APPENDIX A

Other Boston Region Transportation Planning Projects

[Under Development]

Appendix A: Other Boston Region Transportation-Planning Projects

This appendix consists of brief descriptions of planning studies that will be conducted in the Boston Region Metropolitan Planning Organization (MPO) area by individual agencies, such as MassDOT and the MBTA, during FFY 2018. MPO funding will not be used for these studies, although in certain instances an agency or one of its consultants may contract with MPO staff (CTPS) to provide support for the preparation of an environmental impact report or a large-scale study. For these projects, CTPS support work is described in Chapters 4 through 7, with a cross-reference to the project listing in this appendix. Likewise, projects listed in this appendix indicate whether there is a CTPS component. The projects in this appendix are not subject to the MPO's public participation process. Rather, they follow their own public processes, some of which may be required by the Massachusetts Environmental Policy Act (MEPA). They are included here to provide a more complete picture of all the surface-transportation planning projects occurring in the region.

Projects formatted in BOLD are in the process of being updated.

A.1 OTHER BOSTON REGION TRANSPORTATION-PLANNING PROJECTS

Allston I-90, Massachusetts Turnpike Interchange Improvement Project **Agency: MassDOT**

The proposed project consists of an interchange improvement project to address the structural and geometric deficiencies of the I-90 Allston Interchange between Cambridge Street and Commonwealth Avenue in the City of Boston. Context-Sensitive Design alternatives will be discussed and will then be developed for further evaluation in an environmental document that will ensure that the reconstructed interchange and ramp configurations will continue to support the vehicular loading conditions and provide safe and reliable transportation access. The existing viaduct has severely deteriorated, and alternatives under consideration for its replacement will provide MassDOT the opportunity to reconfigure the Allston Interchange, which dates from the 1965 extension of the Massachusetts Turnpike to downtown Boston. This project includes the provision of improving the alignment of I-90 between Cambridge Street and Commonwealth Avenue when all-electronic tolling (AET) is implemented. Provisions for improved access through the project area for alternative modes of transportation will also be considered.

Central Broadway Streetscape Improvements

Agency: City of Somerville

The City of Somerville initiated its Central Broadway Streetscape project in 2014, studying existing transportation needs, and evaluating and preparing an urban streetscape design that improves safety and function along Central Broadway. The study will result in a preferred design and engineering specification for a multimodal corridor that enhances safety and accessibility along Central Broadway, and stimulates economic development opportunities called for in the “Somerville by Design” neighborhood plan for Winter Hill.

Citywide Mobility Plan

Agency: City of Somerville

In 2015, the City of Somerville will launch a 12-18 month citywide strategic planning process focusing on mobility. Extensive data collection and analysis will be conducted, and deliverables will include customized multimodal level-of-service criteria for Somerville. Street typologies and design standards will be established. Capital and operating budgets will be evaluated, and related policies, programs and projects will be studied and

prioritized for consistency with the adopted SomerVision Comprehensive Plan.

Climate Change Adaptation Plan: Phase I, Transportation Asset Vulnerability Assessment — Agency: MassDOT

MassDOT (the Office of Transportation Planning) has been conducting a statewide transportation asset-vulnerability assessment. The study aims to provide a better understanding of which MassDOT's assets (infrastructure) are most likely to be at risk due to future inland flooding by utilizing the latest climate model results, suitable hydrologic and hydraulic tools, geospatial analysis and scenario planning methods. The potential impact of extreme heat on transportation assets and operations is also investigated qualitatively. The project aims to deliver the following outputs: 1) Downscaled climate projections for three emission scenarios (Representative Concentration Pathway 4.5, 6.0 and 8.5) for four future periods (2030, 2050, 2070 and 2100) (completed); 2) A prototype methodology for estimating future climate-related inland flooding risks and asset vulnerability at the state level (in process); 3) High-level synthesis of extreme heat impact on transportation assets and operations (completed); 4) Future 100-year floodplain maps for selected climate scenarios and periods; 5) Risk analysis of MassDOT's critical assets' exposure to future inland flooding.

Arsenal Street Corridor Study — Agency: MassDOT

The Arsenal Street Corridor Transportation Study aims to evaluate existing and future multimodal transportation conditions along the Arsenal Street corridor in the Town of Watertown and its surrounding communities in order to develop and analyze alternatives to improve transportation conditions. The study will have a primary focus on bus service along Arsenal Street and at locations where bus service ties into crossing bus routes, including but not limited to MBTA routes 57, 70/70A, 71 and 73. The study will also examine and evaluate alternatives in the context of vehicular, bicycle and pedestrian use, land use, economic development, community effects, health effects, and

cost, as well as in the context of impact on existing users of the transportation network. Twenty study area intersections, from Galen Street to Soldiers Field Road, are highlighted in the study.

Lower Mystic Regional Working Group Agency: MassDOT

The Massachusetts Department of Transportation (MassDOT) has convened the Lower Mystic River Regional Working Group chaired by the Secretary of Transportation, and made up of elected officials and staff of the three communities of Boston, Everett and Somerville as well as the Metropolitan Area Planning Council (MAPC). Representatives from other state agencies, the office of Representative Mike Capuano, and the Wynn Everett Casino are also members of the Working Group. The purpose of the Working Group is to assess and develop short and long-range transportation improvements that can support sustainable redevelopment and economic growth for this area, particularly in and around Sullivan Square. Central to this work will be transportation analyses to determine likely impacts of development proposals, which will inform potential measures that could be taken to address those impacts, critical infrastructure that may be needed, as well as an examination of potential methods to pay for these improvements in an equitable manner.

Dudley Square Complete Streets Design Project Agency: City of Boston

The Dudley Square Complete Streets Design Project is a Boston Transportation Department (BTD)–led initiative and community-planning process that will develop roadway, intersection, and streetscape design plans for construction in Dudley Square. The initiative aims to modernize existing conditions and bolster the ongoing municipal and private investment projects in Dudley Square, including the Ferdinand Building and the former Area B-2 police station site. The project will consider a range of improvements for traffic, parking, buses, pedestrians, bicycles, accessibility, and the overall safety and aesthetics of the streets and sidewalks. Special emphasis will be given to developing plans that improve the multimodal environment of Dudley Square and build upon previous planning initiatives. The geographic limits of

work are generally bounded by Dudley Street between Shawmut Avenue and Harrison Avenue, Washington Street between Shawmut Extension and Melnea Cass Boulevard, and Warren Street between Kearsarge Avenue and Washington Street.

Fairmount Planning Initiatives — Agency: Various

State transportation agencies are partnering with federal agencies, the City of Boston, and neighborhood-based organizations on a number of planning initiatives designed to improve access to transit and promote sustainable development in the Fairmount Corridor. These initiatives, which are underway as the MBTA completes major infrastructure improvements and three of the four planned new stations on the Fairmount Line, include:

- ***Fairmount Corridor Business Development and Transit Ridership Growth Strategy*: Fairmount CDC Collaborative with the MBTA has received a Transportation, Community and System Preservation grant to improve the transit service connection to job development in the Fairmount Corridor.**
- ***Fairmount Indigo Corridor Planning Initiative*: The Boston Redevelopment Authority is spearheading this planning process, which involves the participation of community and agency stakeholders. A vision for Corridor land use and neighborhood change that is focused on enhanced transit is being developed, along with an action plan for targeted redevelopment and public infrastructure upgrades at station areas.**

CTPS will support Fairmount Planning Initiatives through the* Fairmount Line Station Access Analysis *project (page 6-15).

Green Line Extension — Agency: MBTA

The Green Line Extension (GLX) project is an initiative to extend existing MBTA Green Line service from a relocated Lechmere Station in East Cambridge to Somerville and Medford with a spur to Union Square in Somerville. The purpose of this project is to boost transit ridership, improve air quality, ensure equitable distribution of transit services, and support opportunities for smart-growth initiatives and sustainable development in Cambridge, Somerville, and Medford. The project is

required by the State Implementation Plan (SIP) and fulfills a longstanding commitment of the Central Artery/Tunnel project to increase public transit.

The Federal Transit Administration (FTA) New Starts program provides grants for new and expanded rail, bus rapid transit, and ferry systems that reflect local priorities to improve transportation options in key corridors. In June 2012, FTA approved entry of the GLX Project into the Preliminary Engineering phase of project development under the New Starts Program. In January 2015, the MBTA and the FTA signed a Full Funding Grant Agreement (FFGA), which establishes the scope of federal participation in the Green Line Extension project.

As the project proceeded, it was later found that the estimated cost to construct the GLX project had grown from the $1.992 billion project cost established in January 2015. The new total cost was projected between $2.7 billion and $3.0 billion. The Commonwealth's share of overall project costs would then be between $1.7 billion and $2.0 billion, rather than the initial budget of $996 million.

With the federal contribution capped at $996 million and the Commonwealth responsible for all project cost increases, MassDOT and the MBTA re-evaluated the GLX project in order to recommend to the Commonwealth if, and how, the project should proceed. Then MassDOT and the MBTA worked to identify opportunities to value engineer elements of the project in order to bring costs of the overall project closer to the original anticipated costs. The MBTA Fiscal and Management Control Board (FMCB) and the MassDOT Board of Directors were briefed about these developments.

The GLX project management team developed a new approach to the GLX project that focused on maintaining the same functionality and service plan of the former concept (so as to not diminish ridership, and air-quality and transportation benefits), but to do so in a manner that utilized different construction approaches and designs to reduce costs. In addition, the project management team developed station designs and a vehicle maintenance facility that could provide the same function as originally envisioned, but that were greatly reduced in scope and costs. Based on this redesign, the project management team developed a new project, which had a total capital cost estimate of $2.28 billion.

The MBTA is now moving forward on the project utilizing a design-build (DB) project delivery method. The MBTA issued an invitation to bid in November 2016 and identified three qualified DB teams. A draft request for proposal (RFP) was issued in March 2017. A final RFP will be

issued in May 2017 with proposals and bids due in September 2017. The award of the contract will occur in November 2017 with construction beginning in the spring of 2018.

Intelligent Transportation Systems: Development and Implementation — Agency: MassDOT

MassDOT is engaged in planning, developing, and implementing intelligent transportation systems (ITS) to more effectively operate the transportation system in Massachusetts. MassDOT's Office of Transportation Planning conducts ITS planning, as described in the State Planning and Research Program, Part I. Current planning activities include implementing a statewide ITS planning program, deploying a recently completed statewide ITS strategic plan, maintaining and updating the regional ITS architectures for metropolitan Boston and other regions within the state, increasing awareness of ITS within the transportation community and among related stakeholders, planning activities in support of the use of ITS as a tool for improving system performance and function, and providing assistance in planning for the use of ITS for all modes.

MassDOT's Highway Division established the ITS Programs Unit within the Statewide Operations Division to design, develop, implement, and maintain ITS systems for the state highway system. The ITS Programs Unit works with consultants and contractors on these rapidly evolving technologies. Current activities in the Boston region include operation of the Statewide Traffic Operations Center in South Boston, operation of the high-occupancy-vehicle (HOV) lanes on I-93 into Boston from the north and south, expansion of the real-time travel monitoring (RTTM) system deployment, operation of the Massachusetts Interagency Video Information System (MIVIS) and advanced traveler-information system, and development of an Advanced Transportation Management System.

MassDOT Greenhouse Gas Strategies Phase II – Energy and Emissions Reduction Policy Analysis Tool (EERPAT) Strategy Testing — Agency: MassDOT

MassDOT is working with the Executive Office of Energy and Environmental Affairs (EOEEA) to adapt FHWA's Energy and Emissions Reduction Policy Analysis Tool (EERPAT), which will enable modeling of the effectiveness of various approaches to reducing

transportation sector GHG emissions. The EERPAT tool will help MassDOT model the GHG impacts associated with capital investments, and examine system adjustments for both transit and roadway operations. The EERPAT tool also may allow for the modeling of GHG impacts of education and encouragement policies designed to encourage mode shift, carpooling, and eco-driving. The results of this modeling and other analysis will be used to refine the transportation sector strategies included in EEOEA's Clean Energy and Climate Plan for 2020 (CECP).

MBTA Modal Plans

Agency: MassDOT

MassDOT's Office of Transportation Planning will be undertaking a series of mode-specific plans as part of the Program for Mass Transportation update. MassDOT will procure consultant support for the technical and civic engagement elements of the modal plans.

CTPS will support the development of MBTA Model Plans through the* MassDOT Statewide Planning and Research Program Support *project (page 7-16).

North/South Rail Link Feasibility Study

Agency: MassDOT

NEC FUTURE

Agency: Federal Railroad Administration

NEC FUTURE is a comprehensive federal planning effort, launched by the Federal Railroad Administration in February 2012, to define, evaluate, and prioritize future investments in the Northeast Corridor (NEC), from Washington, D.C to Boston. The FRA has initiated a comprehensive planning process for future investment in the corridor through 2040. Through the NEC FUTURE program, the FRA will determine a long-term vision and investment program for the NEC, and provided a Tier 1 Environmental Impact Statement (EIS) and Service Development Plan (SDP) in 2016 in support of that vision. Technical work includes an analysis of market conditions in the corridor, development of program alternatives, an evaluation of the environmental impacts of those alternatives, and a recommended

approach that balances the needs of various users of the corridor—whether commuters, intercity passengers, or freight—in a manner that ensures safe, efficient travel throughout the Northeast. The NEC Future process has proceeded to Phase 2, which is ongoing. For more information, visit the NEC Future website (http://www.necfuture.com/).

New England University Transportation Center (Region One)

Agency: Colleges and Universities

The New England University Transportation Center (Region One) is a research consortium which includes the Massachusetts Institute of Technology (lead university), Harvard University, and the state universities of Massachusetts, Connecticut, and Maine. It is funded by the USDOT's University Transportation Centers (UTC) Program. The New England UTC conducts multiyear research programs that seek to assess and make improvements to transportation safety, as well as develop a systems-level understanding of livable communities. For further information, visit the New England University Transportation Center's website.

Rutherford Avenue – Sullivan Square Design Project, Charlestown

Agency: City of Boston

The City of Boston is proceeding with the redesign of the Rutherford Avenue corridor in Charlestown, which extends about 1.5 miles from the North Washington Street Bridge to Sullivan Square and provides a critical connection between Everett, Somerville, and other suburbs north and east of Boston, and Boston's downtown business area. The corridor's highway-like design is inconsistent with present-day circumstances, and the function and design of the Sullivan Square rotary is problematic. Pedestrian mobility is limited and bicycle travel is not compatible with the high-speed road. The corridor is 8 to 10 lanes wide (120 to 140 feet), which has created a significant barrier to areas on either side of the roadway, such as the Bunker Hill Community College, Paul Revere Park, the Hood Business Park employment area, and MBTA rapid transit stations.

There are significant transit-oriented development (TOD) opportunities along the corridor, and public investment in new infrastructure will provide support for the development of commercial and residential uses that otherwise would be unlikely

or unable to locate in the area. A number of major structural elements in the corridor were constructed more than 60 years ago; they are approaching the end of their life cycle and will need to be replaced. With the completion of the Central Artery/Tunnel (CA/T) project and more traffic now remaining on facilities such as I-93 and US Route 1, a dramatic reduction in traffic volumes along Rutherford Avenue presents a unique opportunity to transform the corridor's character from a 1950s automobile-oriented facility to a 21st-century multimodal urban boulevard corridor that will attract private developments.

South Coast Rail Project — Agency: Various

The South Coast Rail project will restore passenger rail transportation from South Station in Boston to the South Coast of Massachusetts, including the cities of Taunton, New Bedford, and Fall River. The Final Environmental Impact Statement/Report (FEIS/R) was issued in September 2013, and the state was authorized to advance permitting in November 2013. The project will include 10 new stations, modifications at Canton Junction and Stoughton, and two layover facilities at the end of both the Fall River Secondary leg at the Weaver's Cove East site and the end of the New Bedford Mainline leg at the Wamsutta site.

In November of 2016, in response to a significantly longer time line and a much higher estimated project cost, the SCR team was directed to examine possible strategies for faster implementation of rail service to the South Coast.

On March 15, 2017 MassDOT filed a Notice of Project Change(NPC) with the Massachusetts Environmental Policy Act (MEPA) Office articulating a phased approach to the project. Phase I would build the Southern Triangle from Cotley Junction south to Fall River and New Bedford and using the existing Middleborough Secondary Line, which currently carries freight traffic. Offering limited service, commuter trains would then connect to the Middleborough/Lakeville Service. While design and construction proceeds during Phase I, engineering design on the norther section of the route to Stoughton would continue.

The Southeastern Regional Planning and Economic Development District (SRPEDD) directs the South Coast Rail Task Force, which is composed of appointed members from the 31 communities in the South Coast Rail Corridor, as well as regional transit authorities and environmental groups. Initially established as a result of the 2002 Secretary's Certificate, the Task Force focus is now limited to land-use

planning rather than route determination and vetting. Visit the South Coast Rail website for more information on this project.

Arsenal Street Corridor Transportation Study — Agency: MassDOT

The Arsenal Street Corridor Transportation Study aims to evaluate existing and future multimodal transportation conditions along the Arsenal Street corridor in the Town of Watertown and its surrounding communities in order to develop and analyze alternatives to improve transportation conditions. The study will have a primary focus on bus service along Arsenal Street and at locations where bus service ties into crossing bus routes, including but not limited to MBTA routes 57, 70/70A, 71 and 73. The study will also examine and evaluate alternatives in the context of vehicular, bicycle and pedestrian use, land use, economic development, community effects, health effects, and cost, as well as in the context of impact on existing users of the transportation network. Twenty study area intersections, from Galen Street to Soldiers Field Road, are highlighted in the study.

South Station Expansion Project — Agency: MassDOT

The 13 tracks currently available at Boston's South Station significantly constrain current and future rail mobility not only within Massachusetts but throughout New England and Amtrak's Northeast Corridor. South Station operates above its design capacity for efficient train operations and orderly passenger queuing, and lacks comfortable, modern facilities for passenger queuing, leaving riders standing in the elements as they wait to board their trains.

This project will complete all necessary alternatives analysis, environmental review, and preliminary engineering (approximately 30 percent design) required for the expansion of South Station and for the development of a new midday commuter rail layover facility. The project will include planning and designing an enhanced passenger environment at South Station through improved streetscape and pedestrian, bicycle, local transit, and vehicular facilities in and around South Station, including the reopening of Dorchester Avenue at the station for public use. The project will consider opportunities for joint public-private development above an expanded South Station, and will also include a plan for the relocation of the existing US Postal Service General Mail Facility, which must be moved to accommodate the station's expansion.

Transportation Master Plan

Agency: City of Framingham

The Department of Public Works in Framingham is undergoing a three part transportation plan in conjunction with an economic development plan to identify effects on transportation systems of likely growth, and identify mitigation and improvements of the Town's roadways and bicycle/pedestrian pathways, traffic calming updates, other transportation, and neighborhood outreach efforts. Part 1 of the Transportation Master Plan is currently underway. Part 2 is expected to commence in the near future along with the economic development plan. This comprehensive plan for the Town's transportation systems will provide a long-term "road map" of what is required for improvements and maintenance. The plan will include transportation systems owned and operated by the Town, as well as connections to railroads and state highways.

Edgell Road Corridor Study

Agency: City of Framingham

The Department of Public Works in Framingham developed a draft complete streets assessment of the Edgell Road corridor from Vernon Road north to the Edmands Road/Water Street intersection. The evaluation provides recommendations for enhancement and improvements at six key intersections. Tasks undertaken for this study include: evaluation of existing and projected traffic conditions; review of current bicycle and pedestrian accommodations in accordance with the Town's Complete Streets Policy (adopted January 2015) and current ADA/AAB standards; inventory of needed improvements and ADA ramp concept designs; utility research; crash data analysis; development of improvement alternatives; amongst others.

Bus Rapid Transit Planning

Agency: MAPC, City of Boston

NSPC Mobility Study — Agency: MAPC

Lower Mystic Regional Working Group — Agency: MassDOT, MAPC, CTPS

The Massachusetts Department of Transportation (MassDOT) has convened the Lower Mystic River Regional Working Group chaired by the Secretary of Transportation, and made up of elected officials and staff of the three communities of Boston, Everett and Somerville as well as the Metropolitan Area Planning Council (MAPC). Representatives from other state agencies, the office of Representative Mike Capuano, and the Wynn Everett Casino are also members of the Working Group. The purpose of the Working Group is to assess and develop short and long-range transportation improvements that can support sustainable redevelopment and economic growth for this area, particularly in and around Sullivan Square. Central to this work will be transportation analyses to determine likely impacts of development proposals, which will inform potential measures that could be taken to address those impacts, critical infrastructure that may be needed, as well as an examination of potential methods to pay for these improvements in an equitable manner.

MetroWest LandLine: Phase 1 — Agency: MWRC (MAPC)

MetroWest cities and towns boast many lovely paths and trails, but many of them don't connect. With the MetroWest LandLine Phase I project, MWRC is taking the first step in connecting those trails, and transforming them into a cohesive, regional active transportation and recreational network called the MetroWest Landline.

With this project, which will launch in the fall of 2018, MAPC's transportation team, working with MWRC members, will develop and promote an action plan to close one priority gap in each participating city and town. This joint effort will built community support for those action plans and for further strenghtening the MetroWest LandLine.

Foxboro Station Commuter Rail Pilot Program — Agency: Town of Foxborough

CTPS is assisting MassDOT and the Town of Foxborough with the proposed Foxboro Station Commuter Rail Pilot program. Utilizing the proposed pilot schedule developed as part of the operations analysis effort, CTPS will develop projected ridership estimates for the pilot. Work efforts will include the following:

1. Update CTPS' model to reflect current land use assumptions.
2. Utilizing the operations analysis schedule for the pilot service, model the projected ridership for the pilot duration in terms of daily and annualized riders. Model outputs will include riders boarding at Foxboro Station, new systemwide riders, and diversions from other stations.
3. From the travel demand forecasting effort, identify a ridership target for the pilot period duration, as well as average daily ridership, including riders shifting from other forms of public transit and riders new to public transit. Model outputs identify ridership information as well as highway and transit volumes.
4. In addition to ridership estimates, identify the impact that the proposed pilot service will have on the available parking supply at Foxborough and at other area stations.
5. From the model, identify project parking and ridership revenues for the pilot service, daily and annually.
6. Using outputs from the model, CTPS can also:

*quantify the estimated regional air quality benefits resulting from pilot service.
*identify EJ impacts or benefits of the service.

Foxborough Local Bus Service

Agency: Town of Foxborough

The Town of Foxborough is working with GATRA and the Neponset Valley TMA to establish local bus service between downtown Foxborough and Patriot Place/Gillette Stadium. This bus service will serve 3 out 4 of the Town of Foxborough's Growth Nodes, identified in the 2015 Master Plan as priority areas for development.

Pedestrian/Bicycle Crossing of the Mystic River

Agency: City of Everett

This study will select a bridge design and location and develop 25% design plans for a bike/pedestrian crossing of the Mystic River from the Wynn Resort/Mystic View Park to Draw 7 Park in Somerville. This connection would be a further extension of the Northern Strand Trail from Everett and connect to the developing path network on the east side of the

Mystic River. It would complete a 10-mile continuous off road path from the North Shore to the City of Boston.

Extension of the Northern Strand Bike Trail — Agency: City of Everett

This study will determine an appropriate path and develop a conceptual design for extension of the Northern Strand Community Trail to the Mystic River. The NSCT currently runs from Lynn to Everett, ending just north of Revere Beach Parkway in Everett. The future extension would make connections to the Mystic River, Wynn Resort, Gateway Shopping Center and Mystic View Park.

Lower Broadway Dedicated Bus Lane Study and Design — Agency: City of Everett

Seeking to build on the success of the upper Broadway bus lane, the City seeks to extend a bus-only lane south to the City limits on Rte 99/Broadway. This study would determine how such a lane would be constructed, the extent of ROW acquisitions required, and conceptual design and traffic analysis.

Second Street Reconstruction — Agency: City of Everett

The Everett Transit Action Plan (2016) identified a future transit route that would extend the Silver Line Gateway from Chelsea to Everett Square utilizing existing MBTA ROW as well as Second Street in the City of Everett to reach Everett Square. This study will develop a conceptual design to reconstruct Second Street to accommodate existing vehicle traffic as well as dedicated bicycle and bus lanes from the Chelsea line to Everett Square.

Sweetser Circle Visioning Process — Agency: City of Everett

Sweetser Circle is the interchange between Revere Beach Parkway (Rte 16), Broadway (Rte 99) and Main Street. It is a highly congested and dangerous intersection that does not have adequate accommodations for transit, bicycles or pedestrians. The current roadway layout also prevents access to over 10 acres of un-used parkland. This study would begin a process to develop a new vision for the roadway and parklands in this area that would inform future maintenance and reconstruction of the interchange.

Neighborhood Slow Streets — Agency: City of Boston

Each year, residents, neighborhood associations, and other community-based organizations will be able to apply for traffic calming in a specific neighborhood. Selected neighborhoods will work with the Boston Transportation Department and Public Works Department to plan and implement their Neighborhood Slow Streets project. Rather than planning and implementing changes on one street at a time, Boston will address an entire “zone” within a neighborhood. A typical zone will consist of 10 to 15 blocks. The Slow Streets program will emphasize quick-install, low-cost fixes, such as signage, pavement markings, speed humps, and daylighting.

Performance Parking Pilot — Agency: City of Boston

The Performance Parking initiative aims to set more parking spots aside for those trying to get to our busiest neighborhoods. The iniative is studying how the City can use flexible meter rates to reduce the amount of time it takes to find a parking space. The meter prices may go up or down depending on how full the parking spaces are on certain blocks. The price will stabilize when the amount of drivers using spots reaches our occupancy target, which is about one space open per block. Flexible meter rates have been shown to open up more parking spots in other cities who have used them. By raising meter rates in Boston’s most-congested areas, the city can direct motorists to less busy streets to quickly find spots and boost the use of public transportation and encourage motorists who intend to park for a long time to use off-street parking.

DriveBoston — Agency: City of Boston

DriveBoston is the City’s program to provide parking spaces in municipal lots and on city streets for carshare vehicles. In the pilot phase of the program, 80 spaces will be distributed throughout the city. The pilot phase starts in the fall of 2015 and lasts 18 months. There will be 49 spaces in municipal lots and 31 spaces reserved curbside. Working with Zipcar and Enterprise CarShare, Transportation Department planners visited a number of locations and picked places with the largest benefit for residents that also had the smallest impact on street operations and parking.

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APPENDIX B

Public Participation and Response to Public Comments

[Under Development]

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APPENDIX C

Federal Fiscal Year 2018 UPWP
Universe of Proposed New Studies

Appendix C: Federal Fiscal Year 2018 UPWP Universe of Proposed New Studies

This appendix includes the Universe of Proposed New Projects, which documents the proposed new discrete studies that the Boston Region Metropolitan Planning Organization (MPO) staff and the Metropolitan Area Planning Council (MAPC) staff collected or developed for the development of the federal fiscal year (FFY) 2018 Unified Planning Work Program (UPWP). Each entry includes a summary of the purpose of the proposed study and the anticipated outcomes.

Studies in the universe are organized into the following categories:

- Active Transportation
- Land Use, Environment, and Economy
- Multi-Modal Mobility
- Transit
- Other Technical Support

Each proposed study in the universe is evaluated based on the following evaluation areas:

- **Primary and secondary Long-Range Transportation Plan (LRTP) goal areas :** whether a study addresses, either as a primary focus or secondary focus, one of the six LRTP goal areas:
    - Safety
    - System Preservation
    - Clean Air/Clean Communities
    - Transportation Equity
    - Capacity Management/Mobility
    - Economic Vitality

- **Mode:** whether a study primarily addresses roadway, bicycle, pedestrian, or transit modes of travel

- **Study scale:** whether a study primarily impacts one or two specific communities in the region, or the region as a whole

- **Time frame and type of impact:** whether a study results in research and findings that enhance the state of the transportation planning practice in the Boston Region, low-cost/short-term implementation of improvements, or, long-term implementation (for transportation studies leading to implementation by an agency or construction projects that must follow the Massachusetts Department of Transportation design process)

- **Connection to existing work:** whether a study furthers previously conducted analysis, or builds off or enhances existing MPO work

- **Continuing or new study:** whether a study has been conducted previously at a specific location/roadway and is being conducted again at a new location, or whether a study is a completely new idea that has never been undertaken by the MPO.

Evaluating the studies in this way will allow MPO staff to analyze how federal planning funds are being spent in the region over time and to compare the amount of spending across the various evaluation areas. Furthermore, tracking spending by LRTP goal area, mode, study scale, etc., will allow MPO staff, in coordination with the MPO and the public, to set goals for how federal transportation planning funds are spent by the MPO for the benefit of the region.

In addition to evaluating the proposed new studies in the Universe, MPO staff defines general scopes and estimated costs for the proposed studies and considers potential feasibility issues. These various factors, along with the availability of funds for new studies, were considered as staff identified a recommended set of new proposed planning studies for review by the UPWP Committee. For more information on the process of developing and evaluating the Universe, please see Chapter 1.

FFY 2018 Draft Universe of Studies and Evaluation

			LRTP Goal Areas						Mode			Study Scale		Impact			Other		
ID	Project Name	Project Purpose and Outcome	Safety	System Preservation	Clean Air/Clean Communities	Transportation Equity	Capacity Management/Mobility	Economic Vitality	Multi-Modal Roadway	Bicycle Pedestrian	Transit	Specific Community	Broader Region	Enhance State of Practice	Low-Cost/Near-Term Implementation	Long-Term Implementation	Connection to Existing Work	Continuing Study	New Study
ACTIVE TRANSPORTATION																			
A-1	Analysis of Bicycle and Pedestrian Crash Clusters	**Purpose:** This study would review bicycle and pedestrian crash clusters identified by the MassDOT Highway Division and the Boston Region MPO. Three locations would be selected for closer study and to develop recommendations for safety and mobility improvements to improve bicycle and pedestrian safety. **Anticipated Outcome:** MPO staff would work with municipalities and other stakeholders to propose cost-effective and low-cost improvements to increase safety for bicyclists and pedestrians at those locations.	P		S	S				P		P		S	P		P		
A-2	Before and After Studies of Bicycle- and Pedestrian-Related Improvements in TIP Projects	**Purpose:** This study would conduct detailed counts, analyze crash data, and survey people using the street and businesses to compare "before" and "after" conditions and public perceptions of projects funded through the TIP, with an emphasis on bicycle and pedestrian projects. **Anticipated Outcome:** Identify effects of the newly constructed projects on traveler behavior, safety, and mode split compared to existing conditions and relative to conditions on similar nearby streets that did not receive newly constructed facilities.	P		S	S				P			P			P	P		
A-3	Bicycle Level-of-Service Metric	**Purpose:** This study would help to understand the travel behaviors and comfort levels of cyclists within diverse environments and to be better able to accurately plan for transportation in the Boston region. It would include a literature review of existing bicycle level-of-service (LOS) criteria and would identify data that CTPS staff should use when modeling cyclist trips. Depending on data availability, staff will establish criteria for an LOS metric to use when evaluating bicycle facilities in the Boston region. **Anticipated Outcome:** 1) Enhanced ability to calculate expected bicycle trips and 2) improved prioritization of projects.	P		S	S				P			P	P			P		
A-4	Exploring Places and Times for Car-Free Days	**Purpose:** This study would aim to understand and analyze the appropriateness of instituting car-free days or locations. CTPS staff would work with up to three selected municipalities to analyze streets, days, and times that car-free days would benefit the community and multimodal transportation or recreation throughout the community. Aspects that could be analyzed to understand the possible costs and benefits of establishing a car-free street/day include: traffic and commuting patterns, air quality improvements, economic impact to businesses, and community support, among others. **Anticipated Outcome:** A recommended approach to implementing car-free days/streets and an analysis of the costs and benefits that could be realized.			P			S	P	S		P			P				P

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LAND USE, ENVIRONMENT, AND ECONOMY																			
L-1	Transportation Mitigation of Major Developments: Review of Strategies	**Purpose:** This study would build off of the MPO's Core Capacity Constraints study (included in the FFY 2015 UPWP, to be complete by Fall 2017) that focused on examining strategies to mitigate the impacts new developments may have on the region's transportation system. Through this particular study, inspired by the discussion of transportation mitigation strategies at the January 8, 2015 MPO meeting, MPO staff would explore major land use developments that have occurred in the recent past (perhaps 15 years), along with transportation mitigation measures that were incorporated into the development process. These would include measures to address the impacts that the new development would have on the transportation system, such as the increased travel demand on nearby rapid transit or bus routes. MPO staff would then track the implementation of these measures and try to assess results. **Anticipated Outcome:** Through this process, MPO staff may be able to make recommendations for improvements to transportation mitigation-related processes and regulations and to the types of mitigation measures required by permitting agencies.			S			P	P	S	S	S	P	P					P
L-2	Energy and Electric Vehicle Use in the MPO Region	**Purpose:** MPO staff would gather information and develop a profile of energy use for transportation in the MPO region. MPO staff would focus in particular on energy-use trends that pertain to electric vehicles. **Anticipated Outcome:** This study would inventory the distribution and location characteristics of charging stations,examine the characteristics of the electric vehicle fleet in the Boston region (such as the proportions of electric vehicles that are owned by households as compared to institutions), and analyze trends in the availability and use of these vehicles. Currently, much of this data is held and organized by various municipalities and other bodies that have expressed interest in working together but have not yet done so; the MPO could serve as a clearinghouse for this data-sharing. Other activities may include an analysis of levels of consumption for different fuel types. This information may be useful to the MPO in future plan development and performance-based planning activities.			P				P				P	P					P
L-3	Shopping Behavior and Mode of Arrival	**Purpose:** This study aims to create a regional understanding and application of previous research conducted in other states about shopping behavior by mode of arrival. Previous research indicates that the mode breakdown of arrivals can vary greatly depending on the built environment and context of a retail corridor. In many urban retail corridors more shoppers than merchants might recognize arrive by non-automotive modes and that in many types of stores and retail environments pedestrians, bicyclists, and transit riders spend just as much money as drivers. The supply and availability of parking is an issue in planning and implementing priority bus lanes and bicycle/pedestrian facilities as well as when new development comes to an area. This study would select two or three specific locations in the Boston region to understand local shopping behavior by individuals arriving by various modes. One approach to this study could be to survey retail arrivals and behavior across three very different built environments; another would be to focus on major retail corridors in an urban environment (possibly choosing the locations of study could be to build off of a study that the MPO is currently conducting on priority bus lanes), recognizing that consumer behavior in those corridors is particular poorly understood. **Anticipated Outcome:** This study would seek to quantify findings about mode of arrival and/or customer spending by mode of arrival in specific commercial corridors or areas and make recommendations for allocations of scarce street space and planning resources accordingly. The local knowledge gained from this study could help municipalities adjust parking requirements for new developments and could be an important tool in gaining support for additional bicycle, pedestrian, and transit infrastructure.						P	S	S	P	P	S	P					P
MULTIMODAL MOBILITY																			

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M-1	Safety and Operations Analysis at Selected Intersections	**Purpose:** To examine mobility and safety issues at major intersections on the region's arterial highways, where, according to the MPO's crash database, many crashes occur. These locations are also congested during peak traffic periods. The resulting bottlenecks may occur only at single large intersections, but usually spill over to a few adjacent intersections along an arterial. These intersections may also accommodate multiple transportation modes, including buses, bicyclists, and pedestrians. The study would use data CTPS receives from Google to isolate the traffic effects of crashes on the surrounding road network. **Anticipated Outcome:** This study would build directly on the results of the monitoring of delays and safety along arterial roadways that the Congestion Management Process (CMP) produces, and the resulting recommendations would be "management and operations" improvements.	P	S			S		P			P	S	S	S	P		P	
M-2	Safety Improvements at Express-Highway Interchanges	**Purpose:** Continue to address the 2013 MassDOT Top 200 High-Crash Locations and Highway Safety Improvement Program (HSIP) crash clusters in the Boston Region MPO. Many of these are express-highway interchanges, and some of them do not need costly complete rebuilds but rather low-cost improvements that address safety and operations. **Anticipated Outcome:** The study would review the Top 200 Intersection Clusters and HSIP crash clusters to identify candidate locations. MPO staff would develop low-cost safety and operational improvements.	P	S			S		P			S	P		P		P		
M-3	North Shore Mobility Study	**Purpose:** There is significant interest in examining opportunities to build on latent demand for multimodal transportation options on the North Shore. Interesting possibilities include a South Salem commuter rail station near Salem State Univ.; reviving bikeshare on the SSU campus; coordinating rail shuttles to and from SSU and NSCC; examining possible last-mile partnerships; bringing bike-friendly options to Lynn; the North-South Rail Link and commuter rail modernization in general, with a special emphasis on making the system work for people working non-traditional schedules. **Outcome:** A study of connections between various modes of transit and transportation on the North Shore, with a particular emphasis on connections and scheduling for non-9-to-5 users, existing and potential.					P		S	S	P	S	P		P	S	S		P
M-4	Canton-Area Transportation Study	**Purpose:** The Town of Canton is interested in CTPS studying several potential improvements to the transportation network in and around the town. These include crash-prone intersections, pedestrian improvements, potential impacts from South Coast Rail, and in the longer term potential changes to local interchanges, last-mile partnerships for access to commuter rail, etc. **Outcome:** A study examining short- and longer-term ideas for multimodal transportation options in Canton and the surrounding area.			S		P	S	P	S	S	P			P	S			P
M-5	Potential Impacts of Autonomous Vehicles	**Purpose:** Under this proposal, staff would study the potential ways in which automated vehicles might become part of the regional transportation environment and their potential impacts on needed infrastructure and travel behavior. **Outcome:** An evaluation of ways in which the region's transportation planning and programming priorities might need to change as a result of the introduction of AVs.	P				S		P				P	P		S			P

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M-6	Safe Routes to School Followup	**Purpose:** To determine the percentage of trips generated from driving children to school (consider trip chaining, distance out of way of end destination, public and private schools, metro/suburb/rural differences) and link to effectiveness of SRTS efforts. The study could utilize other data analyze the effectiveness of SRTS – not just crash data, but also health, mode share, equity, etc., but recognize that there are many other factors. This would have to take place over longer period of time. **Outcome:** A study building on previous results to provide a comprehensive picture of the successes and challenges of the SRTS program.	P							P				S	P		P		
M-7	Travel Alternatives to Regional Traffic Bottlenecks	**Purpose:** To use traffic data (Inrix or otherwise) to develop an understanding of how regional traffic moves through cities, and explore alternatives at key bottlenecks that prioritize the needs of municipalities and mode shift to sustainable modes. **Outcome:** a study or handbook about how to handle congestion resulting from regional traffic flows, with an emphasis on providing mode shift opportunities.		S	S		P	S	P			S	P	P	S				P
M-8	Metrics for Describing the Full Spectrum of Travel Needs	**Purpose:** Develop clearer, concise, and gripping ways to use data of roadway users to better communicate balance of needs on a corridor (people throughput versus amount of space used by the vehicles) to steer away from LOS and help prioritize sustainable modes. **Outcome:** develop a set of metrics and/or popularly accessible terms to express the needs of all corridor travelers.	P	S	S	S	S		S	P	S		P	P	S				
M-9	Addressing Safety, Mobility, and Access on Subregional Priority Roadways	**Purpose:** During MPO outreach, Metropolitan Area Planning Council (MAPC) subregional groups identify transportation problems and issues that concern them, often those relating to bottlenecks or lack of safe access to transportation facilities in their areas. These issues can affect livability, quality of life, crash incidence, and air quality along an arterial roadway and its side streets. If problems are not addressed, mobility, access, safety, economic development, and air quality are compromised. **Outcome:** Anticipated outcomes include data collection, technical analysis, development of recommendations, and documentation for selected corridors.	P				S		P			P			P			P	
M-10	Addressing Priority Corridors from the Long-Range Transportation Plan Needs Assessment	**Purpose:** The purpose of these studies are to develop conceptual design plans that address regional multimodal transportation needs along priority corridors identified in the Long- Range Transportation Plan (LRTP), Charting Progress to 2040. These studies include recommendations that address multimodal transportation needs that are expected to arise from potential future developments in the study area. Outcome: Through these studies, MPO staff would recommend conceptual improvements for one or more corridors, or several small sections within a corridor, that are identified by the Congestion Management Process and the LRTP as being part of the needs assessment process. **Outcome:** Studies that would provide cities and towns with the opportunity to review the requirements of a specific arterial segment, starting at the conceptual level, before committing design and engineering funds to a project. If the project qualifies for federal funds for construction of the recommended upgrades, the study's documentation also might be useful to the Massachusetts Department of Transportation (MassDOT) and the municipalities.					P		P			P			P			P	

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TRANSIT																			
T-1	Monitoring On- and Off-Site Park-and-Ride Lot Use at and Near MBTA Stations	**Purpose:** 279 MBTA stations would need to be surveyed for bicycle parking data. Additionally, the MBTA parking lots, which have not been surveyed since 2013, also would need to be updated. The parking lots for this iteration of the park-and-ride lot survey will include any parking near stations that commuters use, including MBTA lots, private lots, and on-street parking. Because it is less costly to make a single visit to stations that offer parking for both modes, this collection effort will combine the data for both bicycle and automobile parking. This task will also include talking to communities to see what the parking trends for each station are and to see if the communities have recommendations of their own. This study would also look at the pricing and management structure of all of the publicly and privately owned parking lots at and near MBTA stations, as well as on-street parking, and might attempt to project demand and pricing dynamics into the future. **Anticipated Outcome:** Update the demand and supply of parking at MBTA stations and catalog the institutional structure that shapes pricing for parking in the lots.					P		S	S	P	S	P		P	S			P
T-2	A Review of Bus Interlining Operations at the MBTA	**Purpose:** Interlining is the practice of using transit vehicles interchangeably between different routes or lines. This study's goal would be to review some of the issues with interlining and discover the conditions where interlining may and may not be operationally beneficial. It would include a review of the MBTA's practices for scheduling running time and using interlining compared with use of these practices at peer agencies. **Anticipated Outcome:** The results of this study would provide the MBTA with parameters they could use to fine-tune how they schedule their services—reaping the benefits of interlining when it makes sense, yet providing reliable and resilient service.		S		S	P				P		P	P					P
T-3	Low-Cost Improvements to MBTA Rapid Transit Service	**Purpose:** This study would examine the transit system in the Boston Region MPO and identify several locations where inadequate service occurs as a result of inefficient passenger queuing, passenger loading, or wayfinding. Three to five locations where this "friction" occurs would be chosen for more in-depth study to identify low-cost solutions that could be implemented. This study would primarily focus on the MBTA rapid transit system but could include the MBTA commuter rail as well as locations within regional transit agency service areas that are in need of improvement. **Anticipated Outcome:** The first part of the study would involve a literature review to determine the range of low-cost solutions that exist and which ones would be most appropriate and efficacious to address identified service issues at the chosen locations. The resulting report would also describe the suggested processes for implementation of the solutions and could recommend an approach to study the after-condition at each location to determine how well the interventions are working.		S			P				P			P					P

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T-4	Beyond Commuter: Conceptualizing a Broadly Targeted Suburban Rail System	**Purpose:** Many suburban stakeholders (including in public meetings on both the North and South Shores) have shown interest in making the MBTA Commuter Rail network more useful to travelers going to a variety of destinations at a variety of times outside the traditional commute hours. This desire has resonance with international, and increasingly North American, efforts to utilize suburban mainline rail infrastructure to provide full-spectrum transit service, rather than a "peaky" service targeted mainly at 9-to-5 commuters. Additionally, utilizing existing rail infrastructure more efficiently and intensively can expand regional transit options at relatively little capital expense. This study will: examine international best practices for using suburban rail infrastructure to provide consistent, frequent service throughout the day; analyze recent North American efforts in this regard, including in Denver and Toronto; and create a conceptual framework for applying the lessons to MBTA's network. **Anticipated Outcome:** A white paper or conceptual study that compiles information on how mainline suburban rail networks have become useful to a broader spectrum of users in other metropolitan areas and begins to develop a framework for applying those lessons to the MBTA commuter rail network.					P				P			P	S		P			P
T-5	Comprehensive Ferry Transportation Planning in the Inner Core Area	**Purpose:** To study the possibility of more ferry service within water-adjacent parts of the ICC area. Quincy, Medford, and Everett are already doing some things with ferry transportation. As part of the casino development, Everett will have ferry service from the casino to South Boston and the airport. This study provides an opportunity for centralizing communication and planning for expansion of ferry services, which is currently being handled by several different bodies. **Anticipated Outcome:** A study analyzing potential demand and trip patterns for new or improved ferry service or other water-based transportation within the inner Boston region.					P	S			P	S	P		P				P
T-6	Title VI Service Equity Analysis: Methodology Development Phase II	**Purpose:** The first phase of this study was conducted to develop an approach to conducting Title VI service equity analyses that improved upon the FTA's methodologies, which led to the idea of using a transit supply metric to quantify adverse effects, known as the Modified Transit Opportunity Index (MTOI). In this first phase, most of the effort was focused on the general idea of using a transit supply metric and working it into the procedure for conducting a Title VI service equity analysis. This second phase will place more emphasis on developing the Modified Transit Opportunity Index to ensure its merit as a method to measure adverse effects, and to develop a program to calculate the Modified Transit Opportunity Index for the entire MBTA network. Some specific items that should be considered: ● How do we compare small changes in MTOI over a large population to large changes in MTOI over a small population? The adverse effects of a service change could be further weighted by the degree of change in MTOI (perhaps through a decay curve), or accompanying policy could state that adverse effects don't exist until the change in MTOI (absolute or percent) passes a certain threshold? ● Should Title VI service equity analysis procedures using MTOI (a measure of transit supply) incorporate ODX data (a measure of transit demand)? ● Do we place weights on the different parameters that form the MTOI metric? ● How do we best combine the multiple data sources required to calculate the MTOI into an effective long-standing platform? **Anticipated Outcome:** This study will result in a tool to calculate the Modified Transit Opportunity Index for the entire MBTA network. The methodology and tool could be adapted to other regional transit authorities.				P					P		P	P	S			P	

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T-7	Estimating Systemwide Passenger Delay Attributed to On-Board Cash Transactions	**Purpose:** The previous study in this series sought to quantify the amount of stop-level delay attributed to a set of variables for a set of trips observed on MBTA Routes 116 and 117. Through multiple regression modeling it was estimated that customers adding value to their CharlieCard take an extra 6.3 seconds to board, and those paying with cash take an extra 9.4 seconds to board. While this may be considered a significant amount of time per occurrence, the observed frequency of these events was low, resulting in a relatively low contribution to bus delay. This study will expand to a systemwide analysis of delay from cash payment, using the MBTA's AFC database. Delay will be assessed on each route from an operator's perspective (delay per bus trip), as well as the customer's perspective (delay per customer) using ODX. This study is important as it provides insight into the tradeoffs between the benefits and burdens of transferring to a cashless system. **Anticipated Outcome:** A report documenting the delay associated with cash fare payment on MBTA routes from both the operator's perspective and the customer's perspective				S	P				P		P	P	S			P	
T-8	Balancing Roadway Space Allocation Among Travel Modes	**Purpose:** Both bike lanes and dedicated bus lanes have become increasinly intriguing and popular options for mobility within the Boston region in recent years, as succesful examples of both have been rolled out. A recent MPO study identified a set of roadway corridors in the Boston region where bus passengers would most benefit from the installation of dedicated bus lanes. However, in addition to challenges related to reallocating road space to non-car modes, the process of creating mobility options must work to allocate space to both bikes and transit, especially in corridors where both modes are popular but street space is scarce. This study will look at the set of previously identified corridors, and develop a strategy for each corridor for bikes and buses to coexist harmoniously. Strategies could involve looking for separate, but parallel paths, for bikes along these corridors, or designing roadway geometries that accommodate both bikes and buses where separate but parallel paths do not exist. **Anticipated Outcome:** For each identified corridor, identification of strategies for bikes and buses to coexist harmoniously, and perhaps a toolkit for designing streets that work for both transit and bikes.	S			S	P			S	P		P	P					P

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T-9	Inferring Trip Origins and Destinations Using WiFi Data	**Purpose:** Transit agencies use a range of data, such as Automated Fare Collection (AFC) and Automated Passenger Counters (APC), in order to understand how customers use the transit system. These data sources provide information about passenger origins, but do not provide information about their destinations or their paths through the system. In a previous study, CTPS developed a procedure for using AFC data to infer customer origin-destination pairs on the rapid transit system. Additionally, the MBTA is in the process of refining a tool to infer passenger origin-destination and trip-path information for the bus and rapid transit network. However, current technology does not provide information to validate the inferred trip-path information and passenger surveys are expensive, take time to conduct and process, and can only provide a snapshot of travel patterns on the day of survey, not continuous information detailing varied travel patterns on the network. Additionally, very limited data is available about the trip patterns of commuter rail riders. This project would study the feasibility of using WiFI connection data to better understand passenger trip patterns, and would develop a pilot program for the MBTA. When a mobile device has WiFi enabled, it will continually search for a WiFi network by sending out a unique identifier (known as a Media Access Control) to nearby routers. In the With WiFi service offered on the Green Line and Commuter Rail, WiFi connection requests from mobile devices can be collected as passengers pass through Green Line stations or commuter rail coaches, and used to infer the passenger's origin and destination within the system. The data collected is automatically de-personalized, which means that no browsing data or personal information is collected, and no individuals can be identified. Origin and destination data collected for these locations will be beneficial because it can be used to compare and calibrate existing methods of inferring origin and destination information from the automatic fare collection (AFC) system on the Green Line, and offer more frequent and cost effective estimations of passenger activity on the commuter rail over traditional methods involving manual passenger counts.					P				P		P		P	S				P
T-10	Green Line Transit Signal Priority Modeling	**Purpose:** This study would use Synchro to estimate the time savings of transit signal priority for the B, C, and E line to determine if service frequency could be increased along the lines, or if it would merely result in reliability improvements. **Anticipated Outcome:** Estimated time savings of transit signal priority for the B, C, and E branches and determination of potential transit time savings and/or increase in service.	S			S	P				P	P			P	S				P
T-11	Evaluating Adequacy of Transit Span of Service	**Purpose:** Transit agencies currently uses ridership levels at the beginning or end of the day to evaluate whether to extend or contract a service's span, that is, the times at which a service operates. However, this data does not provide information about demand outside the existing span of service. This study would look to information beyond ridership to see if there is a consistent way to answer the question "when should this service operate?" This study would develop a methodology to compare the roadway volumes of surrounding streets throughout the day to help guide decisions about changing the span of service. This data might come from roadway counts or Google origin-destination data. Alternative data sources could be explored as well. **Anticipated Outcome:** A methodology to compare the roadway volumes of streets surrounding transit services throughout the day to help guide decisions about changing the span of service.				P	S				P		P	S		P				P

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T-12	Bringing Excess Wait Time Across the Atlantic: Implementing a process to calculate the excess wait time resulting from uneven headways	**Purpose:** The relatively recent implementation of various forms of automated data collection provides the opportunity to measure transit performance from a passenger perspective. For example, traditional measures of on-time performance compare scheduled to actual vehicle arrival/departure times. However, this measure does not necessarily reflect the customers' perspective, particularly on frequent services where customers may not rely on schedules to time their arrival at the stop. Transport for London (TfL) uses an "excess wait time" metric to evaluate how well its frequent bus services are running. This metric describes the additional time passengers must wait because buses are not arriving at even intervals. With this information, we would be able to quantify the 'amount' of delay experienced by passengers on the system. **Anticipated Outcome:** A methodology for calculating the excess wait time resulting from uneven headways				P	S				P		P		P				P
T-13	First- and last-mile shuttle-partnership models	**Purpose:** In the current Long-Range Regional Transportation Plan (LRTP), the Boston Region MPO envisions first- and last-mile shuttles as a potential solution to some of the mobility needs in the MPO region. Upcoming years in the MPO Transportation Improvement Program (TIP) will include a first- and last-mile shuttle component of the community transportation, parking, clean air and mobility priority area. In the past few years, the MPO has studied potential locations, routings, and scheduling of first- and last-mile shuttles as part of the Regional Transit Service Planning Assistance program. In previous years, the MPO also ran grant programs, partnering with municipalities and transportation management associations (TMAs), to initiate these types of first- and last-mile transit services. However, there were only a few applicants to those previous grant programs. There has been little research at the MPO into financially-sustainable partnership models for first- and last-mile transit services. This study would investigate potential partnership models for first- and last-mile transit shuttles and identify the most promising models for inclusion of first- and last-mile transit services in the Boston Region MPO's TIP. **Anticipated Outcome:** A report or white paper detailing potential partnership models for first- and last-mile transit shuttles.					P		S		P	S	P	S	P	S			P
T-14	Considerations for Implementing Transit Signal Priority in the MPO Region	**Purpose:** Municipalities and transit operators in the Boston Region MPO area have started to investigate transit signal priority as a method of providing better travel times to public transit riders at individual intersections or along a corridor with multiple signalized intersections. There are many types of transit priority signal systems and technologies. In advance of any implementation of a transit signal priority system or technology, municipalities and other agencies that own traffic signal systems will have to coordinate with public transit operators on a specific transit signal priority system or a set of transit signal priority technologies. CTPS proposes a review of transit signal priority technologies to understand current transit signal priority systems, their potential for integration with local traffic signal systems, and their potential for integration with local transit operator vehicle fleets. This study will also investigate the institutional issues for implementing transit signal priority in the region. **Anticipated Outcome:** White paper documenting the technological and institutional issues affecting implementation of transit signal priority in the MPO region.				S	P		S		P		P	P	S	S			P

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ID	Project Name	Project Purpose and Outcome	Safety	System Preservation	Clean Air/Clean Communities	Transportation Equity	Capacity Management/Mobility	Economic Vitality	Multi-Modal Roadway	Bicycle Pedestrian	Transit	Specific Community	Broader Region	Enhance State of Practice	Low-Cost/Near-Term Implementation	Long-Term Implementation	Connection to Existing Work	Continuing Study	New Study
T-15	Transit Priority Treatment Evaluation Toolbox for Boston MPO Region	**Purpose:** Municipalities and transit operators in the Boston region have expressed interest in using transit priority treatments to improve travel times for transit vehicles, primarily busses, but also for light-rail. Recent efforts include a peak-period bus lane project in Everett to improve travel times for Boston-bound bus travelers on some MBTA bus routes. Other municipalities and transit operators have expressed interest in exploring transit priority treatments at a corridor, route, and intersection scale. In this study, CTPS would develop a toolbox of evaluation methods and metrics to study transit priority treatments for roadway corridors, transit routes, and street intersections in the MPO region. With an analysis toolbox, CTPS would be better able to respond to requests from municipalities or transit operators that seek out analysis and planning assistance for transit priority treatments. **Anticipated Outcome:** A toolbox of evaluation methods and metrics to study transit priority treatments for roadway corridors, transit routes, and street intersections in the MPO region.				S	P		S		P		P	P	S	S			P
T-16	Traffic and Parking Analysis to Support Potential Dedicated Bus Lanes	**Purpose:** To conduct traffic/parking analysis work for dedicated bus lanes identified in earlier CTPS report "Prioritization of Dedicated Bus Lanes," found at https://www.massdot.state.ma.us/Portals/49/Docs/BusLane20160513%20.pdf. Work would focus on corridors other than Washington Strreet in Roslindale (already studied by MAPC) and North Washington Avenue (studied by City of Boston)**.** **Anticipated Outcome:** Traffic/parking analyses preparing for dedication of bus lanes on a corridor or corridors identified as possible candidates by the previous study.				S	P				P	S	P		P	S	S	P	
T-17	Allston Transit Study	**Purpose:** The Allston I-90 Interchange Project, which will alter the alignment of I-90 and create new land use development opportunity, includes the proposal to create a West Station along the Framingham/Worcester Commuter Rail Line. This infrastructure project also affords the possibility of a bus transit connection through the old Beacon Rail Yard, potentially providing a more direct routing of buses from the Harvard Square area to the Longwood Medical Area via a connection over I-90 and the adjacent rail lines. This proposed transportation study would assess the demand for bus transit service that could connect with the rail service. **Anticipated Outcome:** A study examining possibilities for improving transit in the Allston-Beacon Yard area of Boston, especially those afforded by the rebuilding of I-90 and the redevelopment of Beacon Yard.				S	P	S	S	S	P	P				P			P

Green highlighted rows are new studies that were chosen for funding in FFY 2018. (See Chapter 6.)

FFY 2018 Draft Universe of Studies and Evaluation

			LRTP Goal Areas						Mode			Study Scale		Impact			Other		
ID	Project Name	Project Purpose and Outcome	Safety	System Preservation	Clean Air/Clean Communities	Transportation Equity	Capacity Management/Mobility	Economic Vitality	Multi-Modal Roadway	Bicycle Pedestrian	Transit	Specific Community	Broader Region	Enhance State of Practice	Low-Cost/Near-Term Implementation	Long-Term Implementation	Connection to Existing Work	Continuing Study	New Study
OTHER TECHNICAL SUPPORT																			
O-1	MPO Staff-Generated Research Topics	**Purpose:** This program would support work by MPO staff members on topics that relate to the Boston Region MPO's metropolitan transportation-planning process, that staff members have expressed interest in, and that are not covered by an ongoing Unified Planning Work Program (UPWP) or discrete project. This program was funded for the first time in FFY 2017. **Anticipated Outcome:** This program could bring forth valuable information for the MPO's consideration and would support staff's professional development. The opportunities afforded to staff through this program could yield highly creative solutions to transportation-planning problems.											P	P			P	P	

Notes: (1) Green highlighted rows are new studies that were chosen for funding in FFY 2018. These studies are described in further detail in Chapter 6.

(2) Studies T-14 and T-15 were combined into a single study at the recommendation of staff and committee.

(3) Studies T-6 and T-16 are being conducted by CTPS during FFY 2018, but funded with MassDOT Section 5303 funds from FFYs 2017 and 2018.

(4) Study O-1 was not evaluated using the evaluation areas, as it dedicates an amount of funding for a yet-to-be-determined MPO staff research proposal.

AV/CV = autonomous vehicles/connected vehicles. CTPS = Central Transportation Planning Staff. FFY = federal fiscal year. FHWA = Federal Highway Administration. GHG = greenhouse gas. GTFS = general transit feed specification. LOS = level of service. LRTP = Long-Range Transportation Plan. MassDOT = Massachusetts Department of Transportation. MBTA = Massachusetts Bay Transit Authority. MPO = Metropolitan Planning Organization. P = primary. ROW = right-of-way. S = secondary. SIP = State Implementation Plan. SRTS = Safe Routes to School. UPWP = Unified Planning Work Program

APPENDIX D

Geographic Distribution of UPWP Funded Studies

[Under Development]

APPENDIX D: GEOGRAPHIC DISTRIBUTION OF UPWP STUDIES AND TECHNICAL ANALYSES

D.1 INTRODUCTION

This appendix summarizes the Metropolitan Planning Organization (MPO)-funded work products produced by MPO staff (CTPS) and the staff of the Metropolitan Area Planning Council (MAPC) during federal fiscal years (FFY) 2010 through 2016, as well as those expected to be completed by the end of FFY 2017. The narrative below describes the methodology used to compile this information, as well as some of the additional factors that could be used to further analyze and use this data to inform and guide public involvement and regional equity purposes.

D.2 PURPOSE AND METHODOLOGY

Purpose

The purpose of this data collection is to better understand the geographic spread of Unified Planning Work Program (UPWP) work products (i.e., reports and technical memoranda) throughout the region. In other words, this exercise serves to illuminate which communities and areas of our metropolitan region have been the subject of transportation studies and analyses (or recipients of technical support) conducted by the MPO staff with 3C (continuing, comprehensive, and cooperative) planning funds. The data presented in Table D-1 below covers UPWP tasks completed from FFY 2010 through FFY 2017 and includes work that resulted in benefits to specific municipalities. Studies that had a regional focus are presented in Table D-2.

Maintaining a database to track the geographic distribution of UPWP studies (those benefiting specific communities as well as those benefiting a wider portion of the region) can serve as one important input into the UPWP funding decisions made each FFY. When considered in combination with other information this data on geographic distribution of MPO-funded UPWP studies can help guide the MPO's public outreach to help ensure that, over time, we are meeting the needs of the region with the funds allocated through the UPWP.

Methodology

As noted above, this analysis examined FFYs 2010 through 2017. In order to generate information on the number of UPWP studies produced during these FFYs that benefited specific cities and towns in the Boston region, MPO staff performed the following main steps:

- Reviewed all work products listed as complete in UPWPs from FFYs 2010 through 2017
- Excluded all agency and other client-funded studies and technical analyses in order to focus the analysis on MPO-funded work only
- Excluded all work products that had a focus that was regional or not limited to a specific geography.

- Excluded all work related to certification requirements (Chapter 5) and administration, resource management, and support activities (Chapter 8)
- Compiled a count of all reports and technical memoranda completed specifically for one municipality, or reports and technical memoranda directly benefiting multiple municipalities. In the case where multiple municipalities directly benefit from a report or technical memoranda, the work product was counted once for each municipality that benefited
- Reviewed and discussed the status and focus of studies, technical memoranda, and reports with project managers and technical staff

D.3 PLANNING STUDIES AND TECHNICAL ANALYSES BY COMMUNITY

Table D-1 shows the number of completed MPO-funded UPWP work products from FFY 2010 through FFY 2017 that are determined to provide benefits to specific municipalities. Studies and technical analyses are grouped by the year in which they were completed, rather than the year in which they were first programmed in the UPWP. Examples of the types of studies and work in the table include:

- Evaluating Transit-Oriented Development opportunities at specific MBTA Stations
- Technical assistance on Massachusetts Environmental Policy Act (MEPA) Environmental Impact Reports
- Complete streets analyses for specific municipalities
- Operations analyses and alternative conceptual design recommendations for specific intersections

Table D-1: Number of UPWP Tasks by Federal Fiscal Year and Community, Grouped by Subregion

Community	2010-2014 Total	2015	2016	2017	2010-2017 Total	Population	Minority %	Low-Income %
Boston	18	4	3	1	26	617,599	53.0%	44.1%
Everett	10	3	2	1	16	41,667	46.4%	45.1%
Waltham	10	2	3	1	16	60,632	31.3%	32.2%
Somerville	12	1	1	1	15	75,754	30.9%	33.3%
Cambridge	8	1	4	5	18	105,163	37.9%	33.1%
Newton	10	2			12	85,145	20.4%	20.8%
Quincy	11				11	92,272	34.5%	36.3%
Chelsea	9	1		2	12	35,178	74.7%	47.3%
Malden	9	1		2	12	59,451	47.5%	41.8%
Lynn	7		1		8	90,330	52.4%	48.4%
Medford	6		1		7	56,173	23.8%	29.9%
Revere	7				7	51,755	37.6%	44.3%
Brookline	4	1	1	2	8	58,732	26.7%	27.8%
Melrose	5	1		1	7	26,983	10.5%	25.1%
Belmont	3		2	1	6	24,729	18.6%	21.3%
Arlington	3		1	3	7	42,845	16.4%	24.7%
Saugus	3				3	42,845	16.4%	24.7%
Winthrop	2				2	17,497	11.5%	35.7%
Watertown	1				1	31,915	18.3%	23.5%
Nahant	0				0	3,410	4.5%	33.2%
Inner Core Subtotals	**138**	**17**	**19**	**20**	**194**			
Lexington	8	2			10	31,393	26.3%	18.1%
Lincoln	8	1			9	6,362	17.2%	16.4%
Acton	2	4	1		7	21,924	24.5%	19.1%
Bedford	5	2			7	13,320	16.0%	16.8%
Hudson	5	2			7	19,063	11.1%	30.7%
Maynard	3	4		1	8	10,106	9.9%	30.8%
Sudbury	6	1			7	17,659	10.6%	10.8%
Concord	3	3	1	3	10	17,668	12.8%	18.2%
Littleton	2	3			5	8,925	7.7%	23.2%
Bolton	3	1		1	5	4,897	6.5%	18.7%
Boxborough	1	3			4	4,996	21.1%	23.1%
Stow	3	1			4	6,590	7.8%	19.5%
Carlisle	1	1			2	4,852	12.3%	15.6%
MAGIC Subtotals	**50**	**28**	**2**	**5**	**85**			
Weston	12	2	2	2	18	11,261	16.6%	14.8%
Framingham	13	1	1	2	17	68,321	34.7%	36.3%
Wellesley	9	2	1	1	13	27,984	17.6%	13.8%
Natick	9		1	1	11	33,005	14.6%	24.5%

Southborough	7	1		1	9	9,766	13.9%	13.2%
Marlborough	6			2	8	38,498	24.8%	31.5%
Holliston	4			1	5	13,547	6.7%	25.8%
Ashland	3			1	4	16,593	18.5%	22.0%
Wayland	3			1	4	12,994	14.7%	20.2%
MetroWest Subtotals	**66**	**6**	**5**	**12**	**89**			
Burlington	10	1	1	1	13	24,498	20.8%	22.4%
Reading	8	2	1	1	12	24,746	7.6%	20.7%
Woburn	6	1	1	2	10	38,120	18.3%	28.8%
Wilmington	5		1	1	7	22,324	7.7%	16.4%
Winchester	4		2	1	7	21,374	14.3%	14.9%
Lynnfield	2	2	1	1	6	11,595	6.5%	18.7%
Stoneham	3	1	1	1	6	21,437	9.5%	31.5%
Wakefield	3		1	1	5	24,931	7.0%	24.4%
North Reading	1	1	1	1	4	14,892	6.1%	17.7%
NSPC Subtotals	**42**	**8**	**10**	**10**	**70**			
Salem	5	2	1	3	11	41,340	24.1%	40.6%
Danvers	6			1	7	26,493	6.2%	27.5%
Beverly	4	1		1	6	39,502	8.6%	32.8%
Peabody	4			2	6	51,252	12.3%	36.6%
Rockport	3			1	4	6,952	4.1%	31.4%
Swampscott	3			2	5	13,787	7.0%	22.3%
Gloucester	2			1	3	28,789	5.9%	40.1%
Marblehead	2			2	4	19,809	5.0%	22.3%
Hamilton	1			1	2	7,764	8.7%	25.5%
Ipswich	1			1	2	13,175	5.3%	30.6%
Middleton	0		1	2	3	8,988	12.7%	21.1%
Wenham	1			1	2	4,875	5.5%	22.5%
Essex	0			1	1	3,504	3.9%	25.5%
Manchester	0			2	2	5,136	3.6%	25.9%
Topsfield	0			1	1	6,085	4.7%	15.8%
NSTF Subtotals	**32**	**3**	**2**	**22**	**59**			
Braintree	8	1	1		10	35,745	14.7%	26.2%
Weymouth	5	1			6	53,744	11.9%	32.7%
Cohasset	2	1			3	7,542	3.8%	17.9%
Holbrook	3				3	10,792	19.2%	32.3%
Scituate	2	1			3	18,133	4.7%	22.3%
Hingham	2				2	21,962	4.6%	24.0%
Marshfield	2				2	25,132	4.0%	26.2%
Norwell	2				2	10,506	4.7%	18.0%
Duxbury	1				1	15,059	3.7%	18.7%
Hanover	1				1	13,879	4.2%	20.1%
Hull	1				1	10,293	5.7%	32.4%
Pembroke	1				1	17,837	3.9%	22.1%
Rockland	1				1	17,489	9.2%	35.8%
SSC Subtotals	**31**	**4**	**1**	**0**	**36**			

Milford	7	1			8	28,000	17.5%	31.4%
Hopkinton	6	1			7	14,925	8.3%	14.1%
Medway	4				4	12,752	6.5%	20.5%
Sherborn	4				4	4,119	6.7%	13.1%
Bellingham	3				3	16,333	8.2%	22.8%
Franklin	3				3	31,635	8.6%	19.9%
Millis	3				3	7,891	7.3%	20.8%
Wrentham	3				3	10,955	3.8%	20.9%
Norfolk	2				2	11,227	15.4%	13.7%
SWAP Subtotals	**35**	**2**	**0**	**0**	**37**			
Needham	6	1	1		8	28,886	10.9%	15.2%
Dedham	4	1	1		6	24,729	14.9%	25.1%
Westwood	5	1			6	14,618	8.5%	19.2%
Foxborough	3	1			4	16,865	8.3%	25.2%
Randolph	4				4	32,111	60.9%	36.6%
Walpole	3	1			4	24,071	9.2%	21.6%
Stoughton	3			1	3	26,963	21.6%	31.9%
Canton	2				2	21,561	16.7%	24.3%
Norwood	2				2	28,603	17.3%	30.1%
Medfield	0	1			1	12,024	6.1%	12.7%
Sharon	0				0	17,612	19.0%	16.2%
Milton	5				5	27,002	24.1%	22.3%
Dover	4				4	5,589	8.8%	10.7%
TRIC Subtotals	**41**	**6**	**2**	**1**	**50**			
Grand Total	**435**	**74**	**41**	**70**	**620**			

MAGIC = Minuteman Advisory Group on Interlocal Coordination. NSPC = North Suburban Planning Council. NSTF = North Shore Task Force. SSC = South Shore Coalition. SWAP = South West Advisory Planning Committee.
TRIC = Three Rivers Interlocal Council.

D.4 REGIONWIDE PLANNING STUDIES AND TECHNICAL ANALYSES

In addition to work that benefits specific municipalities, many of the projects funded by the MPO through the UPWP have a regional focus. Table D-2 lists MPO-funded UPWP studies completed from 2010 through 2017 that were regional in focus. Some regionally focused studies may have work products that overlap with those analyzed in table D-1 above.

More information on these studies and other work can be found on the MPO's website (http://bosmpo.ctps.org/recent_studies) or by contacting Sandy Johnston, UPWP Manager, at sjohnston@ctps.org.

Table D-2: Regionally-Focused MPO Funded UPWP Studies

FFY 2017	
Central Transportation Planning Staff	**Metropolitan Area Planning Council**
• Planning for Autonomous and Connected Vehicles • Study of Promising GHG-Reduction Strategies • Using GTFS Data to Find Shared Bus Route Segments with Excessively Irregular Headways • Pedestrian Level-of-Service Metric Development • Exploring the 2011 Massachusetts Travel Survey: MPO Travel Profiles • Exploring the 2011 Massachusetts Travel Survey: Barriers and Opportunities Influencing Mode Shift • Core Capacity Constraints • Barriers and Opportunities Influencing Mode Shift • Bicycle Network Gaps: Feasibility Evaluations	• North Suburban Mobility Study • North Shore Mobility Study • Perfect Fit Parking Report and Website • Hubway Bikeshare Coordination • MetroWest LandLine Gaps Analyses
FFY 2016	
Central Transportation Planning Staff	**Metropolitan Area Planning Council**
• Modeling Capacity Constraints • Identifying Opportunities to Alleviate Bus Delay • Research Topics Generated by MPO Staff (FFY 2016): Transit dependence scoring system using driver license data	• Right-Size Parking Report • Transportation Demand Management—Case Studies and Regulations • Hybrid Electric Vehicle Retrofit Procurement • Autonomous Vehicles and Connected Cars research

• Title VI Service Equity Analyses: Methodology Development • EJ and Title VI Analysis Methodology Review • Transportation Investments for Economic Development	• MetroFuture Implementation technical memorandums
FFY 2015	
Central Transportation Planning Staff	**Metropolitan Area Planning Council**
• Greenhouse Gas Reduction Strategy Alternatives: Cost-Effectiveness Analysis • Roadway Network for Emergency Needs • 2012 Inventory of Bicycle Parking Spaces and Number of Parked Bicycles at MBTA stations • 2012-2013 Inventory of Park-and-Ride Lots at MBTA Facilities • Title VI Service Equity Analyses: Methodology Development	• Population and Housing Projections for Metro Boston • Regional Employment Projections for Metro Boston • Right-size parking calculator
FFY 2014	
Central Transportation Planning Staff	**Metropolitan Area Planning Council**
• Bicycle Network Evaluation • Household Survey-Based Travel Profiles and Trends • Exploring the 2011 Massachusetts Travel Survey: Focus on Journeys to Work • Methodology for Evaluating the Potential for Limited-Stop Service on Transit Routes	• Transportation Demand Management Best Practices and Model Municipal Bylaw • Land Use Baseline for Bus Rapid Transit • MetroFuture community engagement
FFY 2013	
Central Transportation Planning Staff	**Metropolitan Area Planning Council**
• Regional HOV-Lane Systems Planning Study, Phase II • Roadway Network Inventory for Emergency Needs: A Pilot Study • Carbon Dioxide, Climate Change, and the Boston Region MPO: 2012 Update • Massachusetts Regional Bus Study • Boston Region MPO Freight Program	• Regional Trail Network Map and Greenway Planning • MetroFuture engagement at the local level, updates to the Regional Indicators Reports, and Smart Growth Profiles
FFY 2012	
Central Transportation Planning Staff	**Metropolitan Area Planning Council**
• Analysis of JARC and New Freedom Projects	• Snow Removal Policy Toolkit

• Safety and Security Planning • Emergency Mitigation and Hazard Mapping, Phase II • Impacts of Walking Radius, Transit Frequency, and Reliability • MBTA Systemwide Passenger Survey: Comparison of Results • Pavement Management System Development • Roundabout Installation Screening Tool • TIP Project Impacts Before/After Evaluation • Regional HOV System Planning Study • Freight Survey	• MetroFuture implementation strategies—updated implementation strategies including focus on equity indicators
FFY 2011	
Central Transportation Planning Staff	**Metropolitan Area Planning Council**
• Charlie Card Trip Paths Pilot Study • Early Morning Transit Service • Maintenance Cost of Municipally Controlled Roadways • Analysis of Responses to the MBTA Systemwide Onboard Passenger Survey by Respondents in Environmental-Justice Areas • MBTA Core Services Evaluation • MPO Freight Study, Phase I and Phase II • MPO Freight/Rail Study	• MPO Pedestrian Plan • MPO Regional Bike Parking Program • Toolkit for Sustainable Mobility— focusing on local parking issues
FFY 2010	
Central Transportation Planning Staff	**Metropolitan Area Planning Council**
• An Assessment of Regional Equity Outreach 2008–2009 • Coordinated Human Services Transportation Plan Update • Greenbush Commuter Rail Before and After Study • Mobility Assistance Program and Section 5310 Review • Safety Evaluation of TIP Projects • Red Line-Blue Line Connector Study Support	• Creation of a GIS coverage and related database of MAPC-reviewed projects and their mitigation commitments • Implementation of the regional and statewide bicycle and pedestrian plans, and work on bicycle/pedestrian-related issues, including coordination with relevant national, state, and regional organizations

EJ = environmental justice. FFY = federal fiscal year. GIS = geographic information systems. HOV = high-occupancy vehicle. JARC = job access reverse commute program. MAPC = Metropolitan Area Planning Council. MBTA = Massachusetts Bay Transportation Authority. MPO = Metropolitan Planning Organization. TIP = Transportation Improvement Program.

D.5 NEXT STEPS

MPO staff intends to continue to collect this data on an annual basis and develop a process for using it it as one input that can inform UPWP funding decisions. The data summarized in this appendix and future UPWP funding data that is added to it could potentially be used in a number of different ways to help guide the spending decisions made in future UPWPs. Depending on the direction the development of this process takes, some analyses that the MPO could complete in the future include:

- Compare the number of tasks per community to the presence and size of a municipal planning department in each city and town
- Examine the use of different measures to understand the geographic distribution of benefits derived from funding programmed through the UPWP. For example, in addition to analyzing the number of tasks per community, the MPO could consider the number of dollars spent per community or the magnitude of benefits that could be derived from UPWP studies (e.g., congestion reduction, air quality improvement, etc.)
- Examine in more detail the geographic distribution of UPWP studies and technical analyses per subregion or per MAPC community type to understand the type of tasks being completed and how these compare to municipally identified needs
- Examine the number of tasks per community and compare the data to the number of road miles, the median household income, or the minority population in each community
- Develop graphics illustrating the geographic distribution of UPWP studies and spending and mapping that distribution relative to Environmental Justice and Transportation Equity concern areas.
- Compare the number of tasks directly benefiting each municipality with the geographic distribution of transportation needs identified in the Long-Range Transportation Plan (LRTP), *Charting Progress to 2040.* The transportation needs of the region for the next 25 years are identified and organized in the LRTP according to the MPO's goal areas, which include safety, system preservation, capacity management and mobility, clean air and clean communities, transportation equity, and economic vitality.

Making these comparisons with the data will provide the MPO with a clearer understanding of the impacts of the work that is programmed through the UPWP. Additionally, the MPO will be able to make more informed decisions about how we choose to distribute funding for transportation studies and technical analyses throughout the region.

APPENDIX E

MPO Glossary of Acronyms

Acronym	Definition
3C	continuous, comprehensive, cooperative [metropolitan transportation planning process]
A&F	Administration and Finance Committee
AACT	Access Advisory Committee to the MBTA
ABP	Accelerated Bridge Program [MassDOT]
ADA	Americans with Disabilities Act of 1990
ADT	average daily traffic
AADT	annual average daily traffic
AFC	automated fare collection [system]
AMPO	Association of Metropolitan Planning Organizations
APC	automatic passenger counter
APTA	American Public Transportation Association
ARAN	automatic road analyzer
ARRA	The American Recovery and Reinvestment Act of 2009
ASL	American sign language
ATR	automatic traffic recorder
AVL	automatic vehicle location
AWDT	average weekday daily traffic
BCIL	Boston Center for Independent Living
BPDA	Boston Planning and Development Agency, formerly known as the Boston Redevelopment Authority (BRA) [City of Boston]
BRA	Boston Redevelopment Authority [City of Boston]
BRT	bus rapid transit
BTD	Boston Transportation Department

Acronym	Definition
CA/T	Central Artery/Tunnel [project] (also known as "the Big Dig")
CAA	Clean Air Act of 1970
CAAA	Clean Air Act Amendments of 1990
CATA	Cape Ann Transportation Authority
CBD	central business district
CFR	Code of Federal Regulation
CHSTP	Coordinated Public Transit Human Services Transportation Plan
CIC	Community Innovation Challenge
CIP	Capital Investment Plan [MassDOT]
CMAQ	Congestion Mitigation and Air Quality [federal funding program]
CMP	Congestion Management Process
CNG	compressed natural gas
CO	carbon monoxide
CO2	carbon dioxide
CTPS	Central Transportation Planning Staff
CTTAP	Community Transportation Technical Assistance Program
DBMS	Database Management System
DCAMM	Division of Capital Asset Management and Maintenance [Massachusetts]
DCR	Department of Conservation and Recreation
DEIR	draft environmental impact report
DEP	Department of Environmental Protection [Massachusetts]
DMU	diesel multiple unit [transit vehicle]

Acronym	Definition
DTA	dynamic traffic assignment [travel demand modeling]
EERPAT	Energy and Emissions Reduction Policy Analysis Tool
EIR	environmental impact report
EIS	environmental impact statement
EJ	environmental justice
EOEEA	Massachusetts Executive Office of Energy and Environmental Affairs
EOHED	Massachusetts Executive Office of Housing and Economic Development
EOHHS	Massachusetts Executive Office of Health and Human Services
EPA	Environmental Protection Agency [federal]
EPDO	equivalent property damage only [a traffic-related index]
ETC	electronic toll collection
FAST Act	electronic toll collection
FEIR	final environmental impact report
FFGA	full funding grant agreement
FFY, FFYs	federal fiscal year, federal fiscal years
FHEA	Fair Housing Equity Assessment
FHWA	Federal Highway Administration
FMCB	Fiscal and Management Control Board of the MBTA
FONSI	finding of no significant impact
FTA	Federal Transit Administration
GANS	grant anticipation notes [municipal bond financing]

Acronym	Definition
GHG	greenhouse gas [as in greenhouse gas emissions]
GIS	geographic information system
GLX	Green Line Extension [Green Line Extension project]
GPS	global positioning system
GTFS	General Transit Feed Specification [data standard]
GWI	global warming index
GWSA	Global Warming Solutions Act of 2008 [Massachusetts]
HOV	high-occupancy vehicle
HPP	high-priority projects
HSIP	Highway Safety Improvement Program [federal funding program]
HTC	Healthy Transportation Compact
ICC	Inner Core Committee [MAPC municipal subregion]
IMS	intermodal management system
INVEST	Infrastructure Voluntary Evaluation Sustainability Tool [FHWA]
IPCC	Intergovernmental Panel on Climate Change
IT&S	Information Technology and Systems [CTPS group]
ITDP	Institute for Transportation and Development Policy
ITE	Institute of Transportation Engineers
ITS	intelligent transportation systems
JARC	Job Access and Reverse Commute [program]
LAP	language access plan
LCW	Livable Community Workshop

Acronym	Definition
LEP	limited English proficiency
LNG	liquefied natural gas
LOS	level of service
LRTA	Lowell Regional Transit Authority
LRTP	Long-Range Transportation Plan [MPO certification document]
MAGIC	Minuteman Advisory Group on Interlocal Coordination [MAPC municipal subregion]
MAP-21	Moving Ahead for Progress in the 21st Century Act
MAPC	Metropolitan Area Planning Council
MARPA	Massachusetts Association of Regional Planning Agencies
MassDOT	Massachusetts Department of Transportation
MassGIS	[Commonwealth's] Office of Geographic Information Systems
Massport	Massachusetts Port Authority
MassRIDES	MassDOT's statewide travel options program
MBCR	Massachusetts Bay Commuter Railroad
MBTA	Massachusetts Bay Transportation Authority (also known as "the T")
MCAD	Massachusetts Commission Against Discrimination
MEMA	Massachusetts Emergency Management Agency
MEPA	Massachusetts Environmental Policy Act
MGL	Massachusetts general laws
MHS	metropolitan highway system
MOU	memorandum of understanding
MOVES	Motor Vehicle Emissions Simulator [EPA air quality model]

Acronym	Definition
MPO	metropolitan planning organization [Boston Region MPO]
MPOinfo	Boston Region MPO's email contact list
MWGMC	MetroWest Growth Management Committee [MAPC municipal subregion]
MWRC	MetroWest Regional Collaborative [MAPC municipal subregion]
MWRTA	MetroWest Regional Transit Authority
NAAQS	National Ambient Air Quality Standards
NBPD	National Bicycle and Pedestrian Documentation Project
NEPA	National Environmental Policy Act
NHPP	National Highway Performance Program
NHS	National Highway System
NMHC	non-methane hydrocarbons
NOx	nitrogen oxides
NTD	National Transit Database
NTP	notice to proceed
O&M	operations and management
ODCR	Office of Diversity and Civil Rights [MassDOT]
OE	operating expenses
OTA	Office for Transportation Access [MBTA]
OTP	Office of Transportation Planning [MassDOT]
P3	Public Participation Plan [MPO document]
PBPP	performance-based planning and programming
PDM	Pre-Disaster Mitigation Program [federal]

Acronym	Definition
PEV	pedestrian environmental variable
PL	metropolitan planning funds [FHWA] or public law funds
PM	particulate matter [category of air pollution]
PMT	Program for Mass Transportation [MBTA]
ppm	parts per million
PRC	Project Review Committee [MassDOT]
PSAC	Project Selection Advisory Council [MassDOT]
RCCs	Regional Coordinating Councils
RIF	roadway inventory file
RMV	Registry of Motor Vehicles [MassDOT division]
ROC	Rider Oversight Committee [MBTA]
ROW	right-of-way
RPA	regional planning agency
RSA	Roadway Safety Audit [FHWA]
RSS	rich site summary [Web, feed]
RTA	regional transit authority
RTAC	Regional Transportation Advisory Council [of the Boston Region MPO]
RTC	Regional Transportation Center
SAFE	service and fare equity [Title VI]
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act—A Legacy for Users
SCCCT	Statewide Coordinating Council on Community Transportation
SCI	sustainable communities initiative

Acronym	Definition
SDO	supplier diversity office
SFY	state fiscal year
SGR	state-of-good repair
SHRP	Strategic Highway Research Program
SHSP	Strategic Highway Safety Plan
SIP	State Implementation Plan
SNAC	special needs advisory committee
SNLA	Small Necessities Leave Act
SORE	statement of revenue and expenses
SOV	single-occupancy vehicle
SPR	Statewide Planning and Research
SRTS	Safe Routes to School [federal program]
STB	State Transportation Building [Boston]
STBGP	Surface Transportation Block Grant Program [federal funding program; replaced STP]
STIP	State Transportation Improvement Program
STP	Surface Transportation Program [federal funding program; replaced by STBGP]
TAM	transit asset management
TAP	Transportation Alternatives Program [federal funding program]
TAZ	transportation analysis zone [travel demand modeling term]
TCMs	transportation control measures
TCRP	Transit Cooperative Research Program

Acronym	Definition
TDM	travel-demand management, or transportation-demand management
TE	transportation equity
TEAMS	Travel Efficiency Assessment Method
TIGER	Transportation Investment Generating Economic Recovery [TIGER Discretionary Grant program, federal]
TIP	Transportation Improvement Program [MPO certification document]
Title VI	Title VI of the Civil Rights Act of 1964
TMA [1]	transportation management area [FTA, FHWA]
TMA [2]	Transportation Management Association
TMC	turning movement counts
TOD	transit-oriented development
TRB	Transportation Research Board
TREDIS	Transportation Economic Development Impact System [software]
TSIMS	Transportation Safety Information Management System
TSM	transportation systems management [FHWA]
UFP	ultrafine particles
UPWP	Unified Planning Work Program [MPO certification document]
USDOT	United States Department of Transportation [agency oversees FHWA and FTA]
USGS	United States Geological Survey
UZA	urbanized area
V/C	volume-to-capacity ratio

Acronym	Definition
VHT	vehicle-hours traveled
VMS	variable message signs
VMT	vehicle-miles traveled
VOCs	volatile organic compounds [pollutants]
VRH	vehicle revenue-hours
VRM	vehicle revenue-miles
WalkBoston	pedestrian advocacy group [Boston area]
WAT	walk-access transit
WMM	weMove Massachusetts [MassDOT planning initiative]
WTS	Women in Transportation Seminar
YMM	youMove Massachusetts [MassDOT planning initiative]