



**Massachusetts Bay
Transportation Authority**

MBTA Climate Change Strategy Overview

Presentation to MBTA Board of Directors

May 26, 2022



Climate Change Strategy



How does the MBTA prepare for the impacts of extreme storms that will result from climate change?



What is the MBTA doing to address climate change by reducing its greenhouse gases?



Vulnerability Assessments for Future Climate Conditions

Vulnerability assessments are being completed for the entire rapid transit system, key bus and commuter rail facilities and other locations.

- Facilities are being assessed for impacts from storm surge, flooding, wind, snow, ice and other conditions.
- Assessing for forecasted climate conditions in 2030, 2050 and 2070.
 - Findings and recommendations embed into MBTA policies and programs (e.g., capital investment plan, transit asset management system, state of good repair, etc.) to institutionalize resiliency into infrastructure.
 - Working with OCE to develop design guidelines and design standards that address and include climate considerations
- MBTA is working with stakeholders to share data & knowledge, develop policies, and work on regional protection projects that provide benefits to the MBTA's system.
 - Working with the Climate Action teams in Boston, Cambridge, Somerville, and other municipalities we are located in.



Status of Vulnerability Assessments for Future Climate Conditions



Rapid Transit Lines:

- Blue Line – *Completed*
- Red Line – *Completed*
- Orange Line – *Completed*
- Green Line – Spring 2022

Systemwide Assessments:

- Power, Signal & Communications – *Completed*
- Pump Stations – *Completed*
- Bus Maintenance Facilities – *Completed*
- Rapid Transit Vehicle Storage – *Completed*

Critical Facilities:

- Cabot Yard – Summer 2022
- Commuter Rail Facilities – Summer 2022

Commuter Rail:

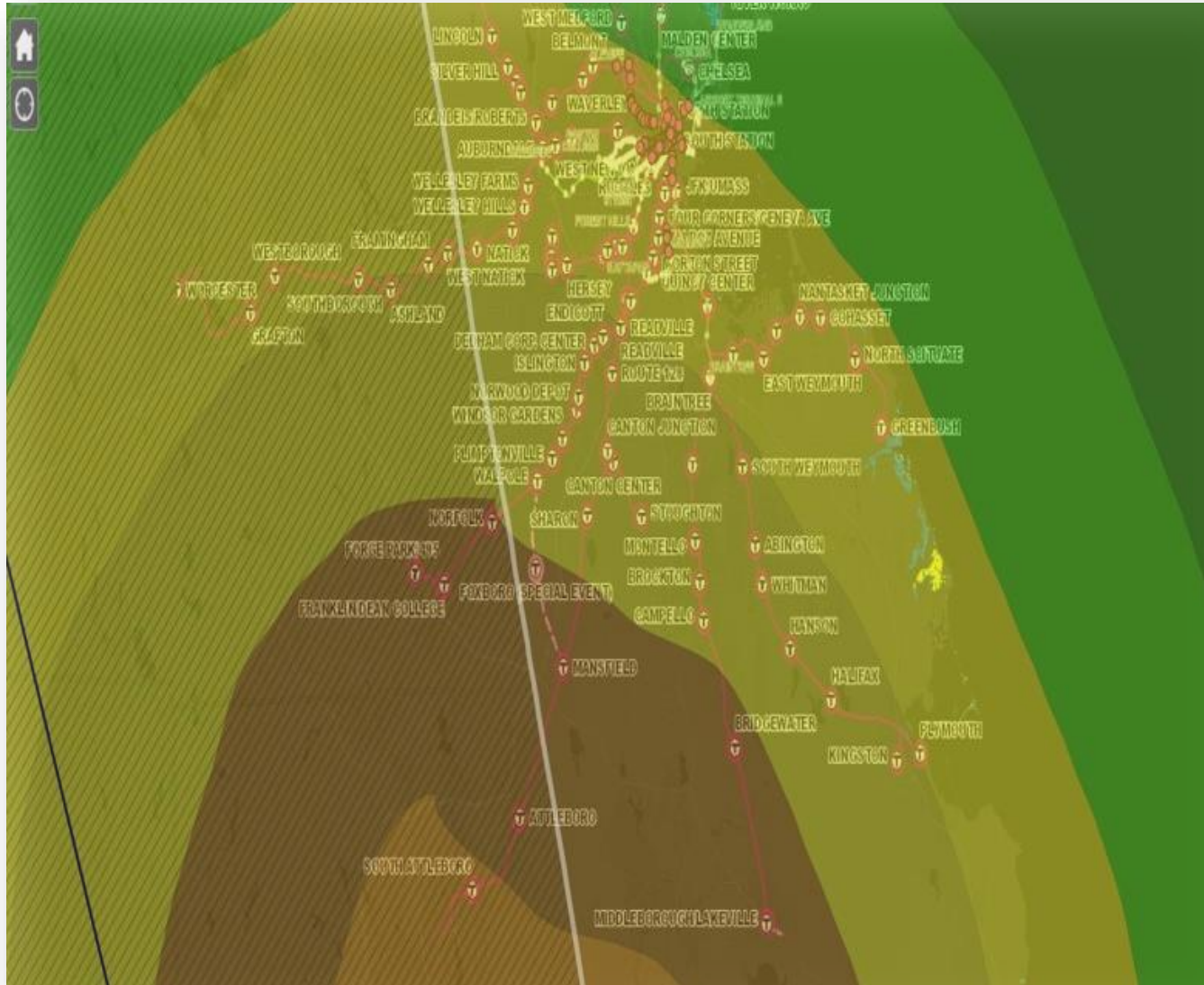
- Network assessment will begin in late 2022 to be completed in late 2023.

MIT Tunnel Study:

- Developed a model of the MBTA tunnel network that projects where would flood and at what rate under various storm conditions.



Utilizing Real Time Storm Data to Locations Most at Risk



Real time storm mapping against MBTA assets initiated as part of the Storm Team.

The MBTA now maps the infrastructure against NWS mapping for storm elements such as:

- Storm Surge
- Extreme Winds
- Rising River and Streams
- Extreme Precipitation
- Tornado Watches
- Other storm elements as needed





Prioritize Resiliency in the Capital Plan

The Capital Investment Plan (CIP) project selection process prioritizes climate resiliency since it maintains and improves the overall reliability of the transportation system. Critical climate resiliency programs and projects currently in the CIP include:

- Systemwide Tunnel Flood Mitigation Program
- Blue Line Tunnel Improvements
- Fiber Optic Burial Project
- Courthouse Station Waterproofing Project
- Pump Improvements



MBTA's Greenhouse Gas Reduction Goals



Governor Baker's Executive Order ("*Leading By Example*") sets goals for state agencies to reduce its greenhouse gases associated with the burning of onsite fossil fuels at buildings and in vehicles:

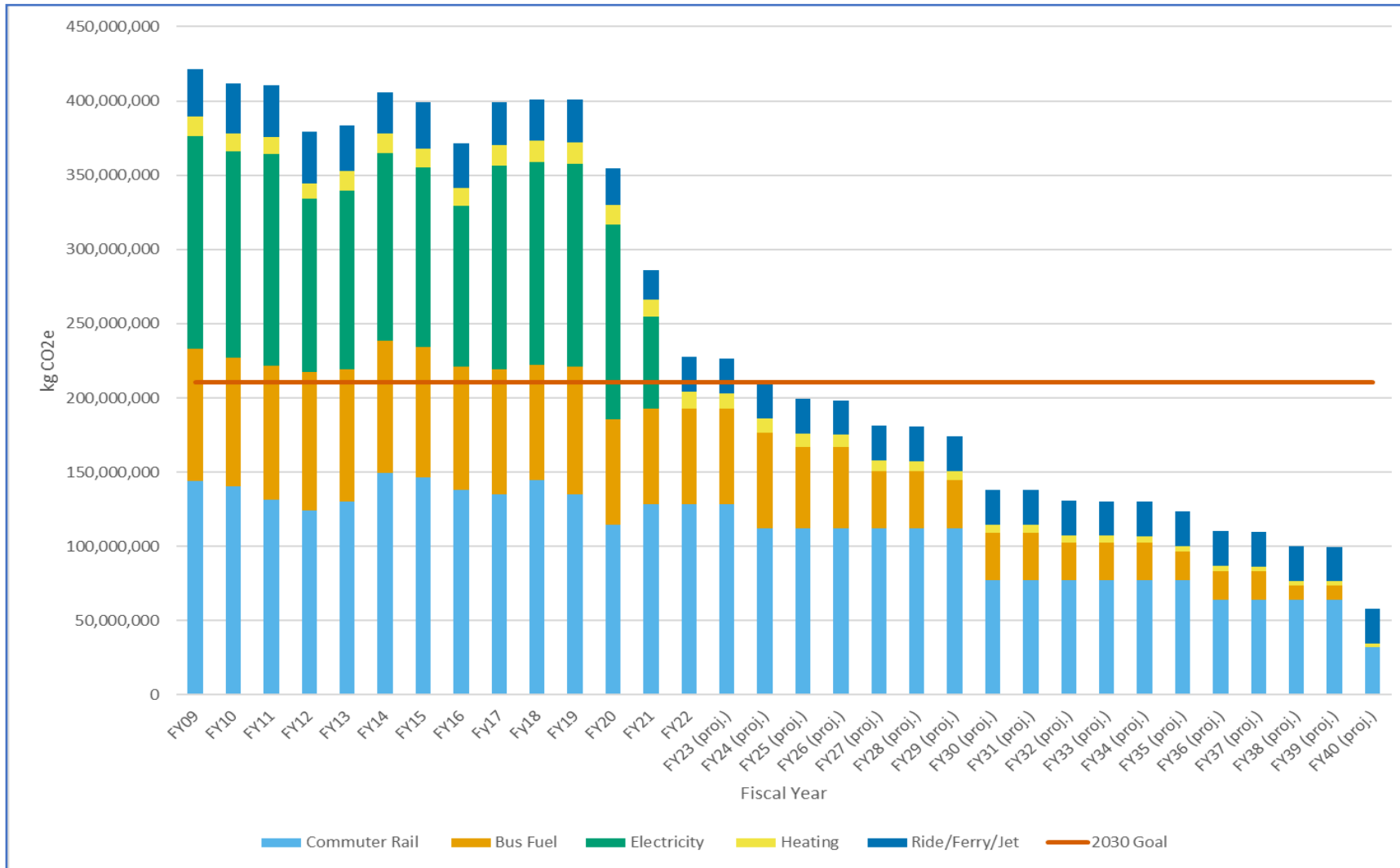
- ✓ 20% in 2025
- ✓ 35% in 2030
- ✓ 60% in 2040
- ✓ 95% in 2050

Commonwealth also has an overall reduction goal of:

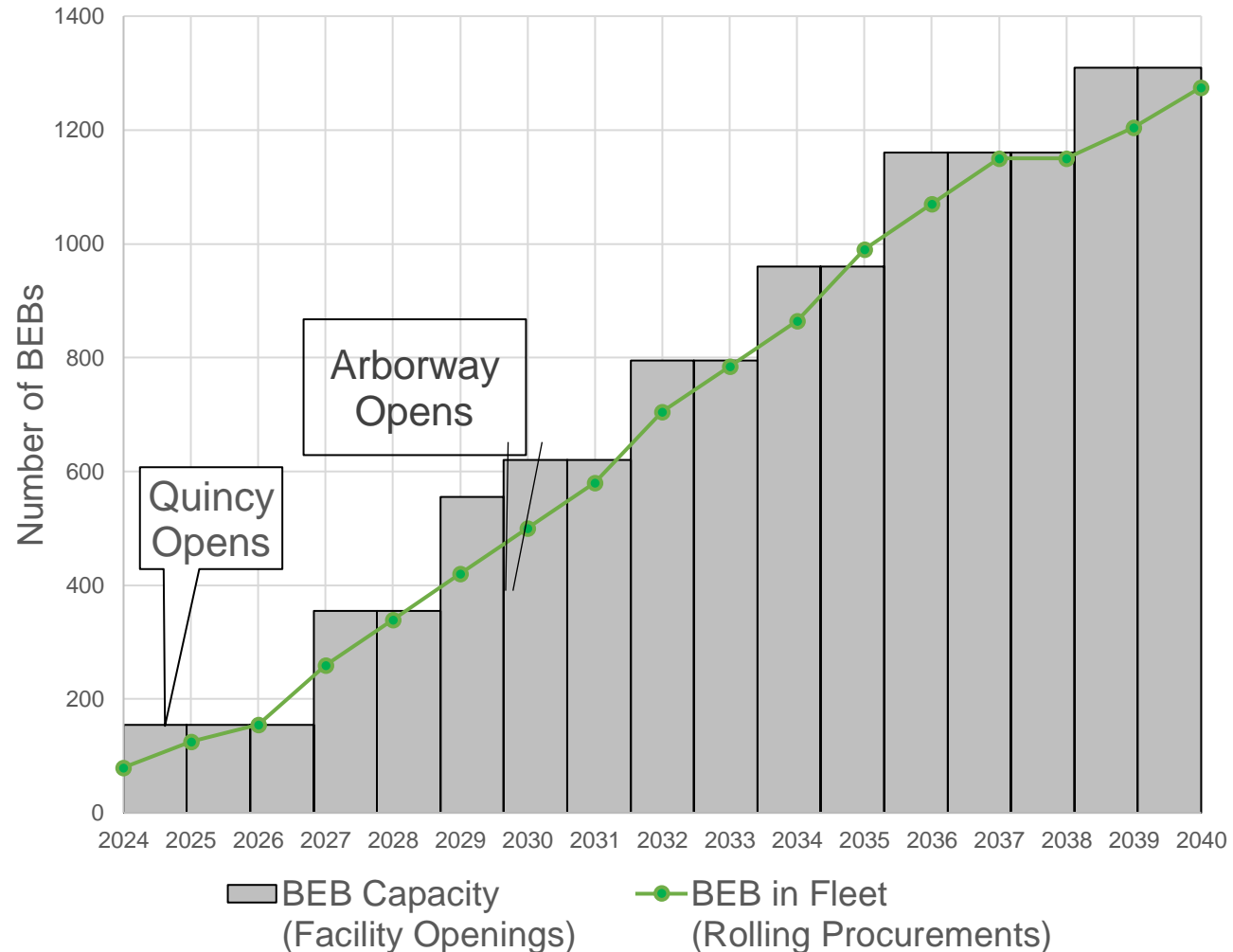
- ✓ 50% by 2030
- ✓ 100% by 2050



Annual System-wide Greenhouse Gas Emissions (kg CO₂ equivalents), 2019 through 2040 (projected)



Bus Fleet and Facility Modernization Goals

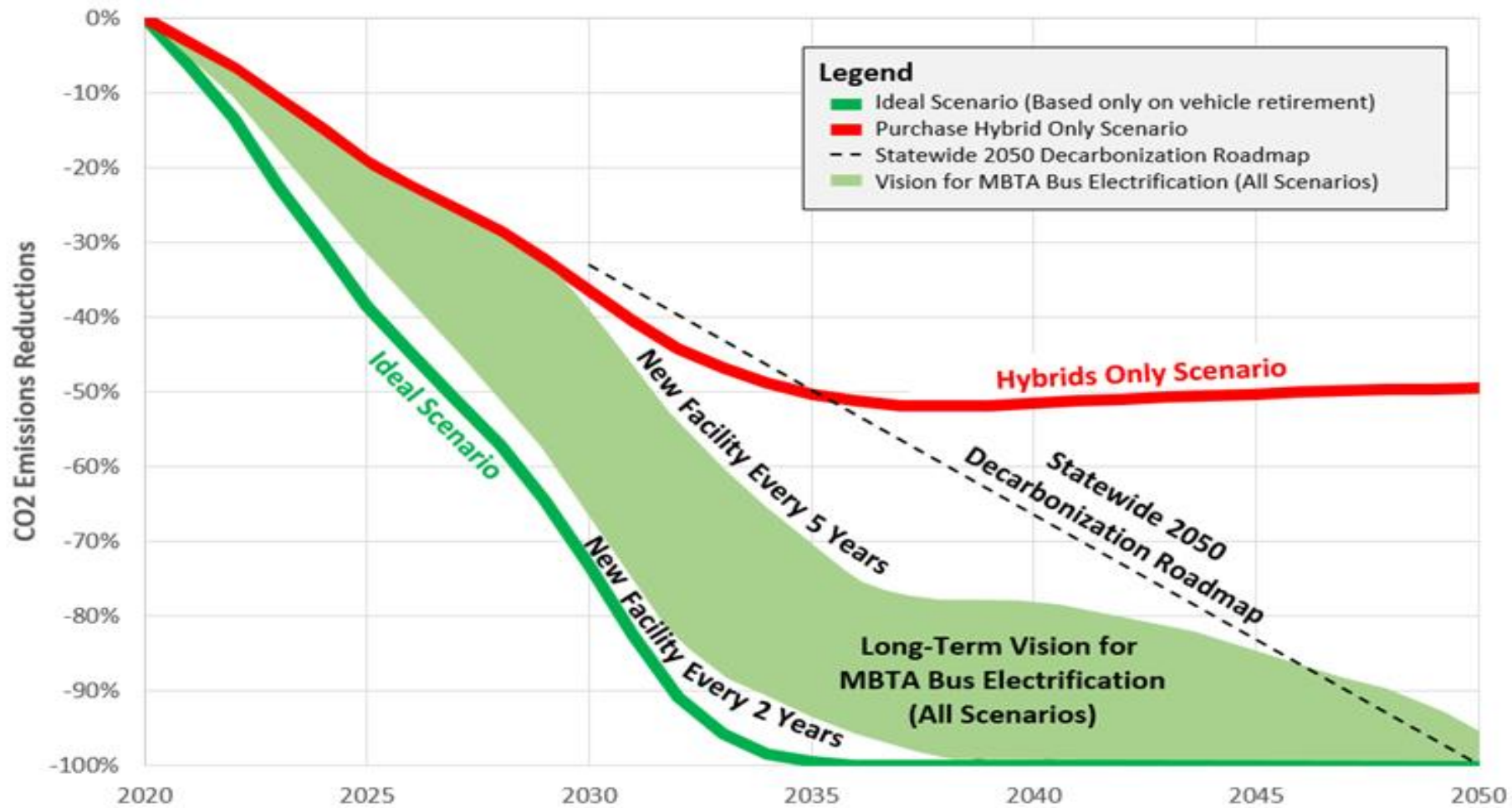


Convert the entire bus fleet to Battery Electric Bus technology by 2040

Build new state of the art facilities to house and maintain new buses



MBTA Bus Emissions Projections – Path to De-Carbonization



Energy Focus on Capital Projects & Asset Management

Incorporating sustainable and energy-focused elements into Capital Projects and Asset Management

Capital Delivery

- New standards for lighting
- Building control and energy management systems
- High-efficiency systems

Asset Management

- Focus on procurement of most efficient asset upgrades:
 - Compressors
 - HVAC Systems
- Upgrades to more energy efficient fixtures
 - Tunnel Lighting Project



FY23-27 CIP | Sustainability & Resiliency (S&R) Spotlight

130+ sustainability & resiliency related projects - account for ~ \$3.7B of programmed spending as part of the 5-year CIP. Incl. but is not limited to:



40+ resiliency and vulnerability projects and assessments to curb climate change and environmental impacts systemwide



40+ projects related to assets, energy, waste management, and remediation to ensure efficiency and long-term sustainability and resiliency of service and facilities



35+ projects to procure, overhaul, and upgrade fleet and facilities for bus electrification, vehicle efficiency, and reduction of carbon footprint

CIP Requests

Requests for projects are evaluated using 8 scoring criteria, which include resiliency under the system preservation, environmental and health effects criteria.

Key S&R Projects:

Rapid Transit

- Fenway Portal Flood Protection (P0117)
- Blue Line Flood Protection (P0582)

Bus

- Procurement of 35 Battery Electric 40ft Buses and Related infrastructure (P0653)
- Arborway Bus Facility Design Funding (P0671b)
- Charlestown Seawall

Systemwide

- Climate Change Resiliency Vulnerability Assessment (P0680)
- Environmental Remediation and Compliance (P0435)
- 45 High Street Master Plan and Systems Resiliency (P0603)
- Pump Improvements
- Tunnel Flood Protection