	L	D	37	#56	D	43	91
Adams St. SB	T	D	48	#205	E	59	#325
Adams St. SB	R	C	34	105	C	32	131
Gallivan Blvd. EB	L	C	23	108	C	26	33
Gallivan Blvd. EB	T+R	F	108	#883	F	170	#837
Gallivan Blvd. WB	L	F	113	146	F	119	139
Gallivan Blvd. WB	T+R	F	203	#774	F	132	#771
Dorchester Ave. NB	L+T+R	D	44	#418	D	44	#411
Dorchester Ave. SB	L+T+R	D	35	#330	F	134	#584
Gallivan Blvd. EB	L	C	29	121	C	21	89
Gallivan Blvd. EB	T+R	E	59	#566	D	48	776
Gallivan Blvd. WB	L	B	15	29	D	49	126
Gallivan Blvd. WB	T+R	E	62	#568	D	48	#767
Washington St. NB	L	B	14	34	C	27	47
Washington St. NB	T+R	C	32	#458	C	32	#228
Washington St. SB	L	C	16	73	C	30	108
Washington St. SB	T+R	B	16	#146	D	45	#333
Morton St. EB	L+T+R	C	30	#366	C	30	#567
Morton St. WB	L+T+R	C	33	#473	D	42	#540
West Selden St. NB	L+T+R	D	44	#186	D	45	169
Selden St. SB	L+T+R	D	35	#102	D	46	173
Morton St. EB	T	A	0	0	A	0	0
Morton St. WB	T	A	0	0	A	0	0
Leston St. NB	L+T+R	B	10	20	B	12	20
Lucerne St. SB	L+T+R	B	15	20	B	14	20
Morton St. EB	T+R	D	41	446	E	66	#646
Morton St. WB	T+R	D	51	#564	D	43	#440
Blue Hill Ave. NB	L	E	67	#423	E	69	#319
Blue Hill Ave. NB	T+R	D	37	#467	D	45	#354
Blue Hill Ave. SB	L	D	55	143	D	54	#278
Blue Hill Ave. SB	T+R	D	40	234	E	68	#511
Morton St. EB	L+T+R	A	3	20	A	4	25
Morton St. WB	L+T+R	A	6	20	A	4	25
Courtland Rd.	NA	NA	NA	NA	NA	NA	NA
Havelock St.	NA	NA	NA	NA	NA	NA	NA

[1] Delay in seconds per vehicle.
[2] 95th-percentile queue length in feet.
means that the 95th percentile volume exceeds capacity.
Note: Shading denotes street approaches with delay and queuing problems.

Signage

- Replace the missing R1-1 signs (Stop) on the following streets: Kenmare Road, Driscoll Drive, Nevada Street, Ellison Avenue, Vera Street, Druid Street, Arbella Road, Milwood Street, Wessex Street, Magdala Street, Alicia Road, and Owencroft Road.
- Replace the missing R6-1L and R6-1R signs (One-Way Street) on Becket Street, Hutchinson Street, Oakridge Street, and Pleasant Hill Road.
- Install R4-7 signs (Keep Right symbol) on locations where it is necessary for traffic to pass to the right of a roadway feature or obstruction, such as a median at an intersection.


R4-7

- Install R10-11b signs (No Turn on Red) at signalized intersections with exclusive pedestrian phases.
- Install object markers OM1,to mark obstructions within or adjacent to the roadway, such as medians and channelized islands.

R10-11a

Pavement and Drainage Rehabilitation

- Rehabilitate pavement that is in poor or fair condition, including curbing and driveway entrances.
- Improve drainage and replace damaged catch basins and address other drainage-related problems.

Bus Transit Service Improvements

Many of the proposed improvements for accommodating pedestrian and bicyclists and making traffic operations efficient would also help transit users and improve schedule adherence for buses, such as:

- Upgrade traffic signal equipment.
- Retime traffic signals to make bus service more efficient.
- Place closely spaced traffic signals into coordination.
- Improve accessibility (pedestrian facilities improvements, bicyclist accommodation, ADA compliance, and signage).

In addition, MPO staff recommend that bus shelters with benches and trash receptacles be provided at two bus stops on Gallivan Boulevard. A review of CTPS bus stop data collected in 2007–09 shows that two bus stops in the Gallivan Boulevard segment have total daily boardings of 70 passengers or greater; those two stops are:

- Gallivan Boulevard at Wilmington Street – 90 boardings on bus Routes 21 and 26.
- Gallivan Boulevard at Morton Street – 78 boardings on bus Routes 21 and 26.

Lighting Improvements

Ensure that adequate lighting is provided to increase safety and security, especially at the following locations: signalized intersections, bus stop locations, and commercial areas. Upgrade street lighting in the Gallivan Boulevard segment by repairing or replacing:

- Lights that are not operating or are going on and off.
- Light fixtures with open or missing covers, or broken glass.
- Damaged and slanted poles.
- Exposed wires and graffiti on streetlight poles.

Landscaping Upgrade

Replace damaged and dead trees, and plant trees in new locations that would benefit from having trees.

4.3.2 Morton Street Segment

The following improvements are proposed for the Morton Street segment (shown in Figure 4-3).

Pedestrian Facilities Improvements

- Upgrade sidewalks in the Morton Street segment
- Provide detectable warning panels on curb ramps and ensure that all curb ramp landings are even with the road surface and meet ADA standards.
- Provide marked crosswalks across Verrill Street, Sutton Street, Wildwood Street, Leston Street, Rhoades Street, Courtland Road, and Havelock Street.
- Remove obstructions and obstacles in crosswalks and sidewalks such as medians without openings and utility and signal equipment poles on curb ramps.
- Align pedestrian signal heads at signalized intersections to face crosswalks directly.
- Provide sufficient “Walk” and “Don’t Walk” times for pedestrians at signalized intersections.

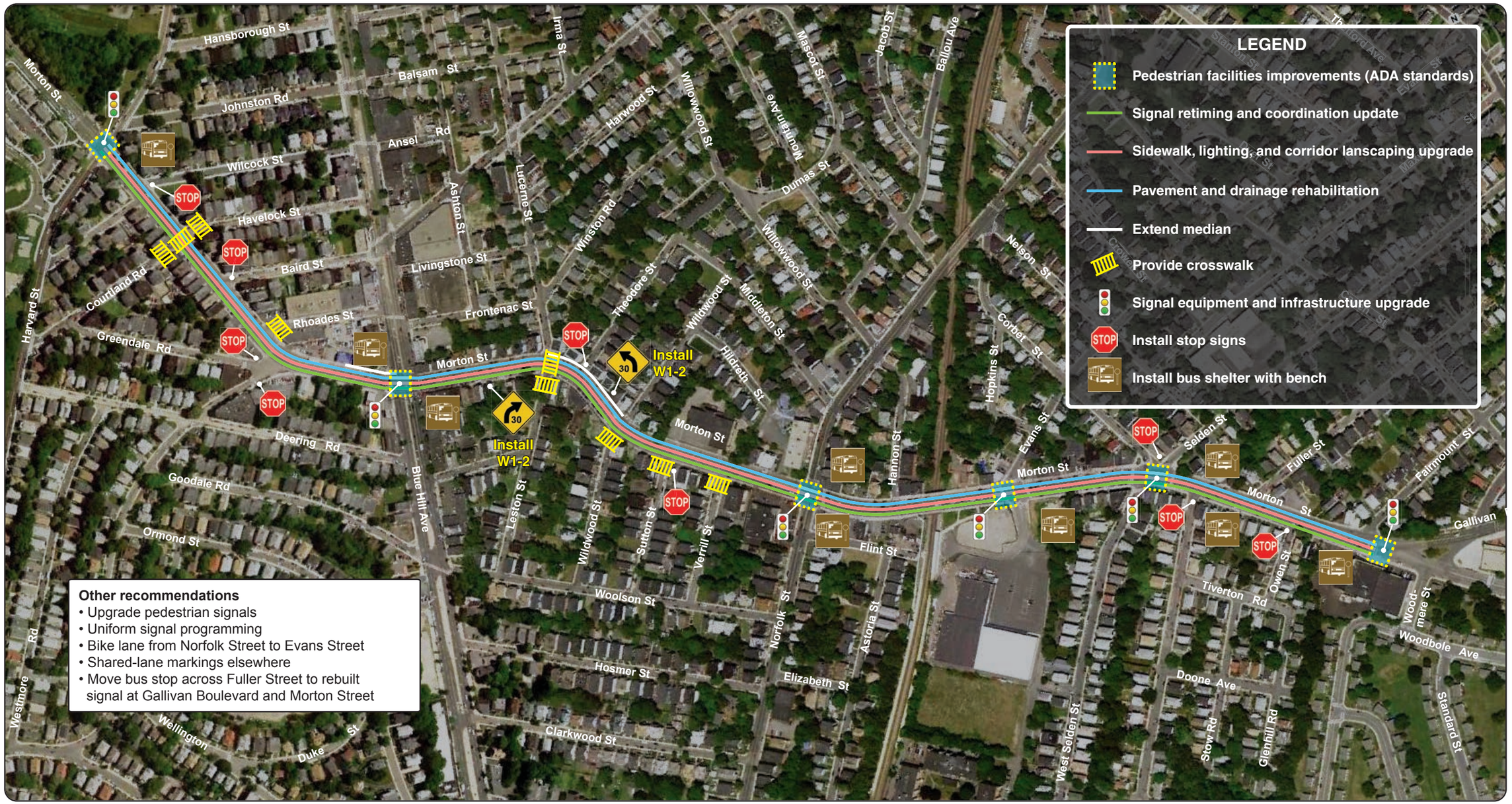


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FIGURE 4-3
Proposed Improvements: Morton Street Segment

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

- Add a countdown display to all pedestrian signal heads that is displayed during the flashing “Don’t Walk” indications.
- Provide accessible pedestrian signals (APS) to communicate information on pedestrian phases in appropriate formats to pedestrians with visual and hearing disabilities.

Bike Accommodations

- Provide bicycle detectors and bicycle detector pavement markings at the signalized intersections.
- Provide bicycle signs and pavement markings indicating the presence of bicycle facilities and use, such as signs and icons (sharrows) to inform motorists to share the roadway.

Traffic Signal Equipment and Infrastructure Upgrade

- Upgrade old substandard traffic signal equipment with an adaptive traffic signal system that is demand-responsive.
- Add an Opticom system to handle emergency vehicle preemption and transit signal priority in the Morton Street segment.
- Repair faulty loop detectors.
- Provide overhead signal heads with black backplates and visors, to increase visibility, attract attention, and shield signal from sunlight and other environmental conditions.
- Replace four-section signal heads with five-section signal heads.
- Add a countdown display to all pedestrian signal heads that is displayed during flashing DON’T WALK indications.
- Provide accessible pedestrian signals (APS) at the signalized intersections to communicate information on pedestrian phases in appropriate formats to pedestrians with visual and hearing disabilities.

Traffic Signal Retiming and Coordination Update

- Put closely spaced signalized intersections on Morton Street into coordinated systems.
- Retime traffic signals to provide optimized timing for vehicles and pedestrians.
- Increase the yellow change interval to 4 seconds.
- Increase the all-red clearance interval to 2 seconds.

- Increase all pedestrian walk intervals to a minimum of 7 seconds, as specified in MUTCD.
- Increase pedestrian clearance intervals to provide sufficient time for pedestrians to cross the streets.

Signage

- Replace missing stop signs on Lorna Road, Owen Street, Fuller Street, Sutton Street, Theodore Street, Wellington Hill Street, Greendale Road, Baird Street, and Wilcock Street.
- Replace missing one-way street signs on Wildwood Street, Hannon Street, Verrill Street, and Courtland Road.
- Install R4-7 signs (Keep Right symbol) on locations where it is necessary for traffic to pass to the right of a roadway feature or obstruction, such as a median at an intersection.
- Install R10-11a signs (No Turn on Red) at signalized intersections with exclusive pedestrian phases.
- Install curve warning signs W1-2 or W1-2a and W3-8 chevron signs to provide drivers with additional information regarding the relative sharpness of an approaching curve between Wildwood Street and Blue Hill Avenue. There are many single-vehicle collisions in the section due to the curvature of the roadway.

W1-2 W1-2a W1-8

Medians and Landscaping Upgrade

- Extend the median between Wildwood Street and Theodore Street about 200 feet further west to Lucerne Street and about 500 feet further east to Verrill Street. The median would provide a refuge area and improve safety for pedestrians who have to cross four travel lanes on Morton Street.
- Extend the median on the west leg of the intersection to prohibit left turns from Morton Street into the Mobil gas station and prevent vehicles from turning left into the Mobil station to access Blue Hill Avenue. A shortcoming of this improvement is that it would also prohibit westbound vehicles from accessing the Mobil station without traveling further westbound and making a U-turn. Extending the median would require coordination with the City, property owners, and abutters, and would not address the issue

of eastbound vehicles using the Mobil station as a cut-through to avoid waiting at the light at Blue Hill Avenue.

- Replace damaged and dead trees, and plant trees in new locations that would benefit from having trees

Pavement and Drainage Rehabilitation

- Rehabilitate pavement in the Morton Street segment including curbing and driveway entrances.
- Improve roadway drainage where the roadway surface sags, causing drainage problems that affect pavement conditions on Morton Street, such as between Blue Hill Avenue and Greendale Road.
- Improve drainage by fixing damaged catch basins.

Bus Transit Service Improvements

As in the Gallivan Boulevard segment, many of the proposed improvements for accommodating pedestrians and bicyclists and making traffic operations more efficient in the Morton Street segment would also help transit users and improve schedule adherence for buses. Some of these improvements are:

- Upgrade traffic signal equipment
- Retime traffic signals
- Place closely spaced traffic signals into coordination
- Improve accessibility (pedestrian facilities improvements, bicyclist accommodation, ADA compliance, and signage)

In addition, MPO staff recommend that bus shelters with benches and trash receptacles be considered at the eight bus stops on Morton Street that meet the eligibility criteria for shelter installation. Those eight stops are:

- Morton Street at Blue Hill Avenue – 596 boardings on bus Routes 21 and 31
- Morton Street at Selden Street – 246 boardings on bus Routes 21 and 26
- Morton Street at Harvard Street – 233 boardings on Routes 21 and 31
- Morton Street at Norfolk Street – 226 boardings on Route 21

- Morton Street before Blue Hill Avenue – 142 boardings on bus Route 21
- Morton Street at West Selden Street – 140 boardings on bus Routes 21 and 26
- Morton Street at Norfolk Street – 123 boardings on bus Route 21
- Morton Street at Evans Street – 95 boardings on bus Routes 21 and 26

In addition, transit priority should be considered for the Morton Street segment to allow approaching buses to place a call to provide a green phase or receive a leading green. This should be carefully considered, along with other potential phasing and timing improvements, and may be complicated by the existing near-side bus stops on the Morton Street, as an approaching bus would place a priority call when it is in fact intending to stop to pick up or discharge passengers before traveling through the intersection. This improvement would require cooperation from the City of Boston and the MBTA.

Lighting Improvements

Upgrade street lighting in the segment by repairing or replacing:

- Lights that do not operate or turn on and off.
- Light fixtures that are open, have broken glass, or are missing.
- Damaged and slanted poles.
- Exposed wires and graffiti on streetlight poles.
- Ensure that the following locations have sufficient lighting to improve safety and increase security: signalized intersections, horizontal and vertical curves on Morton Street, and commercial areas.

4.3.3 Intersections

The proposed improvements at seven intersections that were selected for study are summarized below.

Gallivan Boulevard at Granite Avenue/Adams Street

The following improvements are proposed for this intersection (shown in Figure 4-4).

- Construct an opening in the median on the west leg of Gallivan Boulevard to connect the crosswalks and provide a refuge for pedestrians.

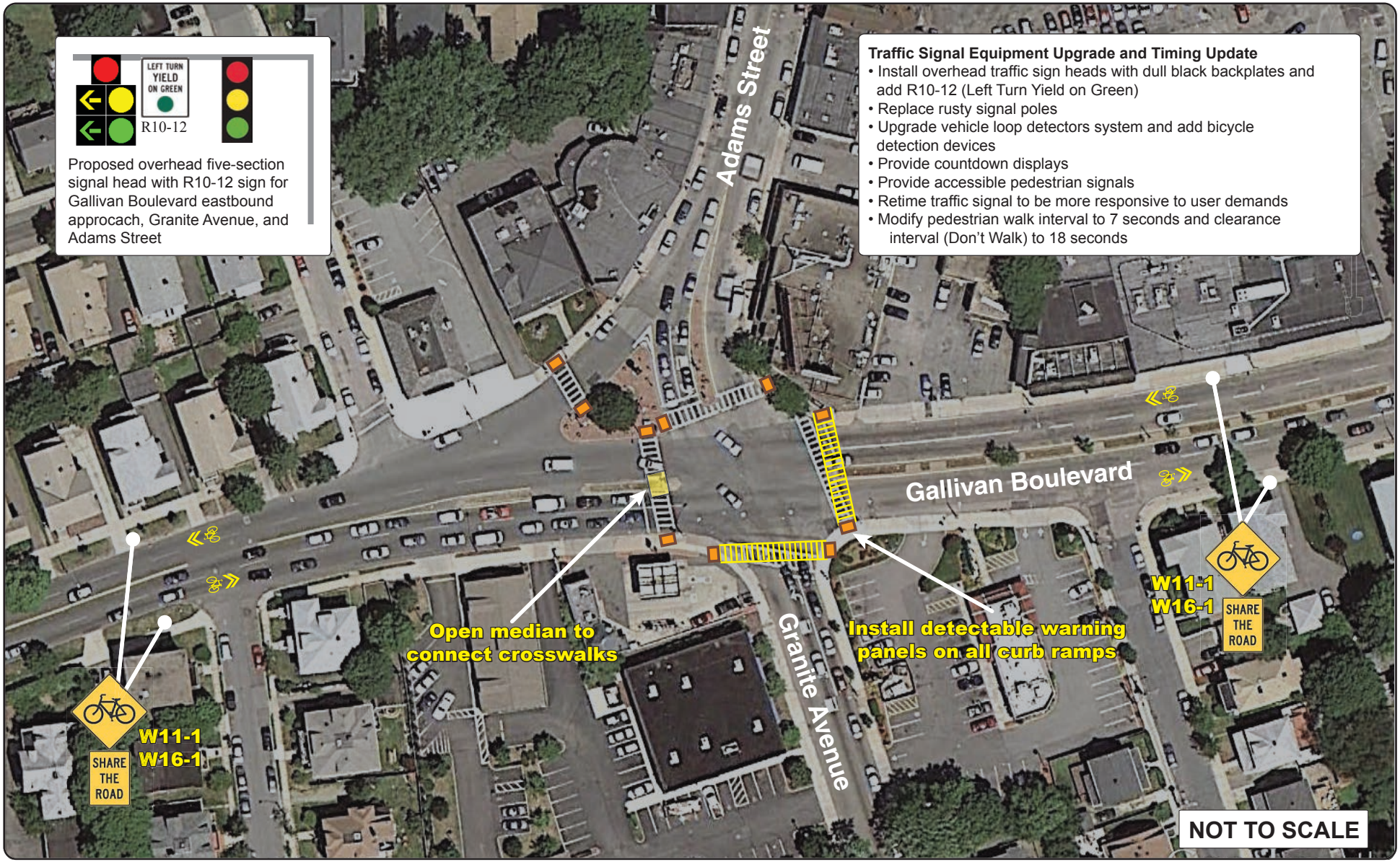

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FIGURE 4-4
Proposed Improvements at the Intersection of Gallivan Boulevard, Granite Avenue, and Adams Street

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

- Install overhead traffic signal heads with black backplates to increase visibility and attract motorists' attention. Overhead traffic signals using span wire or mast arm assemblies could cut down the number of poles at the intersection and reduce obstructions in the sidewalks and on curb ramps.
- Add an Opticom system to handle emergency vehicle preemption and/or transit signal priority at this intersection.
- Upgrade the vehicle loop detector system to make traffic more demand-responsive.

R10-12

- Replace four-section signal heads with five-section signal heads and supplement traffic control for Gallivan Boulevard westbound left-turning motorists by using R10-12 traffic signal signs (Left Turn Yield on Green, with a solid green circle).
- Install bicycle detection devices (loop or video) and bicycle detector pavement markings at the intersection.
- Retime the traffic signal to optimize the response to demands of roadway users, including motorists, bicyclists and pedestrians.
- Update the yellow change intervals to 4 seconds for all traffic phases.


Bike loop detector pavement marking

- Update the red clearance intervals to 2 seconds for all traffic phases.
- Modify the pedestrian walk interval to 7 seconds and the clearance interval to 18 seconds.
- Add a countdown display to all pedestrian signals.
- Provide accessible pedestrian signals (APS) at the intersection.
- Install detectable warning panels on all curb ramps at the intersection and ensure that ramp landings are even with the road surface.
- Realign the pedestrian signal in the southwest corner to face the crosswalk directly.

Gallivan Boulevard at Dorchester Avenue

The following improvements are proposed for this intersection (shown in Figure 4-5).

- Add black backplates to the overhead signal heads to increase visibility and attract motorists' attention.
- Replace existing lead-lag left-turn phase with leading protected left-turn phases for Gallivan Boulevard eastbound traffic and Dorchester Avenue southbound traffic
- Replace four-section signal heads with five-section signal heads and supplement traffic control for Gallivan Boulevard left-turning motorists by using R10-12 traffic signal sign.
- Retime the traffic signal to optimize the response to the demands of roadway users, including motorists, bicyclists, and pedestrians.
- Update the red clearance intervals to 2 seconds for all traffic phases.
- Modify the pedestrian walk interval to 7 seconds and the clearance interval to 19 seconds.
- Provide countdown displays for all pedestrian signals.
- Provide accessible pedestrian signals (APS) at the intersection.
- Install bicycle detection devices (loop or video) and bicycle detector pavement markings at the intersection.
- Add an Opticom system to handle emergency vehicle preemption and/or transit signal priority at this intersection.
- Install detectable warning panels on all curb ramps and ensure that ramp landings are even with the road surface.
- Relocate and align pedestrian signal in the southeast corner to face the crosswalk on east leg of Gallivan Boulevard directly.
- Ensure that signs are located in the appropriate location and mounted at the appropriate height.

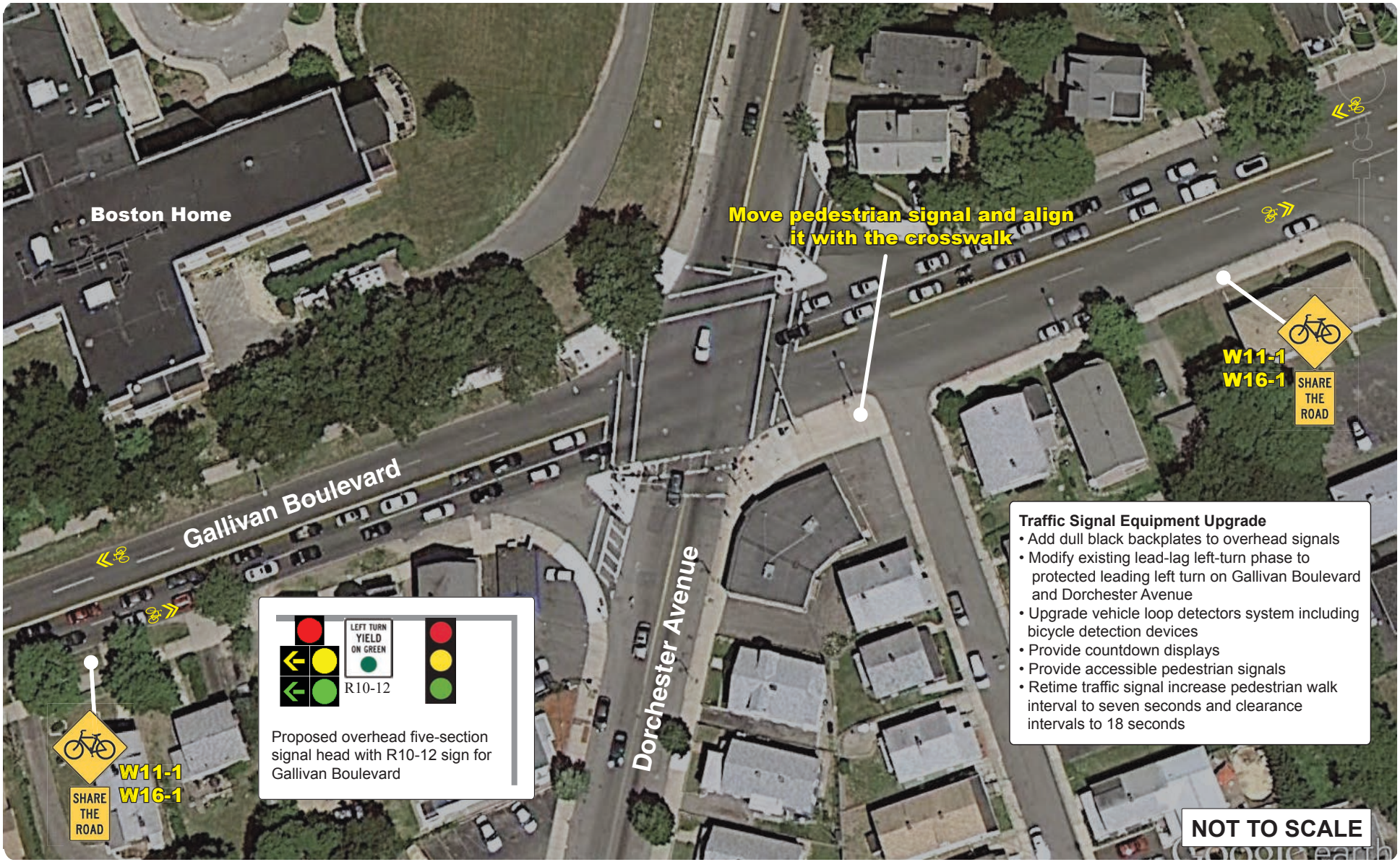

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FIGURE 4-5
Proposed Improvements at Gallivan Boulevard and Dorchester Avenue Intersection

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

Gallivan Boulevard at Washington Street

Three improvement options were developed for this intersection:

Option 1: Make geometric improvements at the Driscoll Drive approach to channelize its traffic to Washington Street, and restripe the Washington Street approaches to add a left-turn bay, as shown in Figure 4-6.

Option 2: Make geometric improvements at the Driscoll Drive approach to tie it into the intersection directly and provide it with a separate traffic signal phase, as shown in Figure 4-7.

Option 3: Reverse the direction of Driscoll Drive to be away from the intersection.

In addition to the three options described above, the following general improvements are proposed for the intersections:

- Install overhead traffic signal heads with black backplates to increase visibility and attract motorists' attention.
- Add an Opticom system to handle emergency vehicle preemption and/or transit signal priority at this intersection.
- Upgrade the vehicle loop detector system to make traffic more demand-responsive.
- Install bicycle detection devices and bicycle detector pavement markings at the intersection.
- Retime traffic signal to optimize response to demands of roadway users, including motorists, bicyclists and pedestrians.
- Increase the pedestrian clearance interval to 19 seconds.
- Adjust the signal timing plans for vehicle phase intervals.
- Add a countdown display to all pedestrian signals.
- Provide accessible pedestrian signals at the intersection.
- Install detectable warning panels on all curb ramps and ensure that ramp landings are even with the road surface.
- Align pedestrian signal in the southeast corner to face the crosswalk on the south leg of Washington Street directly.
- Widen the opening in the triangular island on the west leg of Gallivan Boulevard that separates the through and right-turn movements to accommodate pedestrians in wheelchairs and install an OM1-2 object marker to mark the island.

OM1-2

- Remove obstacles such as signal and light poles in curb ramps.

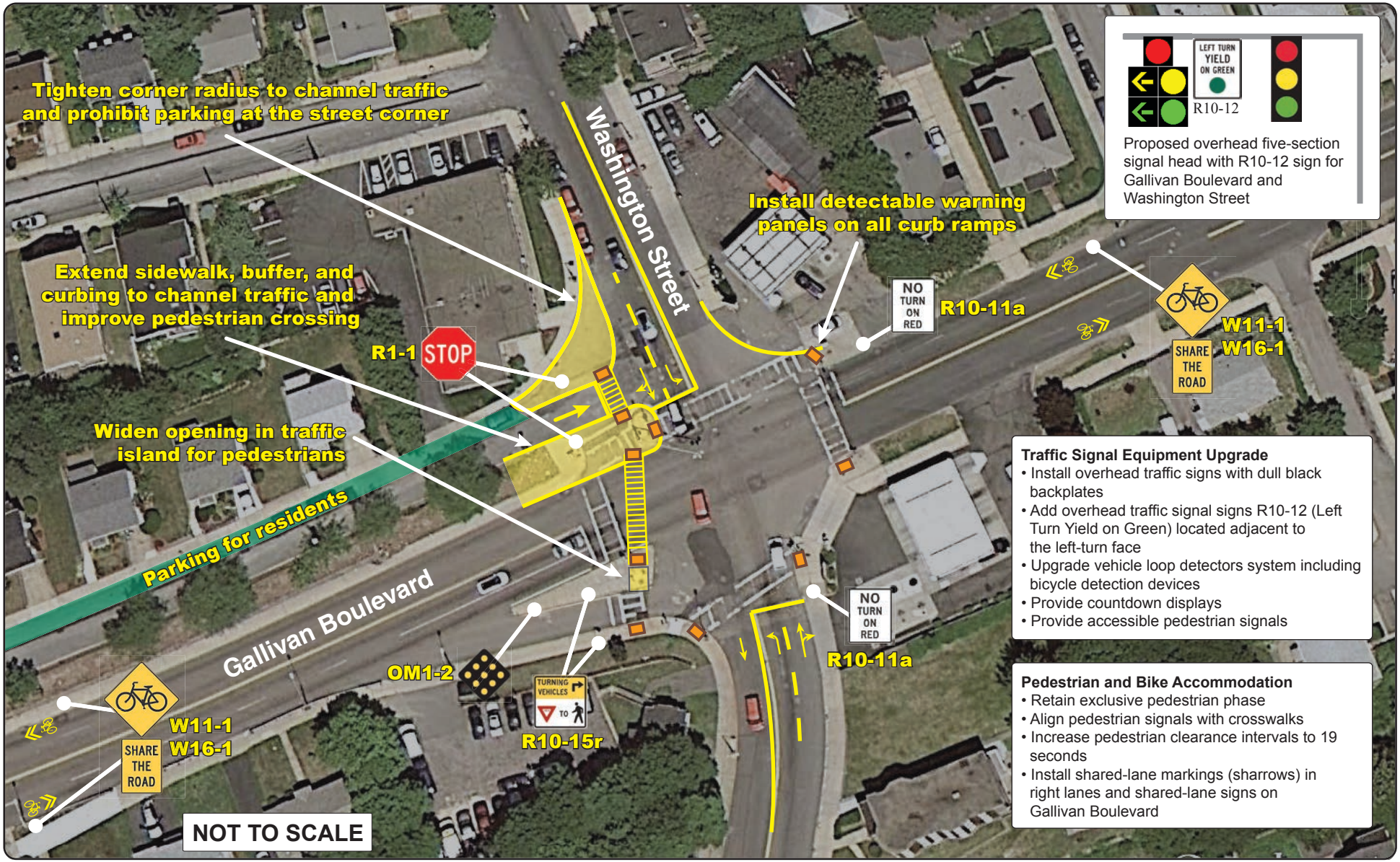

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FIGURE 4-6
Proposed Improvements at Gallivan Boulevard and Washington Street Intersection: Option 1

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

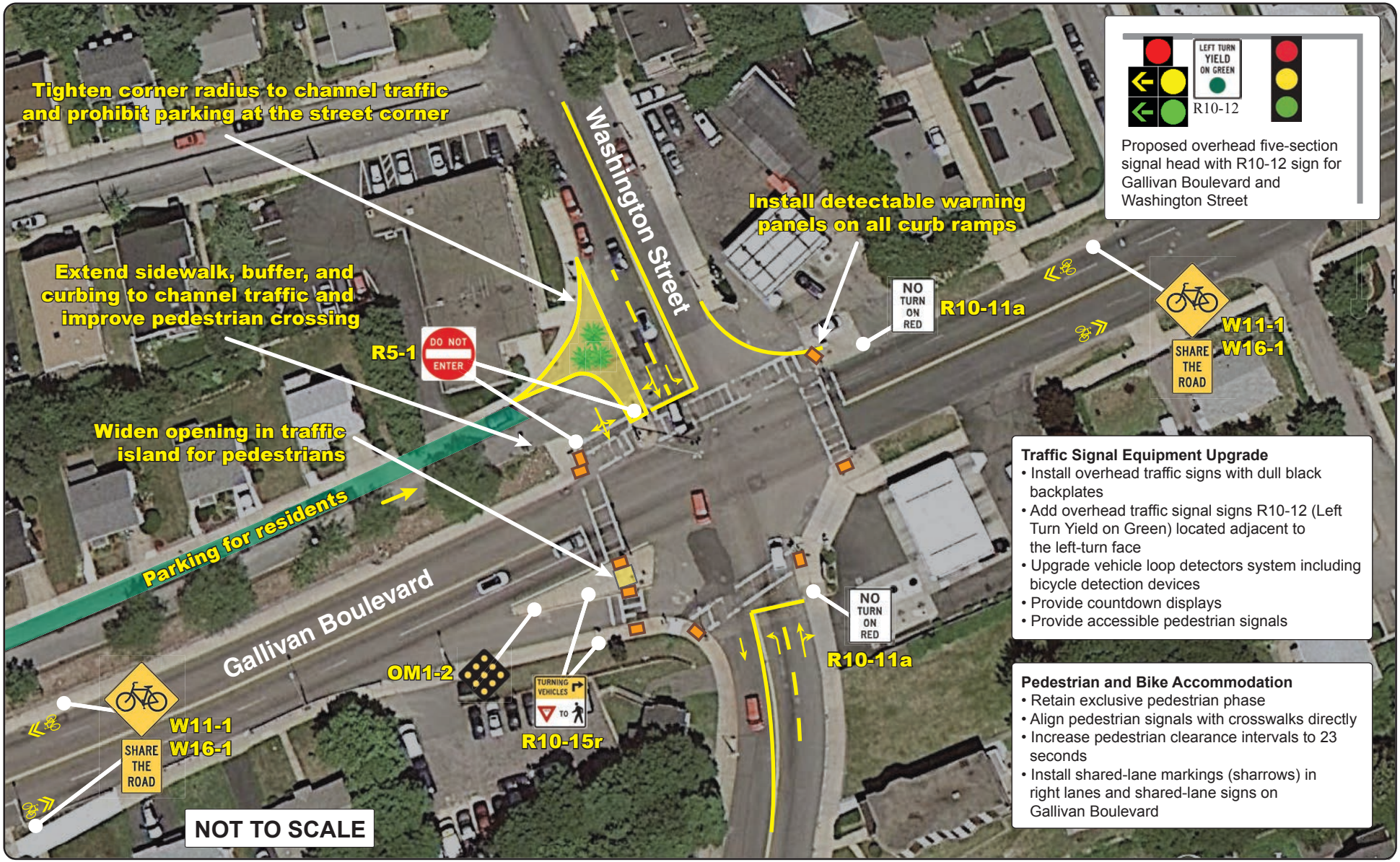

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FIGURE 4-7
Proposed Improvements at Gallivan Boulevard and Washington Street Intersection: Option 2

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

Morton Street at West Selden Street/Selden Street/Corbet Street

The following improvements are proposed for this intersection (shown in Figure 4-8).

- Provide bulb-outs on the Morton Street eastbound approach to West Selden Street and Corbet Street to reduce the crossing distance for pedestrians.
- Install detectable warning panels on all curb ramps and ensure that the curb ramp landings are even with the road surface.
- Add a countdown display to all pedestrian signals.
- Provide accessible pedestrian signals (APS) at the intersection
- Add a leading protected-left-turn phase for the westbound traffic on Morton Street and a five-section signal head for the westbound left turn.
- Upgrade the vehicle loop detector system to make traffic more demand-responsive.
- Add an Opticom system to handle emergency vehicle preemption and/or transit signal priority at this intersection.
- Supplement traffic control for Morton Street left-turning motorists by installing R10-12 traffic signal signs Left Turn Yield on Green, with a green circle).
- Install bicycle detection devices and bicycle detector pavement markings at the intersection.
- Retime the traffic signal to optimize the response to the demands of roadway users, including motorists, bicyclists and pedestrians.
- Update the yellow change intervals to 4 seconds for all traffic phases.
- Update the red clearance intervals to 3 seconds for the Morton Street traffic phases to compensate for the longer distance.
- Modify the pedestrian walk interval to 7 seconds. and the clearance interval to 18 seconds.

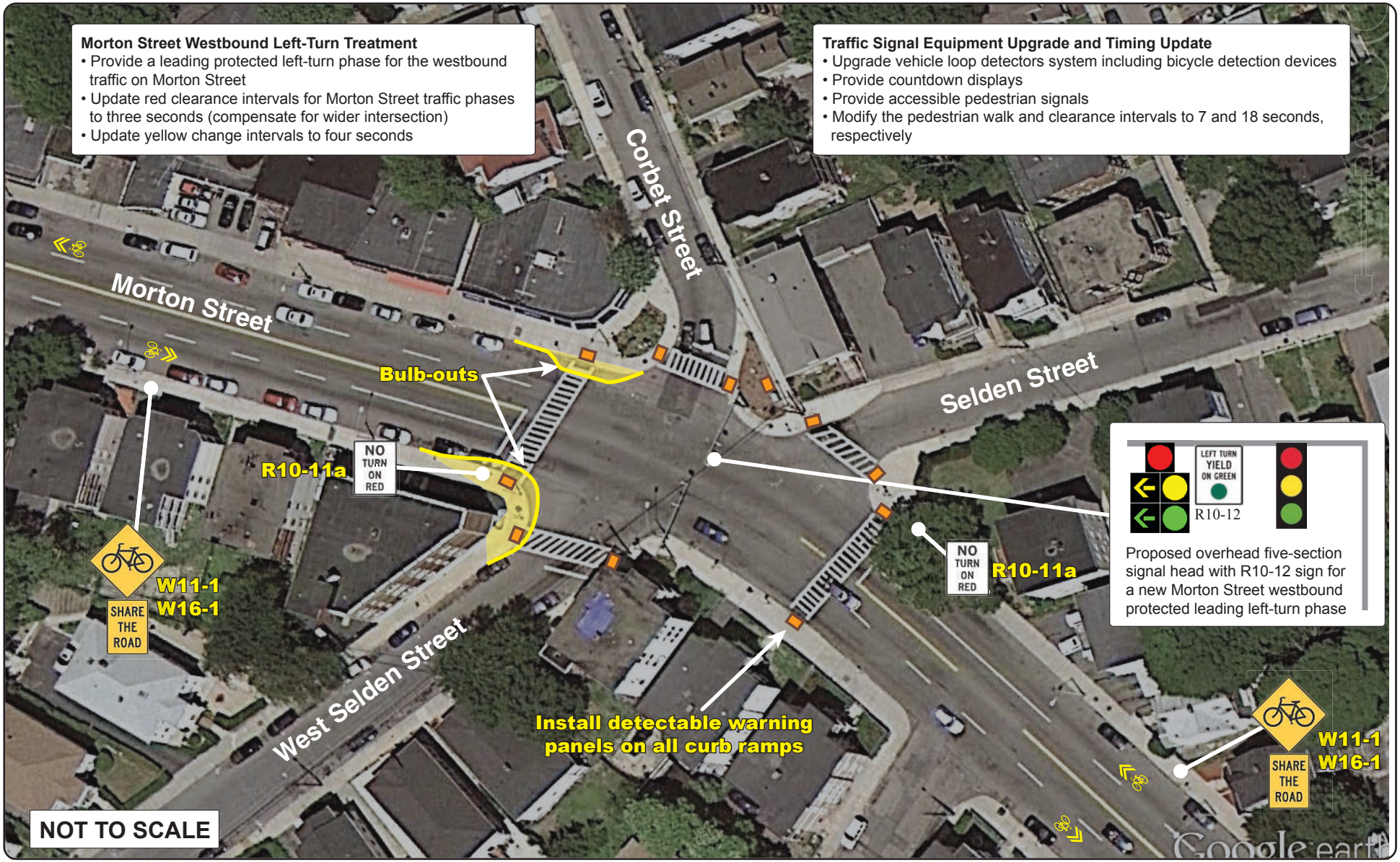

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FIGURE 4-8
Proposed Improvements at the Intersection of Morton Street, West Selden Street, Corbet Street, and Selden Street

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

Morton Street from Lucerne Street/Leston Street to Wildwood Street

The following improvements are proposed for this intersection (shown in Figure 4-9).

- Install a crosswalk across Morton Street at the intersection of Lucerne Street and Leston Street and add sidewalk bulb-outs to reduce the crossing distance for pedestrians.
- Install crosswalks on Leston Street and on the south leg of Wildwood Street. Add sidewalk bulb-outs to reduce the crossing distance for pedestrians at the south leg of Wildwood Street.
- Extend the short median between Wildwood Street and Theodore Street about 200 feet further west to Lucerne Street and about 500 feet further east to Verrill Street. Extending the median would provide a refuge area and improve safety for pedestrians who have to cross four travel lanes on Morton Street.
- Install W1-2 or W1-2a curve warning signs and W1-8 chevron signs to provide drivers with additional information regarding the relative sharpness of an approaching curve. This subsegment of Morton Street had eight single-vehicle crashes between 2007 and 2009.
- Install stop signs on Theodore Street.
- Install one-way signs on Wildwood Street.

Morton Street at Blue Hill Avenue

The following improvements are proposed for this intersection (shown in Figure 4-10).

- Install R1-1 (Stop) signs to control the traffic turning right from Blue Hill Avenue southbound onto Morton Street westbound due to restricted sight lines. Stop signs should be installed on both sides of the right-turn lane because parking is allowed on the right side and it may block motorists' view of a right-side stop sign. In addition, prohibit parking close to the crosswalk to improve safety and visibility for pedestrians.
- Add an Opticom system to handle emergency vehicle preemption and/or transit signal priority at this intersection.
- Replace the existing exclusive pedestrian phase with concurrent pedestrian phasing with leading pedestrian intervals.

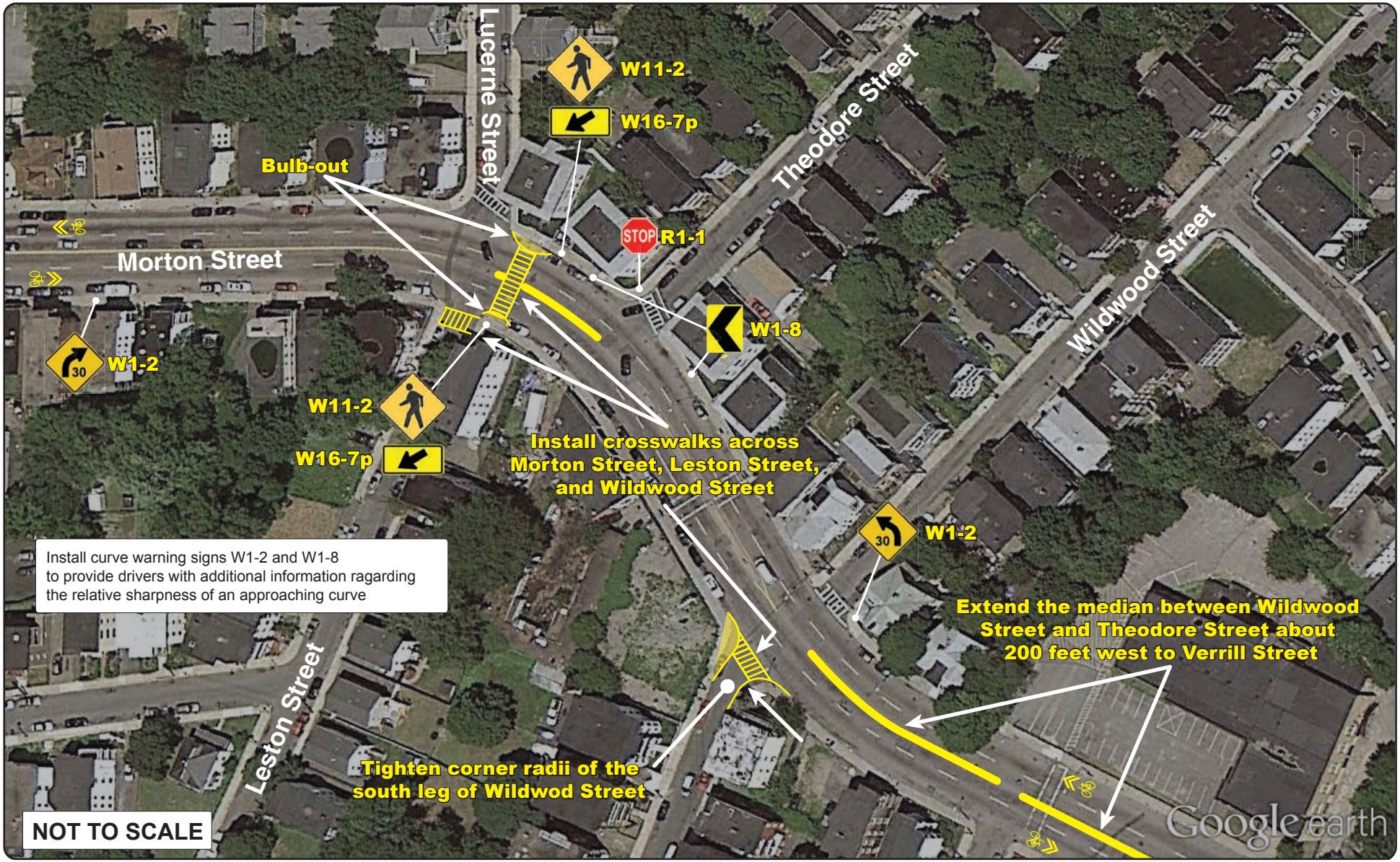

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FIGURE 4-9
Proposed Improvements at Morton Street:
Between Wildwood Street and Lucerne Street

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

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FIGURE 4-10
Proposed Improvements for Morton Street and Blue Hill Avenue Intersection

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study

- In addition, install R10-15 (Turning Vehicles Yield to Pedestrians) signs for Morton Street eastbound right turns. Because left turns are prohibited from Morton Street and left turns from Blue Hill Avenue are protected only, implementing concurrent pedestrian phasing at the intersection would not present problems. Currently, pedestrians often ignore the pedestrian signal indications and cross concurrently with traffic when it is safe to do so. If concurrent phasing is implemented at the intersection, the right-turn arrow for northbound right turns should be removed.

R10-15

- Install detectable warning panels on all curb ramps and ensure that ramp landings are even with the road surface.
- Align pedestrian signals with crosswalks and ensure that the pedestrian signal heads face the crosswalks directly.
- Reconstruct and widen the existing median openings that connect crosswalks on Blue Hill Avenue to 6 to 8 feet to provide sufficient refuge area for pedestrians.
- Install overhead traffic signal heads with black backplates on Morton Street to increase visibility and attract motorists' attention. Overhead traffic signals using span wire or mast arm assemblies can cut down the number of poles at the intersection and reduce obstructions in the sidewalks and on curb ramps.
- Retime the traffic signal to optimize the response to the demands of roadway users, including motorists, bicyclists and pedestrians.
- Update the red clearance intervals to 2 seconds except for the Morton Street traffic phase, which needs 3 seconds.
- Modify the pedestrian walk interval to 7 seconds and the clearance interval to 27 seconds.
- Add a countdown display to all pedestrian signals. Countdown displays would improve safety by notifying pedestrians of the time remaining on the FDW (flashing, don't walk) interval.
- Provide accessible pedestrian signals (APS) at the signalized intersections.
- Install W3-3 (Signal Ahead) signs on the Morton Street eastbound approach due to the curvature of the roadway west of Blue Hill Avenue and add a D3-2 (advance street name) sign below it.


W3-3

D3-2

- Upgrade the vehicle loop detector system to make traffic more demand-responsive.
- Install bicycle detection devices and bicycle detector pavement markings at the intersection.
- Install R4-7 (Keep Right) median signs on Blue Hill Avenue approaches and on the approach of the west leg of Morton Street.
- Install R3-2 (No Left Turn) sign mounted at an appropriate height, preferably overhead, to prohibit left turns from Morton Street.
- Install R3-5 and R3-8 signs (mandatory and advance intersection lane control, respectively) at the intersection. Existing lane assignment pavement markings are not sufficient; they are easily blocked by traffic queues during peak periods.
- Redesign the intersection the approaches of Greendale Road and Wellington Hill Street at Morton Street to streamline traffic from the side streets, reduce crossing distances for pedestrians, and improve sight distance. (Figure 4-10).

Morton Street at Havelock Street and Courtland Road

- The following improvements are proposed for this intersection (shown in Figure 4-11).
- Install a crosswalk across Morton Street at the intersection and add pedestrian crossing signs.
- Install crosswalks on Havelock Street and Courtland Road.
- Tighten the corner radii for Havelock Street to reduce the crossing distance for pedestrians.
- Install one-way signs on Havelock Street and Courtland Road.
- Install detectable warning panels on the curb cut ramps at the intersection.
- Reduce left-turn related crashes at the intersection; two options were considered:
    - Option 1– Consider adding left-turn bays on Morton Street for turning onto Havelock Street or Courtland Road to reduce the number of left-turn crashes at the intersection. The existing roadway pavement width is 60 feet, including parking and the median space. Four 11-foot travel lanes and a 10-foot left-turn bay would require pavement width of about 58 feet. This option would maintain the current traffic movements allowed at the intersection; it would require

taking parking spaces in each direction of Morton Street between Baird Street and Estella Street to implement it. In addition, it would require cooperation with the City of Boston.

- Option 2 – Close the median opening, as recommended in the Morton Street Roadway Safety Audit (RSA). This should only be implemented following an evaluation of the median openings along the entire corridor, as recommended previously. Closing this median would require northbound vehicles turning left to make a left turn at Harvard Street instead and would require an exclusive left-turn bay on the westbound approach of Morton Street; therefore, this improvement should be evaluated in tandem with potential modifications at Harvard Street. While this improvement would eliminate cut-through traffic, the impacts to circulation and to surrounding streets must also be considered.

4.3.4 Project Cost

Based on preliminary cost estimates, the improvements proposed for Gallivan Boulevard and Morton Street, including upgrading pedestrian and bicycle facilities upgrading traffic signal equipment, adding Opticom system, updating the traffic signal timing, making geometric modifications, improving bus transit service, improving signage, rehabilitating and reconstructing pavement (as necessary), implementing median and landscaping treatments, and upgrading the street lighting would cost $6-7 million for the Gallivan segment and another $6-7 million for the Morton Street segment.

There are two MassDOT reconstruction projects proposed for Route 203: one for reconstructing Gallivan Boulevard (MassDOT Project ID #606896) and one for reconstructing Morton Street (MassDOT Project ID #606897). These projects are described in subsections 4.1.3 and 4.1.4 of this report. Project need and initiation forms have been completed and approved by MassDOT's project review committee for these two projects. Currently the two projects are in preliminary design and planning phases and this planning study is part of these phases.

There is currently no funding for these projects; therefore, the likely timing of the MassDOT project is 8 to 10 years from now. MPO staff suggest that MassDOT implement the key short-term improvements through maintenance funds. The medium-term improvements should be implemented when funding becomes available for the projects.

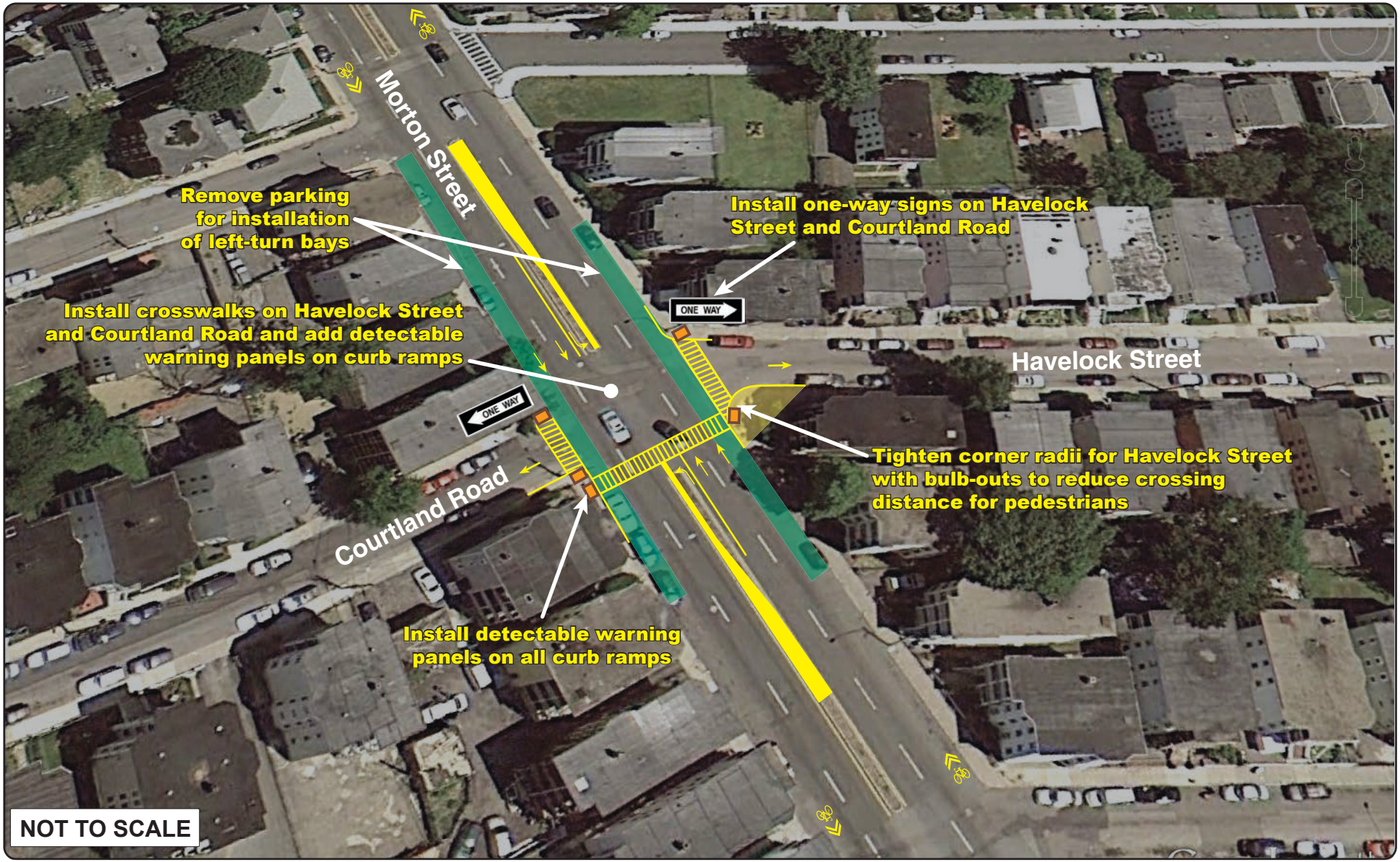

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FIGURE 4-11
Proposed Improvements at the Intersection of Havelock Street and Courtland Road

Route 203 (Gallivan Boulevard and Morton Street): Safety, Mobility, and Access Management Study