

New Discrete Funded Studies in FFY 2021

Project ID	Study or Program	Proposed FFY 2021 CTPS Budget
	Improving Pedestrian Variables in the Travel Demand Model	\$25,000
	Regional TDM Strategies	\$10,000
	Addressing Safety, Mobility, and Access on Subregional Priority Roadways	\$132,120
	Addressing Priority Corridors from the Long-Range Transportation Plan Needs Assessment	\$137,700
	Low-Cost Improvements to Express-Highway Bottleneck Locations	\$61,710
	Trip Generation Rate Research	\$60,000
	Intersection Improvement Program	\$75,000
	Access to CBDs Phase 2	\$75,000
	The Future of the Curb Phase 2	\$60,000
	Multimodal Resilience and Emergency Planning	\$30,000
20905	Staff-Generated Research and Technical Assistance	\$20,000
	Mapping Major Transportation Infrastructure Projects in the Boston Region	\$20,000
	Informing the Big Ideas Behind the MPO's Scenario Planning Process	\$20,700
Total for New Discrete and Recurring Studies		\$727,230

NOTE: This information may be updated as the FFY 2021 UPWP budget continues to develop.

PLANNING STUDIES

The project descriptions in this section describe the new studies chosen by the MPO for funding in FFY 2021. As described in Chapter 2 and Appendix B, CTPS gathers new study ideas each year and classifies them into the following categories: active transportation; land use, environment, and economy; multimodal mobility; transit; safety and security; and other technical work. Each of the project descriptions on the following pages begins with a funding table that shows the project identification number, category, funding sources, and total budget.

IMPROVING PEDESTRIAN VARIABLES IN THE TRAVEL DEMAND MODEL

Project ID Number	
Category	Active Transportation
FFY 2021 Total Budget	\$25,000

Purpose

The CTPS Regional Travel Demand Model uses a variable known as Pedestrian Environmental Variable (PEV) as a metric to gauge the quality of the pedestrian environment at transit stations and stops. The PEV is calculated at the geographic level of the Transportation Analysis Zone (TAZ), the basic building block for analysis in the model. The PEV is presently composed of three weighted, indexed elements:

- pedestrian level of service (based on physical characteristics in the TAZ)
- geographic characteristics of the station/stop (such as presence of sidewalks)
- pedestrian hindrances (such as designated truck routes)

MPO staff and stakeholders have identified the need to improve the model's sensitivity to and handling of the pedestrian environment. The pedestrian environment is critical not only to determining how walking trips function, but also supports analysis of transit trips.

Approach

This task will improve the calculation of PEV by incorporating new variables into its three key elements. Possible new variables may include the following:

- roadway density
- analysis of mixing of uses, density, and other land use characteristics
- intersection density
- safety measures, as represented by crash rates at the TAZ level

Once new PEVs are developed for each TAZ, staff will recalibrate the travel demand model's mode choice component.

FFY 2021 Anticipated Outcomes

Documentation of improved variables that inform the PEV and their implementation in the model.

REGIONAL TRAVEL DEMAND MANAGEMENT (TDM) STRATEGIES COORDINATION

Project ID Number	
Category	Land Use, Environment, and Economy
FFY 2021 Total Budget	\$10,000

Purpose

TDM is a topic of interest to many of the MPO's stakeholders and to municipal and business interests in the Boston region. The basic tenets of TDM practices are fairly well understood, and MAPC has conducted significant work on the practice in the past. However, there is demand among municipalities, TMAs, businesses, and other stakeholders for space in which those who are executing TDM policies can swap information, and those who are examining the possibility of implementing TDM ordinances can ask questions. In addition, stakeholders state that there is a need for better understanding of the legal and legislative context for TDM in Massachusetts, and believe that the MPO and its partner agencies are well-positioned to convene informative conversations on the topic.

Approach

During the process of developing the FFY 2021 UPWP, members of the MPO's UPWP Committee suggested that the MPO and MAPC could collaborate on one or more forums or other such gatherings to discuss TDM. This task sets aside funding for MPO support for those events, including preparation of materials; logistical support; and staff time.

FFY 2021 Anticipated Outcomes

A series of in-person and/or digital forums on the topic of TDM, co-hosted by the MPO and other entities such as MAPC.

ADDRESSING SAFETY, MOBILITY, AND ACCESS ON SUBREGIONAL PRIORITY ROADWAYS

Project ID Number	
Category	Multimodal Mobility
FFY 2021 Total Budget	\$132,120

Purpose

The Boston Region MPO has conducted Addressing Safety, Mobility, and Access on Subregional Priority Roadways studies as part of the UPWP in every FFY since 2013. During MPO outreach, 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.

Approach

To address feedback from the MAPC subregional groups, MPO staff will identify priority arterial roadway segments in the MPO region, emphasizing issues identified by the relevant subregional groups. MPO staff will concentrate on transit service, nonmotorized modes of transportation, and truck activity along these arterial segments. MPO staff will consider numerous strategies to improve these arterials, including examining and evaluating any or all of the following factors.

- Traffic signals (equipment, retiming, redesign, and coordination)
- Bus stop locations
- Processing buses through traffic lights
- Location and management of pedestrian crossings and signals
- Americans with Disabilities Act of 1990 requirements
- Travel-lane use by motorized and bicycle traffic
- Speed limit
- Access management

The improvement strategies will provide a guide to designing and implementing a Complete Streets corridor, which could be recommended to implementing agencies and funded through various federal, state, and local sources, separately or in combination.

FFY 2021 Anticipated Outcomes

The study will include data collection, technical analysis, development of recommendations, and documentation for selected corridors.

ADDRESSING PRIORITY CORRIDORS FROM THE LONG-RANGE TRANSPORTATION PLAN (LRTP) NEEDS ASSESSMENT

Project ID Number	
Category	Multimodal Mobility
FFY 2021 Total Budget	\$137,700

Purpose

The purpose of these studies is to develop conceptual design plans that address regional multimodal transportation needs along priority corridors identified in the MPO's LRTP, *Destination 2040*. These studies include recommendations that address multimodal transportation needs that are expected to arise from potential future developments in the study area.

Approach

The LRTP identified needs for all modes of transportation in the MPO region. These needs guide decision-making about which projects to include in current and future Transportation Improvement Programs (TIP). Projects that address the region's current mobility needs are those that focus on maintaining and modernizing roadways with high levels of congestion¹ and safety problems; expanding the quantity and quality of walking and bicycling; and making transit service more efficient and modern. During the past several years, the MPO has conducted these planning studies, and municipalities have been receptive to them.

MPO staff would select locations for study with consideration of municipal, subregional, and other public feedback, and then would collect data, conduct technical analyses, and develop recommendations for improvements. The recommendations would be forwarded to implementing agencies, which may choose to fund improvements through various federal, state, and local sources, either separately or in combination.

FFY 2021 Anticipated Outcomes

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 CMP and the LRTP as part of the Needs Assessment process.

The studies 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 MassDOT and the municipalities.

¹ Congestion is used as one of the selection criteria for potential study locations. Congested conditions are defined as a travel time index of at least 1.3 (this means that a trip takes 30 percent longer than it would under ideal conditions).

LOW-COST IMPROVEMENTS TO EXPRESS-HIGHWAY BOTTLENECK LOCATIONS

Project ID Number	
Category	Multimodal Mobility
FFY 2021 Total Budget	\$61,710

Purpose

This study would build off of the work conducted in previous iterations of this study, Low-Cost Improvements to Express-Highway Bottlenecks, Phases I-IV. These studies aim to address points in the highway system where traffic flow is restricted with operational and low-cost infrastructure solutions. The recommendations that stem from these studies are aimed at reducing congestion, increasing safety, and improving traffic operations throughout the Boston region. Examples of recommendations from previous phases of this study include creating an auxiliary lane for merging and diverging traffic and lengthening the deceleration lane at an exit. The previous three studies of express-highway bottlenecks were very well received by MassDOT and the FHWA. Some of the recommendations from those studies already have been executed, and the FHWA has interviewed MPO staff about the successful implementation.

Approach

According to the FHWA, “Much of recurring congestion is due to physical bottlenecks—potentially correctable points on the highway system where traffic flow is restricted. While many of the nation’s bottlenecks can only be addressed through costly major construction projects, there is a significant opportunity for the application of operational and low-cost infrastructure solutions to bring about relief at these chokepoints.”² In general, recurring bottlenecks are influenced by the design or operation present at the point where the bottleneck begins—for example, merges, diverges, lane drops, traffic weaving, and any abrupt changes in highway alignment. Low-cost infrastructure solutions, as opposed to major construction projects, could involve changes in the design or operation of merges, traffic operations, or highway alignment. Examples of recommendations from previous phases of this study include creating an auxiliary lane for merging and diverging traffic and lengthening the deceleration lane at an exit. The previous three studies of express-highway bottlenecks were very well received by MassDOT and the FHWA. Some of the recommendations from those studies already have been executed, and the FHWA has interviewed MPO staff about the successful implementation.

FFY 2021 Anticipated Outcomes

Reports documenting low-cost solutions to existing traffic congestion issues at the selected express-highway bottleneck locations.

² Federal Highway Administration, Recurring Traffic Bottlenecks: A Primer: Focus on Low-Cost Operations Improvements, US Department of Transportation, Federal Highway Administration, June 2009, p. 1.

TRIP GENERATION RATE RESEARCH

Project ID Number	
Category	Multimodal Mobility
FFY 2021 Total Budget	\$60,000

Purpose

The Massachusetts Environmental Policy Act (MEPA) and National Environmental Policy Act (NEPA) require certain proposed developments to prepare a traffic/transportation impact analysis. A metric known as trip generation rate, which estimates how many trips people will make from or in response to a particular development, is key to this type of analysis, and impact analyses typically use a trip generation rate manual developed by the Institute of Transportation Engineers (ITE). However, ITE's rates are based on national averages, sometimes generated from a small sample size, and are highly influenced by suburban locations, resulting in a high degree of variability and interpretability in their application.

ITE rates consequently do not necessarily describe the Boston region well, as this region is characterized by differences from national averages in areas such as availability and usage of transit; prevalence of bicycle and pedestrian facilities; and scale of economic growth and density of employment centers. Thus, straightforward application of ITE rates for analysis of projects within the MPO's area of responsibility may lead to trip generation estimates that are highly inaccurate. This error can affect the mitigation imposed on development projects and may change or restrict the scale of the development.

Approach

MPO staff will examine recently completed development impact studies in the greater Boston area, compiling available travel monitoring data and trip generation rates used in MEPA/NEPA submissions, and using the statewide Travel Demand Model's trip generation results as a point of comparison. Staff will then compare the compiled data with ITE rates, with the goal of developing an improved understanding of the relationship between land use, development, trip activity, and the transportation network that is more accurate and specific to the Boston region.

FFY 2021 Anticipated Outcomes

A dataset of information on trip generation in the Boston region and a memorandum or report documenting lessons learned from analysis of that dataset and potential implications for analysis carried out by the MPO or other agencies.

INTERSECTION IMPROVEMENT PROGRAM

Project ID Number	
Category	Multimodal Mobility
FFY 2021 Total Budget	\$75,000

Purpose

In 2014, the MPO participated in an intersection improvement program funded in the TIP by Congestion Mitigation and Air Quality (CMAQ) dollars, with the goal of identifying low-cost improvements that would help alleviate congestion at problem intersections. Through the CMP, MPO staff selected candidate intersections and contacted the relevant municipalities. A consulting firm then visited 35 intersections around the region, altered the signals if necessary, and submitted suggestions for other low-cost improvements to the relevant municipality.

For this UPWP project, MPO staff will survey and analyze additional intersections around the Boston region to determine suitable low-cost improvements.

Approach

Staff will select a set of intersections based on CMP performance metrics, and then consult with planners or engineers from the respective communities to validate the congestion issues at the selected locations. Staff will then survey the selected intersections, develop recommendations for low-cost improvements, and present the recommendations to the relevant municipality. The municipalities can use the recommendations to develop an implementation project that would improve traffic operations.

The original intersection improvement program focused on altering traffic signals while the surveyor was on site. The recommendations from this current study may include alterations to traffic signals, but because MPO staff will not have access to the signal cabinet, the traffic signals will not be altered on site. Instead, recommendations for altering traffic signals will be presented to the relevant municipality for implementation.

FFY 2021 Anticipated Outcomes

Staff will survey 10 to 15 intersections, evaluate them for low-cost improvements, and convey recommendations to municipal staff. The municipalities will be responsible for implementation.

ACCESS TO COMMERCIAL BUSINESS DISTRICTS PHASE 2

Project ID Number	
Category	Transit
FFY 2021 Total Budget	\$75,000

Purpose

This study will serve as a follow up to FFY 2019's *Transportation Access Studies of Central Business Districts*. There is a growing need to ensure that commercial business districts (CBD) can be accessed by users of all transportation modes—including walking, biking, taking transit, using ridehail services, or driving—and growing evidence to suggest that CBDs perform better economically when access by walking, biking, or transit is adequately prioritized. Research from across the region and country has shown that those who arrive by these modes will visit a CBD more frequently, visit more businesses per trip to the CBD, and spend more money in the CBD over time than those who arrive by driving.

However, planners and municipal officials often encounter reluctance from the business community when infrastructural reconfigurations necessary to support more diverse modes of access are proposed, because some business owners may believe the success of their business relies on the ability of their customers to have access to ample nearby street parking. Additional data gathering in this area can help planners' and municipal officials' decision-making efforts in their work to improve access to CBDs, and help make the case to the business community that investments in transportation improvements for non-driving modes are also investments in the economic vitality of the neighborhood overall.

Approach

In the FFY 2019 study, MPO staff conducted surveys of business owners in select CBDs, asking for their perceptions of their customers' travel and spending patterns. Staff then surveyed customers at these businesses as to their actual travel and spending patterns.

Phase 2 of this study will build upon the FFY 2019 work, with surveys conducted in a new set of case study locations, to build a larger sample dataset. Staff will also make the tools used in the survey work accessible to municipalities and other stakeholders, so that they can carry out similar data collection themselves.

FFY 2021 Anticipated Outcomes

The results of this study will be documented and presented in a report. Staff will also produce a toolbox that will be made available to municipalities and other partners for conducting CBD-access studies.

THE FUTURE OF THE CURB PHASE 2

Project ID Number	
Category	Transit
FFY 2021 Total Budget	\$60,000

Purpose

This study will build upon FFY 2019's *Future of the Curb* study, which compiled nationwide examples of cities reconfiguring their curb lanes in response to changing demands on the space. Curb space in urban areas has traditionally been used for parking, but cities throughout the region and across the country have been making changes to the way they used this valuable, but often overlooked, public space. In addition to parking, cities have been reconfiguring their curbs so they can be used for a number of other purposes, including short-term passenger pick-up and drop-off zones; commercial vehicle loading zones; improved infrastructure for people walking and biking; and enhanced transit service, including space for dedicated transit lanes, stations, and stops.

In some cases, these reconfigurations are made on an ad hoc basis, responding to changing demands and economic, environmental, and political constraints at a particular location. In other cases, cities have crafted specific policy to inform how curb space can and should be used. These curb management strategies guide how improvements are developed, prioritized, and implemented.

By actively managing curb space, cities can work to ensure sufficient access to users of all transportation modes, including people walking, biking, taking transit, using ridehail services, and driving. When space is limited and accommodating all modes is not possible or practical, a curbside management strategy can help planners and city officials determine a course of action that is rooted in the shared goals and vision of the community. This ensures that a valuable but limited public asset is used effectively and efficiently.

Approach

As a follow up to the FFY 2019 work, this study will examine existing curb management strategies in use around the country and develop a guidebook for municipalities interested in planning and implementing curb management strategies of their own.

The guidebook will discuss several topic areas:

- developing curb management strategies that are consistent with the municipality's larger goals
- identifying stakeholders and engaging the public in developing curb management strategies
- establishing metrics to evaluate the success of curb management changes; for example, considering effects on access and accessibility, parking turnover, transit reliability, safety, businesses and economic vitality, travel times, congestion, emissions, and other factors

- evaluating how the positive and negative effects of changes to curb management can affect equity populations
- developing a plan for monitoring and enforcing compliance with the curb management strategy
- considering the broader context of curb space changes, including land use, density, and existing activities at the curb

The study will include outreach to municipalities in the Boston region to learn about the process that they took, if any, to implement curb management strategies. The study will document these municipalities' considerations, successes, challenges, and lessons learned.

FFY 2021 Anticipated Outcomes

A guidebook for planning and implementing curb management strategies.

MULTIMODAL RESILIENCE AND EMERGENCY PLANNING

Project ID Number	
Category	Resilience
FFY 2021 Total Budget	\$30,000

Purpose

The purpose of this study is to provide an interactive tool that can help to analyze the impact of various emergency events on the transportation network. As the impacts of climate change intensify and become more frequent, communities must build a more resilient transportation network to safely evacuate from potentially life-threatening weather events. The top concerns for the Boston region include heavy precipitation, coastal and inland flooding and extreme heat. This work will update CTPS' existing All-Hazards Planning tool and incorporate the most up-to-date data sets for multiple transportation modes and hazards.

Approach

The current All-Hazards Planning tool will be updated with the most current information using existing open or publicly available data. The required data sets to be incorporated may include the following categories.

1. Climate hazards
2. Transportation assets for multiple modes
3. Emergency preparedness (that is, designated evacuation routes, shelter facilities, etc.)
4. Critical facilities (that is, hospitals, elderly care, food distribution centers, etc.)

Staff will also examine the possibility of incorporating data on transportation equity populations into the application.

FFY 2021 Anticipated Outcomes

This study will produce a well-designed interactive application, based on the existing All-Hazards Planning tool, to help stakeholders, such as municipal planners, better analyze and visualize transportation impacts in the event of a climate-related emergency. The resulting information will help municipal planners create network redundancies and adaptive infrastructure in hazard-prone areas.

This work may provide the basis for future efforts, such as modeling how transportation network users will react to various emergency or disaster scenarios, perhaps through the LRTP scenario planning process or a future UPWP study.

STAFF-GENERATED RESEARCH AND TECHNICAL ASSISTANCE

Project ID Number	20905
Category	Other
FFY 2021 Total Budget	\$20,000

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 UPWP or discrete project.

This program was funded for the first time in FFY 2016, when the work undertaken consisted of investigating the possibility of using driver license acquisition rates obtained through Registry of Motor Vehicles data as a possible measure of transit dependence. In FFY 2017, MPO staff members completed research projects including an examination of crash rates in Environmental Justice communities; analysis of long-distance commuting in the Boston region and its implications for the MPO; and development of a new software tool for transit planning.

In FFY 2020, the scope of this program was extended to allow MPO staff members to pursue small technical assistance projects for local communities. Individual MPO staff members would be able to identify small-scale needs in the diverse communities in which they live (within the MPO region), and a partner entity or entities to work with in making recommendations to solve the problem. This budget line would provide MPO staff with time to study the problem—involving their colleagues with specialty skills if resources and availability allow—and make recommendations to solve it.

Approach

Interested MPO staff members will complete an application for MPO funding to conduct independent research on a topic of professional interest and potential use in the metropolitan transportation planning process, or pursue a local transportation-related technical assistance project. MPO managers and directors will review the applications and select the most promising topics for study.

FFY 2021 Anticipated Outcomes

The research element of this program will produce valuable information for the MPO's consideration and support staff members' professional development. The technical assistance element will yield highly creative, yet flexible and lightweight, solutions for transportation planning problems. Both elements allow staff to raise the profile of the MPO and publicize its ability to help local communities, whether by publishing compelling research or by reaching out to help solve local problems.

MAPPING MAJOR TRANSPORTATION INFRASTRUCTURE PROJECTS IN THE BOSTON REGION

Project ID Number	
Category	Other
FFY 2021 Total Budget	\$20,000

Purpose

MPO staff a number of years ago created a print *Eastern Massachusetts Transportation Timeline/Map* recognizing infrastructural milestones from 1800 to 2000. The timeline distinguishes highway, transit, bicycle, and airport milestones, and the accompanying map displays the Eastern Massachusetts transportation network along with milestone dates. The timeline/map has not been updated since 2000, and staff have had requests from within the agency and from external stakeholders to update it and move it online.

Approach

This project would compile data from various sources to update the timeline and map to reflect the current status of the transportation network, and create an interactive, layer-based online interface that would be available to the public.

FFY 2021 Anticipated Outcomes

Interactive online tool mapping developments in the transportation network of Eastern Massachusetts from 1800 to the present, and potentially print materials to complement it.

INFORMING THE BIG IDEAS BEHIND THE MPO'S SCENARIO PLANNING PROCESS

Project ID Number	
Category	Other
FFY 2021 Total Budget	\$20,700

Purpose

The transportation world is rapidly evolving. The MPO and its staff have heard significant interest from stakeholders, including municipal partners, in examining how some of the large-scale ongoing trends, open policy questions, and possible developments could affect the MPO's work and the Boston region's transportation system and infrastructure in the upcoming years.

The LRTP is the MPO's main vehicle for tackling large-scale questions. With the next LRTP set to be approved in three years, now is the time to inform the questions the development process should explore. This task will jump-start outreach and framing efforts for the development of the new LRTP, with a special focus on integrating input into possible scenarios to be examined through the scenario planning process.

Approach

To support development of big picture items to be tested through scenario planning, staff would conduct a thorough program of outreach to stakeholders—including MPO member municipalities, other agencies, community groups, and advocacy groups—to determine priorities for possible analyses. Possible scenario elements to discuss with stakeholders include congestion pricing; free transit fares on some or all services; implementation of the Transportation Climate Initiative or another funding mechanism; impacts of climate change or other natural disasters, and the field of resiliency more broadly; and large-scale regional zoning and land-use changes.

FFY 2021 Anticipated Outcomes

Documentation of outreach to a wide range of stakeholders that can inform the development of a framework for LRTP scenario planning and analysis.