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

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?

- Charlie system implemented
- Govt. Center closed
- Automated Passenger Counters on buses
- Late Night Service
- TNC adoption rate rises
- Winter 2015

Event Timeline:
- FY03: Base fare increase 25%
- FY05: Base fare increase 5%
- FY07: Base fare increase 7%
- FY09: Base fare increase 18%
- FY11: Base fare increase 5%
- FY13: Base fare increase 5%
- FY15: Base fare increase 7%

Categories:
- 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 applied
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

Average Sunday ridership all AFC modes

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 is total UPT as reported to NTD
Jobs = Average total employment for the 17 inner core cities and towns

Source: NTD, BLS, US Census
Commute trip mode share is outpacing population and job growth in the Boston region

Sources: US Census, Bureau of Labor Statistics Local Area Unemployment Statistics
Trends differ by mode

Total UPT by Mode

FY 08 FY 09 FY 10 FY 11 FY 12 FY 13 FY 14 FY 15

Commuter Rail
Demand Response (The RIDE)
Ferry
Heavy Rail
Light Rail
Bus

Government Center closure

Source: NTD, MBTA AFC system w/ adjustment for 2015 Bus (AFC = Automated Fare Collection)
Ridership by service hours differs by mode

Number of unlinked passenger trips per revenue vehicle hour

Fiscal Year


Commuter Rail Ferryboat Heavy Rail Light Rail All Bus Total Fixed Route

Government Center closure

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

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

Source: NTD
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