FOCUS 40

The 2040 Investment Plan for the MBTA

STATE OF THE SYSTEM

Moving Together - 2015

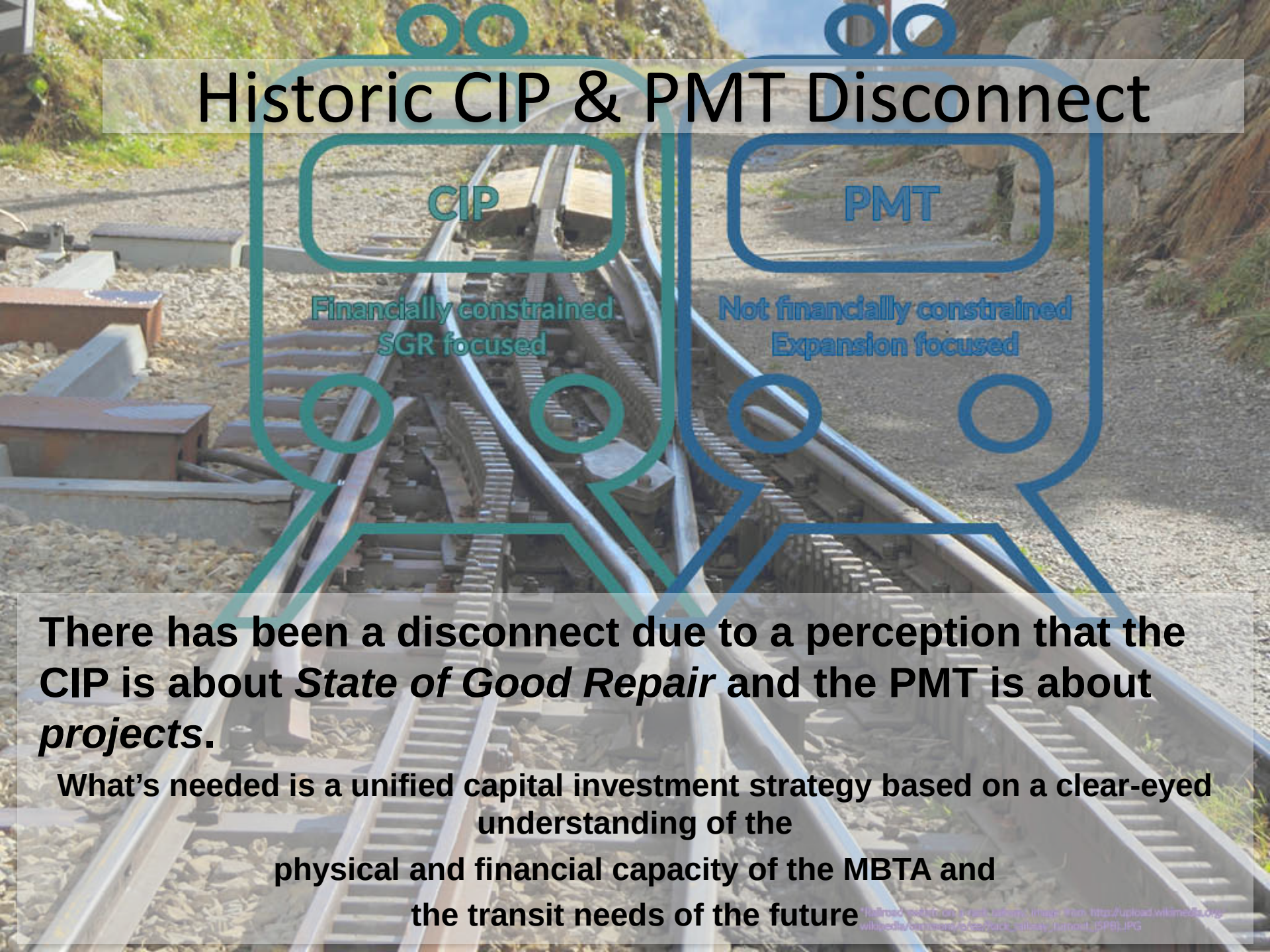
What is FOCUS 40 ?

The 2040 Investment Plan for the MBTA

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



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

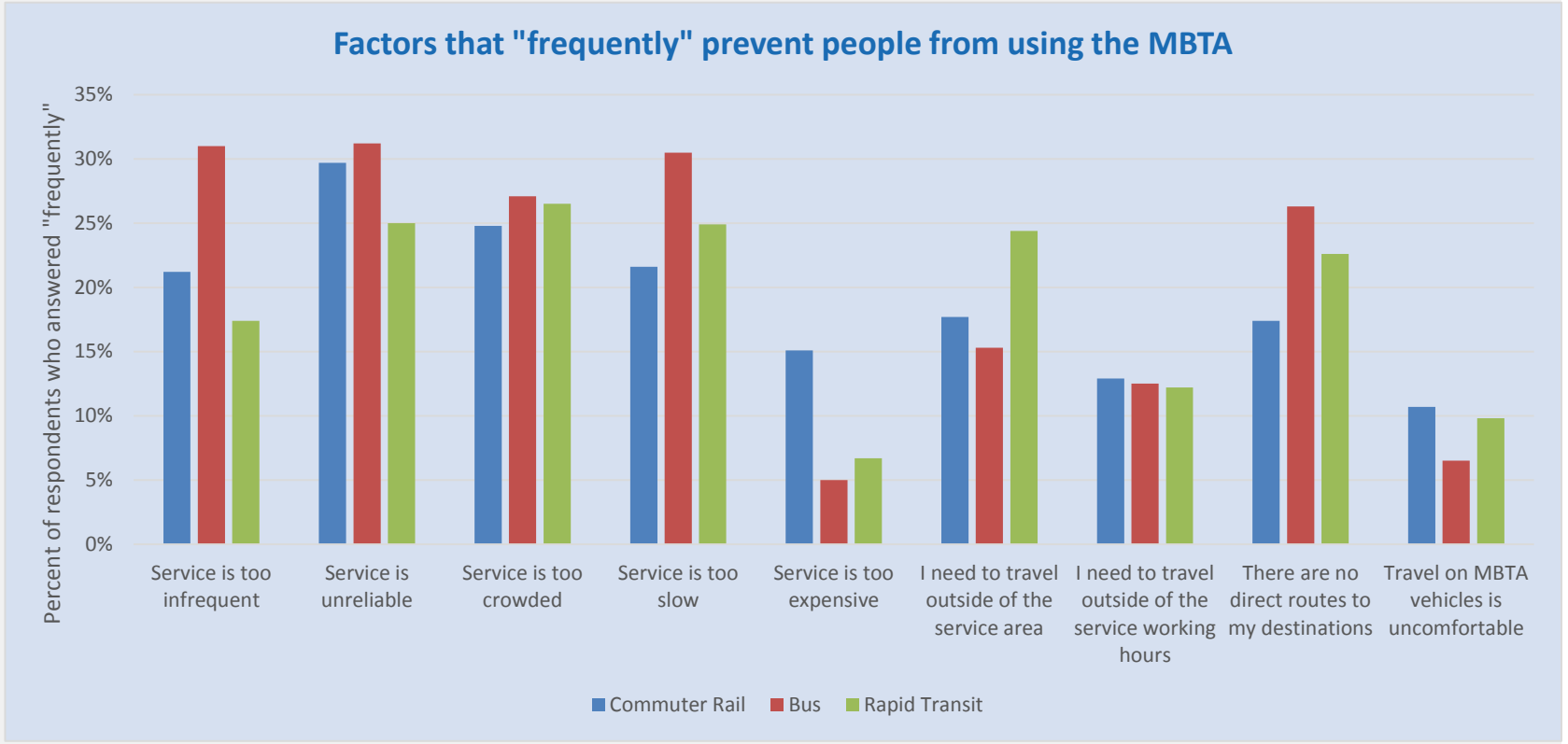
The demographics of customers also varies by mode…

	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**

Source: 2015 SGR Report

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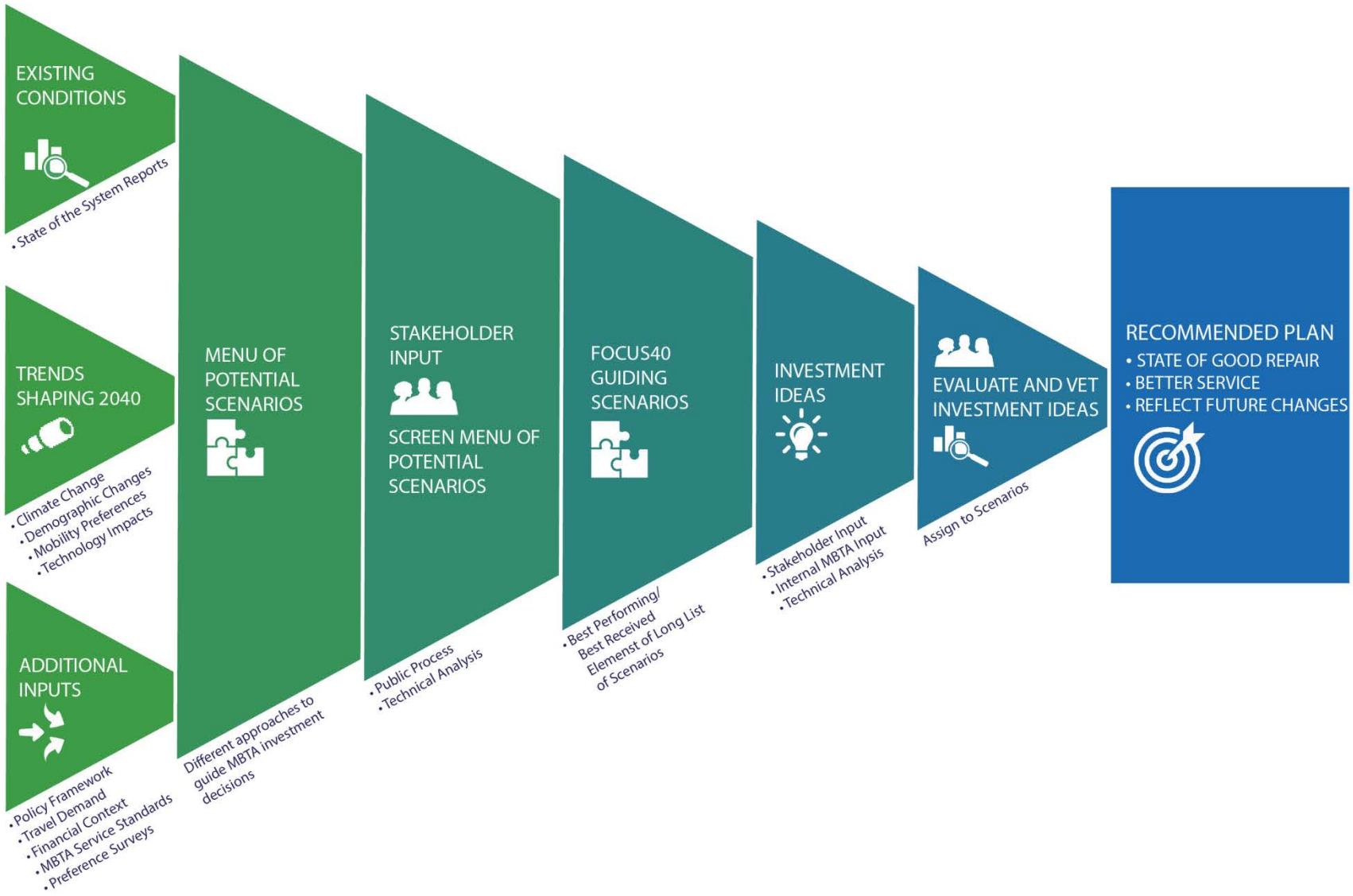
PROJECT ROADMAP



STATE OF THE SYSTEM

An overview of MBTA assets, their age and condition, and how their condition is impacting service delivery.

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.

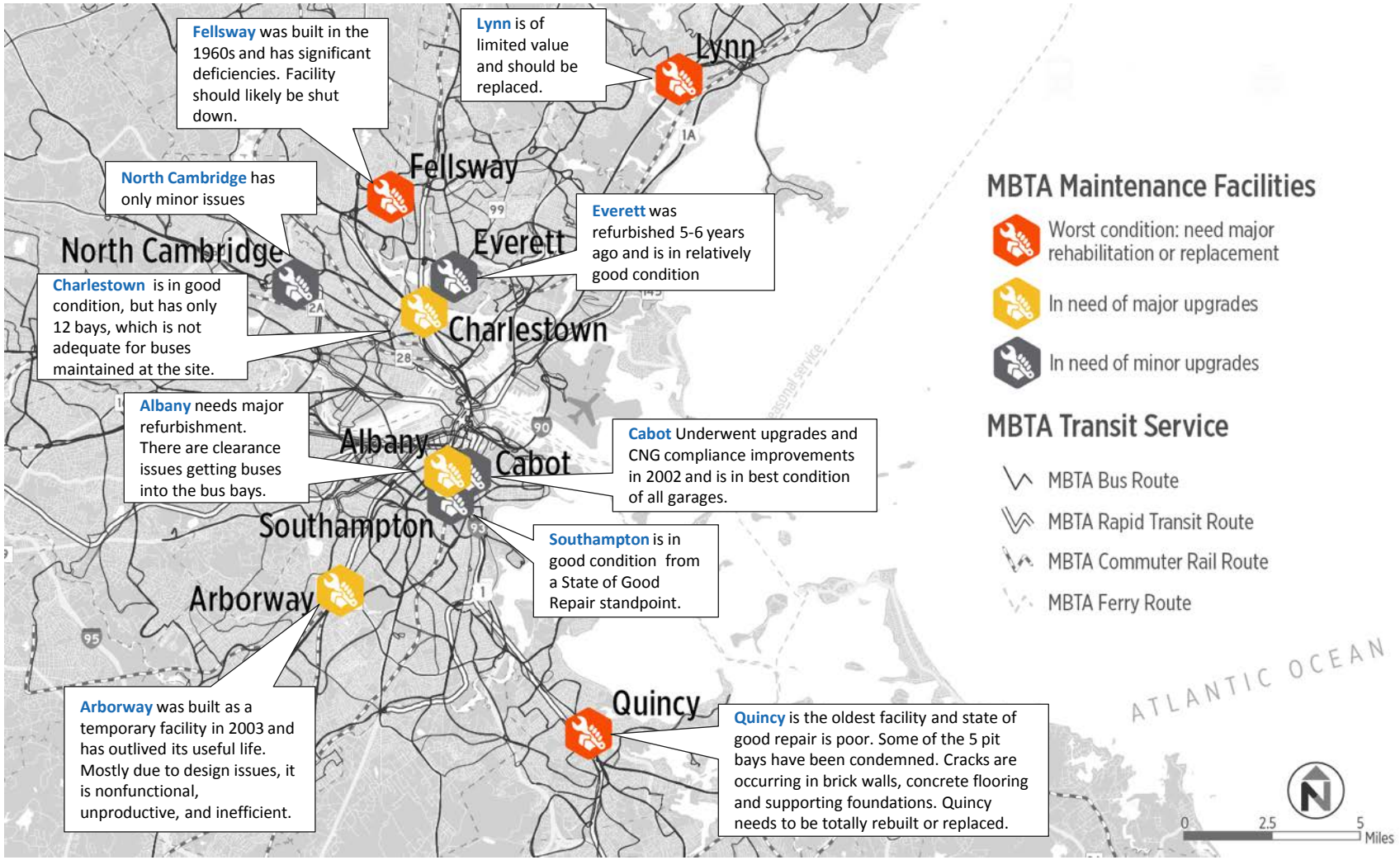
	Bus Age (Years)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Active Buses	60				25		523	124	155	8	24	72					
Inactive Buses	0													15			60
	All 991 active buses within useful lifespan												*75 Inactive buses beyond useful lifespan*				

Source: MBTA (2015)

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

BUS MAINTENANCE FACILITIES

SUMMARY OF CONDITIONS AND NEEDS



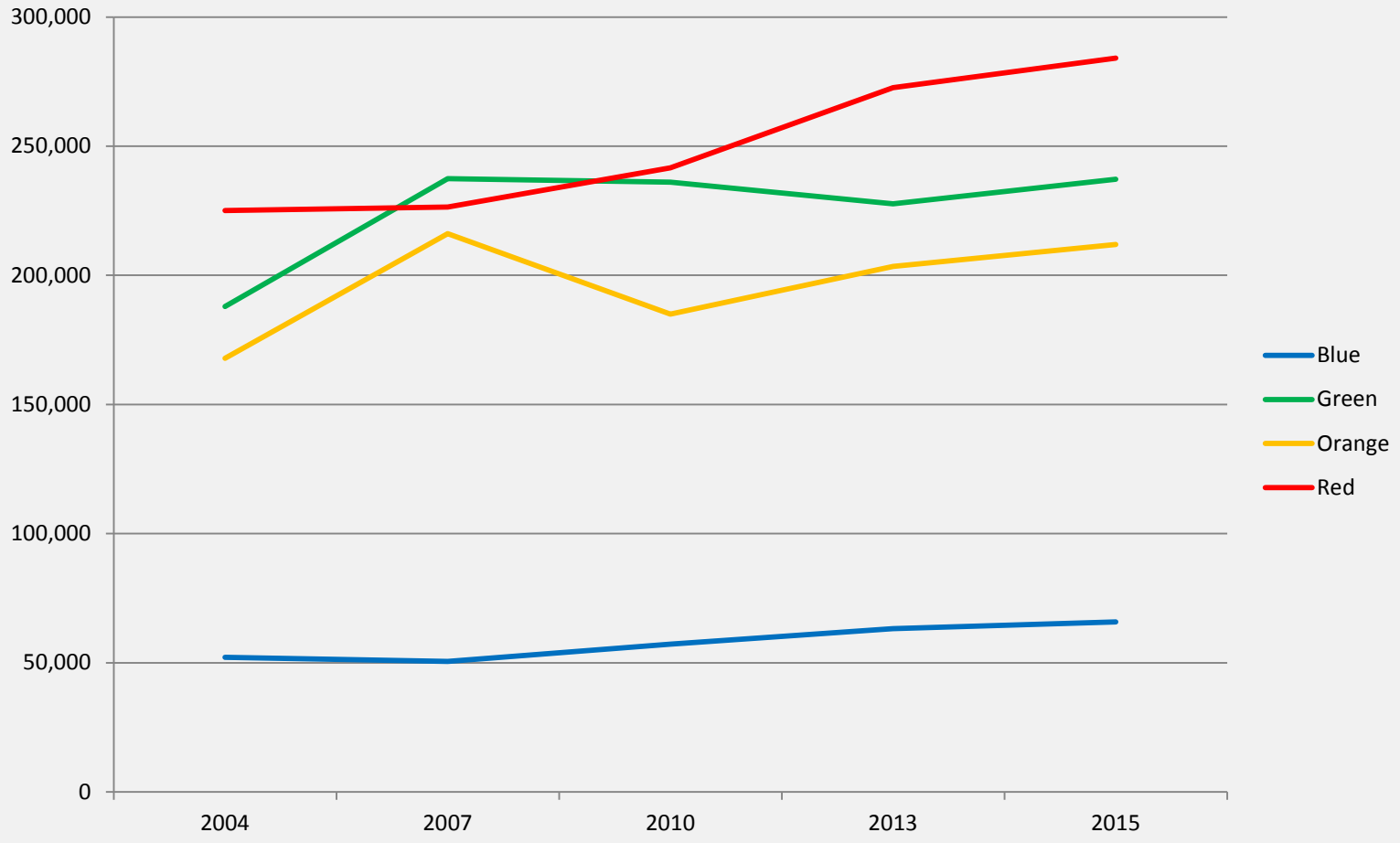
Source: MBTA 2014 Blue Book and "MBTA Maintenance Facility Analysis: Walk Around Document," December 2014, and MBTA document "Evaluation/Condition Assessment of MBTA Bus Maintenance Facilities," recent but undated.

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



Source: MBTA 2014 Blue Book

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.

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

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

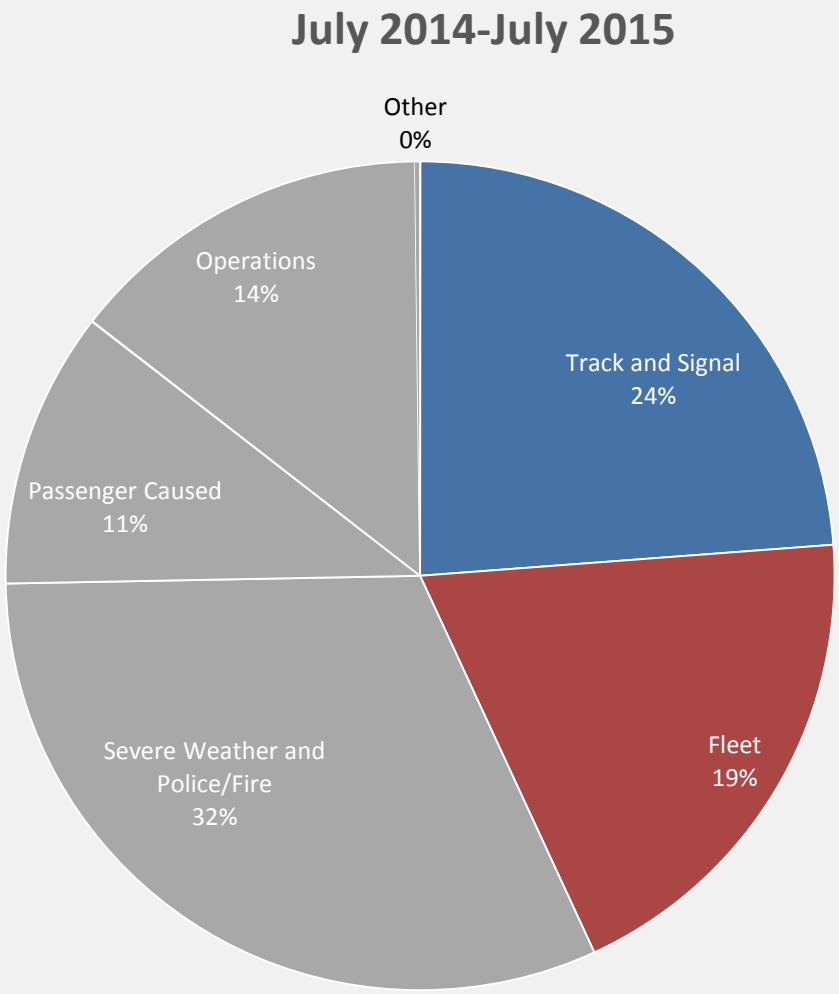
MAJOR CHALLENGES TO MEET CURRENT AND FUTURE RAPID TRANSIT DEMAND

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.

COMMUTER RAIL DELAYS



Winter of 2015 is cause for Severe Weather type of delays being largest as measured in total minutes

Excluding weather, the top two types of delays were Track and Signal, and Fleet

Source: MBTA Commuter Rail Data Files, August 2015

COMMUTER RAIL STATION ACCESSIBILITY

A significant portion of the commuter rail system is either semi-accessible or entirely inaccessible to customers with disabilities.

- Although less than 20% of system ridership occurs at inaccessible stations, several high ridership stations on the Franklin and Worcester Line are inaccessible.
- The high cost associated with making stations fully-accessible could delay some needed SGR investments.

Type of Platform	# of Stations	% of Stations	% of Ridership
Accessible Full High-Level Platforms	49	36%	29%
Semi-Accessible Mini High-Level Platforms	50	38%	52%
Inaccessible Low-Level Platforms	34	26%	19%

COMMUTER RAIL MAINTENANCE AND LAYOVER

The current size and location of layover facilities inhibits future growth in commuter rail service, particularly on the southside– a problem that would be addressed through the South Station Expansion project

- Southside layover capacity currently exists for 25 trainsets, below the 28 needed to meet today's demand, not including future growth.
- The commuter rail maintenance facility's location on the northside in Somerville creates logistical challenges for maintaining rolling stock, the majority of which operates on the southside.
- Layovers at Rockport, Bradford, Worcester, Needham, Pawtucket and Franklin are too small for their current activity. Facility is lacking at Lowell.

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!

TRENDS SHAPING TRANSPORTATION TODAY AND IN 2040

Guiding Questions

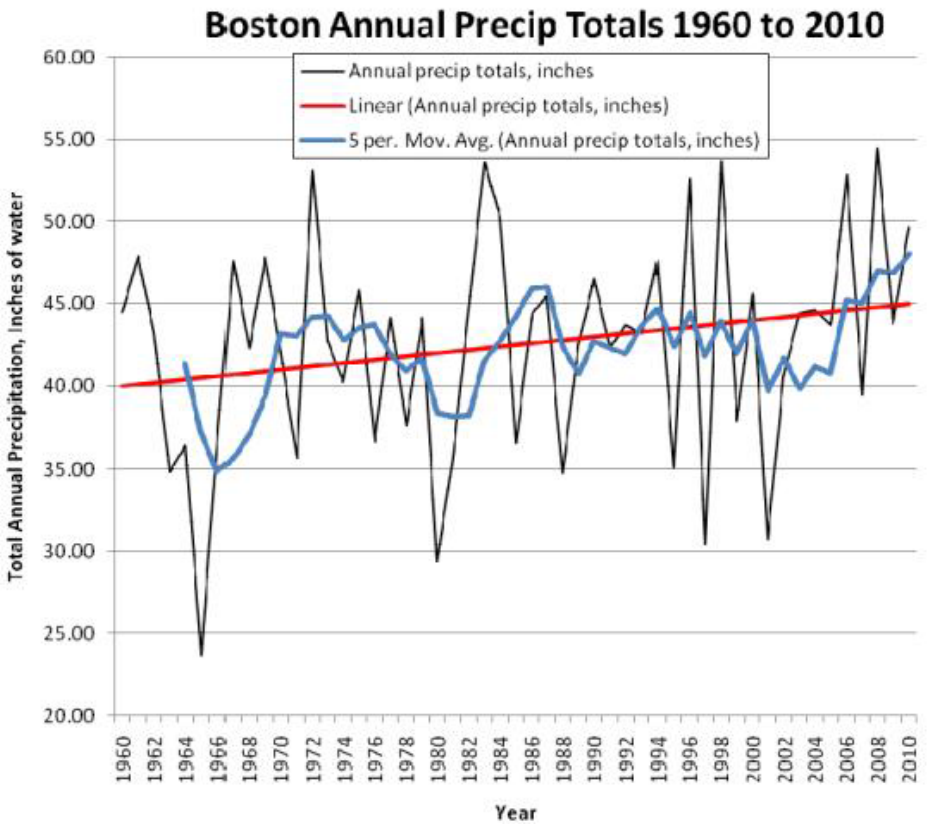
1. **What trends will shape transportation in 2040?**
   - How are these trends defined?
   - How are these trends evolving/changing?

2. **What will public transportation need to look like in 2040 to address these trends?**

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.***

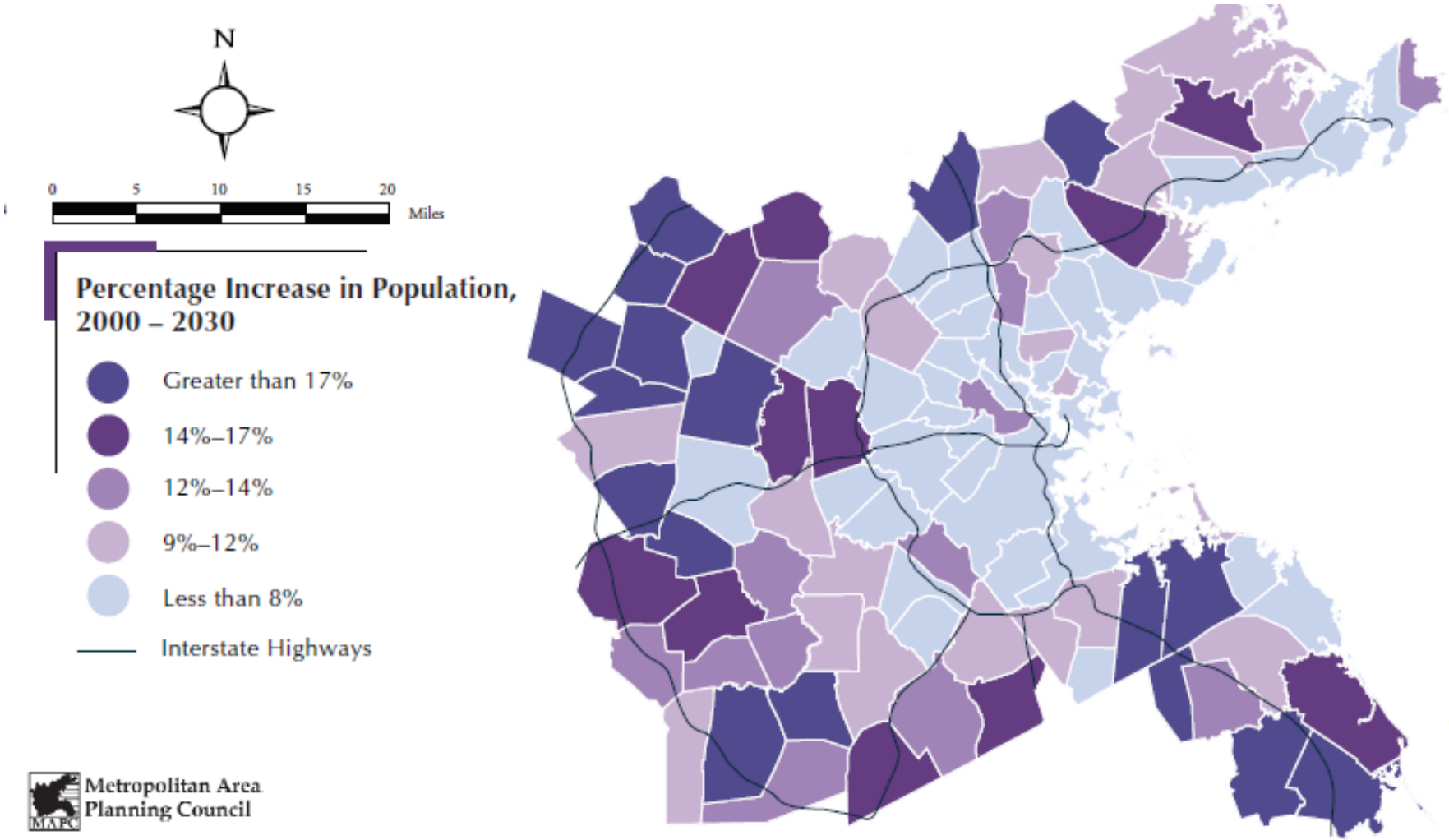
Source: MA Climate Change Adaptation Report, 2011



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**).

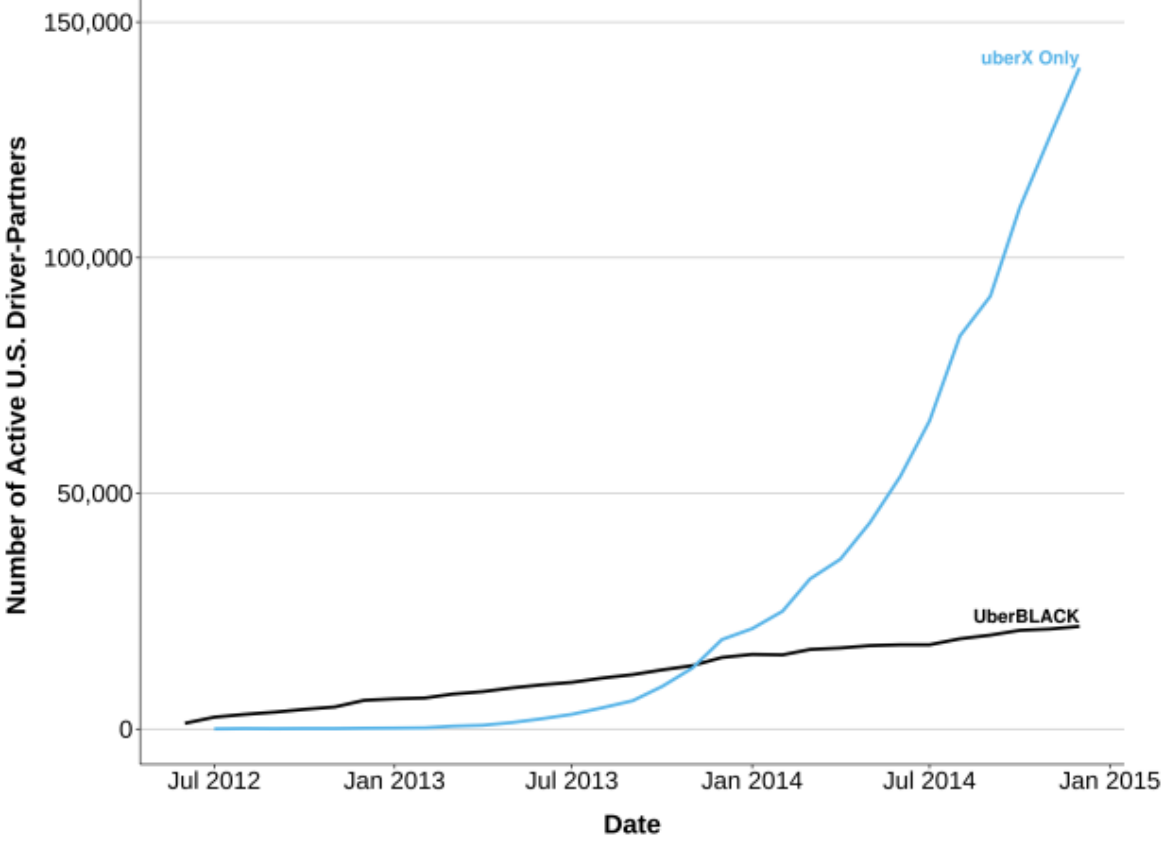
DEMOGRAPHICS: Where will populations increase the most?



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

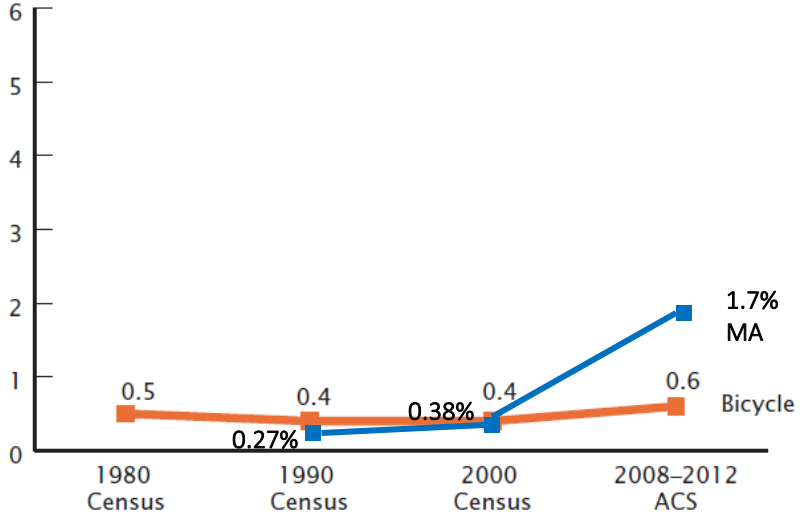


Source: Forbes, 2015.

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

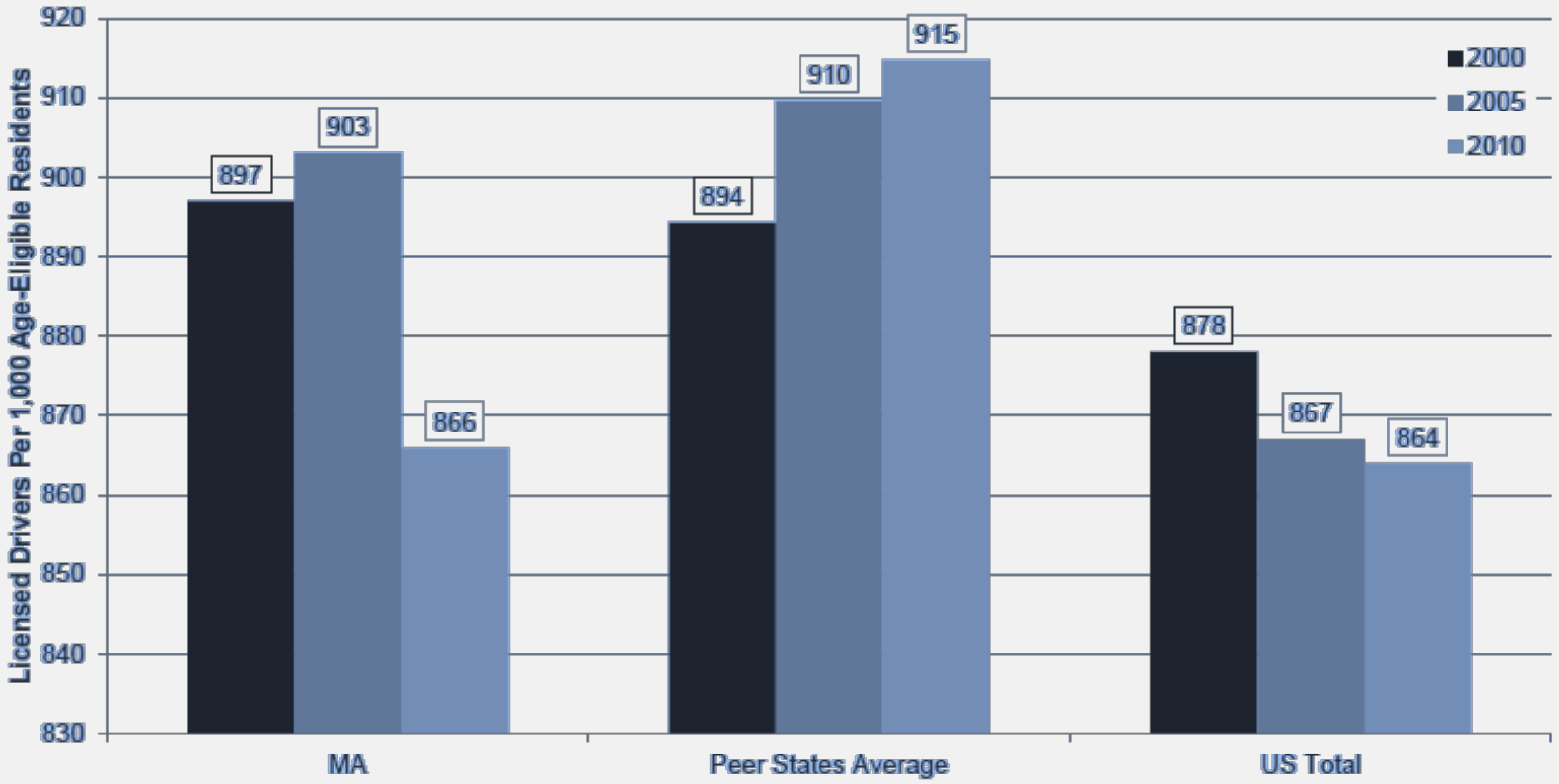
Percent of commuters walking or biking to work



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

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

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



Source: US Bureau of Transportation Statistics, State Transportation Statistics