WORK PROGRAM

LOCATIONS WITH HIGH BICYCLE/PEDESTRIAN CRASH RATES IN THE BOSTON REGION MPO AREA

NOVEMBER 7, 2019

Proposed Motion

The Boston Region Metropolitan Planning Organization (MPO) votes to approve this work program.

Project Identification

Unified Planning Work Program (UPWP) Classification

Boston Region MPO Planning Studies and Technical Analyses

Project Number 13293

Client

Boston Region MPO

Project Supervisors

Principal: Casey Claude
Manager: Mark Abbott

Funding Source

MPO 3C Planning and §5303 Contract #108217

Schedule and Budget

Schedule: Twelve months after work commences

Budget: $70,000

Schedule and budget details are shown in Exhibits 1 and 2, respectively.

Relationship to MPO Goals

The Boston Region MPO elected to fund this study with its federally allocated metropolitan planning funds during federal fiscal year 2020. The work completed through this study will address the following goal area(s) established in the MPO's Long-Range Transportation Plan: safety, system preservation, capacity management and mobility, clean air and clean communities, transportation equity, economic vitality.

Background

The Boston Region MPO published the Pedestrian Report Card Assessment (PRCA) and the Bicycle Report Card in 2017 and 2018, respectively. Rather than providing one cumulative score for a location, both tools grade four separate categories related to travel. This helps users to understand what is contributing to the safety and comfort of walking or bicycling in an area and better reflects the nuance of pedestrian and bicycle travel instead of one all-encompassing score. In this project, the PRCA and Bicycle Report Card will be applied to high crash locations for pedestrians and bicyclists to understand what is contributing to the danger of walking and bicycling at selected crash clusters. This will also help MPO staff identify features of the physical environment that are in need of improvement for the safety and comfort of pedestrian and bicycle travel.

Objectives

The objectives of this project are as follows:

1. Identify High Concern Pedestrian Crash Clusters

   Pedestrian crash clusters will be considered locations of high concern if they are Highway Safety Improvement Project (HSIP)-eligible and if the public has expressed concern about the safety and comfort of the location for pedestrians.

2. Identify High Concern Bicycle Crash Clusters

   Bicycle Crash Clusters will be considered locations of high concern if they are HSIP-eligible and if the public has expressed concern about the safety and comfort of the location for bicyclists.

3. Recommend Pedestrian and Bicycle Improvements

   Identify elements in need of improvement at each study location in the Boston region using the PRCA and Bicycle Report Card scores, and make recommendations that would improve pedestrian and bicyclist safety and comfort.

Work Description

Task 1 Select Study Locations

MPO staff will compile a list of all HSIP-eligible pedestrian and bicycle crash clusters in the Boston region. Staff will then analyze Equivalent Property Damage Only (EPDO) data to rank the pedestrian and bicycle crash clusters in order of greatest impact to least damaging to identify the most dangerous locations for pedestrians and bicyclists in the Boston region.

From this list of HSIP pedestrian and bicycle crash clusters, staff will initially identify as many as 10 locations throughout the MPO region as potential candidate locations for further study and recommendation. MPO staff will generate a list of these locations by

- Reviewing the most recent crash data from the Massachusetts Department of Transportation (MassDOT)'s Registry of Motor Vehicles Division and the new MassDOT crash data dashboard;
- Consulting MassDOT's Strategic Highway Safety Plan;
- Reviewing MassDOT's statewide bicycle and pedestrian plans to address network gaps contributing to safety issues;
- Reviewing Transportation Improvement Program (TIP) projects from the conceptual and pre-TIP categories;
- Reviewing public feedback received via the MPO's outreach program; and
- Soliciting selection recommendations in coordination with the Metropolitan Area Planning Council (MAPC) from MAPC subregions and individual cities and towns that declare their commitment to shepherding the recommended improvements through to design and implementation.

The locations selected for consideration will be based on criteria in the following categories:

- Pedestrian and bicycle safety and comfort concerns
- Operations concerns
- Multimodal significance (supporting or needing to support transit, bicycle, pedestrian, or heavy vehicle activities)
- Implementation potential and support by the municipality and stakeholders for following up with implementation
- Regional equity (specifically, that the study locations would be distributed throughout the MAPC subregions over time)

The potential locations will be screened by safety measures, including EPDO crash-severity ratings, the number of crashes involving pedestrians or bicyclists, the intersection crash rates, and all conflicts at the intersection involving vehicles, pedestrians, and bicyclists.[1]

[1] EPDO or equivalent property damage only is a method of combining the number of crashes with the severity of crashes based on a weighted scale, where a fatal crash is worth 10, an injury crash is worth 5, and a property damage only crash is worth 1. Since 2018, MassDOT applied a new EPDO method (where actual crash costs are factored in) to rank high crash locations in the state. So as not to end up just chasing fatal crashes, all of the fatal and injury crashes were weighted together (about 30 percent of all crashes in Massachusetts). This resulted in any type of injury crash (including fatal, incapacitating, non-incapacitating and possible) having a weighting of 21 compared to a property damage only crash.

Locations that could potentially require major geometry redesigns will not be selected; for example, grade separation or adding travel lanes on an arterial roadway. However, both short-term and long-term improvements will be considered for the selected intersections.

Finally, staff will communicate with municipal officials about their level of interest in following up with implementation of the study recommendations. This input will be in addition to the input solicited from municipalities during the process of selecting candidate locations.

Staff will then select as many as three intersections for detailed study. Both the list of intersections considered and the staff recommendations of which intersections to study will be presented to the MPO.

Products of Task 1

A summary of the HSIP-eligible pedestrian and bicycle crash clusters in the Boston region ranked highest to lowest using EPDO, the selection process, and a table listing selected locations.[2]

Task 2 Collect Data

Once the locations have been selected, staff will collect detailed data pertaining to each location. This will involve visiting each site and creating an inventory of all relevant geometric, land use, and signal features. Data will include:

- Turning movement counts
- Bicycle and pedestrian counts
- Adjacent pedestrian and bicycle networks and their connectivity to the study sites
- Crash data and police crash reports
- Transit vehicle counts and performance
- Signal equipment and timing information
- Geometric data (lanes, curb cuts, sidewalks, crosswalks, transit amenities)
- Land use and zoning information
- Jurisdictional and administrative information
- Roadway speed and origin/destination data from INRIX/RITIS[3]

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[2] The table will include information explaining why the locations were chosen, based on safety concerns, the potential for improvement, and municipal interest in implementation. Staff will present the selection process and results to the MPO.

[3] INRIX is a private company that collects roadway travel times and origin-destination data for most roadways that are collectors, arterials, limited-access roadways or freeways. Regional Integrated Transportation Information System (RITIS) provides INRIX data to the Boston Region MPO through its web portal. The data is archived and provided to transportation planning organizations that use the data to monitor congestion through performance measures.

Products of Task 2

A summary of count, signal, and geometric data for the selected locations, and land use and jurisdictional information.

Task 3 Evaluate Selected Locations

Staff will evaluate each intersection using various analyses. First, the crash data for each intersection will be analyzed with regard to crash type, severity, and whether bicycles or pedestrians were involved in the crashes. Crash diagrams will be constructed for the intersections that have a crash rate that exceeds the MassDOT highway district average. Second, using the PRCA and Bicycle Report Cards, MPO staff will assess the conditions for pedestrians' and bicyclists' safety and comfort. Third, capacity analysis will be performed to determine the operational level of service at each intersection. Particular attention will be given to evaluating existing pedestrian and bicycle operations. Finally, field observations will be performed to yield a complete understanding of safety levels and the operations of vehicles, bicycles, and pedestrians at each location. In addition to the analysis on safety and operations, this evaluation will be based on goals and principals of the statewide pedestrian and bicycle plans, and guidelines from the municipal resource guides for walkability and bikeability.[4] [5] [6] [7]

Products of Task 3

A summary of each selected location's frequency and type of crashes, its PRCA and Bicycle Report Card grades, its operational level of service, an overall assessment of how safe or unsafe the location is, and how well or poorly traffic proceeds through it.

Task 4 Develop Improvement Alternatives

Based on the evaluation performed in Task 3, staff will develop potential recommended short-term and long-term strategies for improving operations and safety at the selected locations. Included with the improvement alternatives will be a preliminary estimation of construction costs. The recommendations will include improvements for pedestrians, bicyclists, motorists, and transit service. The recommended improvements could include curb extensions, bus stop relocations, transit signal-priority options, shorter crosswalks, accessible pedestrian signals, bicycle-detection equipment and signs, signal retiming and coordination, and

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[4] Massachusetts Pedestrian Transportation Plan, Massachusetts Department of Transportation, May 2019.

[5] Massachusetts Bicycle Transportation Plan, Massachusetts Department of Transportation, May 2019.

[6] Municipal Resource Guide for Walkability, Massachusetts Department of Transportation, May 2019.

[7] Municipal Resource Guide for Bikeability, Massachusetts Department of Transportation, May 2019.

additional turn lanes.[8] The cost of the measures will be estimated and the jurisdictional entity or entities responsible for implementation will be identified.

Products of Task 5

A summary of recommended operational and safety improvements for the selected locations.

Task 5 Produce Memoranda Documenting Work

MPO staff will produce a memorandum for each municipality with a selected location that 1) documents the work process; 2) summarizes findings derived from any public input; 3) shares why the location was selected from the pedestrian and bicycle crash clusters of highest concern for pedestrian and bicycle safety and comfort in the Boston region; 4) provides recommendations for improving pedestrian and bicycle safety and comfort at the selected location in the Boston region.

Products of Task 5

Draft technical memoranda, one for each municipality involved in the study.

Task 6 Finalize Study and Prepare for MPO Presentation

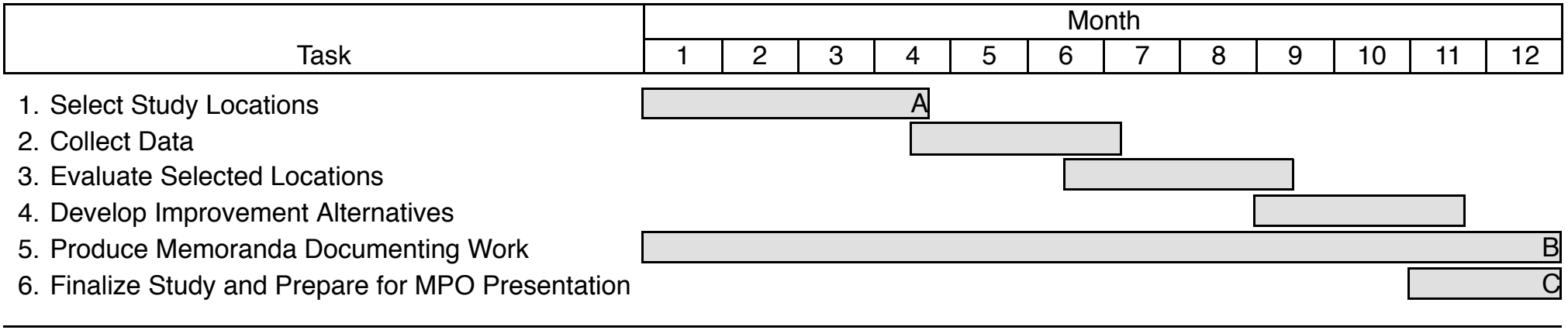
After receiving comments on the draft memoranda from municipal officials, MPO staff will address these comments and finalize the study. The final study results will be presented to the MPO for approval.

Products of Task 6

Final technical memoranda and MPO presentation.

[8] Accessible pedestrian signals are devices that communicate the Walk and Don't Walk intervals at signalized intersections to pedestrians who are blind or who have low vision in nonvisual formats—for example, using audible tones and/or vibrotactile surfaces.

Exhibit 1
ESTIMATED SCHEDULE
Locations with High Bicycle/Pedestrian Crash Rates in the Boston Region MPO Area



Products/Milestones

A: Table of Selected Locations
B: Draft Technical Memoranda
C: Final Technical Memoranda & MPO Presentation

Exhibit 2
ESTIMATED COST
Locations with High Bicycle/Pedestrian Crash Rates in the Boston Region MPO Area

Direct Salary and Overhead							**$69,871**
Task	Person-Weeks				Direct Salary	Overhea (102.11%)	Total Cost
	M-1	P-4	P-3	Total			
1. Select Study Locations	0.4	0.5	4.0	4.9	$6,505	$6,643	$13,148
2. Collect Data	0.4	0.0	3.0	3.4	$4,523	$4,618	$9,141
3. Evaluate Selected Locations	0.5	0.0	4.0	4.5	$5,968	$6,094	$12,062
4. Develop Improvement Alternatives	0.5	0.0	4.0	4.5	$5,968	$6,094	$12,062
5. Produce Memoranda Documenting Work	0.5	0.0	4.0	4.5	$5,968	$6,094	$12,062
6. Finalize Study and Prepare for MPO Presentation	1.0	0.0	3.0	4.0	$5,638	$5,757	$11,396
Total	3.3	0.5	22.0	25.8	$34,571	$35,301	$69,871
Other Direct Costs							**$129**
Travel							$129
TOTAL COST							**$70,000**

Funding

MPO Planning Contract #108217
MPO §5303 Planning Contract #108217