



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Stephanie Pollack, MassDOT Secretary and CEO and MPO Chair
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WORK PLAN

TOBIN BRIDGE MANAGED LANE FEASIBILITY STUDY

JULY 16, 2020

Proposed Motion

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

Project Identification

Project Number 81006

Client

Massachusetts Department of Transportation (MassDOT) Highway Division
Client Supervisor: Andrew Wilkins

Project Supervisors

Principal: Marty Milkovits
Manager: Drashti Joshi

Funding Source

MassDOT On-Call Contract #103869

Schedule and Budget

Schedule: Phase 1: 12 weeks after work commences
Phase 2: 9 months after the conclusion of Phase 1

Budget: Phase 1: \$29,209
Phase 2: \$85,179
Total: \$114,388

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

Relationship to MPO Goals

This study is supported in full with non-MPO funding. Committing MPO staff to this project will not impinge on the quality or timeliness of MPO-funded work.

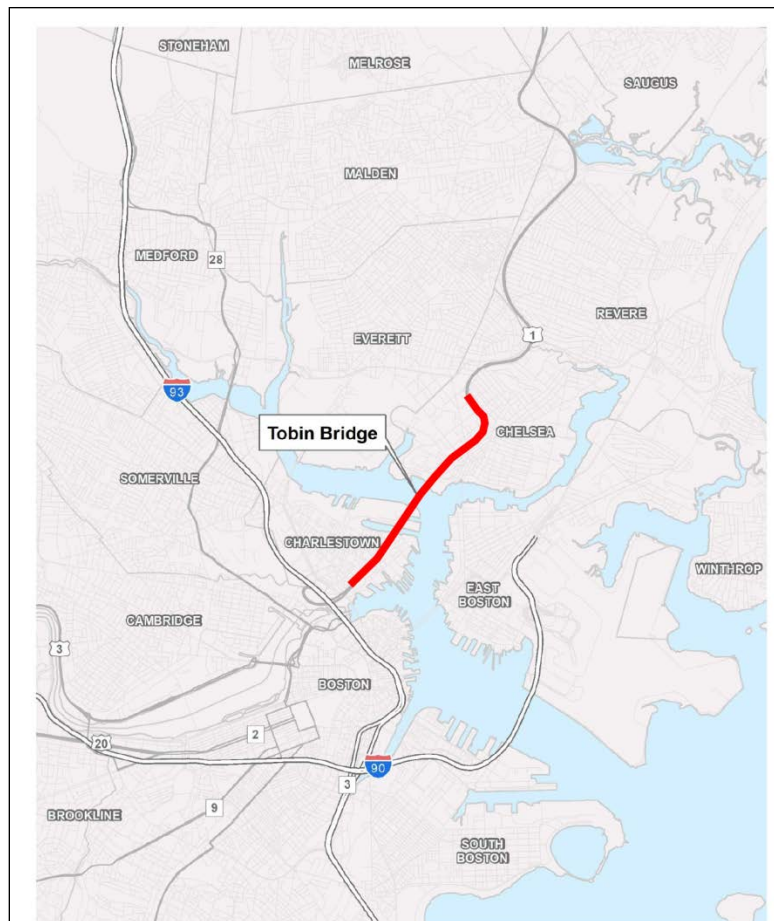
Background

Recently, MassDOT performed the *Bus on Shoulder Screening Study*, which studied a cost-effective bus-on-shoulder (BOS) program intended to improve bus reliability and

travel times. The study identified US Route 1 between Interstate 93 and Broadway (9.9 miles) as a key corridor worthy of further analysis but concluded that shoulder restrictions, particularly on the Tobin Bridge, would constrain implementation of a BOS program.

Subsequently, in March 2020, MassDOT completed Phase I of the *Tobin Bridge Managed Lane Study* and requested that Central Transportation Planning Staff (CTPS) provide modeling support for an analysis of various bus and/or high-occupancy-vehicle (HOV) lane treatments for US Route 1, including the Tobin Bridge, and help analyze the potential benefits as part of a second phase of the study. The managed lanes would extend southbound (SB) from Carter Street to Prospect Street and northbound (NB) from Warren Street to Carter Street. (See Figure 1.)

Figure 1
Proposed Location of Managed Lanes on US Route 1



Source: MassDOT.

Objectives

To help MassDOT understand the implications of restricting access to a general purpose lane on US Route 1 over the Tobin Bridge, CTPS will simulate different scenarios that assume current travel conditions. CTPS will model these scenarios in two phases in order to initially assess the feasibility of a bus-only pilot in 2021 and then to comprehensively understand other potential access scenarios. The four proposed build scenarios will provide insight into the conversion of one of the general purpose lanes to a bus-only and/or HOV lane.

All scenarios will represent the creation of a managed lane on US Route 1 over the Tobin Bridge with different exclusions—an HOV lane restricted to vehicles with two or more occupants (HOV 2+) or three or more occupants (HOV 3+), or a bus-only lane—and toll schemes representing the existing toll and no toll.

The details of each scenario are as follows:

1. Phase 1: Convert one SB and one NB lane to a bus-only lane
2. Phase 2: Convert one SB and one NB lane to an HOV 2+ and bus lane
3. Phase 2: Convert one SB and one NB lane to an HOV 3+ and bus lane
4. Phase 2: Convert one SB and one NB lane to an HOV 2+ and bus lane with a reduced toll or no toll

The analysis will focus on travel during the peak periods. The results will give insight into potential transit and HOV travel-time savings and the impacts on alternative routes. This work will support a continuation of the *Tobin Bridge Managed Lane Phase I Study*, completed in March 2020 by MassDOT, by providing a quantitative analysis of the traffic and transit impacts due to changes in the US Route 1 travel-lane restrictions.

MassDOT will use the results of the Phase 1 analysis for internal and public consideration of whether to convert a general travel lane to a managed lane when the current construction project concludes in spring 2021 and the lane taken as a work zone would otherwise be reopened as a general purpose lane. For the Phase 2 analysis, MassDOT will produce a revised transit service plan for this alternative. CTPS will model this scenario, assuming current travel conditions and a revised transit service plan, and analyze the traffic and transit impacts associated with this scenario.

Work Description

CTPS will support MassDOT and its project team by providing data and analysis. This work will be completed in two phases. Phase 1 will cover modeling of a single build scenario from the four scenarios to provide MassDOT, stakeholders, and the public with insight into the conversion of one general purpose lane in each direction to a bus-only lane. Phase 2 will involve support and participation in public meetings, enhancement

and recalibration of the model to analyze the remaining three alternatives from the scenarios listed above, development and testing of a recommended alternative, and documentation if both phases of the project.

Phase 1: Initial Calibration and Bus-Only Lane Scenario

Task 1 Coordinate with Project Team and Oversee Project

CTPS will work with MassDOT and consultants to help develop travel demand forecasts and respond to questions related to the tasks described below.

Products of Task 1

- Administrative activities and internal coordination
- Coordination with MassDOT and consultants
- Document review
- Response to questions

Task 2 Calibrate and Validate 2018 Base Year

The travel demand model has been calibrated at the regional level and must be reviewed, recalibrated, and potentially refined to best reflect the specific corridor being studied and to ensure reasonable sensitivity in the model to the proposed scenarios. CTPS will conduct this work and validate the corridor to the total daily demand, vehicle speeds, and travel times. Transit ridership on all bus routes operating in the corridor will be validated as well. The calibrated model will then be applied to develop baseline estimates of travel in the study corridor.

Products of Task 2

- Calibrated model for the US Route 1 corridor
- Tabular summary of person and vehicle throughput on the study corridor
- Tabular summary of bus (vehicle and passenger) throughput on the study corridor
- Tabular summary of bus travel times on the study corridor
- Average bus occupancy on all routes through the study corridor

Task 3 Develop and Analyze One Build Alternative

Based on the calibrated 2018 base-year scenario developed in Task 2, CTPS will model the build alternative, which will provide insight into the conversion of one general purpose lane in each direction during peak travel times to a bus-only lane, and summarize the effects on travel patterns. While this will be implemented as a single alternative in the model, the outputs will be presented in the peak direction (i.e. AM [6:00 AM–9:00 AM] peak conditions in the southbound direction and PM [3:00 PM–6:00 PM] peak conditions in the northbound direction).

Products of Task 3

The following summaries will be prepared for the build alternative by peak period and direction:

- Tabular summary of person and vehicle throughput on the study corridor
- Tabular summary of bus (vehicle and passenger) throughput on the study corridor
- Tabular summary of bus travel times on the study corridor
- Average bus occupancy on all bus routes bus through the study corridor
- Volume difference plots

Task 4 Air Quality Analysis

CTPS will perform an air quality analysis consistent with work completed for the Boston Region MPO's most recent Long-Range Transportation Plan (LRTP), *Destination 2040*. The air quality analysis will compare the build alternative with the no-build scenario and report highway emissions by region for several key pollutants.

Products of Task 4

- Tabular summaries of the results of the highway air quality analysis consistent with the most recent LRTP

Phase 2: Enhancement and Recalibration, HOV and Toll Scenarios, Environmental Justice Analysis, Documentation and Public Meeting Support

Task 1 Coordinate with Project Team, Oversee Project, and Attend Public Meetings

CTPS will work with MassDOT and consultants to help develop travel demand forecasts and respond to questions related to the tasks described below.

Products of Task 1

- Administrative activities and internal coordination
- Coordination with MassDOT and consultants
- Attendance and participation in as many as four public meetings
- Response to questions
- Archive project

Task 2 Enhance and Recalibrate 2018 Base Year

The travel demand model will have been calibrated, as described in Task 2 of Phase 1, for the study corridor. However, the model will require some enhancement to

simulate HOV travel segmented by vehicle occupancies of two or more persons and three or more persons. CTPS will examine the impact of the new travel segments on the highway assignment process and recalibrate as necessary. The recalibrated model will then be applied to develop baseline estimates of travel in the study corridor in this phase.

Products of Task 2

- Recalibrated model for the US Route 1 corridor
- Tabular summary of person and vehicle throughput on the study corridor
- Tabular summary of bus (vehicle and passenger) throughput on the study corridor
- Tabular summary of bus travel times on the study corridor
- Average bus occupancy by bus route
- Average vehicle occupancy rate

Task 3 Develop and Analyze Three Build Alternatives

Based on the calibrated 2018 base-year scenario developed in Task 2, CTPS will model the three build alternatives and summarize the effects on travel patterns.

Products of Task 3

The following summaries will be prepared for each of the three alternatives:

- Tabular summary of person and vehicle throughput on the study corridor
- Tabular summary of bus (vehicle and passenger) throughput on the study corridor
- Tabular summary of bus travel times on the study corridor
- Average bus occupancy by bus route
- Average vehicle occupancy rate
- Volume difference plots

Task 4 Develop and Analyze Recommended Build Alternative

MassDOT will conduct a stakeholder and public engagement process to identify the preferred configuration for a managed lane from the four alternatives analyzed in Task 3 in both phases. In coordination with the MBTA and stakeholder and public input, MassDOT will produce a revised transit service plan for this alternative. CTPS will model the recommended alternative accounting for the revised transit service plan and summarize its effects on transit demand and travel patterns.

Products of Task 4

The following summaries will be prepared for the recommended alternative:

- Tabular summary of person and vehicle throughput on the study corridor

- Tabular summary of bus (vehicle and passenger) throughput on the study corridor
- Tabular summary of bus travel times on the study corridor
- Average bus occupancy by bus route
- Average vehicle occupancy rate
- Volume difference plots

Task 5 Air Quality Analysis

CTPS will perform an air quality analysis consistent with work completed for the Boston Region MPO's LRTP, *Destination 2040*. The air quality analysis will compare the build alternatives with the no-build scenario and report highway emissions by region for several key pollutants using the latest version of the US Environmental Protection Agency's MOVES emissions modeling software.

Products of Task 5

- Tabular summaries of the results of the highway air quality analysis consistent with the most recent LRTP

Task 6 Environmental Justice Analysis

CTPS will perform an environmental justice analysis consistent with work completed for the Boston Region MPO's LRTP, *Destination 2040*. The analysis will compare the build alternatives with the no-build scenario and report the differences between the no-build scenario and the build alternatives by population group (minority and non-minority) in addition to income groups (low income and non-low-income).

Products of Task 6

- Tabular summaries of the results of the environmental justice analysis by population and income groups

Task 7 Documentation

CTPS staff will document the methodology developed to support MassDOT's study and the results of the analysis from both Phase 1 and Phase 2.

Products of Task 7

Documentation describing the methodology and results

The Boston Region Metropolitan Planning Organization (MPO) operates its programs, services, and activities in compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of race, color, or national origin (including limited English proficiency), be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination under any program or activity that receives federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, Federal Transit Administration, or both, prohibit discrimination on the basis of age, sex, and disability. The Boston Region MPO considers these protected populations in its Title VI Programs, consistent with federal interpretation and administration. In addition, the Boston Region MPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with U.S. Department of Transportation policy and guidance on federal Executive Order 13166.

The Boston Region MPO also complies with the Massachusetts Public Accommodation Law, M.G.L. c 272 sections 92a, 98, 98a, which prohibits making any distinction, discrimination, or restriction in admission to, or treatment in a place of public accommodation based on race, color, religious creed, national origin, sex, sexual orientation, disability, or ancestry. Likewise, the Boston Region MPO complies with the Governor's Executive Order 526, section 4, which requires that all programs, activities, and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background.

A complaint form and additional information can be obtained by contacting the MPO or at http://www.bostonmpo.org/mpo_non_discrimination. To request this information in a different language or in an accessible format, please contact

Title VI Specialist
Boston Region MPO
10 Park Plaza, Suite 2150
Boston, MA 02116
civilrights@ctps.org
857.702.3700 (voice)
617.570.9193 (TTY)

Exhibit 1
ESTIMATED SCHEDULE
Tobin Bridge Managed Lane Feasibility Study: Phase 1

Task	Week											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Coordinate with Project Team and Oversee Project	[Task 1: Weeks 1-12]											
2. Calibrate and Validate 2018 Base Year	[Task 2: Weeks 1-3]											
3. Develop and Analyze One Build Alternative				[Task 3: Weeks 4-8]								
4. Air Quality Analysis						[Task 4: Weeks 6-7]						

Exhibit 2**ESTIMATED COST****Tobin Bridge Managed Lane Feasibility Study: Phase 1**

Direct Salary and Overhead	\$29,209
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Task	Person-Weeks				Direct Salary	Overhea (106%)	Total Cost
	M-1	P-5	P-4	Total			
1. Coordinate with Project Team and Oversee Project	0.8	0.0	1.3	2.1	\$3,368	\$3,570	\$6,937
2. Calibrate and Validate 2018 Base Year	0.8	0.0	2.0	2.8	\$4,380	\$4,643	\$9,023
3. Develop and Analyze One Build Alternative	1.0	0.5	2.0	3.5	\$5,745	\$6,090	\$11,835
4. Air Quality Analysis	0.0	0.2	0.2	0.4	\$687	\$728	\$1,414
Total	2.6	0.7	5.5	8.8	\$14,179	\$15,030	\$29,209

Other Direct Costs	\$0
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TOTAL COST	\$29,209
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Funding

MassDOT On-Call Contract # 103869

Exhibit 1
ESTIMATED SCHEDULE
Tobin Bridge Managed Lane Feasibility Study: Phase 2

Task	Month								
	1	2	3	4	5	6	7	8	9
1. Coordinate with Project Team, Oversee Project, and Attend Public Meetings	[Task 1: Months 1-9]								
2. Enhance and Recalibrate 2018 Base Year	[Task 2: Month 1]								
3. Develop and Analyze Three Build Alternatives			[Task 3: Months 2-4]						
4. Develop and Analyze Recommended Build Alternative						[Task 4: Month 6]			
5. Air Quality Analysis			[Task 5: Months 3-8]						
6. Environmental Justice Analysis			[Task 6: Months 3-8]						
7. Documentation			[Task 7: Months 3-9]						

Exhibit 2
ESTIMATED COST
Tobin Bridge Managed Lane Feasibility Study: Phase 2

Direct Salary and Overhead	\$85,179
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Task	Person-Weeks					Direct Salary	Overhead (106%)	Total Cost
	M-1	P-5	P-4	P-3	Total			
1. Coordinate with Project Team, Oversee Project, and Attend Public Meetings	2.0	0.0	3.0	0.0	5.0	\$8,058	\$8,541	\$16,599
2. Enhance and Recalibrate 2018 Base Year	1.0	0.0	2.0	0.0	3.0	\$4,752	\$5,037	\$9,789
3. Develop and Analyze Three Build Alternatives	3.0	1.5	5.0	0.0	9.5	\$15,789	\$16,737	\$32,526
4. Develop and Analyze Recommended Build Alternative	0.5	1.0	1.5	0.0	3.0	\$5,086	\$5,391	\$10,476
5. Air Quality Analysis	0.0	0.5	0.3	0.0	0.8	\$1,427	\$1,513	\$2,940
6. Environmental Justice Analysis	0.2	0.0	1.0	0.3	1.5	\$2,196	\$2,328	\$4,524
7. Documentation	1.0	0.5	0.8	0.0	2.3	\$4,041	\$4,284	\$8,325
Total	7.7	3.5	13.6	0.3	25.1	\$41,349	\$43,830	\$85,179

Other Direct Costs	\$0
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TOTAL COST	\$85,179
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Funding
 MassDOT On-Call Contract # 103869