



FOCUS

The 2040 Investment Plan for the MBTA



Cambridge Transit Committee – December 2, 2015

What is



?

MBTA Program for Mass Transportation (PMT)

- Develops the long-term capital investment plan for the MBTA
- Required by statute every 5 years and will fulfill requirement for Fiscal Management and Control Board 20 year capital plan
- Priorities to be implemented through the annual Capital Investment Program (CIP)

Historic CIP & PMT Disconnect

CIP

Financially constrained
SGR focused

PMT

Not financially constrained
Expansion focused

There has been a disconnect due to a perception that the CIP is about *State of Good Repair* and the PMT is about *projects*.

What's needed is a unified capital investment strategy based on a clear-eyed understanding of the physical and financial capacity of the MBTA and the transit needs of the future

STATE OF THE SYSTEM REPORTS

An overview of the MBTA's capital assets, their age and condition, and how their condition impacts system capacity and performance.

SYSTEM OVERVIEW

The MBTA's five modes function as an integrated system, however they differ in terms of the types of service provided, the costs of the service, and the number of passengers served.

MBTA Annual Metrics by Mode - 2013

	Operating Expenses (%)	Fare Revenues (%)	Passenger Miles (%)	Passenger Trips (%)
Bus	29.8	17.8	15.4	29.8
Commuter Rail	26.4	29.9	40.4	8.9
Rapid Transit	35.1	49.9	42.8	60.4
Ferry	0.8	1.1	0.6	0.3
Paratransit	7.9	1.3	0.8	0.5

Source: 2013 NTD Transit Profile

SYSTEM OVERVIEW

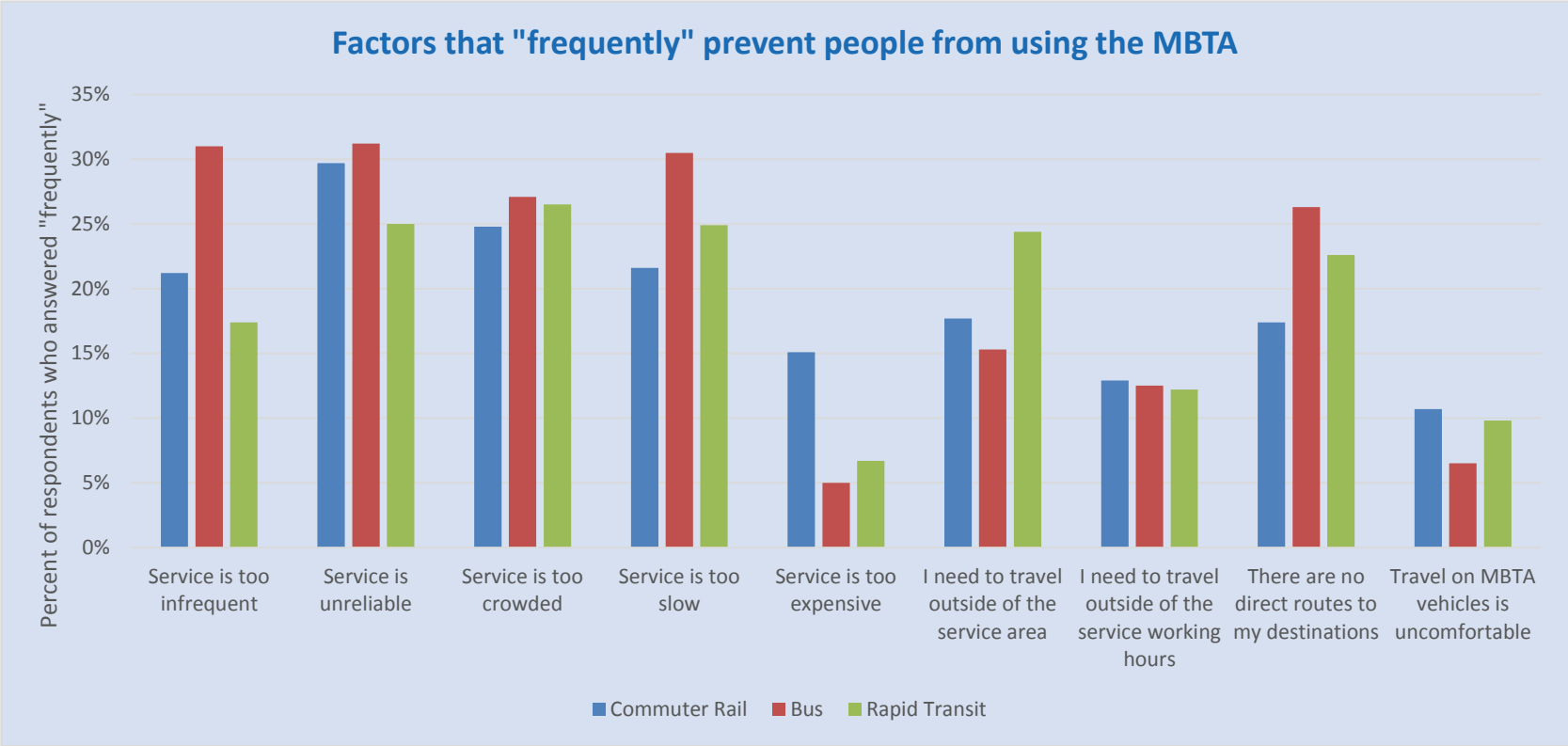
The demographics of customers also varies by mode...

	Minority	Low-income
Rapid Transit	27.5%	24.1%
Bus	46.5%	41.5%
Commuter Rail	13.9%	7.2%
Ferry	5.7%	4.5%
Total	33.0%	28.5%

Source: 2008-2009 MBTA Systemwide Passenger Survey (the MBTA is beginning an update of the systemwide survey in Fall 2015)

SYSTEM OVERVIEW

...as does the customer experience of the various modes:



ASSET PERFORMANCE

State of Good Repair (SGR):

- MBTA maintains a current inventory of capital assets in the SGR Database to identify current and future needs.
- Ranking is done using an SGR score from 1-5 (1: low, 5: high, >2.5: SGR)
 - SGR score is based on age, condition and performance.
 - Score is calculated for each asset and is summarized by asset and modal category.

	SGR Backlog	Asset Replacement Value
Rapid Transit	\$3.4 billion	\$11.8 billion
Bus	\$609 million	\$1.5 billion
Commuter Rail	\$3.04 billion	\$9.62 billion
Ferry	\$2.1 million	\$16 million
Total	\$7 billion	\$23 billion

BUS RIDERSHIP

The MBTA's bus ridership alone is higher than total ridership on all but seven American transit systems. In 2014:

446,700 riders per weekday

235,600 per Saturday

149,200 per Sunday

15 Key Bus Routes account for one-third of all bus ridership.

	Weekday Routes	Weekday Ridership	Saturday Routes	Saturday Ridership	Sunday Routes	Sunday Ridership
Silver Line	5	34,200	5	20,700	5	15,200
Key Bus Routes	15	147,700	15	95,600	15	62,300
Express	23	16,100	4	2,600	2	1,600
Local	127	248,600	107	118,200	76	70,000
Total	170	446,700	131	237,100	98	149,200

Source: MBTA; Note: Ridership figures rounded to nearest 100

AN AGING BUS FLEET

991 active buses:

- Typical lifespan = 12 years; most MBTA buses 7-12 years old
- Dual-mode articulated Silver Line fleet no longer manufactured

Older buses require more maintenance, break down more often, and degrade service reliability.

Upcoming purchase of 369 new buses will bring the average age below the desirable average age of 7 years.

Still, most buses will need to be replaced within the next six years.

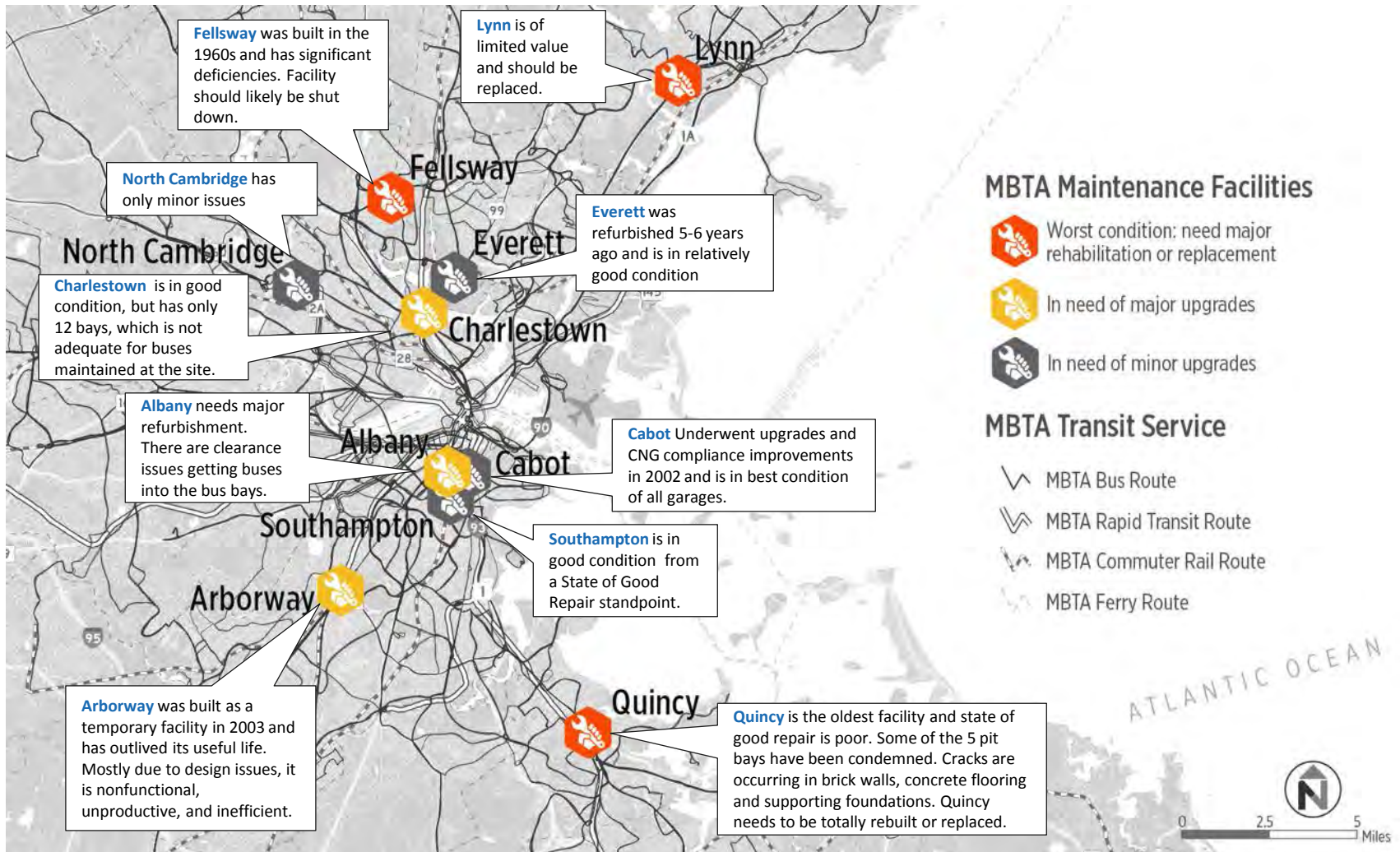
	Bus Age (Years)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Active Buses	60				25	523	124	155	8	24	72						
Inactive Buses	0												15				60
	<i>All 991 active buses within useful lifespan</i>												<i>75 Inactive buses beyond useful lifespan</i>				

Source: MBTA (2015)

Note: Bus overhauls assumed to reduce effective average age by 4 years

BUS MAINTENANCE FACILITIES

SUMMARY OF CONDITIONS AND NEEDS



Source: MBTA 2014 Blue Book and "MBTA Maintenance Facility Analysis: Walk Around Document," December 2014, and MBTA document "Evaluation/Condition Assessment of MBTA Bus Maintenance Facilities," recent but undated.

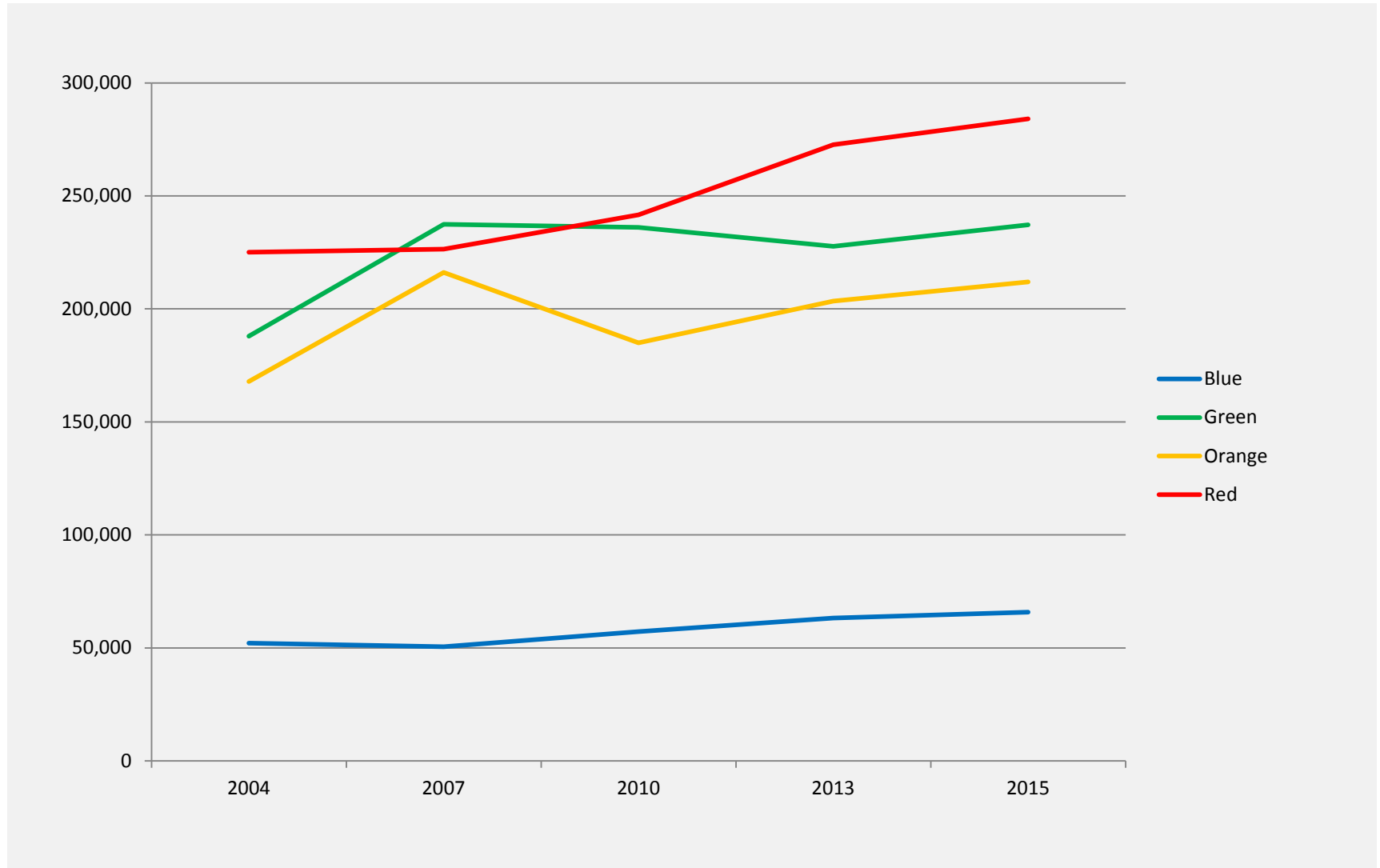
STOPS AND STREETS

MBTA does not own or control most bus stops or local streets, which can limit ability to make improvements.

- 92% of the MBTA's 8,500 bus stops do not have bus shelters, including more than 425 stops with over 100 daily boardings.
- Many bus stops do not comply with accessibility requirements.
- On time performance is negatively impacted by on street congestion



RAPID TRANSIT RIDERSHIP IS GROWING ON ALL LINES



RAPID TRANSIT FLEET

651 total fleet:

- Average Age: 32 years (design lifespan: 25 years)
- 55% are beyond useful life

New Orange and Red Line vehicles will reduce average age and improve reliability, but:

- Mattapan cars are almost 70 years old and replacement parts no longer available.
- Reliability of Type 8 Green Line cars is poor, resulting in frequent breakdowns.

Age (years)	Quantity of Revenue Vehicles						
	7	18	21	27	35	46	69
Blue	94						
Green	95	19		95			
Orange					120		
Red			86	58		74	
Mattapan							10
	<i>294 Vehicles Within Useful Life</i>			<i>357 Vehicles Beyond Useful Life</i>			

RAPID TRANSIT ACCESSIBILITY

38 rapid transit stations are still non-accessible:

- 31 surface Green Line stations
- 4 subway stations on Green Line
- Wollaston Station (Red Line)
- Bowdoin Station (Blue Line)
- Valley Road Station on Mattapan Line

More than half of all Green Line vehicles and all Mattapan trolleys are inaccessible.

Plan for Accessible Transit Infrastructure (PATI) under way – aimed at prioritizing barriers to access and developing long-term plan



MAJOR CHALLENGES TO MEET CURRENT AND FUTURE RAPID TRANSIT DEMAND

Providing additional capacity means systemwide upgrades to many asset classes:

- Platform lengths prevent move to longer trains (even 3-car trains on Green Line)
- Station designs result in uneven passenger loads by car, exacerbating capacity issues
- Signals, fleet size and associated maintenance capacity prevent more frequent service
- Track conditions and geometry limit speed in some locations
- Power upgrades necessary for consistent use of 3-car trains on Green Line



Development near transit has been on the rise and is expected to continue, necessitating additional capacity and modernization in the system.

FARE COLLECTION

In addition to mode-specific capital needs, certain capital assets are a feature of all modes. The most visible is the CharlieCard Automatic Fare Collection system.

- Nearly all bus and surface Green Line fares are collected as passengers board, which slows service.
- Limited access to CharlieCard vending machines in bus-only areas results in further delays as customers add value to their cards at the farebox.
- Retail sales terminals are a potential solution, but they are primarily located outside of bus corridors.

Asset	Quantity
Fare Vending Machines	453
Gates	611
Transfer Machine and Validators	30
Total Fare Equipment at Stations	1,094

STATE OF THE SYSTEM – NEXT STEPS

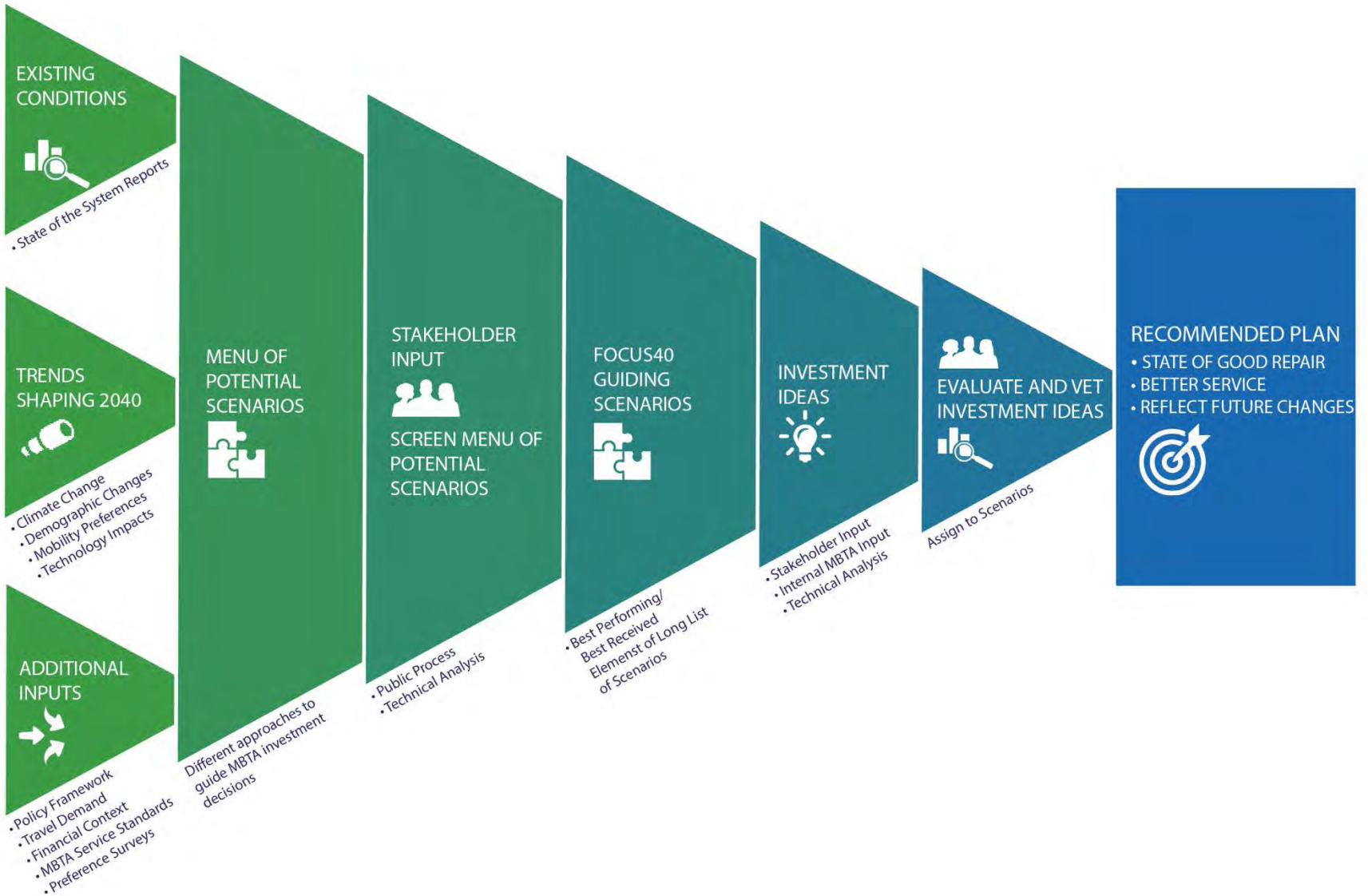
Series of State of the System reports will be released in draft form in November:

- Rapid Transit
- Bus
- Commuter Rail
- The RIDE
- Ferry

Website: mass.gov/massdot/focus40 (*coming soon*)

We encourage you to review the draft reports as they are released to help us improve the final product!

PROJECT ROADMAP



TRENDS SHAPING TRANSPORTATION TODAY AND IN 2040

Guiding Questions

1. What trends will shape transportation in 2040?

- Climate change?
- New mobility options?
- Demographic shifts?
- Technology?
- Others (energy, work)?

2. How might the role of the MBTA need to evolve by 2040 to respond to these trends?

2040 TRENDS: THOUGHT PARTNERS

Step One: Internal review of trends

Step Two: Discuss trends with thought partners:

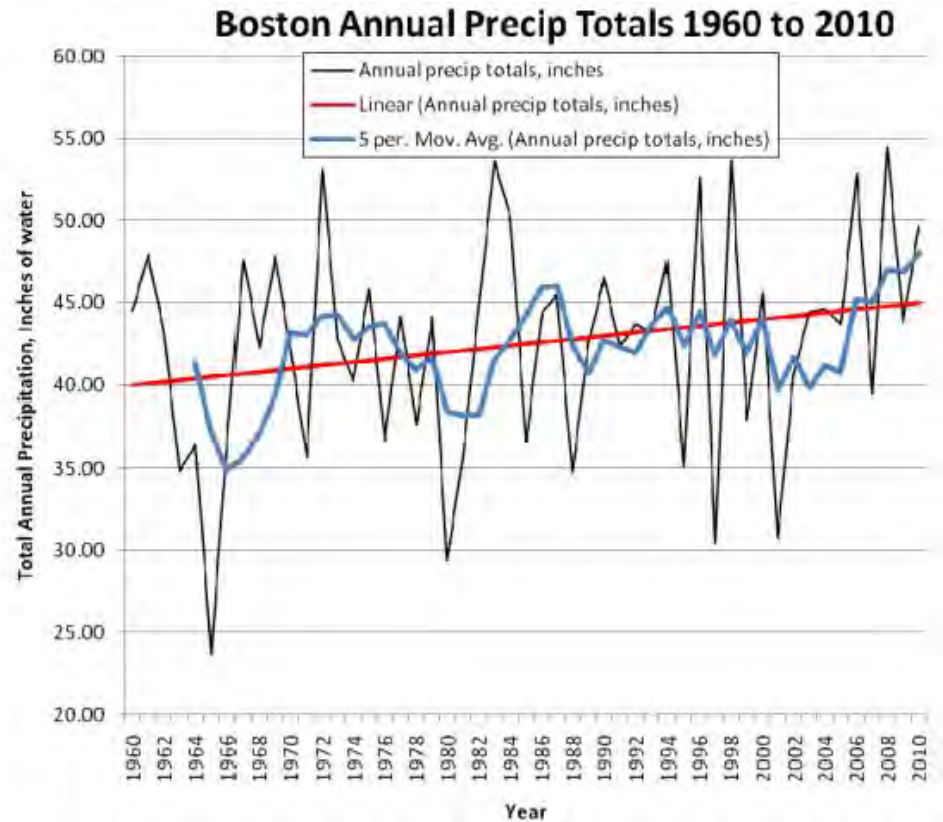
AARP	A Better City	Barr Foundation
Boston Harbor Association	Bridj	Chelsea Collaborative
CLF	DPH	Dukakis Center
EOHED	Future Boston Alliance	GoBoston 2030
Livable Streets	Lyft	MAPC
MassBike	MBTA Advisory Board	Nuestra Comunidad
UMass – Boston Donahue Institute	Vida Urbana	Volpe Center

Step Three: Develop visualizations to support engagement with stakeholders through the website, organizational meetings, Focus40 launch event

CLIMATE CHANGE: Precipitation 2040

- Annual precipitation is predicted to increase 5-8% by 2050 (continuing the trend shown in the chart to the right)
- Winter precipitation is predicted to increase 6-16% by 2050, while summer precipitation is predicted to decrease 1-3%.
- This could mean a higher likelihood of drought in the summer and a higher occurrence of severe snow events in the winter.*

Source: MA Climate Change Adaptation Report, 2011



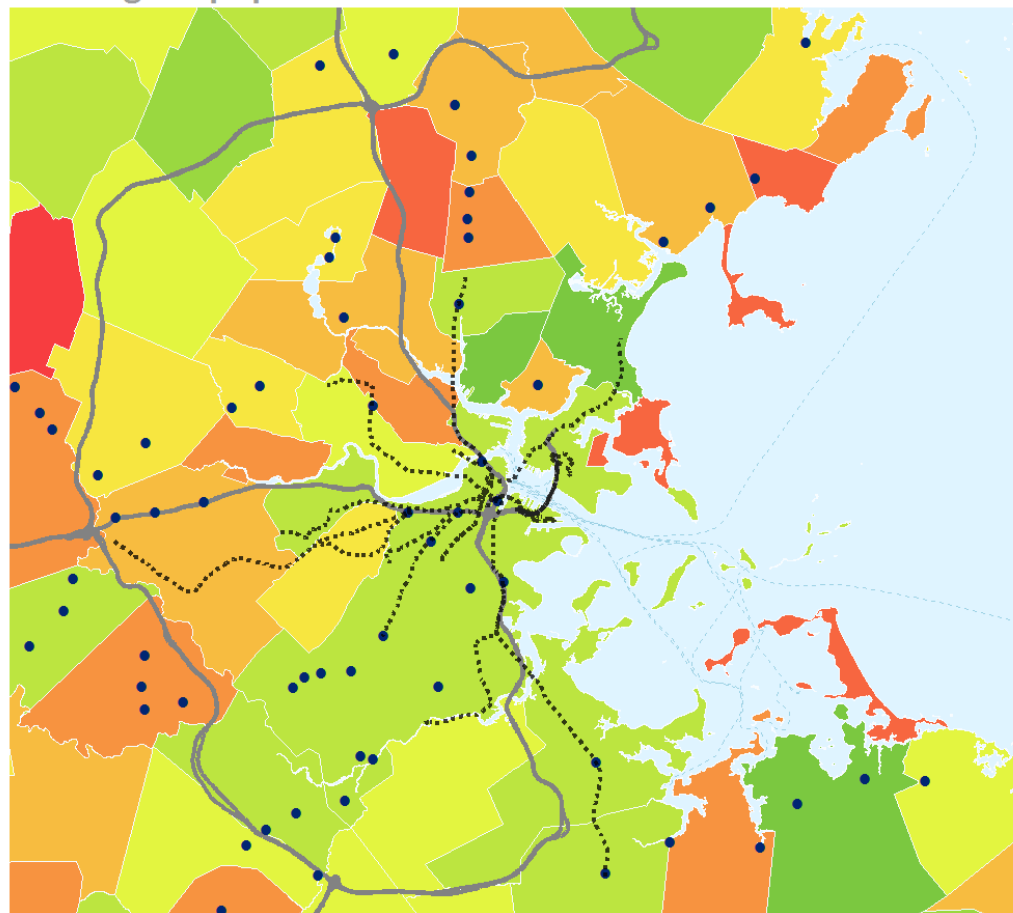
Source: MA Climate Change Adaptation Report, 2011 (MA Office of Water Resources , MA Dept. of Conservation and Recreation



* While winter precipitation is predicted to increase, the number of snow days (per month) is projected to decrease by approximately 2 days per month. This could indicate that while snow storms or snow events may be less frequent, they could be more severe (i.e. **more snow concentrated over less time**).

The population is growing

% change in population 2000-2010



- Roxbury, Fenway, Allston and Downtown accounted for 65.2% of all growth in the city between 2000 and 2010, while Dorchester, Mattapan, Jamaica Plain, Longwood, and Beacon Hill declined in population.
- Due to education and economic opportunities within the Greater Boston region, a large percentage of net migration occurs within the age groups of 15-24.
- Populations ages 25- early 40s experience a relatively high rate of net out-migration. This is also true for populations ages 60 and older (young families and retirement age populations).
- Immigration and college student populations contribute highly to migration trends within the Greater Boston area.

Source: BRA, 2015; Umass Donahue Institute, Office of the Secretary of the Commonwealth of Massachusetts, 2015

The population will continue to grow slowly

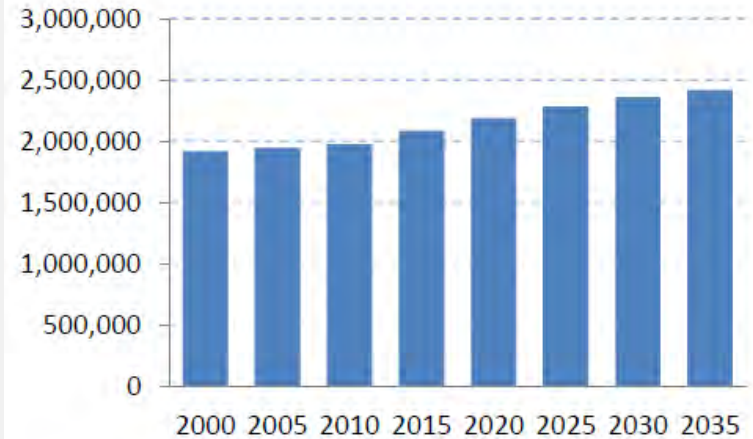
- The population in the Greater Boston area is expected to increase by 22.5% by 2035 (from 2010)
- The population in 2035 is projected to be approximately 2.4 million people, and estimated increase of 443,615 people from 2010.

Source: Umass Donahue Institute, Office of the Secretary of the Commonwealth of Massachusetts, 2015.

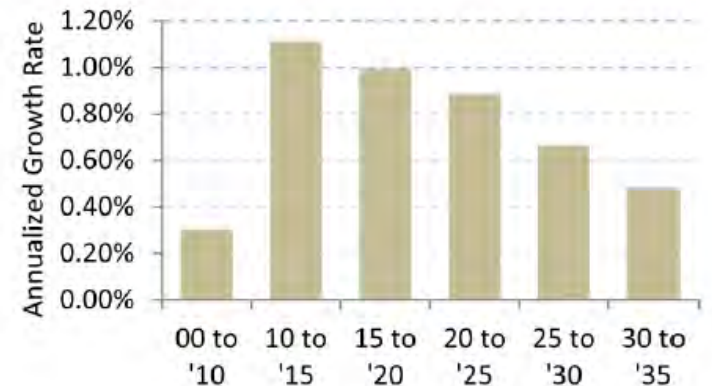
	2010	2035
Natural increase	-	145,173
Net domestic migration	-	- 248,453
Net international migration	-	546,895
Total population	1,975,155	2,418,770

Source: Umass Donahue Institute, Office of the Secretary of the Commonwealth of Massachusetts, 2015.

Projected Population, Greater Boston



Annualized rates of population change, Greater Boston

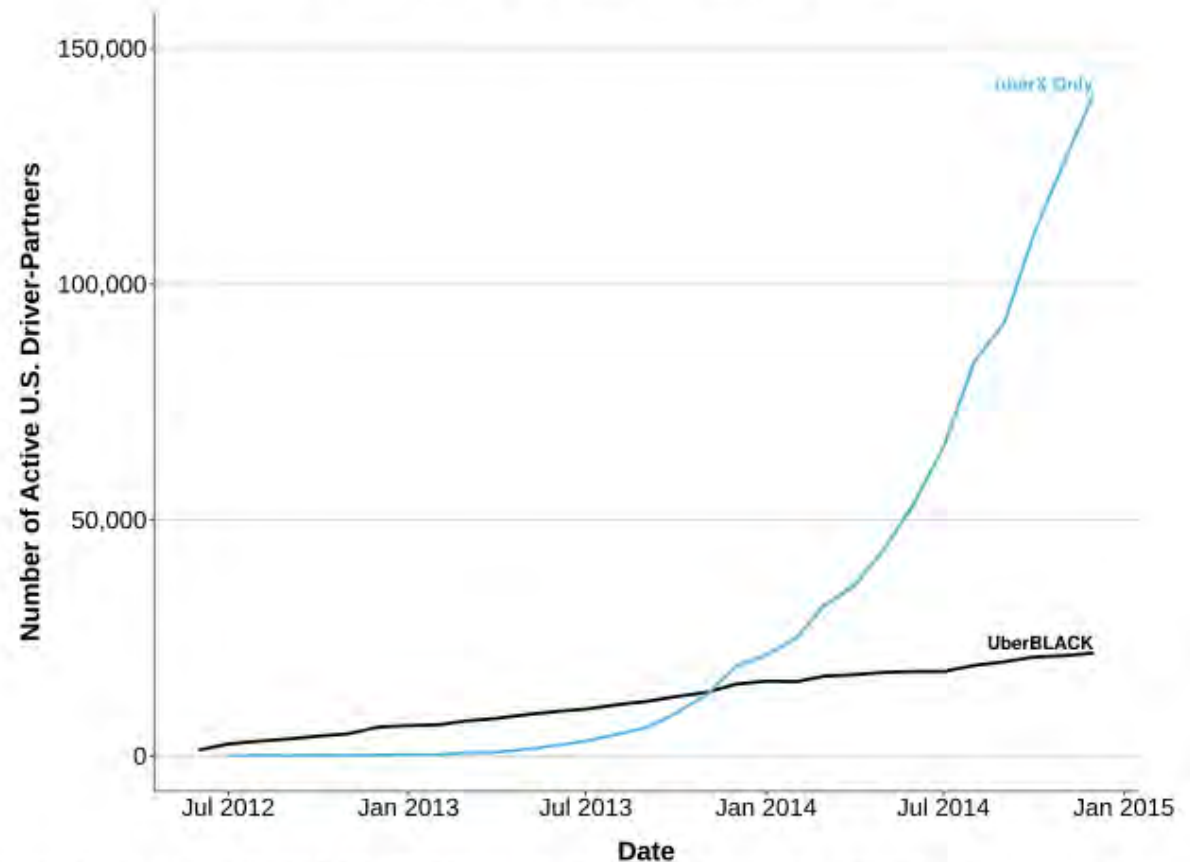


NEW MOBILITY OPTIONS: Uber and Lyft are examples of fast-growing options for first-mile/ last-mile and shared transportation

“Today, Uber has been in Massachusetts for 4 years. Together, we’ve ridden 115 million miles during a combined **28 million trips,** and we’re just getting started.”

–Uber campaign, 10/27 2015

Figure 7: Active Uber Driver-Partners by Service

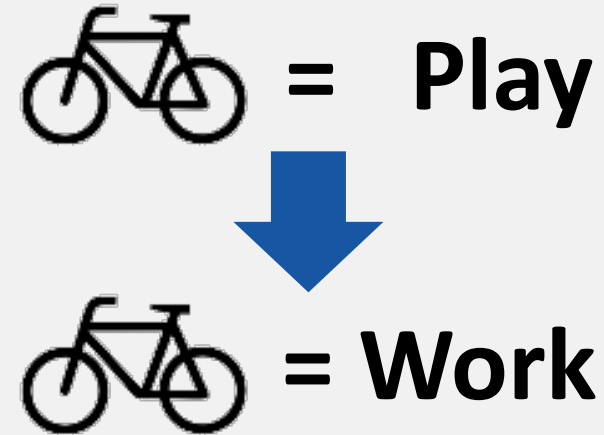


Note: Sample consists of all U.S. UberBLACK and uberX driver-partners making at least four trips in any month (284,898 individuals).

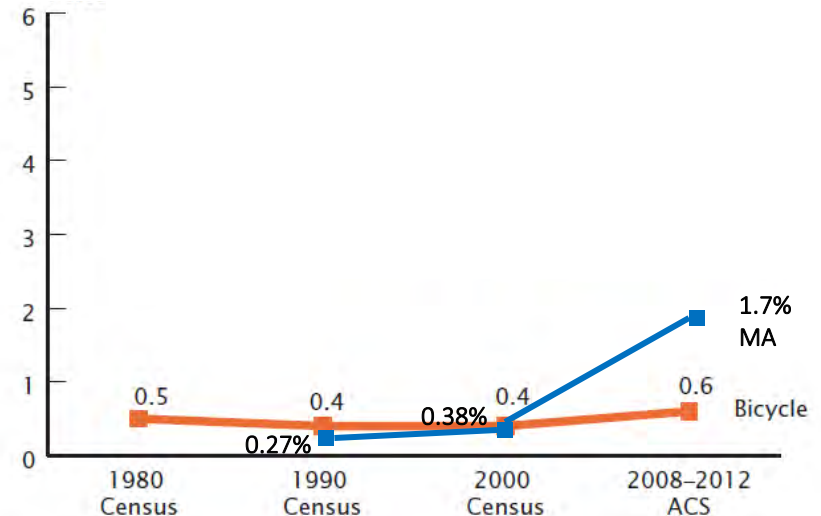
Source: Forbes, 2015.

NEW MOBILITY PREFERENCES: Commuting by bicycle is increasing in the U.S.

- In the US, 0.9% of all trips are by bicycle, and 0.5% are commuting trips.
- From 2000 to 2007 bicyclist commuting increased by **42%**
- States spend an average of 1.2% (\$1.29 per capita) of federal transportation funding on bicycling and walking.
- Bicycle use has evolved from recreational use to commuter use over the past 30 years



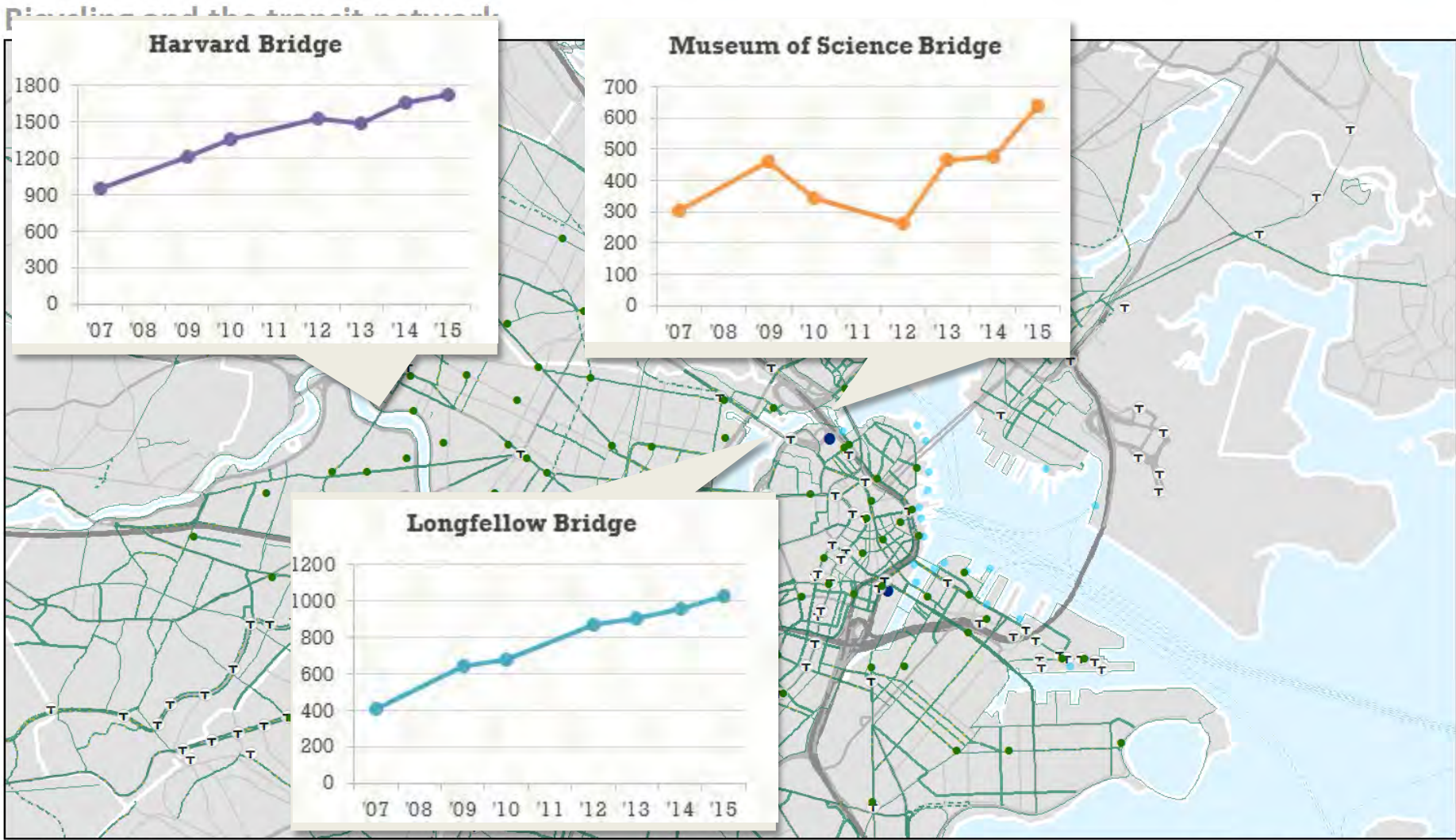
Percent of commuters walking or biking to work



Source: US Census Bureau, Massachusetts Bicycle Transportation Plan, 2008.

Sources: U.S. Census Bureau, Decennial Census, 1980, 1990, 2000; American Community Survey, 2008-2012.

Bicycling continues to increase across the region, supported by facilities, partnerships, and infrastructure

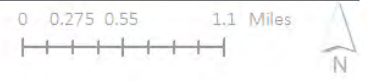


Sources: MassDOT, MBTA, Hubway, MassGIS

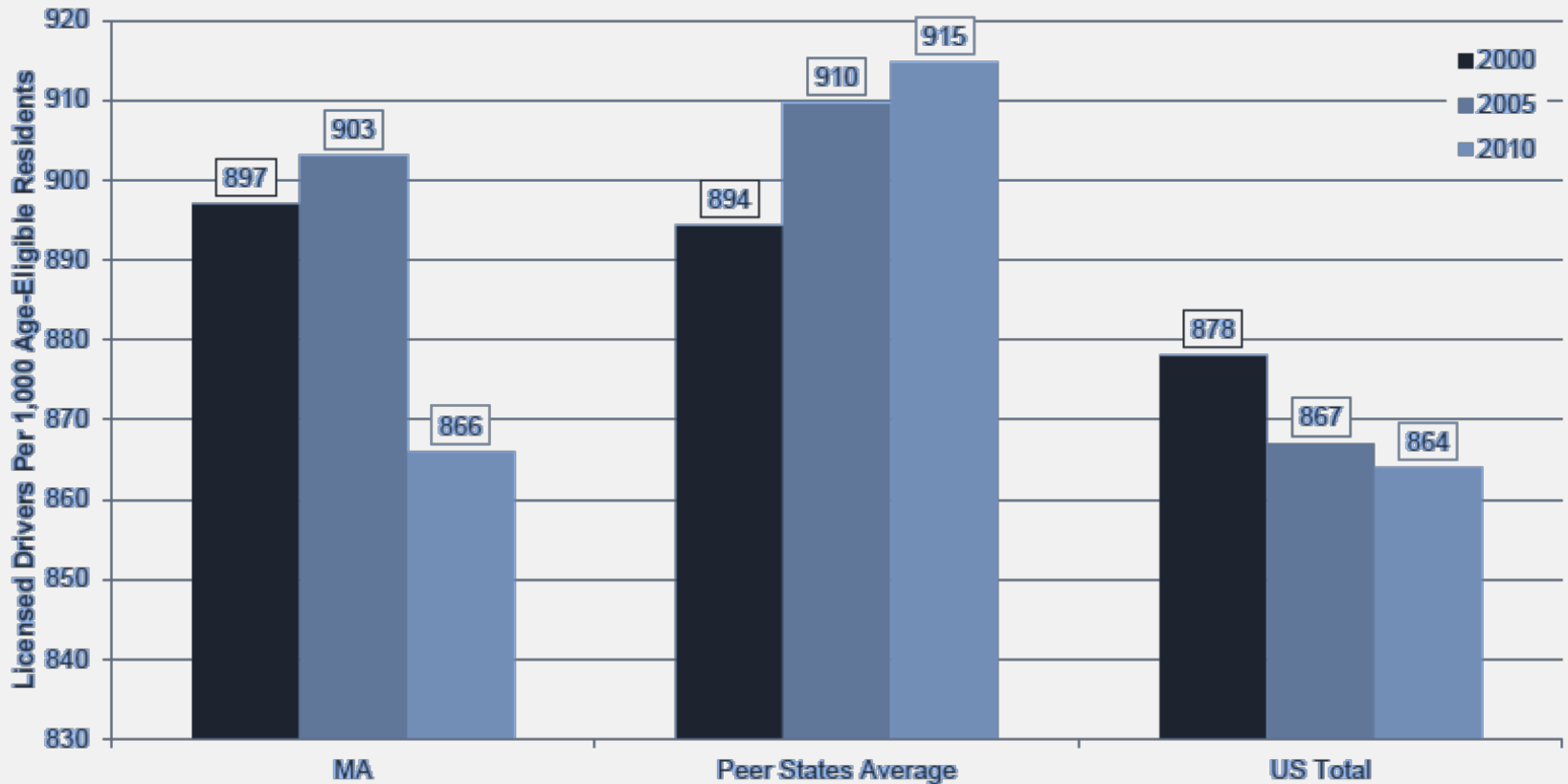
104% increase since 2007

Source: Boston Bike Counts 2015

- Bike routes (existing and proposed)
- Hubway stations



Fewer people in Massachusetts are getting their drivers license than in past years



Source: US Bureau of Transportation Statistics, State Transportation Statistics