



# Transportation Update

American Council of Engineering Companies  
10 December 2019

# Frank DePaola, engineer who led MBTA and state highway division, dies after cancer battle



## Frank DePaola, former MBTA general manager, dies after lengthy cancer battle

By [Travis Andersen](#) Globe Staff, December 9, 2019, 12:28 p.m.





# MassDOT works to . . .

- **Ensure** the safety of all transportation system users
- **Maintain** and modernize assets, investing capital strategically
- **Manage** roadway operations, actively and safely
- **Improve** customer service and experience
- **Expand** transportation options throughout the Commonwealth
- **Reduce** greenhouse gas emissions and increase resiliency
- **Partner** with cities and towns and the private sector
- **Plan** for and implement a multimodal transportation system
- **Use** data to shape decisions and improve performance
- **Anticipate** and prepare for a disruptive future



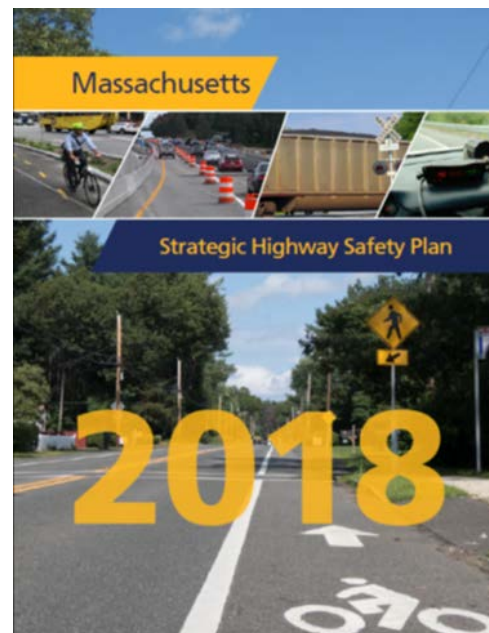
# Safety for All

Ensuring Safety for All Transportation System Users



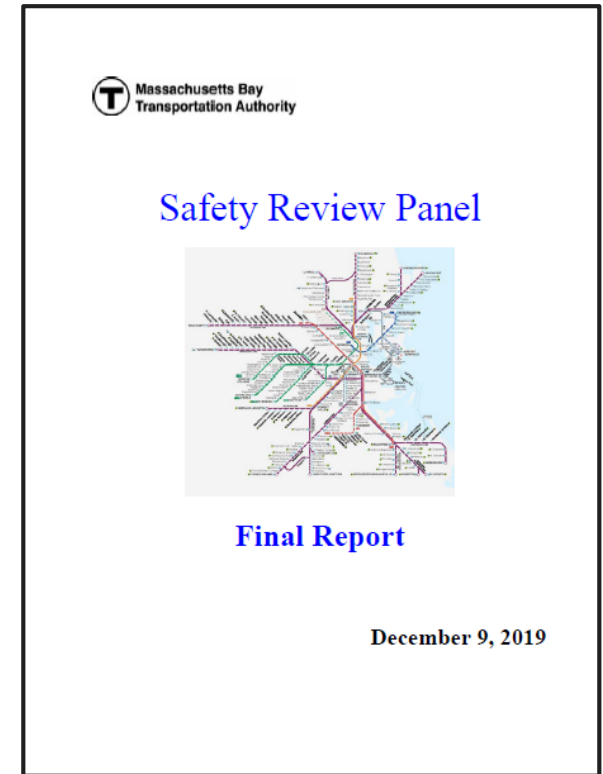


# Hands-Free Legislation – And, Hopefully, More to Come



# MBTA Safety Panel

- MBTA system is safe but could be safer
- MBTA lacks the needed “safety culture”
- Safety Management System required to be approved by July 2020 should be framework for upgrading all MBTA safety functions
- More resources need to be devoted to preventive maintenance





# The Transportation and Climate Initiative

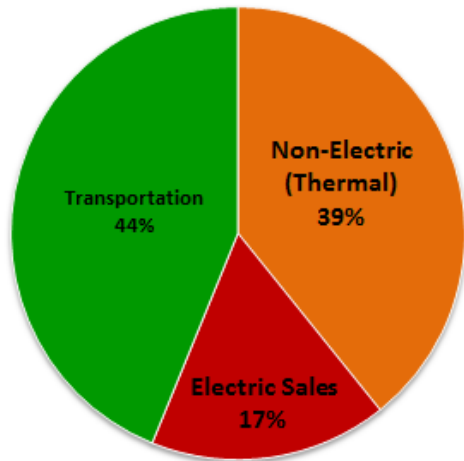
Tackling Transportation's Carbon Footprint



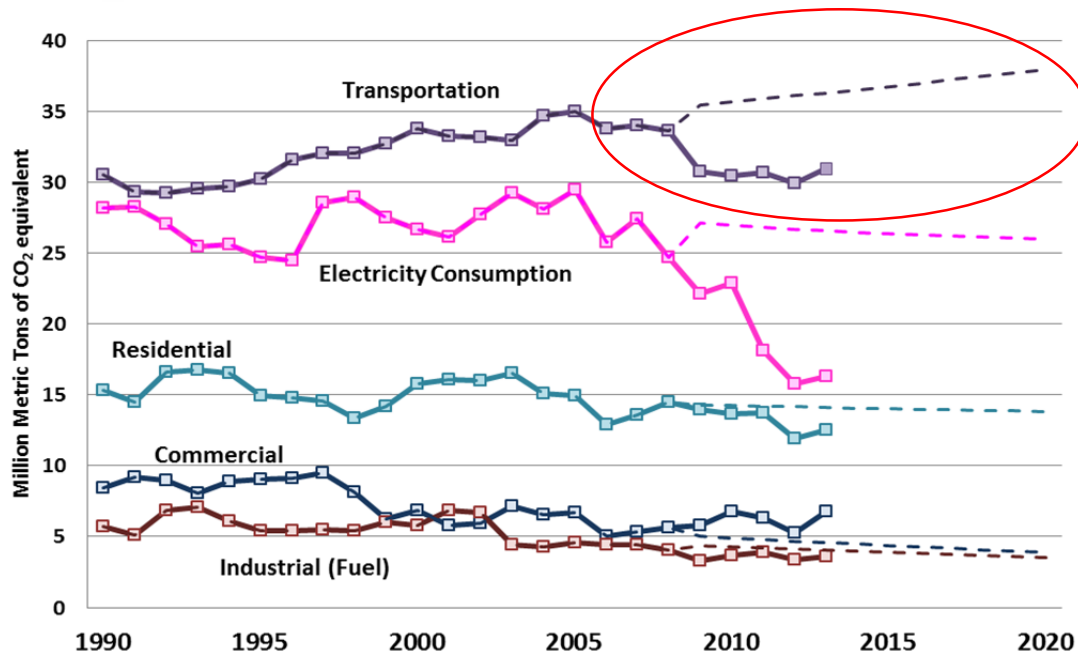
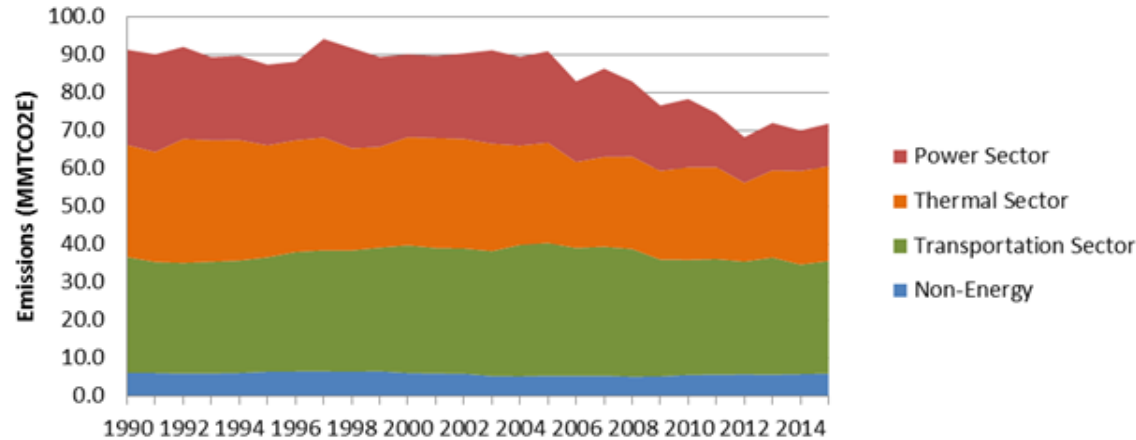
# We must tackle transportation GHG

## Massachusetts Energy Demand

Total: 1,074 Trillion BTU in 2016



## Massachusetts Greenhouse Gas Inventory





### Worcester, Mass., metro area

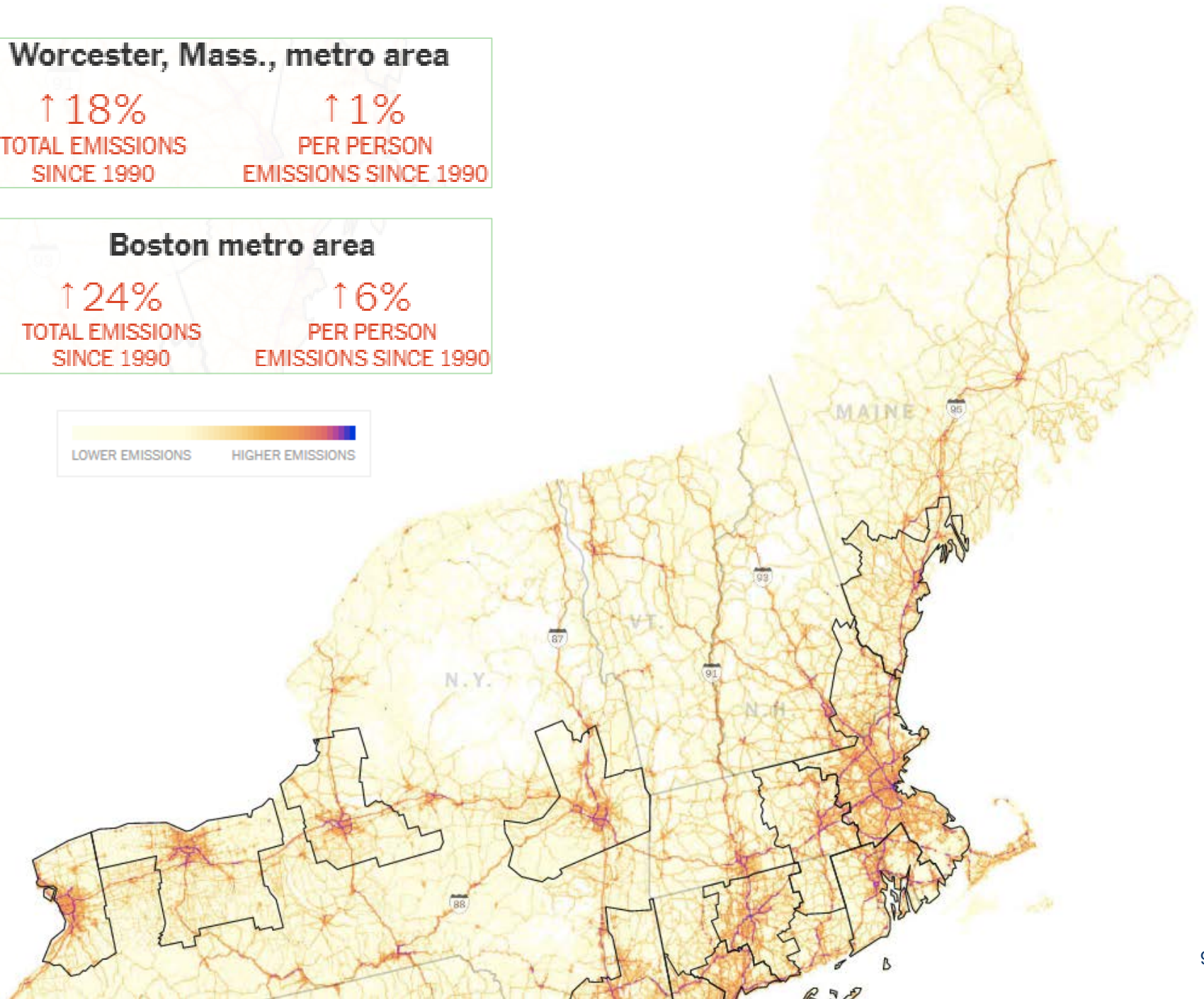
↑ 18%  
TOTAL EMISSIONS  
SINCE 1990

↑ 1%  
PER PERSON  
EMISSIONS SINCE 1990

### Boston metro area

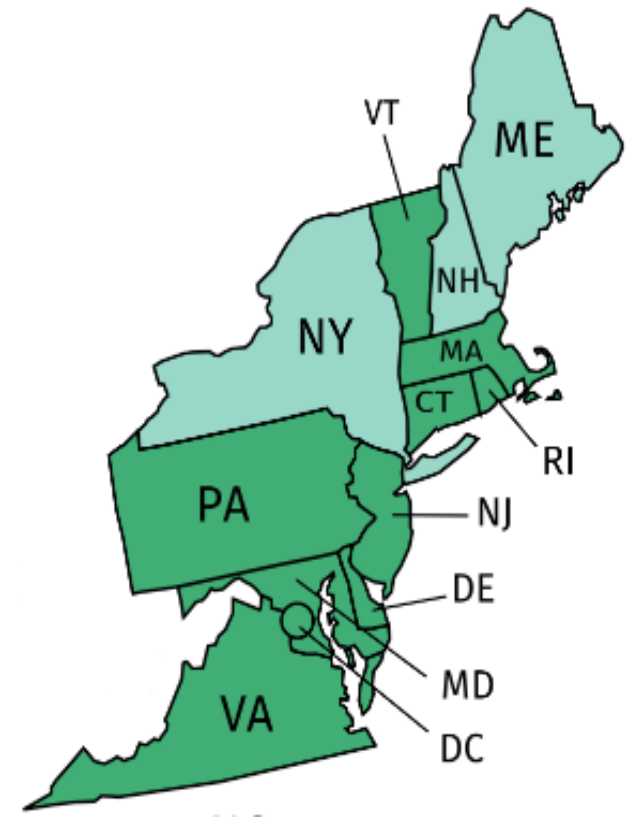
↑ 24%  
TOTAL EMISSIONS  
SINCE 1990

↑ 6%  
PER PERSON  
EMISSIONS SINCE 1990



# Transportation and Climate Initiative (TCI)

- Regional collaboration of 13 Northeast/Mid-Atlantic states, working to improve transportation, develop the clean energy economy, and reduce transportation emissions
- Energy and Environmental Affairs (EEA), Department of Environmental Protection (MassDEP), Department of Transportation (MassDOT) working together to reduce carbon emissions through a “cap-and-invest” program or other mechanism that establishes a price for transportation emissions





# How “cap and invest” works

## Cap and Invest: How it Works



### CAP

A limit, or cap, is set on the amount of carbon dioxide (CO<sub>2</sub>) that is released from vehicles using transportation fuels. The initial cap is based on a baseline or “business as usual” scenario and that cap may be reduced over time.

### ALLOWANCE

Transportation fuel suppliers must obtain an allowance for every ton of carbon dioxide resulting from the fuel they sell.



### AUCTION

The total number of available allowances is limited based on the cap. An auction is held. Transportation fuel suppliers (and other entities that wish to trade or retire them) can bid on available allowances.

### INVEST

States receive payments based on the revenues raised from the sale of allowances. States invest proceeds to reduce transportation carbon emissions through subsidies of lower carbon transportation options.



# Congestion in the Commonwealth

Reaching a Tipping Point





# CONGESTION IN THE COMMONWEALTH

REPORT TO THE GOVERNOR **2019**



# Key findings from the congestion report

1. Congestion is bad because the economy is good.
2. The worst congestion in the Commonwealth occurs in Greater Boston.
3. Congestion can and does occur at various times and locations throughout the Commonwealth.
4. Many roadways are now congested outside of peak periods.
5. Congestion worsened between 2013 and 2018.
6. Simple changes in travel time on an average day do not capture the severity of the problem.
7. Massachusetts has reached a tipping point with respect to congestion.
8. Many commuting corridors have become unreliable, with lengthy trips on bad days.
9. Congestion has worsened to the point where it reduces access to jobs.
10. We should be worried about congestion on local roads, too.

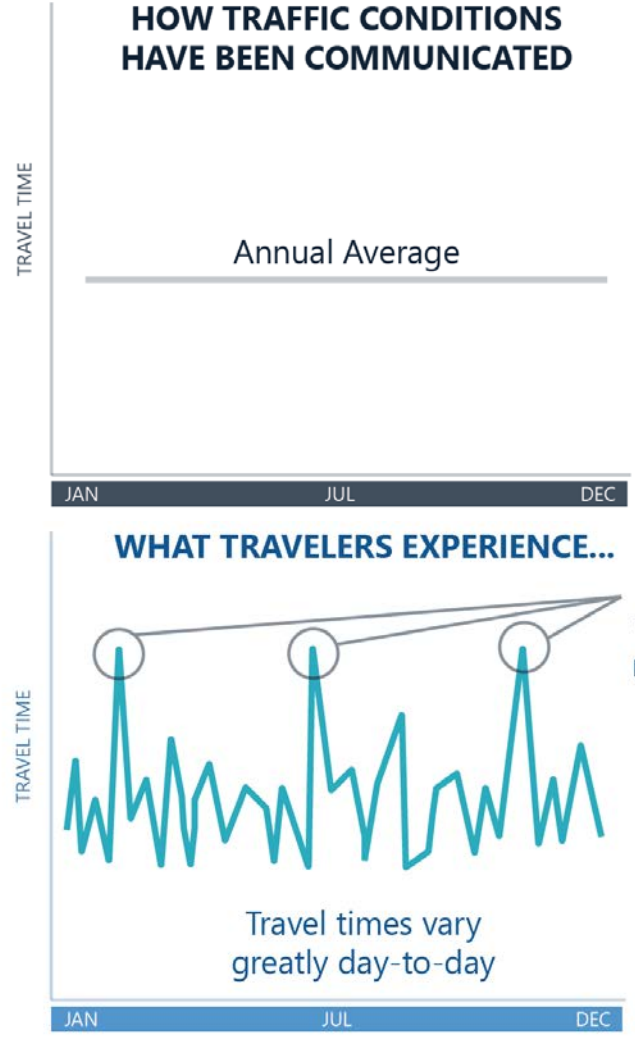
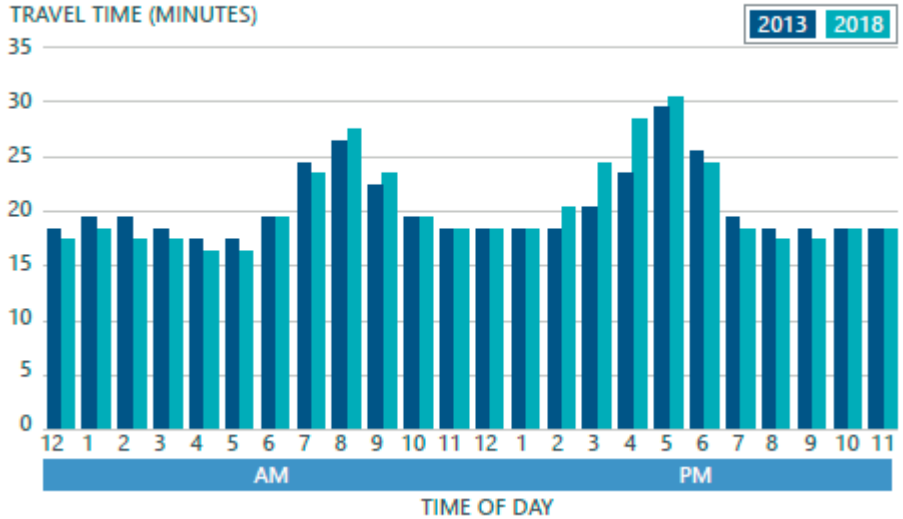




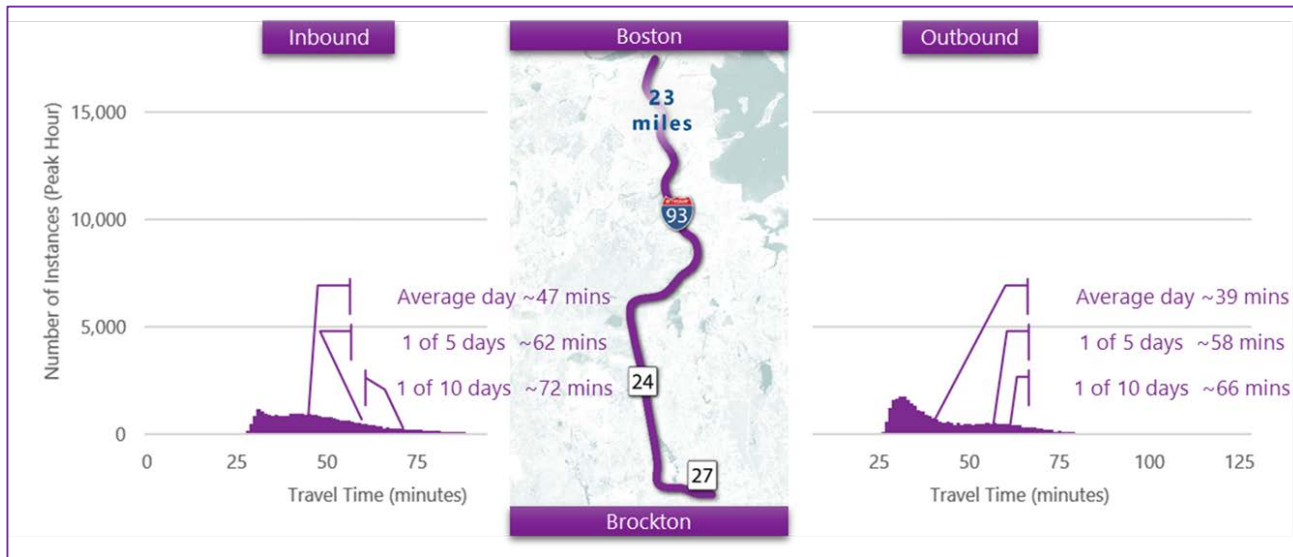
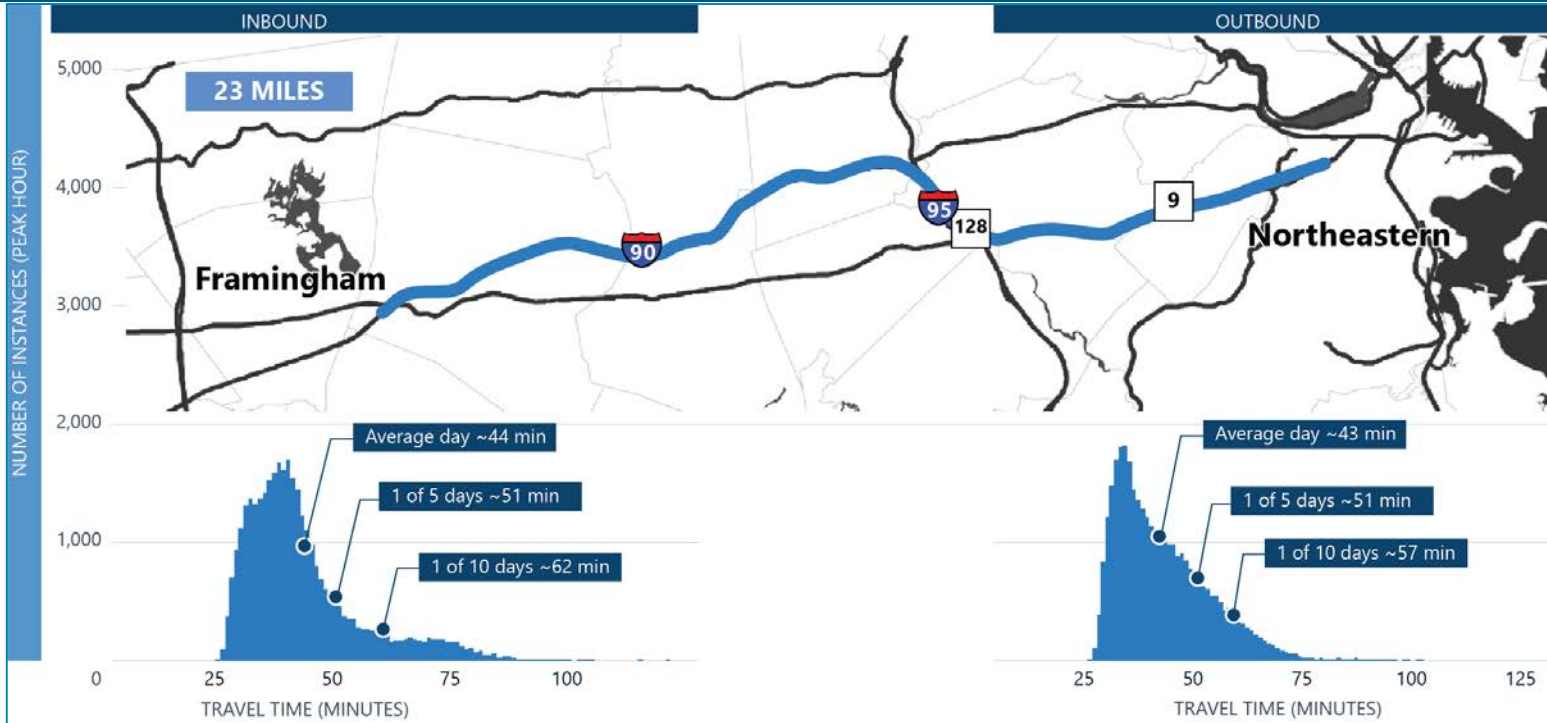
# Changes in travel time on an average day do not capture the severity of the problem

## Change in Congestion (measured in travel time)

I-90 | Eastbound | I-95/128 (Weston) to Logan Airport



# Variable trip times make travel unreliable





# Our transportation system must provide

- **Reliability and safety** – Whether on the roads or transit, people need to be able to depend on the system and predict how long it will take them to get where they need to go.
- **Accessibility** – The system must provide residents with good options for getting to important destinations, including the ability to safely get from where they live to where they work within a reasonable period of time.
- **Sustainability** - The Commonwealth cannot meet its goal of reducing overall greenhouse gas emissions 80 percent by 2050 without substantially reducing transportation sector carbon emissions.
- **Equity** – The system must work for everyone and in communities throughout the state, for residents of cities and of rural communities, workers who can stay home or shift their travel time and those who cannot, and travelers who would like to use transit or share a ride and those who need to drive.

# Recommendations and next steps

- Address local and regional bottlenecks where feasible
- Actively manage state and local roadway operations
- Reinvent bus transit at both the MBTA and Regional Transit Authorities
- Increase MBTA capacity and ridership
- Work with employers to give commuters more options
- Create infrastructure to support shared travel modes
- Increase remote work and telecommuting
- Produce more affordable housing, especially near transit
- Encourage growth in less congested Gateway Cities
- Explore the potential for congestion pricing via managed lanes

# Fixing the System - Faster

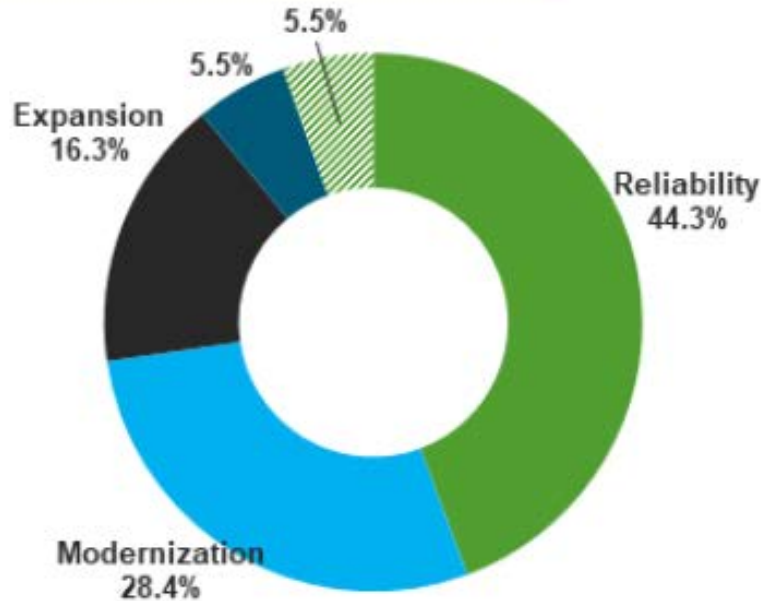
- Accelerating Capital Delivery





# We start with \$18.3 billion funded in the CIP

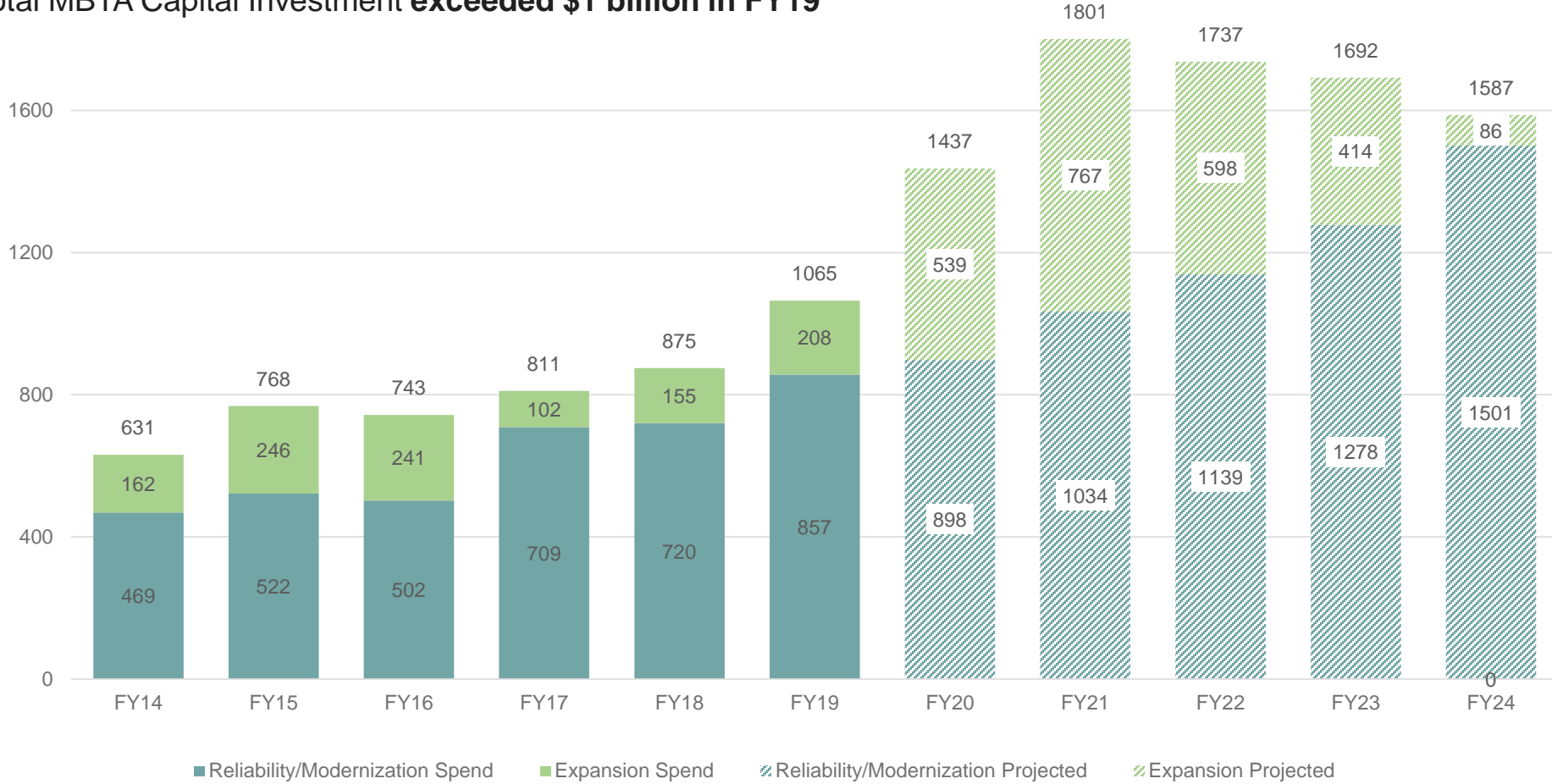
Overall program spending breakdown



<i>millions</i>	SFY 2019-23	SFY 2020-24
Reliability	\$8,376.6	\$8,111.0
Modernization	\$5,122.9	\$5,192.4
Expansion	\$1,926.5	\$2,988.4
Chapter 90	\$1,000.0	\$1,000.0
Planning, Enterprise Services, & Other	\$848.1	\$1,009.3
<i>Five-year total</i>	\$17,274.1	\$18,301.1

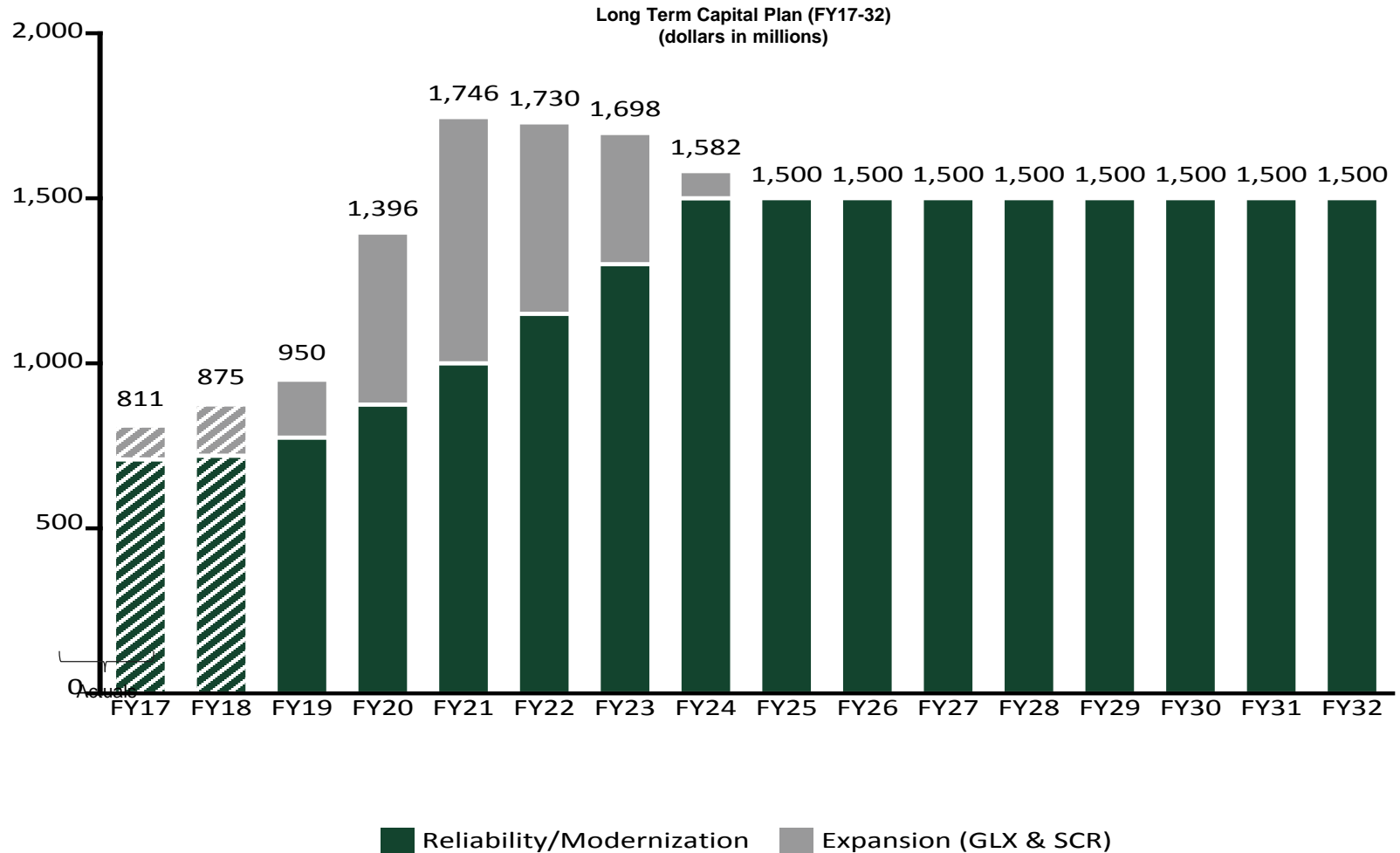
# The MBTA has increased capital spending

Total MBTA Capital Investment **exceeded \$1 billion in FY19**



1801	Reliability/Modernization Capital Spending	Total Capital Spending
FY14-FY18	\$2.9 billion	\$3.8 billion
FY19-FY24	\$6.7 billion	\$9.3 billion

# MBTA capital spending is ramping up to \$1.5B annually





# BUT funding alone won't accelerate investment

- **People** – The MBTA in particular needs a dedicated workforce that can meet both operational and capital delivery needs
- **Procurement and Project Delivery** – Both MassDOT and the MBTA need more ways to procure and deliver projects
- **Capital Resources** – To be useful, any additional funding needs to match the nature and timing of the capital investments that would be made with that funding.
- **Coordination and Disruption** – The sheer number of both roadway and transit projects in and around Boston require detailed coordination and phasing, but also a civic conversation about our collective tolerance for short-term disruption in order to accelerate the repair and modernization of the transportation system.

# Accelerating Capital Delivery: The Flex Force

A one-time hire of operations staff who can support both capital and operating tasks

- Fund will provide short-term flexibility to rapidly hire additional staff and contractors to accelerate capital projects
- Because “flex force” employees need not be entirely dedicated to capital projects, they would also be available to perform additional inspections and operating maintenance
- After initial surge, workforce would be integrated into steady-state operating and capital budgets
- Flexible resources include a mixed workforce of full-time employees, temporary “960” retirees, and external contractors

- |                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Track Laborers</li><li>• Track Persons</li><li>• Track Supervisors</li><li>• Track Forepersons</li><li>• Track System repairpersons</li><li>• Track Engineers</li><li>• Track Executives</li><li>• External consultants</li></ul>                                 |
| <ul style="list-style-type: none"><li>• First class line repairer</li><li>• Power Equipment technicians</li><li>• Power wirepersons</li><li>• Power engineers</li><li>• Line forepersons</li><li>• Power wireperson forepersons</li><li>• Electrical forepersons</li><li>• Cable Splicer/Helper</li></ul> |

- |                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Signal Wirepersons</li><li>• Signal Engineers</li><li>• Signal Foreperson</li><li>• Signal Inspectors</li></ul> |
| <ul style="list-style-type: none"><li>• Management</li></ul>                                                                                            |
| <ul style="list-style-type: none"><li>• Bus Operators</li><li>• Officials</li><li>• Instructors</li></ul>                                               |
| <ul style="list-style-type: none"><li>• Motorpersons</li><li>• Officials</li><li>• Instructors</li><li>• Dispatchers</li></ul>                          |
| <ul style="list-style-type: none"><li>• Diversion Manager</li></ul>                                                                                     |

# Accelerating Capital Delivery – new tools for fixing it faster

- **Clear authority for the MBTA and MassDOT to enter into public-private partnership ('P3') arrangements**
- **Job Order Contracting** for capital projects under \$500,000
  - A number of other transit agencies (CTA, MARTA, WMATA) all use it to deliver high-frequency & low complexity facility-oriented capital projects quickly
  - Example: once established, contractors would be available to perform as needed and on call customer-facing and employee-related repairs and maintenance in stations, platforms and facilities
- Authorization for the MBTA and MassDOT to use the **design/build project delivery** method for all construction and repair projects, not just those with budgets over \$5 million
- Authorization for the MBTA to utilize an alternative project delivery method (**Design/Build/Finance/Operate/Maintain**) in order to contract with a private entity for all aspects of a capital project
  - **Example:** T was unable to use a single DBFOM for AFC 2.0 project, necessitating a separate Design/Build contract for installation of fare equipment to be procured





# Accelerating Capital Delivery – new tools for fixing it faster

- Approval for the MBTA and MassDOT to enter into competitively procured real estate deals or other projects with private parties that include mitigation and the private construction of facilities that will be owned by the agency
- An increase in threshold for required public bidding of construction projects for the MBTA and MassDOT from \$50,000 to \$100,000
- **A + B Bidding** (Section 97)
  - Ability to use ‘A+B’ or ‘cost-plus-time’ procurement method which allows time to complete to be considered in the bid evaluation and award
  - Under the A+B method, each bid submitted consists of two components:
    - The “A” component is the price: a bid of the dollar amount for all contract work -- traditional “low” bid component
    - The “B” component is time: a bid of the total number of calendar days required to complete the project, as estimated by the bidder
  - More than half of US states have used federally-funded projects, including California, New York, Maine and Maryland
  - Example: Any project that impacts traffic and travelling public e.g. Tobin Bridge



# The Transportation Bond Bill

An Act Authorizing and Accelerating Transportation Investment





# The issue is paying for WHAT WE NEED

- **Start by analyzing needs:** What investments are needed in the transportation system to accomplish our objectives
- Remember that funding, by itself, won't solve problems like congestion and reducing greenhouse gas emissions
- **Prioritization is key:** No matter what the annual spending target, investments need to be prioritized and sequenced
- **Funding needs to be matched, in timing and type, to needs:**
  - **Target:** How much investment is needed to achieve a defined investment target?
  - **Timing:** Over what period of time will the target be met – and how fast can spending ramp up?
  - **Type of Capital:** Will the funding source produce the right amount of capital over the right period of time?

# Four Key Themes of 2019 Transportation Bond Bill

- **Theme 1: Rebuilding and Modernizing Assets**

- Federal aid spending authorization
- Next Generation Bridges
- MBTA capital spending authorization
- Approaches to Cape Cod Bridges

- **Theme 2: More and Better Mobility Options**

- Statewide bicycle and pedestrian plan implementation funding
- Water Transportation
- Allston Multimodal Project

- **Theme 3: Supporting our Municipalities**

- Chapter 90
- New Municipal Pavement Program
- New Bottleneck Reduction Program
- New Transit Infrastructure Partnership Program

- **Theme 4: Accelerating Capital Delivery**

- Authority for Public Private Partnership arrangements
- Design Build Authorization for small projects
- Authority for alternative project delivery method (Design/Build/Finance/Operate/Maintain)

# With the bond bill, many ways of funding transportation

- **General obligation bonds:** “Bond cap” or non-federal aid
- **Grant anticipation notes:** \$1.25 billion to fund the Next Generation Bridge Program, modelled on funding used for prior Accelerated Bridge Program
- **“Pay Go” Capital:** Existing tolls on the Metropolitan Highway system and western Turnpike support needed State of Good Repair investments
- **Rail Enhancement Program bonds:** Reauthorizes and expands revenue bond program authorized in the 2014 bond bill to \$5.7 billion
  - With the bond bill providing additional backing with up to half proceeds of the Transportation and Climate Initiative
- **MBTA Revenue bonds:** MBTA bond issuance supported by restructuring of MBTA debt portfolio under FMCB
- **Resiliency funding:** Separate resiliency funding proposed for local and state critical infrastructure

# What the Bond Bill Funds and Does

- **Roads and bridges:** Increases investments in state-owned roads and bridges;
- **Municipal investments and partnerships:** Reauthorizes and creates a half-dozen programs that support municipal investments in roads and bridges, Complete Streets and transit;
- **Mega-Projects:** Provides a down-payment for two critical mega-projects, the Allston Multimodal Project and Cape Cod Canal Bridges and Approaches;
- **Sustainable transportation:** Authorizes investments in sustainable transportation options including walking, biking, water transportation and Regional Transit Authority transit;
- **Congestion relief:** Addresses traffic congestion by following up on some of the key recommendations in our recent Congestion report; and
- **Procurement, project delivery and public-private partnerships:** Provides both MassDOT and the MBTA with new project delivery and procurement tools, including unleashing the power of public-private partnerships.



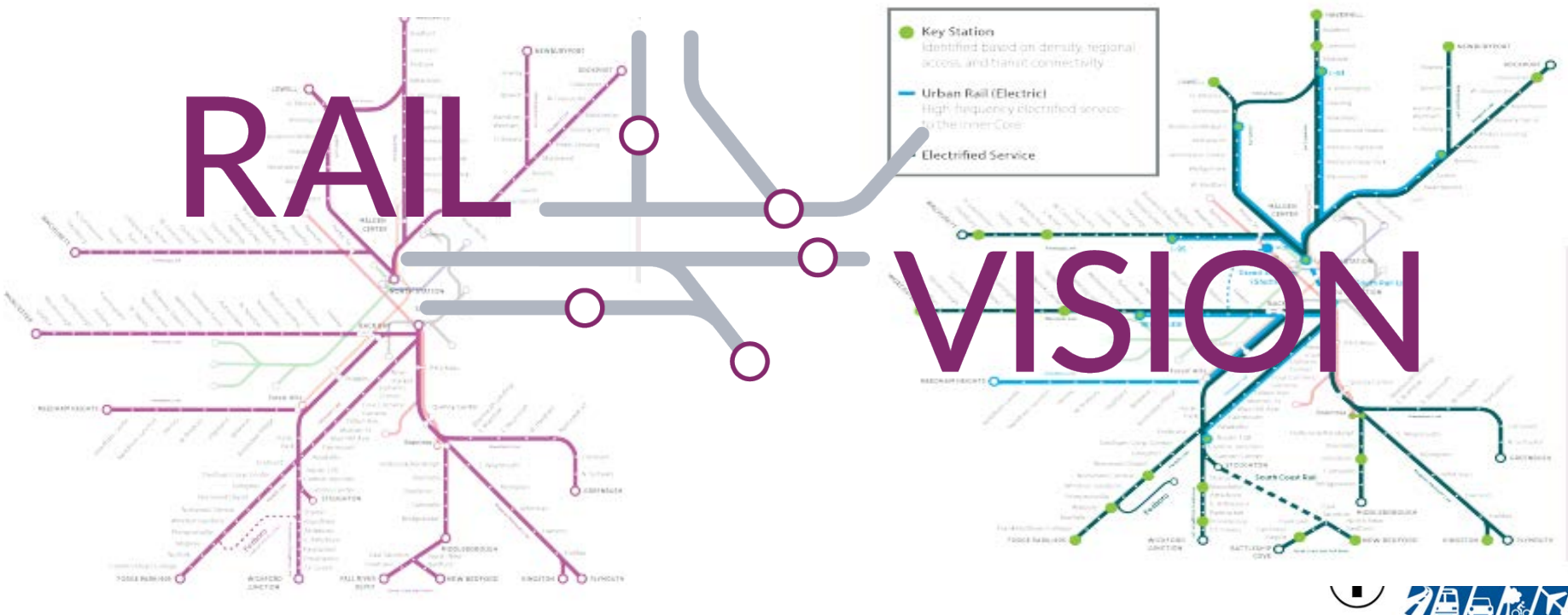
# Improving and modernizing the MBTA network

- Three new capital sources for the MBTA
  - Bond cap for direct capital support
  - Reauthorization and expansion of the Rail Enhancement Program
  - Authorization for bonds backed by revenue from Transportation Climate Initiative (Section 113)
- How will new funding be used?
  - Total capital spending authorization will support an aggressive capital program to address MBTA's reliability and modernization capital needs over 15 years
  - Reauthorizing and expanding the current Rail Enhancement Program to support \$3.4 billion in spending authorization for a variety of improvements and modernization of MBTA infrastructure **supported with proceeds from a future regional carbon reduction program** including, among others:
    - Green Line transformation
    - Better Bus Project implementation
    - Purchase of battery electric, hybrid or other low emission transit vehicles
    - Commuter Rail Modernization – Early action and pilot projects
    - Climate change adaptation and emergency preparedness



# Early actions to transform Commuter Rail

- MBTA Rail Vision has strategies to transform the existing Commuter Rail system into one that better supports improved mobility and economic competitiveness in Greater Boston and beyond.
- A thorough evaluation of costs, ridership potential, and operational feasibility of various alternatives, as well as broad public conversation in 2019, the process has informed the ultimate vision for the future of the Commuter Rail—one that the MBTA will now begin to turn into a reality.
- The bond bill authorizes \$400 million for commuter rail locomotives and coaches/vehicles and for and piloting new service models identified in Rail Vision



# Support for Multimodal Investments

- \$330 million in funding for our Regional Transit Authorities to match federal funding and support state-funded programs
- Additional authorization (\$60 million) for continued support for the Mobility Assistance Program
  - Program supports elder transportation and transportation for people with disabilities
- \$100 million to implement the statewide Bicycle and Pedestrian Plans
- \$25 million for matching municipal grants for water transportation services
- \$250 million for Allston Multimodal Project
- \$400 million for improvements to the MassDOT rail network (primarily freight use) including continued support for the Industrial Rail Access Program (IRAP)
- Increase transit tax credit to match federal limit (Section 57)

# Congestion relief tools

- Establishes a per-employee tax credit of \$2,000 annually for any employee who no longer commutes as a result of an eligible employer program supporting telecommuting, in service of reducing congestion
- \$50 million for a new Local Bottleneck Reduction Program to make grants to cities and towns for moderate, cost-effective congestion relief (eg smart signals)



# Beyond the CIP and bond bill

- Resiliency
  - Separate resiliency funding proposed for local and state critical infrastructure
  - Governor's bill was filed and House has adopted an alternative approach
- Commuter rail transformation
  - Need to develop consensus on approach, timetable (including phasing) and pricetag
  - Need authorization (included in outside section of bond bill) for MBTA to conduct design/build/operate/maintain/finance public-private partnerships
  - Need to decide on procurement strategy for commuter rail contract beyond 2022
  - While all of these things are happening, the bond bill authorizes \$400 million for commuter rail locomotives and coaches/vehicles and for and piloting new service models after Commuter Rail vision is complete
- Allston Multimodal Project
  - Finance plan being developed as project advances through design and MEPA/NEPA



**Thank you for listening.  
Questions?**