



**Massachusetts Bay
Transportation Authority**

MBTA Climate Assessment Overview

Presentation to MBTA Board of Directors
April 25, 2024



Sustainability is a core value and increasing sustainability and climate resilience is a strategic goal of the MBTA

Our Sustainability Value Statement:
We invest resources wisely in solutions for our team, our communities and our environment.

Empower and support staff to develop a culture which prioritizes and promotes safety

Modernize assets and improve connectivity, while ensuring MBTA property is maintained to a state of good repair

Ensure the experiences and perspectives of our staff and riders are accounted for through transparent decision making

Retain, attract, and invest in a diverse and qualified workforce that represents our ridership

Support the economic vitality of the region by providing riders with dependable, frequent, and accessible service

Increase the environmental sustainability and resilience of our transit system

Attract new riders, retain existing riders, and increase the percentage of transit-trips in the region

Communicate openly about our costs and the revenue needed to support our ongoing service and the growth of our system

GOALS



A resilient MBTA is critical to ensure continuity and reliability of service

The **MBTA's Climate Assessment** identifies how to reduce the Agency's environmental footprint and to embed resilience to **protect the system, employees, riders and operations** despite climate-related impacts.



Resilience and energy efficiency supports the MBTA in delivering high-quality service that is safe, reliable, and accessible to increase ridership and support the regional economy.

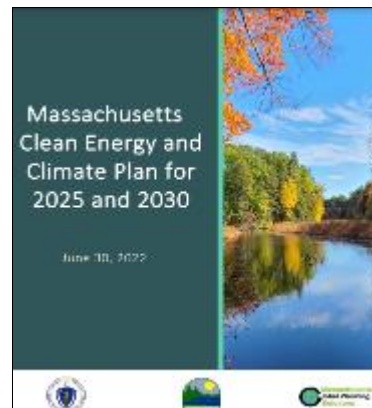
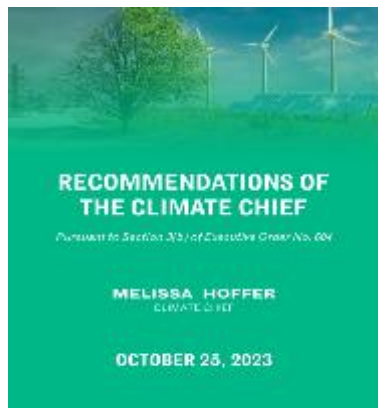


Achieving this ambitious goal supports the Commonwealth's climate plans

Laws and policies also call on the MBTA to reduce its emissions and become more resilient

Supporting the Commonwealth's plans and policies

- The 180-day Climate Chief report contains MBTA-specific recommendations, including economic analysis of investment needed to reach targets, facility decarbonization plan, development of Climate PMO, and support for statewide public education campaigns
- ResilientMass Plan (SHMCAP) actions include completion of climate vulnerability assessments, updated emergency response plans for storm response, Tunnel Flood Mitigation Program implementation, and further incorporation of climate resiliency into MBTA design standards
- Clean Energy and Climate Plan (CECP) 2025 & 2030 and 2050
- Integration and coordination with MassDOT Climate PMO



Laws and Regulations

Global Warming Solutions Act (GWSA) and transportation sector-wide sub-limits set by the state:

- 18 percent below 1990 levels by 2025
- 34 percent below 1990 levels by 2030
- Net zero by 2050

An Act Driving Clean Energy and Offshore Wind (2022)

- Zero-emission passenger bus requirements
- EV charging station requirements

Regulations for Reporting of GHG Emissions 310 CMR

- Ongoing report of emissions



Increasing sustainability also responds to a changing context

External drivers facing the MBTA:



Climate-driven impacts and other hazards (heat, flooding, etc.)



Energy transition from fossil fuels to renewable sources



Funding opportunities



Building and transportation electrification increasing energy demand



Sociodemographic, economic, and political forces (e.g., population growth, migration)

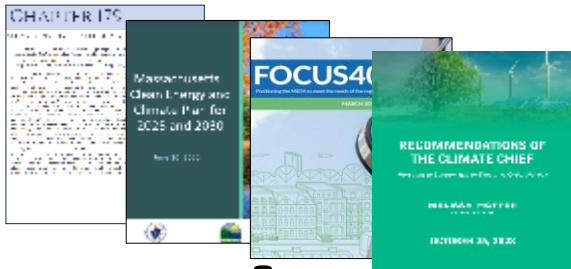


The Assessment provides MBTA with a roadmap of next steps

Climate Assessment project overview

MBTA engaged ARUP to support development of the Climate Assessment:

150+ relevant documents/plans, and **40+** state and federal regulations, policies, and programs reviewed



Engaged **50+** staff from **20+** departments through 1-on-1 interviews and 3 topic-specific workshops

Resilience	Energy and Emissions
Definitions and Key Priorities	Roles and Responsibilities

Climate Assessment Outcomes

Internal review of current activities to assess progress made to date and underway

Assessment of internal capacity, gaps, and process changes within the MBTA to address the impacts of climate change and achieve greenhouse gas reductions

Determination of key priorities and actions needed to support implementation and track progress

Opportunities for interdepartmental alignment through engagement on delivering a resilient and sustainable MBTA

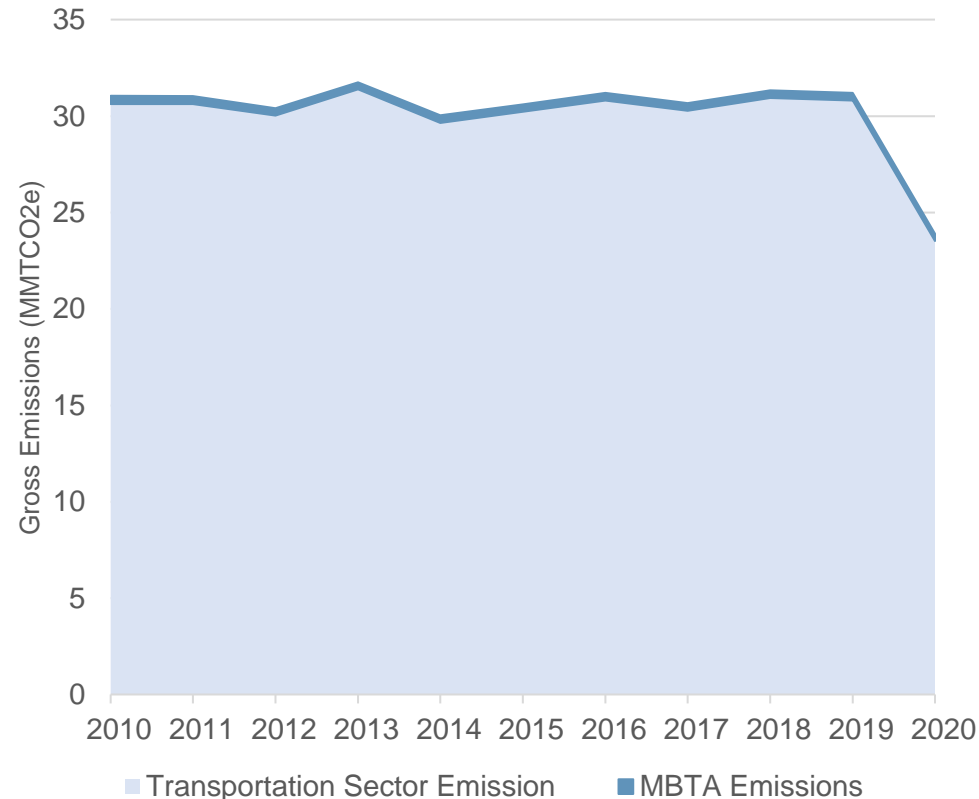
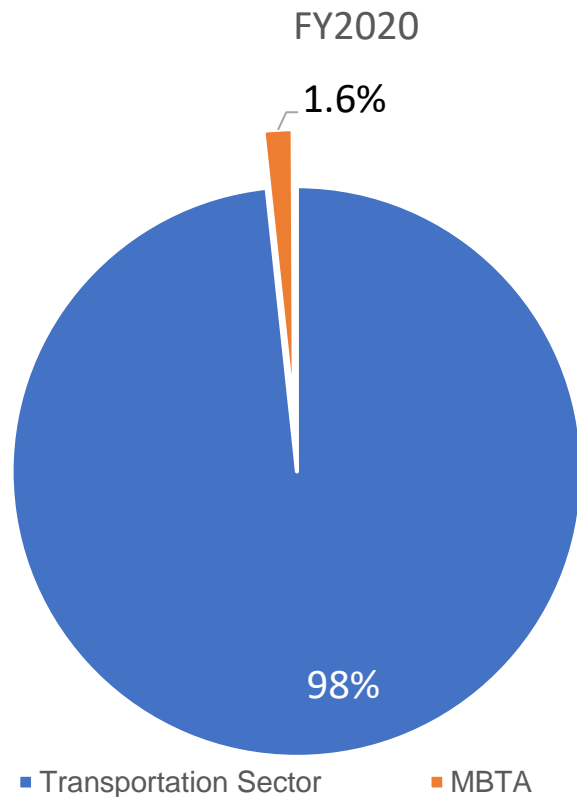


A sustainable MBTA system contributes to meeting MA's net zero emissions goal

The MBTA provides low carbon transportation for the region

At **37%** of emissions, transportation is the largest source of GHG emissions in Massachusetts.

However, MBTA's emissions represent less than ~2% of the sector's emissions and are declining, while accounting for ~10% of commuter trips in the Boston metro area.



MBTA contributes to Massachusetts emission reduction goals through:



Providing transit service as an alternative to single occupancy vehicle (SOV) travel



Fleet and facility decarbonization



Non-revenue fleet electrification



Significant steps taken to increase sustainability and resilience

Recent accomplishments

Energy



Procured Renewable Energy Certificates to offset the entirety of MBTA's electricity load



Invested \$22 Million in energy efficiency projects over 10 years, yielding \$17 Million in annual savings (81 total projects)

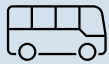


Leveraged the Energy Enterprise Management System (EEMS) and factored energy load into all new projects

Decarbonization



Reduced GHG emissions 43.8% and energy consumption 20% from 2009 baseline



Issued Bus Electrification Plan, procured new BEBs and started construction on maintenance facilities



Certified commuter rail compliance with EPA emission tiers

Resilience



Conducted vulnerability assessments for future climate conditions, including Rapid Transit Lines, Critical Facilities, and Tunnel Networks

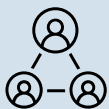


Mapped infrastructure against real-time storm data



Established a climate resilience score for use in CIP project evaluations

Cross-cutting



Created new Climate Policy and Planning team in alignment with the Climate Chief's recommendation



In addition, MBTA has numerous in-progress and on-going initiatives

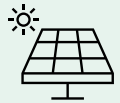
Energy



Expansion of Energy Management Systems to include traction power sub metering, building management systems, 5-minute interval data and demand management



Building upgrades for existing HVAC, Energy Recovery Systems, energy metering, windows, and insulation



Renewable Energy opportunities (i.e. Offshore wind, Battery Installations, On Site)

Decarbonization



Enhancement of sustainable design standards for new construction projects



Installation of EV Chargers



Upgrade of station lighting, including accessibility improvements



Electrification of non-revenue fleet



Implementation of bus facility electrification (construction of Quincy and North Cambridge facilities)



Development of a Facility Master Plan prioritizing decarbonization investments

Resilience



Continue to develop systemwide Tunnel Flood Mitigation Program: Tunnel Portal Doors, Pump Room upgrades, Emergency Planning improvements



Incorporating resilience into design reviews and risk management



Funding for climate resilience projects has been allocated through the CIP and various grants are being pursued such as PROTECT Grant, and SHMCAP Funding from EEA




On-going regional collaboration on adaptation strategies for priority infrastructure, in collaboration with Boston, Cambridge, Somerville, and other municipalities



Recommendations to build and deliver a more sustainable MBTA

Examples of recommendations within the Climate Assessment

-  **Planning and prioritization**
 - Establish systemwide plan to achieve net zero emissions and ensure power needs
 - Complete vulnerability assessments and use to create a systemwide resilience plan
-  **Organizational and Workforce Needs**
 - Incorporate sustainability into Authority decision-making processes
-  **Design enablement & integration**
 - Create energy efficiency protocols for projects outside the capital planning process
 - Integrate climate risk and sustainability reviews into asset management platform and decision-making processes
-  **Analysis and quantification**
 - Conduct economic analyses of resilience needs and of achieving net zero by 2050
 - Evaluate renewable energy generation and energy storage opportunities
-  **Funding**
 - Develop funding strategies to support implementation of Bus Electrification Plan and priority actions identified in proposed resilience, decarbonization and power plans
-  **Communication of risks and priorities**
 - Develop an internal and external communications strategy to strengthen public trust in public transit and understanding of its role in combating climate change

Support needed to implement the MBTA's Climate Assessment

Increasing the sustainability and resilience of the MBTA will require strong partnerships

The Climate Assessment's recommendations will serve as a roadmap for MBTA's new Climate Policy and Planning team. However, implementing these recommendations will require support, including:

Partnerships with utilities to prioritize MBTA power needs in support of fleet and facility electrification

Continued strong coordination with State and municipal partners to implement assessment recommendations

Additional funding to implement assessment recommendations and achieve a resilient and carbon-neutral system

Collaboration with other transportation providers, State agencies, advocates, and the public to achieve the MBTA's strategic goal of increasing the percentage of transit trips in the region

Support in highlighting the important role of the MBTA in meeting and building a more sustainable and resilient Commonwealth

