

Appendix A: Comments and Selection Process

F. Selection of Study Locations

G. Public Participation $\text{æ} \text{å} \hat{\text{O}} [\{ \text{ } \wedge \} \bullet$

Part % Selection of Study Locations



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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

TECHNICAL MEMORANDUM

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

1 BACKGROUND

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

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

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

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

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

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

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

2 SELECTION PROCEDURE

The process for selecting study locations consisted of three steps.

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

Details about each step in the process are provided below.

2.1 Gathering Data and Identifying Potential Arterial Segments

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

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

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

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

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

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

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

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

2.2 Selection Criteria

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

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

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

2.3 Rating Potential Roadways

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

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

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

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

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

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

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

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

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

4 NEXT STEPS

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

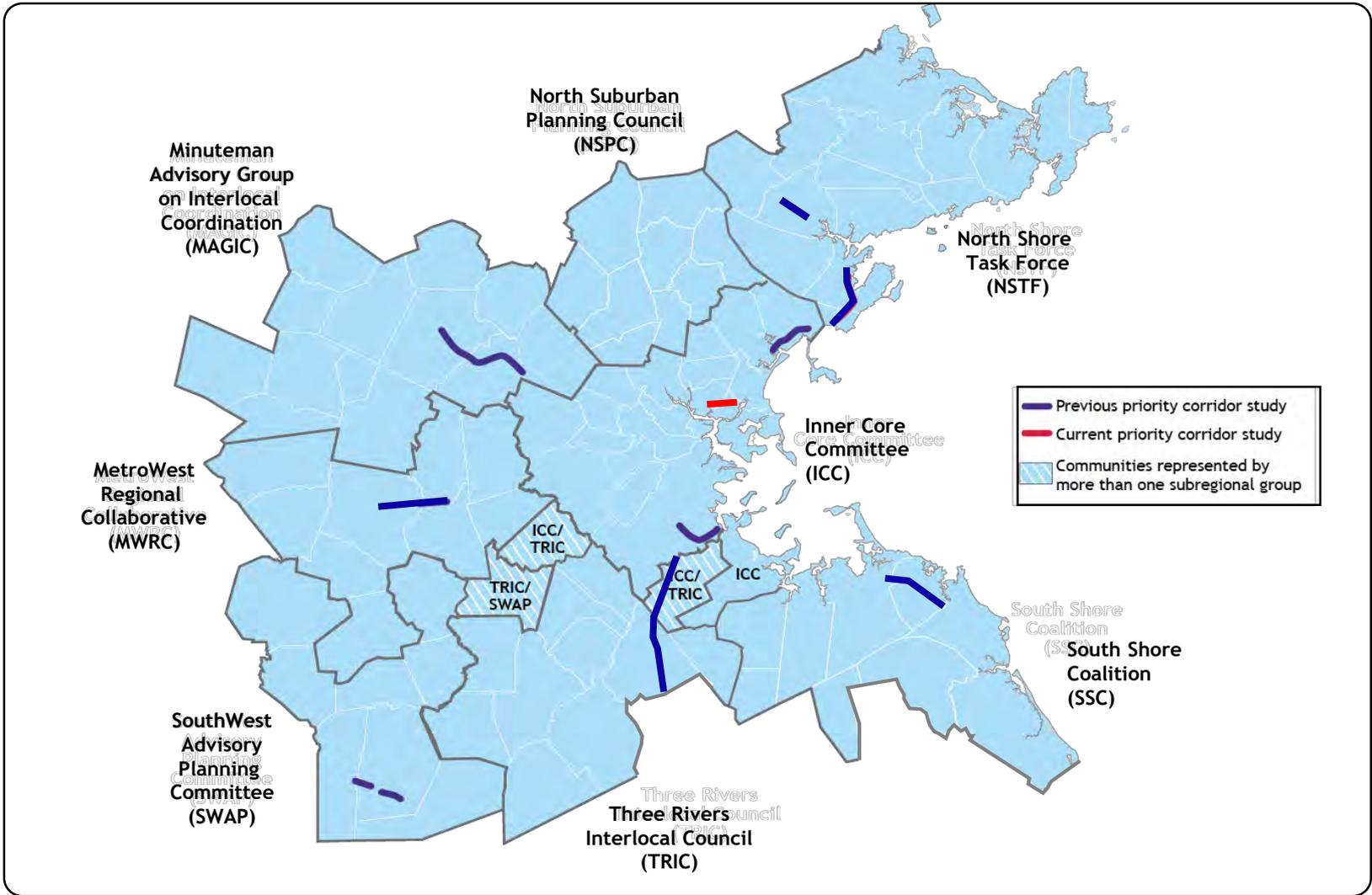
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FIGURE 1
Highway Safety Improvement Program Intersection Crash Clusters

*Addressing Priority
Corridors from the LRTP
Needs Assessment*



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FIGURE 2
Previous and Current LRTP Priority Corridor Studies
by MAPC Subregion

Addressing Priority Corridors from the LRTP Needs Assessment

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

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

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

TABLE 1
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Route 60	Arlington	ICC	4	Arlington	Yes	3	0	2	3.92	Eight MBTA bus stops MBTA bus Routes 67, 62, 76, 77, 78, 79, 80, 84, and 350	Yes	Yes	CTPS and MAPC Community Transportation Technical Assistance Program evaluated the high-crash location at the intersection at Massachusetts Avenue, March 2010. MassDOT Project #606885, The contractor is planning to finish the rest of the bike route symbols and electric work, weather permitting (as of 01/06/2017); in construction.	3	2	3	3	0	1	12	Medium	N/A
Routes 2 and 16 (Alewife Brook Parkway)	Cambridge	ICC	6	DCR	Yes	2	0	2	5.77	MBTA bus Routes 79, 350, 62, 67, 74, 76, 78, 84, and 351 MBTA Rapid Transit on the Red Line MBTA Commuter Rail at Porter Square	Yes	Yes Most of the segment lies within or adjacent to EJ zones.	Alewife Studies, Phase II, CTPS study (2009). DCR announced a comprehensive study of the parkway system for bike lanes. MassDOT Project #605637, Improvements at Route 2 and Route 16. The purpose of this project is to perform minor widening, eliminate a merge condition, and improve throughput capacity and vehicle queue storage at the intersection of Route 2 and Route 16 (Alewife Brook Parkway); under construction.	3	2	2	4	0	1	12	Medium	The Fresh Pond Residents Alliance identified Fresh Pond Parkway and Alewife Brook Parkway as locations in need of transportation improvements. Concerns include pedestrian safety of young students who walk to Shady Hill School because of high traffic volumes, environmental issues, and lack of livability.
Route 2 (Fresh Pond Parkway)	Cambridge	ICC	6	DCR	Yes	2	1	2	2.31	MBTA bus Routes 75, 71, 72, 73, 74, and 78 MBTA Red Line Rapid Transit MBTA Commuter Rail at Porter Square	Yes	Yes Two EJ zones are located within 0.5 miles of the segment.	DCR announced that the agency will conduct a traffic study of several intersections along Mount Auburn Street and Fresh Pond Parkway, in partnership with the City of Cambridge and the MBTA. The study will focus on safety measures, bus prioritization, and accessibility. Conceptual TIP project #987 would acquire Minuteman Path right-of-way in Watertown to connect Minuteman Bikeway from Arlington, Cambridge, and Watertown to Dr. Paul Dudley White Bike Path in Boston.	3	2	2	4	0	1	12	Medium	The Fresh Pond Residents Alliance identified Fresh Pond Parkway and Alewife Brook Parkway as locations in need of transportation improvements. Concerns include pedestrian safety of young students who walk to Shady Hill School because of high traffic volumes, environmental issues, and lack of livability.
Route 16 (Revere Beach Parkway and Mystic Valley Parkway)	Medford	ICC	4	MassDOT	Yes	2, 3	2	4	4.18	MBTA bus Routes 90, 97, 99, 100, 106, 108, 110, 112, and 134 MBTA Rapid Transit on the Orange Line at Wellington and on the Red Line at Porter Square MBTA Commuter Rail at West Medford and Porter Square	Yes	Yes EJ zones are located at the ends of the segment in Somerville and Everett and 0.2 miles away in Medford.	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updating traffic information, assessing parkway conditions, and assessing and understanding deficiencies along the heavily cycled parkways. #604660: Everett-Medford-Bridge Replacements, Revere Beach Parkway (Route 16), E-12-004=M-12-018 Over The Malden River (Woods Memorial Bridge) and M-12-017 Over MBTA and Rivers Edge Drive—The purpose of this project is to replace the existing non-operating draw bridge with a new fixed bridge. (Construction ends in 2020)	3	2	2	4	0	1	12	Medium	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.
Route 9	Natick	MWRC	3	MassDOT	Yes	2	0	8	4.30	MWRTA bus Routes 1, 4, 9, and 10	None	Yes One EJ zone is 0.5 miles away.	MassDOT Project #605091, Work consists of bridge repairs on four bridges over Route 9 and Speen Street, in preliminary design MassDOT Project #605313 will reconstruct the Route 9/Route 27 interchange; 25% project design stage. #607732: Framingham-Natick-Cochituate Rail Trail Construction Including Pedestrian Bridge, N-03-014, Over Route 9 and F-07-033=N-03-029 Over Route 30 (begins 2018/2019) #608281: Framingham-Natick-Adaptive Signal Control On Route 9 (Worcester Road)—Installation of adaptive traffic control signal equipment, vehicle detection, communication equipment, and managing software at five traffic signals (three in Framingham plus two in Natick) on Route 9. (completed summer 2017)	3	2	1	4	1	1	12	Medium	This segment was not selected because, according to MassDOT District 3, the installation of an adaptive traffic control system for five signals and the reconstruction of the Route 9 and Oak Street intersection are currently under construction. The Route 9 and Route 27 interchange is currently in design.
Route 16	Newton	ICC	6	MassDOT and Newton	Yes	3	0	6	2.86	MBTA Routes 59, 170, 505, 553, 554, and 556 MBTA Green Line Rapid Transit MBTA Commuter Rail at West Newton	Yes	Yes An EJ zone lies adjacent to the segment.	MassDOT Project #606780, Bridge Rehabilitation, Route 16 (Washington Street) over I-90, MBTA/CSX Corporation and Access Road; 25% package comments to DE (as of 02/19/2016). Conceptual TIP #1067, Washington Street (Phase 2), from Commonwealth Avenue to Perkins Street	2	2	2	4	0	2	12	Medium	In FFY 2014, a subregional study was conducted on Washington Street in Newton. The location was suggested in 2014 LRTP outreach through verbal comments at a 495/MetroWest Partnership meeting.

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

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

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Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Number of Top-200 High-Crash Locations 2013-15	Number of HSIP-Eligible Crash Clusters 2013-15**	Travel Time Index	Transit Service	Crowded or Late Bus	In or Near Environmenta l Justice Zone	Study, Project, or TIP Project	Safety Conditions***	Congested Conditions***	Multimodal Significance***	Regional Significance***	Regional Equity***	Implementation Potential***	Score	Priority Rating	Summary of Comments
Route 16	Natick	MWRC	3	Natick	Yes	3	0	0	2.21	None	N/A	Yes	No projects	1	2	2	3	1	2	11	Medium	The 495/MetroWest Partnership expressed interest in a Route 16 study. Specific issues in this segments include improvements to accommodate pedestrians and bicyclists.
Route 9	Newton	ICC	6	MassDOT	Yes	2	0	7	5.99	Six MBTA bus stops MBTA bus Routes 60, 52, and 59 MBTA Green Line	Yes	Yes An EJ zone in Brookline is 0.3 miles from the segment.	MassDOT Project #604327, Resurfacing and Related Work on Route 9 (Boylston Street) from the Wellesley/Newton city line to Newton/Brookline city line; completed in summer 2012 MassDOT Project #601704, Reconstruction and Signal Improvements on Walnut Street, from Homer Street to Route 9; in design; 25% package received (as of 12/23/2013) MassDOT Project #606835, Reconstruction of Highland Avenue, Needham Street, and Charles River Bridge, from Webster Street to Route 9; 75% package received (as of 09/23/2016). MassDOT Project #604327, resurfaced this segment, including updates to guardrails and improvements to the existing drainage structures; construction was completed in 2012.	2	2	2	4	0	1	11	Medium	According to MassDOT District 6, improvements were recently made to accommodate new developments. An analysis of the new existing conditions would be helpful to compare with the future projected conditions.
Route 1	Norwood	TRIC	5	MassDOT	Yes	3	0	4	4.85	MBTA Commuter Rail at Islington, Dedham Corp Center, Endicott, Norwood Depot, Windsor Central, Windsor Gardens, and Plimptonville	N/A	Yes One EJ zone lies adjacent to the southern end of the segment.	MassDOT's I-95 South Corridor Study, provided a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 that included a recommended plan of short-term and long-term improvements (June 2010) MassDOT Project #608052, Route 1 at Morse Street (approved by PRC Nov. 2014); in preliminary design MassDOT Project #605857, Route 1 at University Avenue and Everett Street; Town design is at pre-25% MassDOT Project #605321, Bridge Preservation, Route 1 over the Neponset River; in design stage	2	2	2	4	0	1	11	Medium	The location has MassDOT projects and studies and it is not recommended for study.
Route 1A	Revere	ICC	4	MassDOT	Yes	2	0	1	3.93	15 MBTA bus stops MBTA bus Routes 110, 116, 117, 411, 424, 426, 439, 441, 442, 448, 449, 450, and 455 MBTA Rapid Transit on Blue Line MBTA Commuter Rail at Chelsea and River Works	Yes	Yes The entire segment lies within EJ zones.	Conceptual TIP Project #982, Mahoney Circle (Bell Circle) Grade Separation	2	2	2	4	0	1	11	Medium	This arterial segment was not selected because it is part of the Mystic River Working Group Study. In addition, the Wynn Everett DEIR (2015) includes intersection improvements and mitigated traffic operations for Revere Beach Parkway and Mystic Valley Parkway.
Route 9	Wellesley	MWRC	6	MassDOT	Yes	2	0	9	2.76	MBTA Commuter Rail at Wellesley Hills and Wellesley Farms MWRTA bus Route 1	None	None	MassDOT Project #601586, Intersection Improvements at Route 9 (Worcester Street) and Oak Street, from 1500 feet West of Oak Street to 300 feet East of Overbrook Drive, construction ended in spring 2015 MassDOT Project #607340, Resurfacing on Route 9, from Dearborn Street to the Natick town line, in preliminary design MassDOT Project #606530, Drainage Improvements along Route 9 Boulder Creek Culvert (Design Only); 25% design stage (as of 06/10/2015) MAPC Land Use/Corridor Study (fall 2013)	2	2	2	3	1	1	11	Medium	MassDOT has a preliminary assessment of this corridor that will develop into 25% design plans for roadway improvements.
Memorial Drive (Routes 2 and 3)	Cambridge	ICC	6	DCR	Yes	2	2	5	4.99	MBTA bus Routes 747, 1, 47, 64, 66, 70, 70A, 71, 73, 86, and 701 MBTA Rapid Transit available on the Red and Green Lines MBTA Commuter Rail at North Station, Back Bay, Yawkey, Porter Square, and Belmont	Yes	Yes Most of the segment lies within or adjacent to EJ Zones.	DCR announced a \$500,000 comprehensive study of the parkway system for bike lanes in FFY 2015. The goals of the study include updating traffic information, assessing parkway conditions, and assessing and understanding deficiencies along the heavily cycled parkways.	3	2	1	4	0	0	10	Low	None
Route 2	Lincoln	MAGIC	4	MassDOT	Yes	2	0	2	2.93	MBTA Commuter Rail at Concord and Lincoln	N/A	None	MassDOT Project #602894, Crosby's Corner (2 at 2A) Improvements; under construction MassDOT Project #604629, Resurfacing and Related Work on Route 2; completed in 2010 FFY 2013 Priority Corridors for LRTP Needs Assessment Study (Concord and Lincoln)	2	2	2	2	1	1	10	Low	Route 2 was suggested during MPO outreach as a route experiencing congestion that affects MAGIC communities and Cambridge. There are many projects and studies conducted for this corridor, including the Route 2 (Crosby's Corner) improvements.
Route 3A	Marshfield	SSC	5	MassDOT	Yes	3	0	1	2.41	GATRA bus MBTA Commuter Rail at Greenbush	None	None	The corridor is within the limits of MassDOT Project #605664, Resurfacing and Related Work on Route 3A (Duxbury town line northerly to Scituate town line), work includes patching and microsurfacing, shoulder reconstruction, and drainage structures; 100% design stage; no construction funding identified	2	2	2	2	1	1	10	Low	None

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Arterial Segment	Community	MAPC Subregion	MassDOT District	Jurisdiction	National Highway System	Functional Class*	Number of Top-200 High-Crash Locations 2013-15	Number of HSIP-Eligible Crash Clusters 2013-15**	Travel Time Index	Transit Service	Crowded or Late Bus	In or Near Environment Justice Zone	Study, Project, or TIP Project	Safety Conditions***	Congested Conditions***	Multimodal Significance***	Regional Significance***	Regional Equity***	Implementation Potential***	Score	Priority Rating	Summary of Comments
Route 135	Natick	MWRC	3	Natick	Yes	3	0	3	2.97	MWRTA bus Routes 10 and 11 MBTA Commuter Rail at Natick and West Natick	None	None	MassDOT Project #600573 reconstructed Route 135 in Natick in 2008. More extensive improvements were proposed in the downtown area, on East Central Street between North Main Street and Union Street, including signal upgrades, new sidewalks, pavement rehabilitation, and shoulders; Contract #32302 was completed; all construction operations have been suspended (as of 06/30/2007) 2010 CTPS study, West Central Street (Route 135) at Speen Street.	3	2	2	1	1	1	10	Low	Congestion in the downtown area; likely focus area would be on the intersection of Route 135 at Route 27 and the intersection of Route 135 at Speen Street because of the crash history of those locations.
Route 129	Reading	NSPC	4	MassDOT and Reading	Yes	3	0	0	3.06	11 MBTA bus stops MBTA bus Route 136 MBTA Commuter Rail at Wakefield, Reading, and Woburn	Yes	None	No projects	2	2	2	1	2	1	10	Low	None
Route 1	Sharon	TRIC	5	MassDOT	Yes	3	0	1	2.36	MBTA Commuter Rail at Sharon and Walpole	N/A	None	MassDOT's I-95 South Corridor Study, provided a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 that included a recommended plan of short-term and long-term improvements (June 2010) MassDOT Project #603622, Bridge Rehabilitations, Route 1/Route I-95; completed in 2010	2	2	3	2	0	1	10	Low	Segment has MassDOT projects and studies.
Route 16	Sherborn	SWAP	3	Sherborn	Yes	3	0	0	2.96	None	N/A	None	2002 CTPS study, Traffic Congestion in SWAP Subregion: Sherborn Town Center Traffic-Flow Improvement Study Conceptual TIP #915, Washington Street (Route 16)	1	2	1	3	1	2	10	Low	Location was suggested in 2014 LRTP outreach at a 495/MetroWest Partnership meeting. The section that experiences the most crashes and congestion is the town center portion, where Route 16 and Route 27 combine and split.
Route 9	Southborough	MWRC	3	MassDOT	Yes	2	0	2	3.11	MWRTA bus Route 7	None	None	MAPC Land Use/Route 9 Corridor Study (fall 2013). The CTPS Safety and Operations at Intersections study evaluated congestion and safety issues at the Route 9/Oak Hill Road/Central Street intersection in FFY 2012. MassDOT's I-495/Route 9 study, November 2013. The western section of Route 9 in Southborough between the I-95 interchange and Crystal Pond Road was evaluated for short-term and long-term improvements as part of this study. MassDOT Project #607172, Resurfacing and Related Work on Route 9, from Westborough to just west of White Bagley Road; construction ends in summer 2016	2	2	2	2	1	0	9	Low	Most of the intersections on this corridor have already been studied, as MassDOT District 3 has noted.
Route 1	Westwood	TRIC	6	MassDOT	Yes	3	0	0	3.49	None	N/A	None	MassDOT's I-95 South Corridor Study provided a comprehensive evaluation of the I-95 and Route 1 corridors south of Route 128 and included a recommended plan of short-term and long-term improvements (June 2010) MassDOT Project #603162, Route 128 Add-a-Lane Bridges (Bridge III), Route 1 and 1A over I-95/128; completed in 2012	1	2	2	3	0	1	9	Low	Segment has MassDOT projects and studies.
Route 3A	Scituate	SSC	5	MassDOT	Yes	3	0	0	2.21	MBTA Commuter Rail at Greenbush, North Scituate, and Cohasset	N/A	None	FFY 2013 Subregional Priority Corridor Study The corridor is within the limits of MassDOT Project #605664, Resurfacing and Related Work on Route 3A (Duxbury town line northerly to Scituate town line); no construction funding identified. Work includes patching and microsurfacing, shoulder reconstruction, and drainage structures; 100% design stage.	1	2	2	1	1	1	8	Low	The FFY 2013 Subregional Priority Corridors Study was conducted within the segment. MassDOT District 5 comments refer to MassDOT Project #605664 (in the 100% design stage).
Route 62	Concord	MAGIC	4	Concord	Yes	3	0	0	3.66	MBTA Commuter Rail at Concord and West Concord	N/A	None	MassDOT Project #604646 Reconstruction of Main Street (Route 62) from Water Street to the Acton town line. The purpose of this project is to reconstruct a 1.2 mile section of Main Street. The project includes the reclamation and repaving of the existing roadway, installation of granite curbing, ADA, drainage upgrades, and the addition of a sidewalk from Brook Trail Road to the Acton Town Line.	1	2	1	1	1	1	7	Low	None

Notes:

***Functional Class**

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

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

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

*****Selection Criteria**

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

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

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

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

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

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

Acronyms

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

Source: Central Transportation Planning Staff.

Part &: Public Participation and Comments

Seth Asante

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

Hi Seth,

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

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

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

Thanks,

Jay

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

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

Hi Jay,

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

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

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

Thank you,
Seth

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

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

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

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

John DePriest, AICP
Director of Planning & Development

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

Good Afternoon,

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

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

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

Thank you,
Seth

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

Seth Asante

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

Seth, FYI.

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

Hi Chen-Yuan and Mark,

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

Connie

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

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

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

Hi all,

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

Thanks

Connie

Route 16 Priority Corridor Study in Chelsea and Milton

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

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

Name	Affiliation	Email
Tony Sousa	City of Everett	tony.sousa@ci.everett.ma.us
Jay Monty	City of Everett	jay.monty@ci.everett.ma.us
John DePriest	City of Chelsea	JDePriest@chelseama.gov
Alexander Train	City of Chelsea	ATrain@chelseama.gov
Brian Kyes	City of Chelsea	BKyes@chelseama.gov
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Mark Abbott	Boston Region MPO	mabbott@ctps.org
Seth Asante	Boston Region MPO	sasante@ctps.org

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

ATTENDANCE

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

MEETING SUMMARY

Summary of Study Tasks

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

Issues and Concerns Raised

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

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

- Jeff Gomes mentioned Sunday turning movement counts should also be collected in order to model Sunday signal coordination, which might be different from the weekday or Saturday configuration.

- **Traffic Safety**

- Data from the MassDOT crash database show five top-200 crash clusters, seven HSIP-eligible crash clusters, one pedestrian crash cluster, and a high corridor crash rate, all of which is consistent with driver experience using the corridor.

- **Bicycle and Pedestrian Concerns**

- At present, Route 16 is completely unsafe for cyclists. Alex Train mentioned he is an experienced biker and would never bike on any part of Route 16 east of Wellington.
- There is some bicycle and pedestrian traffic generated by people working in nearby industrial properties in Everett or Malden. In particular, the New England Produce Center off Second Street attracts a significant amount of foot and bike traffic ahead of the start of the overnight shift. This is noticeable around 10 PM. Generally the shifts wrap up around 10 AM. These late trips could be missed by the turning movement counts (which also count bicycles and pedestrians) because they are so far from the peak periods. CTPS will monitor the 24-hour ATR counts for an associated increase in heavy vehicle traffic during these hours.

- **Other Comments**

- Both cities expressed interest in posting a public survey similar to what CTPS has done in previous corridor studies in Canton and Milton. Any such survey should be available in Spanish, Portuguese, and Haitian Creole to reach all residents. CTPS should have the translation resources available for this.
- Jeff Gomes mentioned that there are a few other ongoing studies and projects which overlap the corridor, including a VHB conditional assessment study extending from Winthrop Street to the Medford border (*Jeff provided a copy of the study to CTPS*), a project related to the impacts of the Casino, and a study related to the redevelopment of Suffolk Downs.
- John DePriest said that the McDonalds at Washington Avenue will be demolished and rebuilt on the same parcel with more green space. The

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

Follow-Up Tasks

- **MassDOT**
 - Traffic signal timing plans and layouts from MassDOT Highway District 4 for the signalized intersections inside the corridor. *Jeff Gomes has already provided the signal timing information for all 10 traffic signals in the study corridor as well as speed limits and other layouts.*
 - ATRs and turning movement counts
CTPS will update some of the requested locations to include Sunday counts and to clarify the location of ATR #11. *Request for turning movement counts has been updated to incorporate Sunday counts from 11:00 AM to 2:00 PM.*

- **Cities of Chelsea and Everett**
 - Any available data on recent or anticipated changes in land use within the corridor
 - Input on any questions they would like to see included on the online survey

- Any further feedback is welcome throughout the course of the study

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

ATTENDANCE

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

AGENDA

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

MEETING SUMMARY

Data Collection

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

Existing Conditions

MPO staff described the existing conditions, including the following:

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

Identified Problems

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

Short-Term Improvements

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

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

Long-Term Improvements

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

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

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

Issues and Concerns Raised at the Meeting

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

Follow-up Task

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

Seth Asante

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

Hi Seth,

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

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

Thanks and have a nice weekend!

Sara

Sara L. Timoner | Traffic Engineer | MassDOT | Highway Division | District 4
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