Draft Memorandum for the Record
Boston Region Metropolitan Planning Organization Meeting

November 2, 2017 Meeting

10:00 AM–12:12 PM, State Transportation Building, Conference Rooms 2 and 3, 10 Park Plaza, Boston

Bryan Pounds, Massachusetts Department of Transportation (MassDOT), Chair, representing Stephanie Pollack, Secretary and Chief Executive Officer, MassDOT (Meeting was later chaired by Eric Bourassa, Metropolitan Area Planning Council (MAPC), Vice-Chair, beginning with item 4.)

Decisions

The Boston Region Metropolitan Planning Organization (MPO) agreed to the following:

- re-elect the MAPC representative to serve as vice-chair [one-year appointment]
- approve the minutes of the October 5, 2017 meeting

1. Introductions

See attendance on page 11.

2. Public Comments

Stephen Kaiser stated that agenda item 11—a memorandum called “Even Headways along the Trunk Sections of the MBTA Bus Network”—is an outstanding technical report that demonstrates the benefits of scheduling buses evenly along trunk routes. S. Kaiser encouraged the MPO to fund more work in this area.

Frank Tramontozzi (City of Quincy) highlighted two possible Transportation Improvement Program (TIP) projects in Quincy. The Sea Street/Route 3A corridor is a major commuter route from the South Shore. MassDOT is in the process of evaluating Phase 2 of this project. The Quincy Shore Drive at Sea Street intersection is owned by the Department of Conservation and Recreation (DCR), but Quincy is willing to assume responsibility for its maintenance. This project is at 75 percent design. Quincy plans to bring both projects to the MPO’s consideration for possible TIP funding.

3. Chair’s Report—*Bryan Pounds, MassDOT*

There was none.

4. Committee Chairs’ Reports

There were none.

5. Regional Transportation Advisory Council Report—*Tegin Teich, Chair, Advisory Council*

T. Teich noted that the Advisory Council will meet on Wednesday, November 8, 2017. The meeting is scheduled to feature Michelle Danila, MassDOT Complete Streets Engineer. MassDOT and MPO Staff will present on the role of state and regional government in mitigation for major development projects.

6. Executive Director's Report—*Karl Quackenbush, MPO Executive Director*

K. Quackenbush reported that the Federal Highway Administration (FHWA) indicated that they will begin the MPO's quadrennial certification review in July 2018.

7. Update on MPO Elections for Municipal Representation—*Eric Bourassa, Vice-Chair, MAPC*

E. Bourassa reported that uncontested elections were held at MAPC's Fall Council meeting on October 25, 2017, for the four municipal seats. Lexington, Everett, Medway, and Beverly were re-elected for an additional three-year term on the MPO board.

8. Action Item: Annual Vice-Chair Election—*Eric Bourassa, Vice-Chair, MAPC*

A motion to nominate current MAPC, Vice-Chair (E. Bourassa) as Vice-Chair was made by MassDOT (B. Pounds) and seconded by the Inner Core Committee (City of Somerville) (Tom Bent). The motion carried.

9. Approval of Meeting Minutes—*Róisín Foley, MPO Staff*

A motion to approve the minutes of the meeting of October 5, 2017, was made by At-Large Town (Town of Lexington) (Richard Canale) and seconded by the Inner Core Committee (City of Somerville) (T. Bent). The South Shore Coalition (Town of Braintree) (Christine Stickney) abstained. The motion carried.

10. MPO Staff-Generated Research Topics—*Karl Quackenbush, Executive Director, and Sandy Johnston, Betsy Harvey, and Steven Andrews, MPO Staff*

Handouts posted to the MPO's meeting calendar

Memo: Spatial Distribution of Crashes in EJ and Non-EJ Communities in the Boston Region MPO

The Staff-Generated Research Topics program is funded via the MPO's Unified Planning Work Program (UPWP) and allows staff to pursue relevant research on topics of personal interest to them not otherwise covered by an ongoing UPWP or discrete

project. This allows staff to take some risks with analytical work while still working within the parameters of the MPO's goals and objectives. B. Harvey, S. Johnston, and S. Andrews each presented a summary of their recent work conducted under this program, which encompasses three very different topics with different goals.

Spatial Distribution of Crashes in EJ and Non-EJ Communities in the Boston Region MPO

B. Harvey, Transportation Equity Program Manager, presented a memo exploring the spatial distribution of crashes in Environmental Justice (EJ) and Non-EJ communities in the MPO region. EJ communities are transportation analysis zones (TAZs) that meet or exceed the MPO's threshold for low-income households and/or minority population. Several studies have shown that people of color and people with low incomes are more likely to be killed in a vehicle crash than people in other demographic groups. The goal of the study was to explore whether this pattern holds true in the MPO region.

B. Harvey examined vehicle-on-vehicle, vehicle-on-bicycle, and vehicle-on-pedestrian crashes that occurred between 2010 and 2014 using a number of different control measures to calculate the crash rates: population, number of trips, travel time, vehicle-miles travelled (VMT), roadway miles, and lane miles.

While crash rates varied by exposure measure, a strong trend across all measures showed that pedestrian and bicycle crashes were more frequent in EJ TAZs than in non-EJ TAZs. Automobile crashes were not any more frequent in EJ TAZs. Fatal crashes were less frequent in EJ TAZs overall, while injuries were more frequent. Given these findings, B. Harvey investigated the specific types of roadways that are located in EJ TAZs, which might indicate the kind of speeds or driver behaviors that are common in these areas. High-speed roads, like principal arterials, highways, and interstates, make up a larger percentage of total road mileage in EJ TAZs. Locally owned roads are more common in non-EJ TAZs.

MPO staff can use these findings to inform safety efforts across MPO activities, such as in TIP project selection, Performance Based Planning and Programming (PBPP), UPWP study selection, and equity analyses.

Discussion

Nelson Hoffman (FHWA) asked whether B. Harvey considered the existence of bicycle and pedestrian facilities. B. Harvey replied that the study did not consider this.

David Koses (At-Large City) (City of Newton) noted that the prevalence of crashes may be a result of higher density and more pedestrian activity overall in EJ TAZs than in non-EJ TAZs. B. Harvey agreed, but stated that this had been factored into the analysis.

E. Bourassa asked about the accuracy of crash statistics. B. Harvey said that accuracy of statistics is an issue, especially as a result of underreporting, but that looking at different exposure measures accounts for a broad range of possibilities and errors in data.

T. Teich asked whether results of this analysis could be factored into the MPO's TIP evaluation criteria. B. Harvey replied that TIP criteria currently consider high-crash locations and EJ communities separately, but don't specifically consider safety risks to EJ communities as a point of evaluation. B. Harvey encouraged members to consider this in future conversations about project evaluation.

Jim Gillooly (City of Boston) (Boston Transportation Department) asked whether B. Harvey was able to identify specific road types in specific EJ TAZs and compare them to see how much of a factor the nature [roadway design classification] of the road might be. B. Harvey replied that this analysis did not include that, but that future work could.

Rafael Mares (Conservation Law Foundation) asked whether B. Harvey had a theory about the reasons for these higher rates: whether it is attributable to higher rates of walking and biking in general, or whether there is a relationship with road design. B. Harvey stated that the greater prevalence of walking and biking in EJ TAZs should not be used as a way to dismiss greater crash risk, given that encouraging a shift away from single-occupancy vehicles is an MPO goal. B. Harvey encouraged further study of this topic to explore the relationship between road design and crashes, including ways in which the MPO might address this in project selection.

Long-Distance Commuting in the Boston Region—Necessity or "Strategic Mobility Choice"?

S. Johnston, UPWP Manager, presented research that examined long-distance commuting in (and into) the Boston Region MPO area. S. Johnston emphasized that this report and presentation is not intended to be a comprehensive assessment of this travel behavior, but is a starting point for further analysis.

A 2012–13 US Census Bureau report defines super, or long-distance commuting as traveling 50 or more miles one way to work. Extreme commuting is defined as traveling 90 or more minutes to work, one way. Mega commuting is defined as a commute that comprises both of these factors. However, these terms are not used with any consistency in research literature or media. For the purposes of the report, S. Johnston used the term "long-distance commuting;" and he excluded from his analysis those commutes in which work and home are actually fairly close in distance, but where travel takes a long time because of multiple transfers on transit, traffic, or other factors.

A recent Pew Charitable Trusts analysis of American Community Survey (ACS) data indicates that 112,709 people in Massachusetts have commutes that exceed 90 minutes, a 45.4 percent increase between 2010 and 2015. Anecdotal and media speculation have suggested that people are moving to areas like Worcester or Springfield because of affordability concerns in the Boston region.

S. Johnston used two census datasets in compiling this research. Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics (LODES) is administrative data based on tax records of where people live and work. The Census Transportation Planning Package (CTPP) is a standard dataset used in transportation planning, based on ACS data. There are some discrepancies in the two based on the geographies of each dataset.

The table below shows estimates for the total number of long-distance commuters in the MPO region from each dataset.

Source	**LODES*—County Estimates**	**LODES—Distance Estimate (>50 miles)**	**CTPP****	***Charting Progress to 2040* Modeling**
Estimate	96,011 Commuters	43,904	43,941	52,000
Work geography	Four-mile radius from Boston City Hall	Four-mile radius from Boston City Hall	Suffolk County	Central area
Home geography	Top 95 non-MPO counties	Any	Top 95 non-MPO counties	All non-MPO municipalities

The limited research on this topic indicates that the reasons for long-distance commuting range from the dynamics of two-career households and affordability concerns, to attachment to a particular community, or the rise in flexible work scheduling. S. Johnston was able to obtain data from the 2011 Massachusetts Transportation Survey as well as on-board customer survey data from the Northern New England Passenger Rail Authority (NEPRA). The survey data indicate that long-distance commuters into the MPO region are mostly college educated, middle- to high-income men, who are younger than the workforce as a whole. Some of the literature indicates that these individuals have made a “strategic mobility choice,” rather than having been forced to commute long distances by factors like affordability or availability of housing. They may commute long-distance only part-time, making this a manageable choice.

One of the implications of the growth in long-distance commuting is that such commutes may largely ensue from one urban core to another. Metropolitan areas become linked to each other by individuals commuting between them, and non-contiguous transportation planning entities may need to work together more frequently. S. Johnston suggested that the MPO continue to develop an understanding of the long-distance commute, pursue cooperative governance with other MPOs, and focus on mode shift, given the preference for transit among this population.

Discussion

Paul Regan (MBTA Advisory Board) noted his surprise that the highest numbers from outside of Massachusetts came from southern New Hampshire and Maine, and wondered whether these individuals might drive to a commuter rail station and complete their trip via train. S. Johnston replied that mode share is something that could be explored further in a subsequent analysis. He added that the NEPRA data does indicate which stations riders embark at.

Sproute Transit Planning Application

S. Andrews presented the Service Planning R-Based Omnibus Urban Transit Explorer (Sproute), an app created using the programming language R, which currently is hosted on third-party website, shinyapps. Using data from the MBTA, S. Andrews built a dynamic tool to display information about bus routes. S. Andrews demonstrated the tool for the board. Features of this app include the ability to access and visualize data about maximum passenger loads at specific bus stops, trip numbers at specific stops, and which stops on a given route see the most customers. Sproute allows users to experiment with rerouting bus services by seeing how many customers would be affected by removing or relocating specific stops. The app includes information about crowding per trip and at specific times of the day, as well as frequency and reliability. With Sproute, it is possible to explore data at peak travel times or during the entire day, and there are various map layers showing geography, landmarks, and other features. Sproute also includes demographic ridership information, census data describing residents of the corridor served by a bus route, and data regarding fare payments. Sproute also shows elected officials for areas in which bus routes are located.

S. Andrews noted that this work is not only useful for planners, but may help demonstrate to the public more clearly the kinds of data that MPO staff use when creating work products by allowing them to explore the data themselves.

Discussion

E. Bourassa asked whether Sproute is accessible to the public. S. Andrews replied that Sproute is currently an internal tool. Also, because it contains MBTA data, the MBTA will need to approve its release to the general public.

Jay Monty (At-Large City) (City of Everett) asked whether Sproute is easy to update with new data, and whether it is possible to include historic data. S. Andrews replied that it is relatively easy to update. The current underlying data in the app is from 2016.

11. Summary of Methodology and Results: Even Headways along the Trunk Sections of the MBTA Bus Network—*Steven Andrews, MPO Staff*

S. Andrews presented a technical memorandum that describes 1) the problem caused by irregular headways in trunk sections of the MBTA's bus network, 2) the methodology used to understand the implications of these irregular headways, and 3) potential wait-time savings for passengers that would result from rescheduling bus routes in these corridors. As a result of this analysis, the memo contains a list of bus service areas that MBTA service planners may review to discern potential opportunities to improve passenger wait times.

Simple trunks are segments of the bus network where routes merge at a single point and share the same travel path between that point and the route's terminus. Complicated trunks are segments of the bus network where routes operating on the shared segment diverge at some point, such that some riders may not be able to use the routes interchangeably. On complicated trunks, not everyone who boards in the shared segment benefits from even headways.

Many MBTA bus routes have segments in common with other bus routes, but buses on these routes often are not scheduled with respect to each other or with the primary goal of producing even headways. Average passenger wait times might be reduced and distribution of passengers on buses might be improved if headways on these segments were made more even or consistent.

This analysis relied on two major components: a methodology to determine how long people wait for a bus under a given set of circumstances and stop-level ridership data. For the first component, S. Andrews adapted a bus schedule performance evaluation methodology used by Transport for London (TfL). This methodology lays out a process for estimating the actual, scheduled, and excess wait times experienced by riders. After calculating the benefit to each rider of a more even schedule, S. Andrews was able to estimate how many riders would benefit.

S. Andrews reviewed almost 50 trunk sections of MBTA service and mapped when and where the MBTA could save any number of people a significant amount of time by evening out headways, as well as when and where the MBTA could save the most total wait time by evening out headways. Most trunk sections have at least one period where riders could benefit from more even headways.

In aggregate, if the MBTA were to make all of the headway changes identified in the memo, people boarding along trunks during more periods and in more places would have access to frequent service. Approximately 10 percent more riders benefiting from trunk service would gain access to "frequent" service on weekdays and Saturdays, and approximately 3 percent more riders would have access to frequent service on Sundays.

There are limitations and potential future improvements to this methodology. The results do not include the effects on riders of the "branches" of a trunk, and may have overstated the impact of wait-time savings for complicated trunks. Some riders included in the benefit calculation may not actually benefit from more even headways because they need to use a specific route. The average wait-time savings per passenger are not significantly affected by the omission of impacts on these riders. Other data sources, such as the MBTA's origin-destination model (ODx) could help solve this problem.

S. Andrews shared this memo with MBTA service planners in order to help them prioritize any schedule changes they might make in the service of evening headways. S. Andrews reported that there has been some positive feedback about this study from the MBTA.

Discussion

J. Monty asked why some of these schedule issues exist in the first place; asking if it was related to issues related to the availability of vehicles or operators. S. Andrews replied that this could be part of the issue, as well as a myriad other competing interests that service planners must balance. The hope is that the MBTA could use this information to even out headways in situations where other concerns do not take precedence.

12. MassDOT's Geographic Information System (GIS) Project Intake Tool (MaPIT)—*Quinn Molloy, MassDOT*

MaPIT is a tool within GeoDOT, MassDOT's online hub for data interaction. GeoDOT was originally created to store and share geospatial data, but has grown to encompass a suite of tools and mapping applications for municipalities and state and regional government. GeoDOT hopes to identify and reduce redundant or time consuming

workflow processes. Custom tools and maps can all be accessed through a single account. The MaPIT tool was created in order to streamline the project intake process on GeoDOT.

Q. Molloy demonstrated MassDOT's new Geographic Information System (GIS) Project Intake Tool (MaPIT). MaPIT is a comprehensive project-screening tool for preliminary MassDOT project analysis, which was created to streamline the project intake process. Other data layers were added to the tool provide planners with a holistic vision of a project's unique character. MaPIT will replace the paper Project Initiation Form (PIF) and Project Need Form (PNF) submitted by municipalities [project proponents] when ushering a transportation project through MassDOT's process.

MaPIT interacts directly with MassDOT's Project Info System portal and allows for comprehensive project preplanning before evaluation by MassDOT. MaPIT will be online and functional by the next MassDOT Project Review Committee (PRC) meeting in December. The goal of MaPIT is to provide a seamless interface that would allow for more intelligent and dynamic project review.

Q. Molloy demonstrated how to sign in to the MaPIT tool, map a project, and fill out the electronic versions of the PIF and PNF.

A video demonstration of how to use the MaPIT tool targeted towards municipal staff may be found at this web address: https://www.youtube.com/watch?v=Ld9NsSUf7nw.

Discussion

J. Gillooly asked when the tool will be active. Q. Molloy responded that it should be active the week following this meeting. The planned PRC meeting in November was pushed up to December to allow municipalities more time to become familiar with the tool.

E. Bourassa commented that it seemed MaPIT would help streamline the evaluation and scoring process for projects as well, and asked whether the MPO might be able to integrate this tool with the evaluating and scoring process for TIP funding. Q. Molloy responded that the data in MaPIT could be available as a GIS tool to pull into other applications.

T. Bent asked about training for municipalities. Q. Molloy responded that Bay State Roads Program is holding workshops for municipal employees who will be using the tool.

13. Members' Items

J. Gillooly noted that the next public meeting for the Rutherford Avenue/Sullivan Square Design Project will be held on Wednesday, November 15, 2017, from 6:30 PM to 9:00 PM at the Knights of Columbus in Charlestown.

Laura Wiener (At-Large Town) (Town of Arlington) noted that MAPC and Arlington are co-hosting an info session on autonomous vehicles on Tuesday, November 14, 2017 from 7:00 PM to 8:30 PM at Arlington Town Hall.

14. Adjourn

A motion to adjourn was made by the MBTA Advisory Board (P. Regan) and seconded by the Inner Core Committee (City of Somerville) (T. Bent). The motion carried.

Attendance

Members	Representatives and Alternates
At-Large City (City of Everett)	Jay Monty
At-Large City (City of Newton)	David Koses
At-Large Town (Town of Arlington)	Laura Wiener
At-Large Town (Town of Lexington)	Richard Canale
City of Boston (Boston Planning and Development Agency)	Jim Fitzgerald
City of Boston (Boston Transportation Department)	Jim Gillooly
Federal Highway Administration	Nelson Hoffman
Federal Transit Administration	
Inner Core Committee (City of Somerville)	Tom Bent
Massachusetts Department of Transportation	Bryan Pounds
MassDOT Highway Division	John Romano Marie Rose
Massachusetts Bay Transportation Authority	Eric Waaramaa
Massachusetts Port Authority	Laura Gilmore
MBTA Advisory Board	Paul Regan
Metropolitan Area Planning Council	Eric Bourassa
MetroWest Regional Collaborative (Town of Framingham)	
Minuteman Advisory Group on Interlocal Coordination (Town of Bedford)	Richard Reed
North Shore Task Force (City of Beverly)	Denise Deschamps
North Suburban Planning Council (City of Woburn)	
Regional Transportation Advisory Council	Tegin Teich
South Shore Coalition (Town of Braintree)	Christine Stickney
South West Advisory Planning Committee (Town of Medway)	
Three Rivers Interlocal Council (Town of Norwood/NVCC)	Steve Olanoff Tom O'Rourke

Other Attendees	Affiliation
Tom Kadzis	BTD
Stephen Kaiser	Citizen of Cambridge
Rafael Mares	Conservation Law Foundation
Quinn Molloy	MassDOT
Steve Olanoff	TRIC Alternate
Eddie Sporn	Citizen
Frank Tramontozzi	City of Quincy
Scott Zadakis	CrossTown Connect TMA

MPO Staff/Central Transportation Planning Staff
Karl Quackenbush
Robin Mannion
Steven Andrews
Jonathan Belcher
Lourenço Dantas
Annette Demchur
Róisín Foley
Betsy Harvey
Sandy Johnston
Anne McGahan
Scott Peterson