BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Richard A. Davey, MassDOT Secretary and CEO and MPO Chairman
Karl H. Quackenbush, Executive Director, MPO Staff

MEMORANDUM

DATE **July 10, 2014**

TO **Boston Region Metropolitan Planning Organization**

FROM **Karl H. Quackenbush**
CTPS Executive Director

RE **Work Program for: Barriers and Opportunities Influencing Mode Shift**

Action Required

Review and approval

Proposed Motion

That the Boston Region Metropolitan Planning Organization vote to approve the work program for Barriers and Opportunities Influencing Mode Shift presented in this memorandum

Project Identification

Unified Planning Work Program Classification

Technical Support/Operations Analysis Projects

CTPS Project Number

11148

Client

Boston Region Metropolitan Planning Organization

CTPS Project Supervisors

Principal: Annette Demchur
Manager: Steven Andrews

Funding

MPO Planning Contract #78890
MPO §5303 Contract #78922

Impact on MPO Work

This is MPO work and will be carried out in conformance with the priorities established by the MPO.

Background

Most people in the transportation field intuitively know, and research has corroborated, transit usage correlates with several variables. However, we do not have an adequate understanding, especially for the Boston metropolitan region, of the relative importance of each of these variables in influencing a mode shift from single-occupancy vehicles to transit, and the synergy between those variables. Some of the variables contributing to a mode shift from single-occupancy vehicles to transit are:

- Population density
- Employment levels and density
- Proximity to transit
- Land use
- Travel time
- The level of transit service provided
- The price of competing modes
- Parking policies

Several data sets that have recently been made available include the Massachusetts Household Survey, the American Community Survey (ACS), and the updated Boston Region Metropolitan Planning Organization (MPO) regional travel demand model set, which will provide a basis for better understanding the relationships between the variables that can cause mode shift. By mining these data sources, we can quantify the determinants of transit mode share, with the goal of understanding the situations and factors that will cause people to shift to transit from single-occupancy vehicles.

An examination of the variables that lead to transit mode shift, coupled with findings from a literature review, will help inform members of the public, planners, and policy makers about which factors could be used to help influence people to make a mode shift from single-occupancy vehicles to transit. The results of this study could help inform the project evaluation process and might be useful for incorporating MassDOT's important policy initiative for mode shift into the capital planning process.

The Metropolitan Area Planning Council (MAPC) will conduct a companion study that will focus on the factors that effect a mode shift from single-occupancy vehicles to walking and bicycling, and will identify areas that are likely to support these mode shifts.

Through this work, the MPO will support the mode-shift goals of the Massachusetts Department of Transportation (MassDOT), which were introduced in June 2010 in its GreenDOT initiative. Under the GreenDOT program, MassDOT has the planning

and policy goal of tripling the mode share of the three healthy modes (walking, bicycling, and public transit) by 2030. In order to make progress toward these goals, policymakers need to understand the characteristics of geographic areas and the types of transportation investments that are most likely to induce travelers to shift their mode choice away from automobiles.

Objectives

- To present the factors that relate to mode choice in an informative, easily accessible manner, and to quantify the effect of each on mode choice
- To identify areas that might be most likely to support relatively high transit mode shares and areas that are unlikely to support high transit mode shares
- To identify the types of transportation investments and locations that have the greatest potential to support mode shifts from single-occupancy vehicles to transit

Work Description

The work required to accomplish the project's objectives will be carried out in the three tasks described below.

Task 1 Review Past Studies

MPO staff will review reports of past studies that dealt with the relationship of demographics, transit service levels, and built and natural environmental factors to mode choice. Staff will also review literature about the mode choice step of the travel demand modeling process.

Task 2 Gather and Analyze Data

Staff will delve into the Statewide Household Travel Survey, the ACS, and the regional travel demand model set to identify and describe the main factors that influence mode share in the Boston region. These factors will include the effects of the following characteristics:

- Transit service characteristics such as cost, in-vehicle travel time, number of transfers, and frequency of service
- Regional characteristics such as population and employment
- Local characteristics such as out-of-vehicle travel time and the degree to which the built environment is "pedestrian-friendly"

Using this information, staff will conduct analyses that will relate the data to mode share. For example, how much of an effect do transfers have on transit mode share? What effect do short out-of-vehicle travel times have on transit mode share? If current transit riders were to stop using transit, which modes might they

be most likely to use? How do local development characteristics influence mode share? Through this analysis, staff will attempt to identify which areas are likely to support high transit mode shares and which are not. Similarly, staff will attempt to determine which factors are most effective in encouraging people to shift from single-occupancy vehicles to transit.

Products of Task 2

- Notable and relevant factors obtained from the model and other data sources
- Analysis of how these factors affect mode share, including an analysis of which areas in the region might, and which areas might not, support a high transit mode share.

Task 3 Prepare a Final Report

Using the data, factors, and relationships identified in Task 2, coupled with information gathered during the literature review, staff will create a very accessible document that communicates the influence various factors have on mode choice and relates those effects to policies and projects that can affect transit mode share.

This information will be presented with real-world examples that support the conclusions derived from the data in the regional travel demand model. The document will inform readers of the types of approaches that can be used to shift people from single-occupancy vehicles to transit, and may also discuss the implications of the results of Task 2 as they relate to the effectiveness of the factors in the diverse types of communities found within the MPO region: the inner core, regional urban centers, maturing suburbs, and developing suburbs.[1]

Products of Task 3

An easily accessible, broadly applicable white paper that relates the data (including the statewide household survey and other demographic data), factors, and methodology used in the regional travel demand model, including information gathered during the literature review, to mode share. This documentation will provide the means for identifying the types of changes in the environment and the types of transportation investments that could effectuate a mode shift from single-occupancy vehicles to transit.

[1] These community types are defined in the Metropolitan Area Planning Council's classification system "Massachusetts Community Types," published in July 2008. "Massachusetts Community Types" also includes the "rural towns" classification. No towns within the Boston Region MPO area fit this classification.

Estimated Schedule

It is estimated that this project will be completed seven months after work commences. The proposed schedule, by task, is shown in Exhibit 1.

Estimated Cost

The total cost of this project is estimated to be $68,055. This includes the cost of 26.8 person-weeks of staff time and overhead at the rate of 97.42 percent. A detailed breakdown of estimated costs is presented in Exhibit 2.

KQ/SPA/spa

Exhibit 1
ESTIMATED SCHEDULE
Barriers and Opportunities Influencing Mode Shift

Task	Month						
	1	2	3	4	5	6	7
1. Review Past Studies							
2. Gather and Analyze Data from the Regional Travel Demand Model and Statewide Household Travel Survey							
3. Prepare a Final Report							

Exhibit 2
ESTIMATED COST
Barriers and Opportunities Influencing Mode Shift

Direct Salary and Overhead	**$68,055**

Task	Person-Weeks				Direct Salary	Overhead (97.42%)	Total Cost
	M-1	P-5	P-3	Total			
1. Review Past Studies	0.2	0.0	2.0	2.2	$2,462	$2,398	$4,860
2. Gather and Analyze Data from the Regional Travel Demand Model and Statewide Household Travel Survey	1.8	4.5	11.3	17.6	$22,666	$22,081	$44,747
3. Prepare a Final Report	2.5	0.5	4.0	7.0	$9,345	$9,103	$18,448
Total	4.5	5.0	17.3	26.8	$34,472	$33,583	$68,055

Other Direct Costs	**$0**

TOTAL COST	**$68,055**

Funding

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