



**TRANSPORTATION**

**ADVISORY COMMITTEE**

**MARCH 6, 2019**

# Choices for Stewardship: Recommendations to Meet the Transportation Future

## *Commission on the Future of Transportation in the Commonwealth of Massachusetts*

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Taubman Center for State and Local Government

Harvard Kennedy School of Government

March 2019

- Governor Baker signed Executive Order No. 579 to establish the Commission on the Future of Transportation in the Commonwealth
- Commission focused on five key areas:
  - Climate and resiliency
  - Transportation electrification
  - Autonomous and connected vehicles
  - Transit and mobility services
  - Land use and demographic trends
- Target Year: 2040



# **IT'S EASY TO GET THE FUTURE WRONG**

**We have a long history of it, in fact.**

# HARRY WARNER 1925

One of the Warner Brothers

**“Who the hell wants  
to hear actors talk?”**



# THOMAS WATSON 1943

Chairman of IBM

**“I think there is a world market for maybe five computers.”**



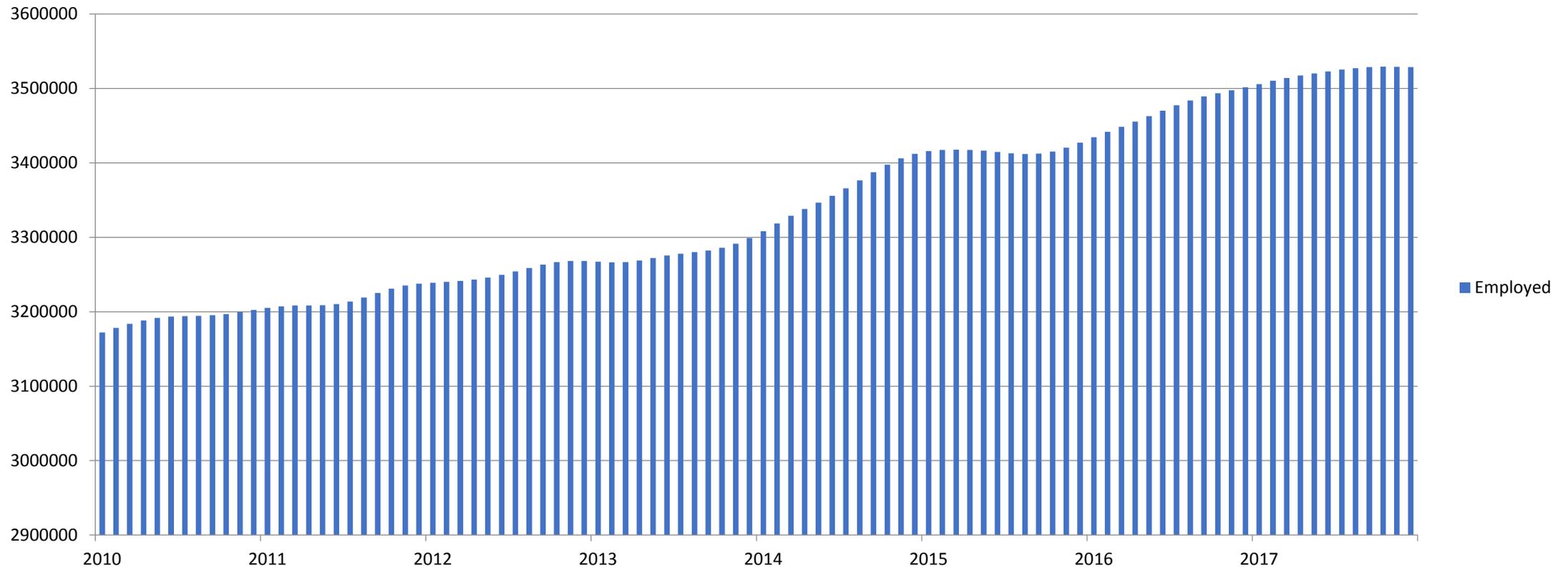
# How the report is organized

- Volume I: Choices for Stewardship: Recommendations to Meet the Transportation Future
  - Section 1: Facts, Trends, & Issues
  - Section 2: Scenario Planning
  - Section 3: Commission Recommendations
- Volume II: Background Books – Facts, Trends, & Issues
  - Demographics and Land Use
  - Transit, Active Transportation, and Mobility Services
  - Autonomous and Connected Vehicles
  - Climate Change and Resilience
  - Transportation Electrification

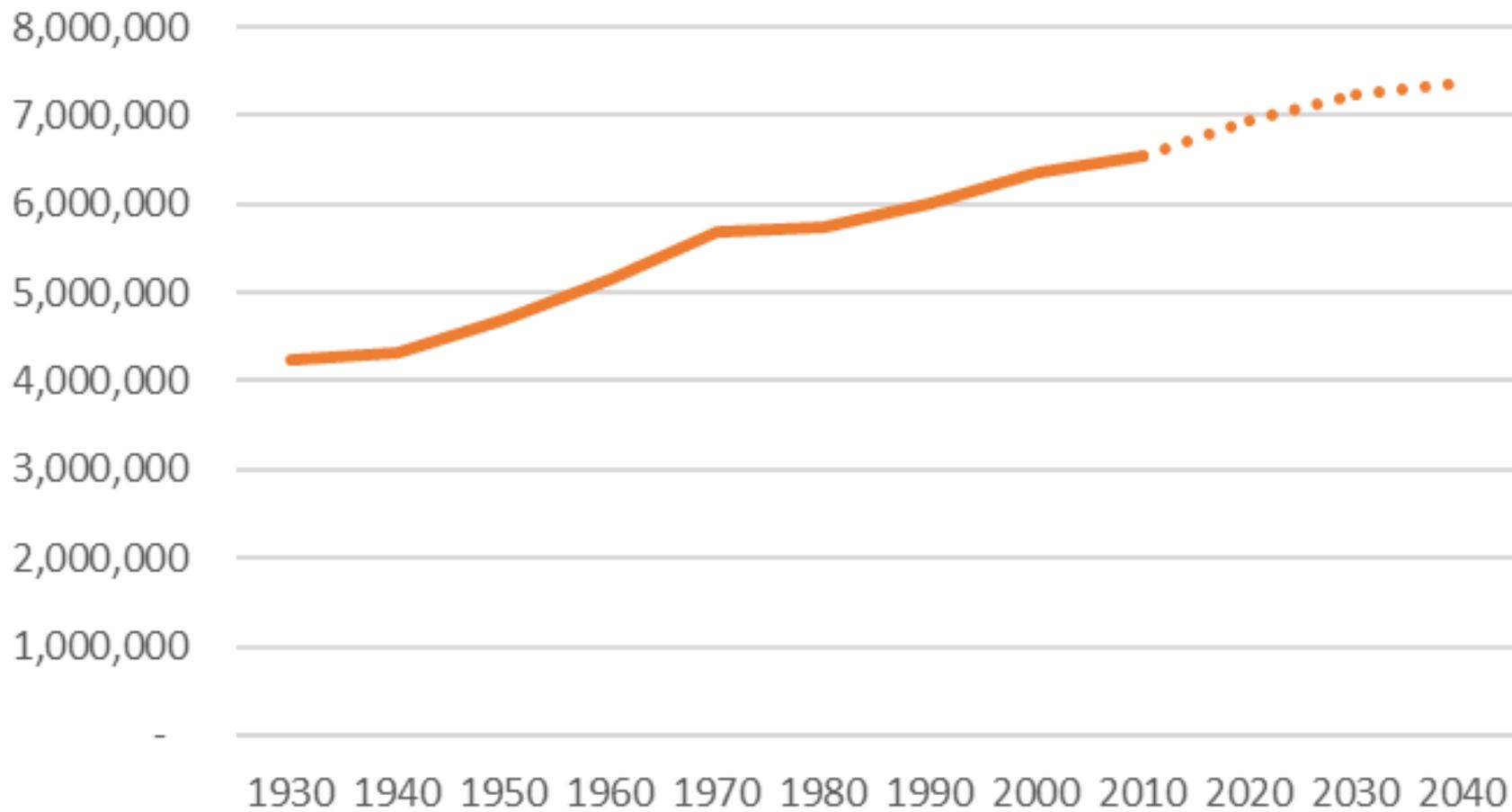
# Section One: Facts, Trends & Issues

# Over 356,000 Newly Employed (2010-2017)

**Employed**



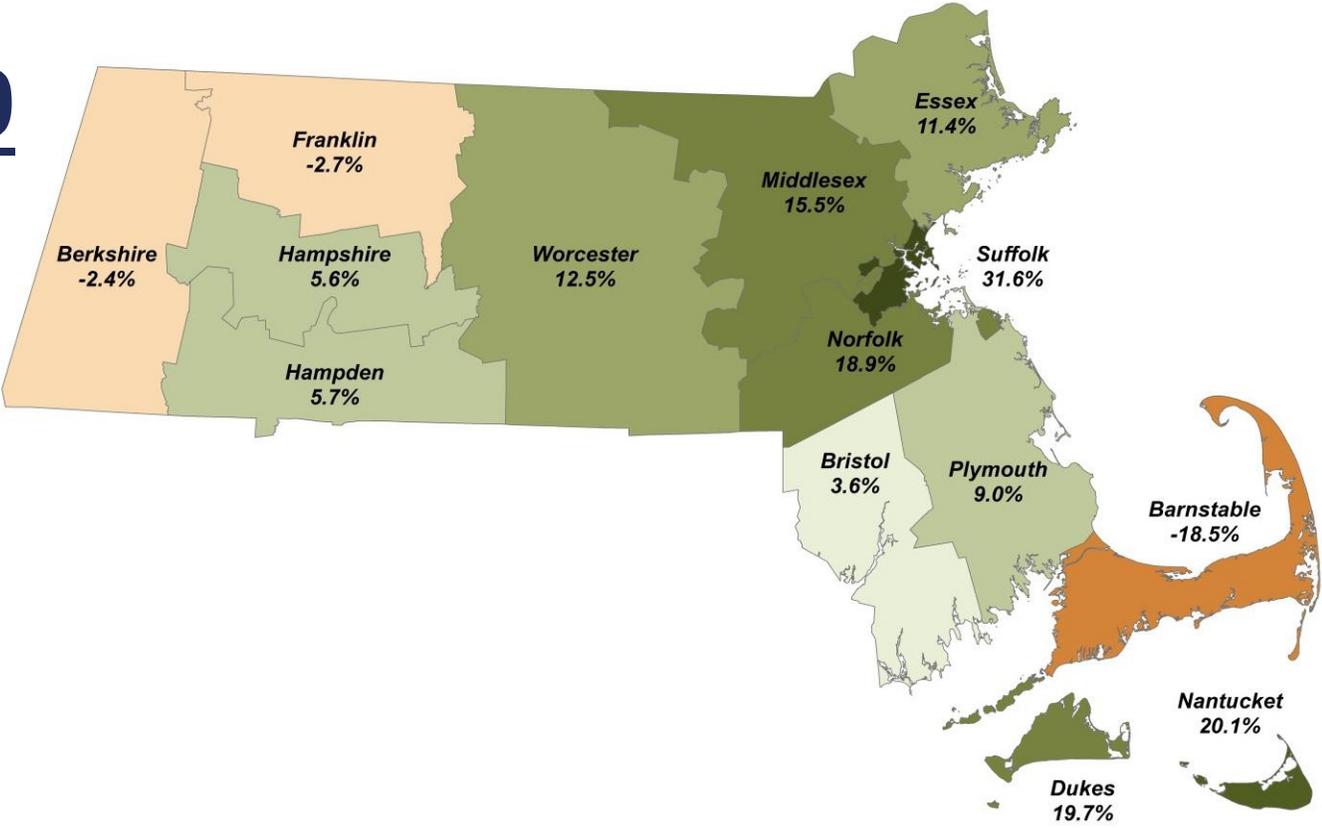
Massachusetts Population 1930-2040, Actual and Projected



# By 2040: MA Population is Projected to Grow by ~600,000

## Anticipated Percent Change in Population by County

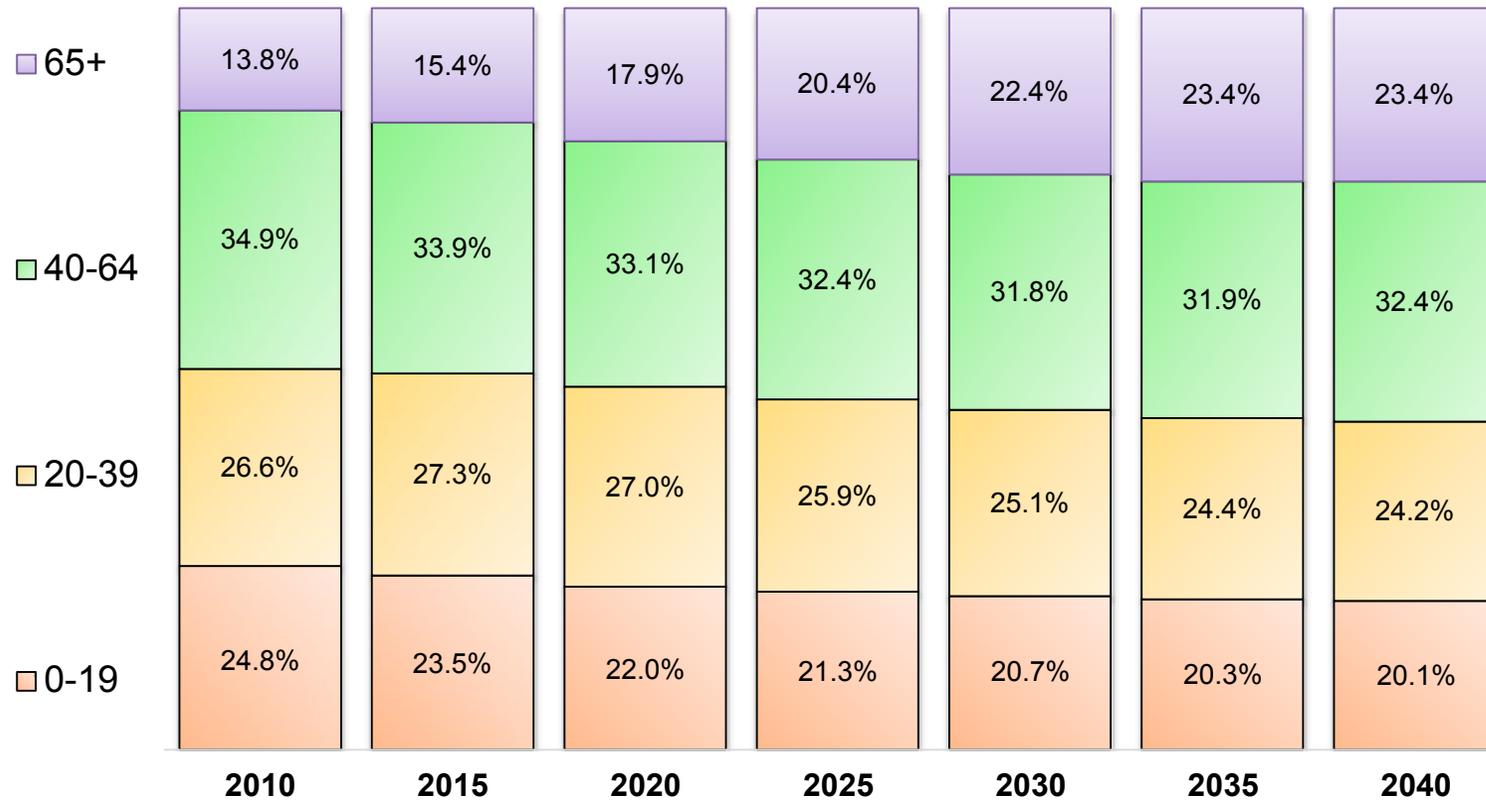
**2010-2040**



Source data:

# 65+ Nearly Doubles as Share of Population

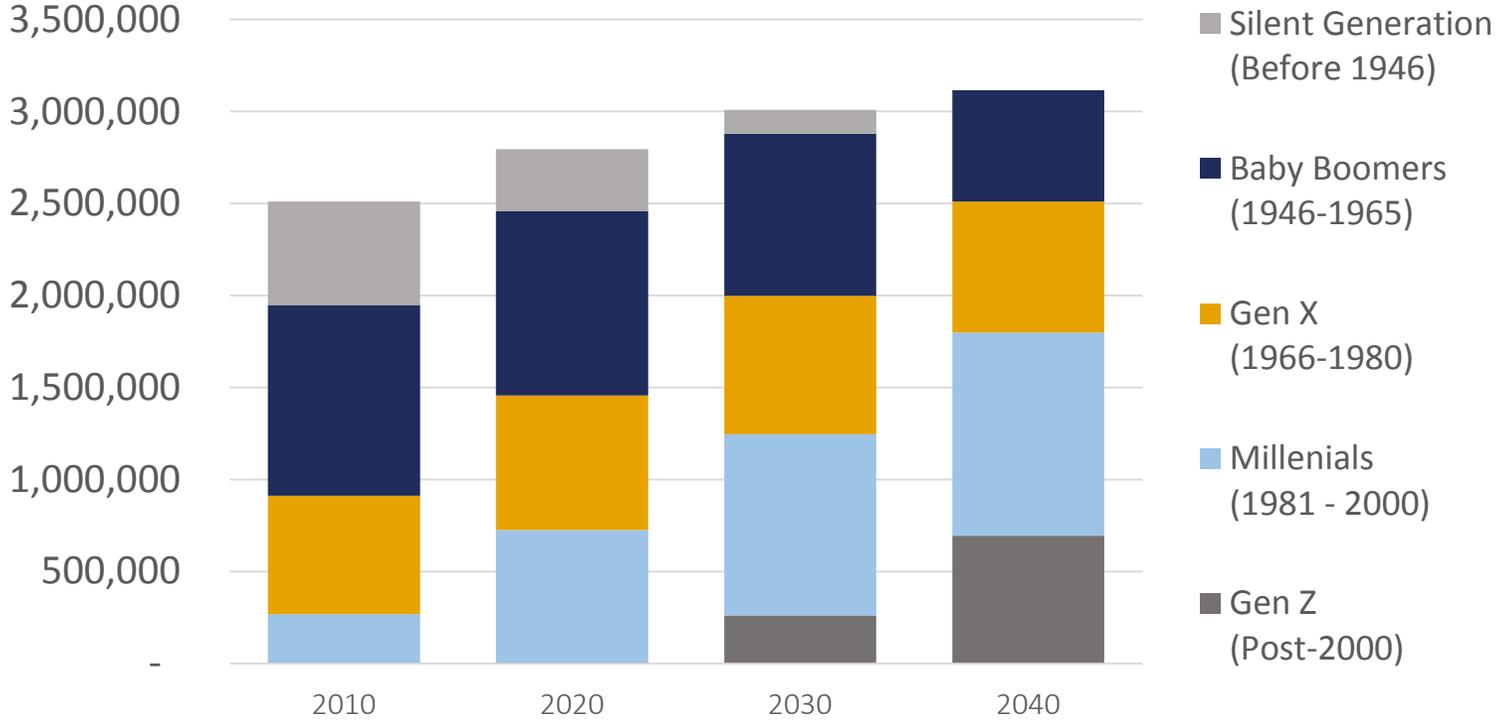
**Massachusetts Projected Population Distribution by Age Group  
2010-2040**



Source Data: U.S. Census Bureau, 2010 Census Summary File 1; UMass Donahue Institute Population Projections 2018

# By 2040, most households will be headed by someone born after 1980

Householders by Generation, Massachusetts, 2010 - 2040



Source data: MAPC Household Projections & UMDI/MassDOT Population Projections

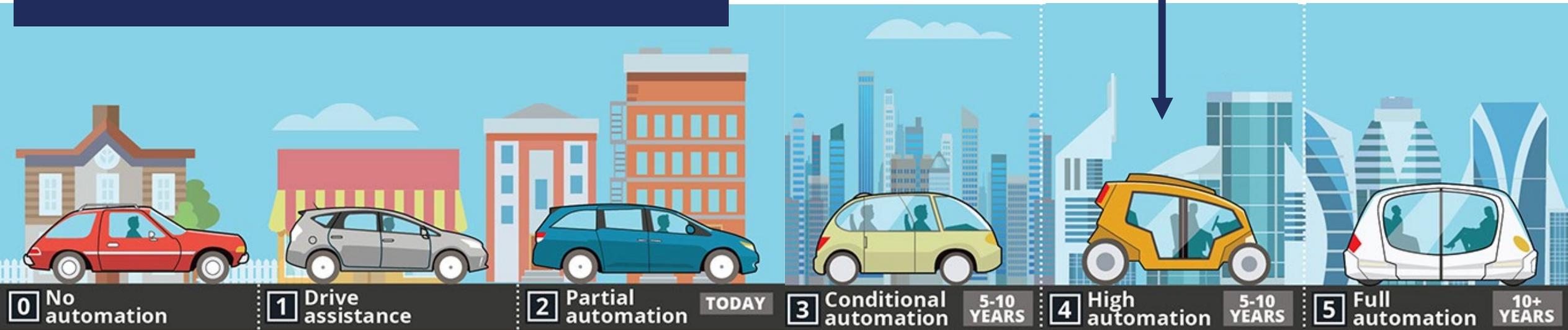
# AV Technology: 5 Levels of Automation

Level 4&5: No Human Drivers. When? Widely Varies

“a fully-featured Google self-driving car might be 30 years away.” Chris Urmson SXSW 2016

Level 4 AV technology could be **19-75%** of vehicles by 2040.

Bansal and Kickelman “Forecasting American’s Long-term adoption of connected and autonomous vehicles technologies”, Transportation Research part A. 2017



## Facts/Trends/Developments:

- Cost and willingness to pay are the major economic forces behind technology adoption
- Full level 5 automation is more than 10 years away

## Impacts

- Level 4 automation is an important consideration, where when and how might these vehicles be bounded



Everything else including listed above falls under - **Vehicle-to-Everything (V2X)**



**People - Vehicle-to-Pedestrian (V2P)**



**Other vehicles - Vehicle-to-Vehicle (V2V)**



**Network or Cloud - covered by Vehicle-to-Network (V2N)**

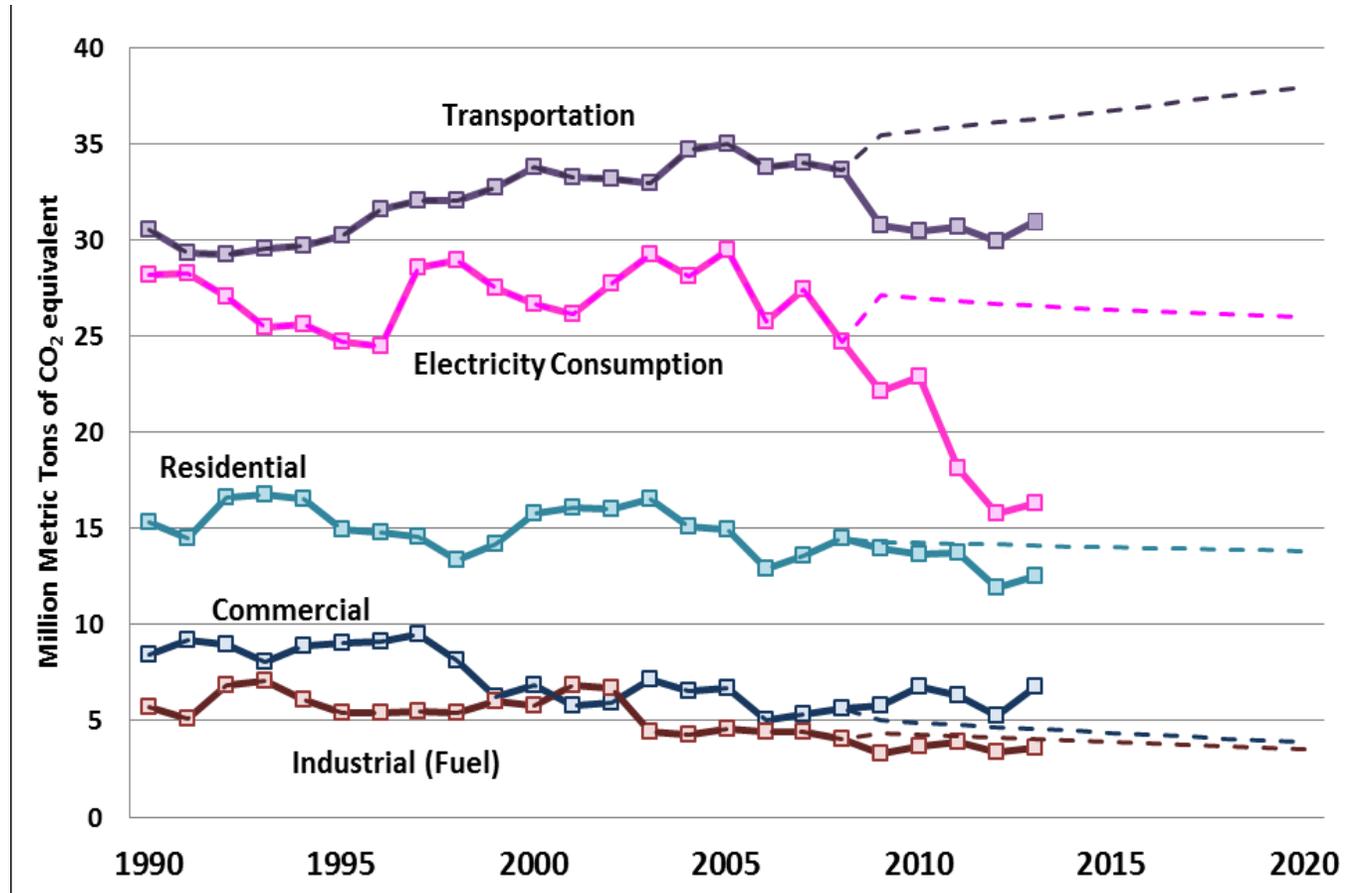


**Nearby devices, such as sensors, cameras, or personal devices - Vehicle-to-Device (V2D)**



**Infrastructure objects such as traffic lights, signs or even roadblocks or lane marks - Vehicle-to-Infrastructure (V2I)**

# Transportation Has Largest Share of CO2 Emissions



# Chinese are electrifying bus fleet

## China's Shenzhen city electrifies all 16,359 of its public buses

The city has transformed the entire bus fleet.



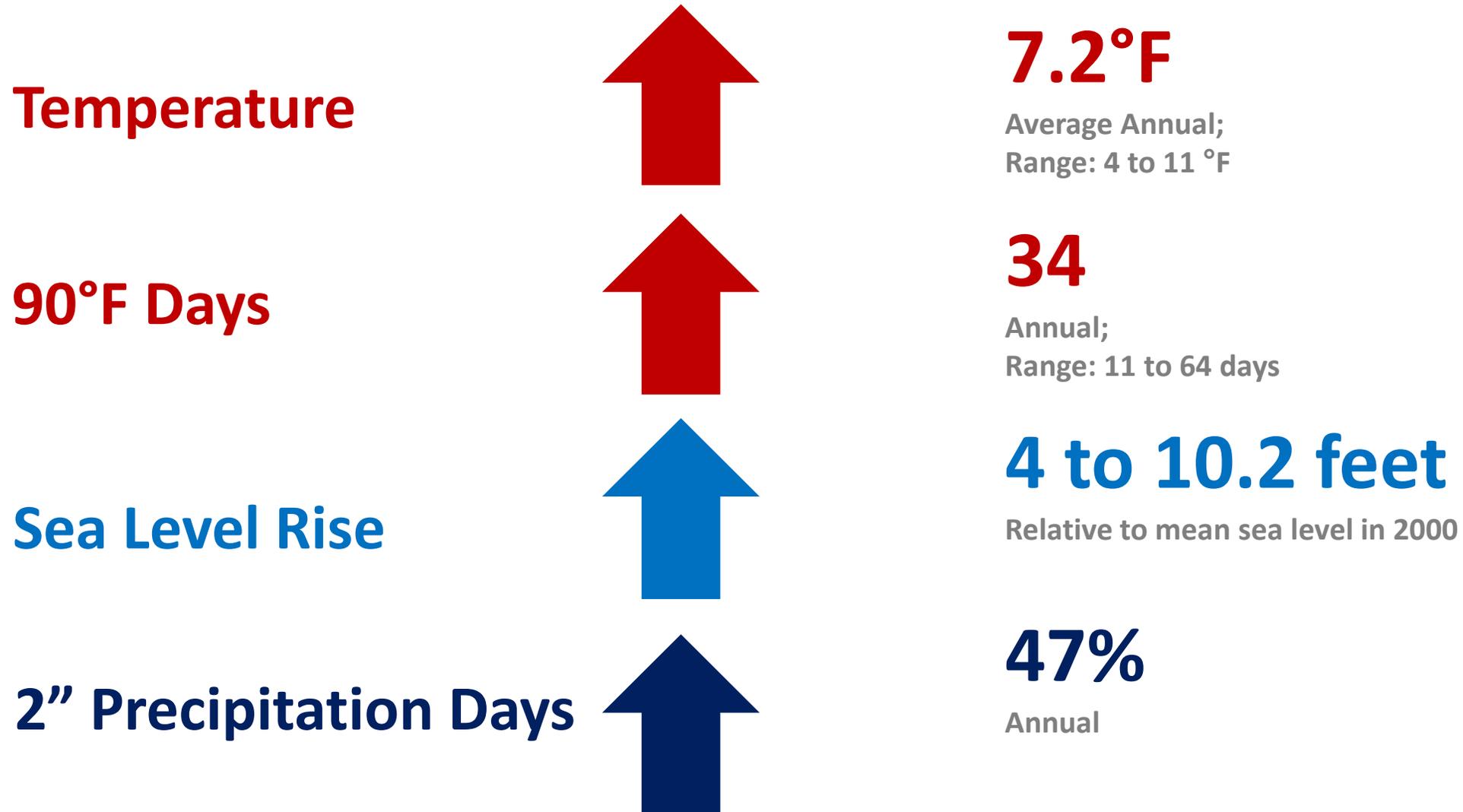
Daniel Cooper, @danielwcooper  
12.29.17 in Green

32  
Comments

6405  
Shares



# Massachusetts Climate Changes Projected by the 2090s



Source: Northeast Climate Adaptation Science Center

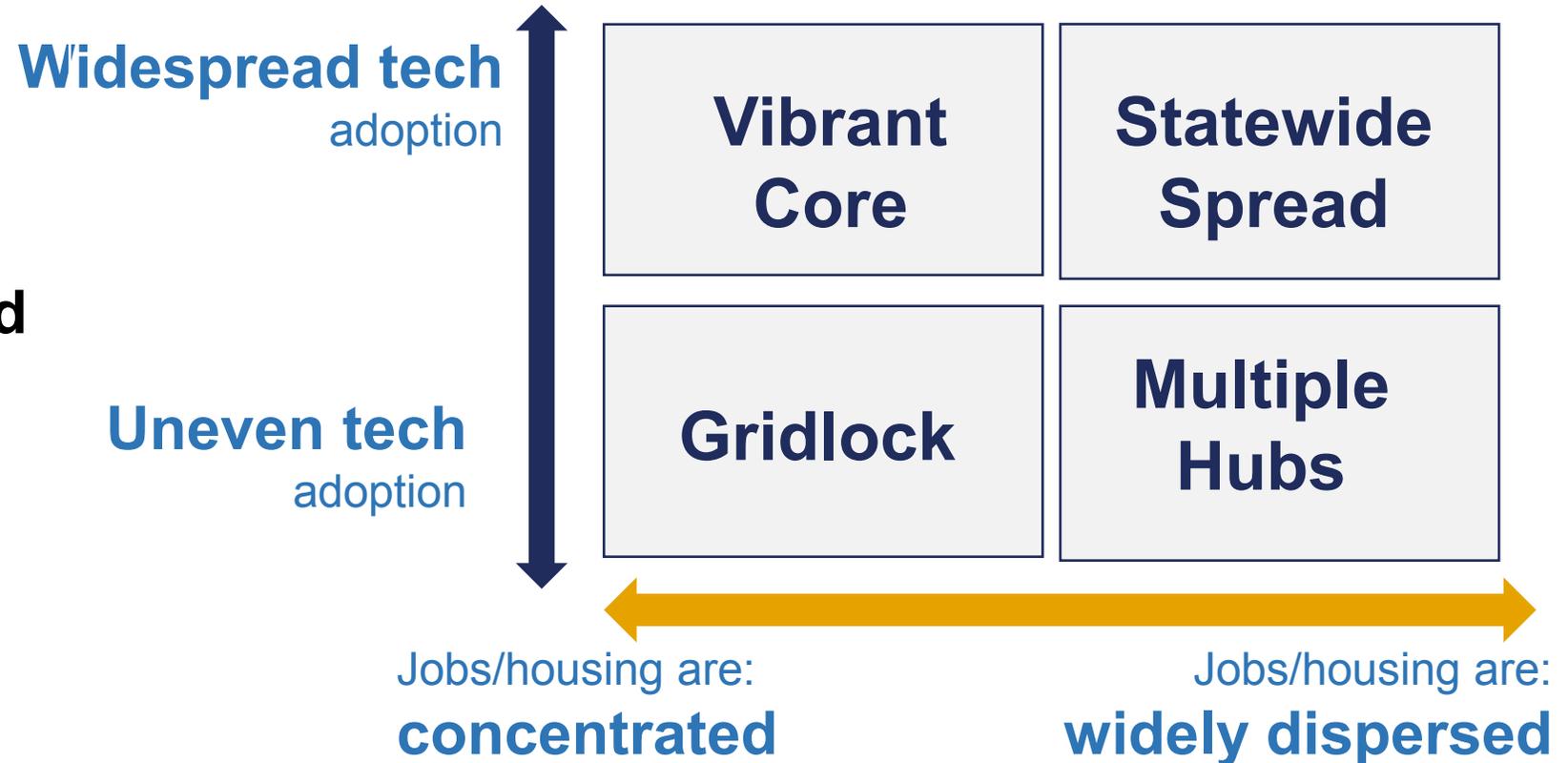


# Section Two: Scenario Planning Plausible Scenarios for 2040

# COMMISSION'S SCENARIOS

**Technology adoption**, and whether it is available and adopted uniformly by people across generations or geographical areas, will strongly influence travel options and needs.

**The distribution of jobs and housing** will impact travel options and needs - in 2040, in other words, it will matter whether the increase in jobs and housing is concentrated or more widely dispersed.



# Section Three: Commission Recommendations

## 5 Major Categories; 18 Total Recommendations

- 1. Transit.** Modernize existing transit and transportation assets to more effectively and sustainably move more people
- 2. Technology.** Create a 21st century “mobility infrastructure” to capitalize on emerging changes in transportation technology and behavior
- 3. Climate.** Substantially reduce GHG (greenhouse gas emissions) from the transportation sector
- 4. Econ Development/Land Use.** Coordinate and modernize land use, economic development, housing, and transportation policies and investment
- 5. Governance.** Make changes to current transportation governance and financial structures

## ***Pair One: Foundation***

**Recommendation #1: Prioritize investment in public transit as the foundation for a robust, reliable, clean, and efficient transportation system.**

- The Commission elected to lead with this first, foundational recommendation because high-frequency, high-capacity public transit is the most efficient and sustainable way to move large numbers of people.
- This will be true in 2040 even in the scenario that the transportation system is be dominated by fleets of electrified autonomous vehicles.

**Recommendation #2. State and municipal roadway design and operation should prioritize person throughput, rather than vehicle throughput, so that corridor capacity is allocated to moving as many people as possible.**

- Transportation agencies too often prioritize the movement of vehicles over the mobility of the people.
- Going forward, roadway owners must prioritize the movement of the maximum number of people, regardless of mode.

## ***Pair Two: Addressing Congestion and New Mobility***

**Recommendation #3. Work with multiple stakeholders to better manage today's traffic congestion – and the congestion challenges of the future.**

- Congestion is at a nearly intolerable level in the Boston metro region.
- With the anticipated growth in population and jobs, it is likely that congestion will only get worse without action.
- But there is no silver bullet – congestion is a product of many factors, and there is no single solution that will alleviate it.

**Recommendation #5. Support and accelerate efforts to consume transportation differently.**

- MassDOT should lead the development of policies related to changes in mobility practices, including ride-sharing, vehicle-sharing, Mobility as a Service (MaaS), on-demand mobility (ODM), and micro-mobility.

## ***Pair Three: Infrastructure***

**Recommendation #6. Enable a statewide telecommunications infrastructure to support the availability of real-time transportation information and deployment of connected and autonomous vehicles.**

- The Commonwealth should promote full statewide communications infrastructure (5G, Wi-Fi, and their future counterparts) that can support and enable new technologies and services, from connected and automated vehicles (C/AVs), to real-time traffic and asset management systems, to telecommuting opportunities.
- Telecommunications are already essential to our transportation systems. New technologies will likely increase people's reliance on the telecommunications network.

**Recommendation #7. The Commonwealth should facilitate a statewide electric charging infrastructure, and/or for other alternative fuels that is fast, equitable, robust, and resilient in order to support an increasing fleet of zero emission vehicles.**

- To meet MA Global Warming Solution Act goals, all types of vehicle owners, including residents, businesses, and government will need to reduce reliance on fossil fuels.
- However, only through a robust charging network will consumers have the necessary confidence in reliability for wide-scale EV adoption.

## ***Pair Four: Addressing Climate Change***

**Recommendation #9. Establish a goal that beginning in 2040, all new cars, light duty trucks, and buses sold in Massachusetts will be electric or another technology that meets same emissions standards.**

- Achieving the GWSA mandate will require the near-complete transition of our vehicle fleet to electric vehicles or other zero-emission vehicle technology.
- Because vehicle fleets turn over slowly, for vehicles on the road to be electric by 2050, we will need all vehicle sales to be electric by no later than 2040.

**Recommendation #10. Collaborate with NE and Mid-Atlantic states to establish a regional, market-based program to reduce transportation sector GHG emissions.**

- The Commonwealth should support the development and implementation of a regional program that uses market mechanisms and public investment as a means to limit greenhouse gas emissions from the transportation sector.
- One form that such a program might take is a cap and invest program for transportation emissions.

## ***Pair Five: Ambition***

**Recommendation #15. Coordinate the reinvention of MBTA ‘commuter rail’ with local, regional, and state land use and economic development strategies to maximize the ridership and economic benefits of the reinvented system.**

- The goal is to re-orient the ‘commuter rail’ from its current configuration as a commuter train taking passengers to and from Boston to a regional train system that connects hubs and serves the region all day, every day.

**Recommendation #4. Establish a Commonwealth Transportation Technology Transformation Initiative (T3I) to promote solutions to our most complicated transportation issues and build upon our reputation in transportation innovation and technology.**

- This recommendation is intended to be both aspirational in terms of establishing the state as a leader in the transportation transformation, as well as to provide a practical platform of support, technical assistance and innovation.

## ***Pair Six: Organization & Resources***

**Recommendation #17. Prepare MassDOT and other transportation-related entities to effectively oversee a changing transportation system.**

Our specific recommendations include:

- A dedicated MBTA Board
- Explicit coordination around housing, economic development, environment, and transportation
- A new paradigm for MassDOT, MBTA, and RTAs
- Data-sharing: a comprehensive effort with public and private entities that protects privacy while enabling improved services, traffic operations, and integrated mobility options

**Recommendation #18: Develop a fiscally sound and responsible transportation resource plan to operate, maintain, and upgrade the transportation system.**

- Among the most significant contributions that today's decision makers could make to the public for the year 2040 is to commit to providing sufficient resources for the proper maintenance, operation, and upgrades to the state's transportation network.
- The Commission concludes its report with this recommendation, not because it is the least important, but, rather, because the promise found in our earlier recommendations can only be achieved through a long-term commitment to providing the resources necessary to operate and maintain the Commonwealth's evolving transportation system.

# In Closing

- The report title -- *Choices for Stewardship: Recommendations to Meet the Transportation Future*
- Bill Gates: “We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction.”

# LINKS TO COMMISSION & REPORT

[mass.gov/orgs/commission-on-the-future-of-transportation](https://mass.gov/orgs/commission-on-the-future-of-transportation)

Choices for  
Stewardship:  
Recommendations to  
Meet the  
Transportation Future

VOLUME I

Submitted Pursuant to  
Executive Orders 579 and 580

COMMISSION ON THE FUTURE OF TRANSPORTATION IN  
THE COMMONWEALTH

Choices for  
Stewardship:  
Background Books –  
Facts, Trends, & Issues

VOLUME II

Submitted Pursuant to  
Executive Orders 579 and 580

★ COMMISSION ON THE FUTURE OF TRANSPORTATION IN THE COMMONWEALTH



# Vision for Future of Transportation Implementation



**1. Transit.** Modernize existing transit and transportation assets to more effectively and sustainably move more people

- Help frame and support a Comprehensive Transportation Finance Plan
- Work with legislative leaders to ensure necessary federal funding and New Starts programming
- Support 21<sup>st</sup> century bus infrastructure to better utilize existing road space and right-of-ways
- Provide necessary research and framework for new Project Development and Delivery Models for the MBTA



**2. Technology.** Create a 21st century “mobility infrastructure” to capitalize on emerging changes in transportation technology and behavior

- Lead efforts to use technology (e.g. AET) to better price transportation usage and improve congestion in the Boston region
- Complete research and recommendations for forward-looking applications of electric fleet vehicles and systems technology (bus maintenance facilities, signals, etc..)
- Continue to provide advice and implementation guidance for the MBTA’s AFC 2.0 roll-out over next two years

**3. Climate.** Substantially reduce GHG (greenhouse gas emissions) from the transportation sector

- Participate in Transportation & Climate Initiative development of “RGGI for Transportation” cap-and-invest program for the Northeast region
- Help build a framework for a decarbonized transportation system including cost estimates of various strategies and financing options
- Work with members to develop resiliency strategies and infrastructure

**4. Econ Development/Land Use.** Coordinate and modernize land use, economic development, housing, and transportation policies and investment

- Drive Commuter Rail Vision Study goals by pushing for a truly modern regional rail that will maximize ridership, increase sustainable development and improve housing affordability
- Create template for advancing TOD and the Public Realm

5. **Governance.** Make changes to current transportation governance and financial structures

- Complete best-practices overview and recommendations for transit agency governance structure

**A WORKING DOCUMENT • FEBRUARY 2019**



**AN UPDATE ON  
TRANSPORTATION  
FINANCE**

# PRESS COVERAGE OF REPORT

## STATE OF THE BUILT ENVIRONMENT REPORT: PRESS COVERAGE

- 22 stories placed in print, online, and radio
- High social media engagement
- Stories emphasize system modernization & need for comprehensive finance plan

Sentinel & Enterprise

The Berkshire Eagle

Gloucester Daily Times

WORCESTER  
**Business**  
Journal

BOSTON  
BUSINESS JOURNAL

BOSTON  
**25**  
WFXT

CURBED  
BOSTON

**22**  
NEWS  
Working for You  
wwlp.com

POLITICO  
MASSACHUSETTS PLAYBOOK

STATE HOUSE  
NEWS SERVICE

The Boston Globe

WGBH

MASS LIVE  
Powered by The Republican.

BOSTON  
Herald

CommonWealth  
POLITICS, IDEAS & CIVIC LIFE IN MASSACHUSETTS

THE  SUN

# BOSTON GLOBE EDITORIAL

**It will take more than a fare hike to fix Mass.  
transit**



# STATE HOUSE NEWS SERVICE

## EXCITEMENT, UNCERTAINTY MARK TRANSPORTATION DEBATE, SPILKA SAYS

By Katie Lannan

STATE HOUSE NEWS SERVICE

"Right now, I plan to focus less on individual policy proposals and more on bringing the right people to the table to get things done," Spilka said last week at a meeting of the board of the Boston-based group A Better City, according to her prepared remarks. "As I've said before -- I don't think we can afford to take any idea off the table right now when it comes to transportation -- either in terms of fixes, or in terms of how we pay for it."

A Better City in late February released a report tallying an \$8.4 billion shortfall in revenues needed to ensure state roads, bridges and MBTA infrastructure are in a state of good repair over the next 10 years.

# MBTA FARE INCREASE COMMENT LETTER

30 plus min delay 5:05  
Due to Power Problem

# QUESTIONS?

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