SERVICE DELIVERY POLICY WORKSHOP

October 20, 2016

Office of Performance Management and Innovation,

Planning and Scheduling Department, Office of Transportation Planning

Agenda

- Context
  - Framework for service planning, the bus network
- Process
  - Current process, proposed process
- Measures
  - Proposed Service Delivery Policy
- Trade-Offs
  - Examples of trade-offs
- Next Steps
  - FMCB approval of proposed process, Service Delivery Policy, and trade-offs

CONTEXT

Overview

- The goal of the service delivery process is to produce measurable improvements for MBTA customers in a timely manner

- Today's presentation/discussion outlines staff recommendations for moving forward to improve service delivery

- The recommended process focuses on the bus network
  - Service planning for rapid transit will be based on the line-by-line capacity planning work already underway

7 steps for service improvements

1. Define and prioritize **the problems and tradeoffs**
2. Set **measures** to evaluate key attributes
3. Do baseline **analysis** of how current service performs
4. Set **targets** (short-term and aspirational)
5. Determine **tactical tools** to use to improve service
6. **Implement** service and other changes
7. **Evaluate** progress toward achieving targets

Service Delivery Policy

Tracker & Strategic Plan

Tactical toolbox for bus service improvements

Operational Changes
- All door boarding and faster fare collection
- Improved dispatching tools and procedures

Partnerships with municipalities
- Bus lanes
- Signal priority and queue jumps

Private sector partnerships

Capital Projects
- Fleet facilities
- Additional buses

Service Changes
- Routes alignment and stop spacing
- Frequency and span changes

Pilots are one method to test different tactics

Data

- We have a lot of data:
  - Surveys, ridership statistics, reliability performance, crowding models, demographics, etc.
- Our proposed measures are based on the best available data
- Our data is limited by availability and data quality
- We use models to measure passenger experience
- We shouldn't limit our problem definition by where we have data

1 Context

The Bus Network

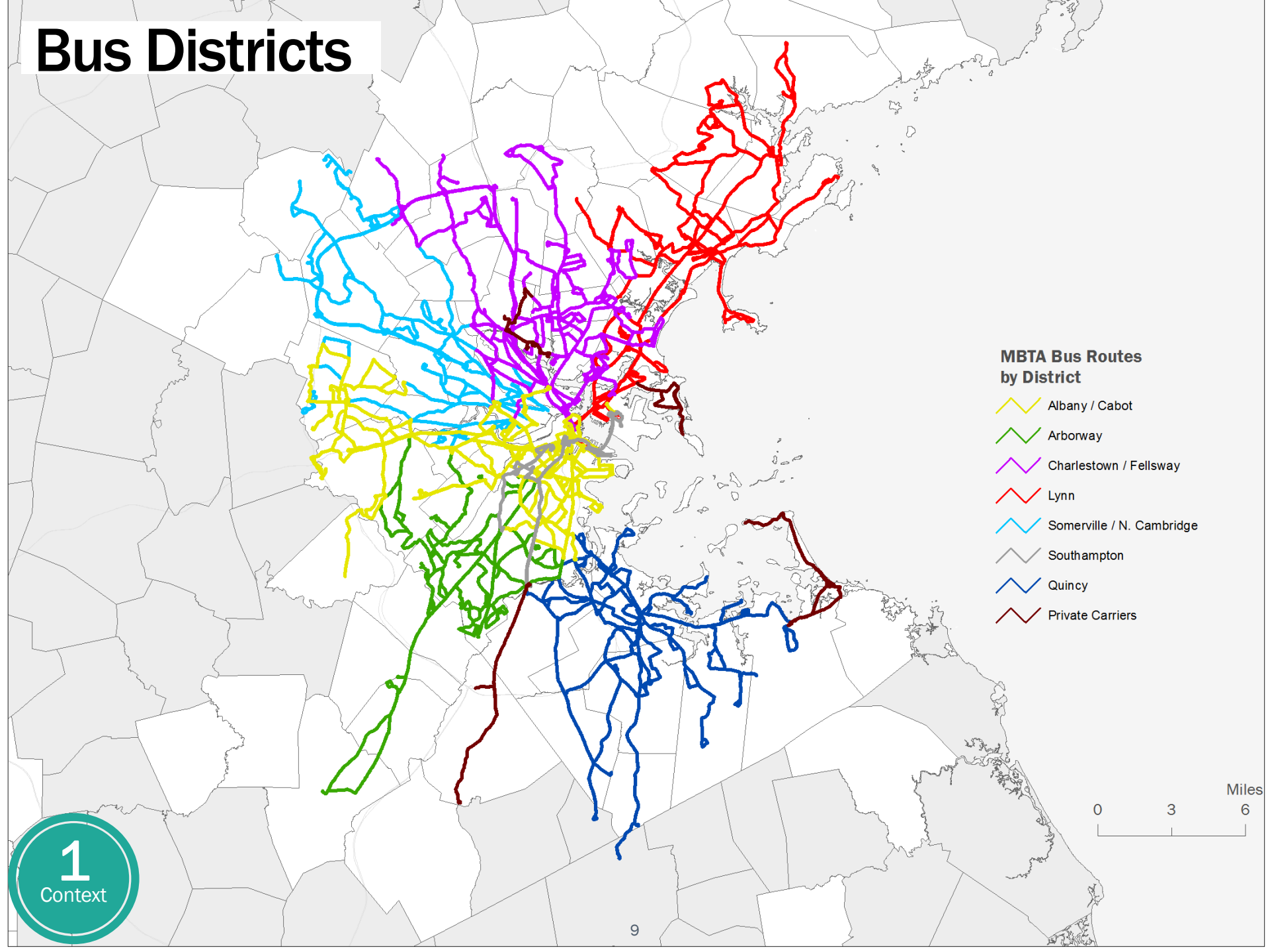
- 175 directly-operated routes, 5 contracted-bus routes
- 446,700 daily riders
- Approximately half of all bus trips include a transfer
- Types of bus routes
  - Local bus routes with full weekday service
  - Key bus routes with longer span and higher frequency (19 routes)
  - Commuter bus route with limited peak-direction trips, includes express bus routes with limited stops

Type	Percent of Routes	Total Weekly Ridership	Percent of Bus Ridership
Local Bus	73%	1,362,756	55%
Key Bus	11%	1,029,512	42%
Commuter Bus	24%	68,014	3%

1 Context

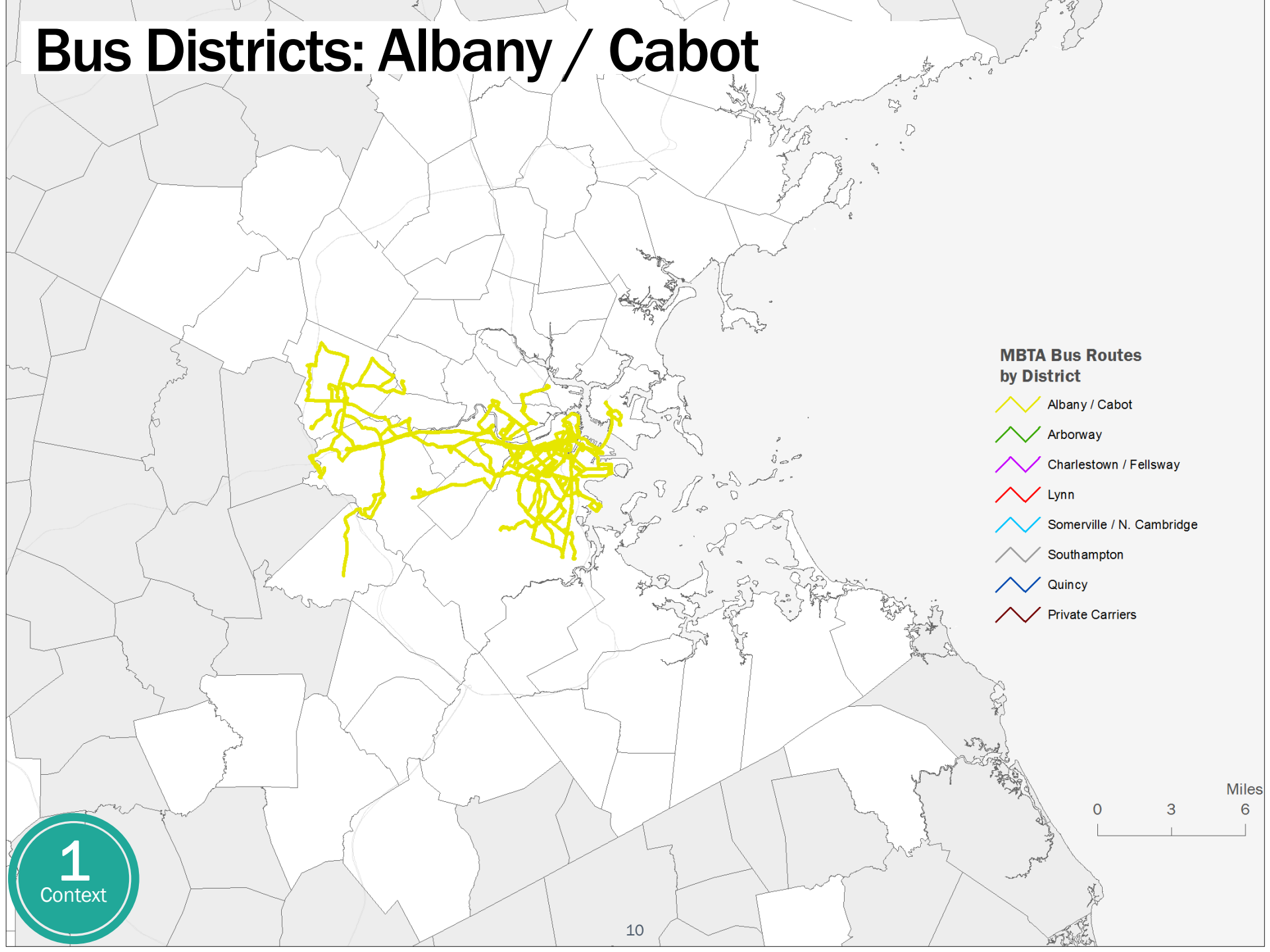
Service organized into 7 bus districts

Bus Districts



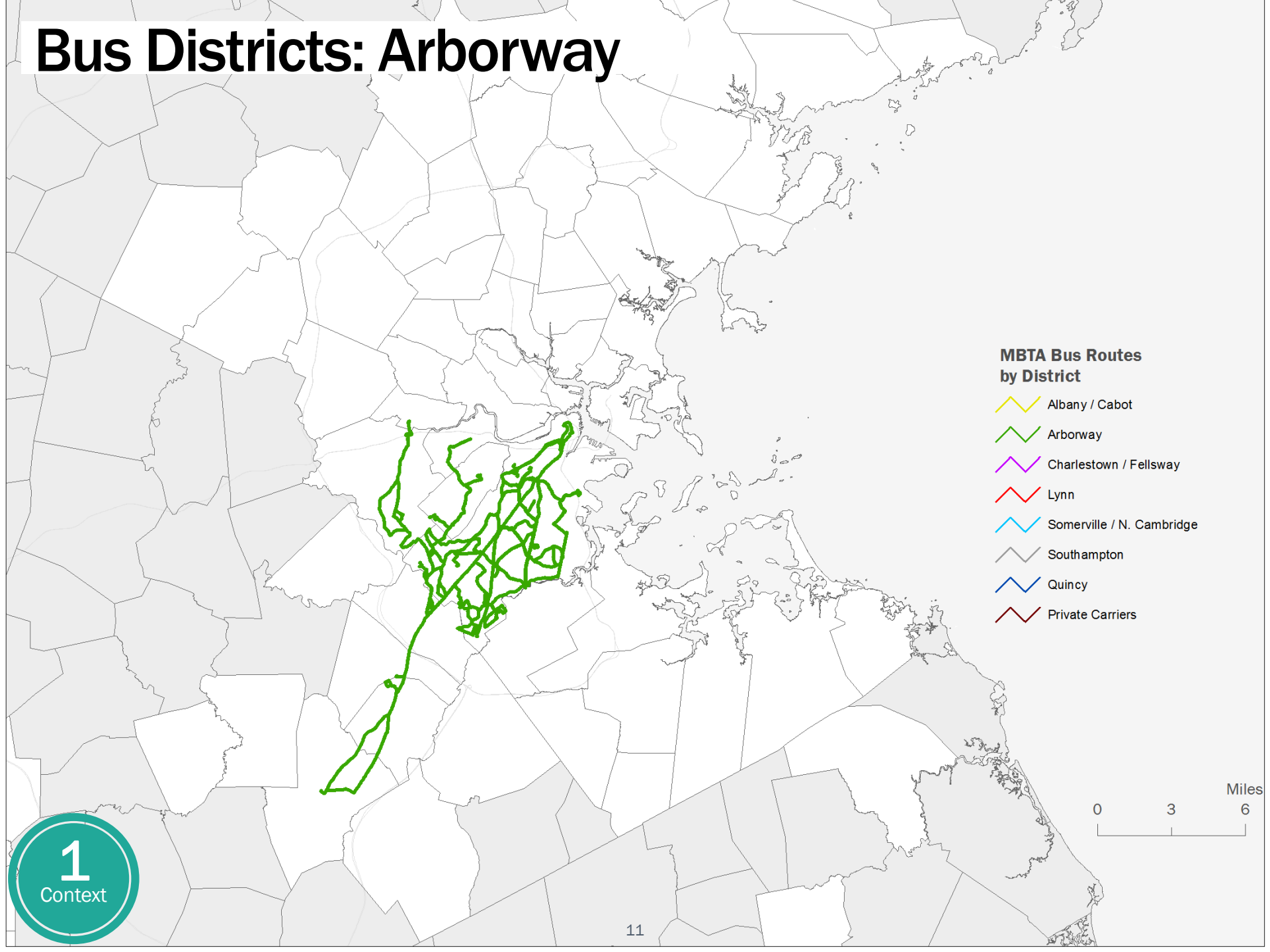
1
Context

Bus Districts: Albany / Cabot



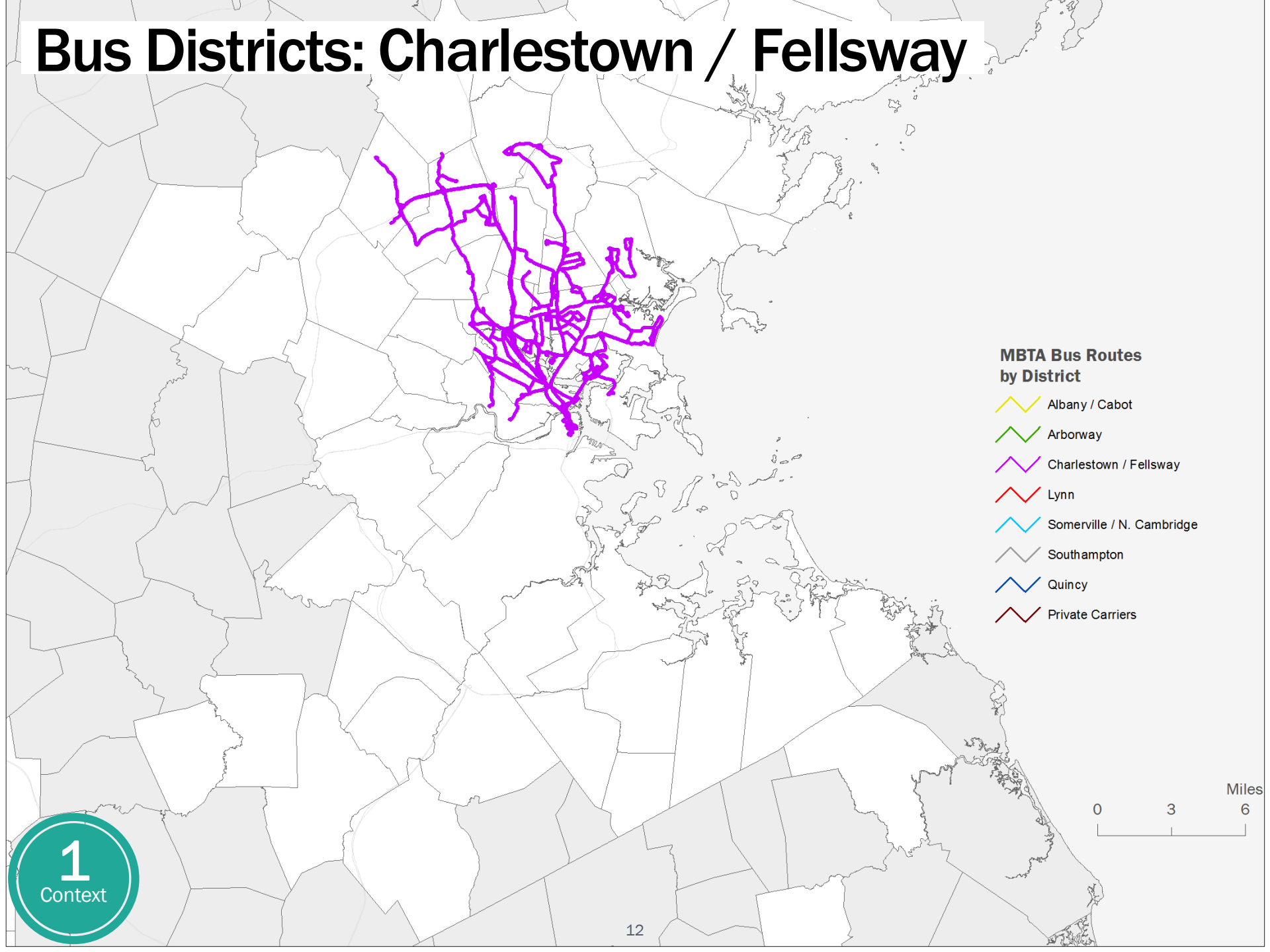
1
Context

Bus Districts: Arborway



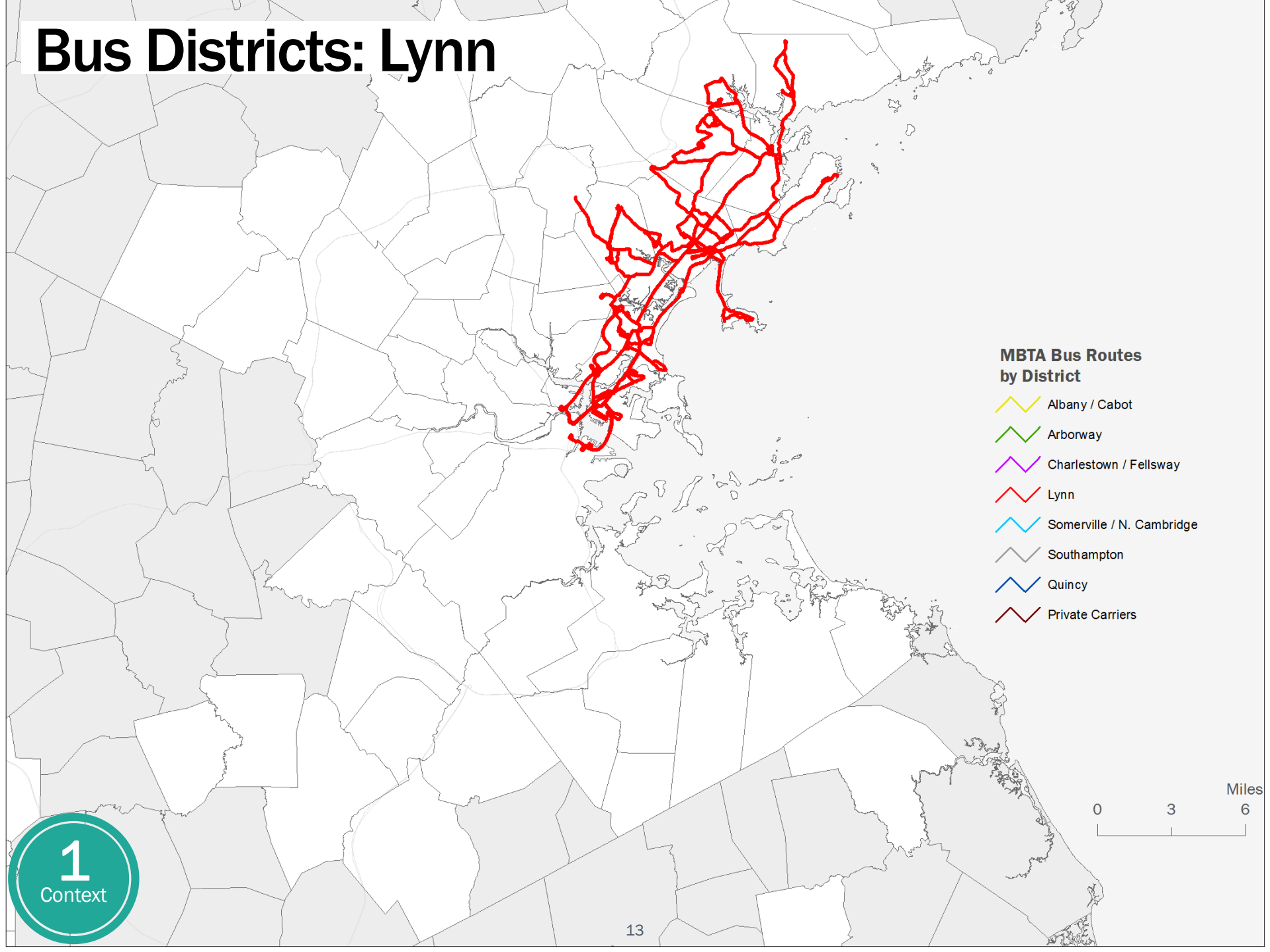
1
Context

Bus Districts: Charlestown / Fellsway



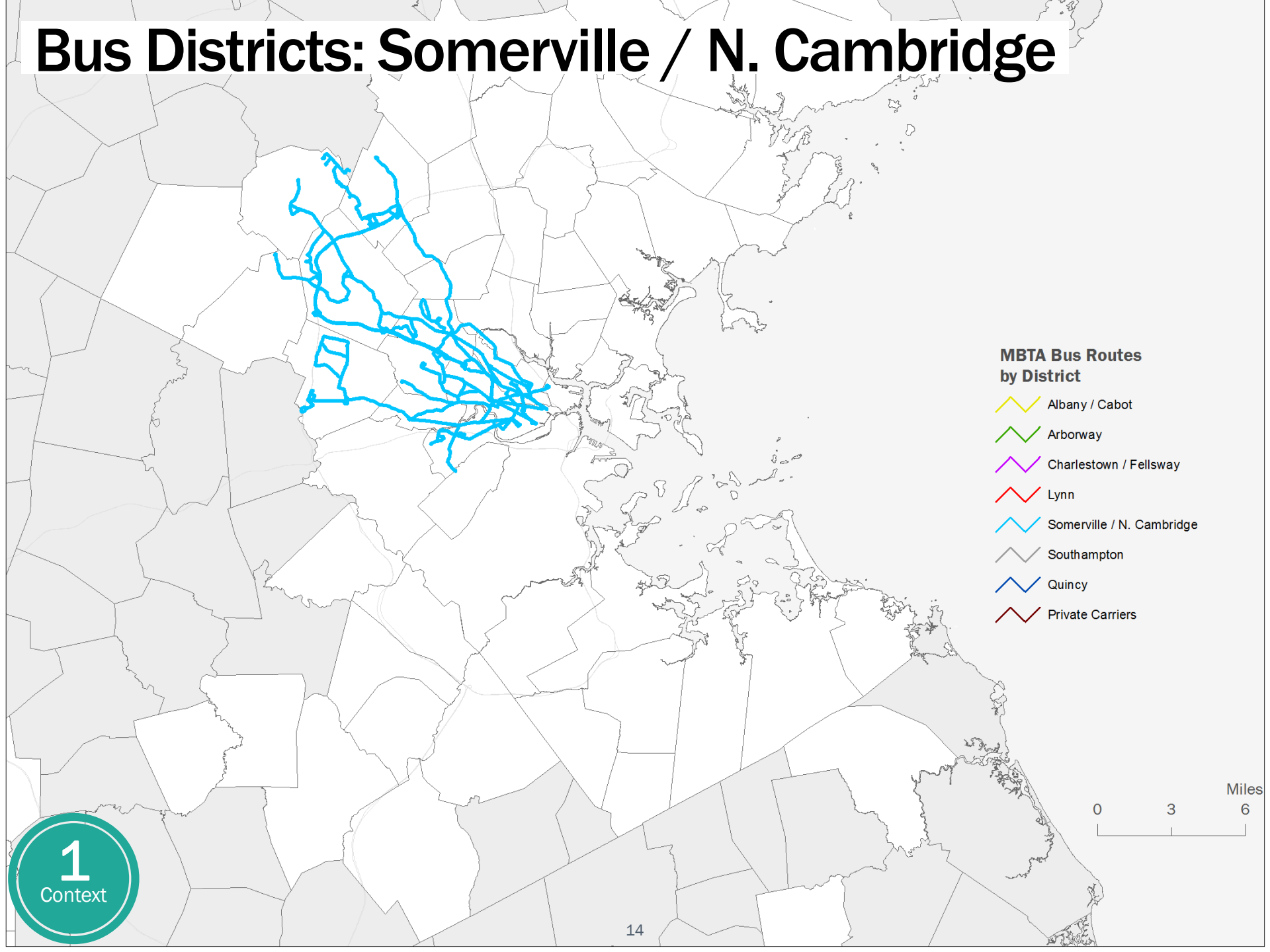
1
Context

Bus Districts: Lynn



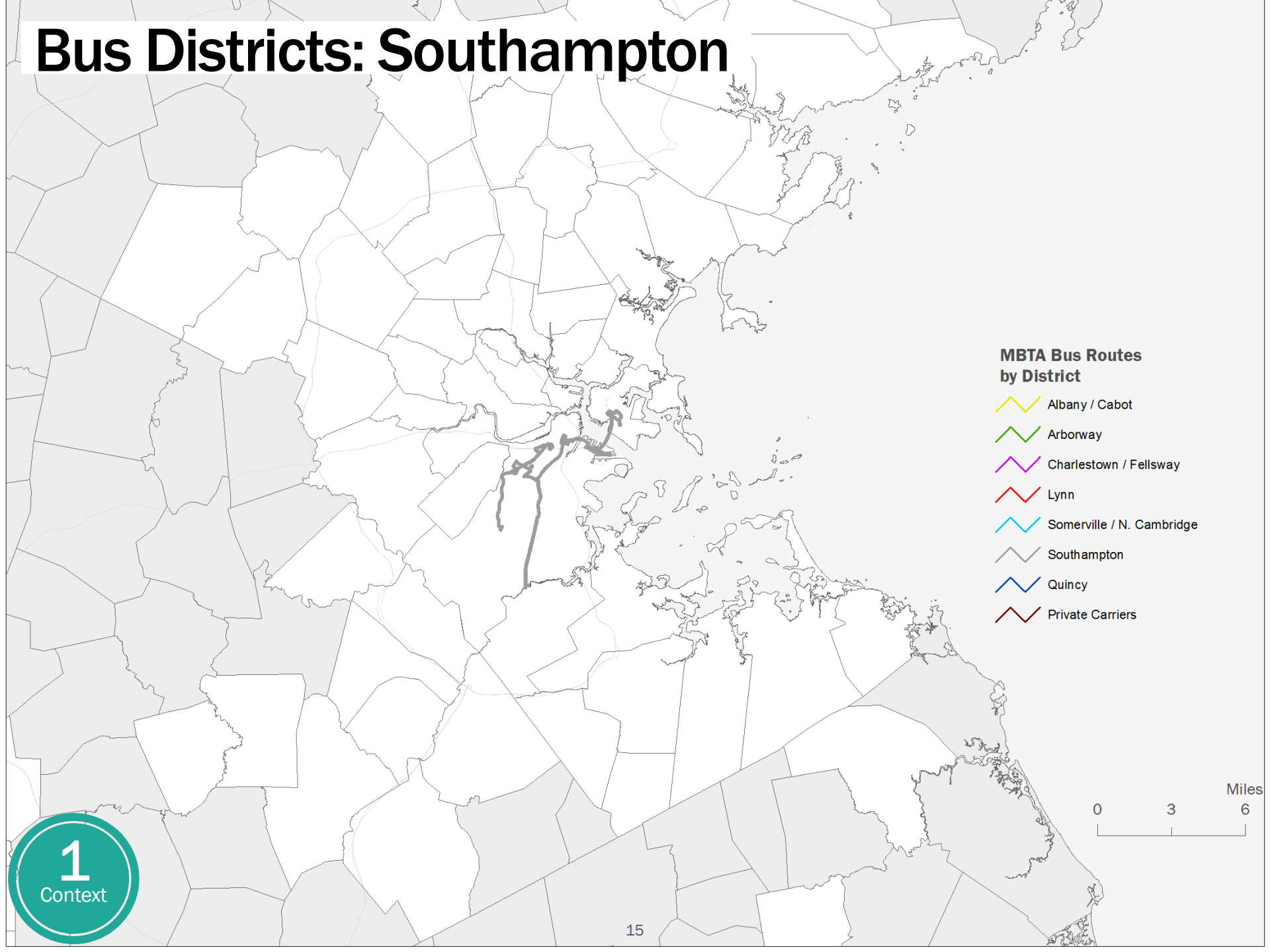
1
Context

Bus Districts: Somerville / N. Cambridge



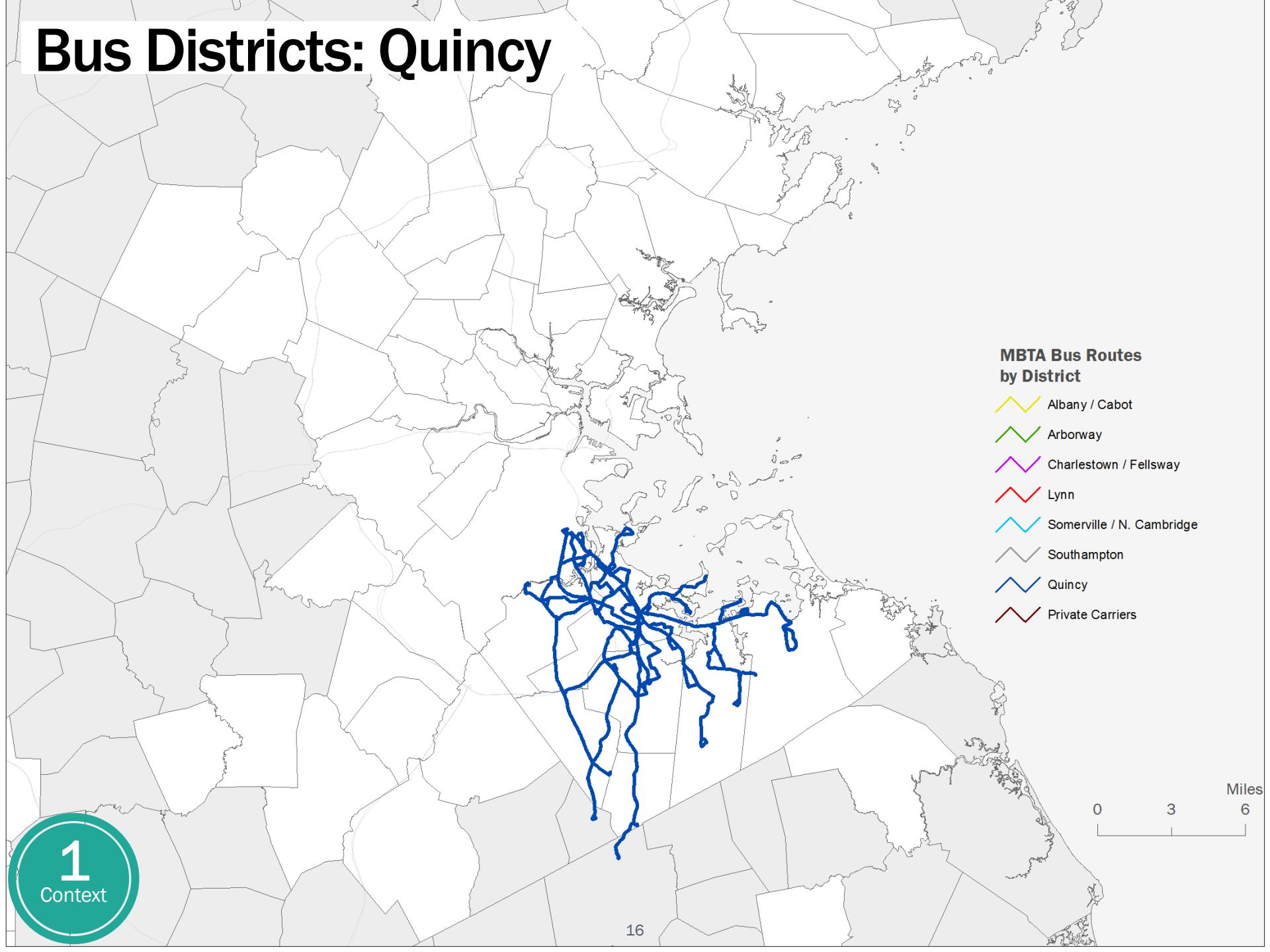
1
Context

Bus Districts: Southampton



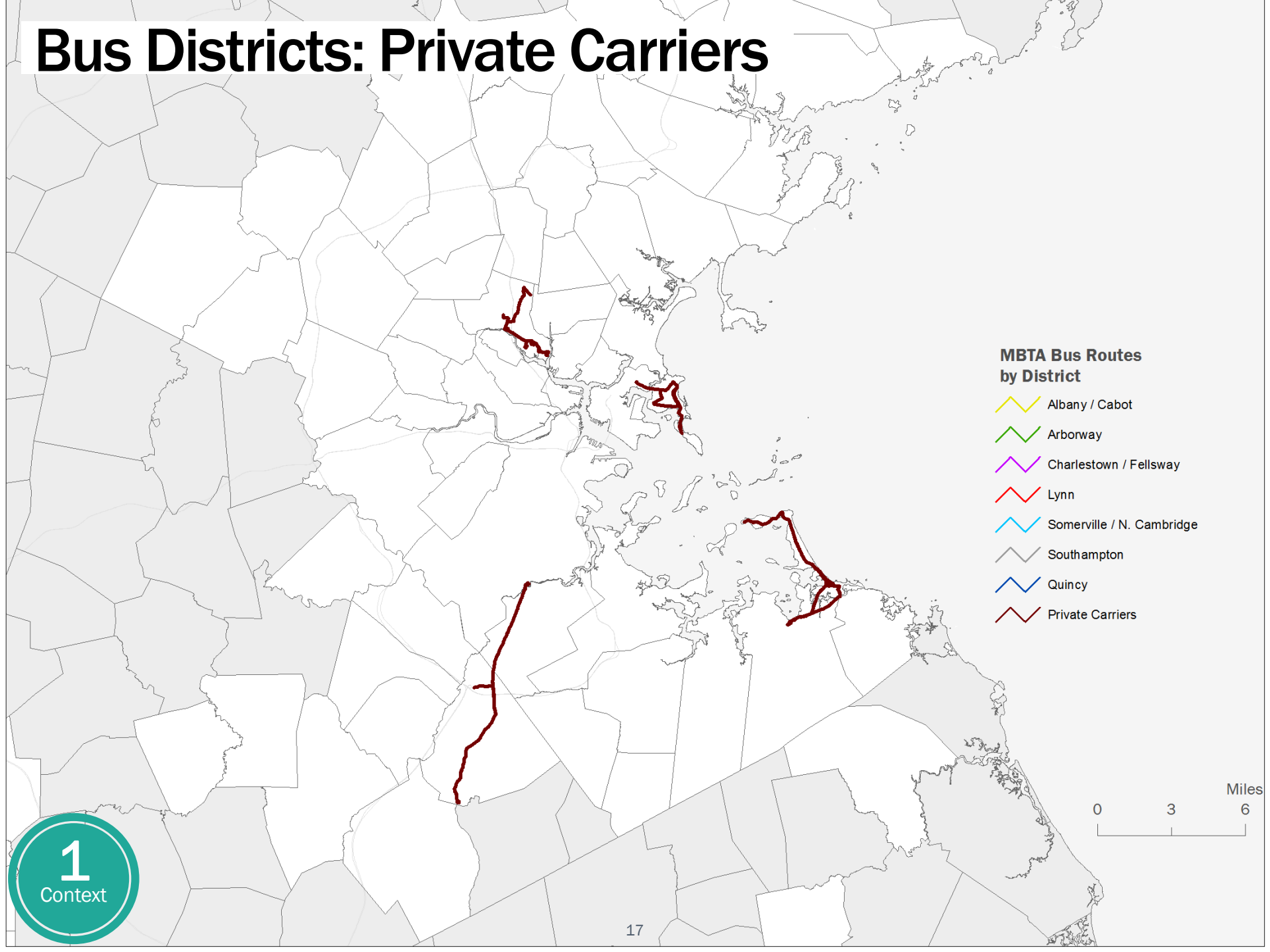
1
Context

Bus Districts: Quincy



1
Context

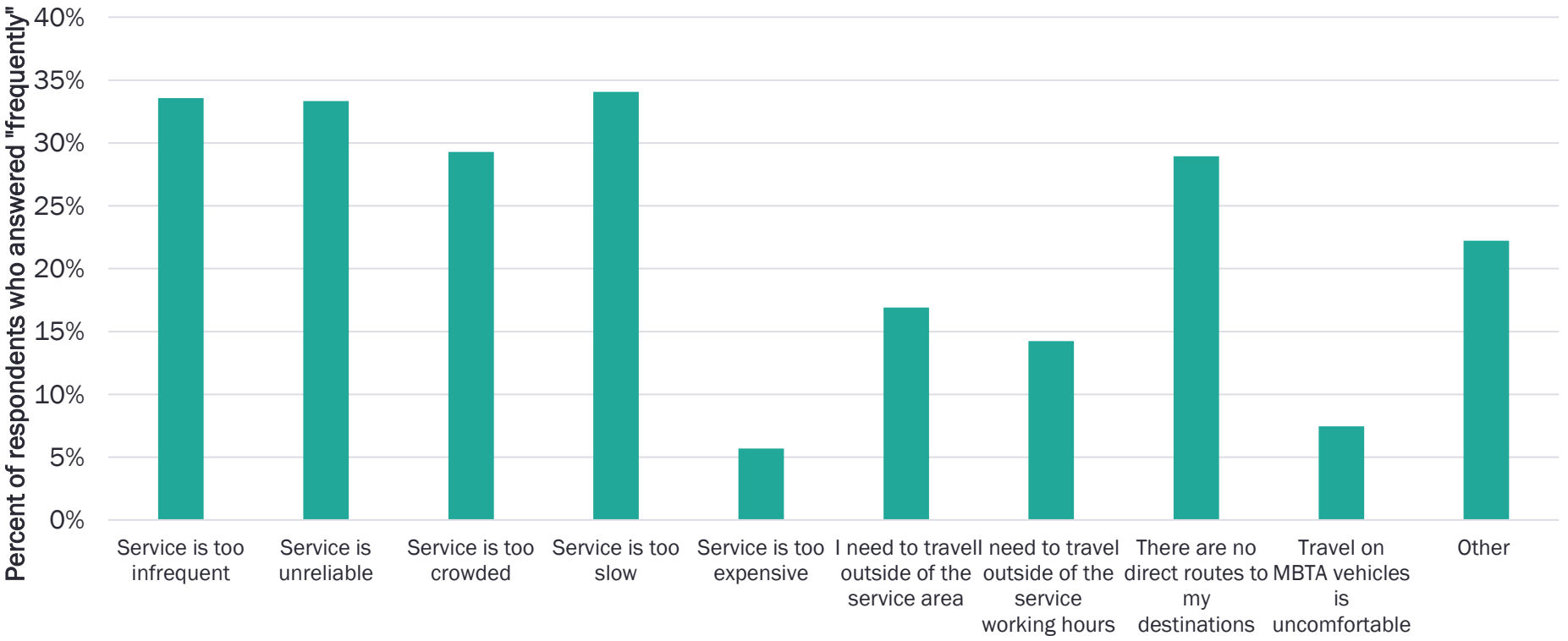
Bus Districts: Private Carriers



1
Context

Survey Results

Factors that “frequently” prevent bus riders from using the MBTA



Source: Service Standards Survey, July 2015; Total responses 6027

1 Context

massDOT Massachusetts Department of Transportation

PROCESS

Current Service Planning Process

- Quarterly changes
  - Focus on bus, heavy rail, and light rail
  - Scope: Schedule updates; individual stop adjustments
  - No “major service changes”
  - Within existing budget and fleet
- Biennial Service Plan
  - Focus on bus
  - Scope: Reallocation of resources between routes; re-routing; corridor- or route-level stop consolidation
  - Individual or collective changes may be defined as “major service changes”
  - Historically has assumed the existing operating budget and fleet
  - The last Service Plan was conducted in 2008

2 Process

Proposed Service Planning Process

"Rolling" District-Level Bus Service Planning

- Replace static biennial process with a constant process that addresses bus districts on a rolling basis
- First district process would take approximately 1 year
- Afterward complete 2-3 districts annually so all service revisited every 3 years
- Process includes a Schedule Rebuild and Service Plan for each district
  - Schedule rebuild updates all running times, matches frequency and span to demand, and addresses crowding
  - Service Plan modifies routes and coverage to reflect travel patterns and improves service using all the tactics in the toolkit

2 Process

Proposed Service Planning Process

"Rolling" District-Level Process

Start with one district…

- Schedule Rebuild – 6 months to implement
  - Analyze data to update run times for every route-variant-direction combination
  - Build garage-level vehicle schedule for all routes
  - Develop a garage-level operator schedule for all routes
  - Operator pick process
  - Prepare rating for operations
  - Day of service delivery
- Service Plan – 6 months to implement
  - Analyze data to change routing, frequencies, or span
  - Public process to collect input
  - Build garage-level vehicle schedule for all routes
  - Develop a garage-level operator schedule for all routes
  - Operator pick process
  - Public process to present the plan
  - Prepare rating for operations
  - Day of service delivery

2 Process

massDOT Massachusetts Department of Transportation

Proposed Service Planning Process

Network Optimization

- Priorities and key measures for optimizing network determined as part of the Strategic Plan
  - How to measure future demand
  - Where we need to add capacity
  - How should we measure connectivity
- Modify network and coverage to reflect travel patterns
  - Analyze regional origins and destinations and future development
- Planning for all modes in the network
  - Improve reliability and capacity through infrastructure investments on subway and light rail
  - Evaluate commuter rail schedules and coverage and pros/cons of “commuter” vs “regional” rail

2 Process


3639
HYUNDAI PRESENTS
BOSTON MARATHON JIMMY FUND WALK
REGISTER TODAY
The Jimmy Fund
SEPTEMBER 25
HYUNDAI
BOSTON MARATHON JIMMY FUND WALK
REGISTER TODAY
SUNDAY, SEPTEMBER 25

MEASURES

Policy Framework

Service Delivery Policy addresses service availability, service quality, and service planning measures

Service availability measures

1. Coverage
2. Minimum Frequency
3. Minimum Span of Service

} Route

4. Accessible } Network

Service quality measures

5. Reliable
6. Comfortable

} Route

7. Safety
8. Communication

} Network

Service planning measures

9. Cost-efficiency } Route

10. Capacity
11. Connectivity

} Network

Should we have an equity measure?

Proposal is to focus on the six route level measures for rolling service planning

Policy Development Process

Collaborative process between MBTA, MassDOT, CTPS and stakeholders since early 2015

- Policy Advisory Committee of internal and external stakeholders met 4 times to draft objectives and review measures
- Technical Advisory Committee met 7 times to determine measures based on best available data
- Online survey with over 6000 responses
- 10 workshops with community organizations

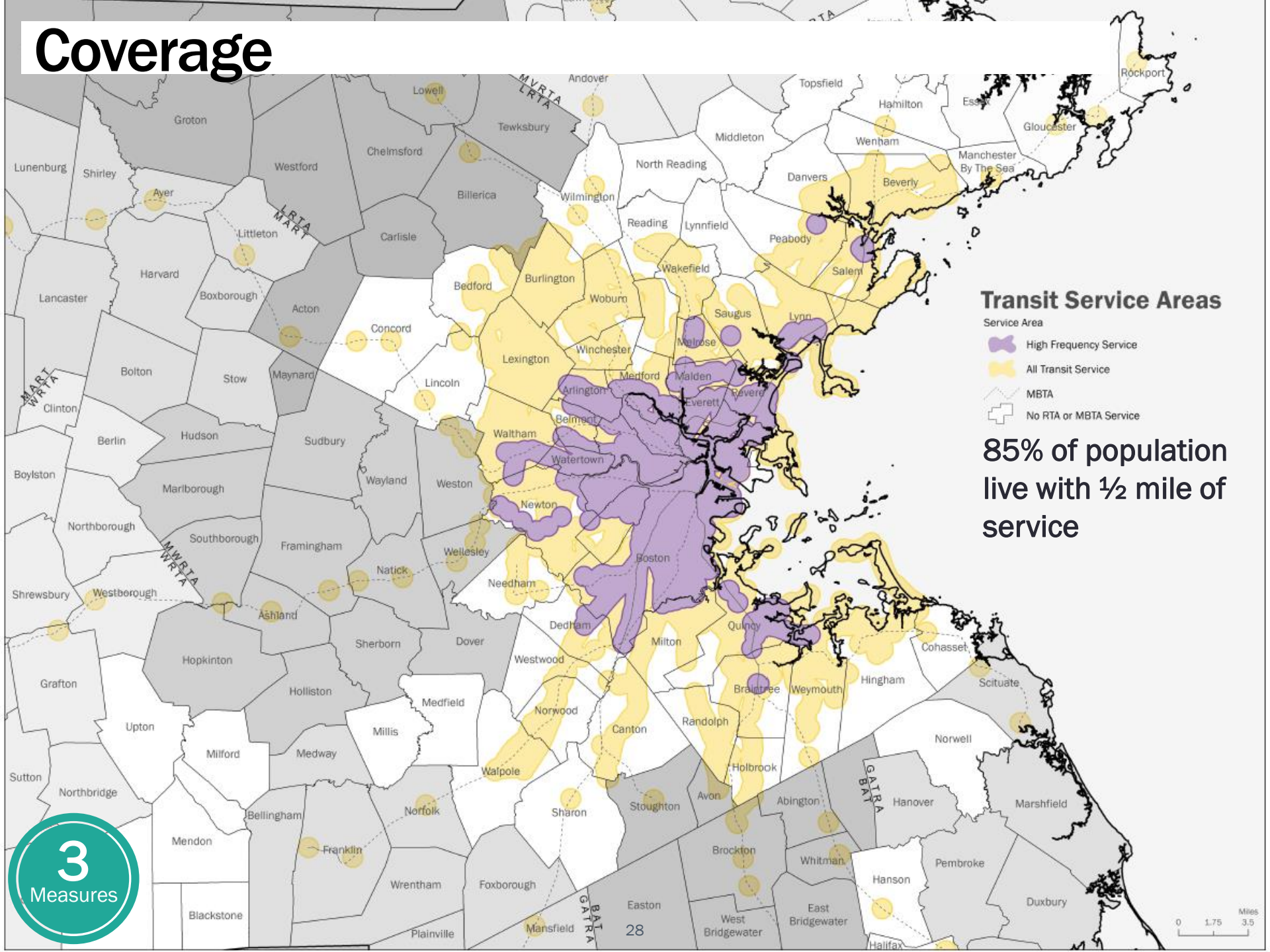
Proposed Service Availability Measures

1. Coverage
   - Base: Percent of the population that lives no more than 0.5 miles from a transit stop
   - Frequent Service: Percent of the population that lives no more than 0.5 miles from high-frequency service (defined as a minimum 15-minute headway on weekdays and 20-minute headway on weekends) and in census block groups with densities greater than 7,000 people/sq. mile.
   - Low-Income: Percent of low-income households that are no more than 0.5 miles from a transit stop

No proposed target for coverage

3 Measures

Coverage



3 Measures

Proposed Service Availability Measures

2. Minimum Frequency
   - Measures are established by mode and time of day to set the minimum number of trips that the MBTA should run.
3. Minimum Span of Service
   - Measures are established by mode and day of the week to set the minimum hours during which service should be available.

- Minimums set the floor of service that the MBTA should be providing, service can go above to meet demand
- Constraints often prevent the MBTA from meeting these minimum thresholds
- The RIDE availability is based on the span of service and coverage of the fixed route service

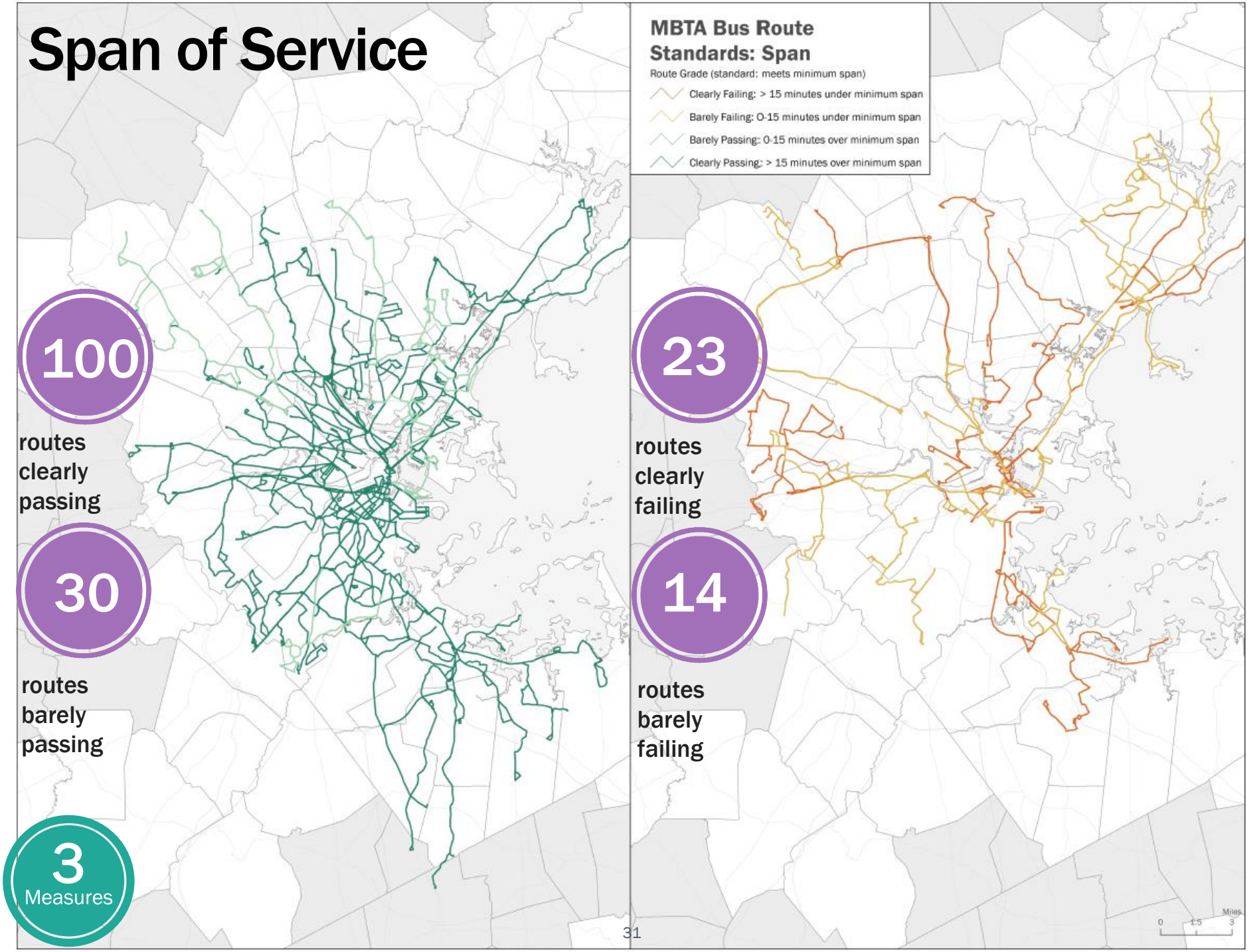
Minimum Span of Service

Proposed in draft Service Delivery Policy

Mode	Day	Minimum Span of Service
Bus		
Local	Weekday	7:00 AM – 7:00 PM
	Saturday[1]	8:00 AM – 6:30 PM
	Sunday[1]	10:00 AM – 6:30 PM
Community	Weekday	10:00 AM – 4:00 PM
Commuter	Weekday	7:00 – 9:00 AM and 4:00 – 6:30 PM
Supplemental	Weekday	No minimum span
Key Bus Routes	Weekday	6:00 AM – midnight
	Saturday	6:00 AM – midnight
	Sunday	7:00 AM – midnight
Heavy Rail	Weekday	6:00 AM – midnight
	Saturday	6:00 AM – midnight
	Sunday	7:00 AM – midnight
Light Rail	Weekday	6:00 AM – midnight
	Saturday	6:00 AM – midnight
	Sunday	7:00 AM – midnight
Commuter Rail	Weekday	7:00 AM – 10:00 PM
	Saturday	8:00 AM – 6:30 PM
Boat	Weekday	7:00 AM – 10:00 PM
	Saturday	8:00 AM – 6:30 PM

1 *This is a guideline for high-density areas. There is no minimum span for low-density areas on weekends.*

Span of Service



100 routes clearly passing

30 routes barely passing

23 routes clearly failing

14 routes barely failing

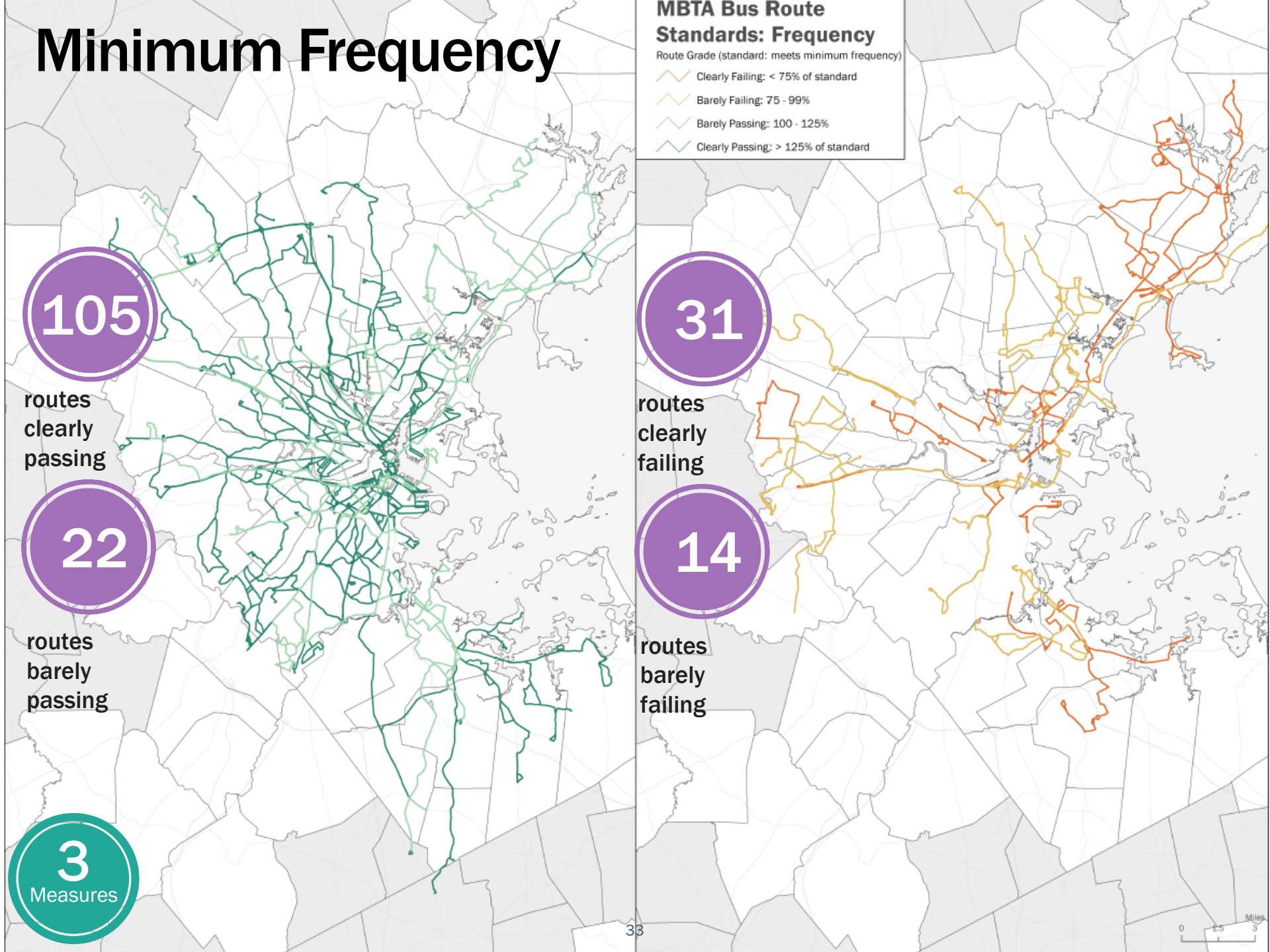
3 Measures

Minimum Frequency

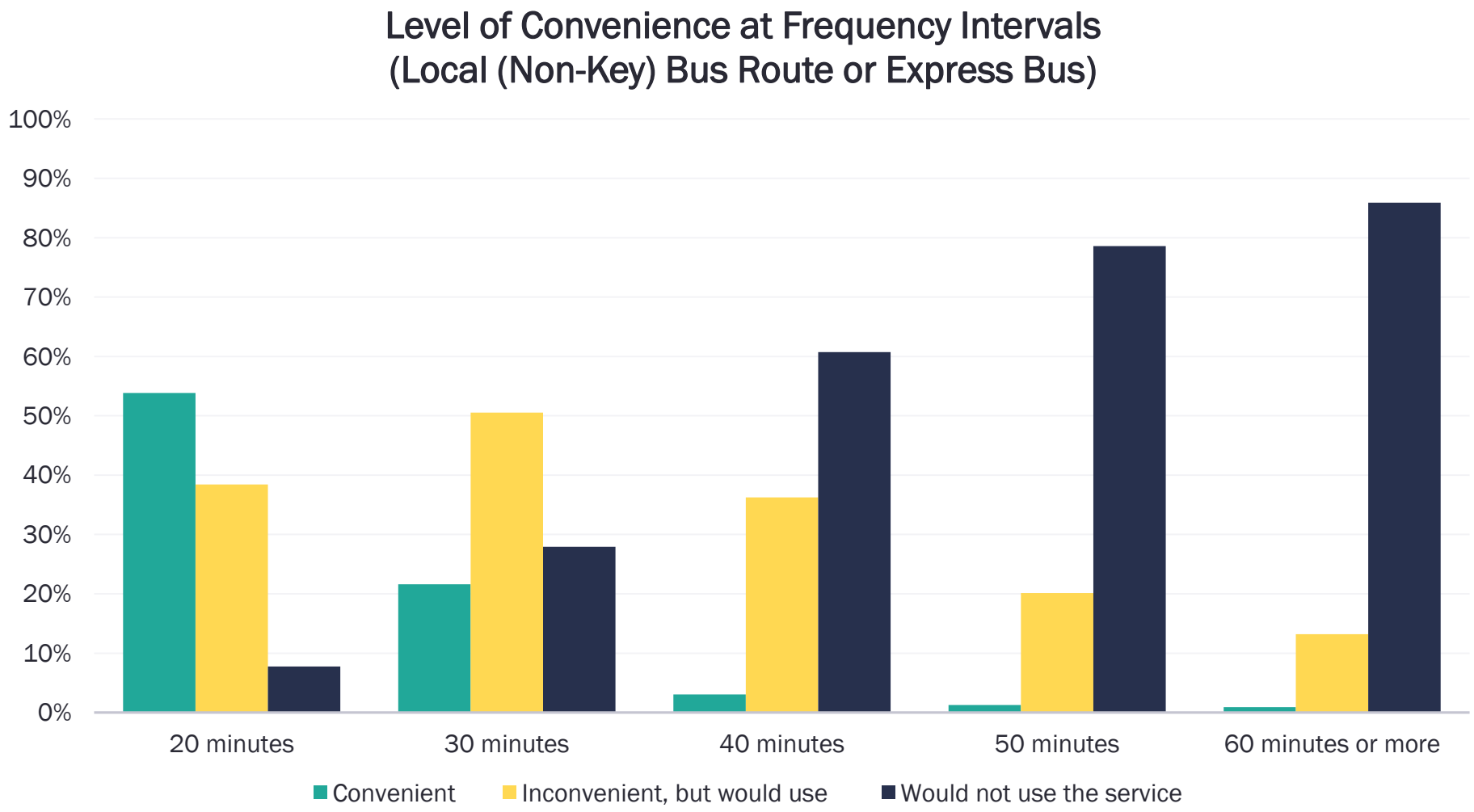
Proposed in draft Service Delivery Policy

Mode	Weekday Time Periods	Minimum Frequency or Maximum Headway
Bus	AM and PM Peak	Every 30 minutes
Local	All other periods	Every 60 minutes
Community	Saturday and Sunday	Every 60 minutes
Commuter	AM Peak	3 trips in the peak direction
	PM Peak	3 trips in the peak direction
Key Bus Routes	AM and PM Peak	Every 10 minutes
	Early AM and Midday Base/School	Every 15 minutes
	Evening and Late Evening	Every 20 minutes
	Saturday and Sunday	Every 20 minutes
Rapid Transit	AM and PM Peak	Every 10 minutes
	All other periods*	Every 15 minutes
	Saturday and Sunday	Every 15 minutes
Commuter Rail	AM Peak	3 trips in peak direction
	PM Peak	4 trips in peak direction
	All other periods	Every 3 hours in each direction
	Saturday	Every 3 hours in each direction
Boat	AM and PM Peak	3 trips in the peak direction
	Off-Peak periods	Every 3 hours

Minimum Frequency



Survey: local/commuter headways

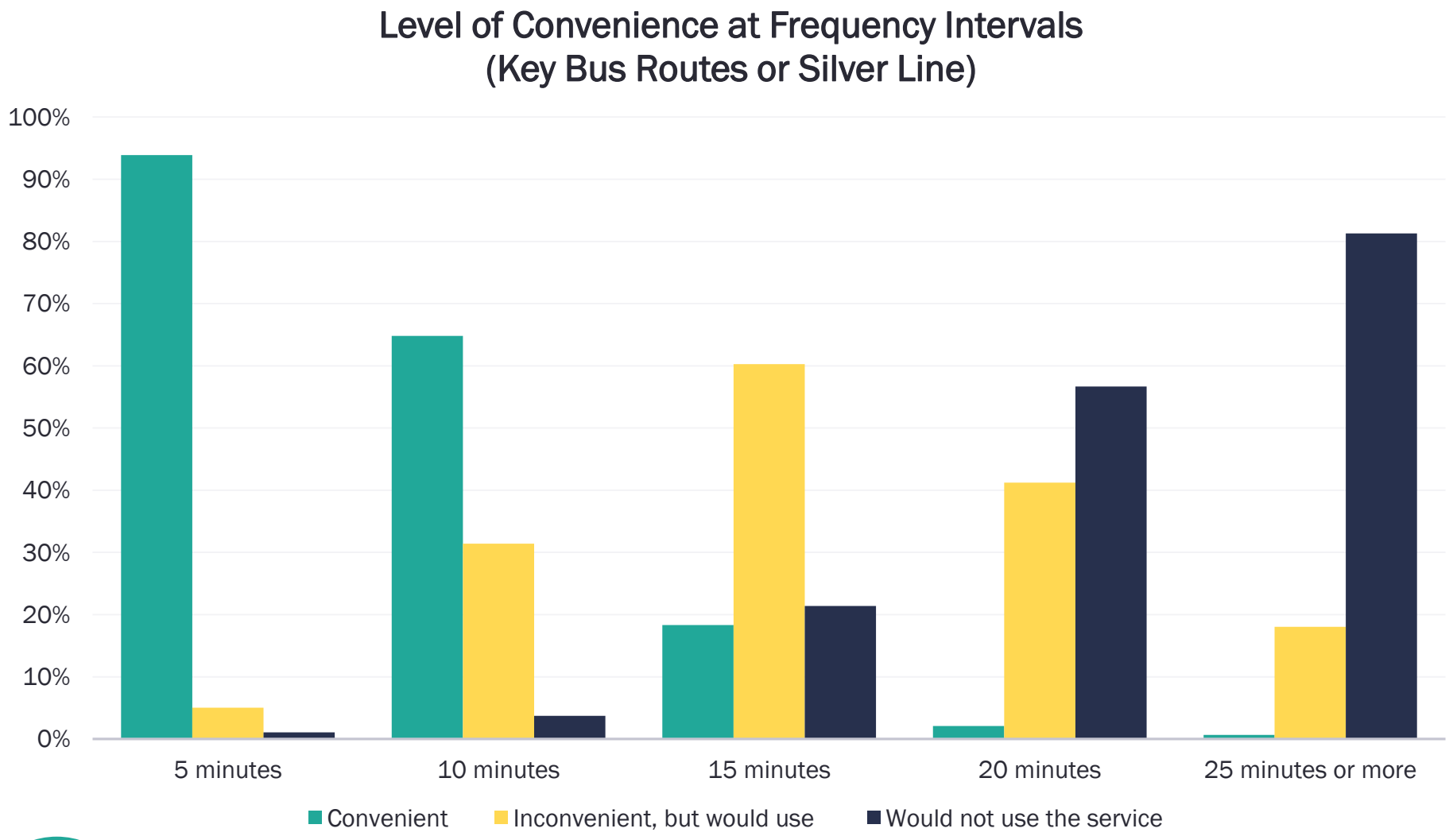


3 Measures

Source: Service Standards Survey, July 2015

massDOT Massachusetts Department of Transportation

Survey: key bus headways



3 Measures

Source: Service Standards Survey, July 2015

massDOT Massachusetts Department of Transportation

Proposed Service Quality Measures

4. Reliability
   - Measures are established by mode and frequency of service
   - Bus Reliability:
     - Scheduled-Departure Service: Service that operates with a headway longer than 15 minutes.
       - Origin timepoint: The trip must leave between 0 minutes before and 3 minutes after its scheduled departure time.
       - Mid-route timepoints: The trip must leave between 1 minute before and 6 minutes after its scheduled departure time.
       - Destination timepoint: The trip must arrive no later than 5 minutes after its scheduled arrival time.
     - Frequent Service: Service that operates with a headway less than or equal to 15 minutes.
       - Origin or mid-route timepoints: The trip must leave no later than the scheduled headway plus 3 minutes.
       - Destination timepoint: The actual run time must be no more than 120 percent of the scheduled run time.

Proposed Service Quality Measures

Reliability (continued)

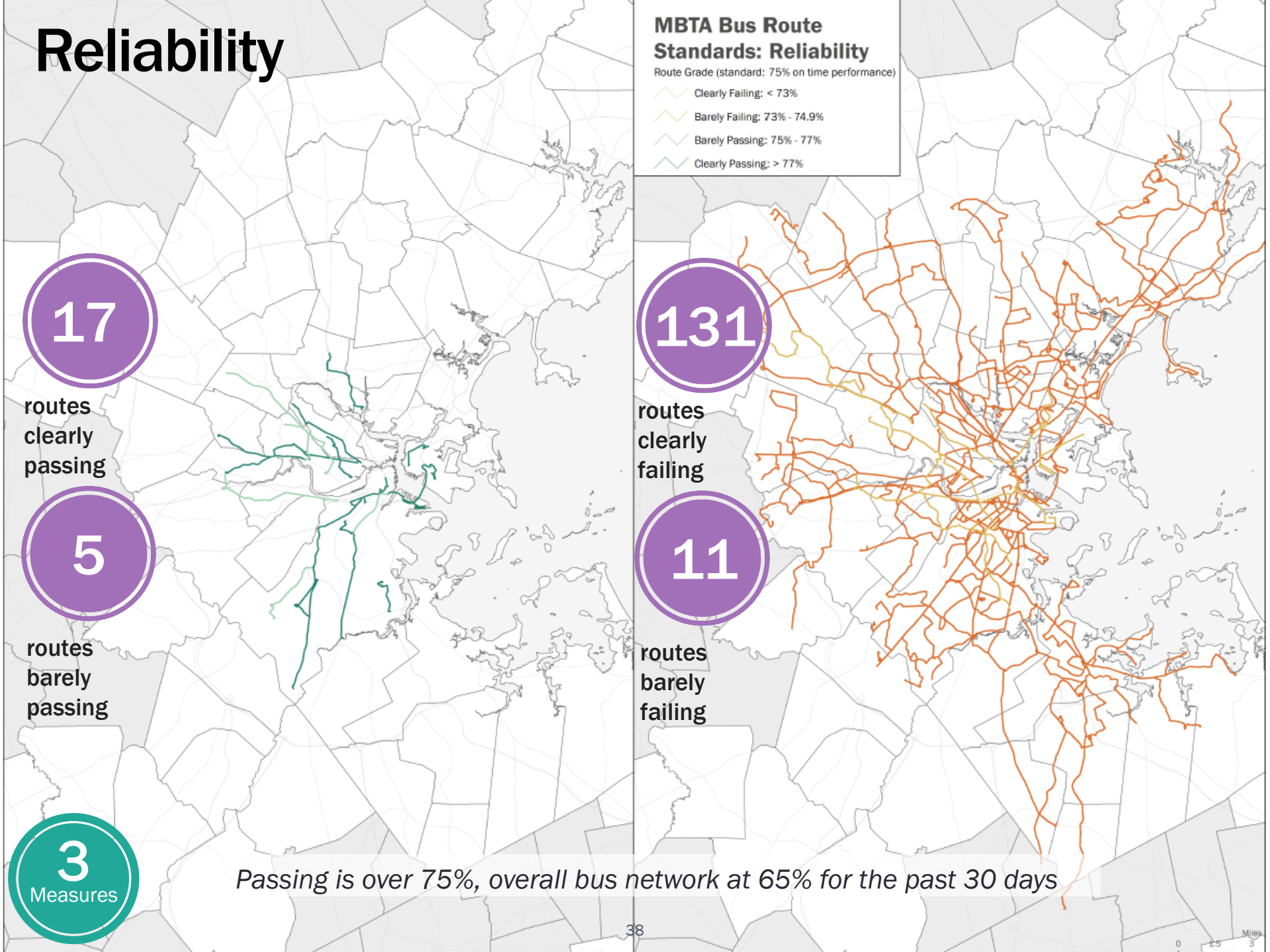
- Rapid Transit Reliability:
  - Light Rail and Heavy Rail: Passengers should wait the scheduled headway, or less, at each station; passengers in-vehicle travel times should be no more than 3 minutes longer than the scheduled travel time
  - Mattapan Line: The trip must leave no later than the scheduled headway plus 3 minutes; the actual run time must be no more than 120 percent of the scheduled run time.

- Commuter Rail and Boat Reliability:
  - Depart the passengers' origin stations/docks no earlier than 0 minutes and no later than 5 minutes after the time published in the schedule; arrive at the passengers' destination stations/docks no later than 5 minutes after the time published in the schedule.

- Service Operated
  - Percent of scheduled service that is actually provided for each bus route, light rail line, heavy rail line, commuter rail line, and boat route.

3 Measures

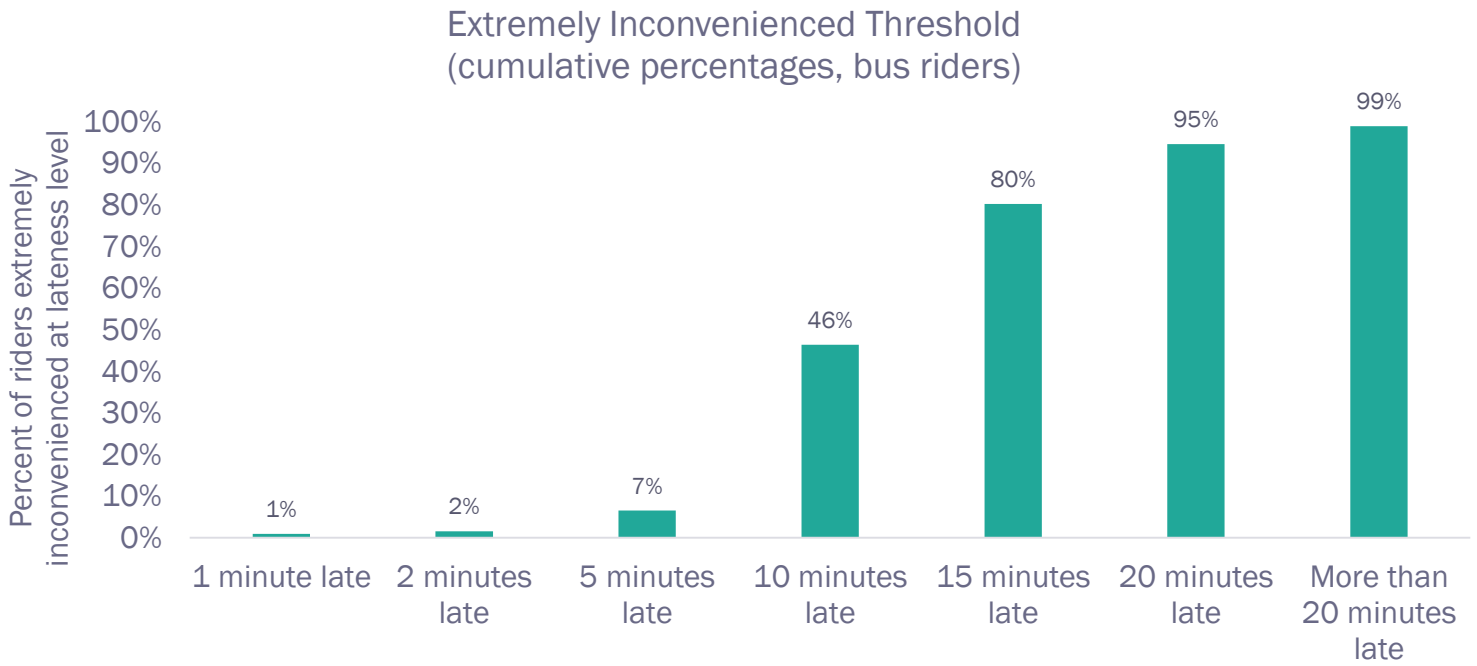
Reliability



Survey: satisfaction with reliability

- Satisfaction with reliability is the biggest driver of overall customer satisfaction in our panel survey
- Travel time, wait time, and crowding (in that order) are the biggest drivers of recent trip satisfaction

Source: Panel Survey, July 2015-September 2016



Source: Service Standards Survey, July 2015

3 Measures

massDOT Massachusetts Department of Transportation

Proposed Quality Measures

5. Comfortable

- Measures are established by mode.
- Bus Crowding:
  - High-volume time periods: The maximum comfortable passenger-to-seat ratio for high-volume travel periods is 140%. At loads less than 140% of seated capacity, all passengers are considered comfortable. No passengers are considered comfortable when the vehicle load exceeds 140% of seated capacity.
  - Low-volume time periods: The maximum comfortable passenger-to-seat ratio for lower-volume travel periods is 125%. At loads less than 125% of seated capacity, all passengers are considered comfortable; between 125% and 140% of seated capacity, seated passengers are considered comfortable; and no passengers are considered comfortable when the vehicle load exceeds 140% of seated capacity.

3 Measures

Proposed Service Quality Measures

Comfortable - continued

- Rapid Transit Crowding:
  - Light rail vehicles: Passengers occupying space in the aisle should have no less than 3.75 square feet of personal space in peak hours and 10.00 square feet of personal space in off-peak hours
  - Heavy rail vehicles: Passengers occupying space in the aisle should have no less than 3.00 square feet of personal space in peak hours and 10.00 square feet of personal space in off-peak hours.
- Commuter Rail Crowding:
  - For early AM, AM peak, midday school, and PM peak time periods, the maximum passenger-to-seat ratio is 110%.
  - For sunrise, midday base, evening, late evening, night, and weekend time periods, the maximum passenger-to-seat ratio is 100%.
- There is no crowding measure for the ferry mode.

3.
Metrics

What does crowded look like?

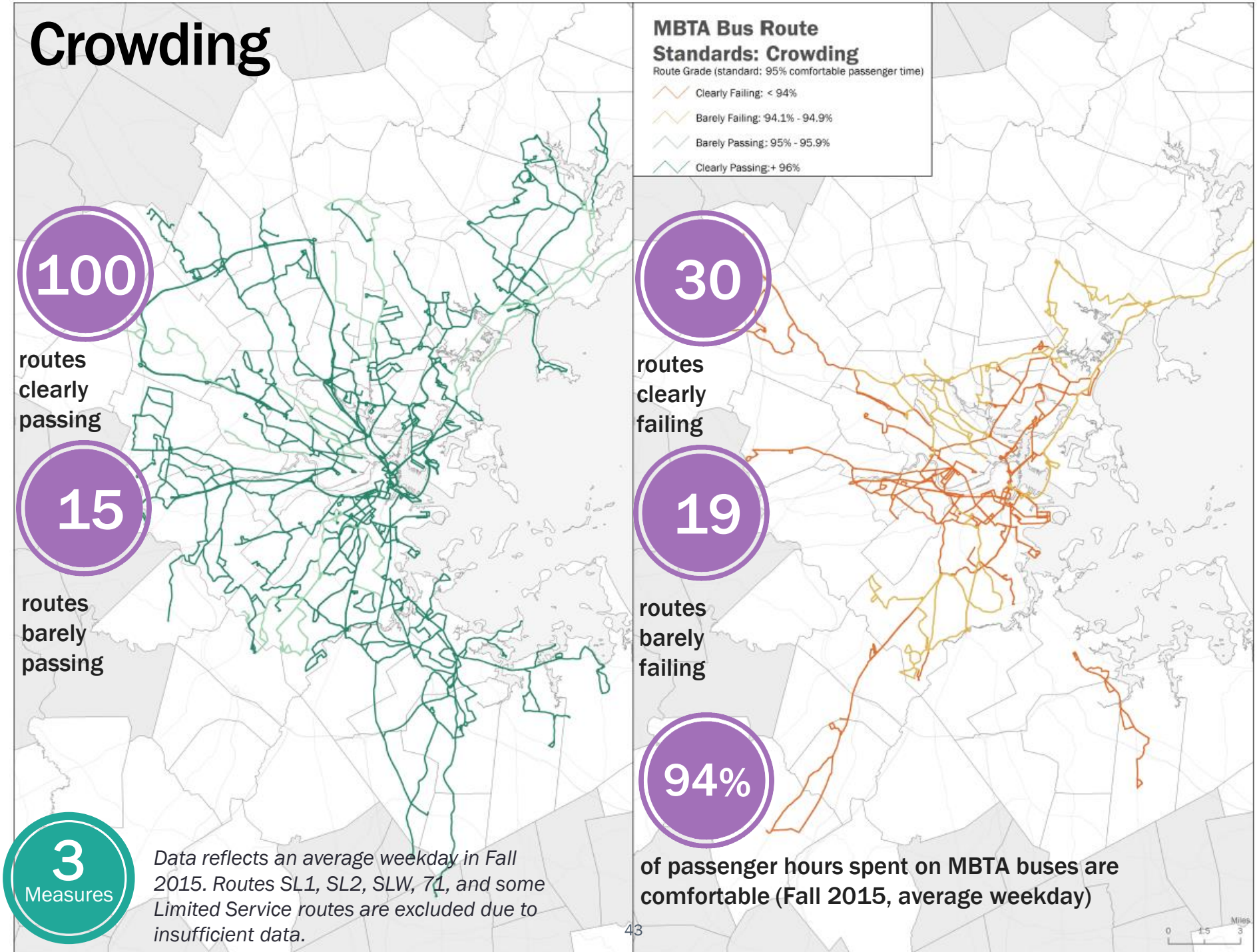
150% of seated capacity **154% of seated capacity**

Above 140% of seated capacity, all passengers are considered uncomfortable

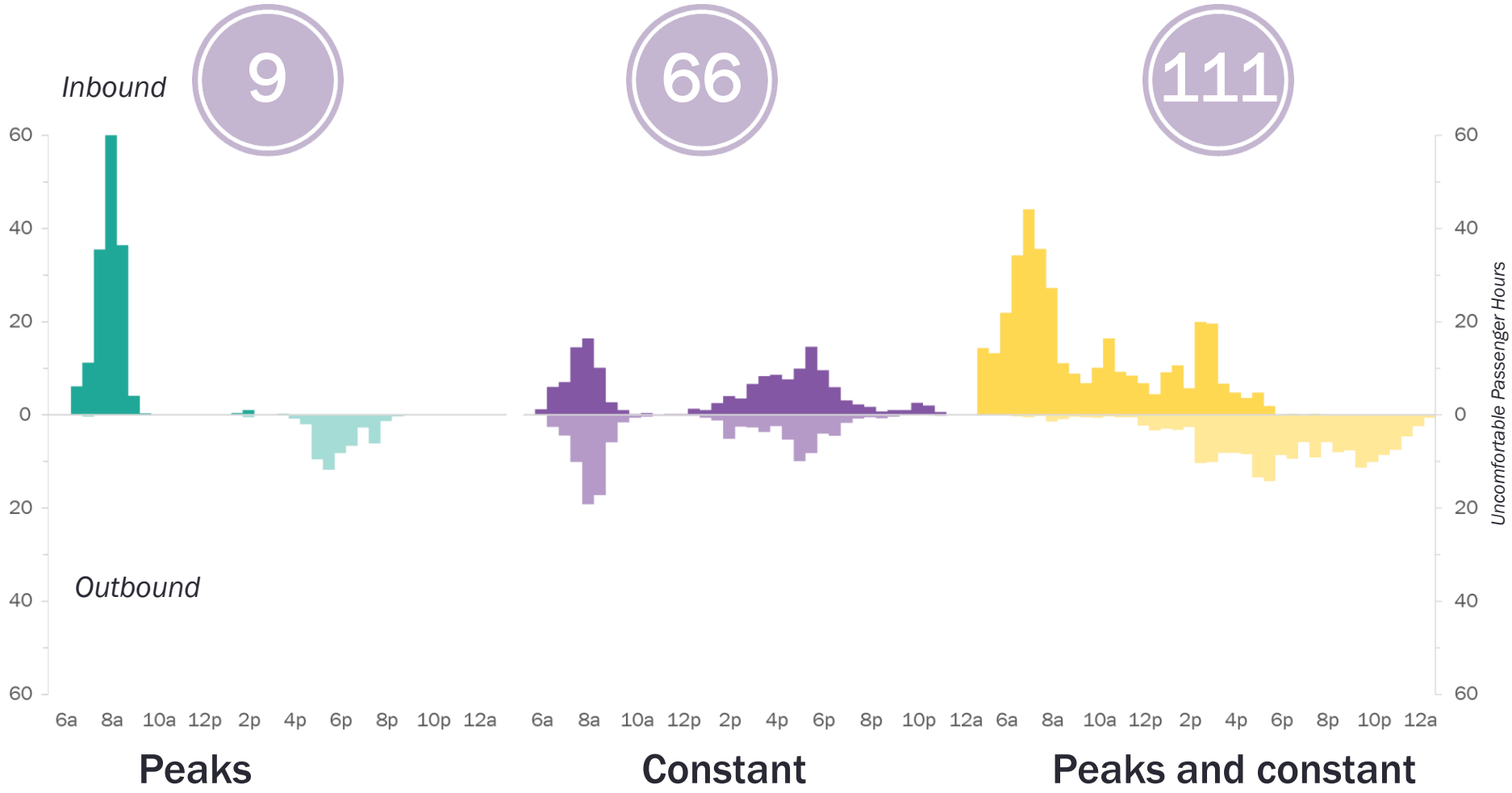
3 Measures

massDOT Massachusetts Department of Transportation

Crowding


MBTA Bus Route
Standards: Crowding
Route Grade (standard: 95% comfortable passenger time)
Clearly Failing: < 94%
Barely Failing: 94.1% - 94.9%
Barely Passing: 95% - 95.9%
Clearly Passing:+ 96%
100
routes clearly passing
15
routes barely passing
30
routes clearly failing
19
routes barely failing
94%
of passenger hours spent on MBTA buses are comfortable (Fall 2015, average weekday)
3
Measures
Data reflects an average weekday in Fall 2015. Routes SL1, SL2, SLW, 71, and some Limited Service routes are excluded due to insufficient data.
Miles
0
1.5
3

Patterns of bus crowding



3 Measures

massDOT Massachusetts Department of Transportation

Proposed Service Planning Measure

6. Cost-Efficiency

Existing Bus Cost-Effectiveness Standard in the 2010 Service Delivery Policy

$$Net\ cost/passenger = \frac{Operating\ Costs\ - Service\ Revenue}{Boarding\ Customers}$$

Deficient Route: greater than 3 times the system average

Considerations

- Relative measure
- Service revenue means routes with higher seniors/students/TAP passengers have higher costs
- Doesn't measure all benefits
- Only for bus

Should we measure both the benefits and the costs?

	Weekday	Saturday	Sunday
Average net cost per passenger	$2.14	$2.02	$1.94
Clearly Passing (<2.75x average cost)	151	112	90
Barely Passing (2.75x to 2.99x average cost)	6	2	1
Barely Failing (3x to 3.24x average cost)	3	2	5
Clearly Failing (>3.25x average cost)	8	7	3

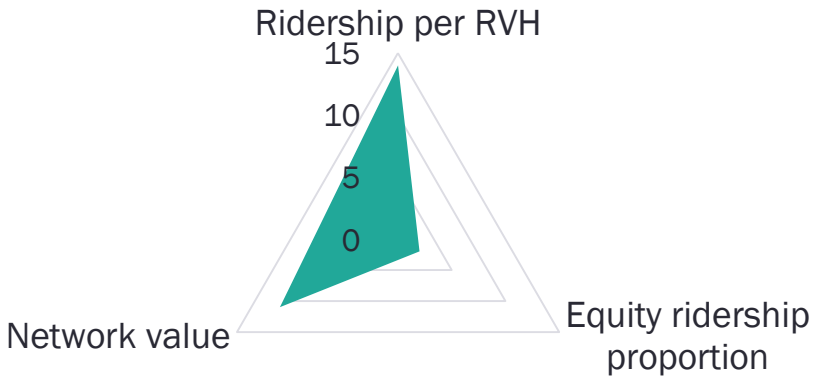
3 Measures

Cost-Efficiency: Proposed Measure

$$Cost\ Efficiency = \frac{Benefit\ of\ Operated\ Service}{Cost\ to\ Operate}$$

Where Cost to Operate=

- *Standard cost per service hour for each mode*
- *Additional service hours represent additional cost; a route that provides the same value in fewer service hours is more "cost-efficient"*



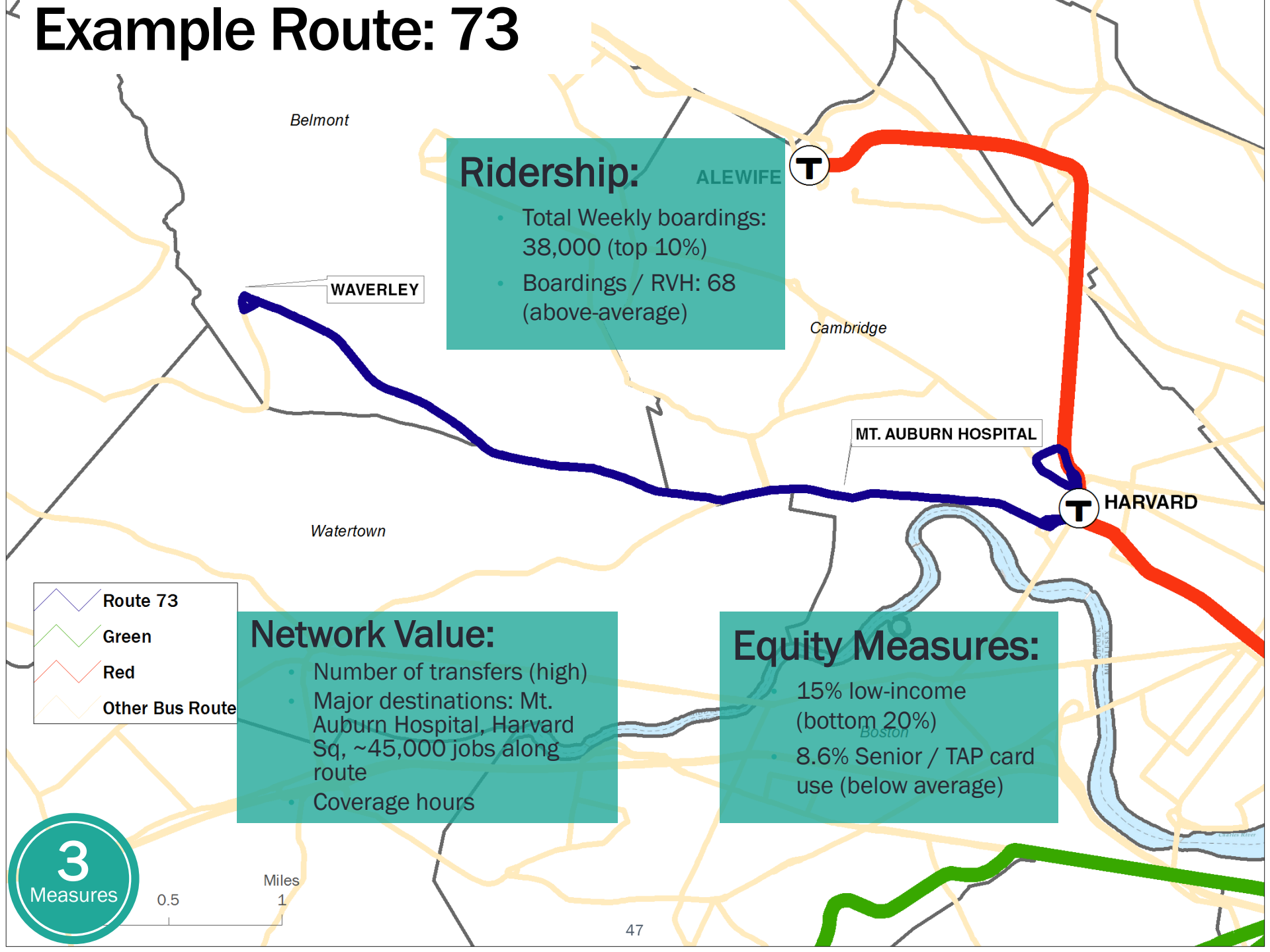
The benefits are provided by three metrics scored on a scale:

- Ridership per Revenue Vehicle Hour
- Equity ridership proportion
- Network value, itself composed of three metrics:
  - Hours of added coverage
  - Service to major destinations
  - Number of transferring riders

3 Measures

massDOT Massachusetts Department of Transportation

Example Route: 73



Ridership:

- Total Weekly boardings: 38,000 (top 10%)
- Boardings / RVH: 68 (above-average)

Network Value:

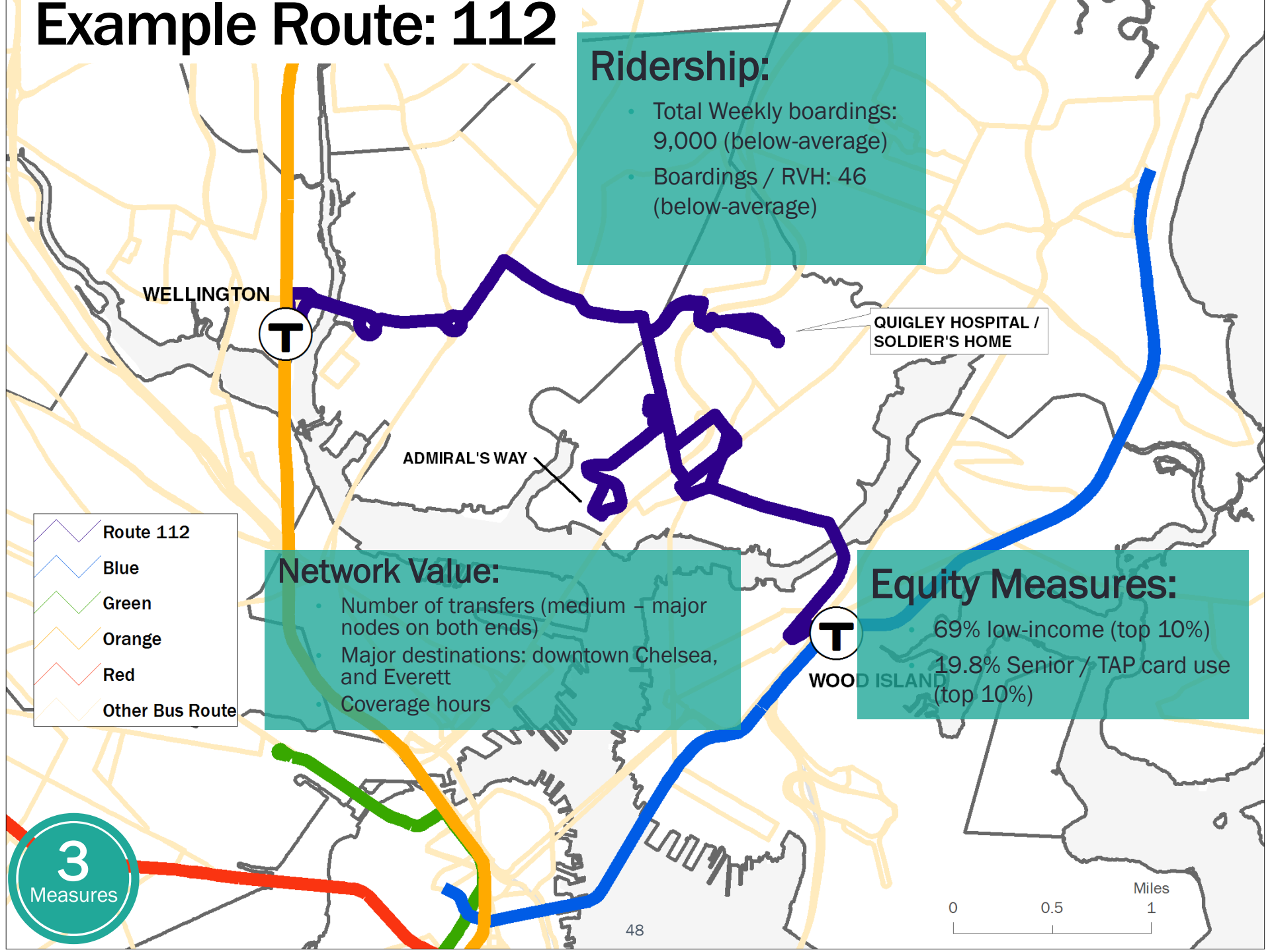
- Number of transfers (high)
- Major destinations: Mt. Auburn Hospital, Harvard Sq, ~45,000 jobs along route
- Coverage hours

Equity Measures:

- 15% low-income (bottom 20%)
- 8.6% Senior / TAP card use (below average)

3 Measures

Example Route: 112



Ridership:

- Total Weekly boardings: 9,000 (below-average)
- Boardings / RVH: 46 (below-average)

Network Value:

- Number of transfers (medium – major nodes on both ends)
- Major destinations: downtown Chelsea, and Everett
- Coverage hours

Equity Measures:

- 69% low-income (top 10%)
- 19.8% Senior / TAP card use (top 10%)

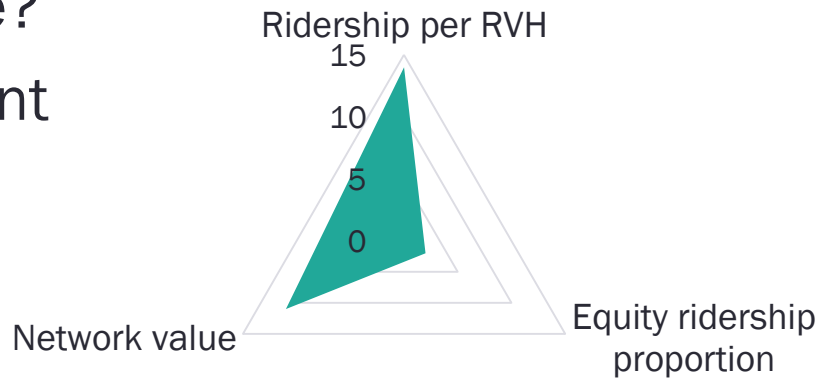
3 Measures

Implications

- Separates benefits from cost
- Different services can combine to create the same benefit score
- Identifies routes' strengths and weaknesses; suggests more specific/targeted interventions to raise cost-efficiency
- Can apply to other modes

Discussion questions

- Should scores be relative or absolute?
- Are some components more important than others? How should they be weighted?



3 Measures

massDOT Massachusetts Department of Transportation

Proposed Network Measures

4. Accessibility
   - Platform hours accessible (elevator uptime and accessible stations)
   - Percent of trips with accessible vehicles
7. Safety
   - Set in coordination with state and federal regulatory partners
8. Communication
   - Real-time prediction accuracy measure
   - System status measure
     - The MBTA will provide its users with elevator status alerts within 10 minutes of identified change in operability status.
   - Announcements according to ADA and Language Access Plan
10. Capacity
11. Connectivity

No proposed measures, to be discussed as part of Strategic Plan

3 Measures

Should there be an equity measure?

- Is equity ensuring access for people who cannot afford other means of transportation?
  - Then include in cost-efficiency and measure changes to low-income coverage when making service changes
- Is equity ensuring people all over the region have access to the system?
  - Then measure changes to overall coverage when making service changes
- Is equity ensuring that our service quality and service changes aren't disproportionate when considering race/ethnicity or income?
  - Addressed by Title VI
- How else should we measure equity?

3 Measures

Service Delivery Policy and Title VI

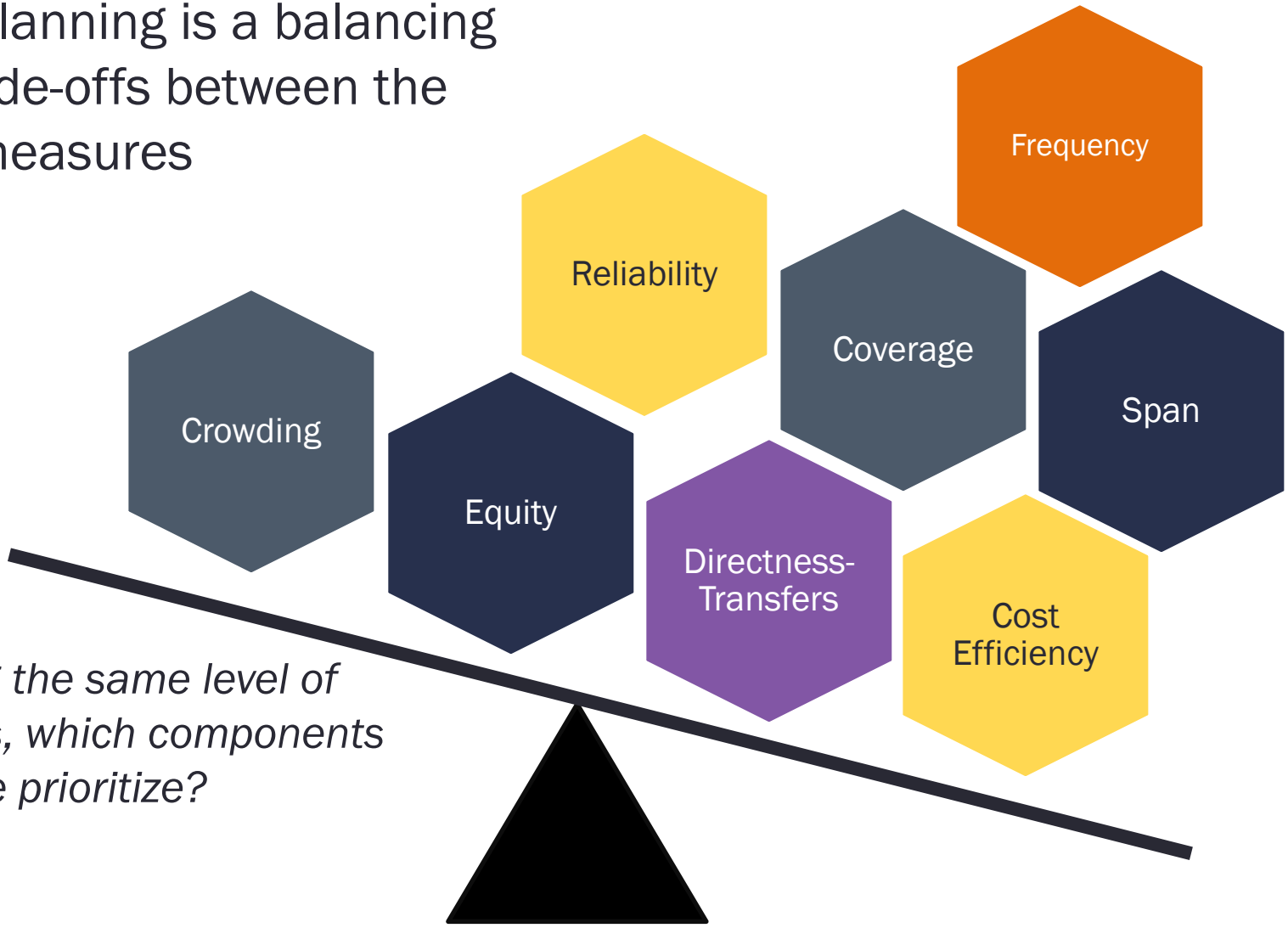
What requires Disparate Impact/Disproportionate Burden analysis under Title VI

- Major service changes or fare changes
  - A service change that is defined as a “major service change” or any fare change requires an equity analysis using the thresholds described the DI/DB policy.
- Periodic monitoring
  - Measures the systemwide distribution of transit amenities, vehicle assignment, and all standards in the Service Delivery Policy
  - Where a disparity is identified, the MBTA should identify steps to address the disparity
  - The threshold for the service monitoring is proposed to be the same as the threshold for major service changes in the DI/DB policy

TRADE-OFFS

TRADEOFFS

Service planning is a balancing act of trade-offs between the various measures



Assuming the same level of resources, which components should we prioritize?

4 Trade-offs

massDOT Massachusetts Department of Transportation

Key tradeoffs

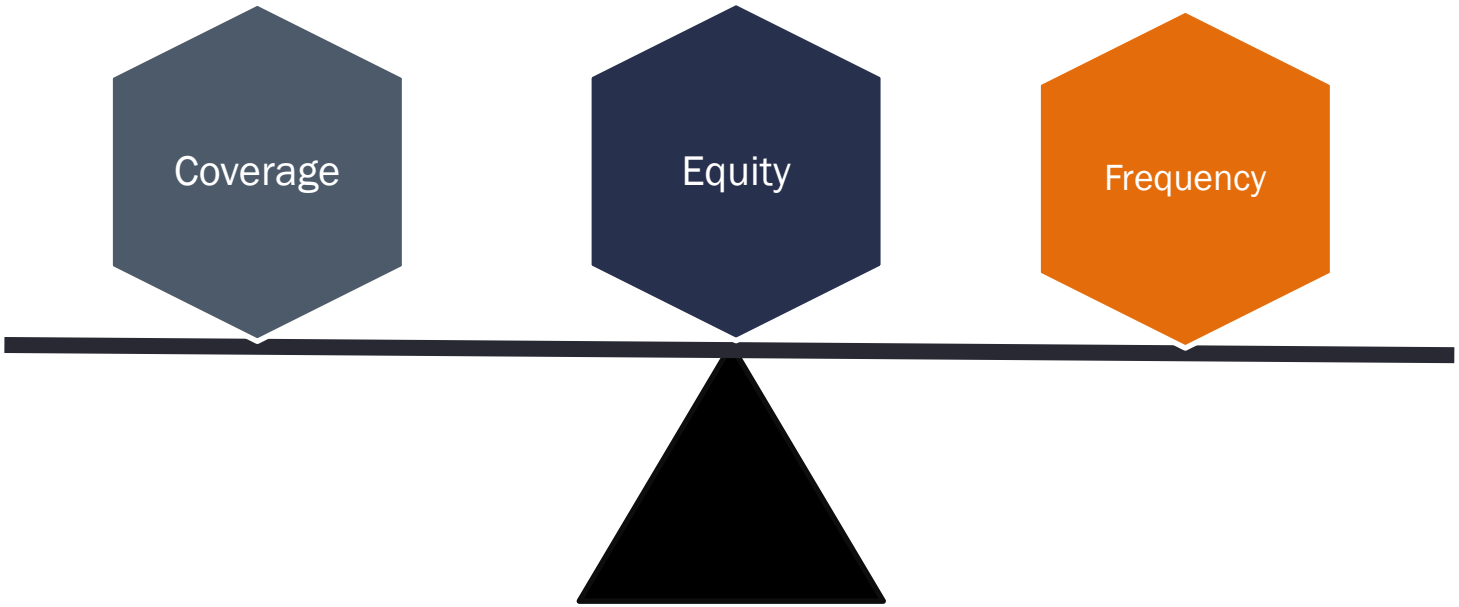
Metric	Trade-Off	
Coverage	• Less frequent service to more areas	• More frequent service to fewer areas
Frequency and Span	• More frequent service for a shorter time	• Less frequent service for a longer time
Transfers	• More routes/fewer transfers with less frequent service	• Fewer routes/more transfers with more frequent service
Directness	• Shorter walks to stops with slower, less direct service	• Longer walks to stops with faster, more direct service
Reliability	• Fewer trips with more reliability	• More trips with less reliability

4 Trade-offs

Trade-Offs

Should we prioritize:

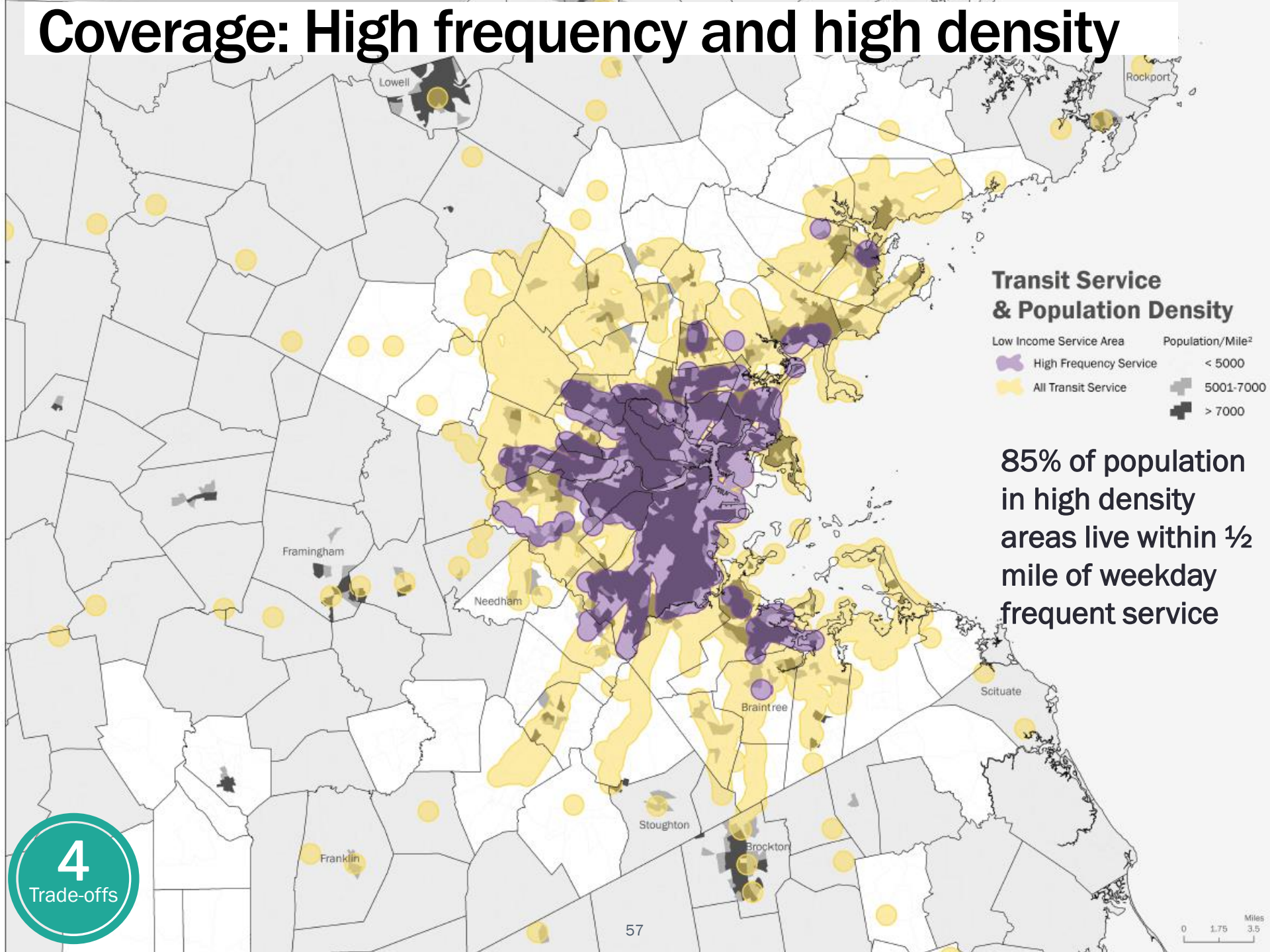
- High frequency coverage in high density areas?
- Coverage of low-income households?
- Or overall coverage with less frequency?



4
Trade-offs

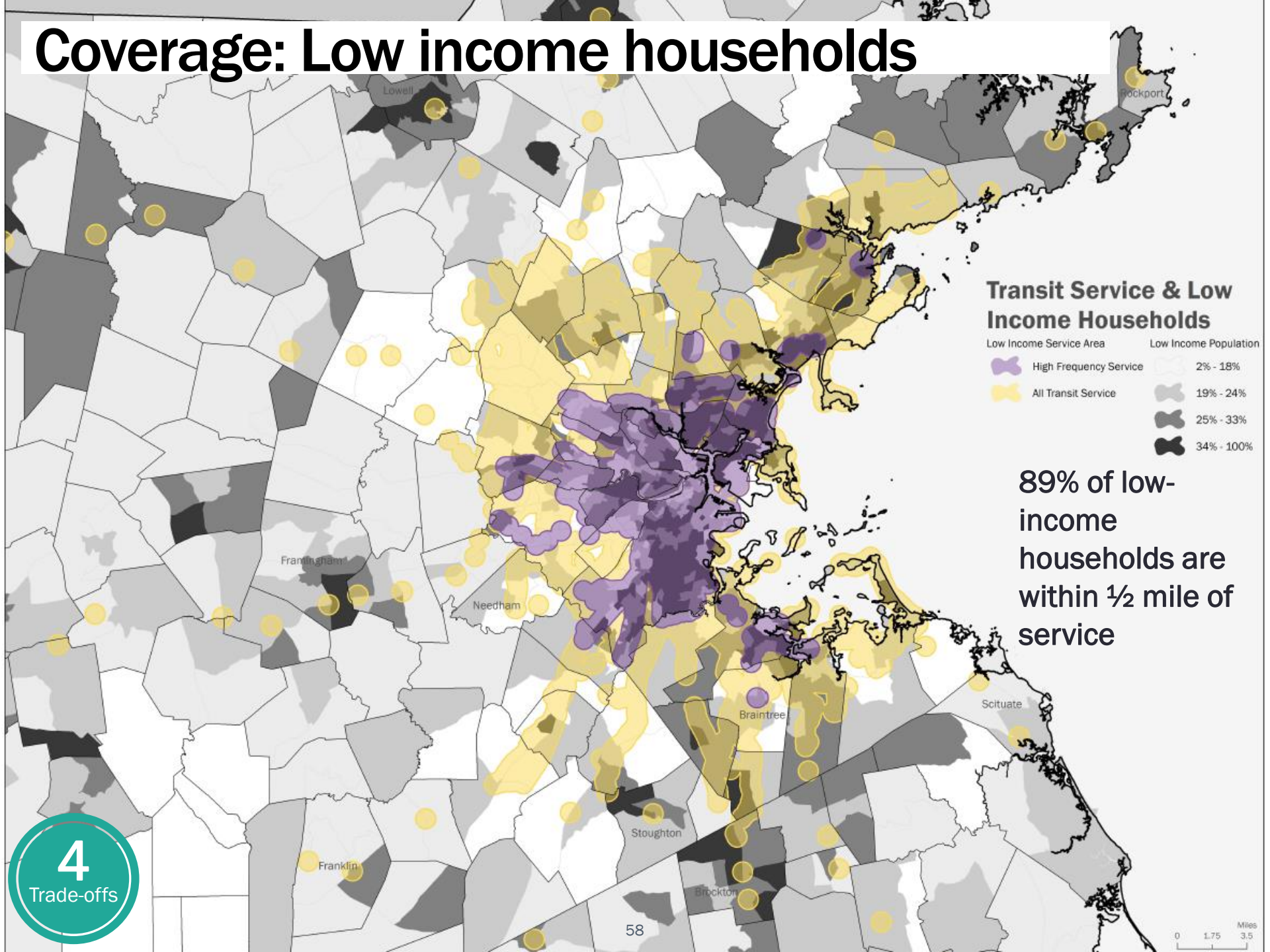
massDOT
Massachusetts Department of Transportation

Coverage: High frequency and high density



4
Trade-offs

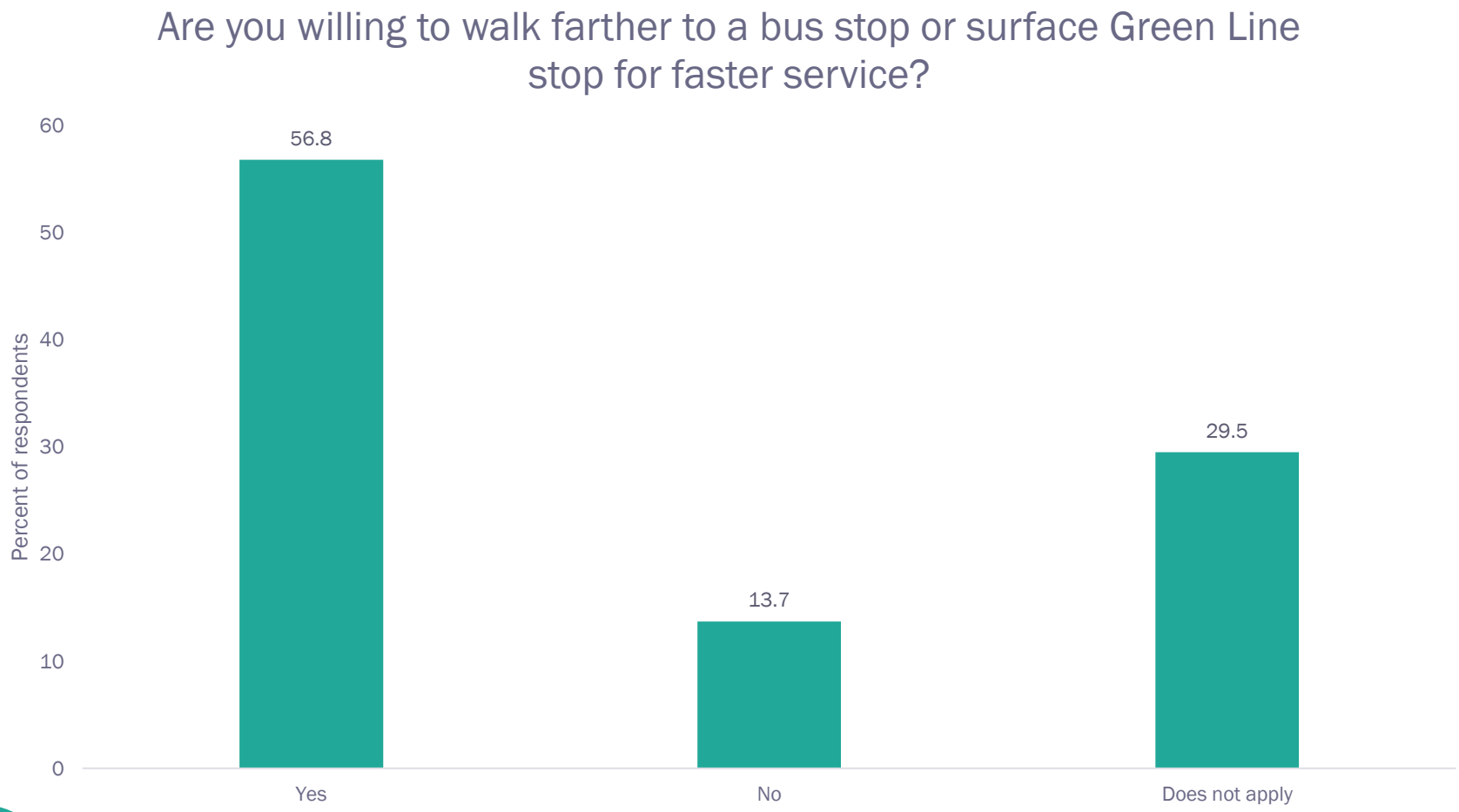
Coverage: Low income households



4
Trade-offs

Coverage vs. Frequency

Survey respondents have a preference for high frequency service



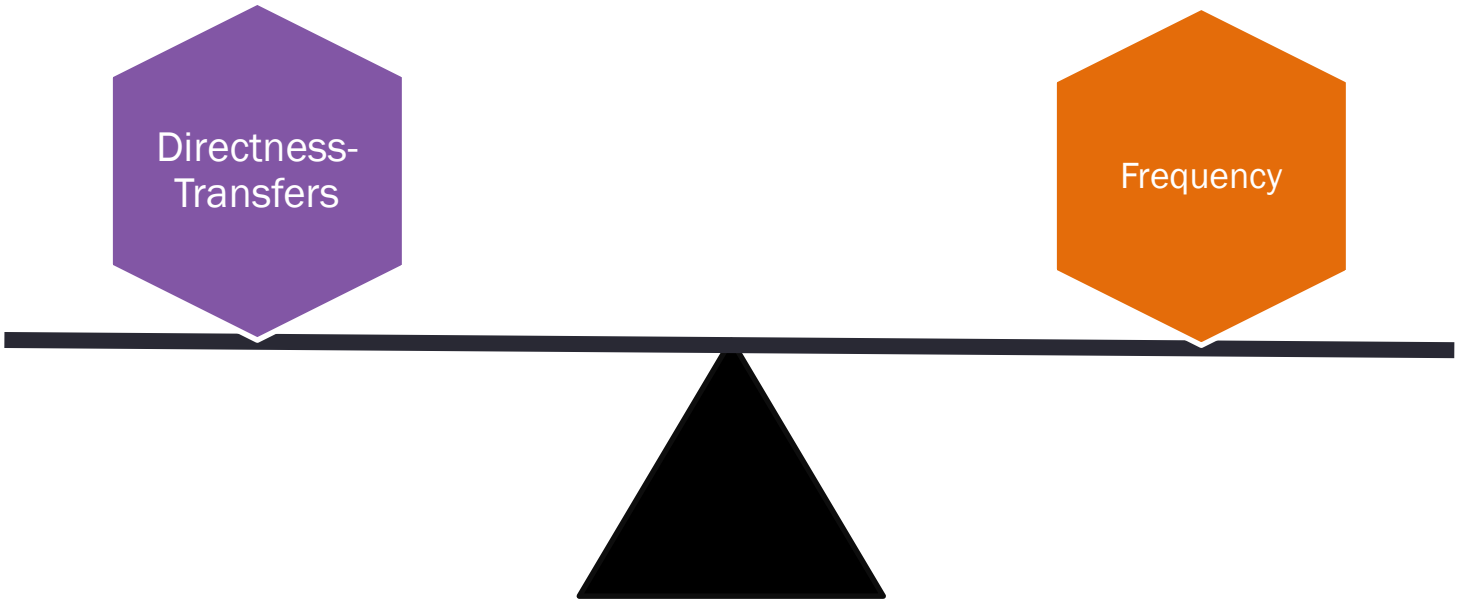
Source: Service Standards Survey, July 2015

4 Trade-offs

massDOT Massachusetts Department of Transportation

Trade-Offs

If the coverage remains the same, should we prioritize one seat rides with lower frequency or higher frequency service that might require a transfer?

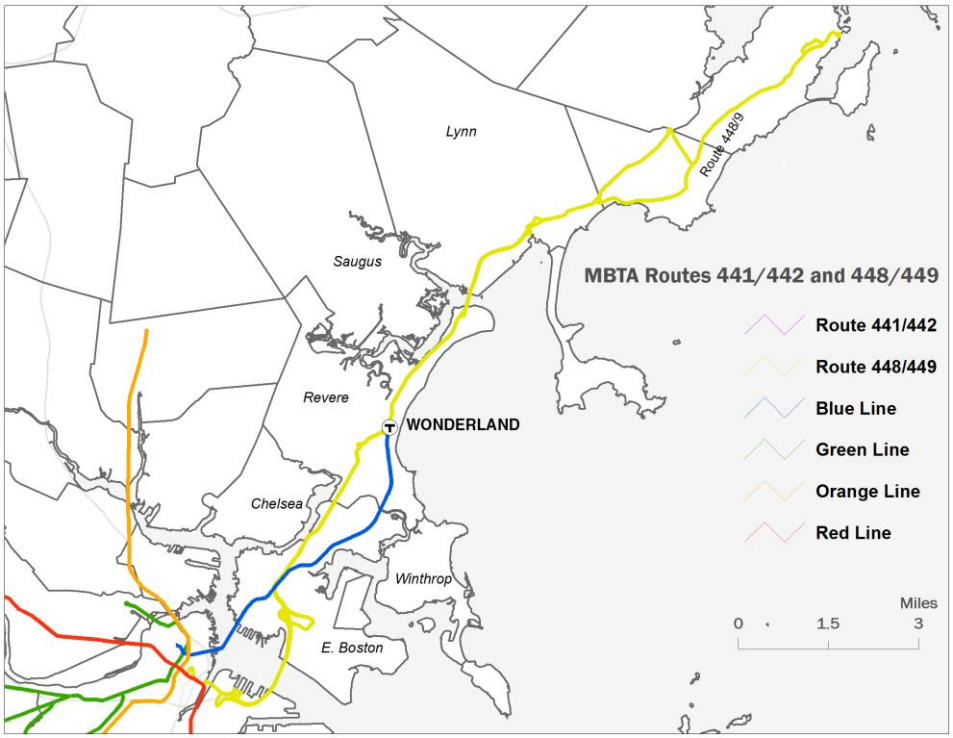


4
Trade-offs

massDOT
Massachusetts Department of Transportation

Directness of Travel vs. Frequency

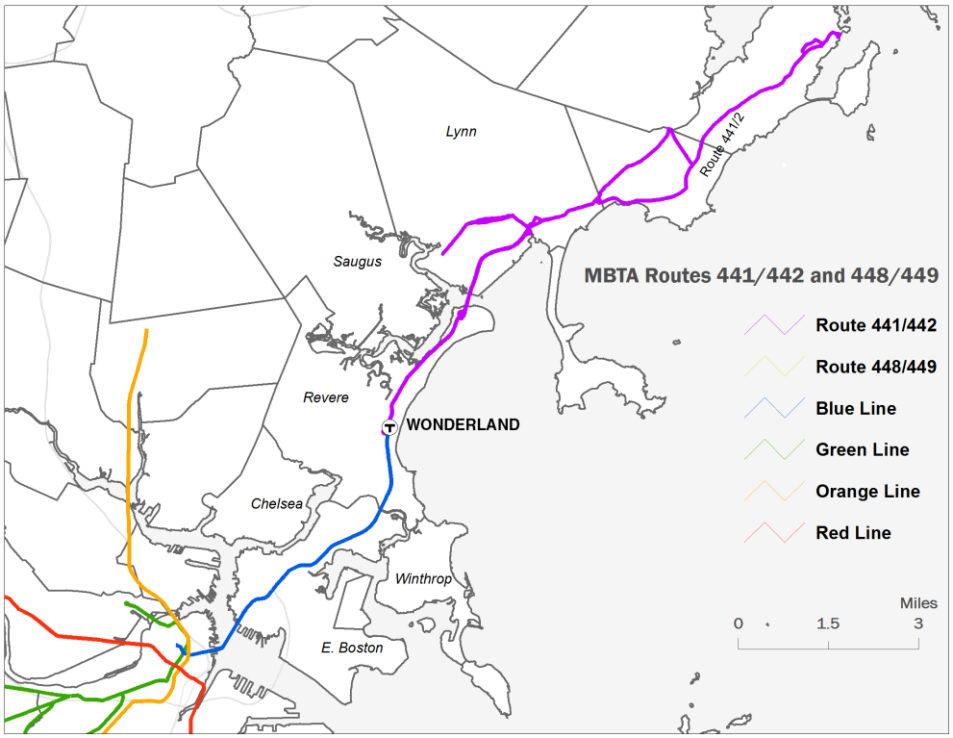
- Existing routes provide service from Marblehead to Wonderland (441/442) and Downtown (448/449).
- Current service level:
  - 441/442 (local bus): AM Peak headway of 16 minutes for the corridor, service throughout the day
  - 448/449 (commuter bus): headway of 30 minutes for the corridor, 5 trips total during AM peak only
  - Ridership approximately similar
  - Combined headway of 10.5 minutes
- If 448/449 service were reassigned to 441/442, headways on the 441/442 would decrease from 16 mins to 8.3 mins at 7:00 AM.



4
Trade-offs

Directness of Travel vs. Frequency

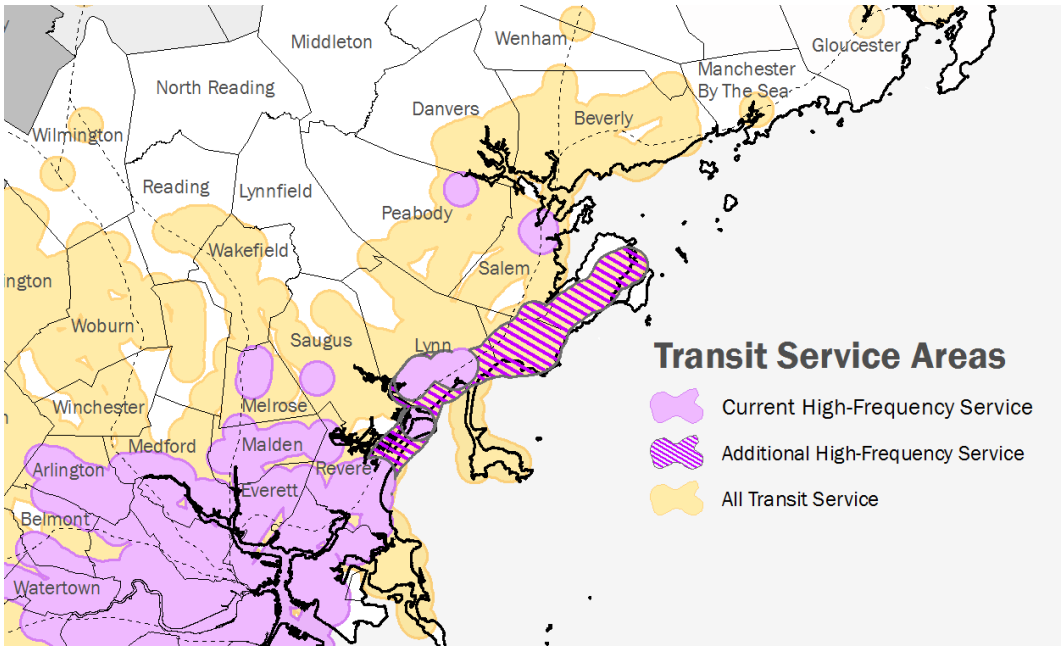
- Existing routes provide service from Marblehead to Wonderland (441/442) and Downtown (448/449).
- Current service level:
  - 441/442 (local bus): AM Peak headway of 16 minutes for the corridor, service throughout the day
  - 448/449 (commuter bus): headway of 30 minutes for the corridor, 5 trips total during AM peak only
  - Ridership approximately similar
  - Combined headway of 10.5 minutes
- If 448/449 service were reassigned to 441/442, headways on the 441/442 would decrease from 16 mins to 8.3 mins at 7:00 AM.



4
Trade-offs

Directness of Travel vs. Frequency

- Overall coverage does not change very much (448/449 riders can still get downtown by transferring at the Blue Line)
- Upside: The 441/442 becomes effectively a key bus route at peaks.
  - The riders experience time savings with increased frequency.
  - High-frequency coverage is expanded in an area with little high-frequency service
- Downside: The riders on the 448/449 will have their travel time to downtown increase with the required transfer to the Blue Line.

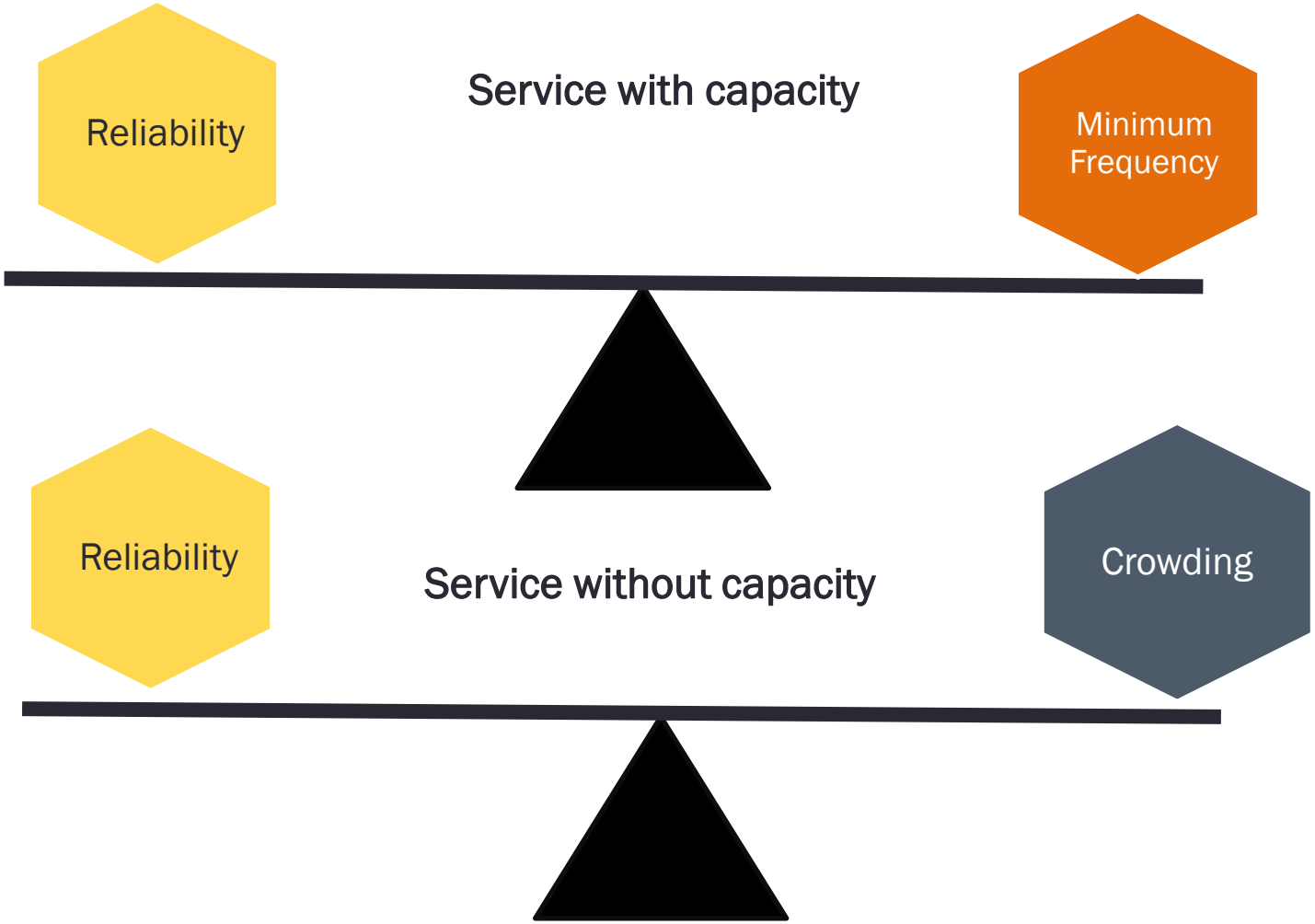


4
Trade-offs

massDOT
Massachusetts Department of Transportation

Trade-Offs

Should we schedule reliable, but less frequent service, or less reliable, but more frequent service?

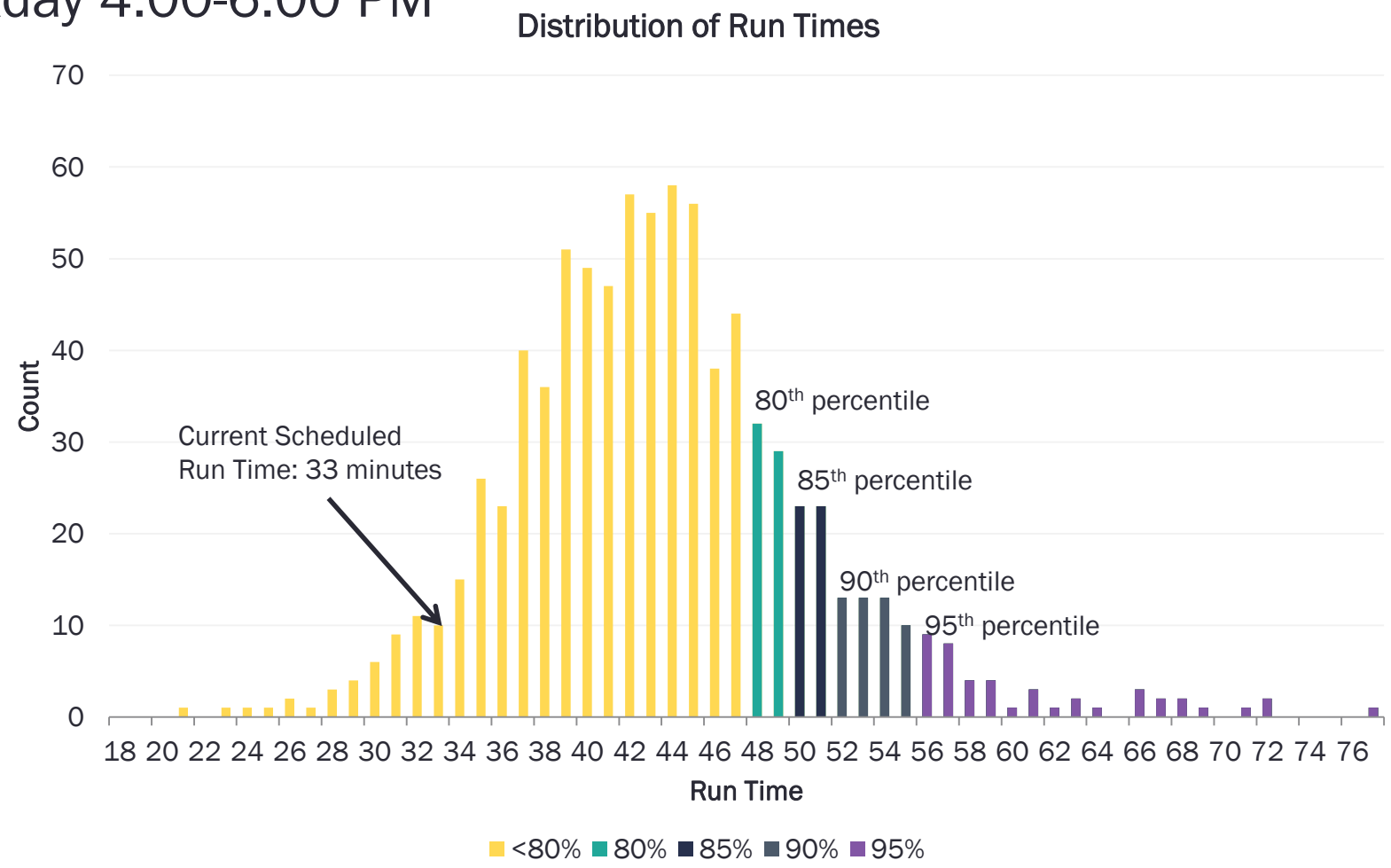


4 Trade-offs

massDOT Massachusetts Department of Transportation

Reliability vs Frequency

- Variability exists in the time it takes to run the route
- Example Route 111 (Haymarket –Woodlawn), outbound, weekday 4:00-6:00 PM



4
Trade-offs

massDOT
Massachusetts Department of Transportation

Reliability vs Frequency

- When we increase the run + layover time, if the number of buses does not increase, the headway needs to increase.

Run Time Percentile	4:00-6:00 PM Outbound Run + Layover Time	4:00-6:00 PM # Buses	4:00-6:00PM Outbound Headway
80%	48 minutes	8	11 minutes
85%	50 minutes	8	11 minutes
90%	52 minutes	8	12 minutes
95%	56 minutes	8	13 minutes

Current headway is 8 minutes, corresponding to a 33-minute run + layover time

Reliability vs Crowding

- When we increase the headway, crowding increases.

Run Time Percentile	4:00-6:00 PM Outbound Headway	4:00-6:00 PM Outbound Average Maximum Load
80%	11 minutes	52
85%	11 minutes	52
90%	12 minutes	57
95%	13 minutes	62

Current average maximum load is 38 passengers, corresponding to a 8-minute average headway.

A bus is considered crowded at loads greater than 55 passengers.

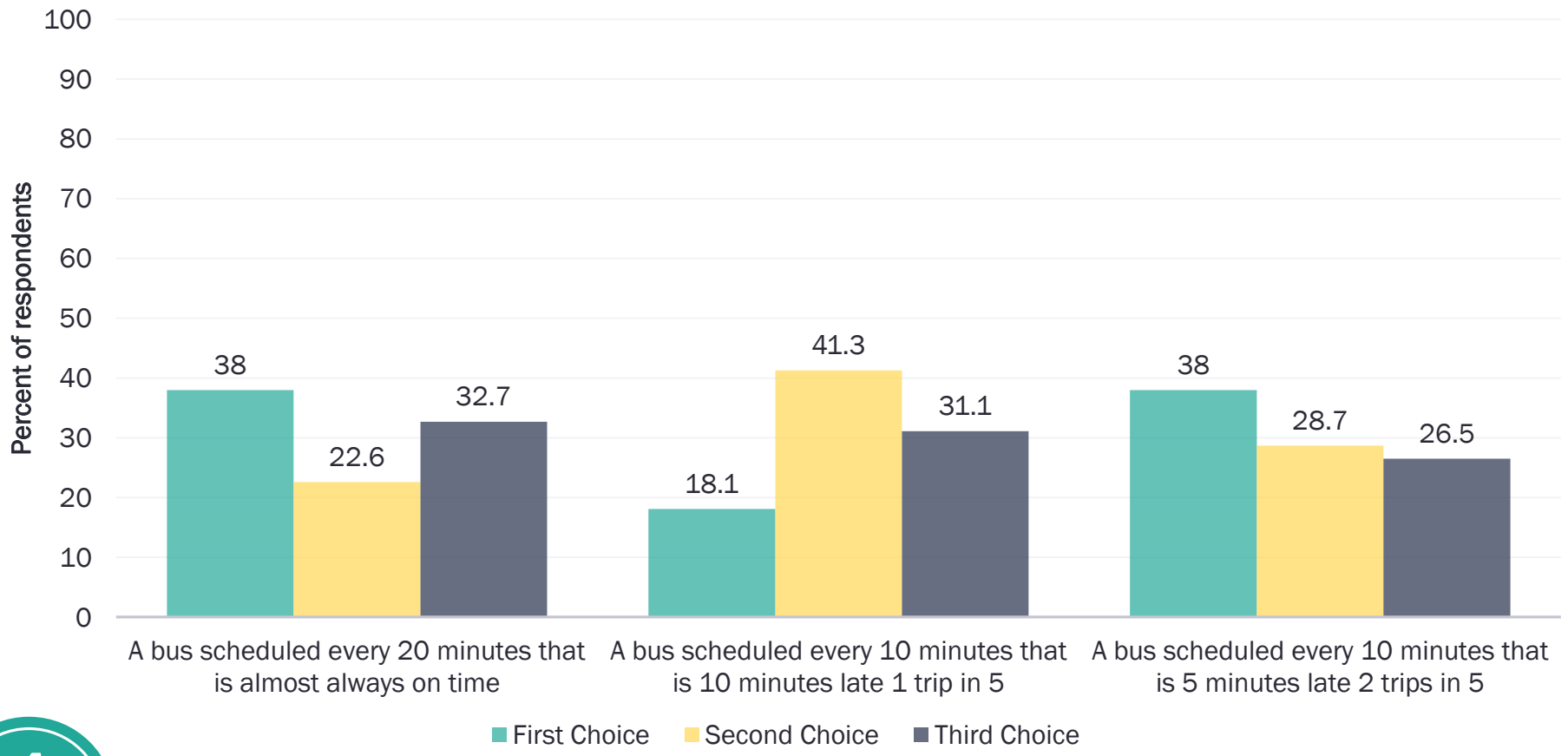
Note that maximum load is a different way to measure crowding from the passenger comfort metric.

Reliability vs Crowding

- Route 111 is an extreme example
- Other routes will have smaller run-time adjustments or crowding impacts
  - Route 93: PM peak run times increased by only 7.2%; headway increase from 8 to 9 minutes; average maximum loads increase from 34 to 37
- Buses can be reallocated between routes
  - Shifting a bus from Route 93 to Route 111 would result in a Route 93 headway of 9.5 minutes and an average PM peak maximum load of 40
  - Shifting a bus to Route 111 would improve the headway from 12 to 10 minutes, and reduce the average PM peak maximum load from 57 to 47

Survey: Reliability vs Frequency

Survey respondents express varying and conflicted views regarding the choice between reliability and frequency.



Source: Service Standards Survey, July 2015

4 Trade-offs

massDOT Massachusetts Department of Transportation

Reliability Frequency Toolbox

Tools to address this problem

- Speed up buses and reduce variability of run times
  - Service and operating changes:
    - Reduce coverage by scheduling shorter routes
    - Reduce the number of stops
    - Reduce dwell times at stops by changing the way that passengers board
    - Decrease bus bunching with better dispatching tools and procedures
  - Municipal partnerships:
    - Bus signal priority
    - Dedicated bus lanes and queue jumping
- Reallocate buses from routes with capacity to routes without capacity
- Increase the number of buses operating

4 Trade-offs

Summary of tradeoffs

- What should be the main priorities in the rolling service planning process?
  - Improving reliability, even if it requires reductions in scheduled frequency and increases in crowding
  - Reducing crowding, even if it requires reductions in frequency in other routes, reductions in coverage, or worse reliability
  - Improving frequency in areas with high-population density, but possibly increasing transfers
  - Improving/maintaining coverage for areas with large low-income populations
  - Increasing/maintaining overall coverage, but reducing frequency
  - Meeting minimum frequency and span

4 Trade-offs

Next Steps

1. Finalize the Service Delivery Policy
   - Adding today's feedback on priorities and tradeoffs
   - Provide revised draft to FMCB by November 7
   - Get public input
   - Service Delivery Policy adopted by FMCB
2. Initiate Service Planning process, starting with a pilot district as a pilot
   - Once pilot is complete, conduct rolling service planning for all 7 districts every 3 years
3. Incorporate additional measures and targets for the network in the Strategic Plan
   - Use measures to do network-wide service planning

5 Next steps

APPENDICES

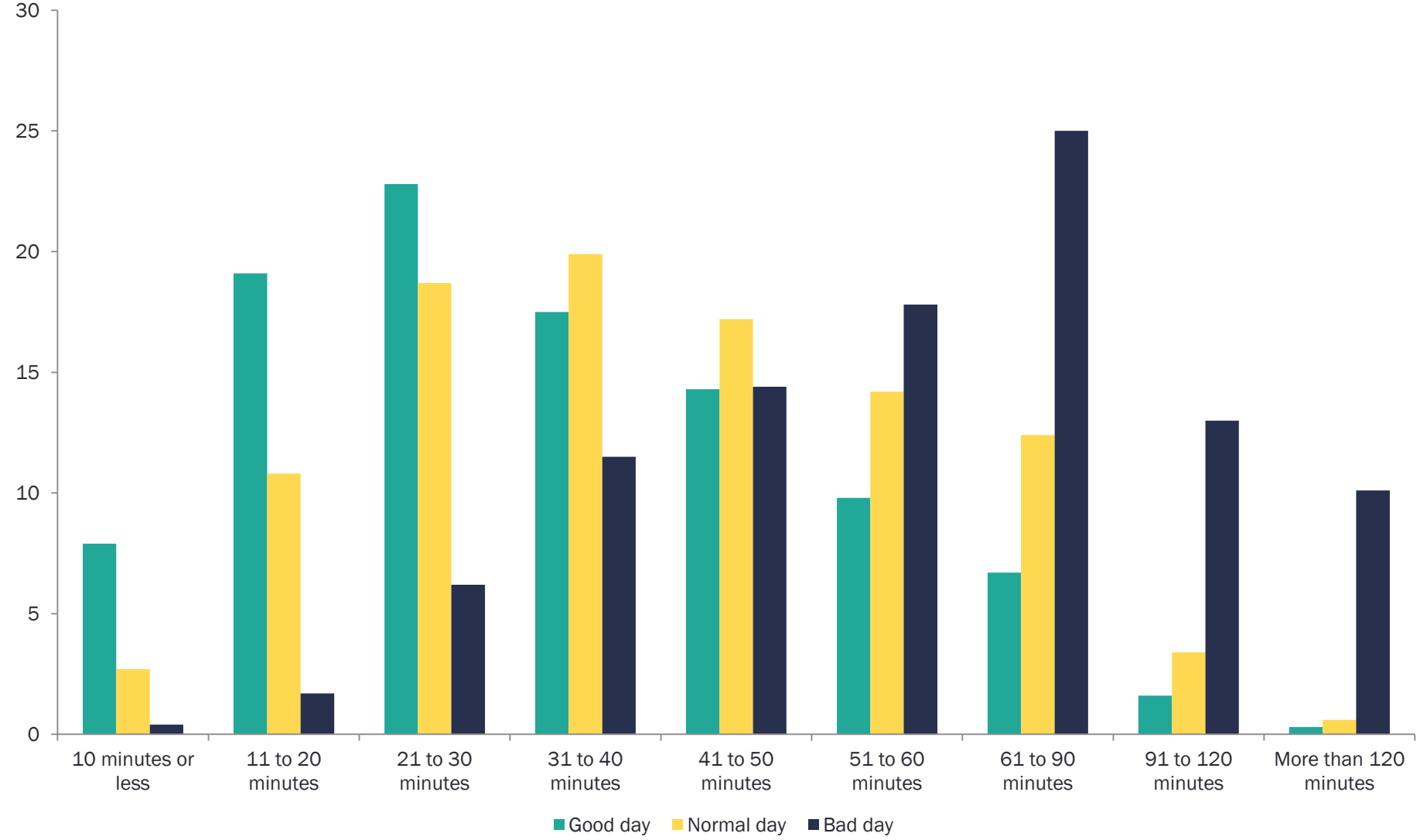
Network Standards

- Accessibility
  - Percent of total platform hours that are accessible
  - Percent of trips with at least one ADA-compliant vehicle
- Communication
  - Real-time prediction accuracy standards
    - At 0.0-to-5.0 minutes away from a stop, the difference between the prediction and the actual arrival should be between -1 and +1 minutes.
    - At 5.1-to-10.0 minutes away from a stop, the difference between the prediction and the actual arrival should be between -2 and +3 minutes.
  - Elevator status available within 10 minutes of identified change in operability status
  - 100% of stops announced according to ADA policies
  - 100% of announcements made in languages as specified by the Language Access Plan

5
Next steps

Appendix: Survey Results

How long does your most frequent trip on the MBTA take?



Source: Service Standards Survey, July 2015

7 STEPS CASE STUDY BUS CROWDING

What do these 7 steps look like in practice?

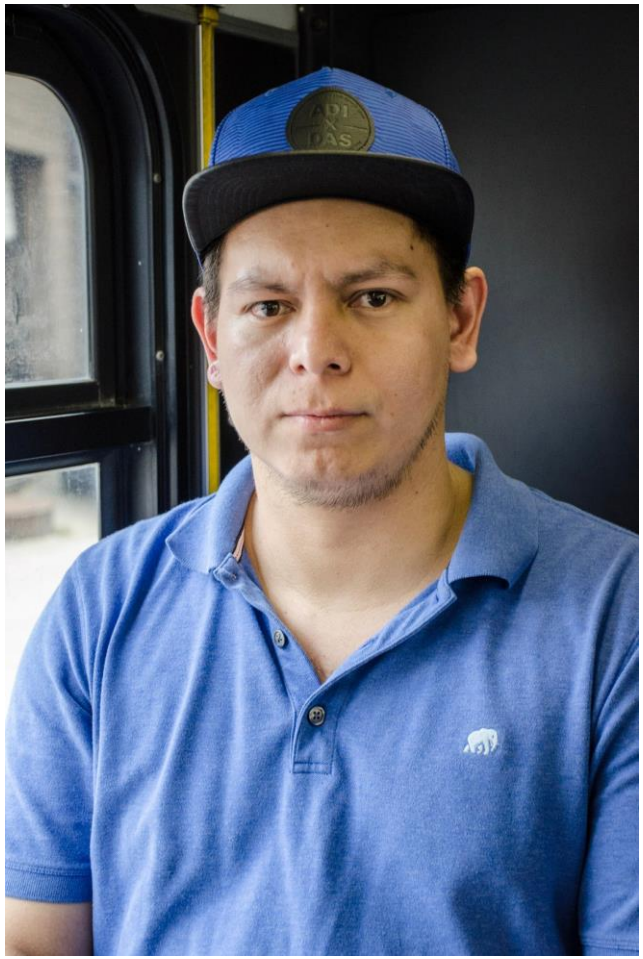
1. The Problem

Customer Experience Interviews

"I normally take the 111 bus seven days a week and it is usually very full. Sometimes it is so full that I have to wait for two or three buses to pass, and will have to wait up to 10-20 minutes for another bus.
-Edwin , 111 Rider

"Yo uso este bus normalmente todos los días, siete días a la semana. Si me vengo en el bus de las 5 PM o por la mañana, a veces tengo que esperar 2-3 buses que pasen e esperar unos 10-12 minutos para poder entrar a otro bus. Durante la mañana normalmente hay mucha gente, en un bus con capacidad de 40 personas, esto se llena entre 60-90 personas.
-Rosa Maria, 111 Rider

111



massDOT Massachusetts Department of Transportation

Customer Experience Interviews

OPMI interviewed riders on the 7, 111, 66 and 57, the most critical crowding bus routes, this is what they said…

57

I ride the 57 every day to go to work. If I am here a lot earlier I can usually get a seat. If it is a lot later it is completely packed, especially if people don't move down the bus. (As he was speaking he was being left behind by the bus that was passing by.) - Jason, 57 Rider

I am always left behind by the buses because they are too crowded. I sometimes take the green line because this bus is not as reliable. - Kioko, 57 Rider

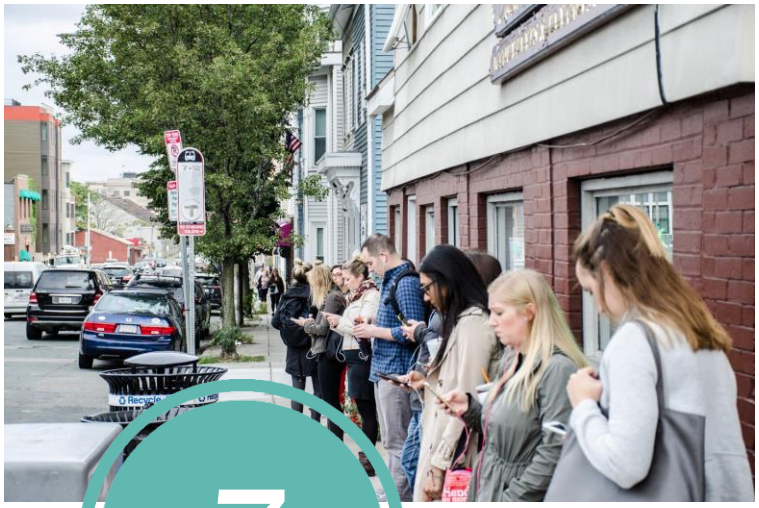
Customer Experience Interviews

"I ride the 66 bus every day to get to work, my experience really depends on the time, if I get here five minutes before, either 8:25, and the next couple of buses will be really crowded. Because this is so early on the route, I can usually get a seat, but by commonwealth ave, we are packed on the bus. In the afternoon, I usually don't take the bus back because it is so crowded" -- Lindsay, 66 Rider

66

"When I go in the morning, it is usually the case that buses come right after the other every second and then the next one does not come for another half an hour. Right around 6:30 PM coming back from work, it is very crowded and the service is very infrequent, but most of the time I would rather walk then wait for the bus for 20 minutes. As you see there are 3 buses coming, this is an everyday experience for me."
- Hema Chey , 66 Rider

Customer Experience Interviews



7

"I usually take this bus to get to work every week day. Usually it is very crowded. Usually the buses will be back to back, and sometimes there will be a bus loading people here and around the corner you would have another bus loading more people up, when they are not already full. So earlier, at like 8:45, usually the bus would be really crowded and there would be a line around the corner."

- Sean, 7 Rider

"I usually ride the 7 bus every day to go to work. I am left behind every day because the buses are too crowded. I often take other forms of transportation, Yesterday I took Uber, because I didn't feel like waiting for 3 buses until I could get on. - Kate, 7 Rider

1. The Problem

WHAT ARE PASSENGERS SAYING ON OUR SURVEYS?

"I take the 66 nearly every day and it is a total nightmare. A timely, pleasant experience would be an exception. Wait time should not be more than 10 minutes during rush hour according to the schedule and most times we get passed up by several buses before one has enough room to pick people up. And even then, it is always completely packed and miserable.

The 66 ruins my morning, every morning."

"On most days the #7 or #9 bus is overcrowded.

I sometimes have to wait 3 and 4 buses before I get on,

mostly going home during the hours of 56:30. Because I get on the bus at one of the first stops I can get on but the next 2 or 3 stops people cant get on."

"During rush hour additional 111 buses are needed at Woodlawn. Traffic causes all morning buses to arrive 15-20 min late each day. Due to over crowding, you can wait 45 min to get on a Woodlawn bus...You have to force your way on.

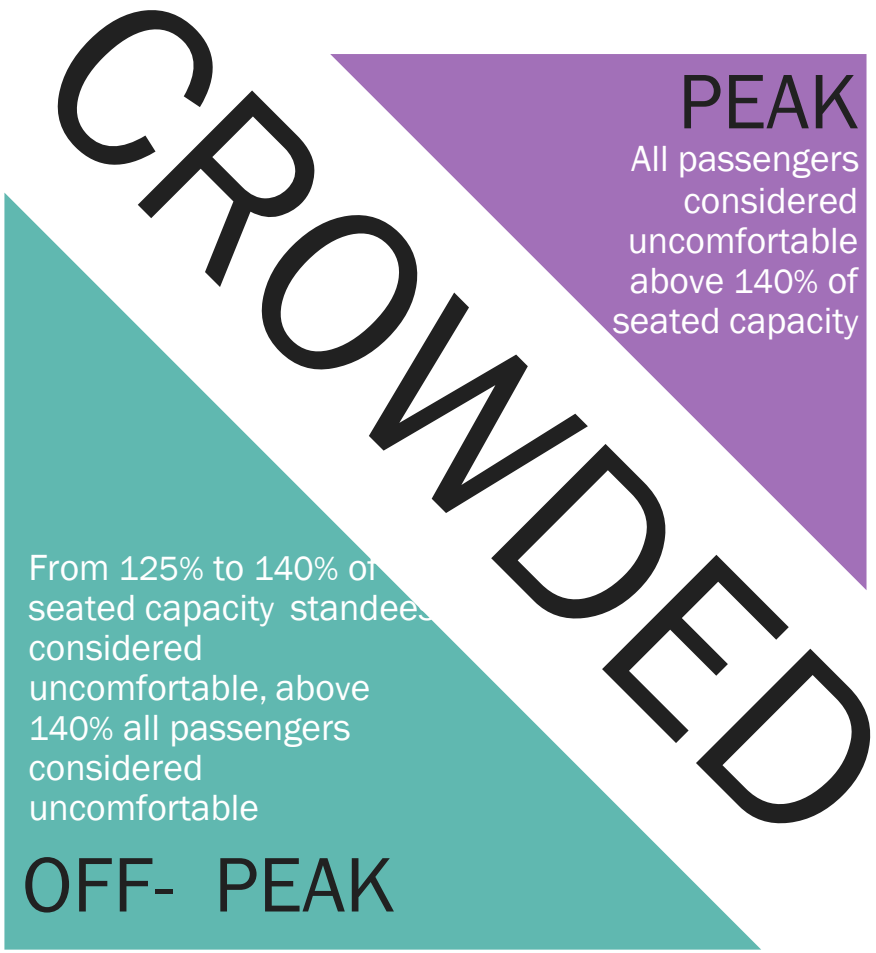
This is not a pleasant experience."

"The crowds on the buses have gotten dangerously large over the last 6 months during all hours of the day.

Buses are ...crammed full of people, with drivers who frequently stop short, drive too fast, and threaten the safety of all on the bus. The number of buses during busy times is nowhere near what it needs to be to serve the clientele safely."

massDOT Massachusetts Department of Transportation

How do we define crowded?



MAGNITUDE

Measure amount of passenger time that is uncomfortable.

PROPORTION

Percent of passenger time that is comfortable

2.
Metrics

A route is considering failing the measure if less than 95% of passenger hours are comfortable

massDOT Massachusetts Department of Transportation

What does crowded look like?

150% of seated capacity

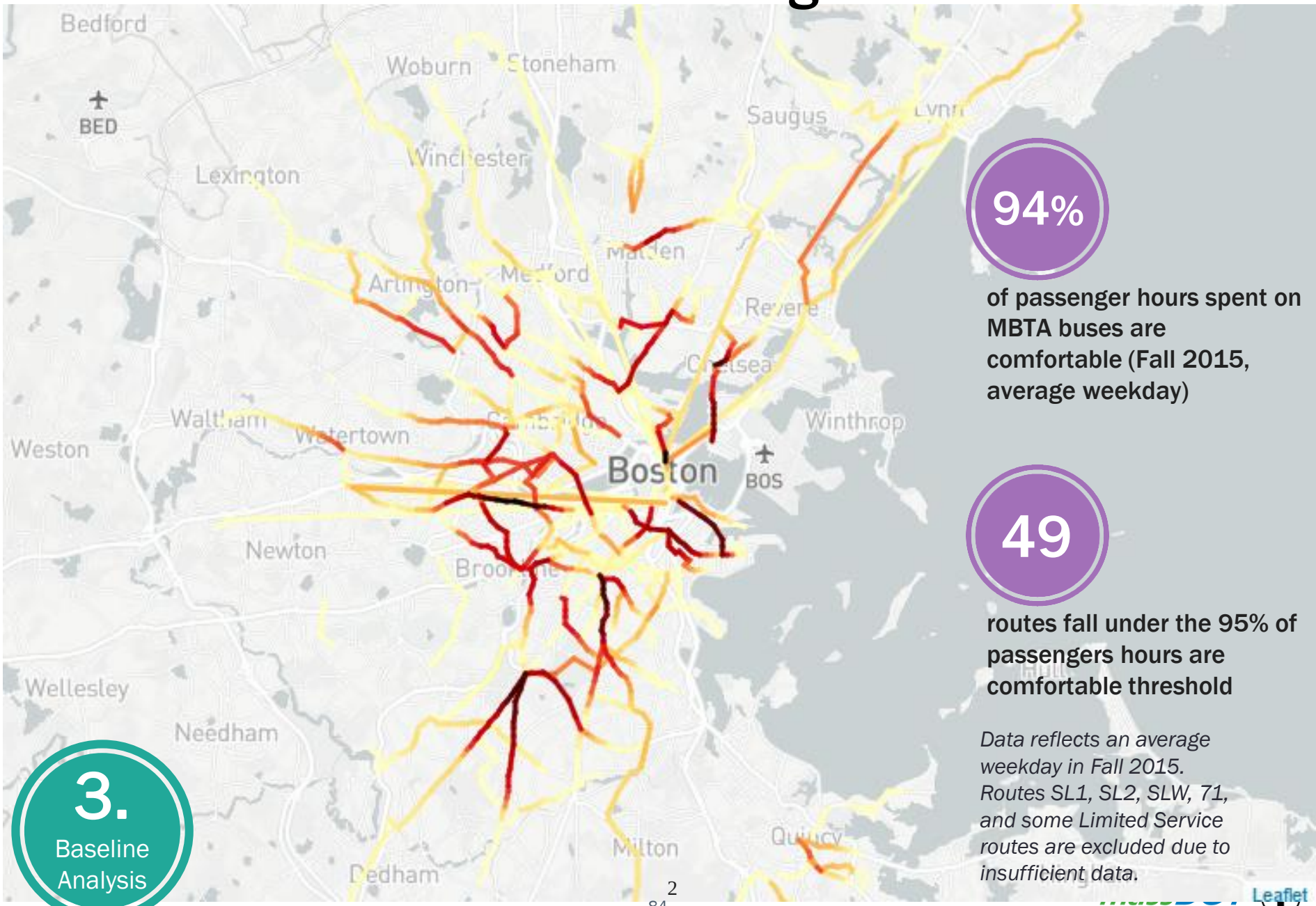
154% of seated capacity

Above 140% of seated capacity, all passengers are considered uncomfortable

2. Metrics

massDOT Massachusetts Department of Transportation

Bus crowding



94%

of passenger hours spent on MBTA buses are comfortable (Fall 2015, average weekday)

49

routes fall under the 95% of passengers hours are comfortable threshold

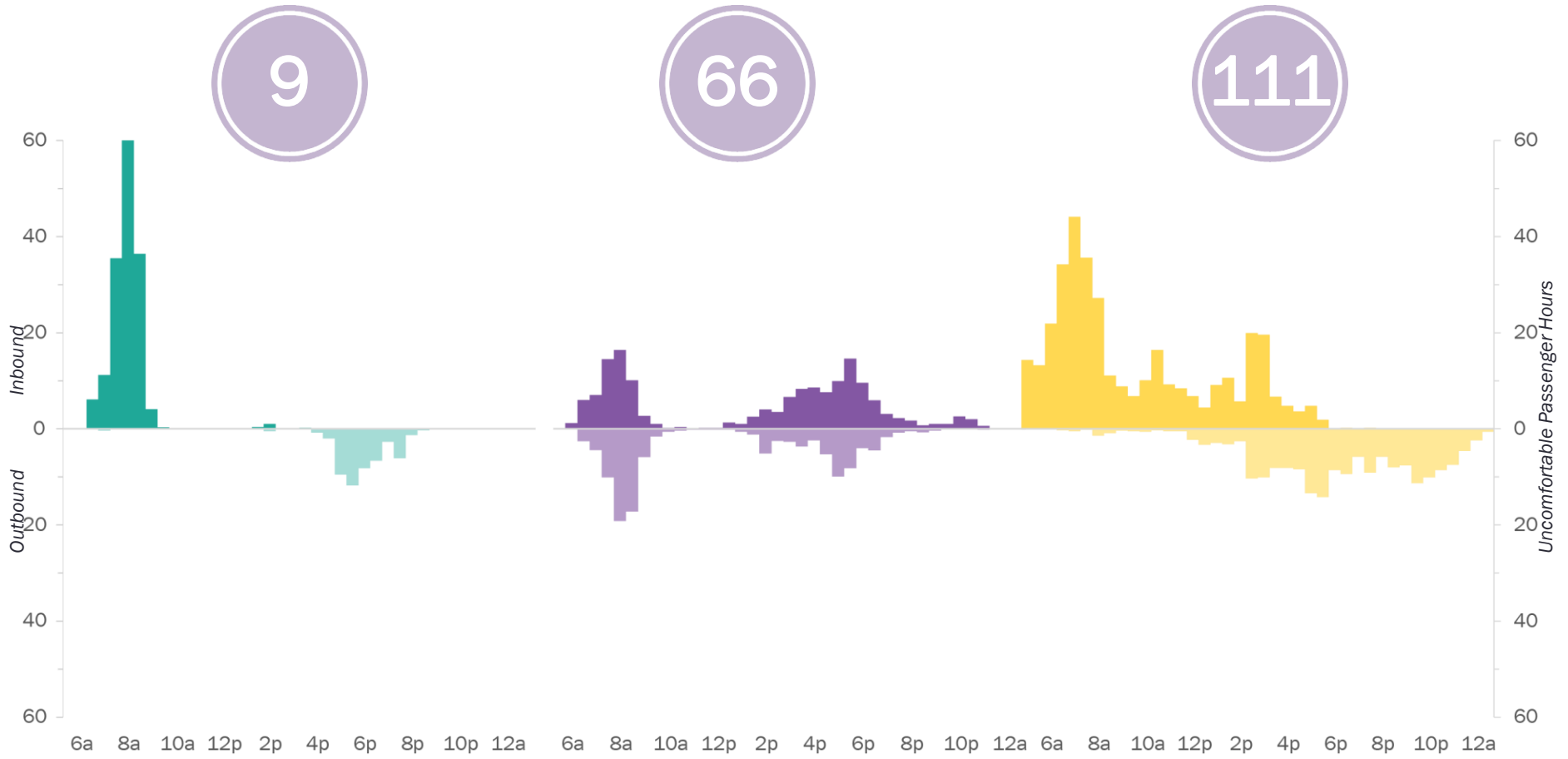
Data reflects an average weekday in Fall 2015. Routes SL1, SL2, SLW, 71, and some Limited Service routes are excluded due to insufficient data.

3. Baseline Analysis

Massachusetts Department of Transportation

Leaflet

Patterns of bus crowding



3. Baseline Analysis

massDOT Massachusetts Department of Transportation

Causes of bus crowding

Preliminary analysis indicates different causes of crowding for different bus routes and at different times of day.

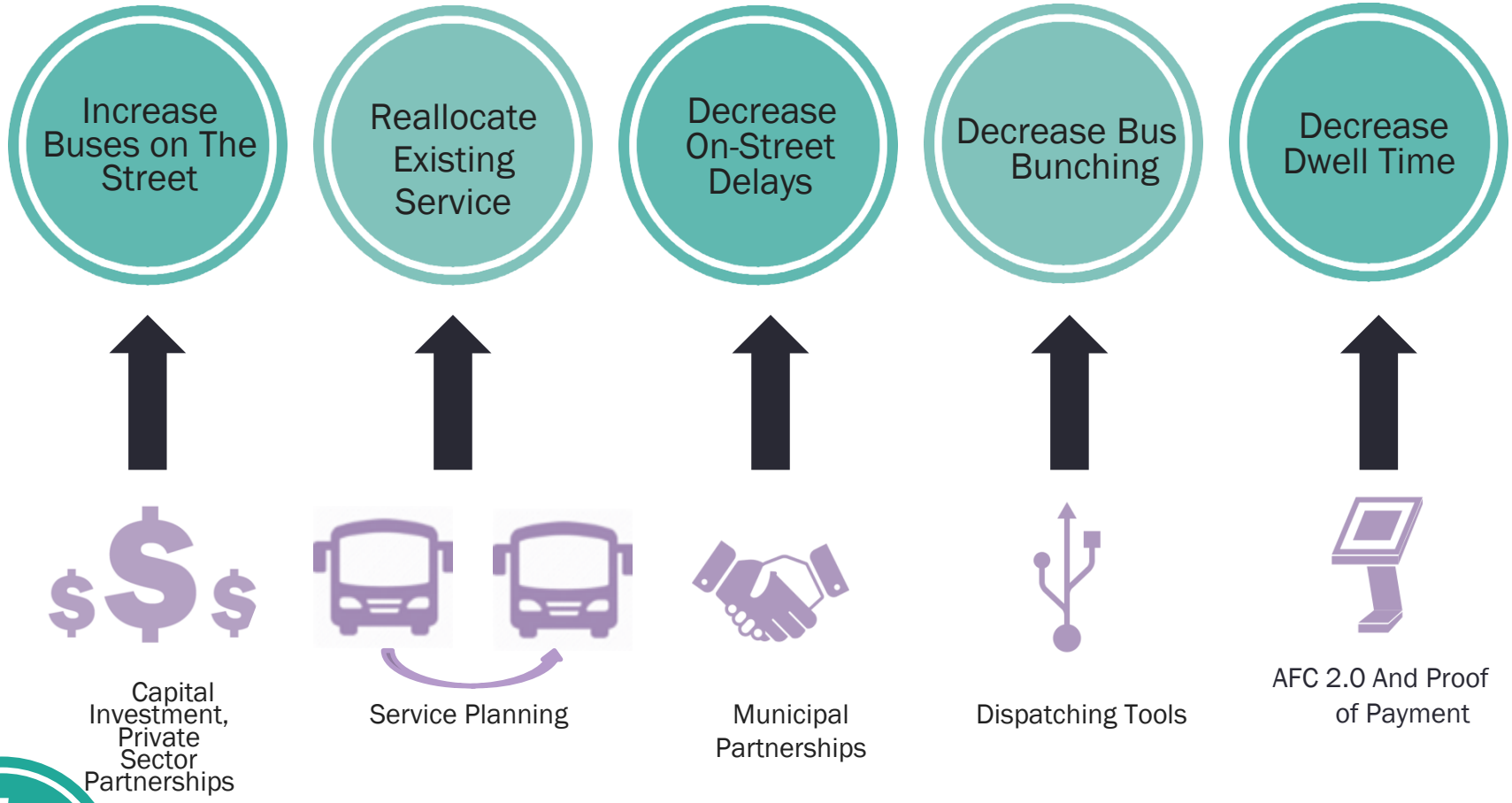
Crowding can be caused by:

- Bus bunching
- Not enough service in a specific time period
- Dropped trips
- Uneven passenger demand

This analysis will inform which tools to use to address the problem.

3. Baseline Analysis

What tools can we use to solve this?



5. Tools

massDOT Massachusetts Department of Transportation