Choices for Stewardship: Recommendations to Meet the Transportation Future

Commission on the Future of Transportation in the Commonwealth of Massachusetts

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- 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.”

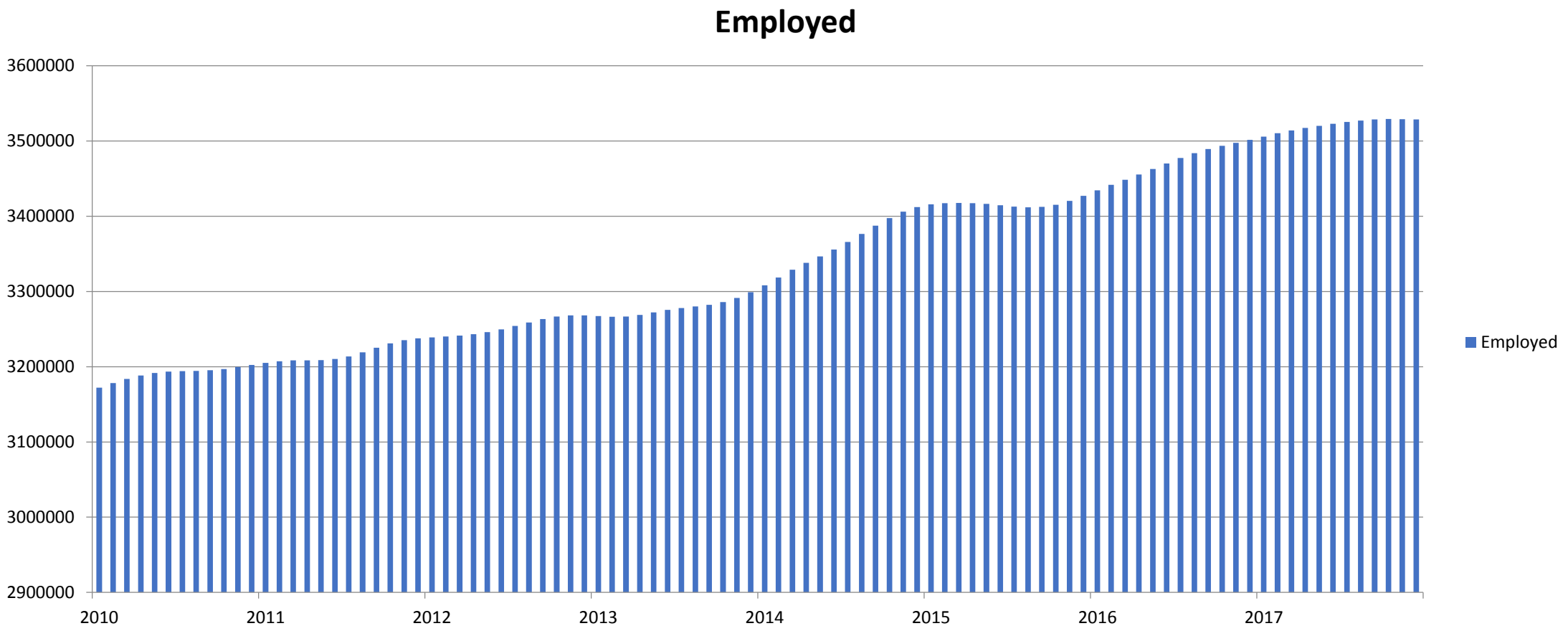
How the report is organized

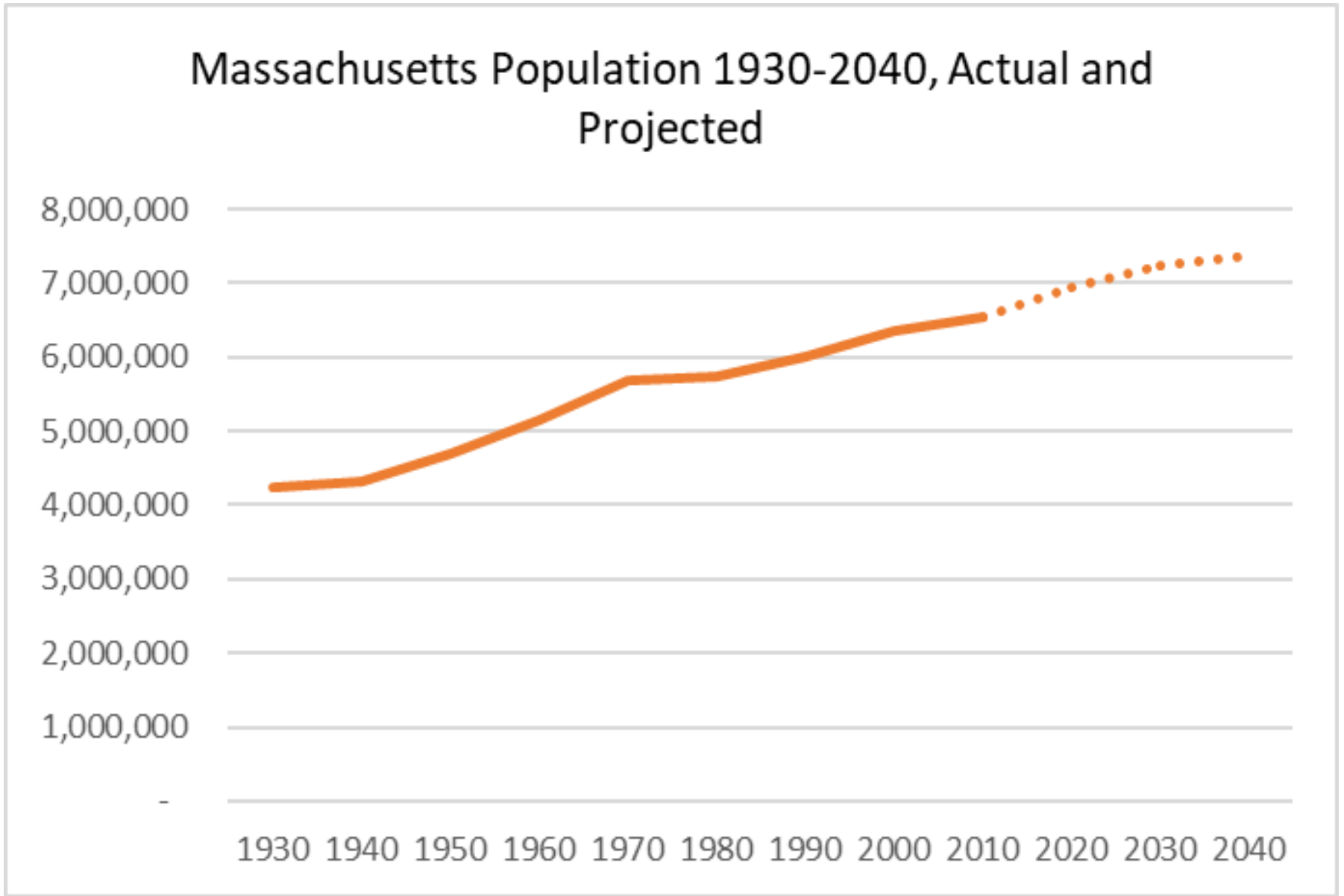
- Volume I: Choices for Stewardship: Recommendations to Meet the Transportation Future
  - Section 1: Facts, Trends, & Issues
  - Section 2: Scenario Planning
  - Section 3: Commission Recommendations

- 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)

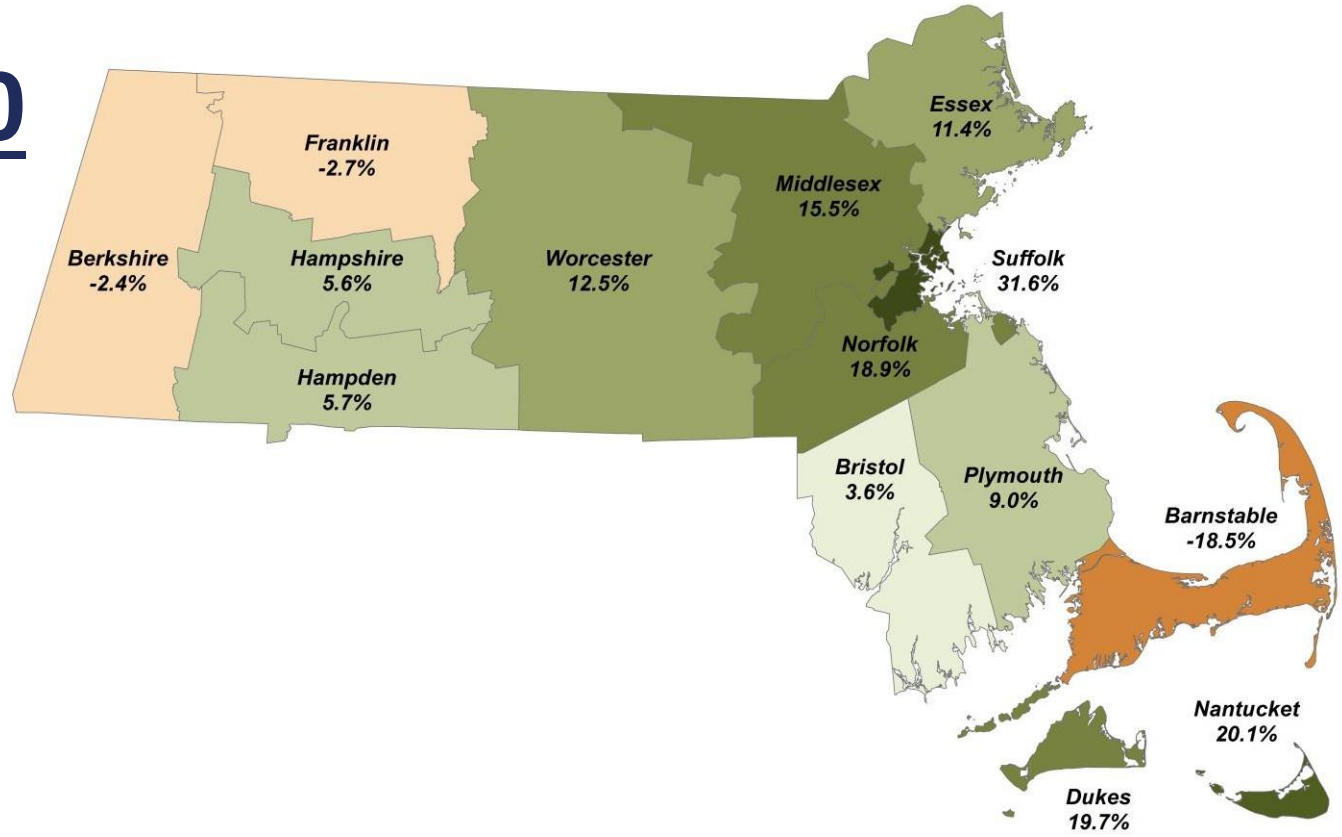



Massachusetts Population 1930-2040, Actual and Projected
8,000,000
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
-
1930 1940 1950 1960 1970 1980 1990 2000 2010 2020 2030 2040

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

Anticipated Percent Change in Population by County

2010-2040



Source data:

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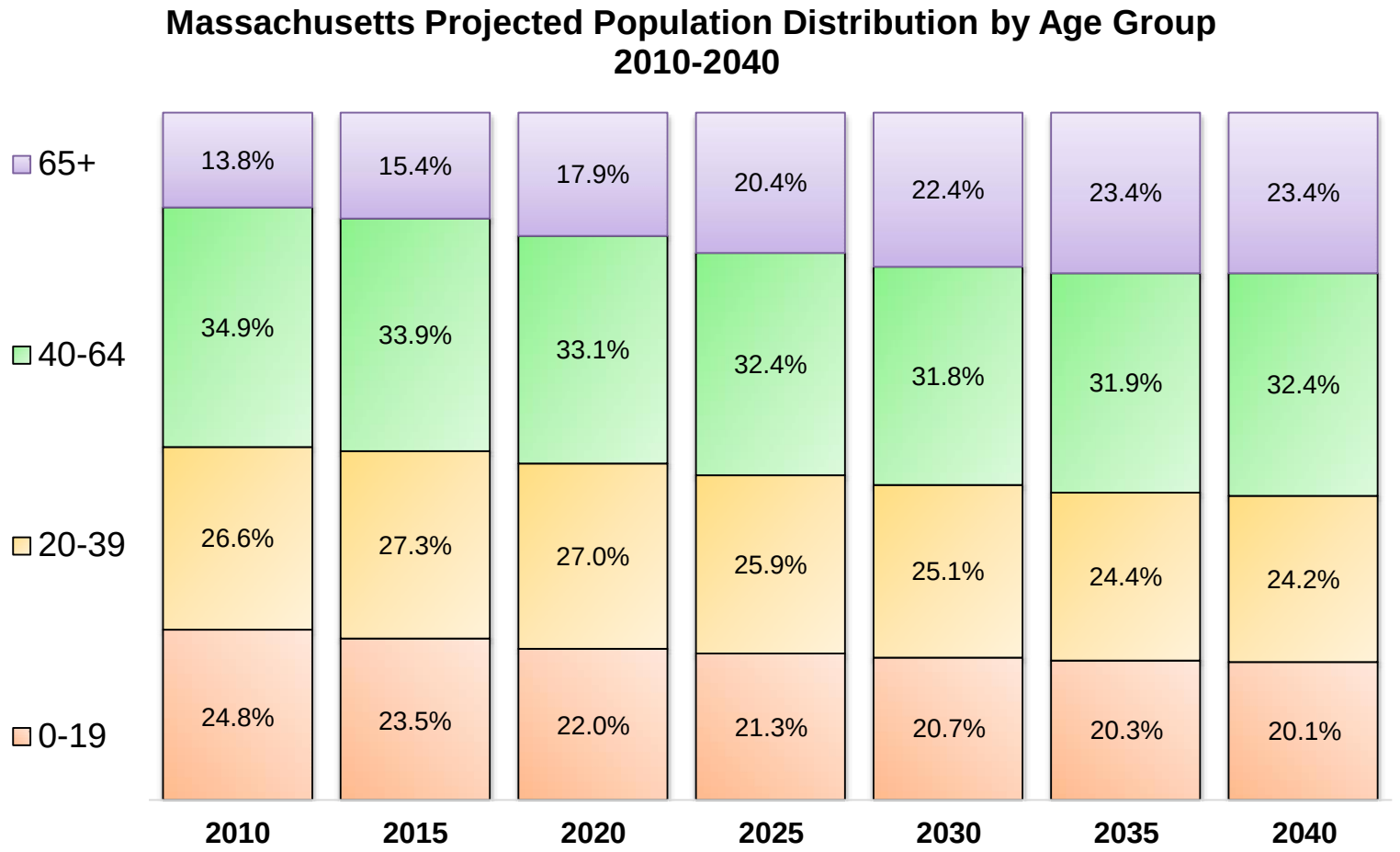
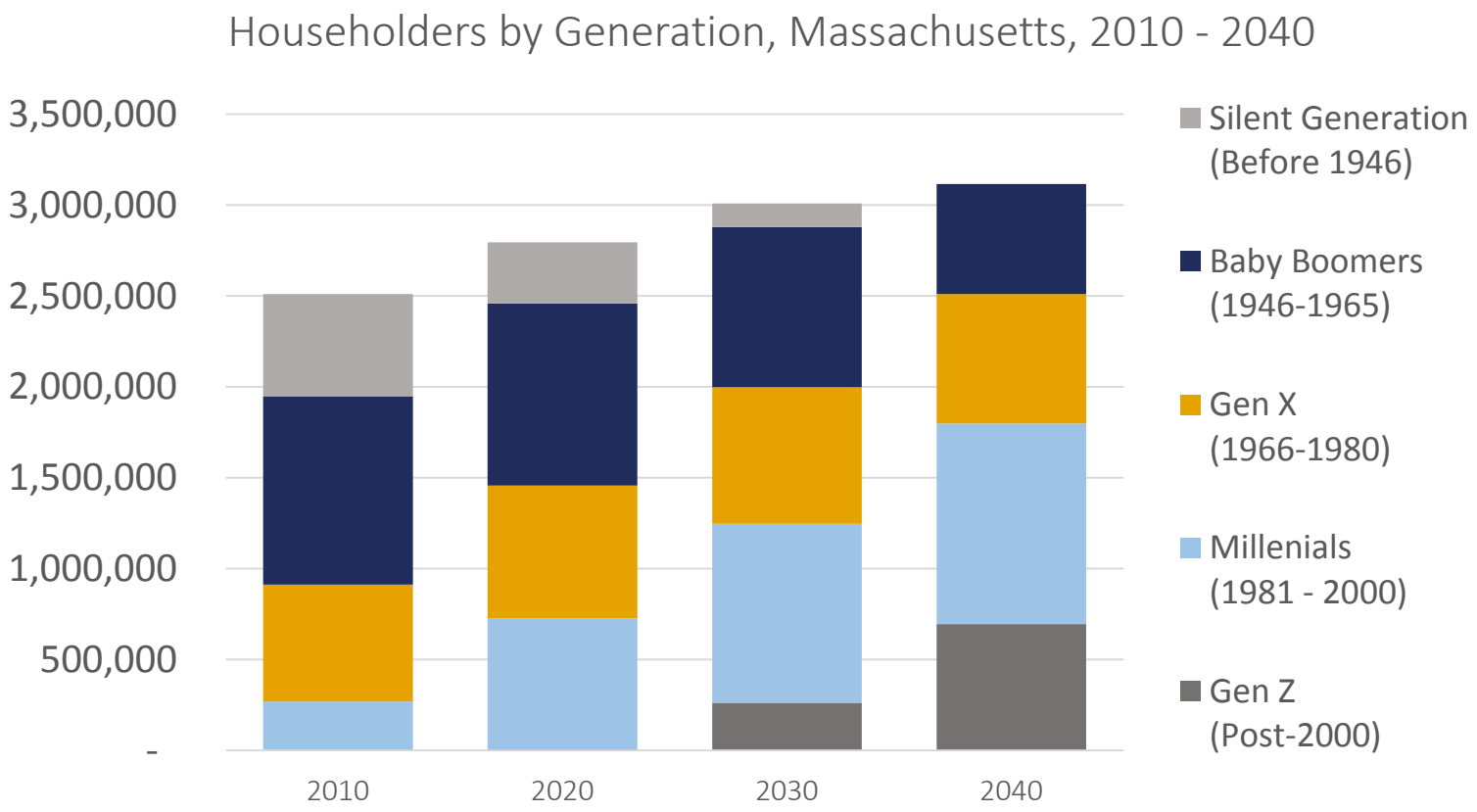
65+ Nearly Doubles as Share of Population



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



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:

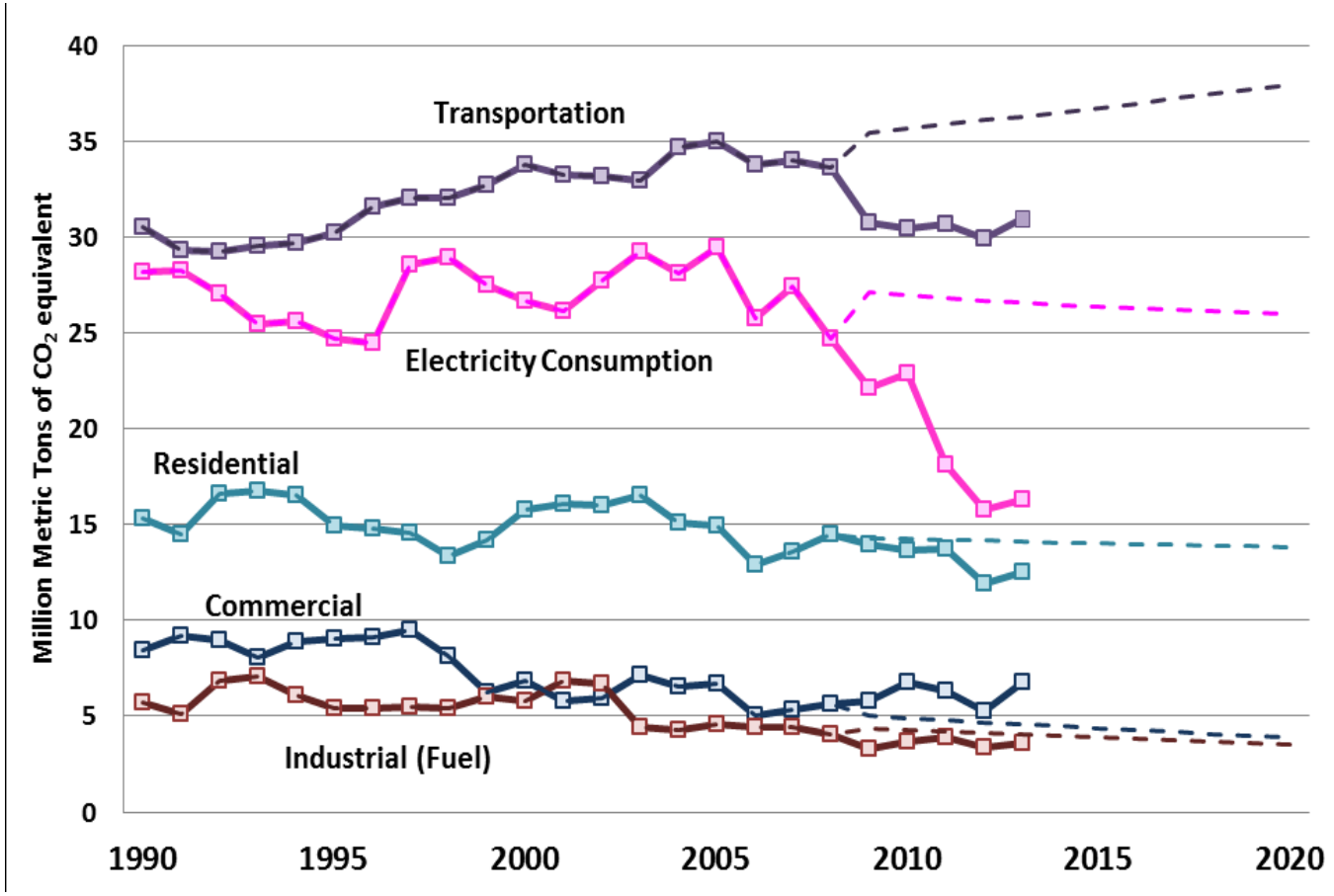
- Cost and willingness to pay are the major economic forces behind technology adoption
- Full level 5 automation is more than 10 years away

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)
Nearby devices, such as sensors, cameras, or personal devices - Vehicle-to-Device (V2D)
Other vehicles - Vehicle-to-Vehicle (V2V)
Infrastructure objects such as traffic lights, signs or even roadblocks or lane marks - Vehicle-to-Infrastructure (V2I)
Network or Cloud – covered by Vehicle-to-Network (V2N)

Transportation Has Largest Share of CO2 Emissions



Chinese are electrifying bus fleet

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

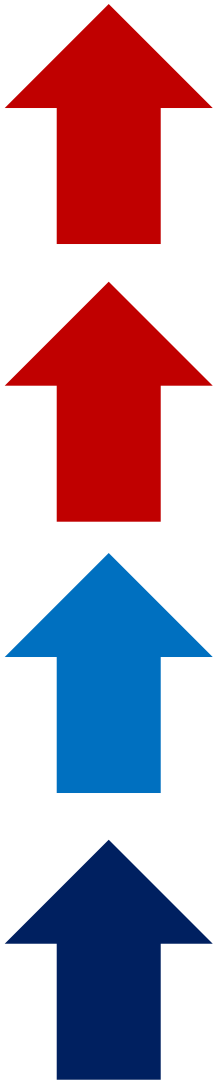
The city has transformed the entire bus fleet.

Daniel Cooper, @danielwcooper
12.29.17 in Green

32 Comments

6405 Shares

Massachusetts Climate Changes Projected by the 2090s



Temperature

7.2°F

Average Annual;
Range: 4 to 11 °F

90°F Days

34

Annual;
Range: 11 to 64 days

Sea Level Rise

4 to 10.2 feet

Relative to mean sea level in 2000

2” Precipitation Days

47%

Annual

Source: Northeast Climate Adaptation Science Center

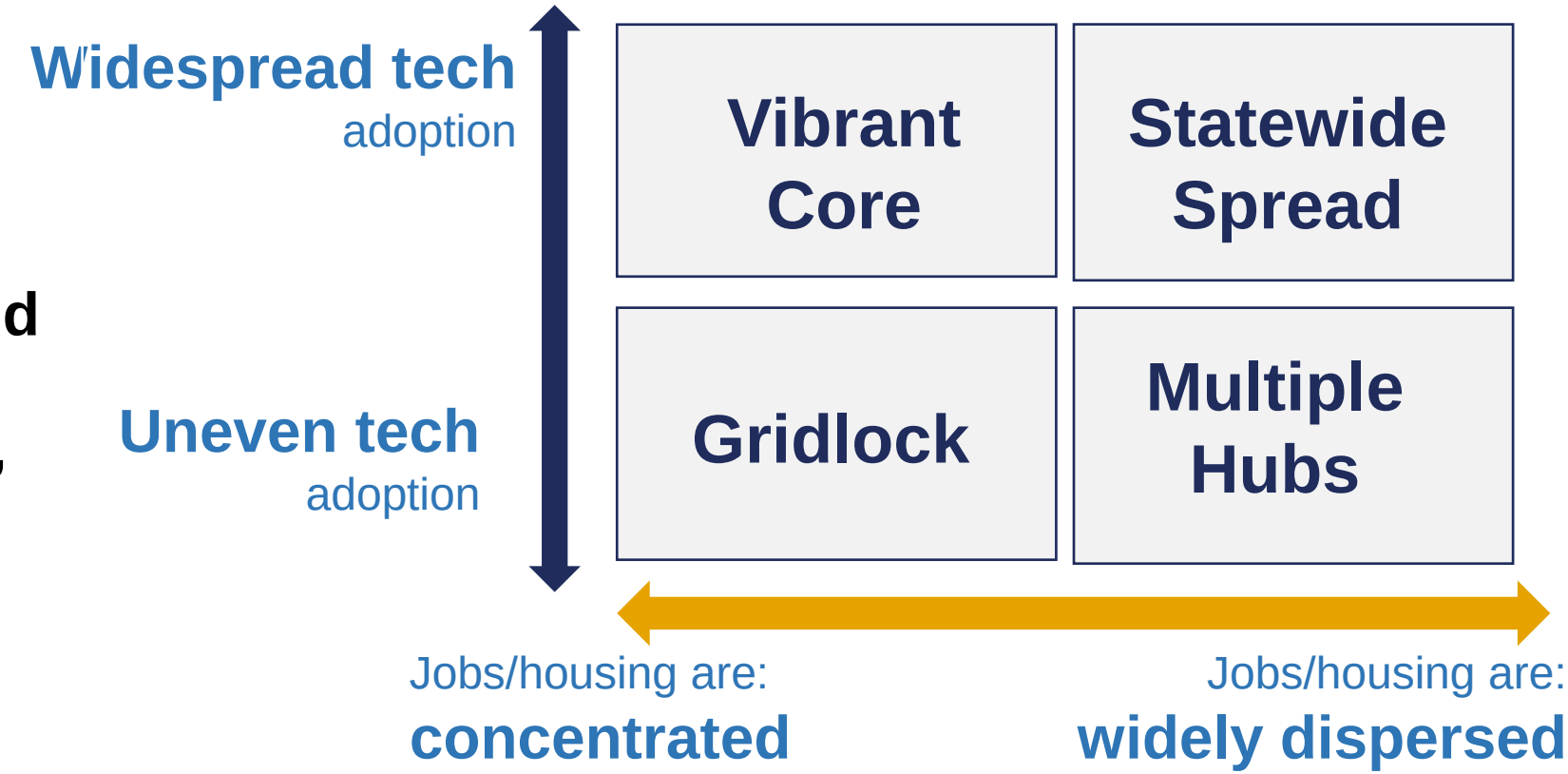

Boston
6 feet of
Sea Level Rise
Image and data courtesy NOAA
Sea Level Rise Viewer
Broad Sound
Revere
Middlesex
Suffolk
Everett
Mystic River
Reservation
Assembly
Row
Chelsea
Chelsea River
Suffolk
Downs
Belle Isle
Marsh
Reservation
Winthrop
Boston
Boston Harbor
Charles River
Suffolk
Deer Island
Deer
Island
Boston Harbor

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.

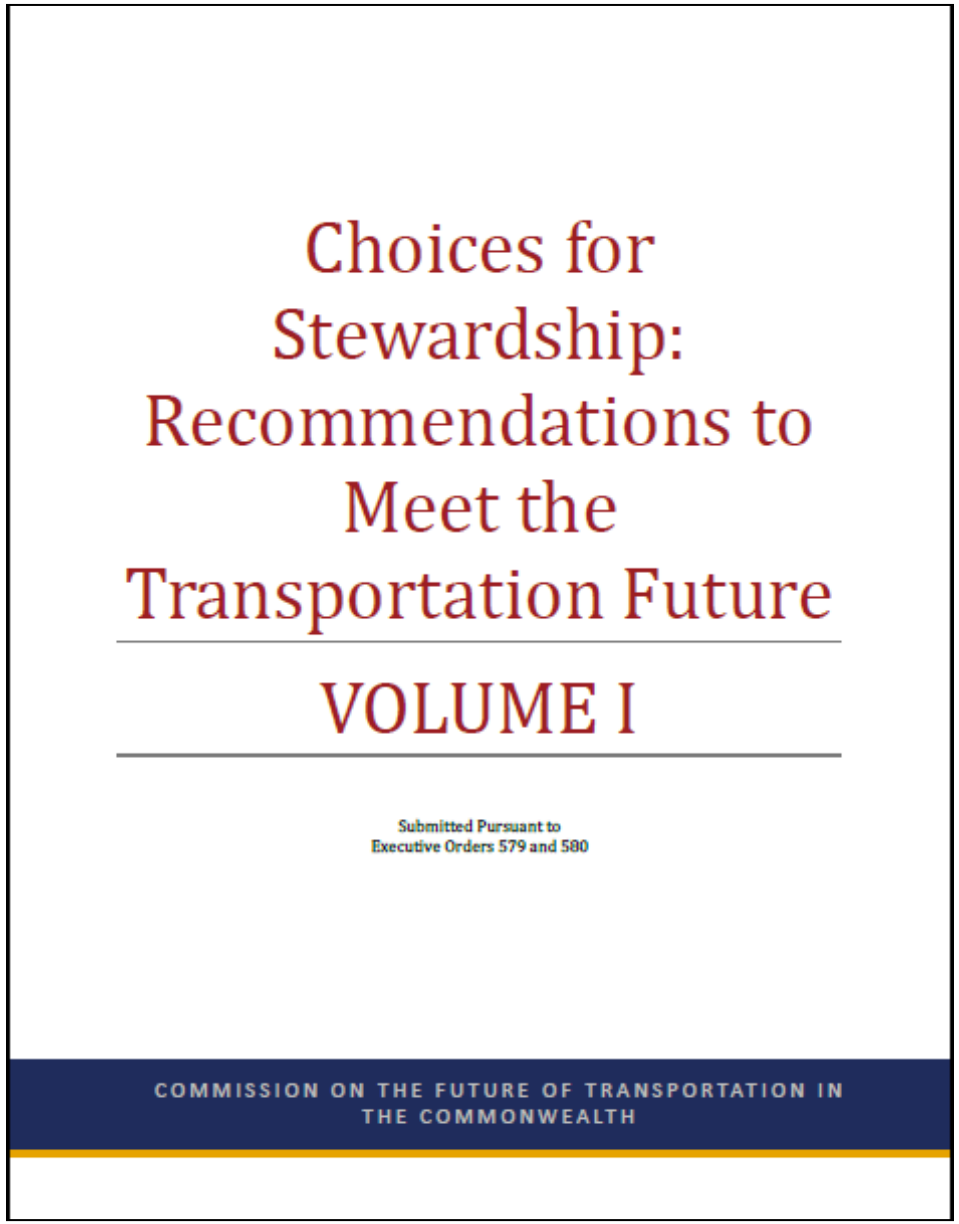
- Among the most significant contributions that today's decision makers could make to the public for the year 2040 is to commit to providing sufficient resources for the proper maintenance, operation, and upgrades to the state's transportation network.
- The Commission concludes its report with this 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