Massachusetts Bay Transportation Authority

Fare Collection Strategy – Green Line

Fiscal & Management Control Board

April 25, 2016

MBTA Fare payment - now and future

Current

Bus/Subway fares can only be enforced at point of entry to the system

No proof of payment required once in the system/onboard

Bus/surface light rail enforcement primarily by operators

No real time information about gate/box failure

Future with AFC 2.0

Payment required in advance with proof-of-payment onboard

All vehicles and stations beyond the gates would be paid areas

Fare enforcement team responsible for enforcement and inspections systemwide

Payment possible at all doors of buses and surface light rail

No cash payment onboard

Fare Evasion

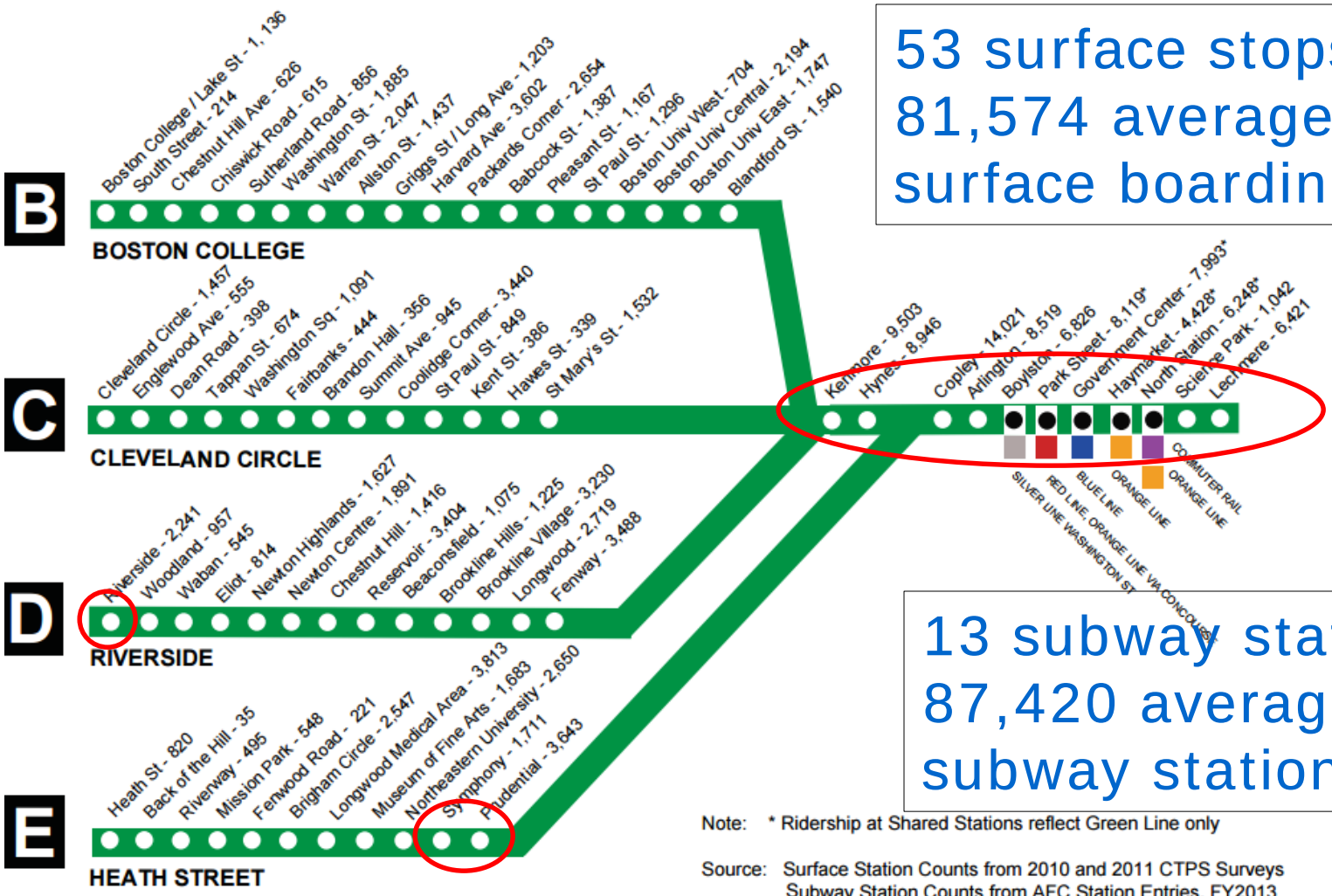
Mode	Timing	Approach	Estimated Value
Green Line Surface	Short Term	Policy	$1.3- $4.5M
Bus	Longer Term	AFC 1.5 AFC 2.0	$1.0 - $2.4M

Fare evasion happens on every mode, but scale and size differs by mode. All modes are under review.

Green Line Surface: Initial focus is on the surface portion of the Green Line. These lessons and techniques will be transferable to bus in near term

Station: Real-time gate failure notification system required to increase gate up-time –current system is based on visual inspection

Green Line Surface & Subway



53 surface stops
81,574 average weekday surface boardings

= gated stations

13 subway stations
87,420 average weekday subway station entries

Note: * Ridership at Shared Stations reflect Green Line only

Source: Surface Station Counts from 2010 and 2011 CTPS Surveys
Subway Station Counts from AFC Station Entries, FY2013

Green Line Surface Fare Payments

Current

Off Peak:

- Front door only via farebox.
- If all doors are used announcements ask rear-door boarders to use fare box

Peak:

- All door boarding
- Limited on board inspection
- Announcements encourage farebox use, but crowding limits ability

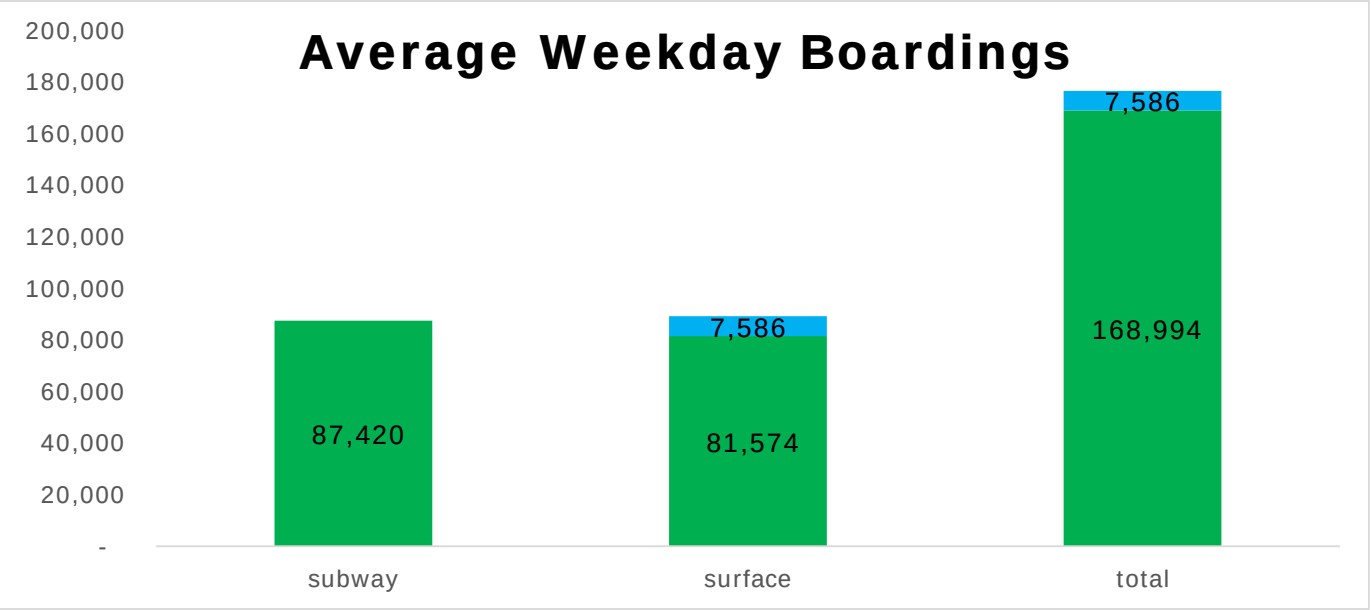
Recent Past

- Front-door-only Apr 2012 – Jul 2014.
- Revenue for Apr- Jun 2012 was 4% greater than same 2011 period.
- Trade offs: longer dwell times, more crowding, unhappier customers.
- Current policy adopted in response to public frustration.

GL Surface Boarding – 7 questions

1. What is scale of rear-door boarding?
2. Of these, how many have passes?
3. What is scale of revenue loss?
4. How can we inspect more at rear-doors?
5. What is cost to inspect more and ROI?
6. What trade-offs are acceptable to inspect more rear-door boarders?
7. How measure overall success?

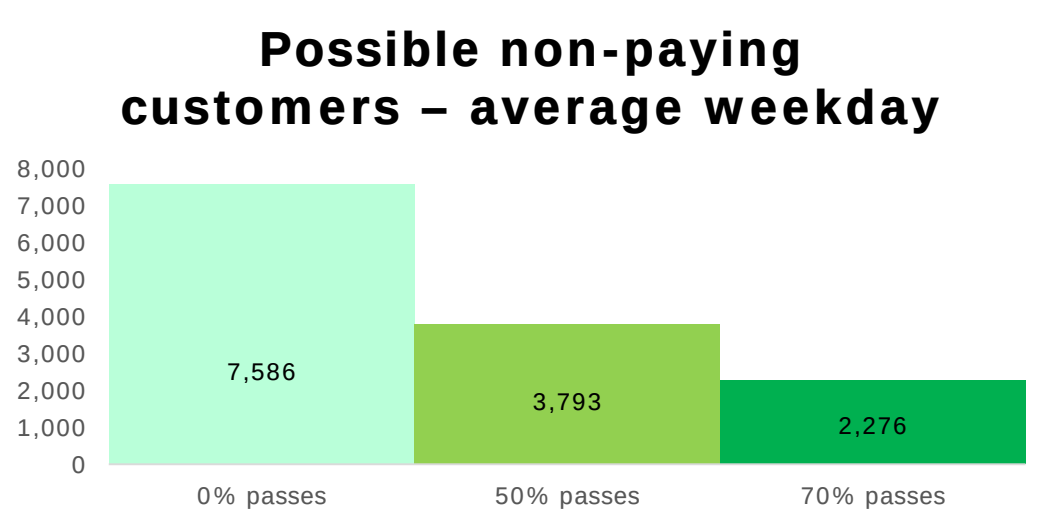
Q1. What is scale of rear-door boarding?



Just completed Non-Interaction study by CTPS estimates that about 9.3% of surface boardings take place via rear doors.

This is about 7,586 boardings on an average weekday

Q2. How many rear-door boarders have passes?

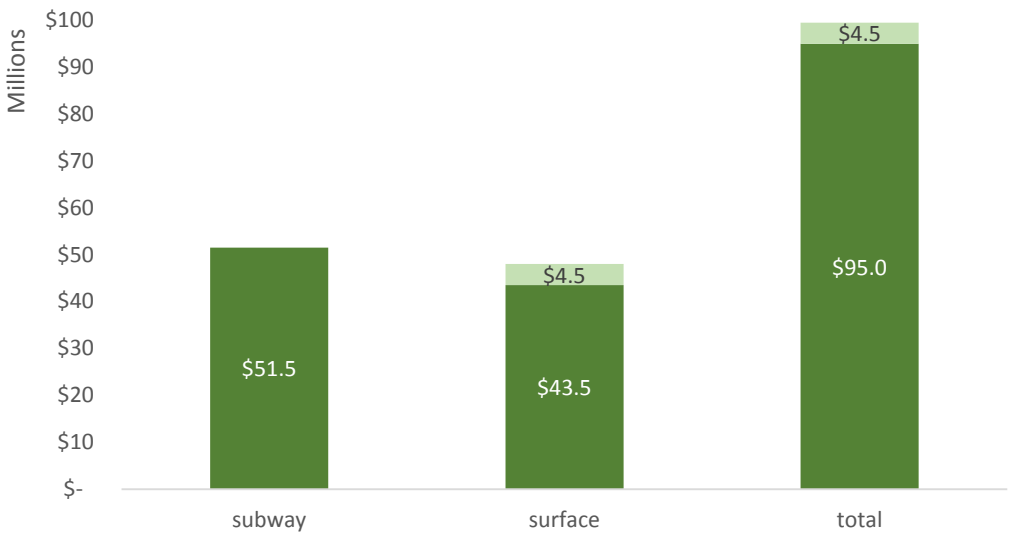


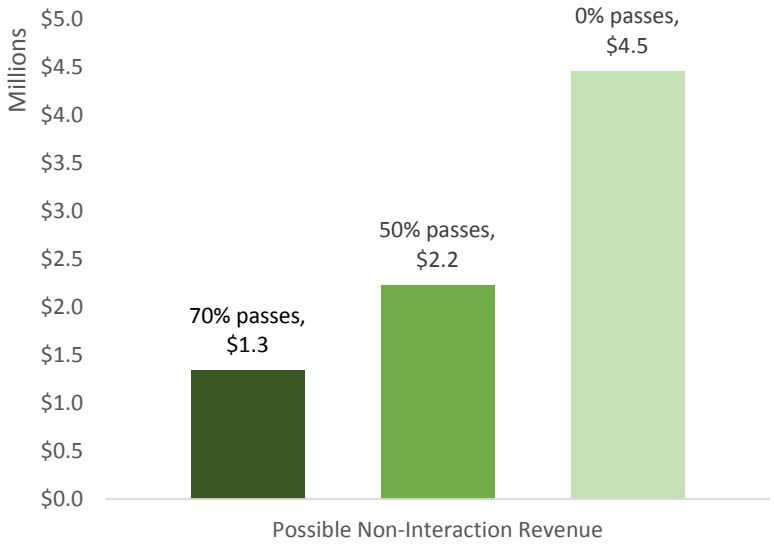
We have estimates based on surveys and observations:

2010 - 51% pass holder observation by CTPS
2014 - 56% pass holder observation by CTPS

We have a plan to firm these estimates up using technology and data.

Q3. What is scale of revenue loss?



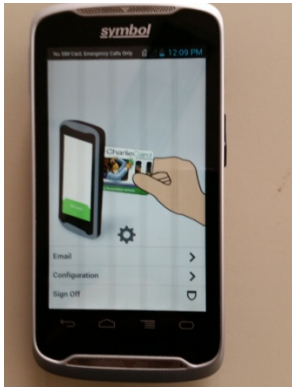


If we're missing 9.3% of surface revenue, the range of revenue loss is $1.3 - $4.5 million annually depending on the pass holder percentage.

Q4. How can we inspect more at rear doors?

Immediate & On-going

- Additional employees deployed with validators.
- Evasion audits in cooperation with Transit Police
- Special order & training blitzes for GL employees



Prototype next gen. handheld validator

Near Term

- New validators to firm up rear-door pass holder %
- Fare box downtime estimate

As part of AFC 2.0

- Rear door validators on vehicles
- On-board random inspection teams
- Real-time fare box status notification system

San Francisco rear-door mounted electronic validator

Q5. What is cost to inspect more & ROI?

On 11 days in Feb.& Mar. 2016, 15 employees at 12 different surface stations validated fares. 215 staffing hours costing $11,287 (all-in) were used.

Employees walked platforms inspecting all fares, not just rear-doors, and directing ticket-users to front doors.

20,835 fares were validated.
- 15,164 were passes (73%)
- 5,671 were stored value (27%)

$11,386 in stored value was deducted.

Some % of this probably would have been un-recouped.

An unknown number of ticket users were directed to use the front door of the train and the fare box.

Q5 cont. What is cost to staff surface stations?

52 surface platforms** → 1 employee per platform → 3 hours per day (6 – 9AM) → *156 staffing hours per day*

156 hours per day → 250 working days per year → *39,000 staffing hours per year*

39,000 hours per year → $52.50/ hour*** → *$2,047,500 annual wage cost*

* Assuming sufficient validator numbers
** 53 total stations less Riverside which is already gated
*** Assuming use of L589 employees on straight time. Loaded cost. We also can price out hiring a private company to provide this service for a pilot

Q6. What trade-offs are acceptable?

Besides staffing, other options would encourage greater AFC interaction and revenue collection. These come with trade-offs.

Riverside Station fare gates.
Photo by @milesonthembta

Additional fare gates at D Branch stations

- Unknown expense or ROI.
- Extensive community outreach effort required
- Not suitable for all D stations, or other branches

Return to Front-door-only boarding

- Increased customer frustration
- Increased dwell time
- Decreased through-put
- Rear-doors still used – diminished potential.

Front door only boarding

Q7. How measure success?

1. Drive fare revenue and generate a positive ROI on the labor spend to staff stations

2. Develop a definitive estimate of revenue loss from rear-door boardings without passes

3. Equal number of stored value cards validated on AM peak surface as in PM peak subway each day - proving we inspect stored value customers each way.

4. Improve our paying customers experience by demonstrating that the MBTA is serious about collecting fares from all riders

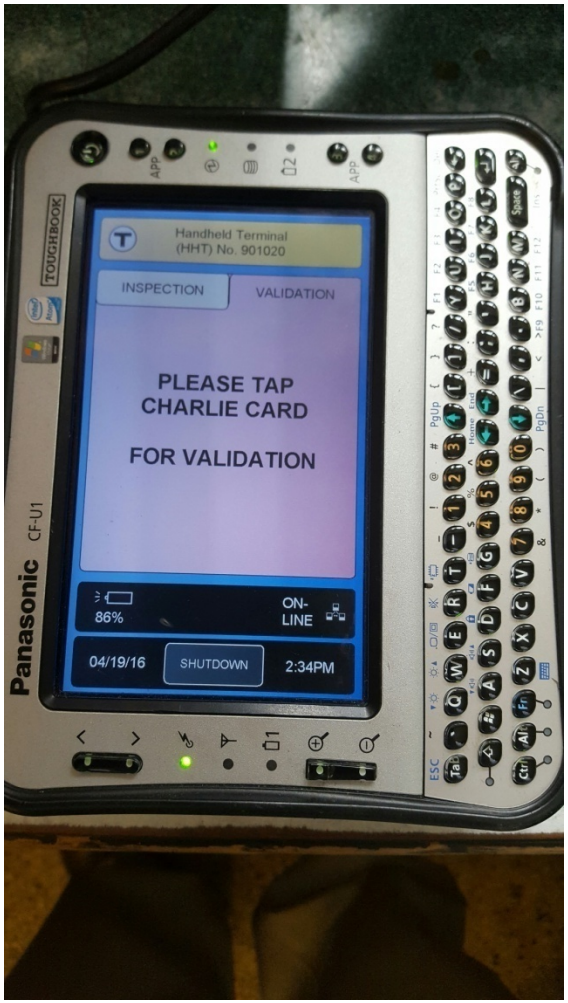
Next Steps

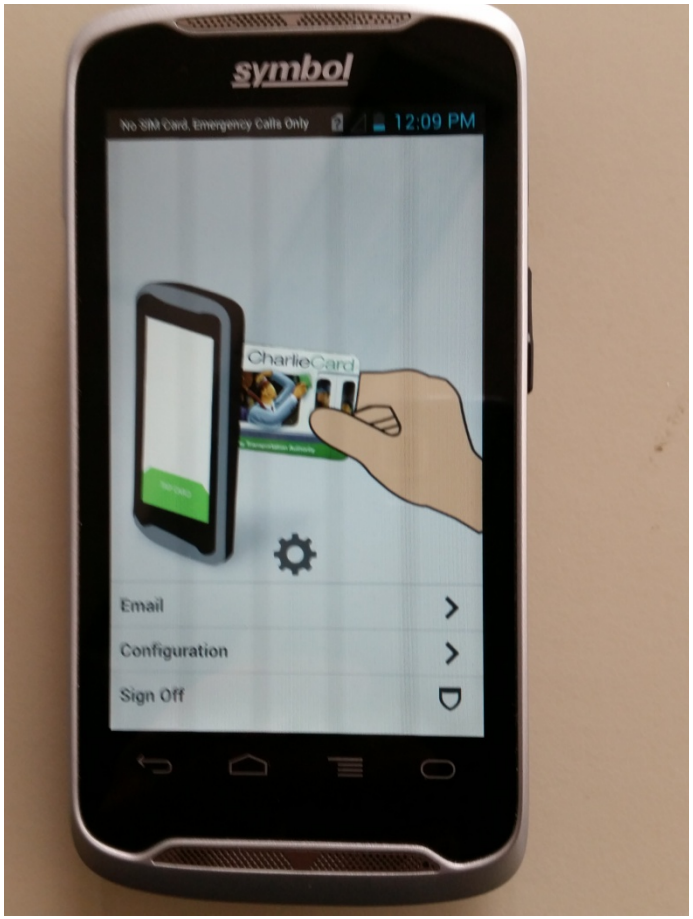
Given that the limitations of existing system make 100% surface collection difficult without significant CAPX and/or OPX investment and/or service disruptions:

- Do not revert to front-door-only-at-peak. History suggests that impacts on customers outweigh the benefits of additional revenue.
- Using new validators, study is underway to determine percentage of rear-door boarders with and without passes.
- Investigation underway to launch an 8-week pilot to staff every surface platform during AM peak to validate every fare, either with T employees or a 3rd party for labor.
- Do advance 2.0 quickly

Appendix

Hand-held validators: Old Vs. New





GL Surface rate compared

TABLE 1
Reported Fare Evasion Rates on Services
Using a Proof-of-Payment Fare Verification Method, as of 2002, 2012

Agency	Mode	Evasion Rate (Percentage)
Niagara Frontier Transportation Authority, Buffalo, NY	Light Rail	< 2.0
Dallas Area Rapid Transit	Light Rail	2.6
Dallas Area Rapid Transit	Commuter Rail	4.3
L.A. County Metropolitan Transportation Authority	Bus Rapid Transit	0.8
L.A. County Metropolitan Transportation Authority	Light Rail	0.8
L.A. County Metropolitan Transportation Authority	Heavy Rail	0.8
Metro Transit, Minneapolis-St Paul, MN	Light Rail	0.7
Metro Transit, Minneapolis-St Paul, MN	Commuter Rail	0.1
MTA NYCT, New York City	Bus Rapid Transit	6.1
Metro Light Rail, Phoenix, AZ	Light Rail	4.0–6.0
Bi-State Transportation Commission, St. Louis, MO	Light Rail	2.0
MTA, Baltimore, MD	Light Rail	0.5
NJ Transit, Northern New Jersey	Light Rail	1.0–2.0
Regional Transportation District, Denver, CO	Light Rail	2.0
Regional Transportation District, Sacramento, CA	Light Rail	2.0
San Diego Trolley, San Diego, CA	Light Rail	6.0
Southern California Regional Rail Auth., Los Angeles, CA	Commuter Rail	1.5–3.5
Santa Clara Valley Transportation Authority	Light Rail	1.8
Sound Transit, Seattle, WA	Light Rail	0.3
Tri-Rail, Miami, FL	Commuter Rail	2.0

Sources: TCRP Report 80 (2002). TCRP Synthesis 96 (2012).