



MEMORANDUM

DATE December 19, 2013
TO Boston Region Metropolitan Planning Organization (MPO)
FROM Seth Asante, MPO Staff
RE Safety and Operations Analyses at Selected Intersections—FFY 2014 Task 1: Intersection Selection Procedure

1 BACKGROUND

This study builds upon recommendations generated by the Boston Region MPO's Congestion Management Process (CMP) to address safety and congestion at intersections in the MPO region. In previous funding years, the MPO completed six similar studies, and received favorable responses from municipalities for assisting them with the conceptual design of low-cost improvements, and their planning and implementation processes.

The previous studies examined large, complex intersections, simpler intersections, and locations that included two or more adjacent intersections. This study focusses on simpler intersections.

As with previous studies, the basic requirements for a location to be a candidate for selection are to be an intersection on an arterial roadway in the MPO region where 1) many crashes occur, according to the MassDOT crash database; 2) there is congestion during peak periods; and 3) there is serious interest to implement improvements from agencies and/or municipalities.

2 SELECTION PROCESS

MPO staff selected four locations (the maximum allowed for in the work program) to analyze for potential safety and operations improvements. The selection procedure comprised two major parts. First, staff identified 18¹ locations as potential candidates for the study through the following steps:

- Reviewed the MassDOT 2009–11 Statewide Top-200 Crash Locations list and selected the at-grade signalized and unsignalized intersections in the MPO region that have an Equivalent Property Damage Only (EPDO)²

¹ Note that the 17th and 18th locations, in Westwood, were added to the list of potential locations at the suggestion of the town.

² EPDO = 10*Fatal Crashes + 5*Injury Crashes + 1*Other Crashes (Property Damage Only or Not Reported).

rating of more than 92. There were 83 intersections that met those criteria.

- Appraised each of those 83 intersection's location, geometry, degree of congestion, and transit services using the MPO's CMP travel-time and intersection databases.
- Read responses from the CMP Intersection Survey to identify issues and concerns related to the screened locations.
- Excluded locations that belong to a larger potential study area, such as highway interchanges, or a long traffic corridor with an extensive area of congestion.
- Excluded intersections that are programmed with an advanced status (such as, a 25%-or-greater design status) in the 2014–17 Transportation Improvement Program (TIP) and those that have been, or are being studied, by the MPO or other agencies.

Second, staff chose four of the 18 identified locations through the following steps:

- Used ArcMap to cross-reference detailed MassDOT 2009–11 crash data at the 16 locations and the State Road Inventory File. This allowed staff to examine in greater detail the exact location, pattern of crashes, and number of pedestrian- or bicycle-related crashes in the context of each crash location's jurisdiction and related roadway information.
- Reviewed data related to each of five selection criteria (see below).
- Consulted with MassDOT Highway Division District offices, and municipalities, to evaluate the locations scoring highest (i.e., meeting at least four of the five criteria) in the selection process.

Below are the five criteria used for assessing a location's suitability as a study candidate:

- **Pedestrian/Bicycle Crashes:** Location has a total number of pedestrian/bicycle crashes greater than or equal to three during the three-year period examined.
- **Congestion:** Location experiences extensive delays during peak periods.
- **Transit Significance:** Location carries bus route(s) or is adjacent to a transit stop or station.
- **Regional Significance:** Location carries high proportion of regional traffic or noticeable commuter bicycle traffic.

- Implementation Potential: Location is either under MassDOT jurisdiction, has a TIP “conceptual” status, or has a strong commitment from a city or town.

Note that geographic equity also was a factor in selection: The MPO did not select study locations in the same area as another study location, or in the same area as a location selected in the preceding cycle of this study.

Table 1 lists the 18 identified locations, their municipalities, major intersecting streets, total number of 2009–11 EPDO crashes, total crash count, number of fatal/nonfatal crashes, number of pedestrian/bicycle crashes, related transit routes, jurisdictions, TIP status, and overall score based on the selection criteria.

3 INTERSECTIONS SELECTED FOR STUDY

Of these 18 locations, staff recommended four (highlighted in table) to be evaluated for improvements:

- Washington Street (Route 53) and Broad Street in Weymouth
- Medway Road (Route 109) at Kmart Shopping Plaza in Milford
- High Street (Route 109) at Nahantan Street in Westwood
- High Street (Route 109) and Pond Street in Westwood

MPO staff contacted officials from the towns of Milford, Westwood, and Weymouth and they are all interested in this study.

In summary, staff began the selection process with the 83 intersections in the region with the highest crash rates then iteratively applied extensive sets of criteria. In addition, the process included thorough interactions with MassDOT District offices, and cities and towns. Through this careful exercise, the MPO staff identified four locations in the MPO region—to be discussed and approved by the MPO—that it believes are most suitable for this study.

If the MPO approves this selection, staff will meet with officials from Milford, Westwood, Weymouth, and related agencies to discuss the study specifics, conduct field visits, collect data, and perform various analyses for the proposed intersections.

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TABLE 1
Potential Study Locations in the Region, with Selection Criteria
Selected Locations Highlighted in Yellow
Safety and Operations Analyses at Selected Intersections

Location ¹	Community	MAPC Subregion	MassDOT District	Jurisdiction	Street 1	Route 1	Street 2	EPDO Crashes Rating ²	Total Crashes	Fatal Crashes	Injury Crashes	PDO and Non-Reported Crashes	Ped./Bike Crashes ⁴	Transit Routes	TIP Status	Bike/Ped Crashes ³	Congestion	Transit Significance	Regional Significance	Need/Interest Assessment	Total Score	Comments
1	WALTHAM	ICC	4	City/Town	LEXINGTON STREET	--	TRAPELO ROAD	188	104	0	21	83	4p+1c	MBTA 70A	None	X	X	X	--	X	4	No advance study or design. FFY 2013 Safety and Operations Analyses at Intersections included a location in Waltham.
2	FRAMINGHAM	MetroWest	3	City/Town	CONCORD STREET	126	WAVERLEY STREET	182	78	0	26	52	8p+7c	MWRTA 1,2,3,4, 7	TIP Advertised	X	X	X	X	--	4	Routes 126, 135 Framingham Downtown Railroad Crossing, Route 126 Downtown Roadway Improvements. Not recommended by MassDOT District 3.
3	LYNN	ICC	4	City/Town	WESTERN AVENUE	107	FRANKLIN STREET	161	77	0	21	56	4p+1c	MBTA 424, 434, 450	None	X	X	X	--	X	4	No advance study or design. FFY 2013 Safety and Operations Analyses at Intersections included a location in Lynn.
4	BOSTON	ICC	6	MassDOT	MORTON STREET	203	HARVARD STREET	159	47	0	28	19	2p	MBTA 21, 31	None		X	X	X	--	3	RSA completed in 2011; Intersection reconstructed.
5	WEYMOUTH	SSC	6	MassDOT	WASHINGTON STREET	53	MAIN STREET	155	91	0	16	75	3p	MBTA 225	None	X	X	X	--	--	4	CTPS Route 53 study (November 2003).
6	LYNN	ICC	4	City/Town	WESTERN AVENUE	107	CHESTNUT STREET	148	72	0	19	53	2p	MBTA 424, 434, 450	None	--	X	X	--	X	3	No advance study or design.
7	WEYMOUTH	SSC	6	MassDOT	WASHINGTON STREET	53	MIDDLE STREET	139	71	0	17	54	3p	MBTA 225	None	X	X	X	--	--	3	MassDOT Project # 114906 reconstructed intersection in 2012.
8	SWAMPSCOTT	NSTF	4	MassDOT	PARADISE ROAD	1A	SWAMPSCOTT MALL	135	43	0	23	20	1p	MBTA 441, 448	None	--	X	X	X	--	3	MassDOT Project #601520, reconstructed the Paradise Road and Swampscott Mall intersection in 2005.
9	WEYMOUTH	SSC	6	MassDOT	MAIN STREET	18	WINTER STREET	128	60	0	17	43	0	MBTA 225	None	--	X	X	X	--	3	MassDOT Project #601843 reconstructed the Route 18 (Main Street) and Winter Street in 2002.
10	MILFORD	SWAP	3	City/Town	MEDWAY ROAD	109	KMART SHOPPING PLAZA	121	85	0	9	76	0	MWRTA 6	None	--	X	X	X	X	4	High-crash location. Strong support from the Town of Milford.
11	SALEM	NSTF	4	MassDOT	WASHINGTON STREET	114	CANAL STREET	119	59	0	15	44	6p+1c	--	TIP 2014, 75% Design	X	X	--	X	--	3	MassDOT Project #605146, currently in design, will reconstruct the intersection. Programmed in FFY 2014 TIP.
12	WALPOLE	TRIC	5	MassDOT	PROVIDENCE TURNPIKE	1	HIGH PLAIN STREET	118	54	0	16	38	1p	--	None	--	X	--	X	--	2	RSA conducted in 2013, consultant retained for engineering and design. Included in MassDOT's I-95 South Corridor Study.
13	BRAINTREE	SSC	6	MassDOT	GRANITE STREET	37	FRANKLIN STREET	118	42	0	19	23	0	MBTA 236, 238	None	--	X	X	X	X	4	No advance study or design. FFY 2013 Safety and Operations Analyses at Intersections included a location in Braintree.
14	ARLINGTON	ICC	4	City/Town	MASSACHUSETTS AVENUE	3	MYSTIC STREET	111	59	0	13	46	2p+2c	MBTA 67, 77, 79	TIP 2014, 25% Design	X	X	X	--	X	4	MassDOT Project #606885, currently in design, will reconstruct the intersection. Programmed in FFY 2014 TIP.
15	HANOVER	SSC	5	MassDOT	COLUMBIA ROAD	53	BROADWAY	102	38	0	16	22	1p	--	None	--	X	X	X		3	No advance study or design
16	WEYMOUTH	SSC	6	Town/City, MassDOT	WASHINGTON STREET	53	BROAD STREET	96	52	0	11	41	1p	MBTA 225	None	--	X	X	X	X	4	Strong interest from the Town of Weymouth.
17	WESTWOOD	TRIC	6	City/Town	HIGH STREET	109	NAHANTAN STREET and POND STREET	92	60	0	8	52	2p+1c	--	None	X	X	--	X	X	4	The Town of Westwood cited these intersections for consideration; they have safety and congestion problems. They are the town's preferred locations for a study.
18	WESTWOOD	TRIC	6	City/Town	WASHINGTON STREET	1A	EVERETT STREET/ CLAPBOARDTREE STREET	74	42	0	8	34	1p	MBTA 34E	None	--	X	X	X	X	4	Town of Westwood cited this intersection for consideration.

¹ Locations are in order by EPDO rating.

² EPDO Crash Rating = 10 * Fatal Crashes + 5 * Injury Crashes + 1 * Other Crashes (Property Damage Only or Unknown Severity), based on MassDOT's Top 200 High Crash Locations: 2009-11 crash data.

³ Selection Criteria (Check mark in table means criterion is met):

Ped/Bike Crashes: Total number of ped./bike crashes > 2

Congested Conditions: Experiences extensive delays during peak periods.

Transit Significance: Carries bus route(s) or is adjacent to a transit route or station.

Regional Significance: Carries high proportion of regional traffic or carries noticeable commuter bike traffic.

Need/Interest Assessment: No recent study/design and has a strong interest from MassDOT/communities.

⁴ C Bikes, P Pedestrian.

CTPS Central Transportation Planning Staff. FFY Federal Fiscal Year. ICC Inner Core Committee. MassDOT Massachusetts Department of Transportation. MBTA Massachusetts Bay Transportation Authority. MetroWest MetroWest Regional Collaborative. MWRTA MetroWest Regional Transit Authority. NSTF North Shore Task Force. RSA Road Safety Audit. SSC South Shore Coalition. SWAP South West Advisory Planning Committee. TRIC Three Rivers Interlocal Council. Source: CTPS.