



## BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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Jamey Tesler, MassDOT Secretary and CEO and MPO Chair  
Tegin L. Teich, Executive Director, MPO Staff

### WORK PROGRAM

## SUSTAINABILITY AND DECARBONIZATION IN THE FREIGHT AND LOGISTICS SECTOR IN THE NORTH SUFFOLK AREA

NOVEMBER 3, 2022

### Proposed Motion

The Boston Region Metropolitan Planning Organization (MPO) votes to approve this work program.

### Project Identification

#### Unified Planning Work Program (UPWP) Classification

Boston Region MPO Planning Studies and Technical Analyses

**Project Number** 13808

#### Client

Boston Region MPO

#### Project Supervisors

*Principal:* Rebecca Morgan

*Manager:* Sandy Johnston

#### Funding Source

MPO Combined Planning and §5303 Contract #118967

### Schedule and Budget

**Schedule:** 11 months after work commences

**Budget:** \$67,500

Schedule and budget details are shown in Exhibits 1 and 2, respectively.

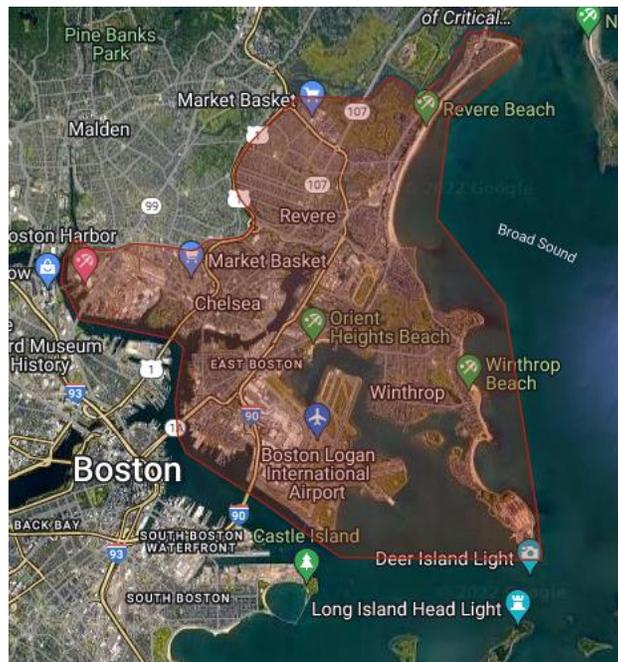
### Relationship to MPO Goals

The Boston Region MPO elected to fund this study with its federally allocated metropolitan planning funds during federal fiscal year (FFY) 2023. The work completed through this study will address the following goal area(s) established in the MPO's Long-Range Transportation Plan (LRTP): safety, capacity management and mobility, clean air and clean communities, transportation equity, and economic vitality.

## Background

The study area encompasses a concentration of vital light industrial and industrial uses in northern Suffolk County and a small part of southern Middlesex County, including parts of Chelsea, Everett, Revere, East Boston, and Winthrop. The study area is defined by the Mystic River and Boston Harbor to the south; Atlantic Ocean to the east; the Saugus River at Point of Pines to the north; and to the west by a line following the Pines River, US Route 1, MA Route 16 (Revere Beach Parkway), and the Malden River.

**Figure 1: Study Area**



[A digital version of this image can be found here.](#)

Home to Logan Airport, several port facilities, and rail and highway infrastructure, the study area is a key node for freight transportation and logistics, serving the entire Boston region and much of New England. The area is also home to a variety of industries, including distribution of road salt, fuel storage, and produce distribution that make use of the availability of multimodal transportation infrastructure. At the same time, the study area is densely settled and its population contains major clusters of Environmental Justice (EJ) communities. The jobs provided by the industrial and commercial sectors within the study area are critical for the economy of the area and the wider region, but at the same time the transportation sector plays an outsized role in emitting carbon dioxide, nitrous oxide, particulate matter, and ultrafine particulate matter, degrading public health. This study seeks to balance the preservation of this economically critical industrial and logistical cluster, which supports numerous blue-collar jobs in a heavily immigrant community, with analysis of and development of

strategies for the relief of the environmental and health burdens it imposes on the surrounding municipalities, and of its greenhouse gas (GHG) emissions.

Originally proposed by the City of Chelsea, the study is being advanced by the Metropolitan Area Planning Council (MAPC), the Boston Region MPO, and the Central Transportation Planning Staff (CTPS). Other sponsors include the cities of Boston, Everett, and Revere and the town of Winthrop. This study will serve as a proof of concept for future similar analyses around the Boston region. This scope represents the first of what we hope will be several phases of this study. Future phases would engage in further analysis and potentially make recommendations for plans, policies, and projects that could begin to address the issues identified in this study.

## Objective(s)

1. Document existing conditions relating to freight and logistics in the study area.
2. Document resident and stakeholder needs relating to the benefits of and burdens imposed by the freight and logistics sector within the study area.
3. Analyze and understand factors that currently, and in the future, may affect the ability to decarbonize the freight and logistics sector in this area and make it cleaner.

## Work Description

CTPS and MAPC staff will work collaboratively. The study involves both quantitative and qualitative elements, ranging from mapping infrastructure, land use, and population demographics to engagement with local stakeholders and activists. Staff will seek to leverage existing resources and collaborate with other workflows (primarily at CTPS and MAPC, such as development of the *Destination 2050* Long-Range LRTP, but also those carried out by other agencies) wherever possible. Each subtask in this work scope identifies whether CTPS or MAPC is carrying it out, or if responsibility is shared. The budget element of this scope, as expressed in Exhibit 2, covers only the CTPS elements of this project. The scope is accompanied by an addendum from MAPC exhibiting its commitment to the project and a breakdown of its budget for the study. MAPC is committing \$37,850 of its FFY 2023 UPWP funds to its responsibilities on this study. CTPS contributions will also include time from the Communications and Engagement, Editorial, and Graphics teams, which are budgeted separately.

### Task 1 Gather Basic Relevant Data

Task 1 focuses on collecting and mapping relevant baseline data about the study area. Wherever possible, study staff will draw on existing data sources and/or collaborate with other CTPS, MAPC, and external workflows, such as LRTP development, to share resources and data.

***Subtask 1.1 Map Freight Infrastructure***

Staff will map infrastructure relevant to the movement and organization of freight in the study, including but not limited to

- ports and related infrastructure,
- rail infrastructure,
- truck corridors (both legally defined/signed and observed),
- major shippers, and
- warehouses and intermodal facilities.

Work on this subtask will be carried out by CTPS. Some work on this subtask will be shared with LRTP Needs Assessment development.

***Subtask 1.2 Map EJ Populations***

Staff will draw on existing CTPS and MAPC datasets, and parallel current work, to map the EJ communities within the study area. This mapping will provide a baseline for future analyses and recommendations. Work on this subtask will be carried out by CTPS.

***Subtask 1.3 Map Industrial and Logistics Land Use***

Staff will create a baseline map of land use within the study area, focusing on industrial, commercial, and logistics uses. Ideally, this map will include data on existing zoned and planned uses. Data sources may include

- MAPC's draft industrial land use study and other data maintained by MAPC Economic Development and Data Services teams,
- MAPC Zoning Atlas,
- State-maintained assessor's data, and
- relevant data maintained by municipalities in the study area.

Work on this subtask will be carried out by MAPC, with advisement from CTPS.

***Products of Task 1***

Task 1 will yield baseline data to support more detailed analysis, and maps of existing conditions within the study area.

**Task 2 Literature Review**

Task 2 will build staff's familiarity with key topics relevant to this study through a focused literature review targeted at identifying existing strategies, resources, and technologies for decarbonizing and greening the freight and logistics sector.

***Subtask 2.1 Review Local, Regional, and State Plans***

Staff will review plans and planning documents for the study area produced by all relevant municipalities, and relevant elements of regional- and state-level plans issued by entities such as MAPC, the MPO, Massachusetts Department of Transportation (MassDOT), and Massachusetts Port Authority (Massport). In

reviewing the plans, staff will document elements relevant to this study, such as freight and environmental concerns. Work on this subtask will be carried out by MAPC.

***Subtask 2.2 Review Examples of Area-Based Freight Decarbonization and Environmental Plans***

Staff will review examples of studies and plans that examine decarbonization and environmental improvement of the freight and logistics sector within a specific geographic area. Staff will examine documents from both North America (and in particular areas known to have tackled challenges similar to those outlined in this study, such as Southern California and the New York/New Jersey port area) and around the world, including any similar studies done in Massachusetts. Work on this subtask will be carried out by CTPS.

***Subtask 2.3 Review Research on Effects of Mode Shift on GHG Emissions and Air Quality***

In addition to electrification of vehicles and infrastructure, air quality and GHG emissions can, especially in the short- to medium-term, be improved through modal shift—moving freight from trucks to low- or no-carbon modes. Staff will review existing research on the impacts of freight modal shift, both for goods arriving in or departing from the region and for local delivery. For interregional freight, low- or no-carbon modes include rail and maritime shipping; for local delivery, low- or no-carbon modes include bicycle or e-bicycle delivery. Work on this subtask will be carried out by CTPS.

***Products of Task 2***

Task 2 will yield documentation of a focused literature review, which will be included in the final work product for this study. This task will also considerably build staff familiarity with relevant issues.

**Task 3 Detailed Stakeholder Consultation**

The basic challenges faced by those within the study area are well known: high burdens of pollutants, high GHG emissions, and the need to reconcile economic activity and environmental improvement. Tasks 1 and 2 provide the data necessary to begin to tackle those challenges. Task 3 is designed to sharpen the focus of the study by providing these data to local stakeholders, asking them to react to the information, and engaging them in dialogue about further analyses and possible recommendations. MAPC and CTPS staff will collaborate on this task, drawing on existing relationships and building new ones. CTPS and MAPC will work together on all subtasks under Task 3.

***Subtask 3.1 Consult Local Government Entities***

The initial impetus for this study came from the City of Chelsea. CTPS and MAPC have consulted staff from all relevant municipalities and the North Suffolk

Resiliency Collaborative, which is housed at the City of Chelsea, throughout development of the concept for this study and will continue that close relationship while the study proceeds. Staff will also engage Massport and MassDOT on relevant issues, such as MassDOT's ongoing Route 1A East Boston study.<sup>1</sup>

### ***Subtask 3.2 Engage Local Businesses***

Staff will also engage local businesses that make significant use of freight and logistics systems and infrastructure within the study area. This will include local businesses identified by municipal partners, trucking companies and associations, local rail freight provider CSX, and electric utilities.<sup>2</sup>

### ***Subtask 3.3 Engage Activists and Advocates***

With a legacy of environmental justice concerns, the study area is home to many activist and advocacy groups that are engaged with issues relevant to this study. Staff will work with CTPS' Communications and Engagement team to build meaningful relationships with these groups to help define further analyses and possible recommendations.

### ***Products of Task 3***

Task 3 will yield expanded and deepened relationships with study area stakeholders and a structure for receiving their input on the study, work to be carried out, and possible recommendations. This feedback will in turn shape the direction of tasks 4 through 6.

## **Task 4 Directed Quantitative Research**

Task 4 includes more detailed quantitative analysis and research that will be shaped by and is dependent upon information learned in Tasks 1 through 3. Tasks 4 through 6 will be revisited and potentially revised after the completion of Tasks 1 through 3. As with other tasks, it will be coordinated with other CTPS and MAPC work on similar topics.

### ***Subtask 4.1 Regional Freight Patterns***

Staff will use existing and emerging data to examine, analyze, and potentially project freight movement in, out, around, and through the study area. To the extent feasible, movements will be broken down by vehicle classification, industry/sector, and origin/destination geography. Depending on data availability, this subtask may seek to analyze a subset of data to draw further insights on vehicle emissions. This task will especially draw on emerging freight data products available through MassDOT and is expected to have considerable

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<sup>1</sup> For more on this study, see <https://www.mass.gov/route-1a-corridor-study>

<sup>2</sup> National Grid serves Everett, Revere, and Winthrop, and Eversource serves East Boston and Chelsea.

overlap with LRTP and Freight Program work. Work on this subtask will be carried out by CTPS.

#### ***Subtask 4.2 Electrification Infrastructure and Grid Analysis***

Staff will analyze existing physical infrastructure presence, capacity, and opportunities for expansion to support fleet electrification. The analysis will include an assessment of necessary site infrastructure (private) and public utility infrastructure. This task will draw in part on recent research by grid providers such as National Grid about the impacts of fleet electrification.<sup>3</sup> Work on this subtask will be carried out by MAPC.

#### ***Subtask 4.3 Vehicle Storage***

Staff will determine where freight vehicles are being stored and laying over to help determine current-day impacts and potential magnitude and locations of charging infrastructure for electric vehicles, especially heavy ones. This subtask will draw on a mix of local input and data products, if available. Work on this subtask will be led by CTPS with input from MAPC.

#### ***Subtask 4.4 Further Analysis***

Staff will pursue additional analyses and research yet to be defined, according to the results of Tasks 1 through 3 and resource availability. Work on this subtask will be carried out by either agency, as needed.

#### ***Products of Task 4***

Task 4 will produce detailed and in-depth analyses on regional freight patterns, vehicle storage, and related topics.

### **Task 5 Directed Qualitative Research and Engagement**

Task 5 includes more detailed qualitative analysis and engagement that will be shaped by and is dependent upon information learned in Tasks 1 through 3. CTPS and MAPC will work jointly on all subtasks under Task 5.

#### ***Subtask 5.1 Research the Economics of Transitioning to Clean Trucks***

Most freight in the Eastern Massachusetts region, including in the study area, moves by truck. This subtask will extend the literature review conducted in Task 3 and focus on the economics of transitioning to clean/no-carbon trucking by

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<sup>3</sup> See, for examples, [The Road to Transportation Decarbonization: Understanding Grid Impacts of Electric Fleets, National Grid – Infographic](#) and [The Road to Transportation Decarbonization: Understanding Grid Impacts of Electric Fleets, National Grid – Report](#)

truck type and industry sector. Analyses will include both environmental benefits and potential impacts to businesses, both operational and financial.

#### ***Subtask 5.2 Industry Stakeholder Interviews***

Informed by previous baseline research, staff will conduct stakeholder interviews with a subset of relevant industry representatives located or operating in the study area to capture their understanding of zero emissions vehicles (ZEV) and identify their challenges for ZEV acquisition and deployment. Interviews will seek to better understand the age of fleets and ownership of trucking assets.

#### ***Subtask 5.3 Advocate and Activist Interviews***

Informed by previous baseline research, staff will conduct stakeholder interviews with a number of local community members, advocates, and activists to gain their perspective on relevant challenges and issues. Interviews will focus on additional understanding of key community impacts and challenges; visions of possible futures; and confronting tradeoffs between different potential actions.

#### ***Subtask 5.4 Further Analysis***

Staff will pursue additional analyses and research to be defined according to the results of Tasks 1 through 3 and resource availability. This may include additional in-person data collection.

#### ***Products of Task 5***

Task 5 will produce a detailed and updated understanding of stakeholder needs around the study area.

### **Task 6 Work Product Production**

Task 6 wraps up the study and produces materials presentable to the MPO and the public. CTPS and MAPC will both work on elements of each subtask under Task 6.

#### ***Subtask 6.1 Create Initial Recommendations***

Staff will synthesize information gained from analysis and stakeholder feedback and create a set of recommendations. The nature and scope of the recommendations will vary according to how much work can be accomplished in this phase of the study and may include ideas and concepts for future phases of the study.

#### ***Subtask 6.2 Create StoryMap***

Staff will use materials produced in previous tasks to create an ArcGIS StoryMap to report on the study. This format is well suited for displaying maps and large amounts of both qualitative and quantitative data.

#### ***Subtask 6.3 Promote Work and Ensure Accessibility***

Given the concentration of limited English proficiency populations in the study area, staff will produce abstract or summarized versions of the StoryMap in as

many Safe Harbor languages relevant to the study area as possible, as well as following standard MPO procedures for ensuring the products' accessibility to people with disabilities.

***Subtask 6.4 Present to MPO***

Staff will produce a PowerPoint presentation and present the work to the MPO.

***Products of Task 6***

Task 6 will produce the final work products of this study.

**Exhibit 1**

**ESTIMATED SCHEDULE**

**Sustainability and Decarbonization in the Freight and Logistics Sector in the North Suffolk Area**

| Task  | Month |   |   |   |   |   |   |   |   |    |    |   |
|---|-------|---|---|---|---|---|---|---|---|----|----|---|
|   | 1     | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |   |
| 1. Gather Basic Relevant Data                   | █     |   |   |   |   |   |   |   |   |    |    |   |
| 2. Literature Review                            | █     |   |   |   |   |   |   |   |   |    |    |   |
| 3. Detailed Stakeholder Consultation            |       |   |   | A | █ |   |   |   |   |    |    |   |
| 4. Directed Quantitative Research               |       |   |   |   |   | █ |   |   |   |    |    |   |
| 5. Directed Qualitative Research and Engagement |       |   |   |   |   | █ |   |   |   |    |    |   |
| 6. Work Product Production                      |       |   |   |   |   |   |   |   |   | █  |    | B |

Products/Milestones

A: Present initial research to stakeholders

B: Present work product to MPO

**Exhibit 2**

**ESTIMATED COST**

**Sustainability and Decarbonization in the Freight and Logistics Sector in the North Suffolk Area**

|                                   |                 |
|-----------------------------------|-----------------|
| <b>Direct Salary and Overhead</b> | <b>\$67,500</b> |
|-----------------------------------|-----------------|

| Task  | Person-Weeks |     |     |      |      |       | Direct Salary | Overhead (119.34%) | Total Cost |
|---|--------------|-----|-----|------|------|-------|---------------|--------------------|------------|
|   | M-1          | P-4 | P-3 | P-2  | Temp | Total |               |                    |            |
| 1. Gather Basic Relevant Data                   | 0.2          | 0.2 | 1.0 | 3.4  | 1.0  | 5.8   | \$7,048       | \$8,411            | \$15,459   |
| 2. Literature Review                            | 0.0          | 0.0 | 1.0 | 3.0  | 0.0  | 4.0   | \$4,851       | \$5,789            | \$10,640   |
| 3. Detailed Stakeholder Consultation            | 0.2          | 0.2 | 1.0 | 0.6  | 0.0  | 2.0   | \$2,827       | \$3,374            | \$6,201    |
| 4. Directed Quantitative Research               | 0.2          | 0.2 | 1.0 | 4.0  | 1.0  | 6.4   | \$7,707       | \$9,197            | \$16,904   |
| 5. Directed Qualitative Research and Engagement | 0.2          | 0.2 | 1.0 | 1.2  | 0.0  | 2.6   | \$3,529       | \$4,211            | \$7,740    |
| 6. Work Product Production                      | 0.8          | 0.2 | 1.1 | 1.2  | 0.0  | 3.3   | \$4,813       | \$5,743            | \$10,556   |
| Total   | 1.6          | 1.0 | 6.1 | 13.4 | 2.0  | 24.1  | \$30,774      | \$36,726           | \$67,500   |

|                           |            |
|---------------------------|------------|
| <b>Other Direct Costs</b> | <b>\$0</b> |
|---------------------------|------------|

|                   |                 |
|-------------------|-----------------|
| <b>TOTAL COST</b> | <b>\$67,500</b> |
|-------------------|-----------------|

**Funding**

MPO Combined Planning and §5303 Contract #118967

The Boston Region Metropolitan Planning Organization (MPO) operates its programs, services, and activities in compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of race, color, or national origin (including limited English proficiency), be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination under any program or activity that receives federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, Federal Transit Administration, or both, prohibit discrimination on the basis of age, sex, and disability. The Boston Region MPO considers these protected populations in its Title VI Programs, consistent with federal interpretation and administration. In addition, the Boston Region MPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with U.S. Department of Transportation policy and guidance on federal Executive Order 13166.

The Boston Region MPO also complies with the Massachusetts Public Accommodation Law, M.G.L. c 272 sections 92a, 98, 98a, which prohibits making any distinction, discrimination, or restriction in admission to, or treatment in a place of public accommodation based on race, color, religious creed, national origin, sex, sexual orientation, disability, or ancestry. Likewise, the Boston Region MPO complies with the Governor's Executive Order 526, section 4, which requires that all programs, activities, and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background.

A complaint form and additional information can be obtained by contacting the MPO or at [http://www.bostonmpo.org/mpo\\_non\\_discrimination](http://www.bostonmpo.org/mpo_non_discrimination). To request this information in a different language or in an accessible format, please contact

Title VI Specialist  
Boston Region MPO  
10 Park Plaza, Suite 2150  
Boston, MA 02116  
[civilrights@ctps.org](mailto:civilrights@ctps.org)

**By Telephone:**

857.702.3700 (voice)

For people with hearing or speaking difficulties, connect through the state MassRelay service:

- **Relay Using TTY or Hearing Carry-over:** 800.439.2370
- **Relay Using Voice Carry-over:** 866.887.6619
- **Relay Using Text to Speech:** 866.645.9870

For more information, including numbers for Spanish speakers, visit <https://www.mass.gov/massrelay>.