

KENDALL SQUARE MOBILITY TASK FORCE

Meeting #6

Bus Enhancements and Priority Corridors

September 6, 2016



massDOT
Massachusetts Department of Transportation



AGENDA

- Introductions and Admin 10 min
- Bus Enhancements 35 min
- 2040 Base Case Model Results 10 min
- Bus Priority Corridors 50 min
- Next Steps 5 min
- Public Comment 10 min



An aerial photograph of Boston, Massachusetts, showing the city skyline and the harbor. The harbor is filled with water, and several sailboats are visible. The city buildings are densely packed, and the harbor is bordered by a road and a bridge. The text "ADMINISTRATIVE ITEMS" is overlaid on the image in a large, bold, black font.

ADMINISTRATIVE ITEMS





TASK FORCE SCOPE

- Task Force Co-Chairs:
 - Brian Dacey: Kendall Square Association VP
 - Susanne Rasmussen: City of Cambridge, Community Development Department
- Task Force Staff / Website
 - Transitioned to City of Cambridge
 - New website: <http://www.cambridgema.gov/CDD/Projects/Transportation/kendallsquaremobilitytaskforce>
 - MassDOT consultant work to be complete by September 30, 2016
- Key Coordination
 - CTPS: 2040 Base Case modeling, evaluate bus alternatives
 - Focus40 goals, Gaps Analysis, evaluation criteria
- MassDOT and the MBTA remain members of the Task Force





TASK FORCE SCOPE

- Remaining Scope (to be complete in January 2017):
 - Finalize opportunity statements and associated actions (complete), and tie to existing conditions data
 - Finalize evaluation criteria/performance measures
 - Develop transportation priorities
 - Enhanced bus connections alternatives
 - Bus priority corridor concept
 - Red Line capacity
 - Grand Junction transportation options
 - Shuttles and Transportation Network Companies (TNCs)
 - Recommend policies and projects (short and long-term)





TASK FORCE MEETINGS

Type	Description	Date
Task Force	Bus priority concepts / Red Line capacity	September 20, 2016
Public	Bus alternatives / priority concepts / Red Line capacity	October 12, 2016 (NEW DATE)
Task Force	Bus alternatives analysis (CTPS) and Grand Junction mobility charrette	October 25, 2016
Task Force	Draft policy recommendations	November 22, 2016
Public	Summary of work and discussion of draft recommendations	December 13, 2016
Task Force	Present/finalize recommendations	January 17, 2017





ADDITIONAL RESOURCES

Additional Study Resources and Analysis

- Red Line capacity (developer mitigation)
 - \$50k available from Boston Properties mitigation
 - Must be scoped and put out to bid
 - Scope may not be clear until early 2017
- Grand Junction Transit Feasibility and Workshop
 - \$35k from Grand Junction Greenway design funds
 - Workshop on October 25, 2016





ADDITIONAL RESOURCES

- MIT mitigation
 - \$175k for transit and mobility studies prior to the issuance of a Certificate of Occupancy for commercial development over 300,000 s.f. of Gross Floor Area
 - \$250k for transit investments prior to the issuance of a Certificate of Occupancy for commercial development over 600,000 s.f. of Gross Floor Area.
 - Possible uses:
 - Red Line peak capacity and demand
 - Communication-based-train-control (CBTC) systems
 - MBTA bus service and bus priority treatments





ADDITIONAL RESOURCES

- Kendall Square Transit Enhancement Program (KSTEP)
 - Parties involved: City, CRA, Boston Properties (BP), MBTA, MassDOT
 - \$6 million initially from BP to “preserve, enhance, and expand transit access and mobility in Kendall Square”
 - Could include, for example:
 - Capital investments for Red Line, bus, shuttles
 - Operating and capital support for new ground transportation
 - Submitted draft MOU to MEPA as part of Notice of Project Change in 2016
- Additional topics or analysis?



An aerial photograph of Boston, Massachusetts, showing the city skyline and the harbor. The harbor is filled with water, and several sailboats are visible. The city buildings are densely packed, and the harbor is bordered by a promenade with trees. The text "BUS ENHANCEMENTS" is overlaid on the image in a large, bold, black font.

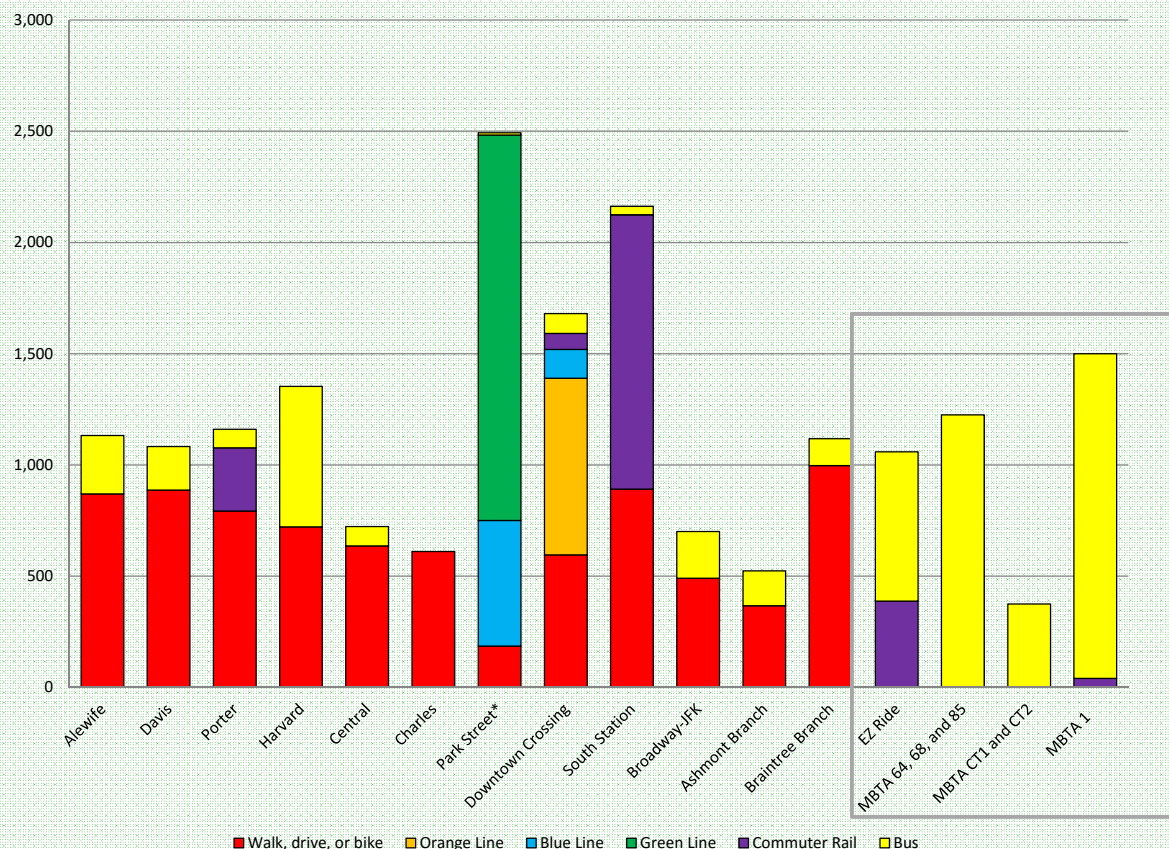
BUS ENHANCEMENTS





EXISTING CONDITIONS: BUS SERVICE IN CONTEXT

Estimated Kendall Weekday Arrivals via Public Transit



- 22% of transit trips to the Kendall study area arrive via bus
- Of those bus trips, about 19% of passengers entering the study area are transfers to the Red Line

Arriving in the Study Area on a Bus





BUS SERVICE IMPROVEMENT PRINCIPLES

- *Improve existing services* with strong linkage to/from the study area and direct routes, but poor quality of service. Look at routes now carrying the highest shares of total transit travel to/from Kendall, any or all of:
 - MBTA 1 (Boston) – 6% (1,250 trips)
 - EZRide – 6% (1,225 trips)
 - MBTA 64 – 4% (775 trips)
 - MBTA 85 – 3% (625 trips)
- *Provide new direct connections* to/from locations identified as poorly connected relative to others (and with high demand for trips to Kendall): Charlestown, Allston/Brighton, Somerville, Medford
- *Create high-quality bus corridor(s)* to improve generally low-speed (8 mph) local bus operation and poor service reliability (high excess wait times)





- Existing bus routes carrying the highest shares of total transit travel to/from the study area:
 - MBTA 1 (Boston) – 6% (1,250 trips)
 - EZRide – 6% (1,225 trips)
 - MBTA 64 – 4% (775 trips)
 - MBTA 85 – 3% (625 trips)

EXISTING SERVICES: KENDALL ‘LINKAGE’

Route (Destination)	Total Weekday Boardings for Route	Weekday Boardings from Kendall	Percentage of Route's Boardings to Kendall	Percentage of Kendall Transit Arrivals via this Route
1 (Harvard)	4,200	250	6%	1%
1 (Dudley)	8,900	1,250	14%	6%
CT 1 (BMC)	2,500	125	5%	1%
CT 2 (Sullivan)	1,550	175	11%	1%
CT 2 (Ruggles)	1,500	250	17%	1%
64 (Oak Square)	2,000	775	39%	4%
68 (Harvard)	500	475	95%	2%
85 (Spring Hill)	650	625	96%	3%
EZ Ride	1,976	1,227	62%	6%



'SPOT' IMPROVEMENTS FOR LOCAL BUSES

- 'Toolbox' of measures might include:
 - Sections of exclusive bus lane
 - Queue jumpers
 - Traffic signal priority
- Implementation requires evaluation of 'toolbox' measures for each identified 'hot spot'.
- Some 'hot spots' may not be remediable because of local circumstances





OPERATIONAL IMPROVEMENTS FOR LOCAL BUSES

- ‘Toolbox’ of measures might include:
 - Stop consolidation or relocation
 - Rear door exits only
 - Rerouting (e.g. CT2 southbound via Ames St.)
- Measures will need to be coordinated with MBTA Bus Operations





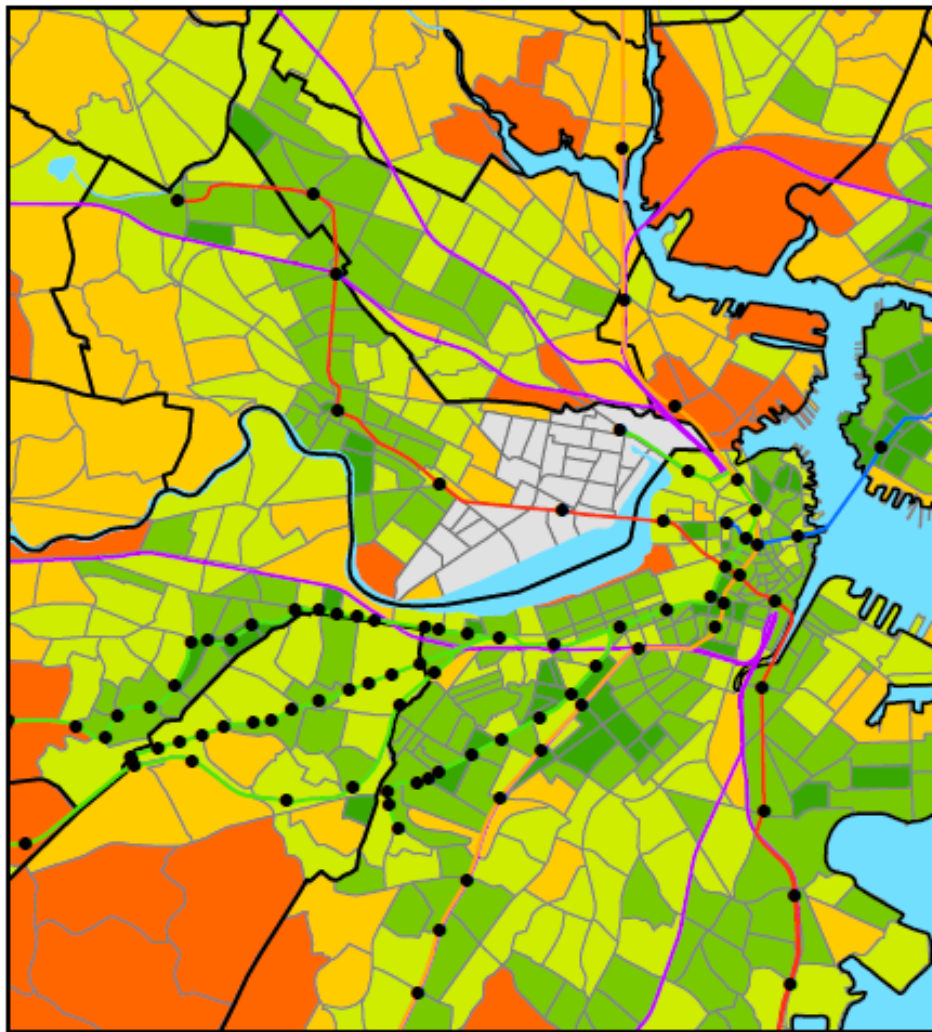
NEW CONNECTIVITY

- Possibilities for *new* connections would:
 - Serve areas that are poorly connected
 - In terms of transit door-to-door time;
 - In terms of number of transfer required; and
 - In terms of a lower transit mode share relative to areas at a comparable distance from Kendall
 - Be strongly linked to Kendall in terms of number of trips being made, and
 - Serve communities with a high percentage of Kendall Square employees as identified by PTDM



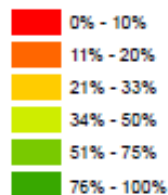
TRANSIT MODE SHARE TO/FROM KENDALL SQUARE

- Locally, proximity to rapid transit is very important
- Green Line service area has high transit mode share, despite being less well connected than Red Line station vicinities
- Some nearby areas (Charlestown, Everett, Medford) have a relatively low transit mode share to Kendall

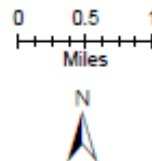
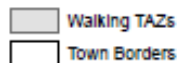


Transportation Analysis Zones

Transit Mode Share



MBTA Line

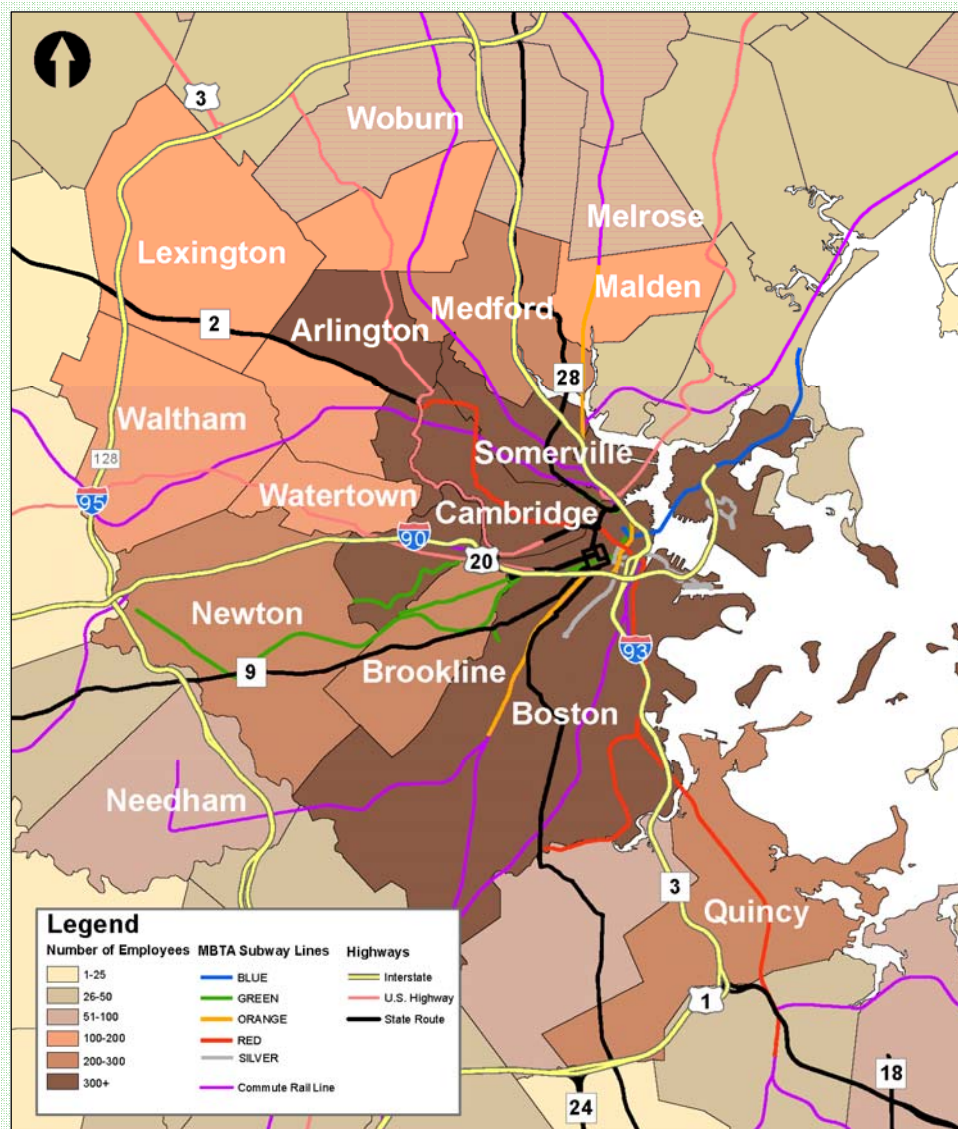




KENDALL SQUARE EMPLOYEE ORIGINS (PTDM DATA)

Greatest concentration
of employees from:

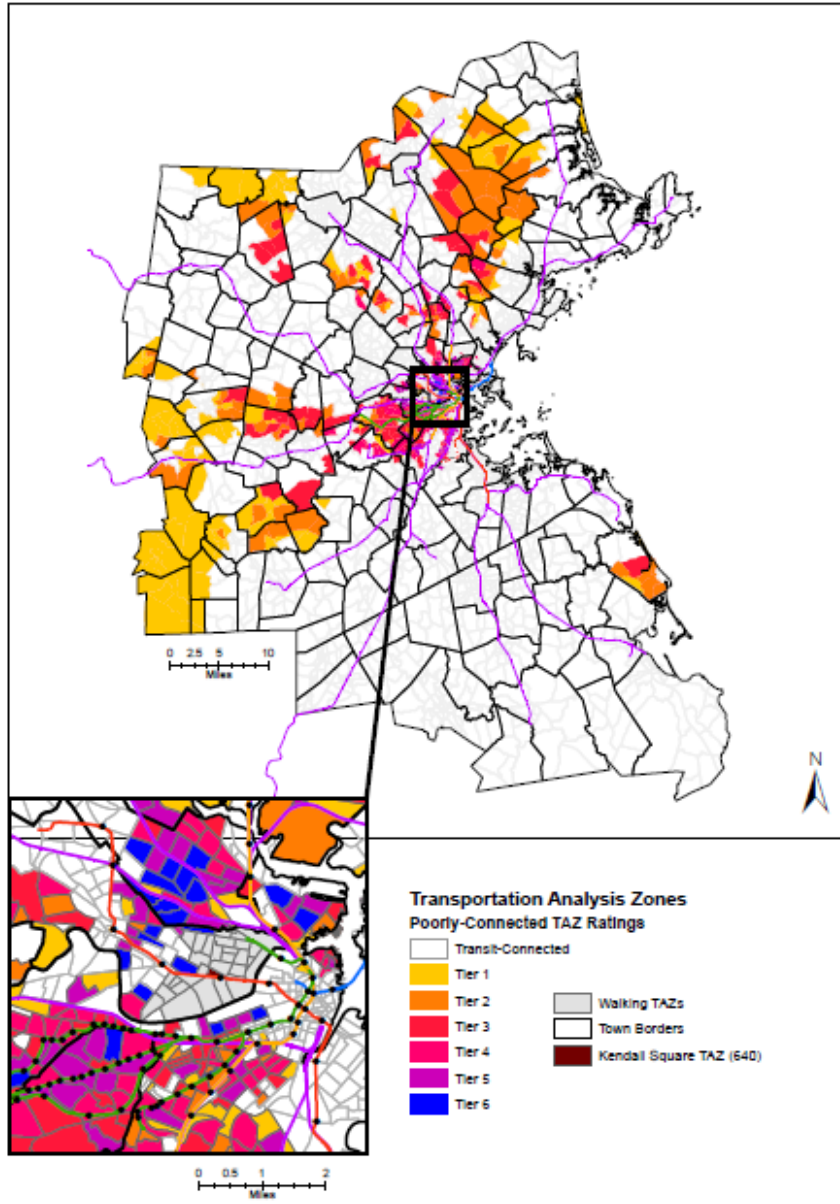
- Cambridge
- Boston
- Somerville
- Arlington



CTPS

TAZs Poorly-Connected
to Kendall Square by Transit

Kendall Square
Task Force



POOR CONNECTIVITY AND KENDALL LINKAGE

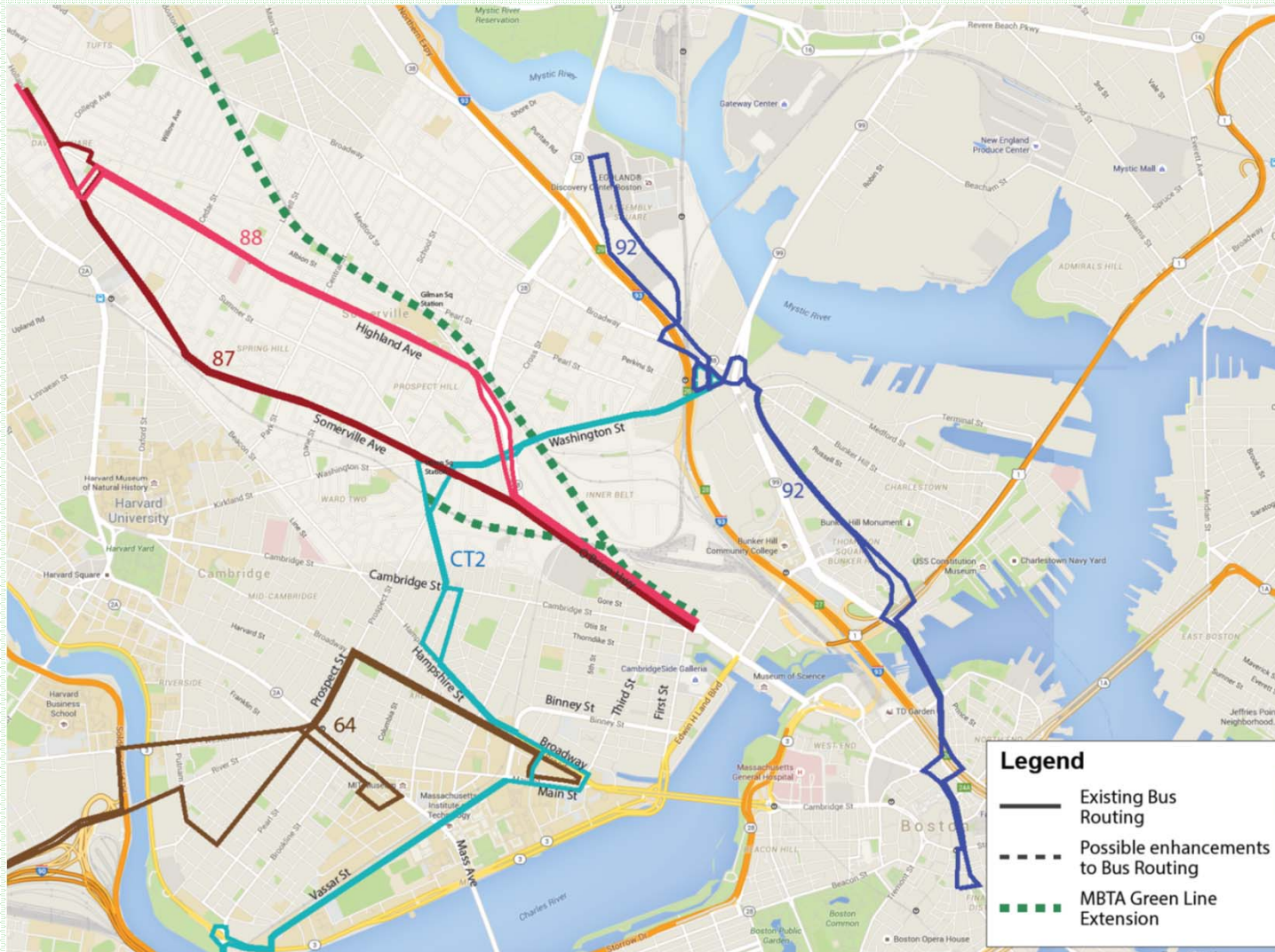
- Suburban poorly-connected areas do not have high trip end density. Better transit connections to central Boston would help Kendall.
- More locally, areas of potential include:
 - Charlestown
 - Medford/Somerville
 - North Brookline
 - Allston/Brighton
 - Cambridgeport



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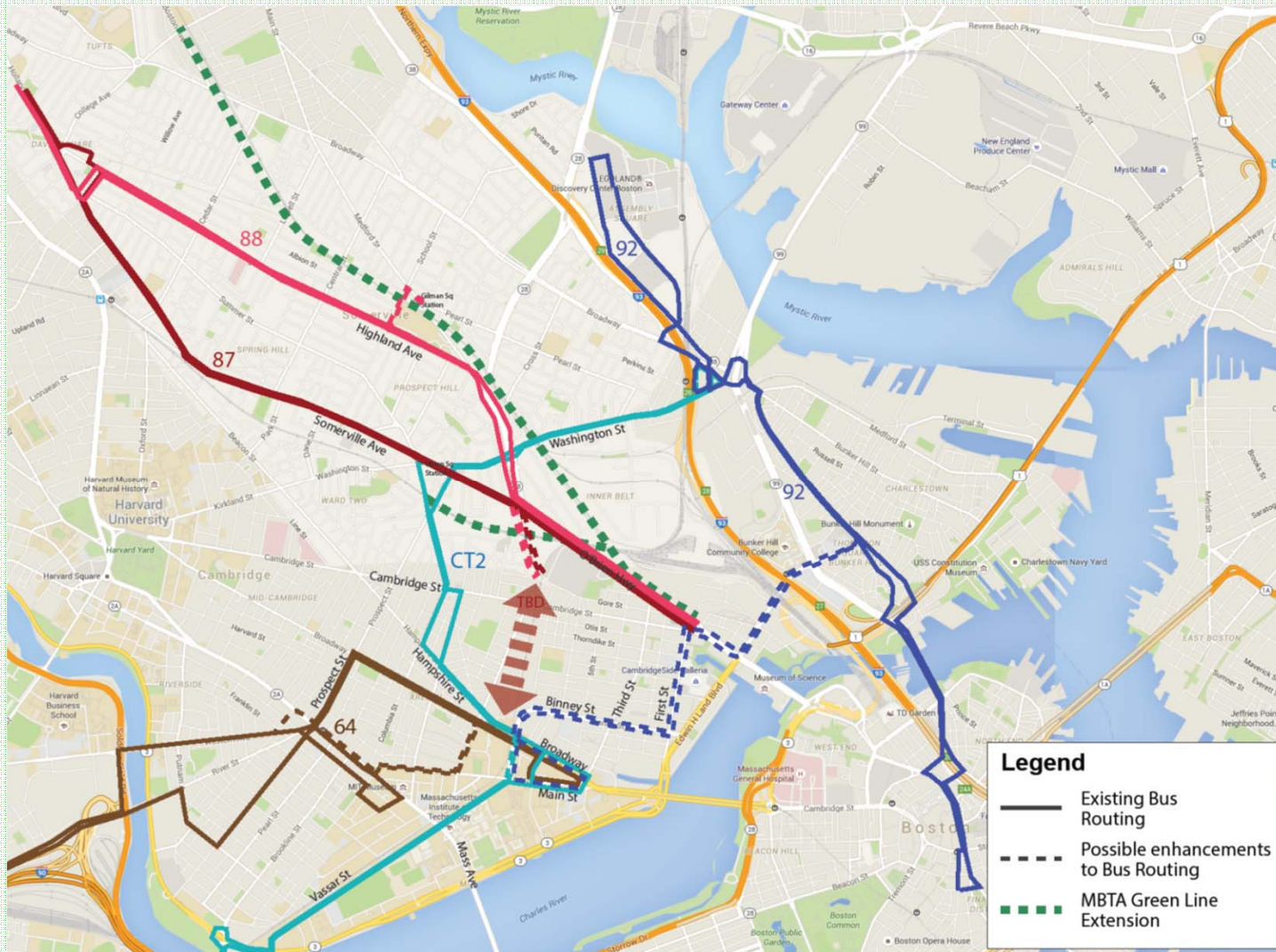
ENHANCED CONNECTIONS: OVERVIEW

Routes being considered: 64, CT2, 87, 88, 92



ENHANCED CONNECTIONS: OVERVIEW

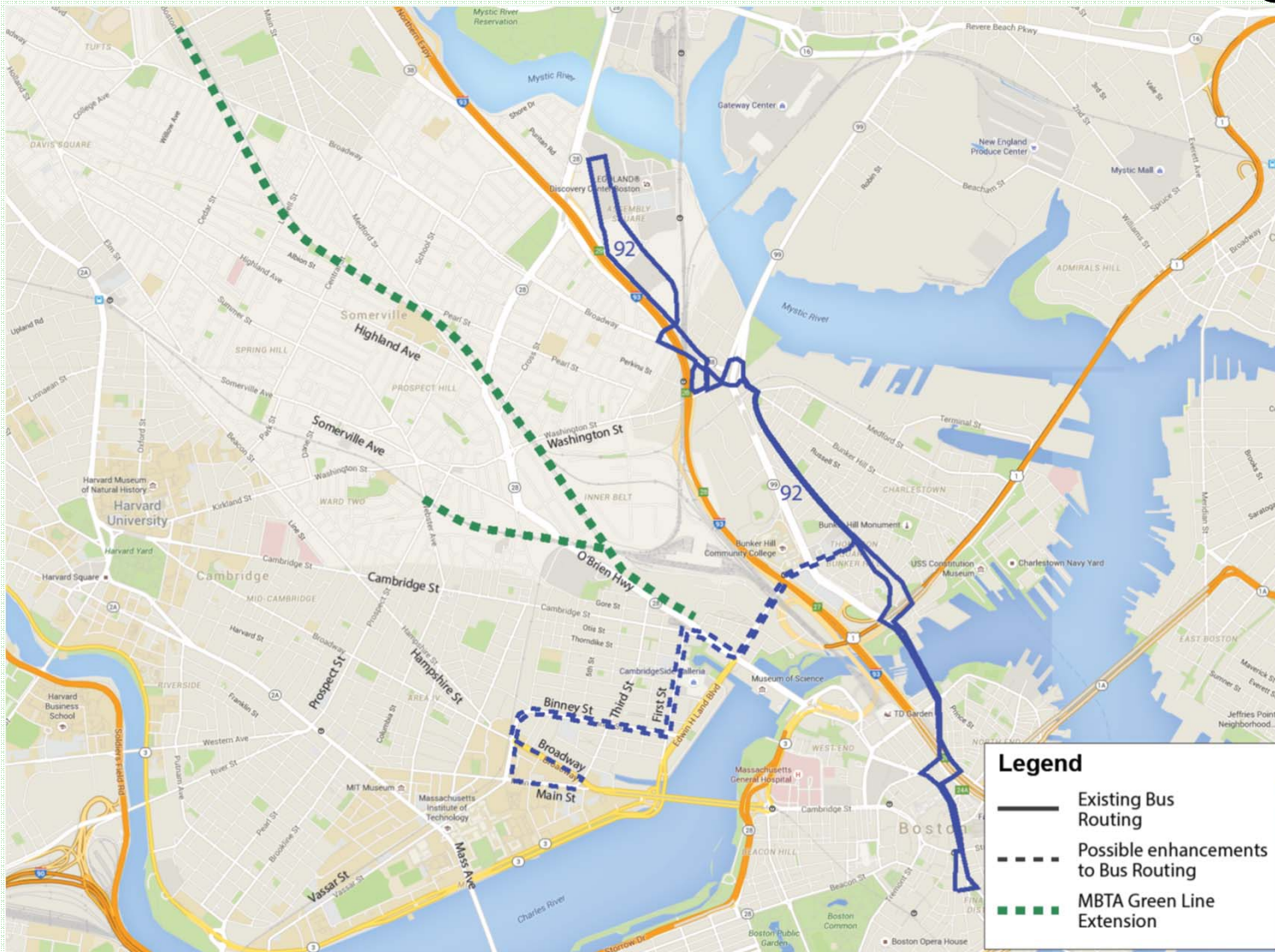
Routes being considered: 64, CT2, 87, 88, 92





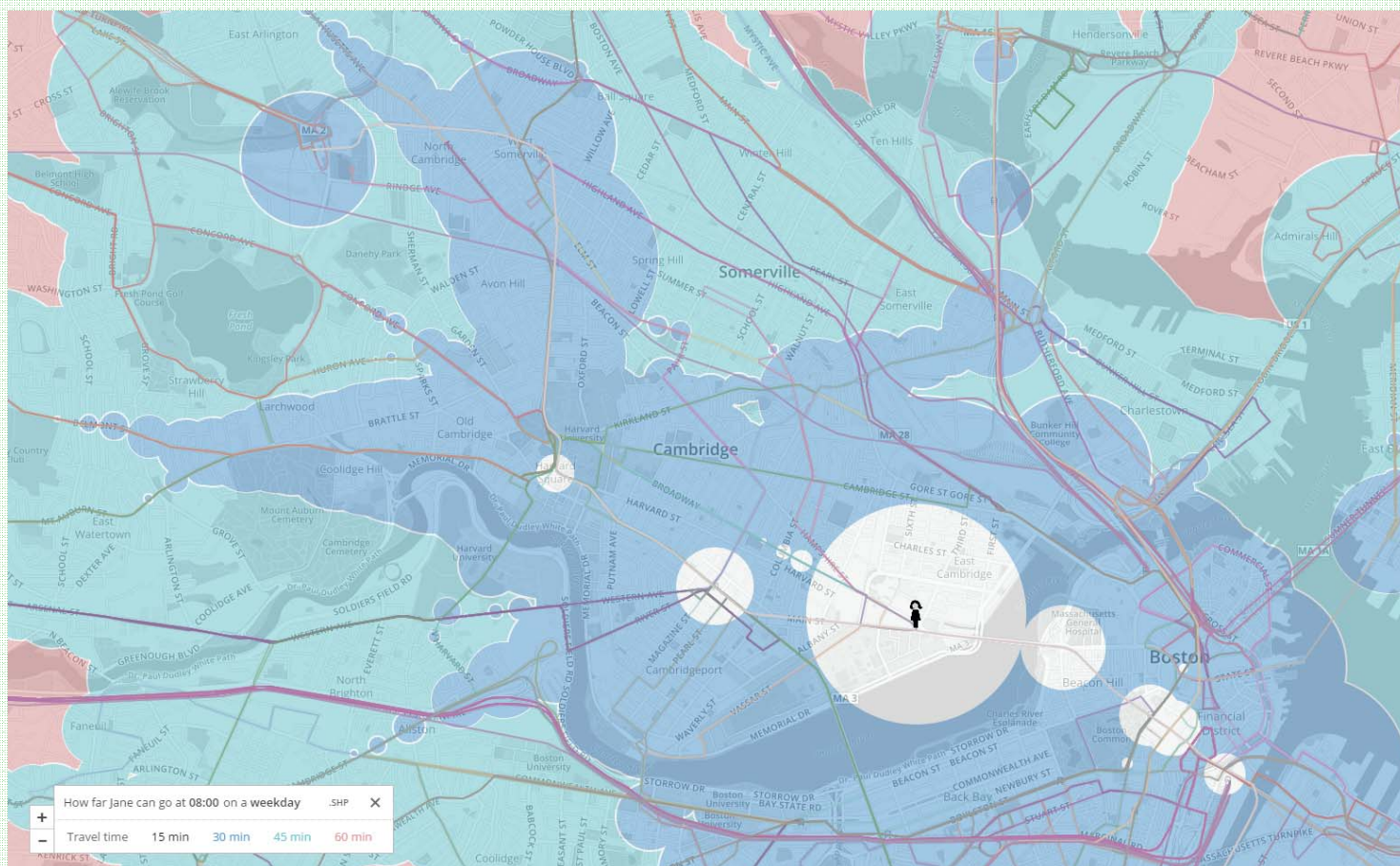
ENHANCED CONNECTIONS: CHARLESTOWN

- Modifying routes or adding services to provide direct connections from established service areas in Charlestown to Kendall and the GLX



8AM

TRAVEL TIME BEFORE ENHANCEMENTS

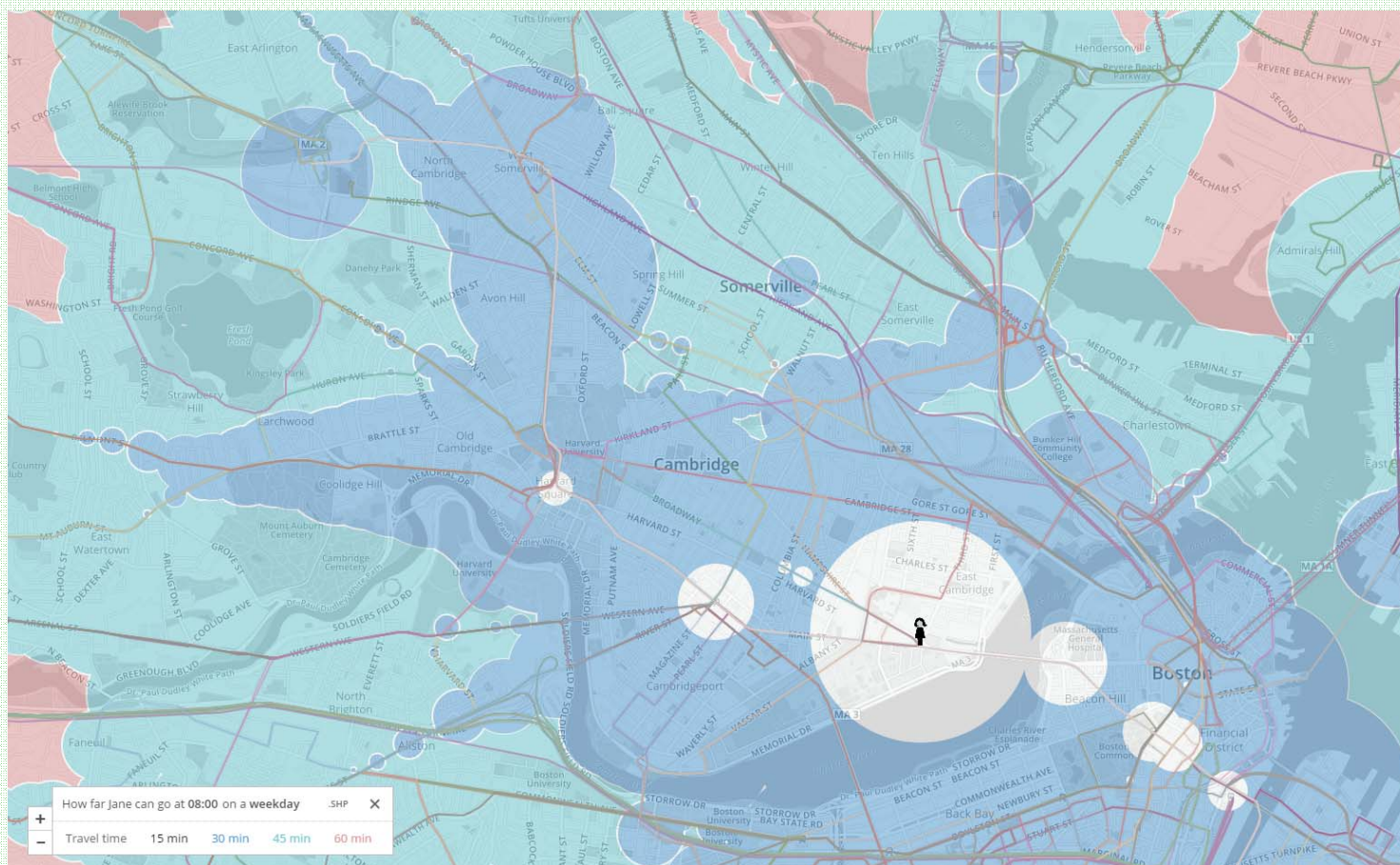


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AFTER, GLX & SOME 92 TO KENDALL VIA FIRST

8AM

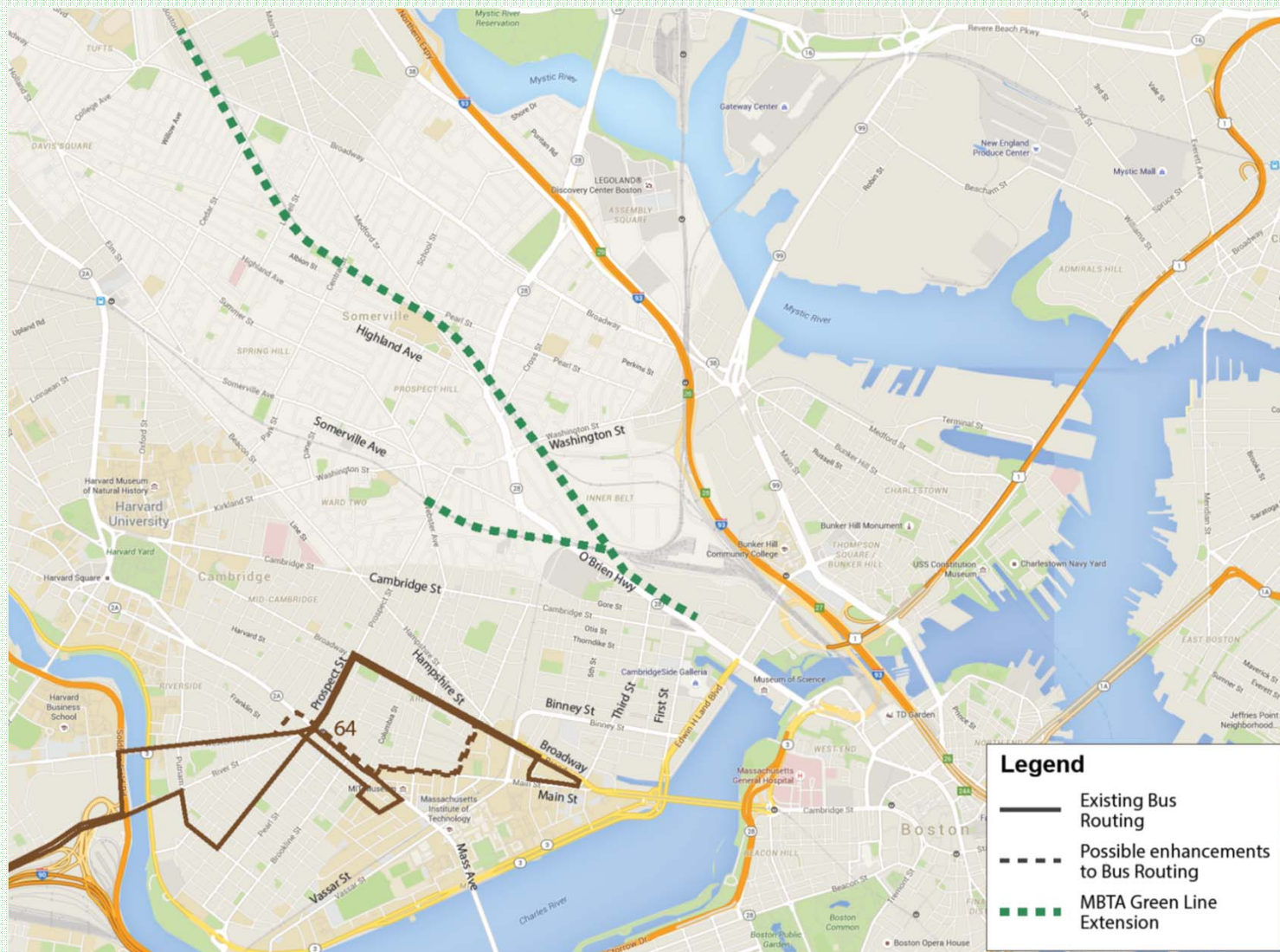


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ENHANCED CONNECTIONS: CAMBRIDGEPORT/ALLSTON/BRIGHTON

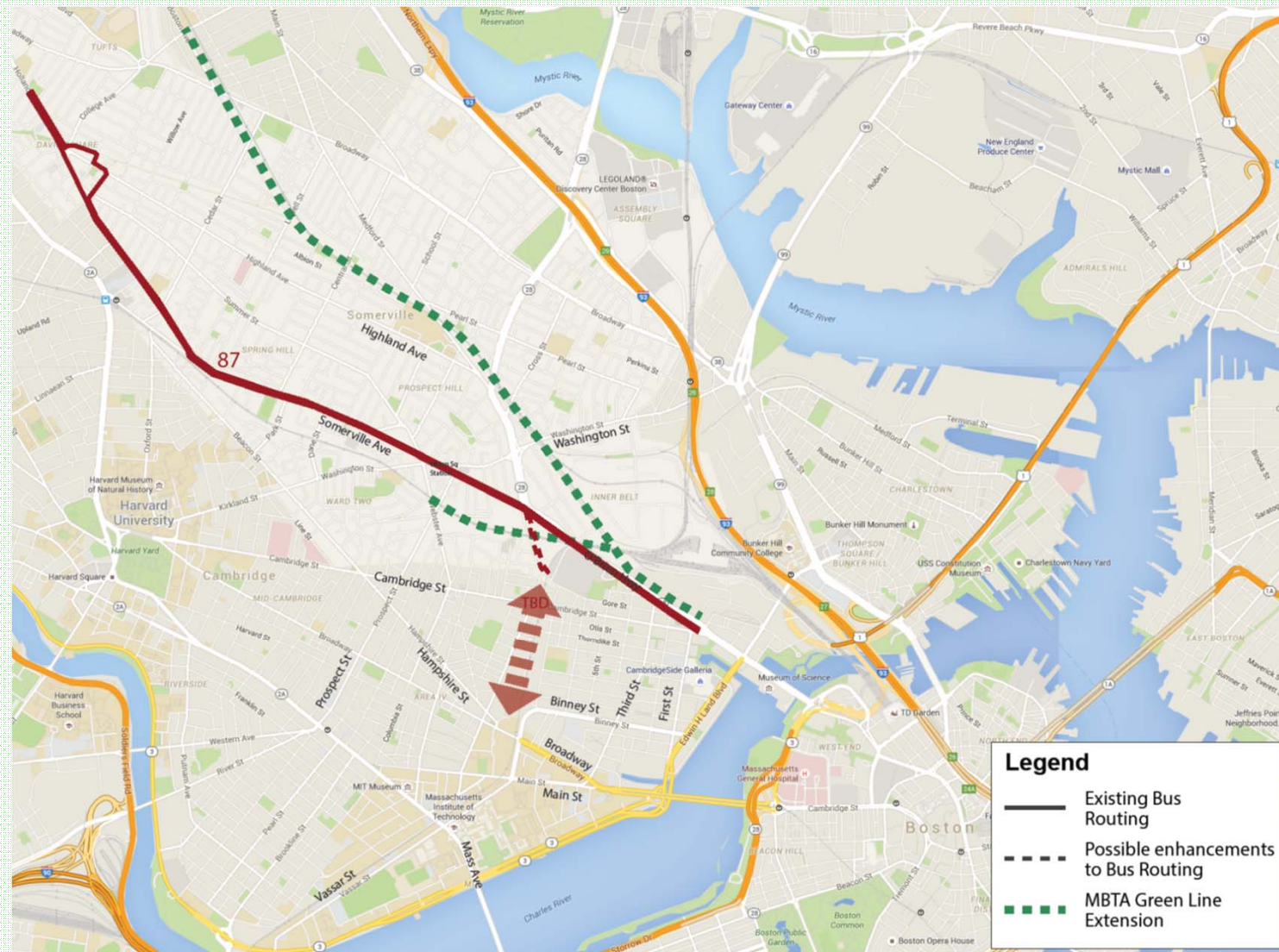
- Re-route peak route 64 between Central Sq and Kendall from Broadway to Mass Ave
- Consider off-peak service on this portion of the route





ENHANCED CONNECTIONS: SOMERVILLE/CAMBRIDGE

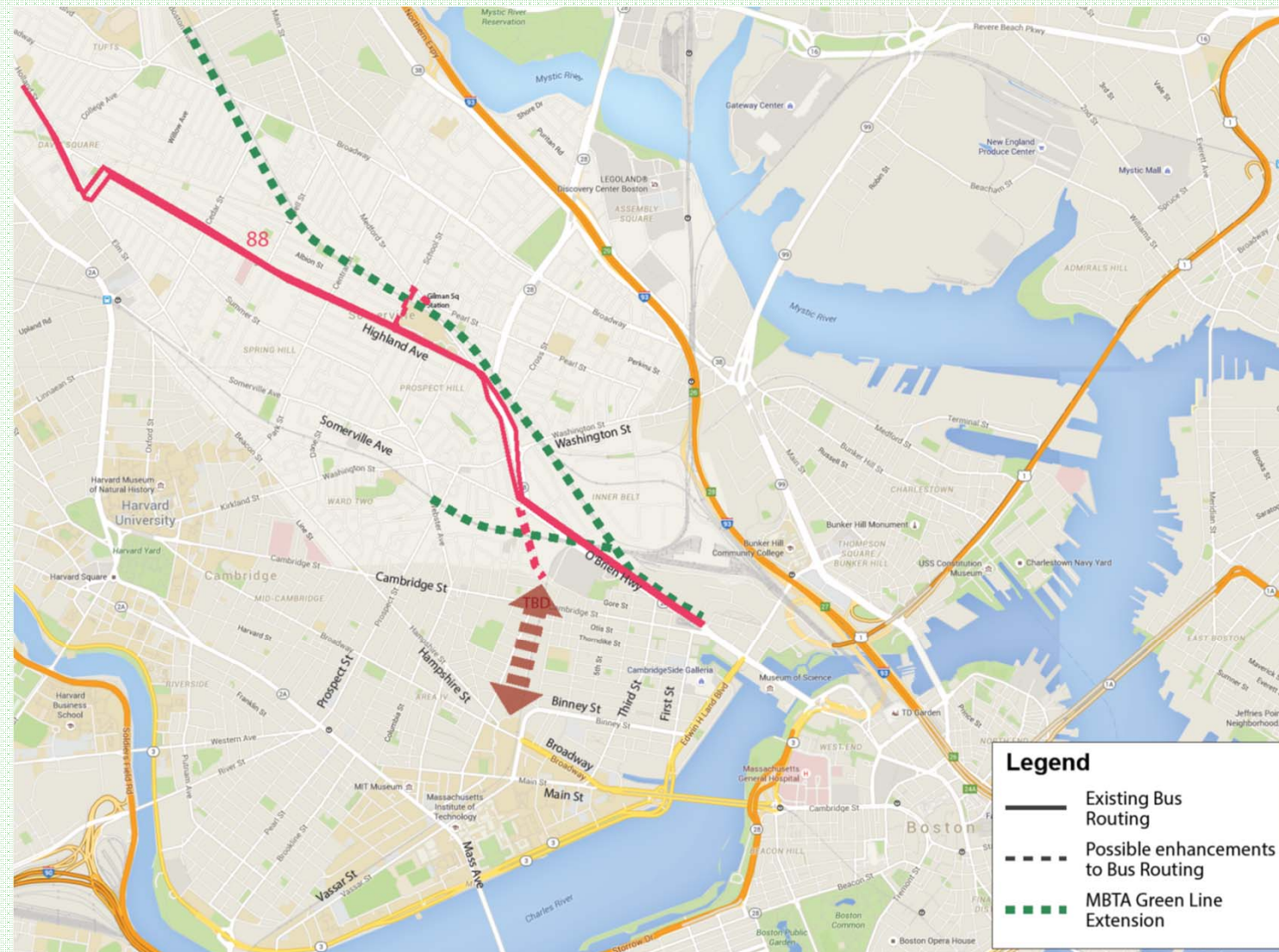
- Bring routes 87 and 88 into Kendall vs Lechmere. Connections with Green Line would occur further west on the GLX.
- Route from Cambridge St to Kendall TBD, could use First St but longer distance





ENHANCED CONNECTIONS: SOMERVILLE/CAMBRIDGE

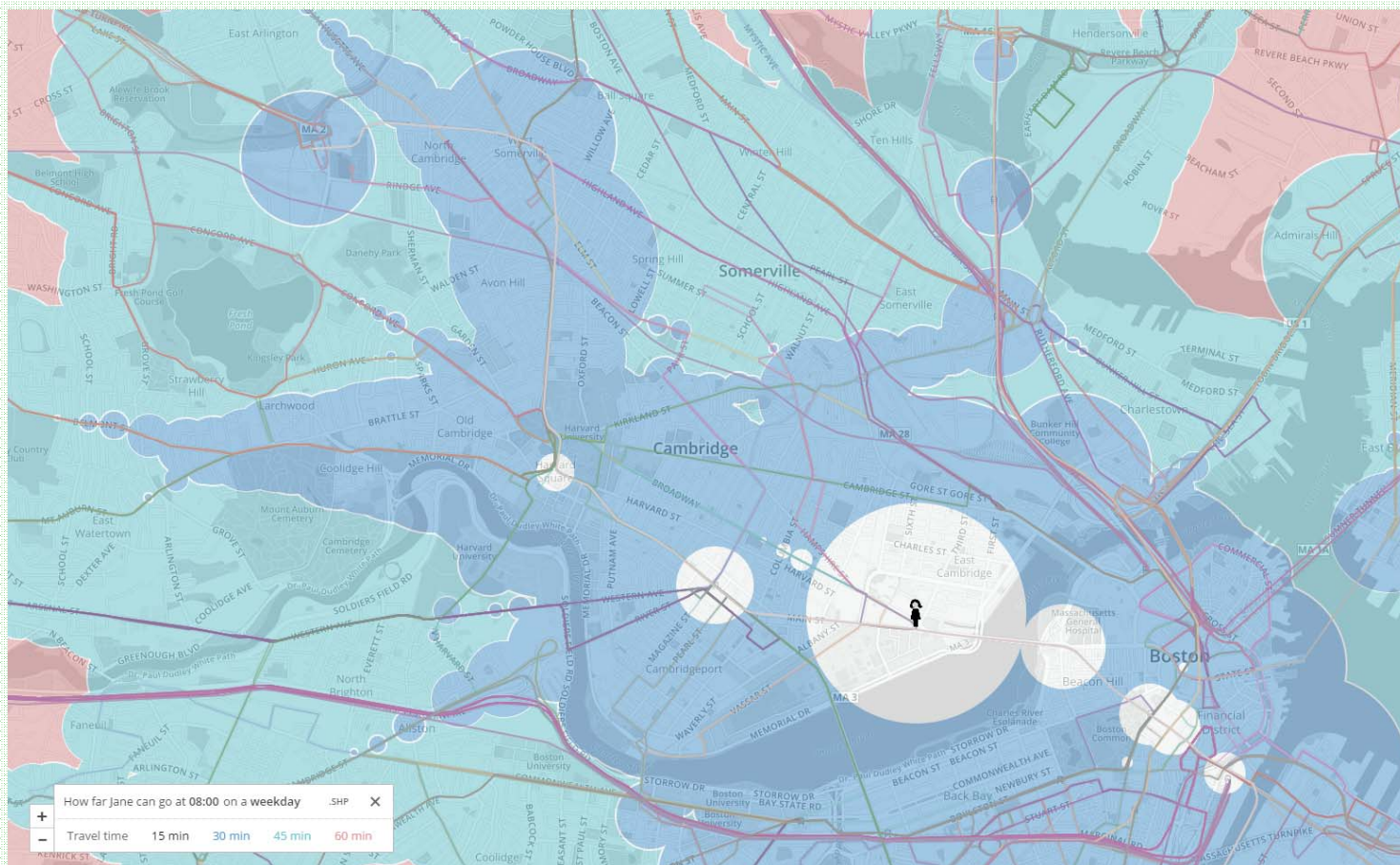
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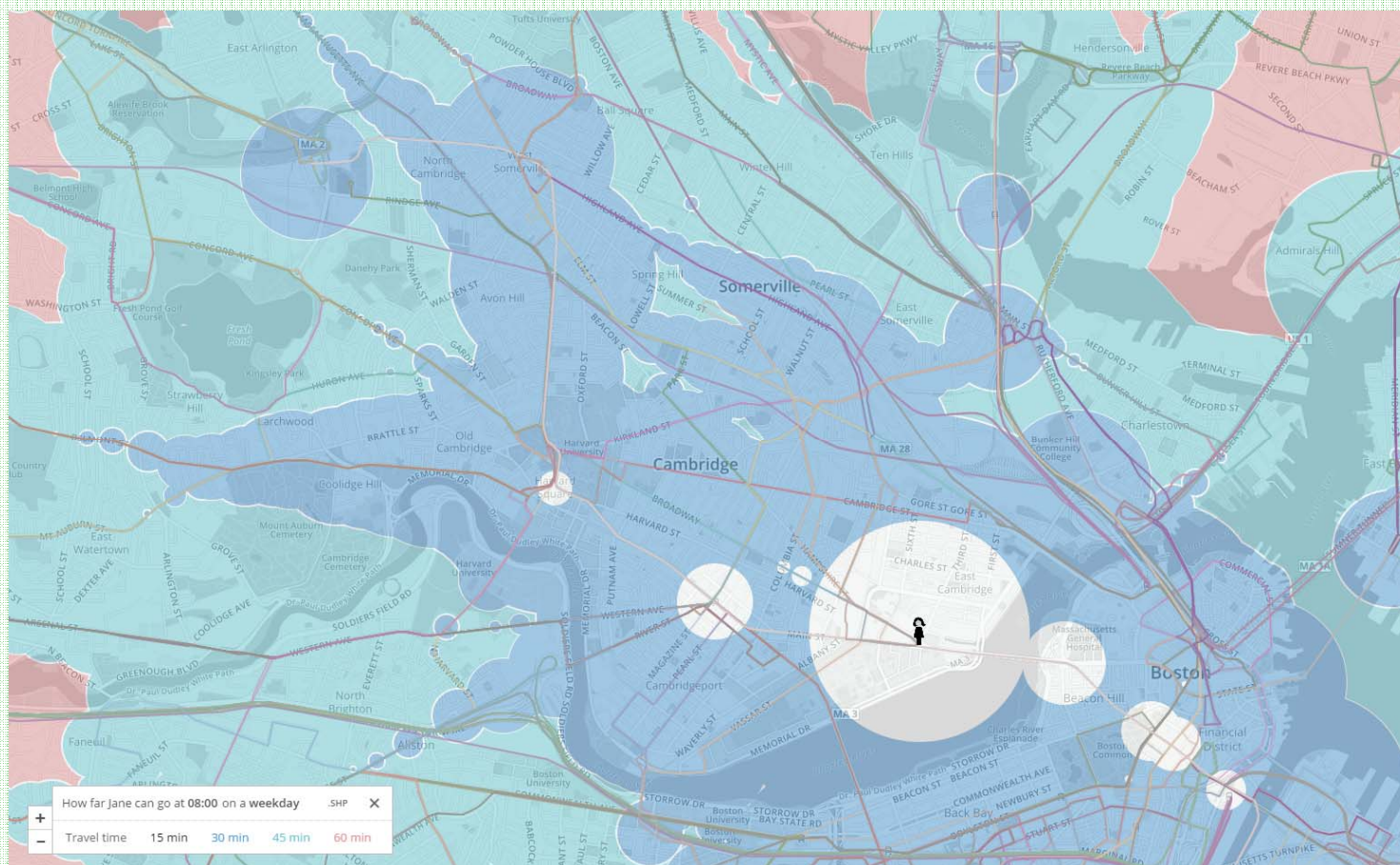


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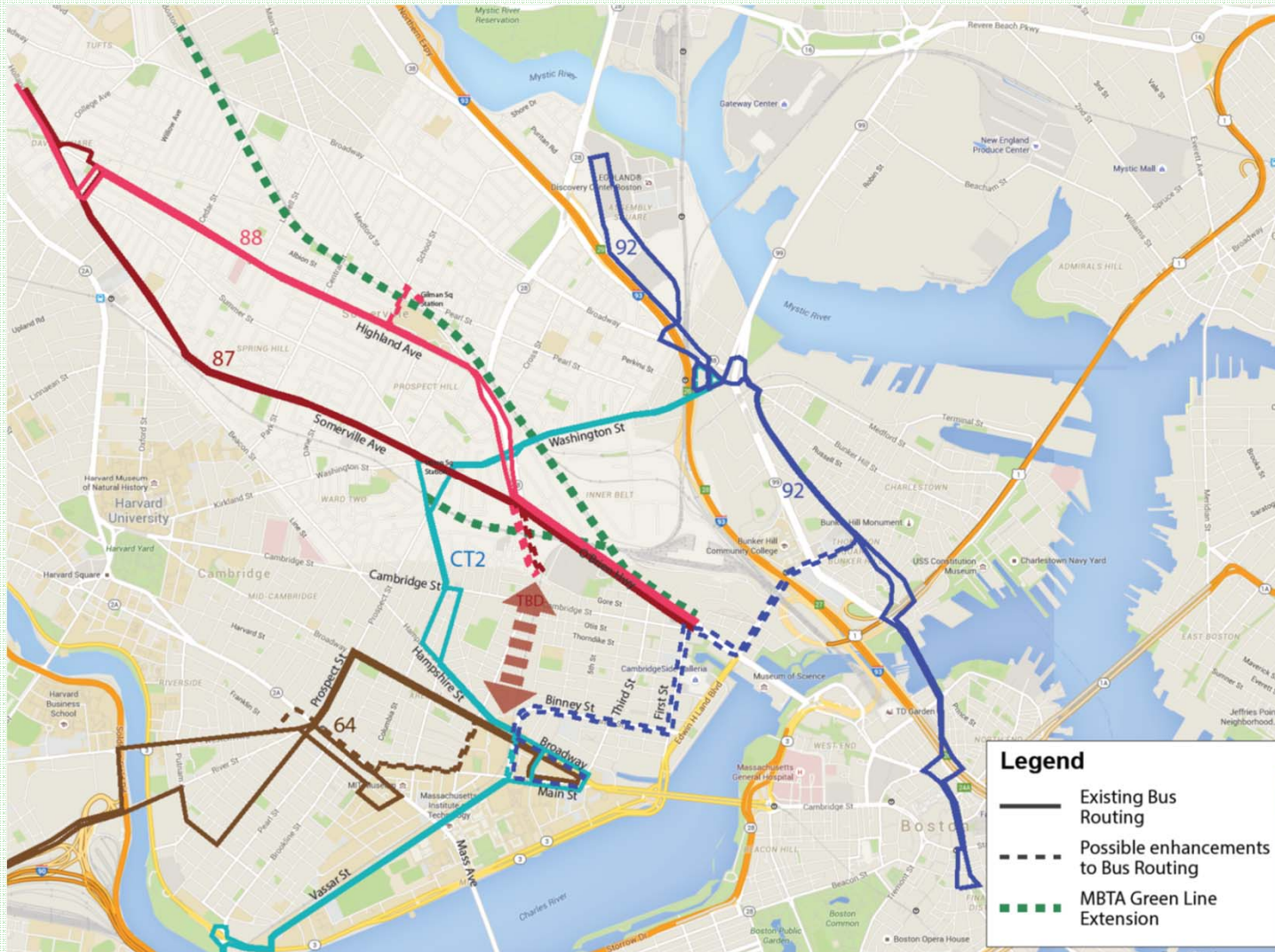
AFTER, 8AM, GLX & 87/88 TO KENDALL VIA FIRST

8AM



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ENHANCED CONNECTIONS: SUMMARY



- 64 consistently routed on Main St to Kendall
- CT2 on Ames (skip Kendall loop)
- 87/88 to Kendall via roads TBD (travel time based on First)
- 92 to Kendall via First





SCENARIOS

- Constrained
 - Identify things that won't require more vehicles or cost more in terms of operating budget.
 - Also could include improvements to the existing service (travel time, reliability) to reduce costs.
 - E.g., rerouting routes to Kendall, making changes to streets and signals
- Unconstrained
 - Assumes additional operating funds - can require more vehicles and increase costs
 - E.g. can provide increased service (span, frequency), and even new routes.





SAMPLE INCREASED SERVICE

- Example: Estimated Total Annual O&M Cost of Improving CT2 Service (2014\$)

	Vehicles Operated in Maximum Service	Annual Revenue Vehicle-Hours	Annual Revenue Vehicle-Miles	Estimated Total Annual Cost
Present Service*	6	13,575	109,000	\$2,116,000
Increase Peak Service to 15-minute headway	1	3,250	26,000	\$480,000
Increase Mid-day Service to 20- minute headway	0	2,125	17,000	\$275,000
Extend Evening Service 2 hours at 30-minute headway	0	1,500	12,500	\$197,000
Total Additional Cost per Year				\$952,000

* 20-minute headway in peaks, 30 minutes off-peak, last trips leave about 7:00 pm.





REPRESENTATIVE SCENARIOS

Improvement Type	Route	Potential Scenario - Constrained	Potential Scenario - Unconstrained
Connections to Charlestown	92	Reroute 11 of 22 existing weekday peak trips each way to/from Kendall Instead of downtown Boston via [streets TBD]. Frequency ~ 30 minutes to each station.	Add 22 weekday peak trips in each direction between Sullivan Station and Kendall via [streets TBD] (headway ~ 15 min).
Connections to Somerville/Medford	88	Reroute 5 of 10 existing weekday peak trips each way to/from Kendall Instead of Lechmere via [streets TBD]. Frequency ~ 40 minutes to each station.	Add 10 weekday limited-stop peak trips in each direction between Clarendon Hill and Kendall via [streets TBD] (headway ~ 20 min).
Connections to Somerville/Medford	87	Reroute 5 of 10 existing weekday peak trips each way to/from Kendall Instead of Lechmere via [streets TBD]. Frequency ~ 45 minutes to each station.	Add 10 weekday limited-stop peak trips in each direction between Broadway @ Mass Ave and Kendall via [streets TBD] (headway ~ 25 min).
Operational improvements	85	Stop consolidation and TSP at key intersections	Stop consolidation and TSP per 'constrained' scenario, plus increase peak period frequency from 25 to 15 minutes, and off-peak frequency from 30 to 20 minutes.
Connections to Cambridgeport/Allston/Brighton	64	Reroute 16 peak period trips each way between Kendall and Central (~ every 15 min) on the mapped route	Operate all 37 weekday trips each way to/from Kendall on the mapped route



An aerial photograph of Boston, Massachusetts, showing the city skyline and the harbor. The harbor is filled with water, and several sailboats are visible. The city buildings are densely packed, and the harbor is bordered by a promenade. The word "DISCUSSION" is overlaid in a large, bold, black font on a semi-transparent grey rectangular background in the center of the image.

DISCUSSION



An aerial photograph of Boston, Massachusetts, showing the city skyline and the harbor. The harbor is filled with water, and several sailboats are visible. The city is densely packed with buildings, and the harbor is bordered by a promenade. The text "2040 BASE CASE MODEL RESULTS" is overlaid on the image in a large, bold, black font.

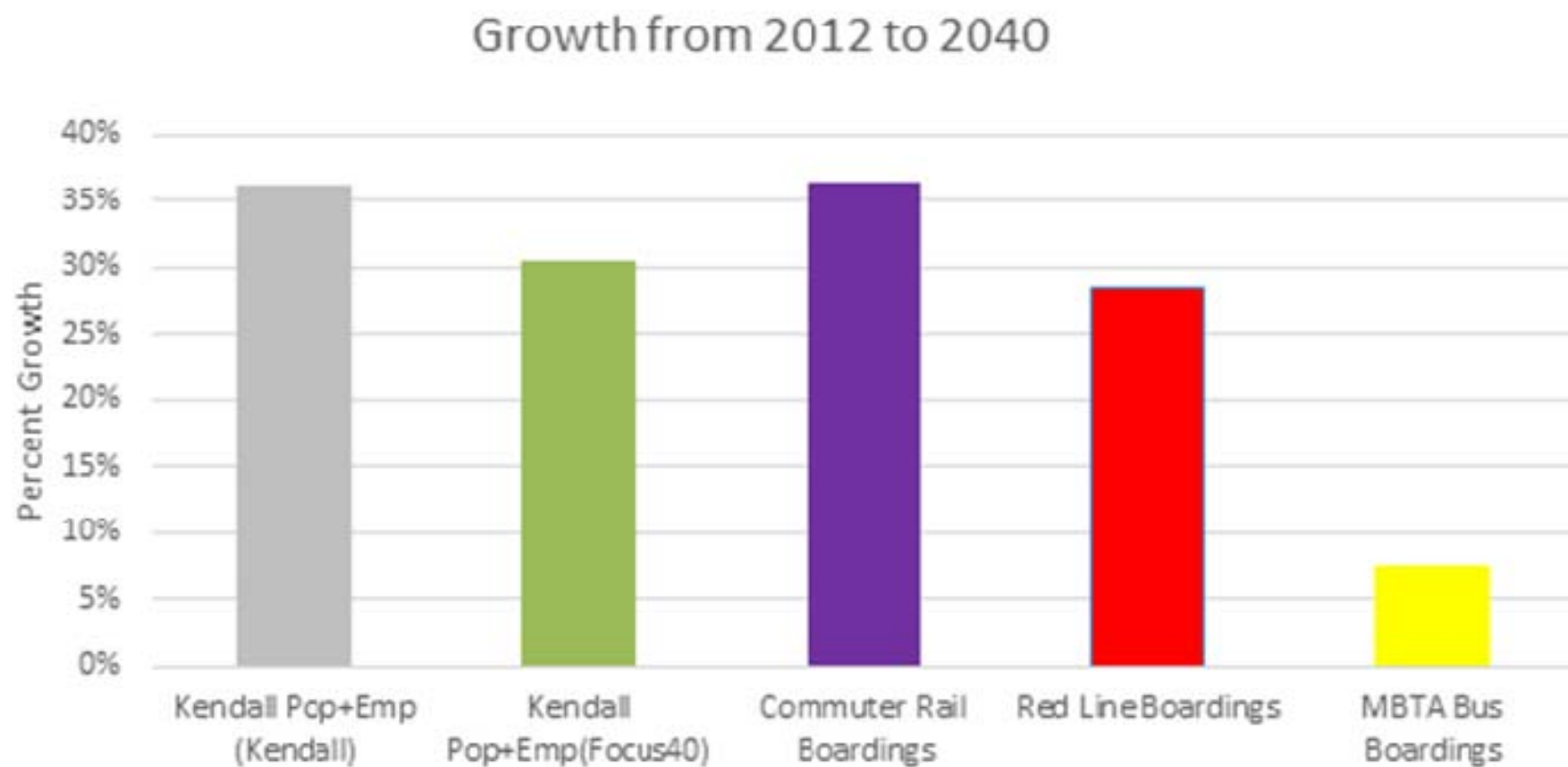
2040 BASE CASE MODEL RESULTS





FUTURE CONDITIONS

CTPS 2040 Base Case: Overall Growth





FUTURE CONDITIONS

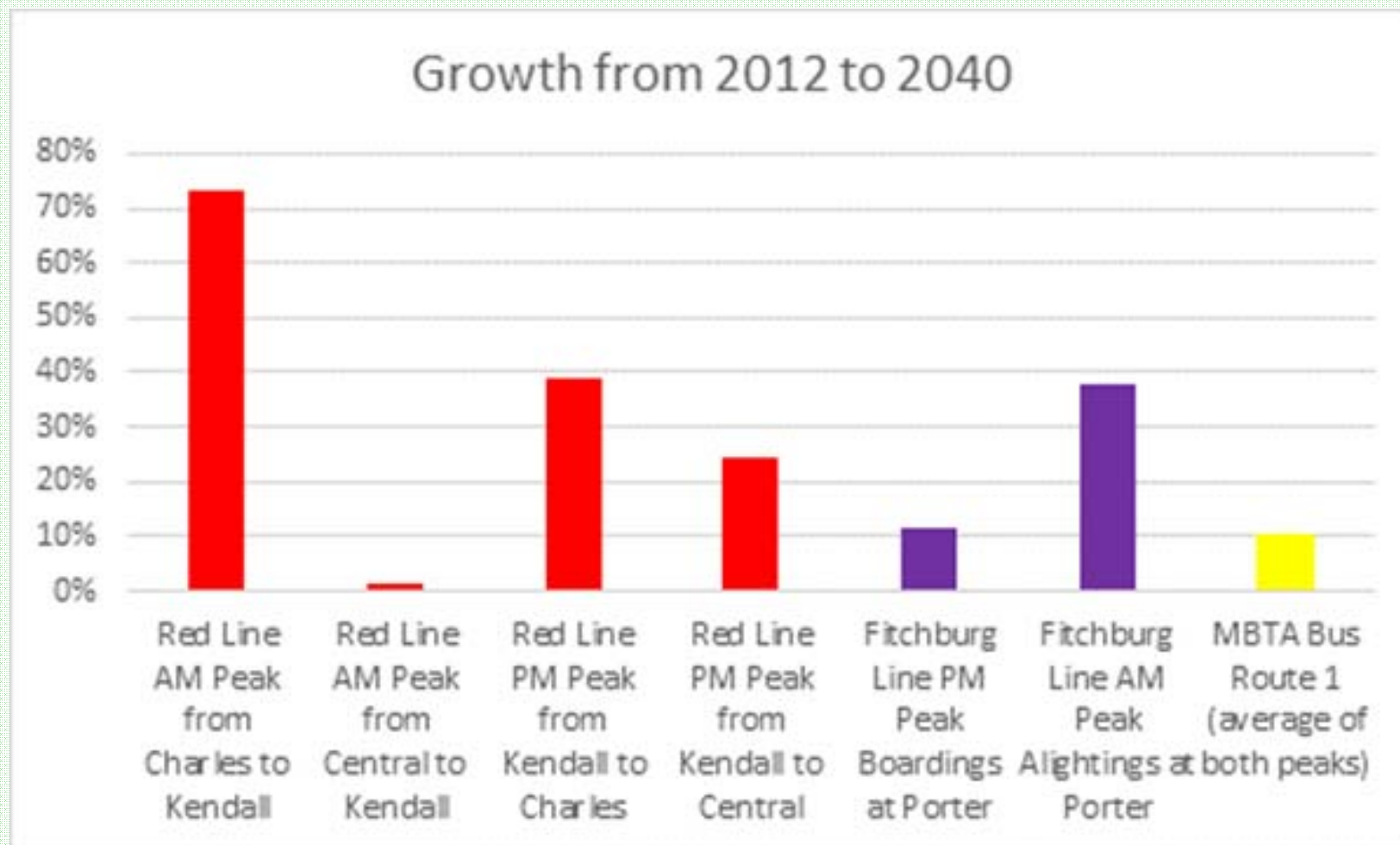
- CTPS 2040 Base Case Modeling
 - Completed for Focus40, likely underestimates future transit demand as it does not assume increased square footage in Kendall Square updated from the K2C2 study.
 - Focus40 gaps analysis and scenario analysis will help understand the scale of the challenges, but may not be complete in time for the KSMTF process.
 - For the KSMTF, the model will be helpful indicating whether the bus strategies will help relieve pressure on the Red Line.





FUTURE CONDITIONS

CTPS 2040 Base Case: Growth in boardings for Red Line, Fitchburg line, #1 bus





BUS PRIORITY CORRIDORS





EXISTING CONDITIONS: BUS SERVICE QUALITY

- Existing bus services to/from Kendall do *not* rate well in terms of:
 - Travel time (speed)
 - Travel time consistency
 - Service regularity
- Long dwell times (>20% of running time) and general traffic delays slow service and cause 'bunching'

Route (Destination)	PM Travel Time and LOS from Kendall*	PM Travel Time Reliability and LOS from Kendall*	Percent of Running Time that is Dwell Time, PM Peak
1* (Harvard)	13.7 (E)	2.6 (E)	31%
1* (Dudley)	28.6 (F)	5.3 (E)	34%
CT 1* (BMC)	23.9 (F)	5.6 (F)	22%
CT 2 (Sullivan)	22.4 (F)	4.4 (F)	18%
CT 2 (Ruggles)	32.0 (F)	7.0 (F)	24%
64 (Oak Square)	45.1 (D)	5.6 (E)	30%
68 (Harvard)	16.2 (D)	4.1 (F)	26%
85 (Spring Hill)	17.9 (E)	5.7 (F)	21%
EZ Ride	20.8 (F)	4.6 (F)	N/A

* Routes which serve the study area but do not serve Kendall Station





PRIORITY CORRIDOR CONCEPT: HIGHER QUALITY BUS SERVICE

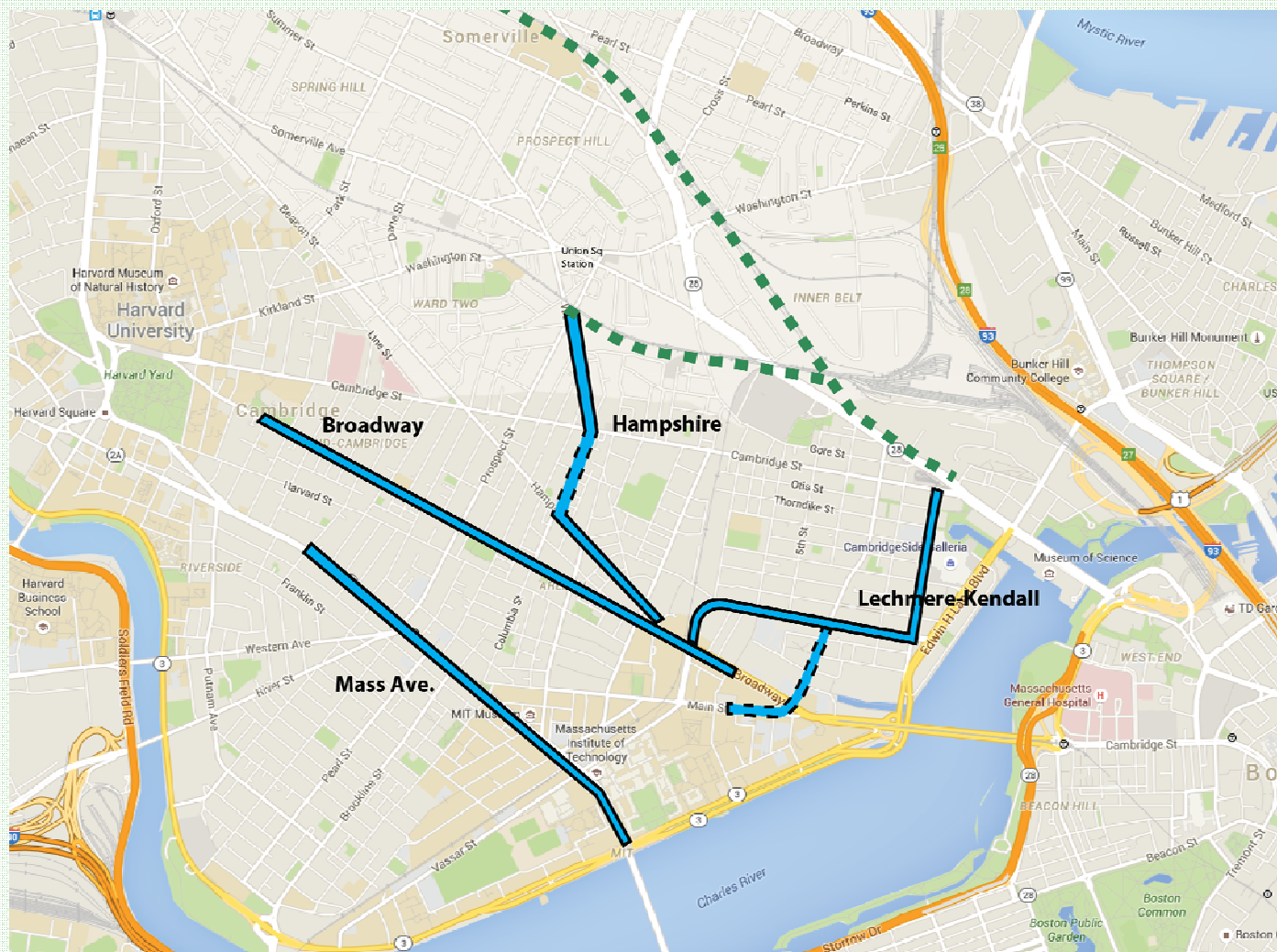
Representative Features:

- Exclusive bus lanes
- Consolidated or limited stops
- Traffic Signal Priority
- Near-level boarding
- Off-board fare collection or exit by rear doors only





PRIORITY CORRIDORS CONSIDERED



- Mass Ave does not serve Kendall directly; will be studied separately by the City
- Passenger volumes on Hampshire and Broadway are relatively low
- Lechmere-Kendall could:
 - Improve EZ Ride times
 - Improve transit access to Binney Street
 - Leverage accessibility of GLX





PRIORITY CORRIDOR DISCUSSION



Lechmere to Kendall Considerations:

- Define routes and streets
- Right of Way
- Mode balance
- Traffic operations

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DISCUSSION



NEXT STEPS





NEXT STEPS

- Consultants to take input from meeting and finalize constrained and expanded fleet scenarios
- Discuss and finalize scenarios and performance measures with CTPS in late September
- Results of scenarios will be modeled throughout October, available for November 22 draft recommendations meeting
- Next meeting (September 20): Gaps analysis and Red Line discussion



An aerial photograph of Boston, Massachusetts, showing the city skyline and the harbor. The harbor is filled with water, and several sailboats are visible. The city buildings are densely packed, and the harbor is bordered by a promenade. The text "PUBLIC COMMENT" is overlaid on the image in a large, bold, black font.

PUBLIC COMMENT





HOW TO GET INVOLVED

- Website: <http://www.cambridgema.gov/CDD/Projects/Transportation/kendallsquaremobilitytaskforce>
- Contacts:
 - Brian Dacey, President, Cambridge Innovation Center
617-401-2870, dacey@cictr.com
 - Susanne Rasmussen, Director of Environmental & Transportation Planning, City of Cambridge
617-349-4607, srasmussen@cambridgema.gov
 - Tegin Bennett, Transportation Planner, City of Cambridge
617-349-4615, tbennett@cambridgema.gov
- Next Task Force Meeting: September 20 (Red Line focus)
- Next Public Meeting: October 12 (bus and Red Line)



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THANK YOU!

