

RIDERSHIP TRENDS

Office of Performance Management &
Innovation

February 27, 2017

Summary

- FMCB is considering a ridership goal for its strategic plan and this presentation is designed to inform that discussion
- Ridership is a key measure of our service
- Ridership trends are difficult to analyze due to changing methodologies and the large number of internal and external factors impacting it
- Multiple ways to analyze ridership provide useful insights
- Overall ridership is on pace with job and population growth
- The T's ability to serve and grow ridership depends on capacity in time and space

Why have a ridership goal?

A ridership goal could inform:

- Capital decision-making about capacity
- Service planning and operating decisions
- Fare policy decisions
- In order to achieve environmental, social, and economic goals for transit, the MBTA may want to maintain or increase our market share for trips in the Boston region
 - As population and employment increase, this means increasing ridership and our capacity

How do we define and measure ridership?

- Measure unlinked passenger trips defined by National Transit Database (NTD) guidelines
- Different methods of collecting data by mode
 - Heavy/Light Rail: Automated Fare Collection (AFC)
 - Bus: AFC and Automated Passenger Counters (APCs)
 - Commuter Rail: Conductor Counts
- Methodologies have changed over time

2304 square routes and recorded ridership for 1982 in 1981. Total projected patrons. The growth of is 47.7 million patrons. The average bus RTD's fleet accounts for an average bus age of only five years, with approximately

A special election seeking voters for increased sales tax to fund construction of a 77-mile light rail system will be sought.

Ridership counts.

Subsidy requests under Section 5 of the Urban Mass Transit Act must include accurate ridership counts. The new Denominator Multiple-Tally Counter provides **officially accepted** tabulations — any size counter for your required rider classifications.

Back mounting bracket provided for easy installation — simple and convenient to use.

THE DENOMINATOR CO., INC.
Woodbury, Connecticut 06798 — Tel. 203-263-3210
Tally Counters — Since 1914

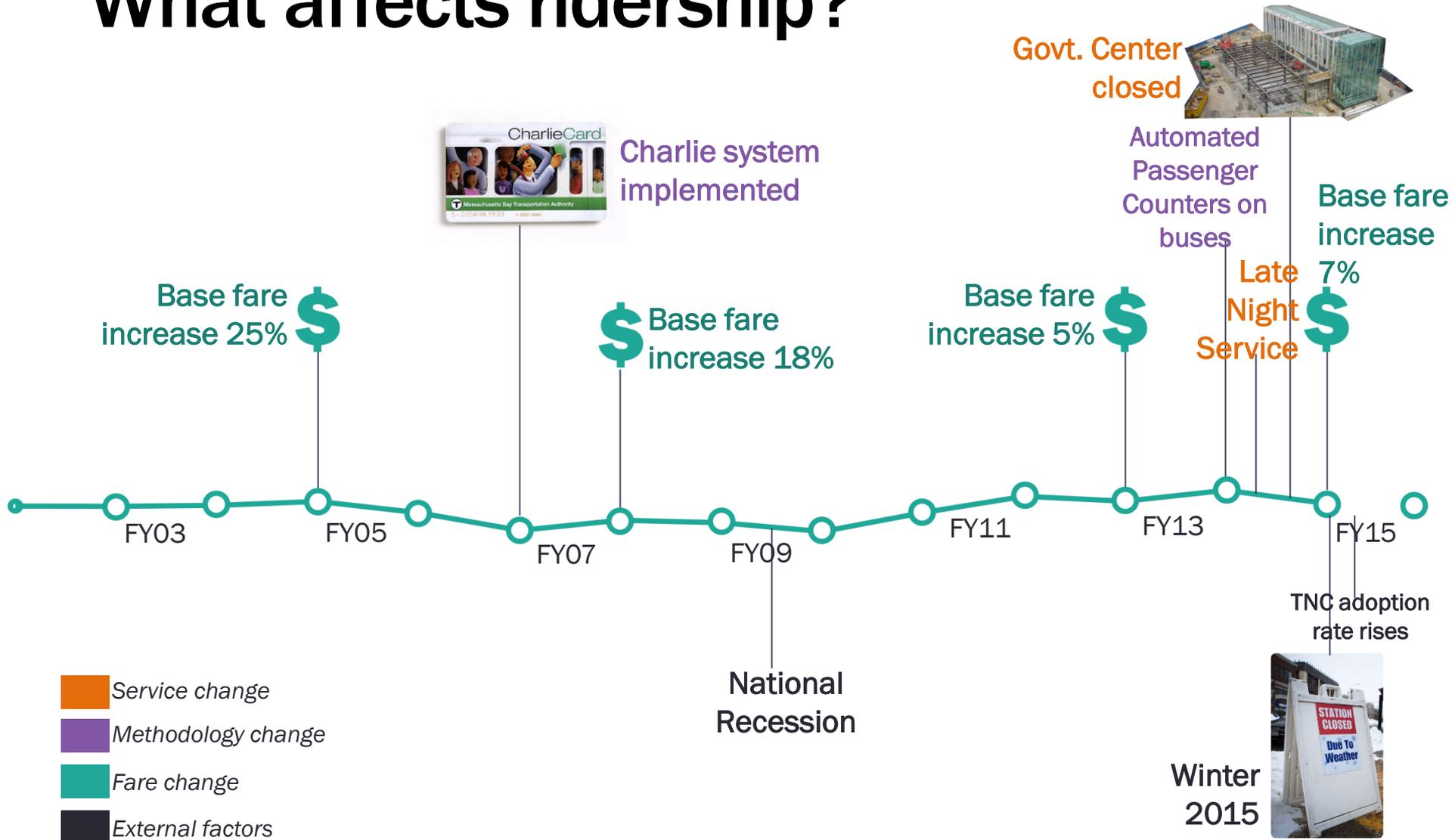
Ad from 1982 issue of *Passenger Transport* magazine

What we report

- To NTD*:
 - Monthly ridership, by mode, from AFC system with adjustments for non-interaction and transfers. Non-AFC from manual counts (Commuter Rail and Boat) or RIDE software
 - Yearly ridership, by mode, by day type and overall.
 - Bus collected using on-board APC scaled to total service provided.
 - Other modes as above with additional checks.
- On MBTA Back on Track Dashboard:
 - Average weekday ridership for the last available month, from AFC system with above adjustments.

**An error was discovered in the FY15 bus ridership reported to NTD due to a methodology change. This presentation includes a corrected number.*

What affects ridership?



- Service change
- Methodology change
- Fare change
- External factors

No single analysis tells the complete story

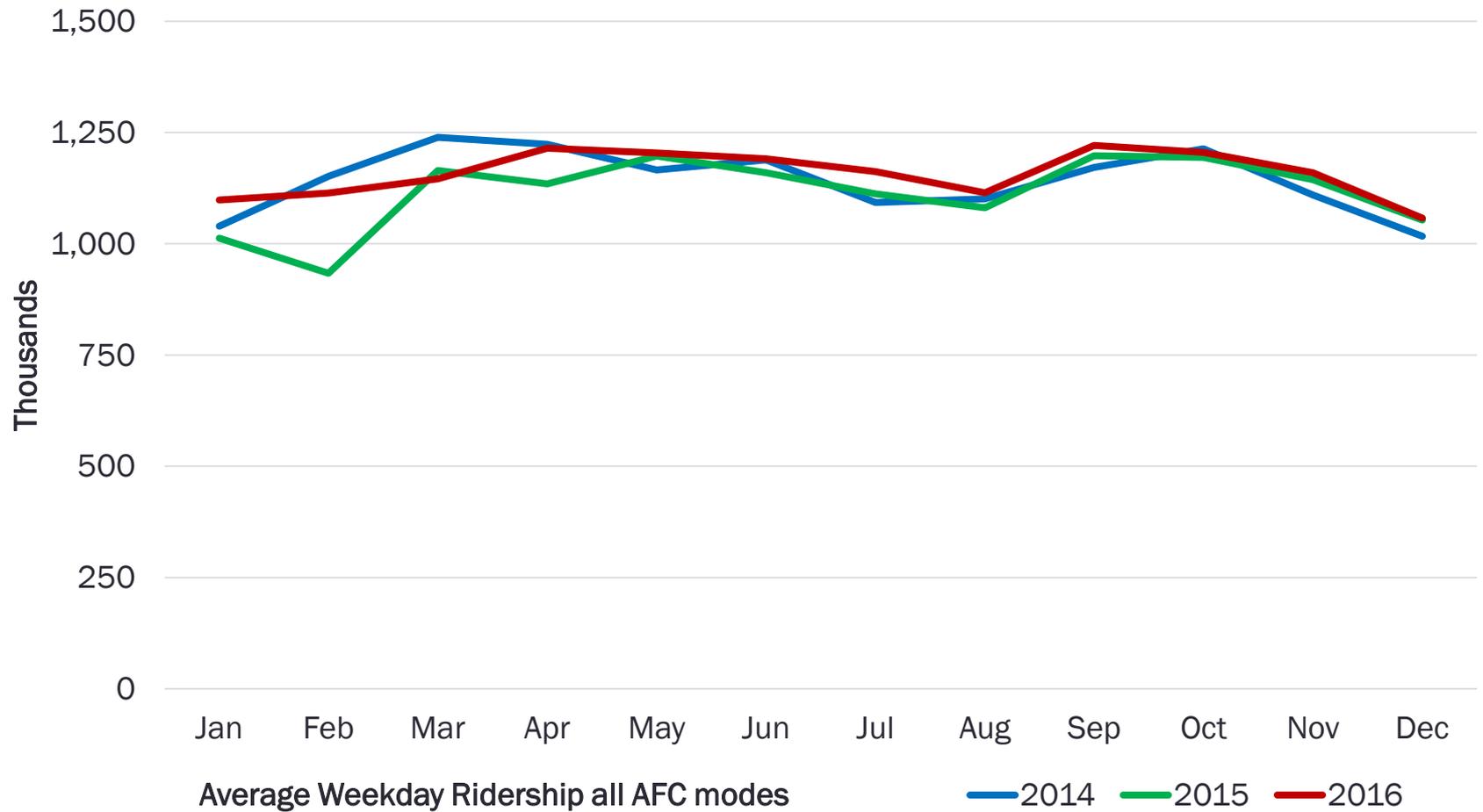
Unlinked Passenger Trips (UPT) is an imperfect measure, but allows comparisons to other systems

We analyze the change in Unlinked Passenger Trips

- Over different timeframes to see trends
- Compared to external factors for context
- Compared to our service levels to measure efficiency
- By mode for comparison
- By day type to see changes in peak and off peak ridership

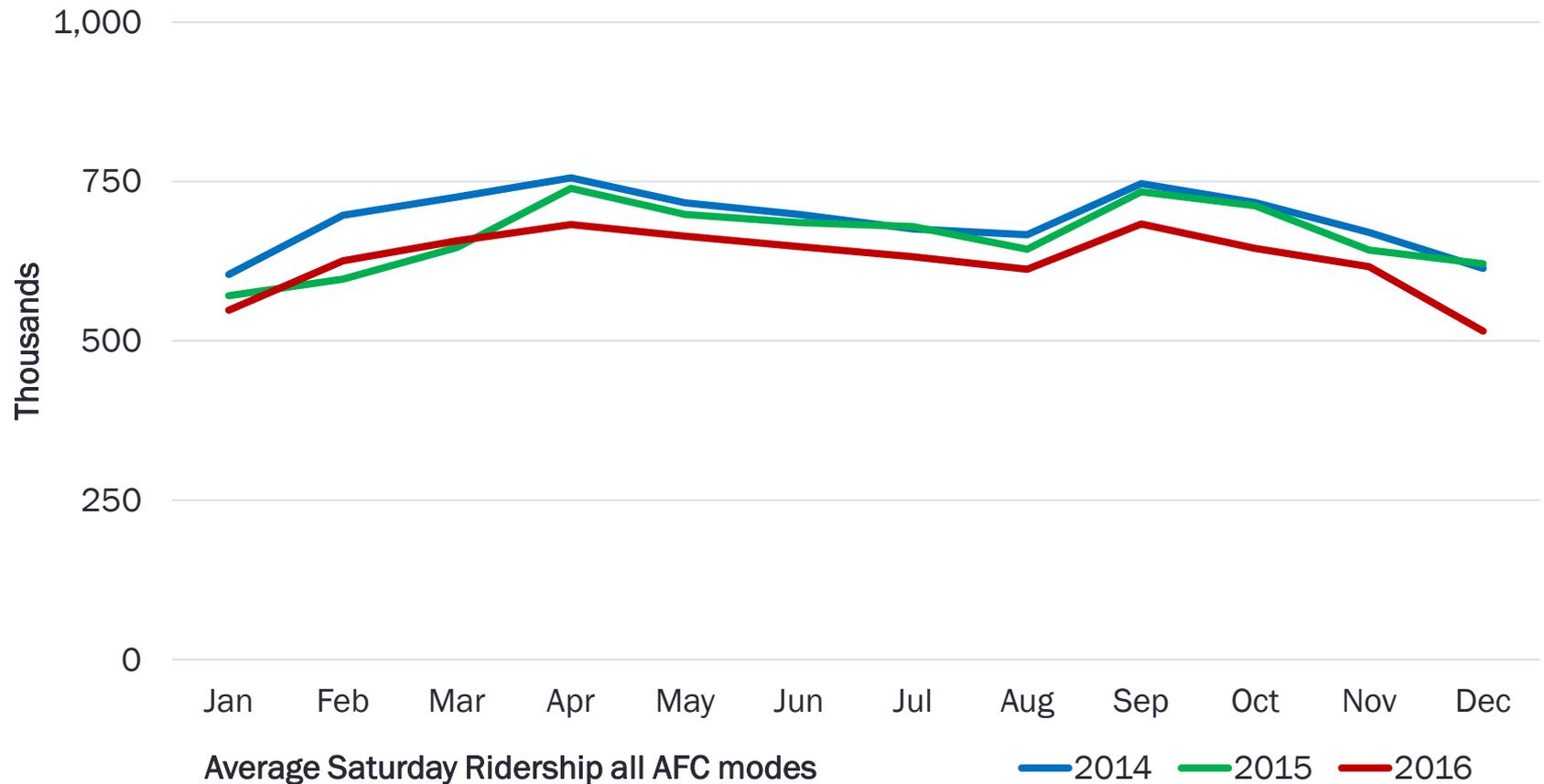
TRENDS

Month over month 2016 weekday ridership steady



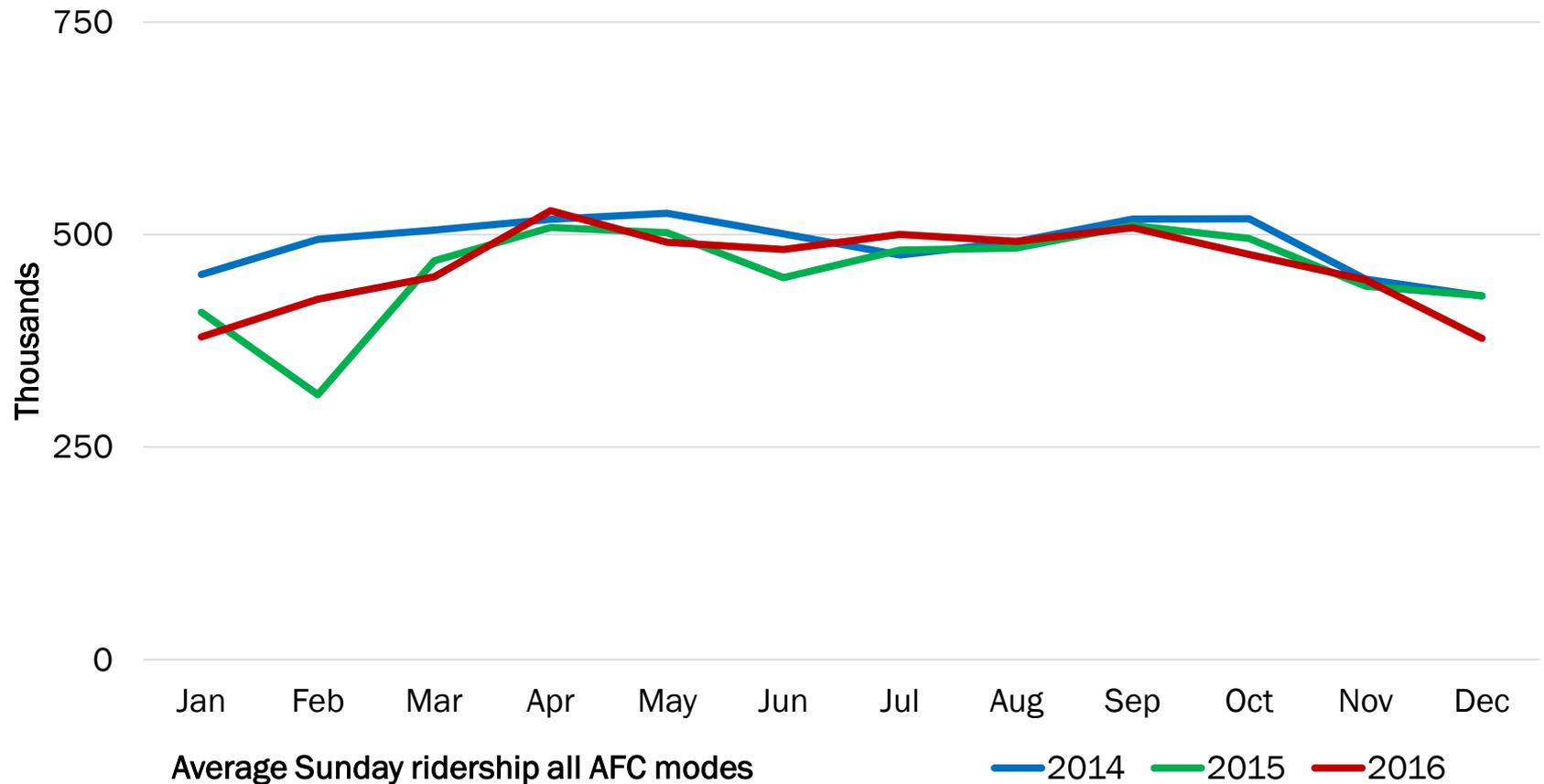
Source: MBTA AFC system with non-interaction factors applied₉

2016 Saturday ridership decreasing, aligns with the end of Late Night



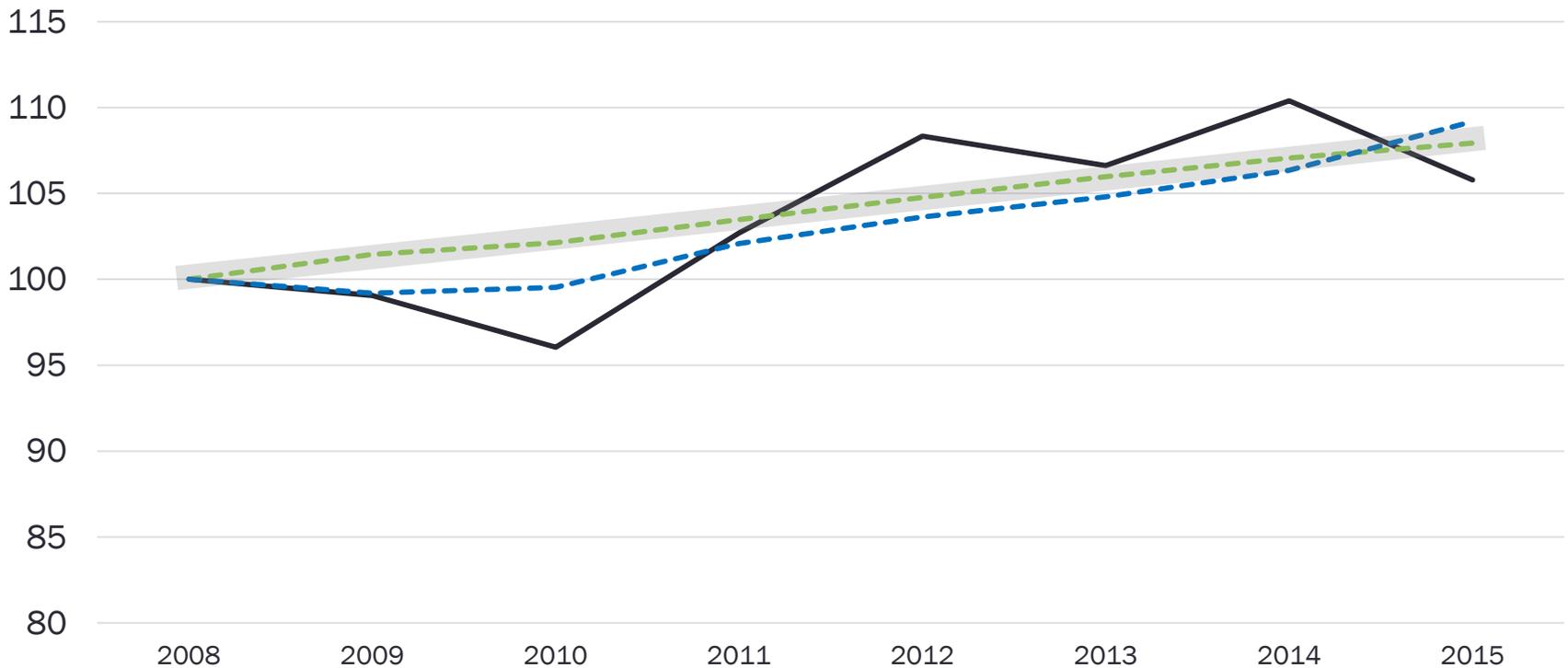
Source: MBTA AFC system with non-interaction factors applied

Sunday ridership has small fluctuations



Source: MBTA AFC system with non-interaction factors applied

Ridership growth on pace with job and population growth



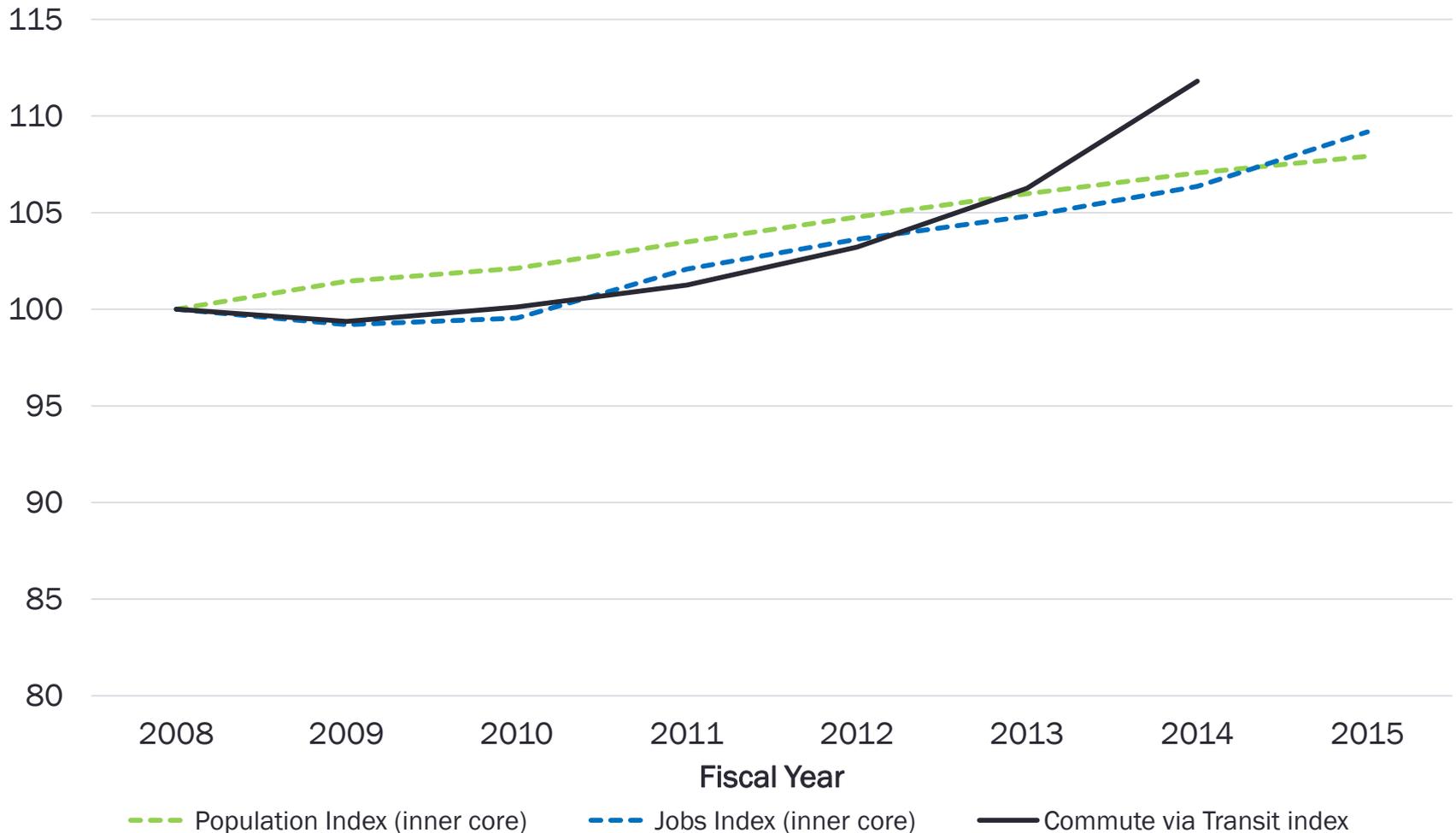
Jobs, Population and Ridership Indexed to 2008

- Ridership Index - All Modes
- - - Population Index (inner core)
- - - Jobs Index (inner core)

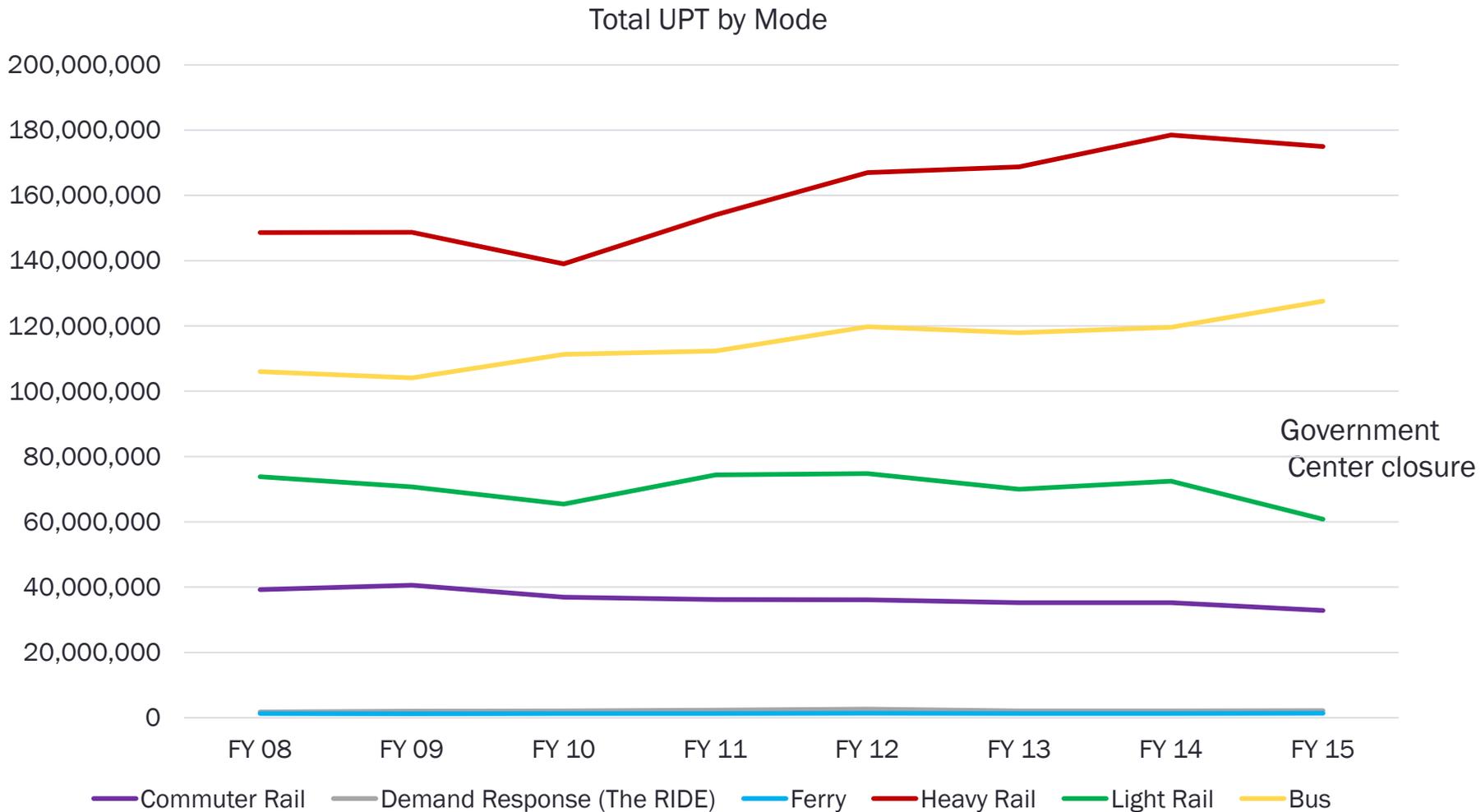
Ridership is total UPT as reported to NTD

Jobs = Average total employment for the 17 inner core cities and towns

Commute trip mode share is outpacing population and job growth in the Boston region

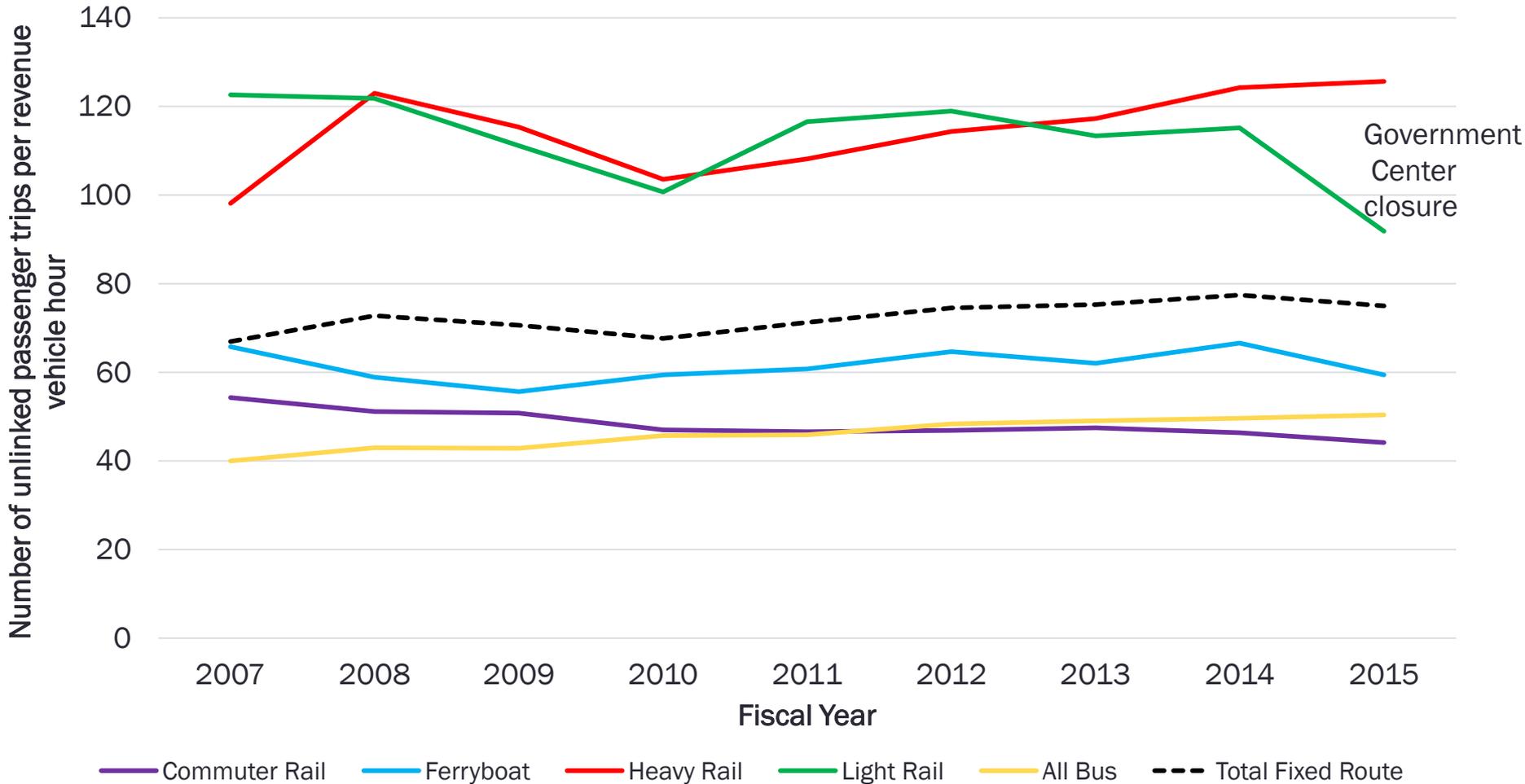


Trends differ by mode



Source: NTD, MBTA AFC system w/ adjustment for 2015 Bus (AFC = Automated Fare Collection)

Ridership by service hours differs by mode



Source: NTD

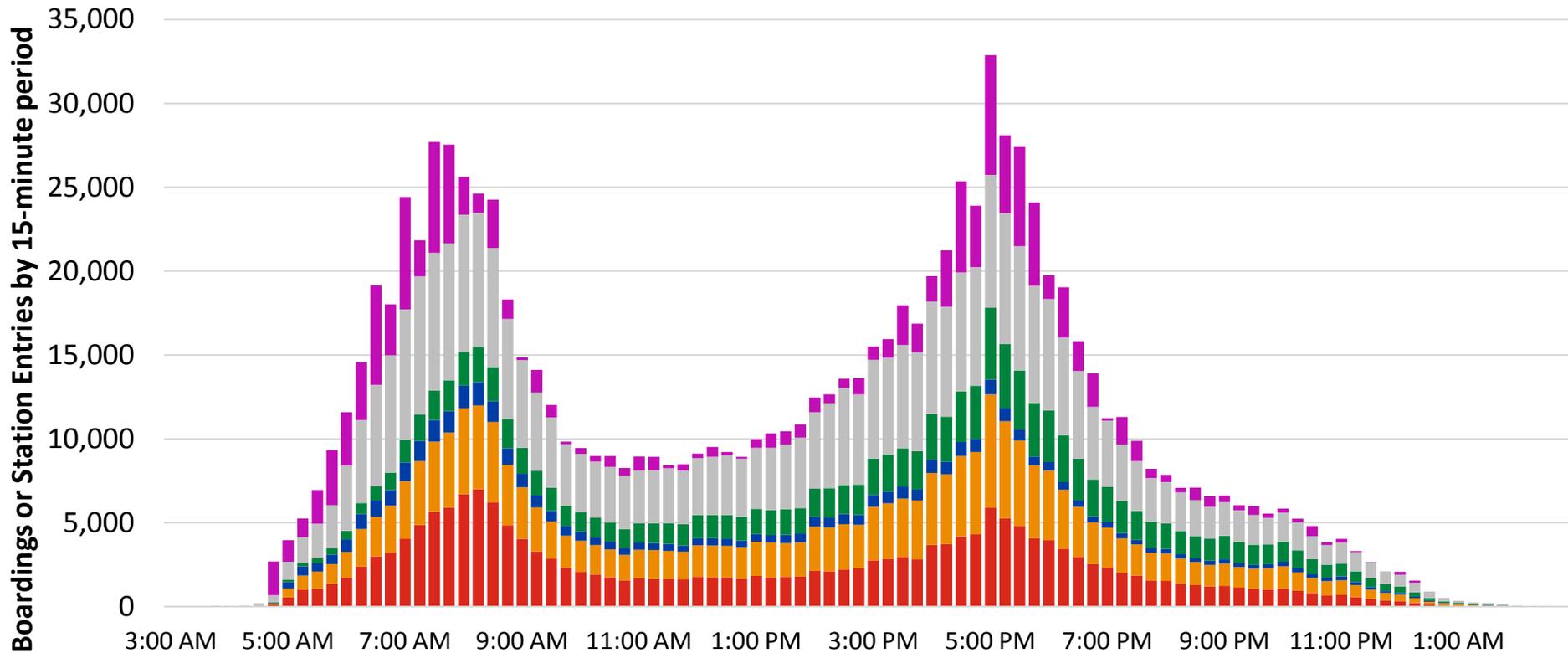
CAPACITY

Capacity affects ability to meet demand

- Capacity constraints are spatial and temporal
- Bottlenecks (single links or stations) can reduce capacity on entire lines
- Questions to consider:
 - In the short-term, can we increase ridership where we have capacity off-peak and lower volume routes?
 - In the medium and long-term, where and when do we need to increase capacity?

Time of day capacity constraints

Average weekday FY16



■ Red Line
 ■ Orange Line
 ■ Blue Line
 ■ Light Rail
 ■ All bus
 ■ Commuter Rail

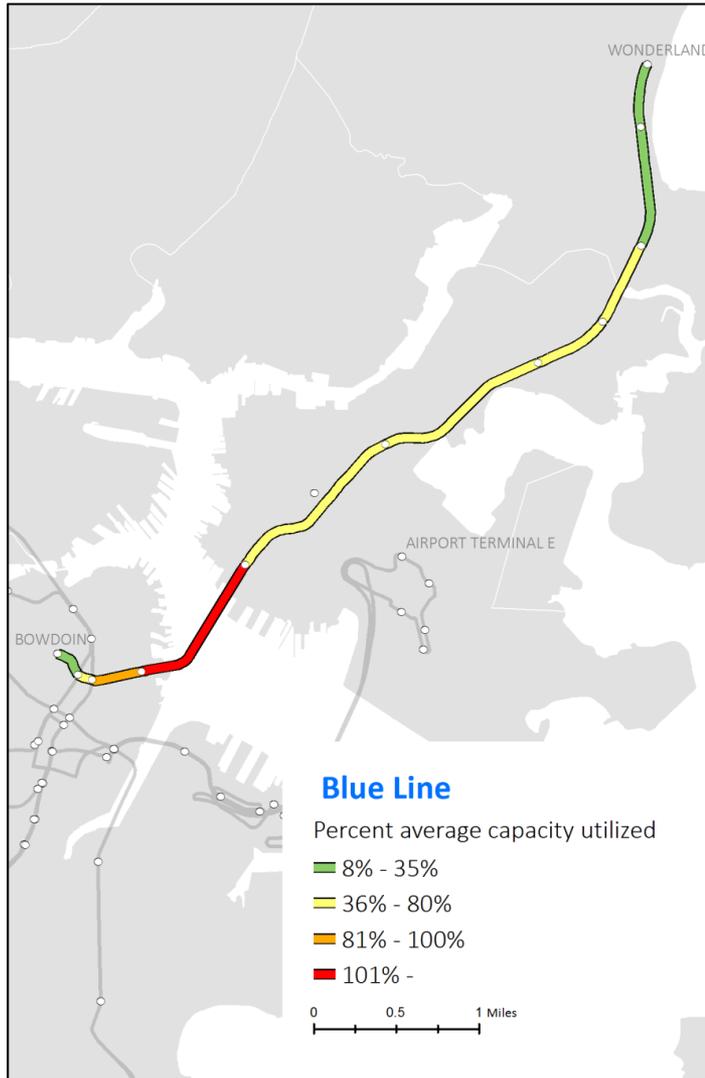
Notes:

- Commuter Rail boardings based on departure time of train from its origin, not actual passenger boarding time
- Commuter Rail counts average of October 3-7, 2016
- Other boardings are average weekday in FY16
- Counts are unadjusted for behind-gate transfers or non-interaction boardings, undercounts morning peak on Light Rail

Source: MBTA AFC system, Keolis conductor counts and train schedule

[Ridership by 15 min - weekdays fy16.xlsx]

Bottleneck capacity constraints (Focus40 analysis)



- Bottlenecks can be caused by high ridership segments, low speeds caused by dwell time or operating constraints
- Solutions depend on the cause

Map shows percent of theoretical capacity utilized from 8:00-8:30 AM on an average weekday

Source: MassDOT / MBTA Focus40

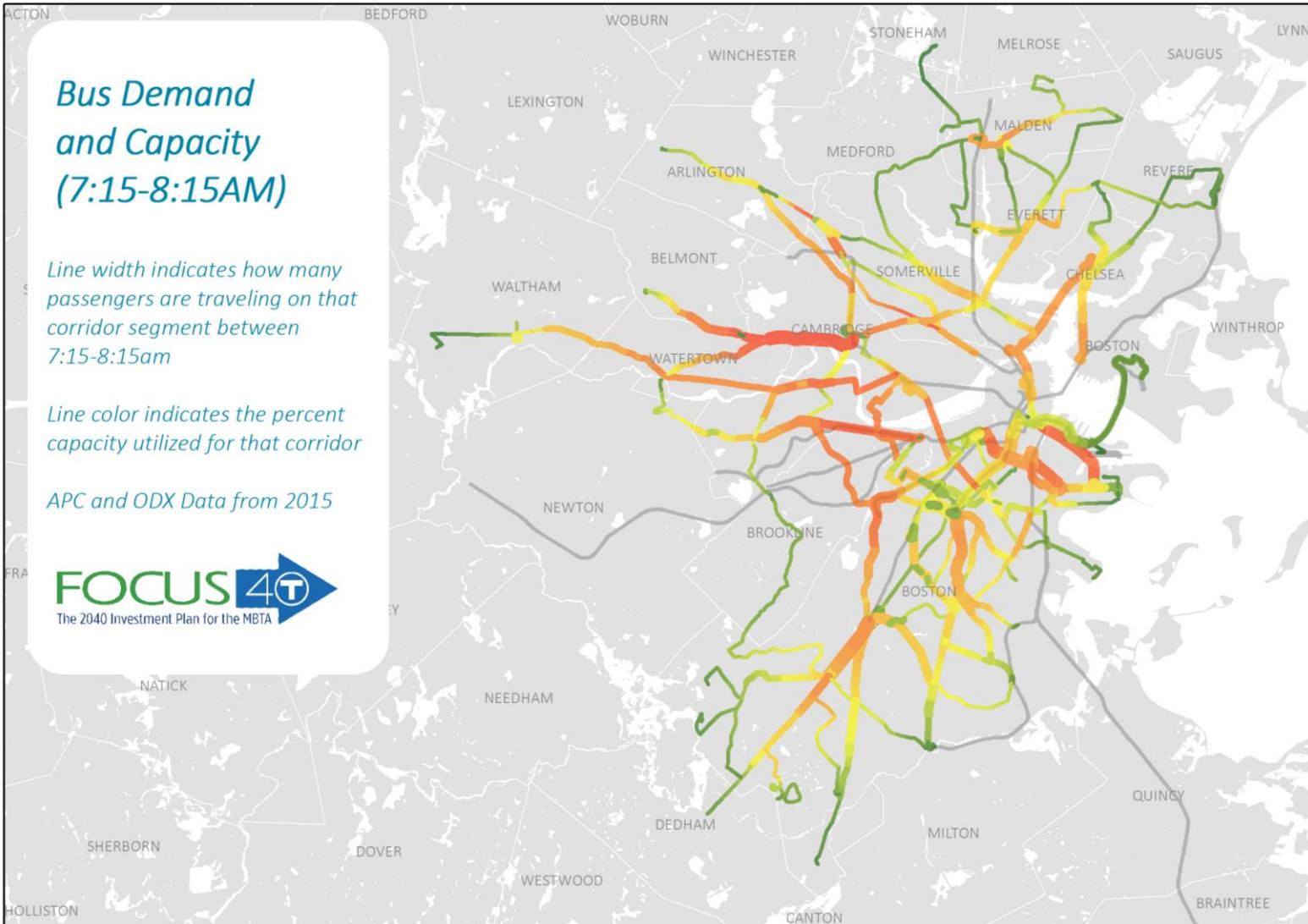
Capacity constraints also exist on the bus network

Bus Demand and Capacity (7:15-8:15AM)

Line width indicates how many passengers are traveling on that corridor segment between 7:15-8:15am

Line color indicates the percent capacity utilized for that corridor

APC and ODX Data from 2015

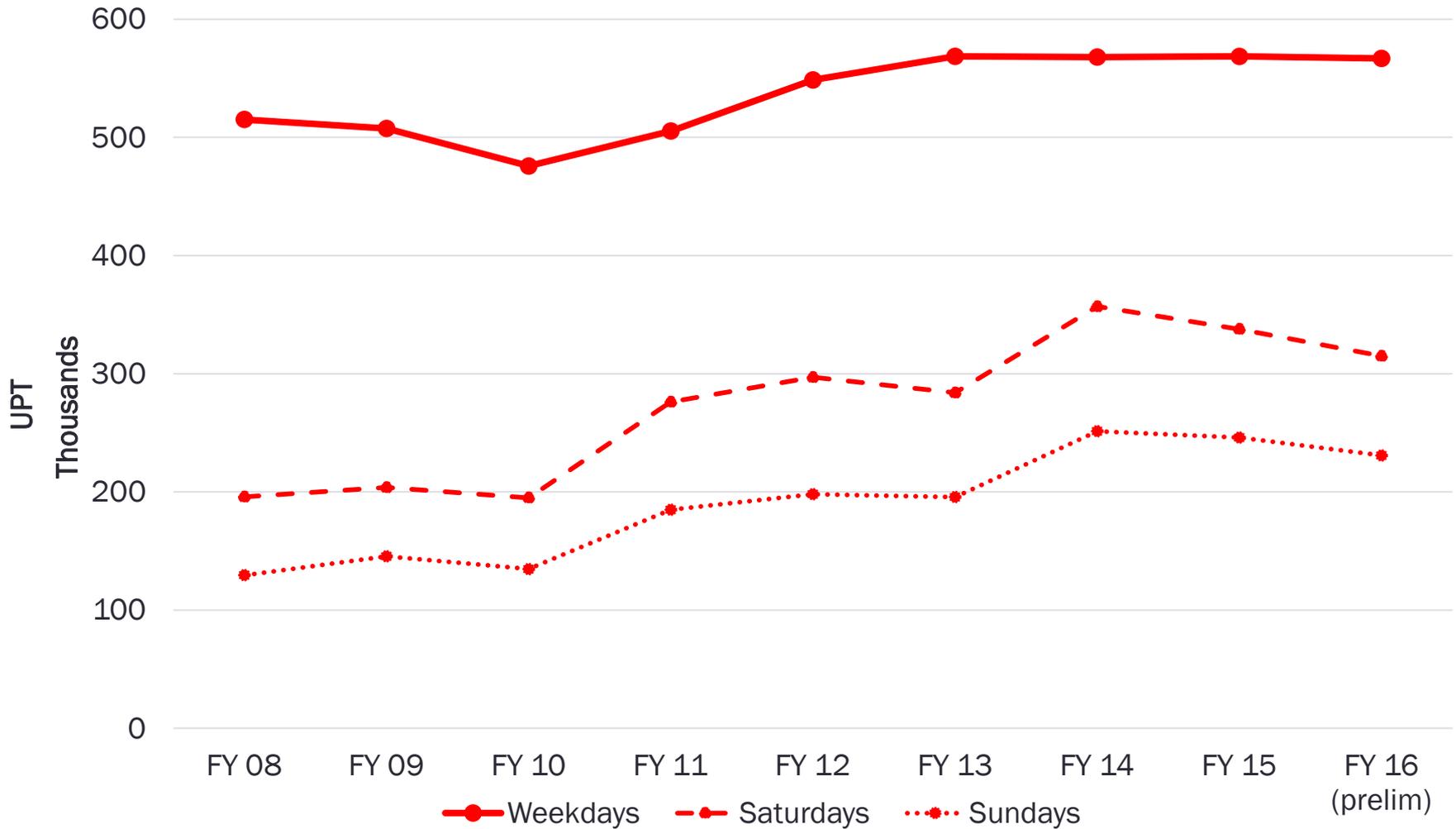


Discussion

- Should the MBTA have a ridership goal?
- Over what timeframe?
- How should the ridership goal inform operating, capital, and fare policy decision-making?

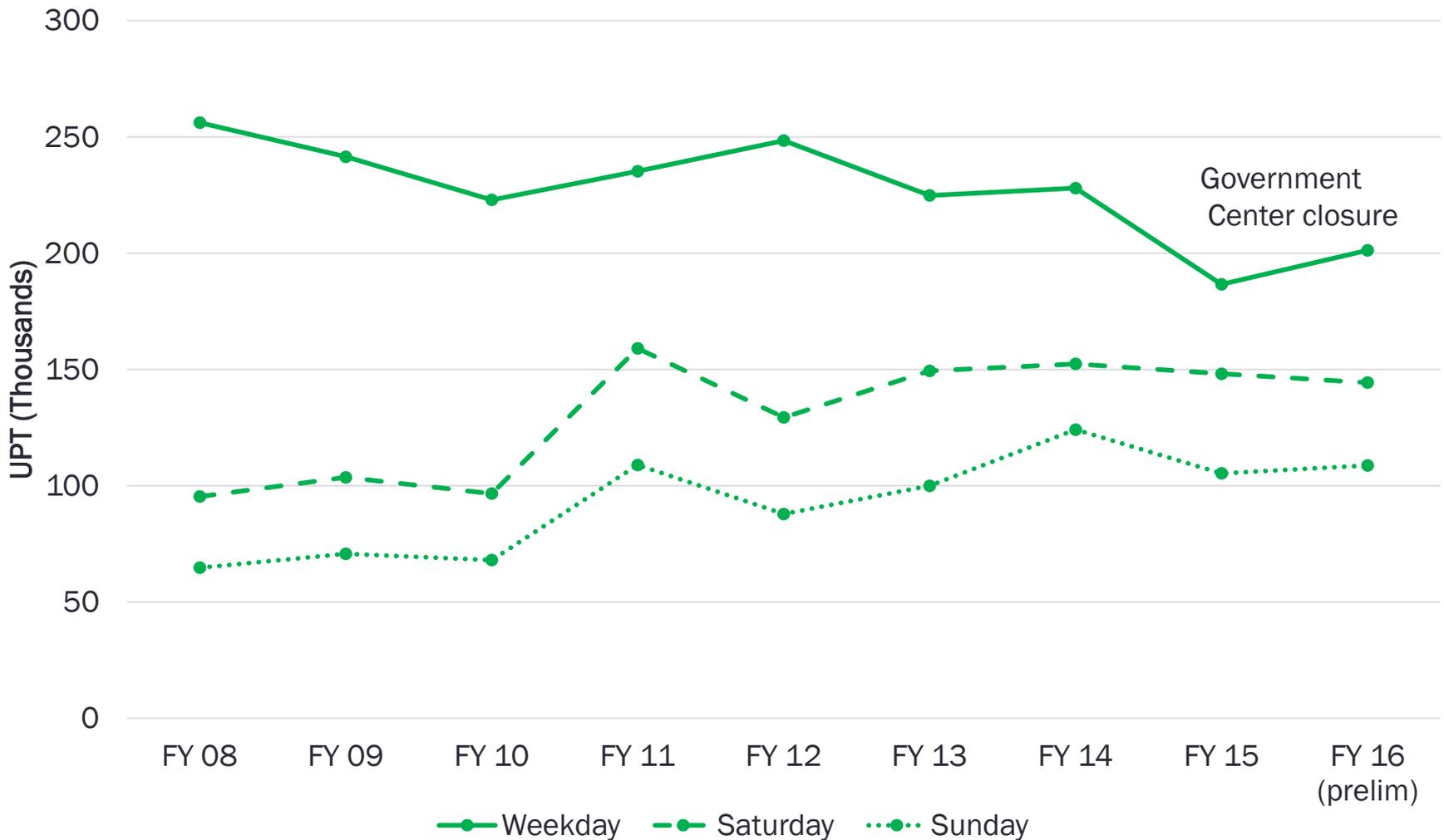
APPENDIX

Heavy Rail Average UPT by Day Type



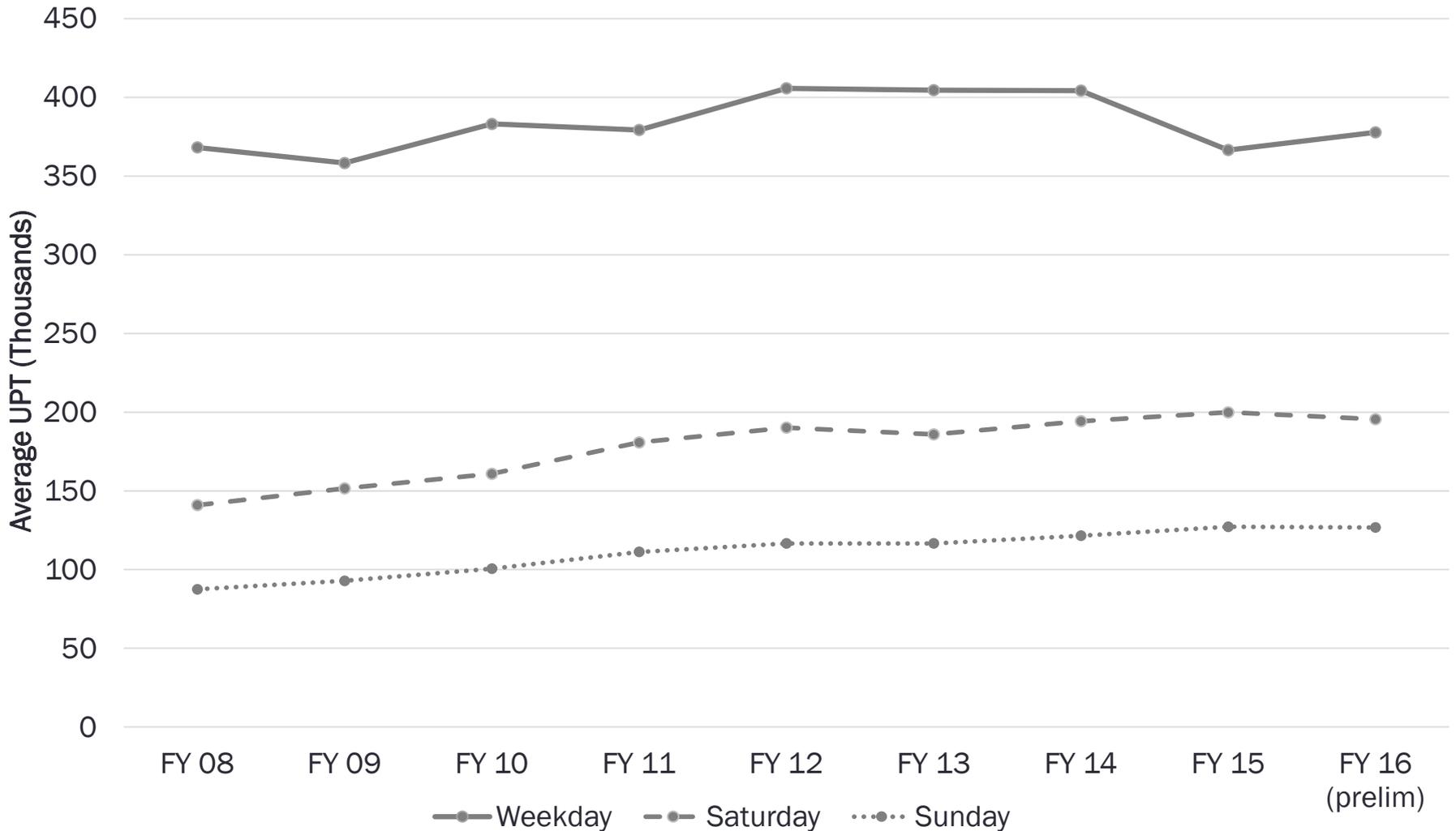
Source: NTD, MBTA AFC system w/ adjustments

Light Rail Average UPT by Day Type

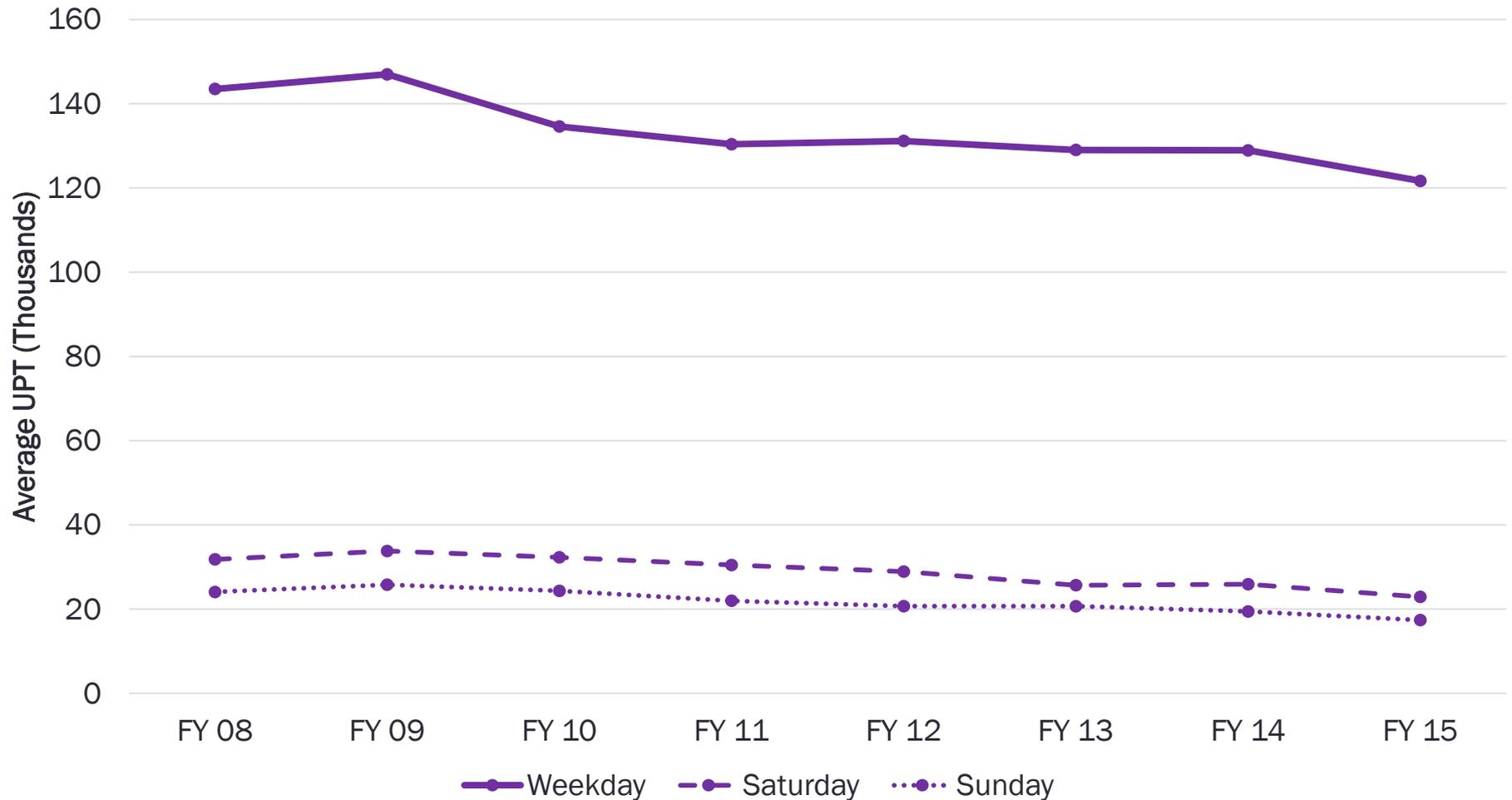


Source: NTD, MBTA AFC System w/ adjustments

Bus Average UPT by Day Type

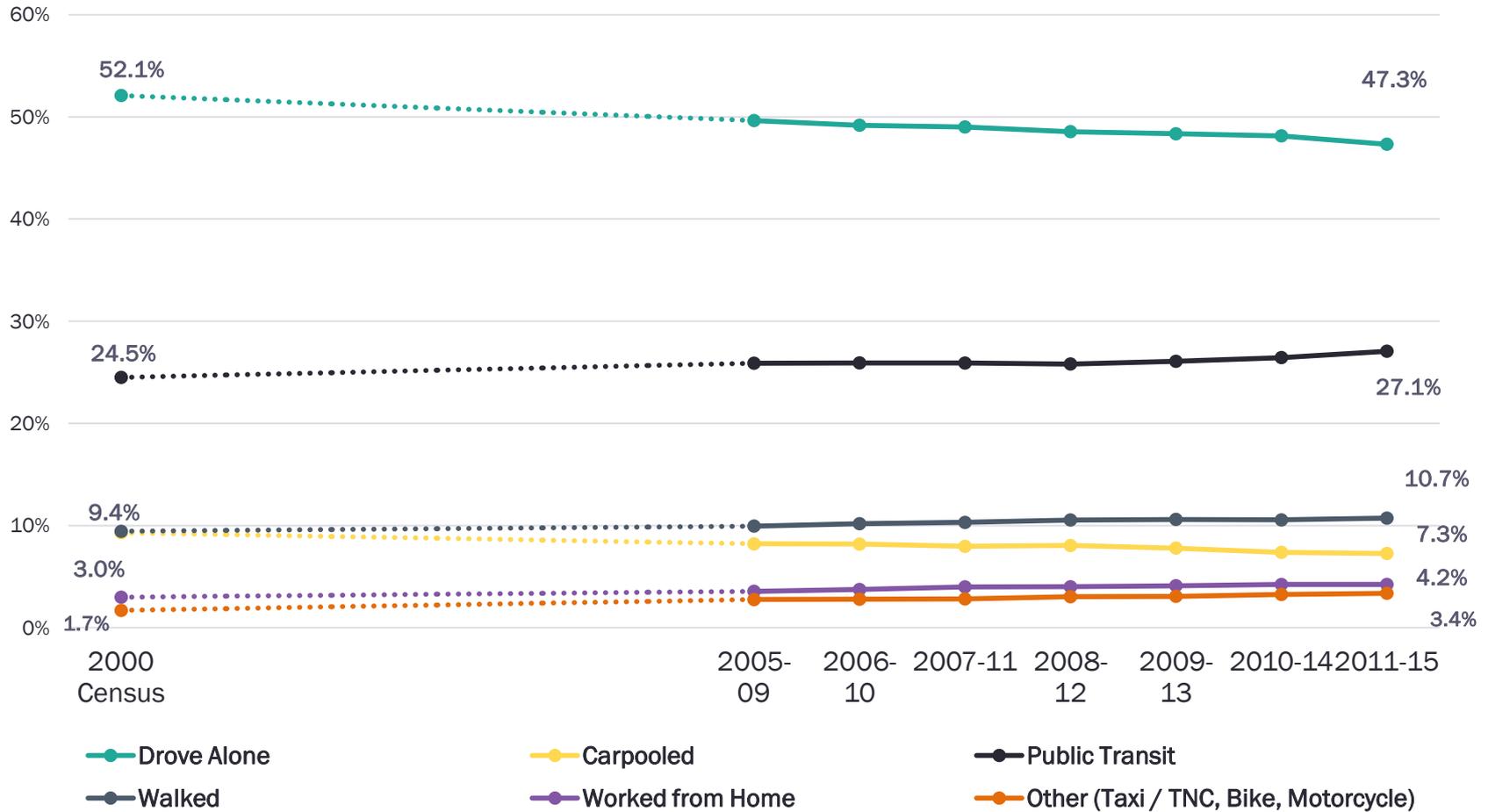


Commuter Rail Average UPT by Day Type



Source: NTD

Census Commute to Work Share



Source: US Census and American Community Survey, 17 inner core communities