



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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

DISPARATE IMPACT METRICS ANALYSIS: FFY 2020

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 13298

Client

Boston Region MPO

Project Supervisors

Principal: Annette Demchur

Manager: Betsy Harvey

Funding Source

MPO Planning and §5303 Contract #108217

Schedule and Budget

Schedule: 11 months after work commences

Budget: \$40,000

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 (FFY) 2020. The work completed through this study will address the following goal area(s) established in the MPO's Long-Range Transportation Plan (LRTP): transportation equity.

Background

The Federal Transit Administration and the Federal Highway Administration require MPOs to identify and address impacts that may result from their investments that disproportionately affect minority and low-income populations (protected populations) compared to nonminority and non-low-income populations. These are referred to as disparate impacts and disproportionate burdens (DI/DB), respectively. This study will build off of the work undertaken in the MPO's Transportation Equity Program in FFYs 2018 and 2019 (Phase 1) to develop a DI/DB Policy. The DI/DB Policy allows the MPO to identify potential future DI/DBs that would likely result from the projects programmed in the LRTP.

Phase 1 of the DI/DB Policy development consisted of

- Engaging the public through a stakeholder working group and a public workshop to get input on the content of the DI/DB Policy;
- Identifying the forecasting error in the MPO's regional travel demand modeling process for each metric; and
- Updating metrics to analyze for potential DI/DBs. These consisted of 10 metrics within three categories.

Phase 1 culminated in May 2019 with the completion of a draft DI/DB Policy. The MPO then used the draft policy to evaluate the impact of the major infrastructure projects that change the capacity of the transportation network contained in *Destination 2040*, the MPO's most recent LRTP. In *Destination 2040*, the MPO assessed 10 metrics for potential DI/DBs within three categories: accessibility, mobility, and environmental metrics. The draft DI/DB Policy enabled the MPO to identify potential adverse effects on minority or low-income populations. It did not incorporate the second component of the analysis as required by federal guidance, which is to determine if the adverse effects would be significantly high and adverse. This study will develop methods to allow the MPO to complete the analysis.

Objective(s)

The goal of this study is to develop thresholds for each metric category analyzed in *Destination 2040* and defined in Phase 1 of this work: accessibility, mobility, and environmental. The thresholds would allow the MPO to determine when an impact to minority populations or low-income populations would be significantly high and adverse. The findings from this study will be used to update the MPO's draft LRTP DI/DB Policy.

Work Description

The work will be completed according to the following three tasks.

Task 1 Conduct a Literature Review

MPO staff will conduct a review of the literature on the use of accessibility, mobility, and environmental metrics for analyzing impacts at a regional scale. The metrics that were analyzed in *Destination 2040*'s DI/DB analysis will be part of the literature review. Specifically, these metrics will include:

- Accessibility metrics
 - Access to jobs via public transit within a 60-minute trip
 - Access to retail opportunities via public transit within a 60-minute trip
 - Access to healthcare facilities via public transit within a 40-minute trip
 - Access to higher education via public transit within a 40-minute trip
- Mobility metrics¹
 - Average attraction travel time via highway
 - Average production travel time via highway
 - Average attraction travel time via public transit
 - Average production travel time via public transit
- Environmental metrics
 - Congested vehicles-miles traveled²
 - Carbon monoxide emissions (kilograms per square mile)

As part of the literature review, staff will review how other MPOs and state departments analyze these metrics for DI/DBs. The review will also include relevant Massachusetts statewide policies and academic research on equity analyses.

Task 2 Develop and Test Preliminary Thresholds

In this task, staff will use the results of Task 1 to identify preliminary thresholds for each of the metric categories. Staff will examine data from base year (2016) model runs developed for *Destination 2040* to determine if thresholds could be derived from these data based on the existing differences between protected and non-protected

¹ Mobility metrics evaluate the door-to-door travel time for trips produced in and attracted to MPO TAZs. Trips attracted to TAZs are those generated by non-household land uses within the MPO region. Trips produced in TAZs are those generated by households.

² Congested VMT assesses the volume-to-capacity ratio on the roads within or adjacent to each TAZ; those with a ratio of 0.75 or greater are considered congested.

populations.³ As part of this task, MPO staff will seek input from the stakeholder working group established in Phase 1 of this effort on thresholds that are being considered. This may take the form of a survey, webinar, or in-person meeting, depending on the availability of stakeholders. Based on the findings from the literature review and the work in Task 2, staff will then develop a set of preliminary threshold recommendations and test them using the *Destination 2040* DI/DB analyses. Based on the results of these tests, staff will select a final set of threshold recommendations. Staff will also document any challenges encountered in developing thresholds for any of the metrics.

Task 3 Produce a Final Report and Present Findings

Staff will produce a final report documenting the methodologies and results from the study. The report will include relevant material from previous tasks, including a summary of the literature completed in Task 1, and the methodology and results from developing the preliminary thresholds in Task 2. It will also provide threshold recommendations for each of the metric categories. Finally, the report will propose changes to the MPO's current draft LRTP DI/DB Policy. MPO staff will present these results to the MPO board. The findings from this study will be used to update the draft LRTP DI/DB Policy and to subsequently seek endorsement of the policy from the MPO.

Product of Task 3

Final report and presentation to the Boston Region MPO board.

³ Each population is estimated for the TAZs within the MPO region (as the TAZ is the unit of geography that is used in the regional travel demand model), which the MPO uses to perform the LRTP DI/DB analysis.

Exhibit 1
ESTIMATED SCHEDULE
Disparate Impact Metrics Analysis: FFY 2020

Task	Month											
	1	2	3	4	5	6	7	8	9	10	11	
1. Conduct a Literature Review												
2. Develop and Test Preliminary Thresholds												
3. Produce a Final Report and Present Findings									A		B	

Products/Milestones

A: Final report

B: Presentation to the MPO board

Exhibit 2
ESTIMATED COST
Disparate Impact Metrics Analysis: FFY 2020

Direct Salary and Overhead	\$40,000
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Task	Person-Weeks				Direct Salary	Overhead (102.11%)	Total Cost
	M-1	P-5	P-3	Total			
1. Conduct a Literature Review	0.0	4.0	0.0	4.0	\$7,946	\$8,114	\$16,060
2. Develop and Test Preliminary Thresholds	0.0	1.9	0.0	1.9	\$3,774	\$3,854	\$7,628
3. Produce a Final Report and Present Findings	1.2	1.8	1.8	4.8	\$8,071	\$8,241	\$16,312
Total	1.2	7.7	1.8	10.7	\$19,791	\$20,209	\$40,000

Other Direct Costs	\$0
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TOTAL COST	\$40,000
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Funding

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 MassDOT Contract #108217