Research in Progress

Commuter Bus Demand, Incentives for Modal Shift, and Impact on GHG Emissions (Part II)

Research Need

In an effort to reduce Greenhouse Gas (GHG) emissions from the transportation sector, MassDOT Rail and Transit Division is interested in understanding the potential market for expanded commuter bus service into Boston, its impact on modal split, and the effect on reducing GHG emissions associated with transportation.

Goals/Objectives

The goal of this project is to build on existing models of commuter mode choices to identify potential express commuter bus services that would most cost effectively reduce GHG emissions by attracting current drivers. The project has three objectives:

1. Improve the detail and accuracy of the commuter bus demand estimates obtained during Part I of this study by utilizing demographic data about the commuters in each Origin-Destination (OD) market.
2. Analyze the potential impact on operating buses in dedicated lanes or running on highway shoulders (space permitting) to achieve faster travel times and attract more riders.
3. Conduct an analysis of the specific local characteristics of commuter bus stop locations that are likely to impact ridership (e.g., urban vs. suburban, parking availability, connection to local transit and bike/pedestrian infrastructure).

Methodology

The research links mode choice models with emissions models, allowing us to estimate the number of new commuter bus passengers attracted from cars (which reduces emissions) or from existing transit services. In this project:

1. Estimate the demographic characteristics of commuters for specific ODs, defined as town pairs in the Boston region.
2. Include socio-economic characteristics in the mode choice model and calibrate it to observed ridership for the Framingham-Boston corridor.
3. Compare commuter bus ridership and GHG emissions for buses operating in congested traffic or in dedicated lanes.
4. Analyze site-specific factors that affect transit ridership and access mode based on the finer geographic scale of analysis at the level of Travel Analysis Zones (TAZs).

Project Information

This project is being conducted as part of the Massachusetts Department of Transportation (MassDOT) Research Program with funding from Federal Highway Administration (FHWA) State Planning and Research (SPR) funds.

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September 2019