Kendall Square Mobility Task Force

Meeting #2

June 23, 2015

massDOT

Agenda

- Introduction & Task Force Business
- Existing Conditions – Built Environment
- Existing Conditions – Travel Patterns
- Existing Conditions – Current Trends
- Further Analysis & Summary
- Public Comment

massDOT

INTRODUCTION
& TASK FORCE BUSINESS

Task Force Membership

Biogen	East Cambridge Business Association	MBTA
Boston Properties	East Cambridge Planning Team	MIT
Cambridge Redevelopment Authority	Friends of the Grand Junction	MIT Investment Management Company
City of Cambridge	Kendall Square Association	Newtowne Court/Washington Elms Tenant Council
Charles River TMA	MassDOT	Volpe National Systems Center

massDOT

Meeting Schedule

Task Force

June 23, 2015
September 8, 2015
October 27, 2015
January 5, 2016
February 23, 2016

Public

September 2015
November/December 2015
February 2016

massDOT

Study Schedule

Kickoff

Today

Conditions & Issue Identification

September

Performance-Based Goals

Public Meeting

Alternatives Development

Public Meeting

Late Fall/Winter

Recommendations

Final Report

Public Meeting

February 2016

massDOT

Study Goals & Outcomes

- Examine the current conditions of Kendall Square transportation
  - Establish a baseline for comparison
  - Identify issues and opportunities that emerge
  - Develop goals and objectives to reach desired future
- Estimate future needs
- Set performance-based goals for transportation initiatives
- Recommend policies and projects to meet goals
  - Multiple timeframes
  - Financially prudent

massDOT

EXISTING CONDITIONS: BUILT ENVIRONMENT

History of Built Space

- Established as an industrial district
- Grand Junction Railway
- MIT in 1916

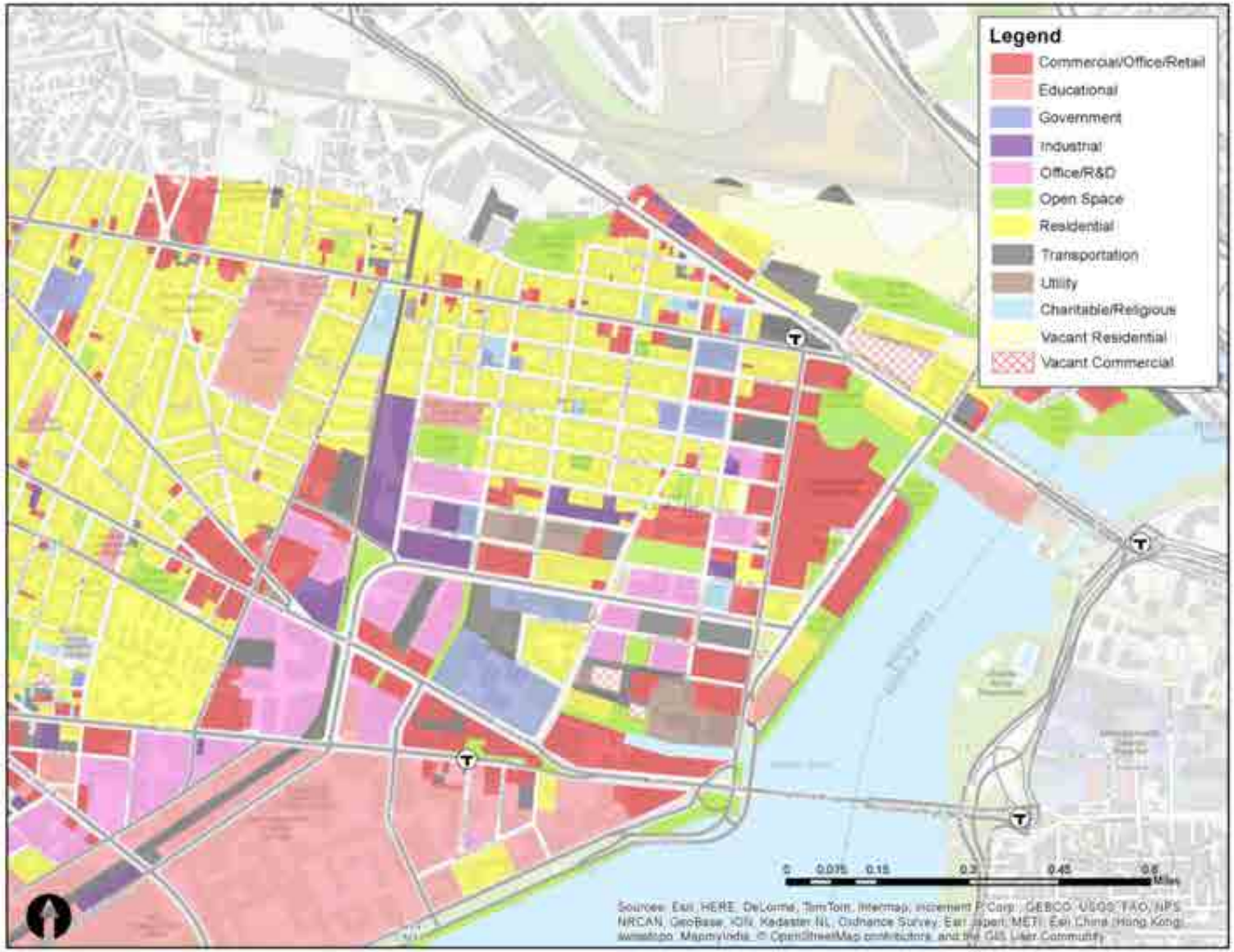
- 1955 Cambridge Redevelopment Authority
- 1960's Urban Renewal
- Plans for NASA became Volpe Center
- Cambridge Center Office/R&D

- East Cambridge Riverfront Plan
- 2001 Citywide Rezoning
- Urban Renewal → Mixed use, pedestrian focus

- Thriving innovation community
- Multimodal transportation
- Transformation to a vibrant community

KENDALL SQUARE MOBILITY TASK FORCE

Land Use Today

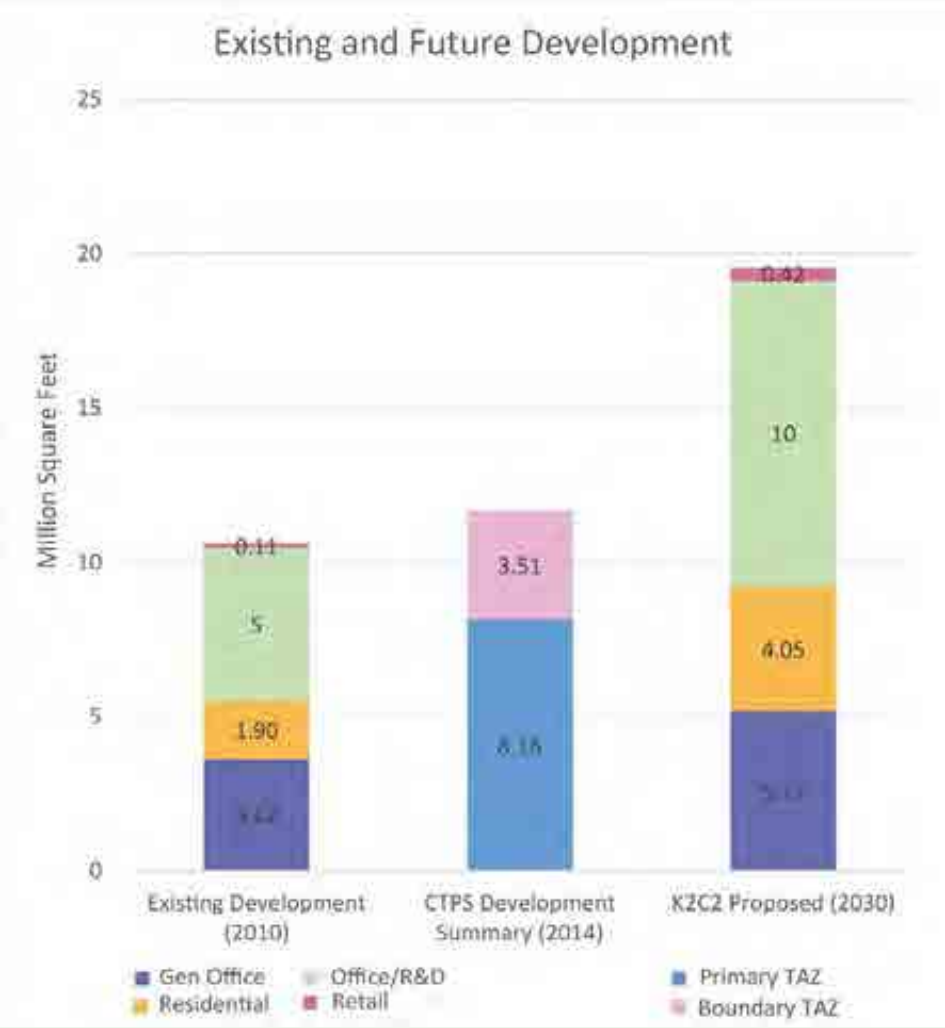


- 24-hour, mixed use district
- K2C2 rezoning

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

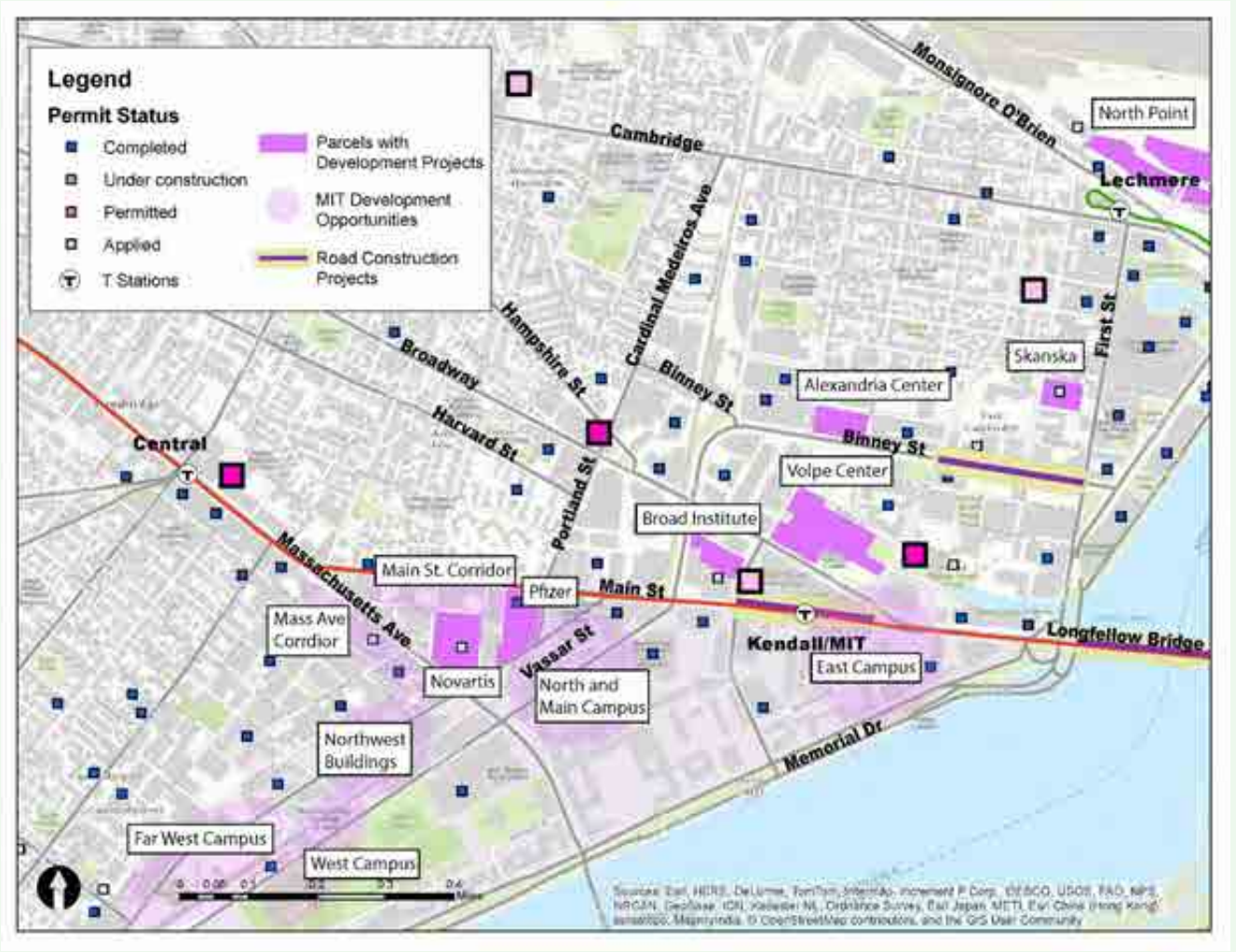
Development Projections



massDOT

KENDALL SQUARE MOBILITY TASK FORCE

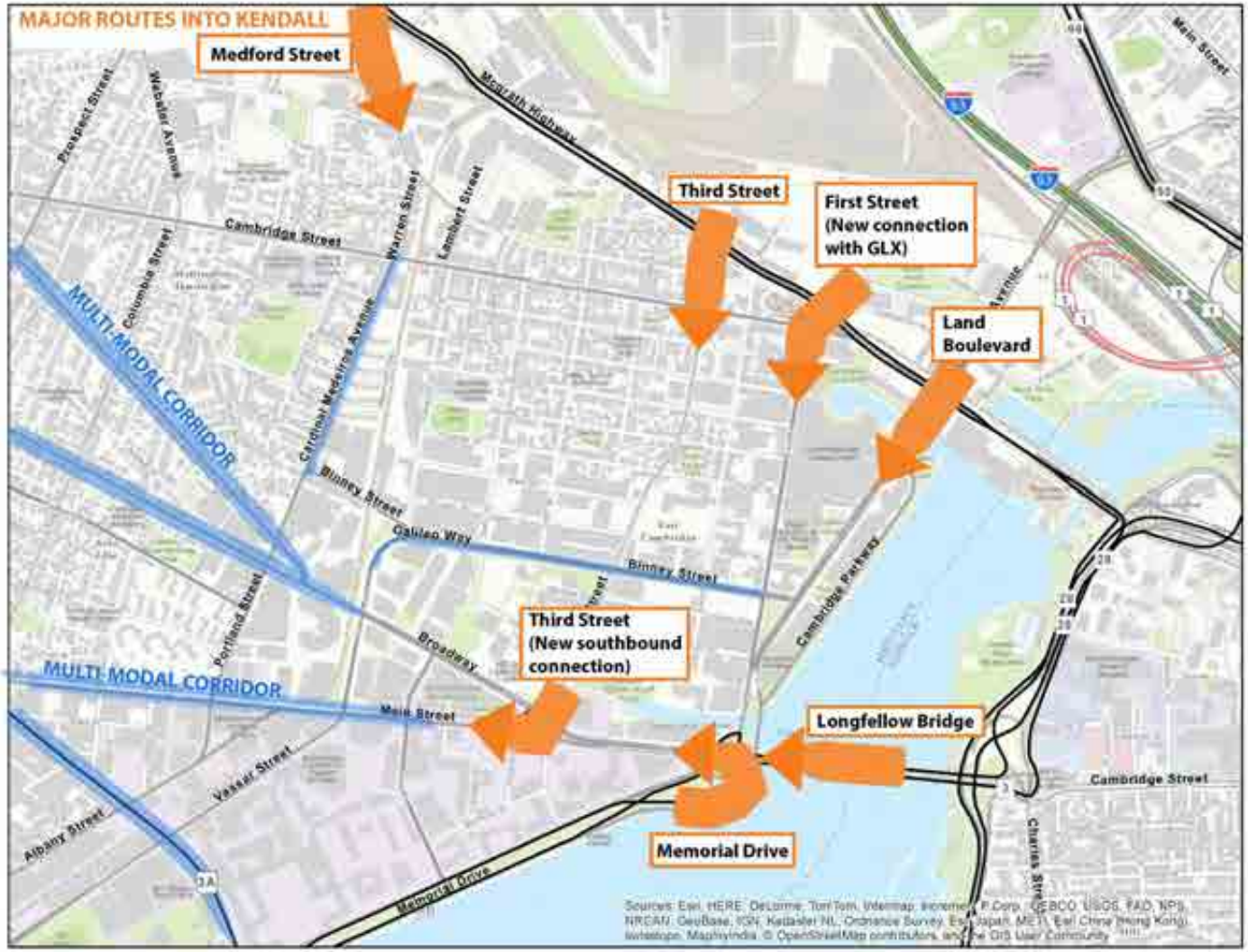
Recent and Planned Development



massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Roadway Network

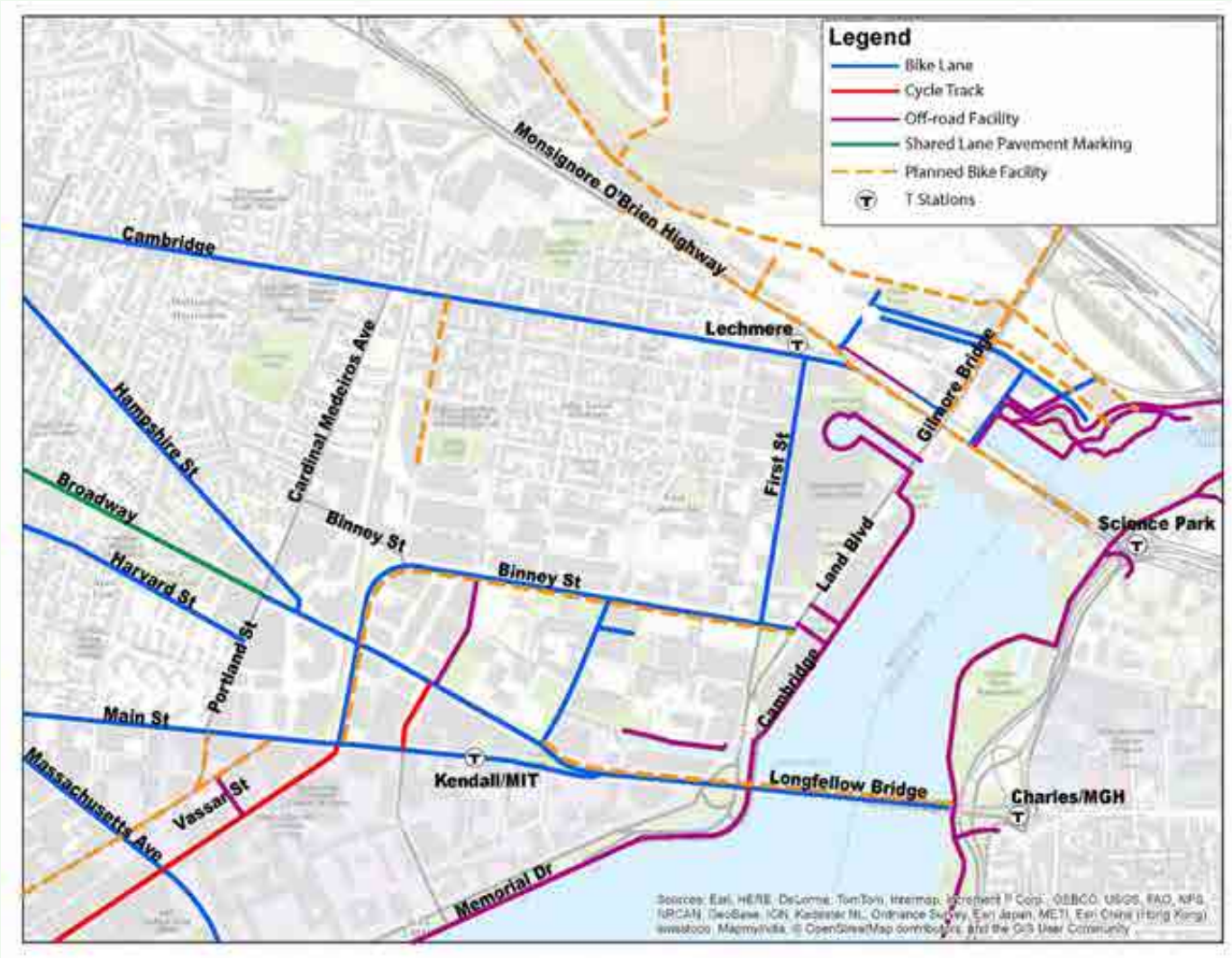


- Arterials provide regional connections
- Local roads provide parcel level access
- Multimodal corridors combine bus, bikes, automobiles

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Bicycle Connections



massDOT

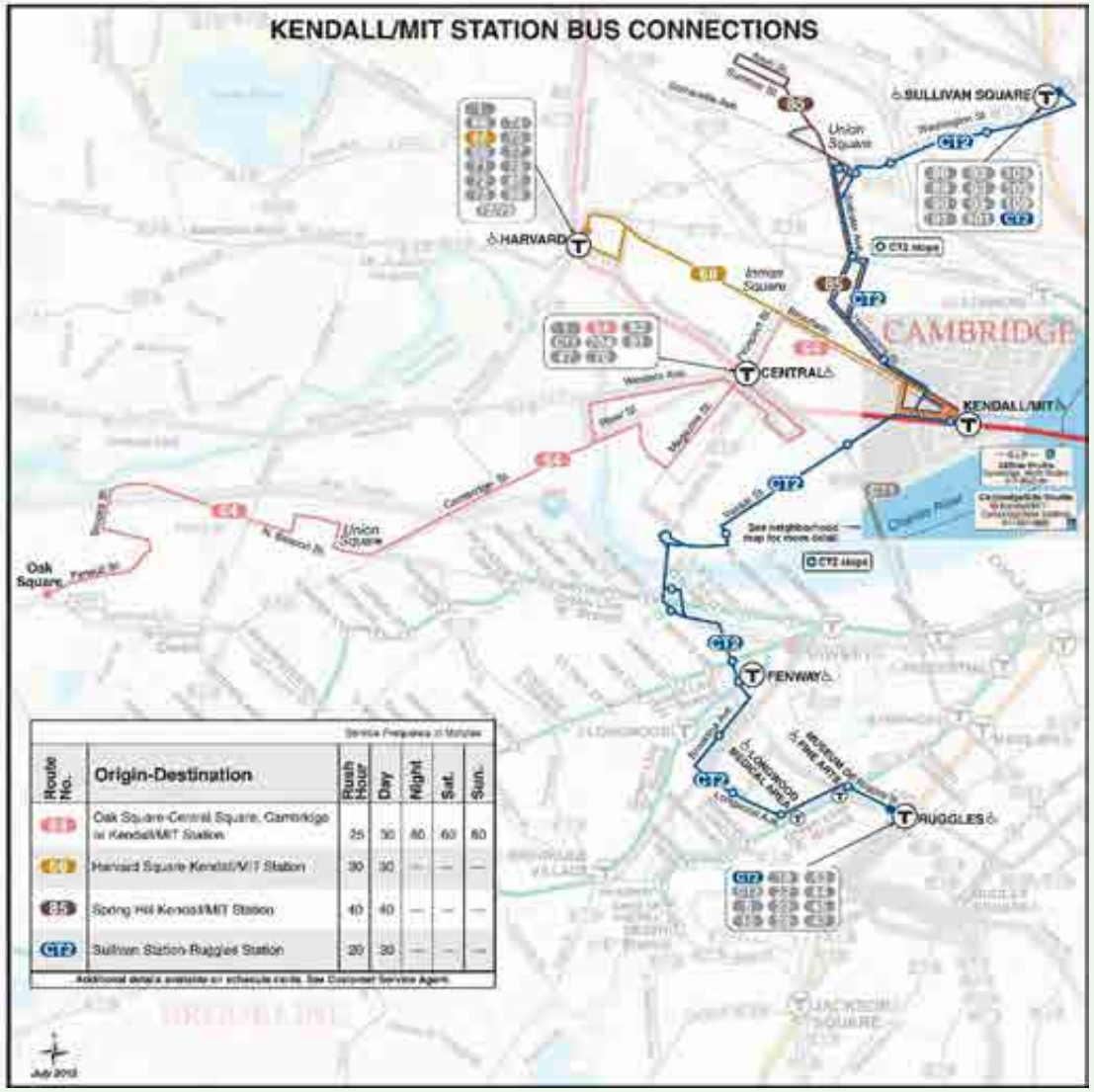
KENDALL SQUARE MOBILITY TASK FORCE

Public Transit Network

- Red Line rapid transit services Kendall Square
- Green Line light rail service to the north, extending to the west in the future
- Kendall Square serves as a hub for connecting bus service
- Bus service is limited nights and weekends

massDOT

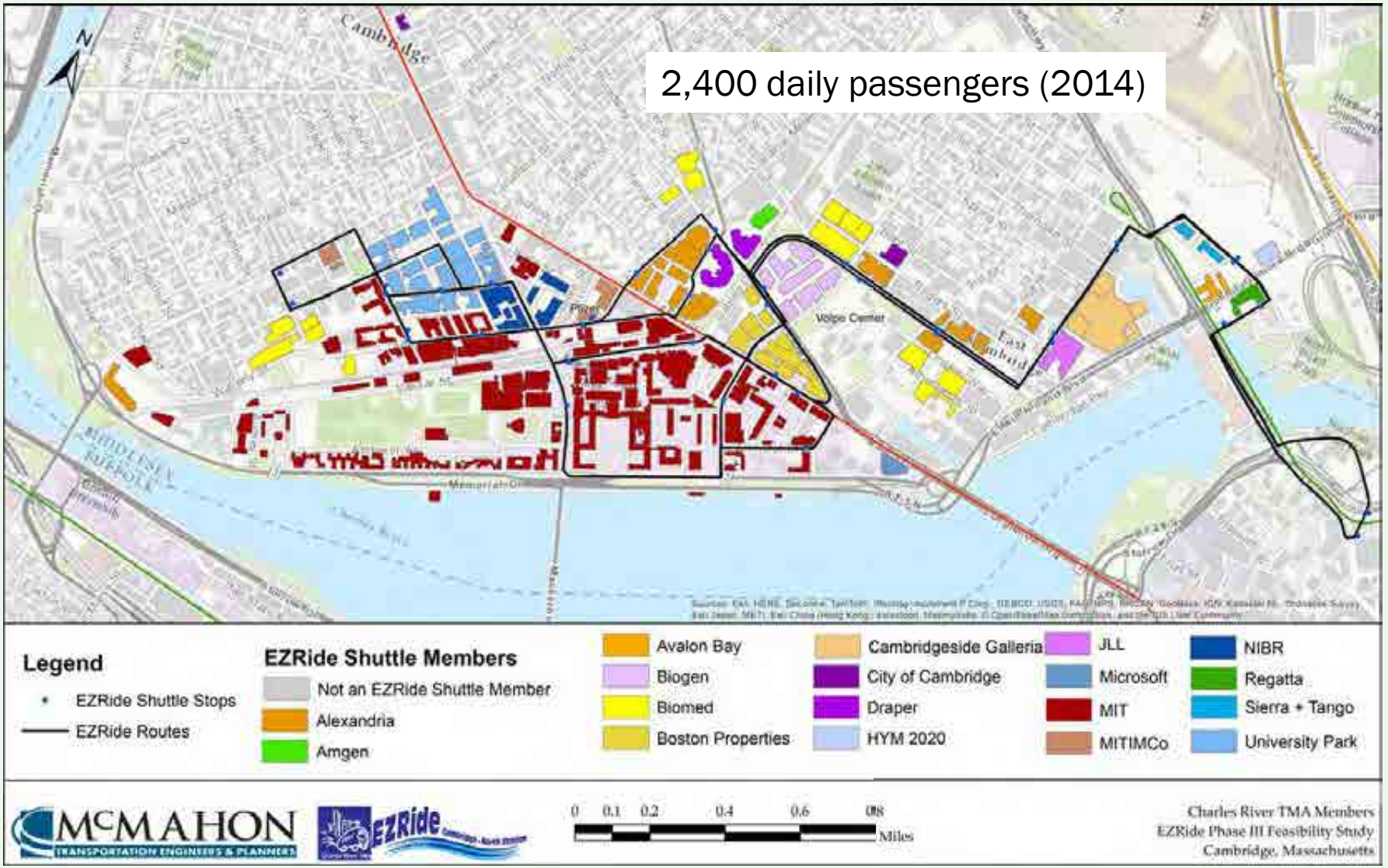
MBTA Bus Services



- About 18,900 transit trips to the study area each weekday
- Majority via Red Line
- 30% of transit trips involve 1 or more transfer

massDOT

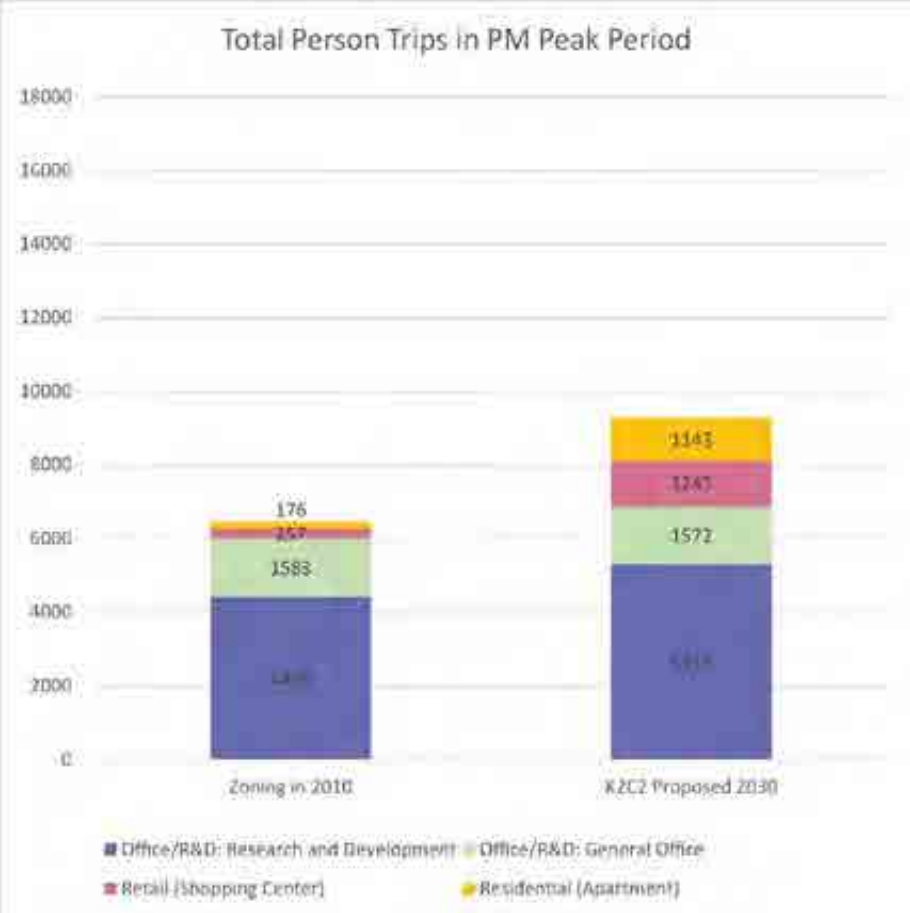
EZRide Service



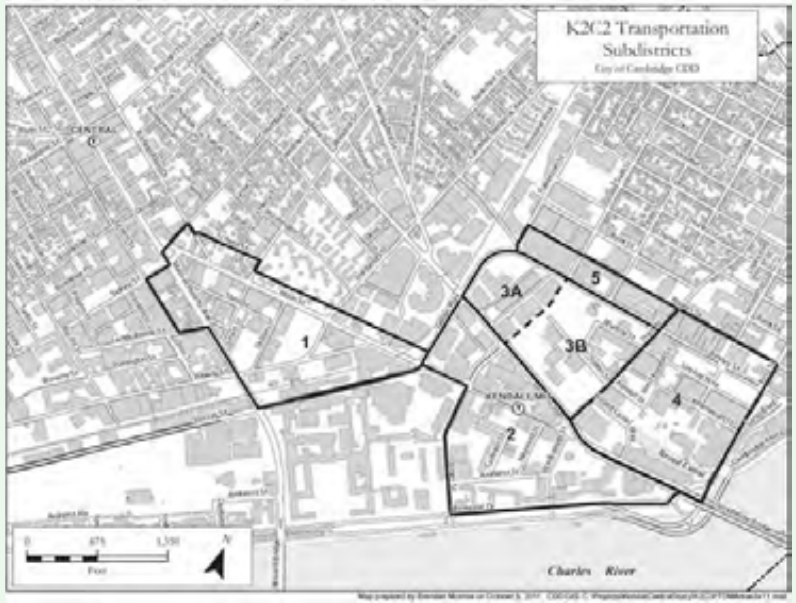
massDOT

EXISTING CONDITIONS : TRAVEL PATTERNS

Forecasted Trips



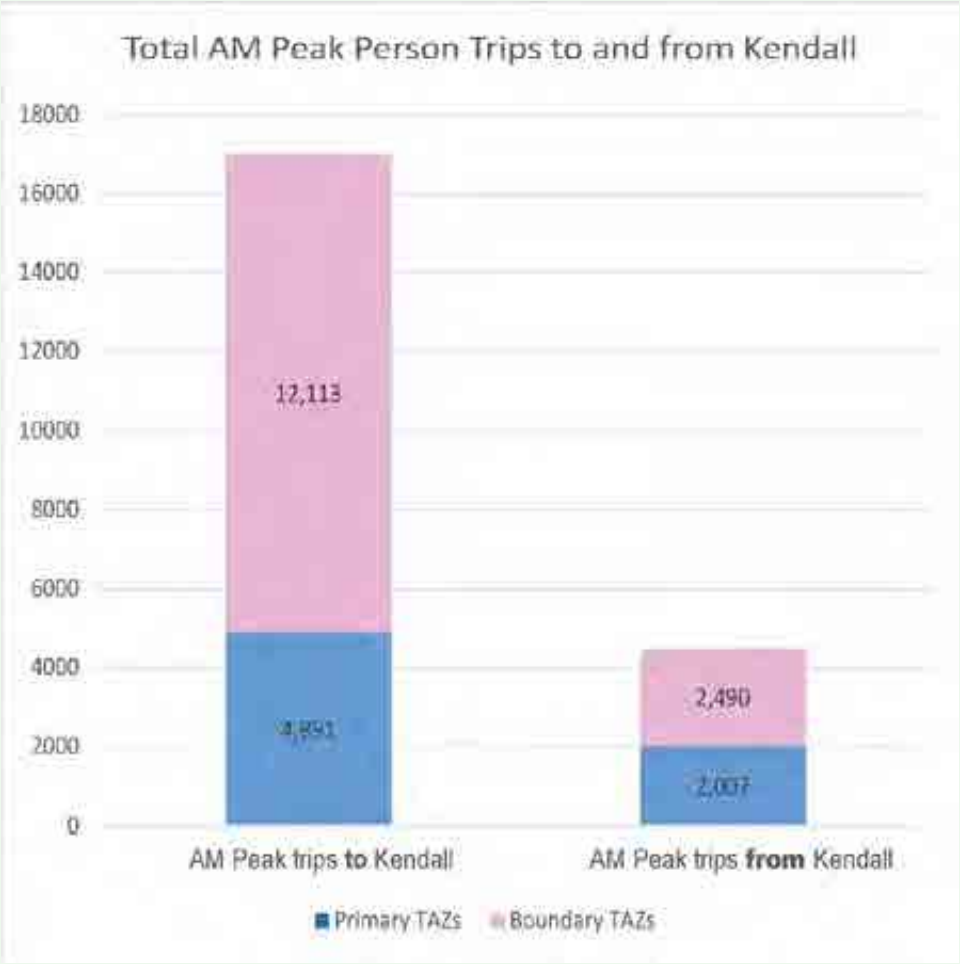
- K2C2 projects a 44% increase in PM peak period person trips in the K2 area by 2030



massDOT

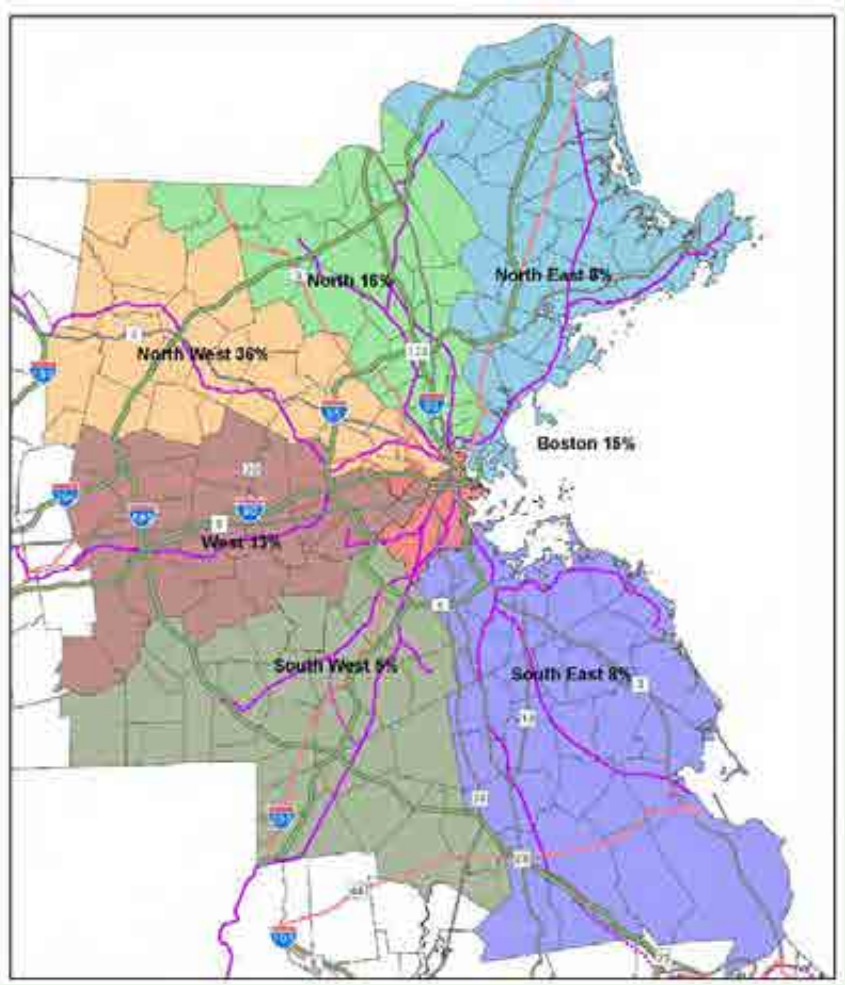
KENDALL SQUARE MOBILITY TASK FORCE

Forecasted Trips



massDOT

Kendall Square Employee Origins (PTDM Data)



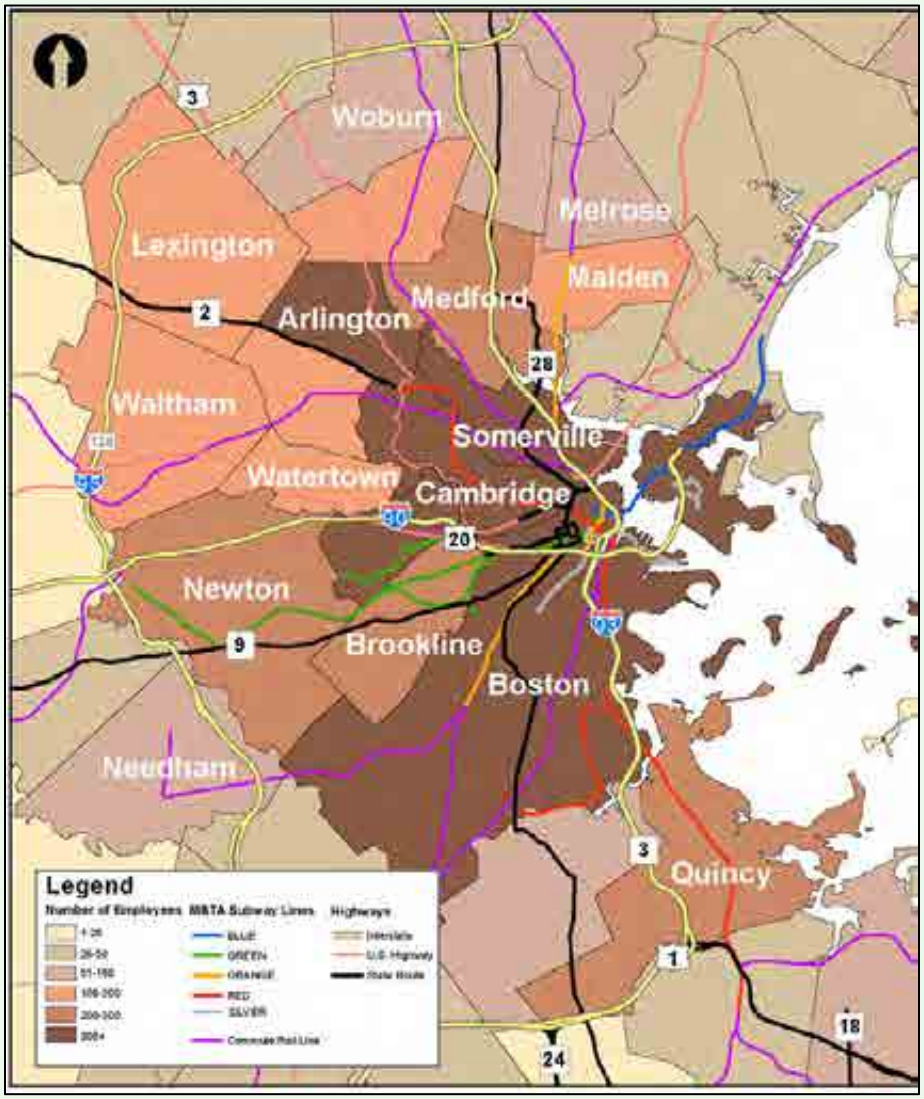
- Greatest number of Kendall Employees from Boston, Cambridge, Northwest region
- 50% of employees come from top 10 communities

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Kendall Square Employee Origins (PTDM Data)

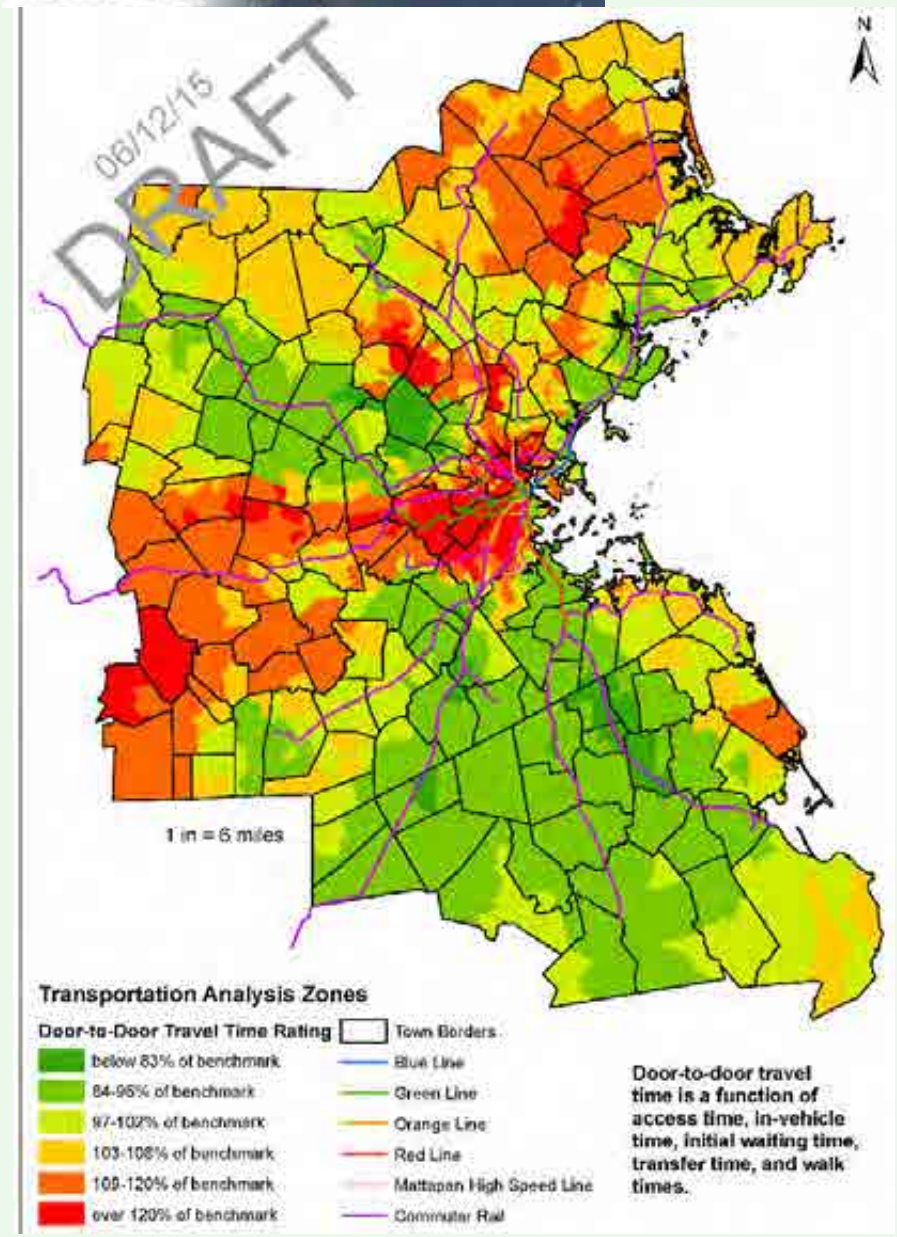
- Greatest concentration of employees from Cambridge, Boston, Somerville, Arlington



massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Travel Time

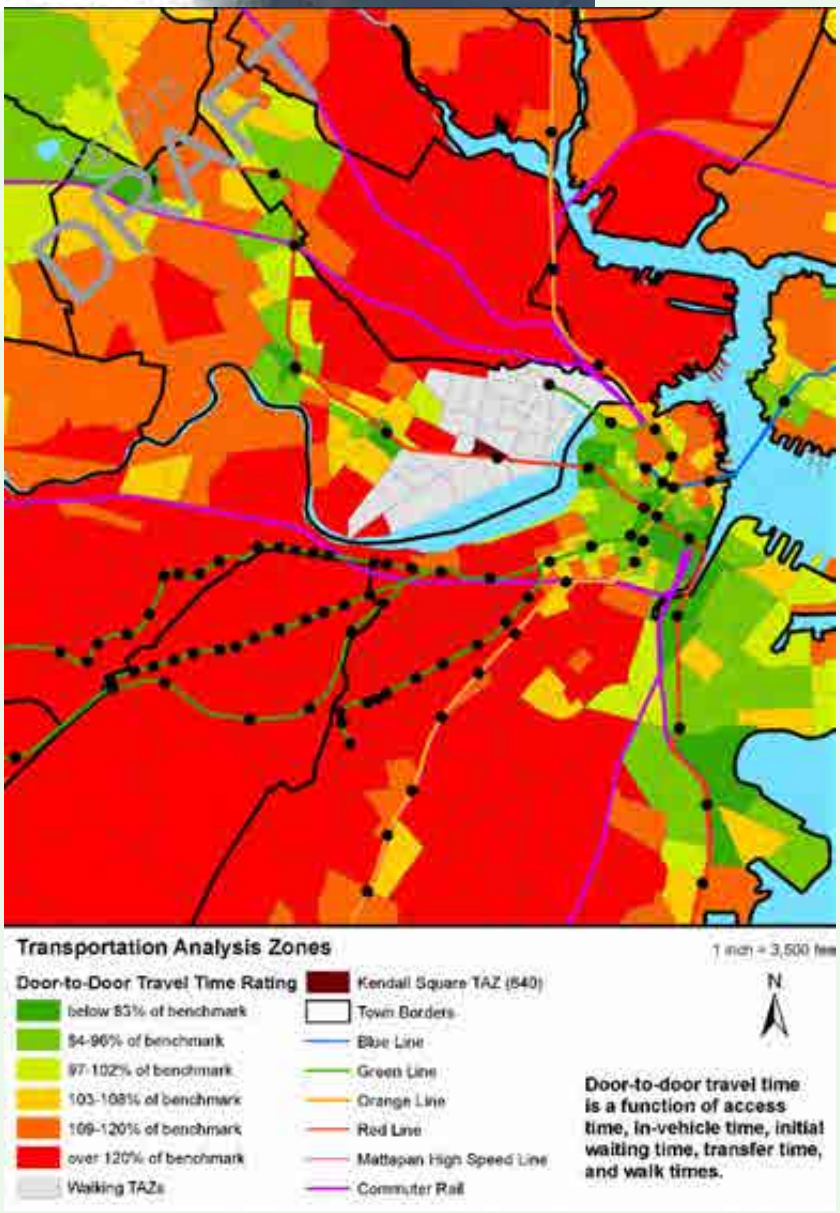


- Commuter rail services with direct Red Line connections (South Station or Porter) offer better door-to-door times
- Average speed matters (Needham is slowest commuter rail)
- Worcester Line passengers have to ‘backtrack’ vs Fitchburg Line transfer at Porter
- Good bus connections from Lexington to Alewife
- Good express bus service coverage of North Shore

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Travel Time



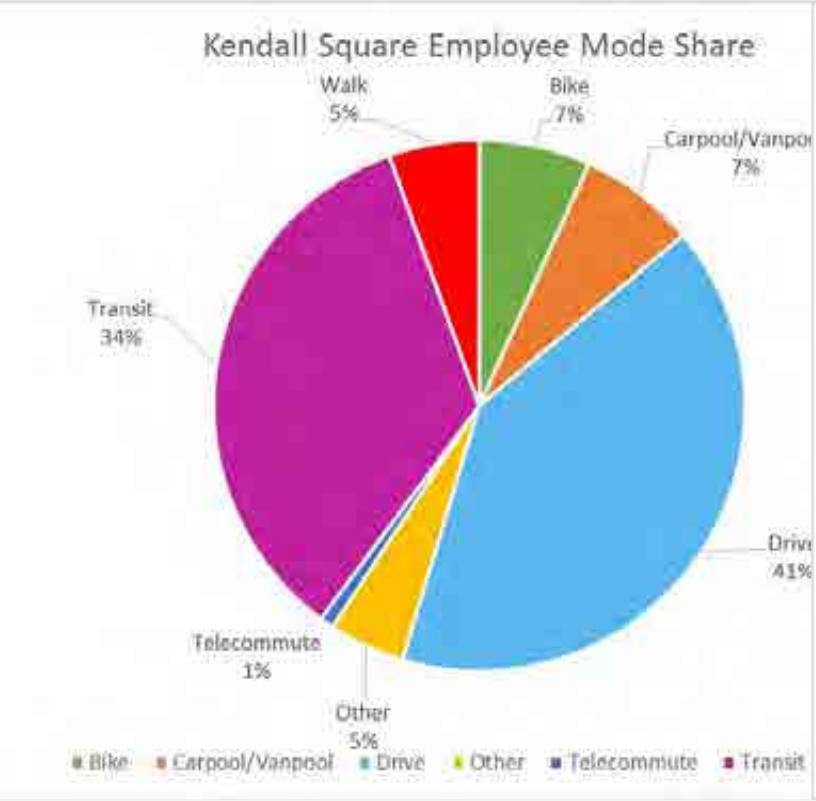
- Locally, zones adjacent to Red Line stations have a distinct advantage
- Local bus connections to South Boston and Lexington do well
- 'Backtracking' into Green Line territory increases time relative to distance
- Local bus connections in Cambridge, Somerville, and much of Boston are slow and/or indirect.

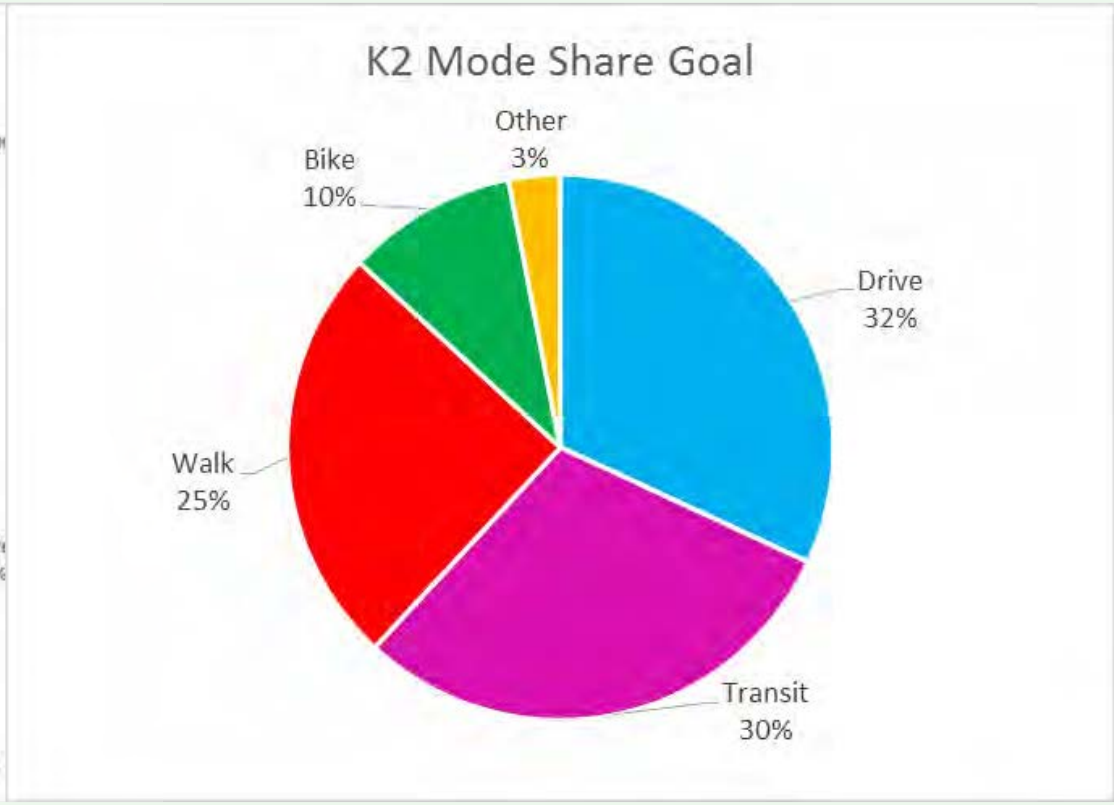
massDOT

EXISTING CONDITIONS : TRAVEL TRENDS

KENDALL SQUARE MOBILITY TASK FORCE

Mode Shares





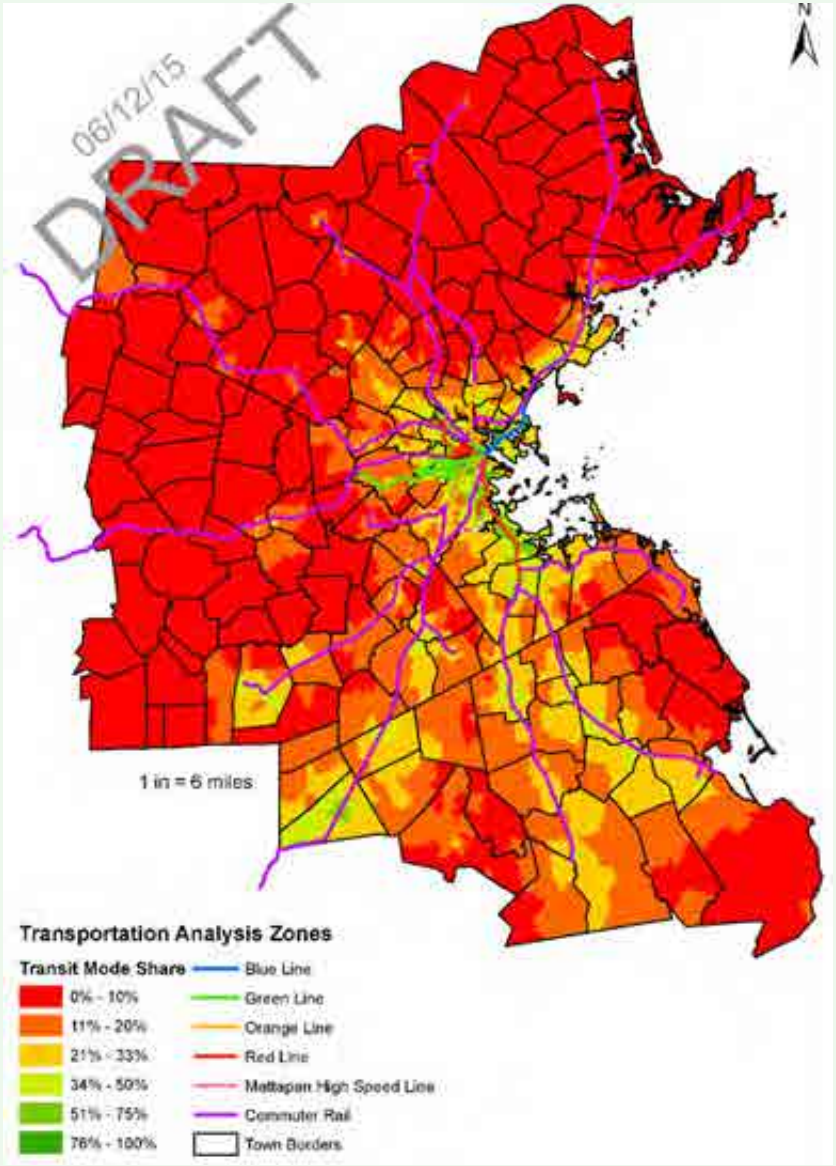
Source: Cambridge PTDM data, 2014

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

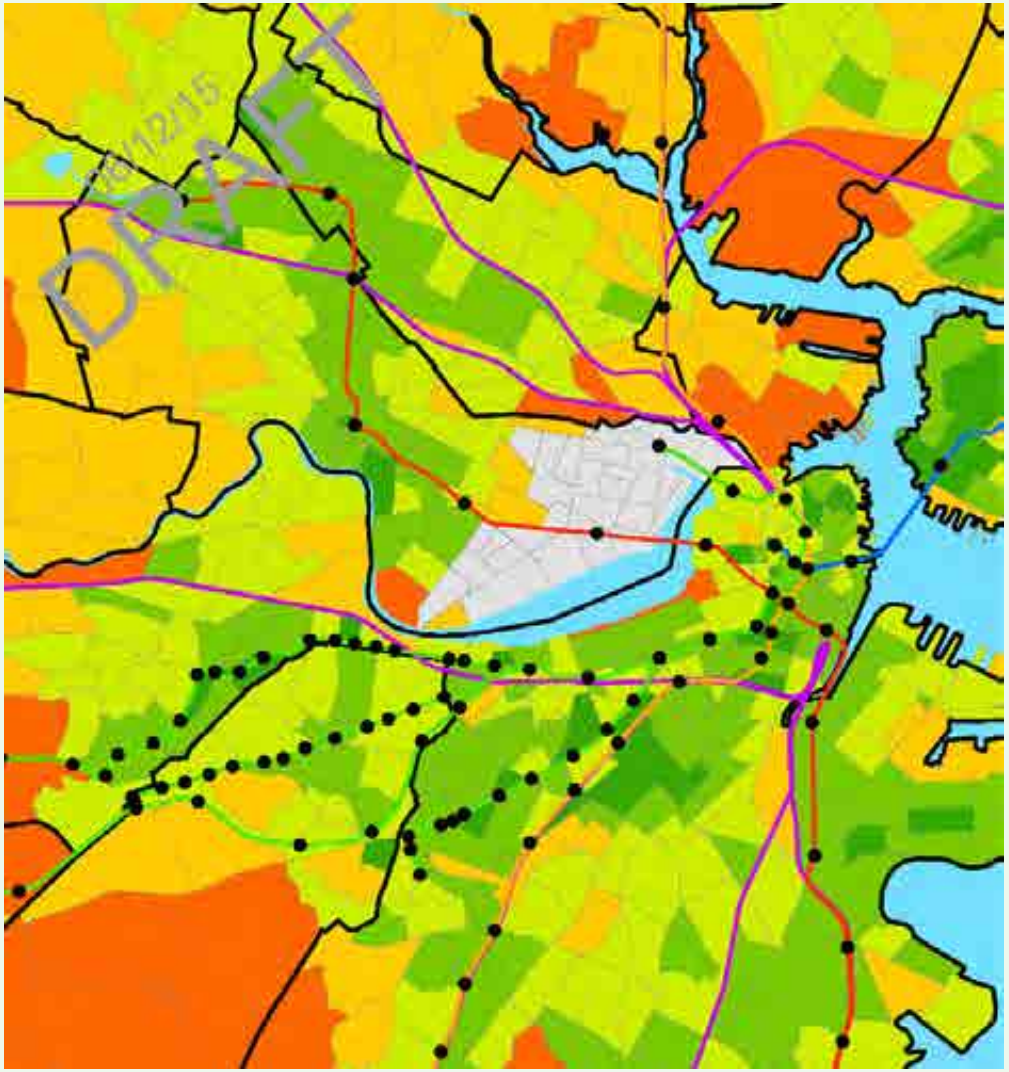
Transit Mode Share

- Although the regional-scale *market* for travel to Kendall is stronger to the north and west, a higher *share* of this market from the south uses transit
- Connectivity to the Red Line at South Station and Alewife is very important



massDOT

Transit Mode Share

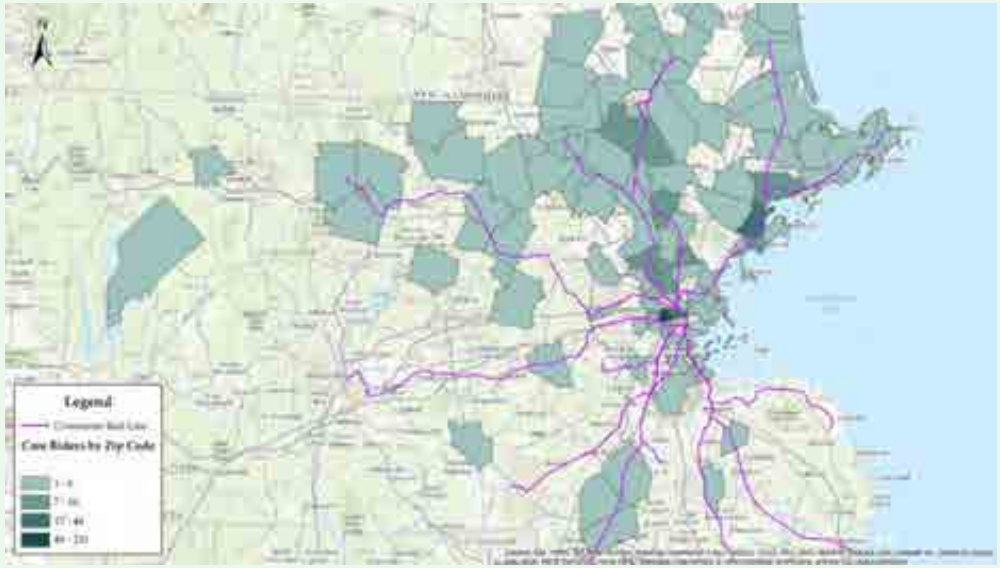


- Locally, proximity to rapid transit is very important
- Green Line service area has high transit share, despite being less well connected than Red Line station vicinities
- Some nearby areas (Charlestown, Everett, Medford) have a low mode share to Kendall

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

EZRide Survey 2014
Home Zip Code



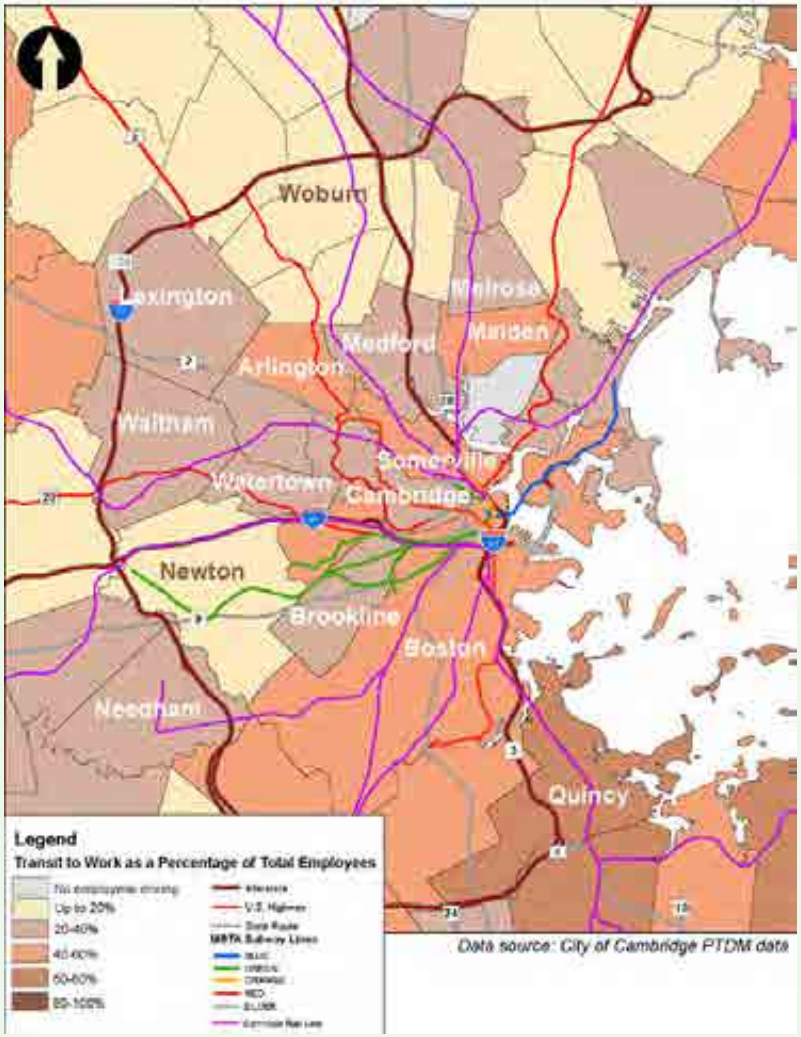
- Frequent Riders: Influenced by north side commuter rail, and connections at North Station

- Non-riders: Distributed throughout the region

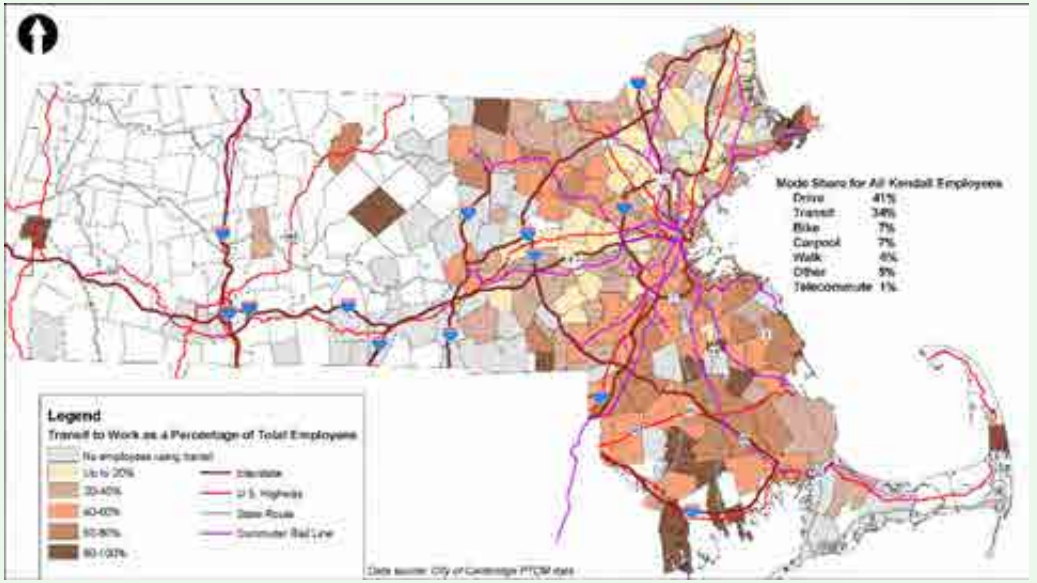
massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Kendall Square Employee Transit



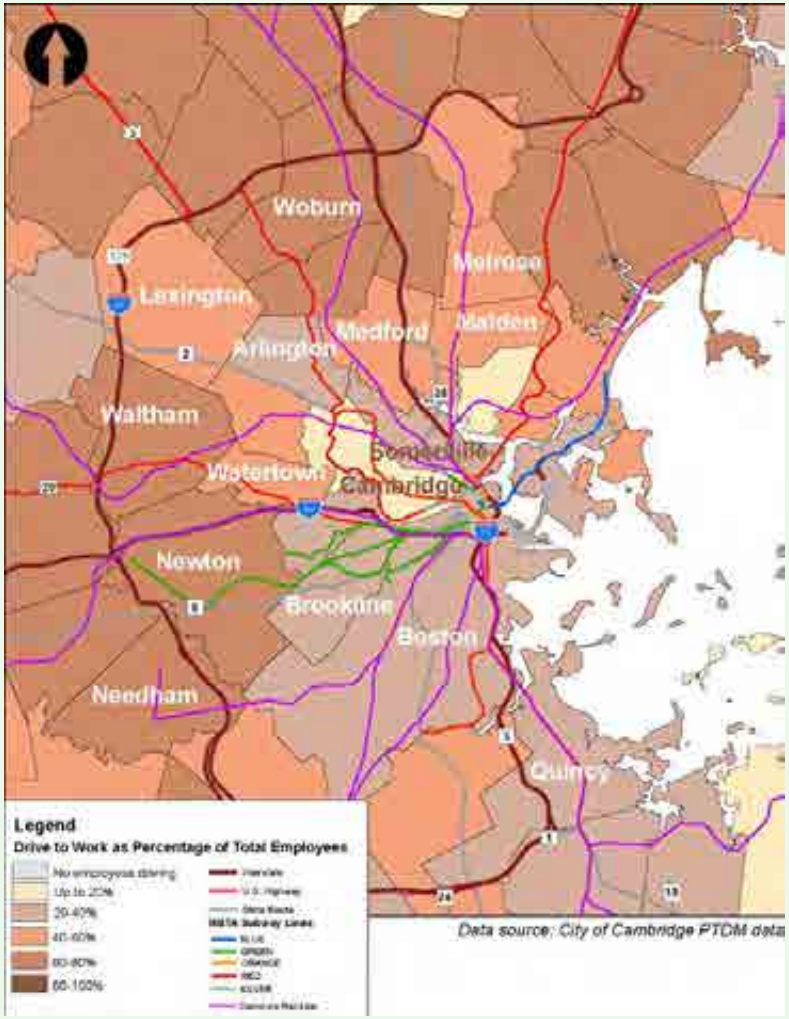
- 34% of employees take transit to work in Kendall Square



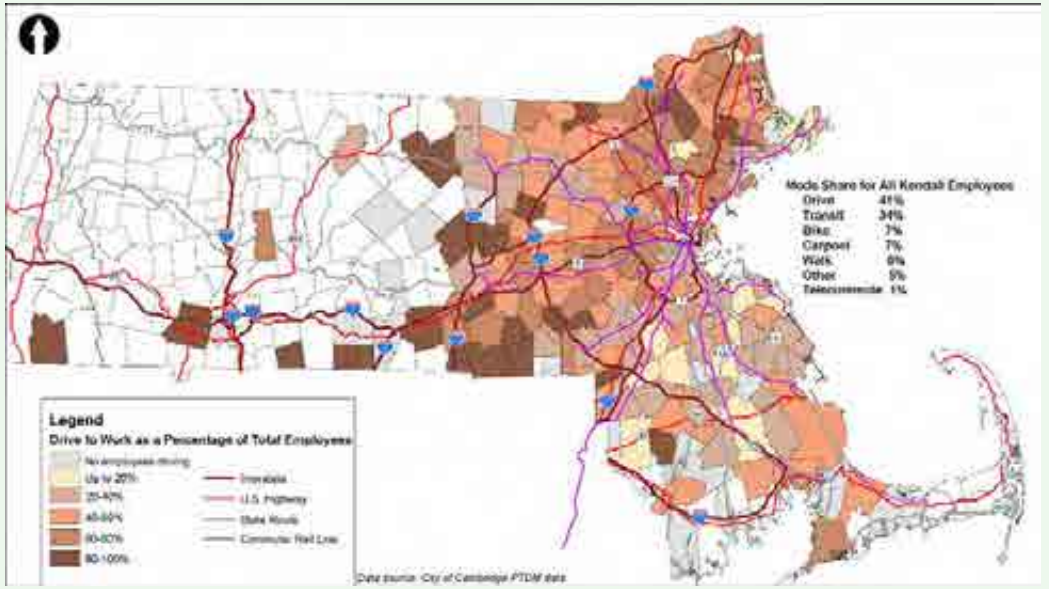
massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Kendall Square Employee Drive Alone



- 41% of Kendall Square employees drive alone to work



massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Bicycle Growth

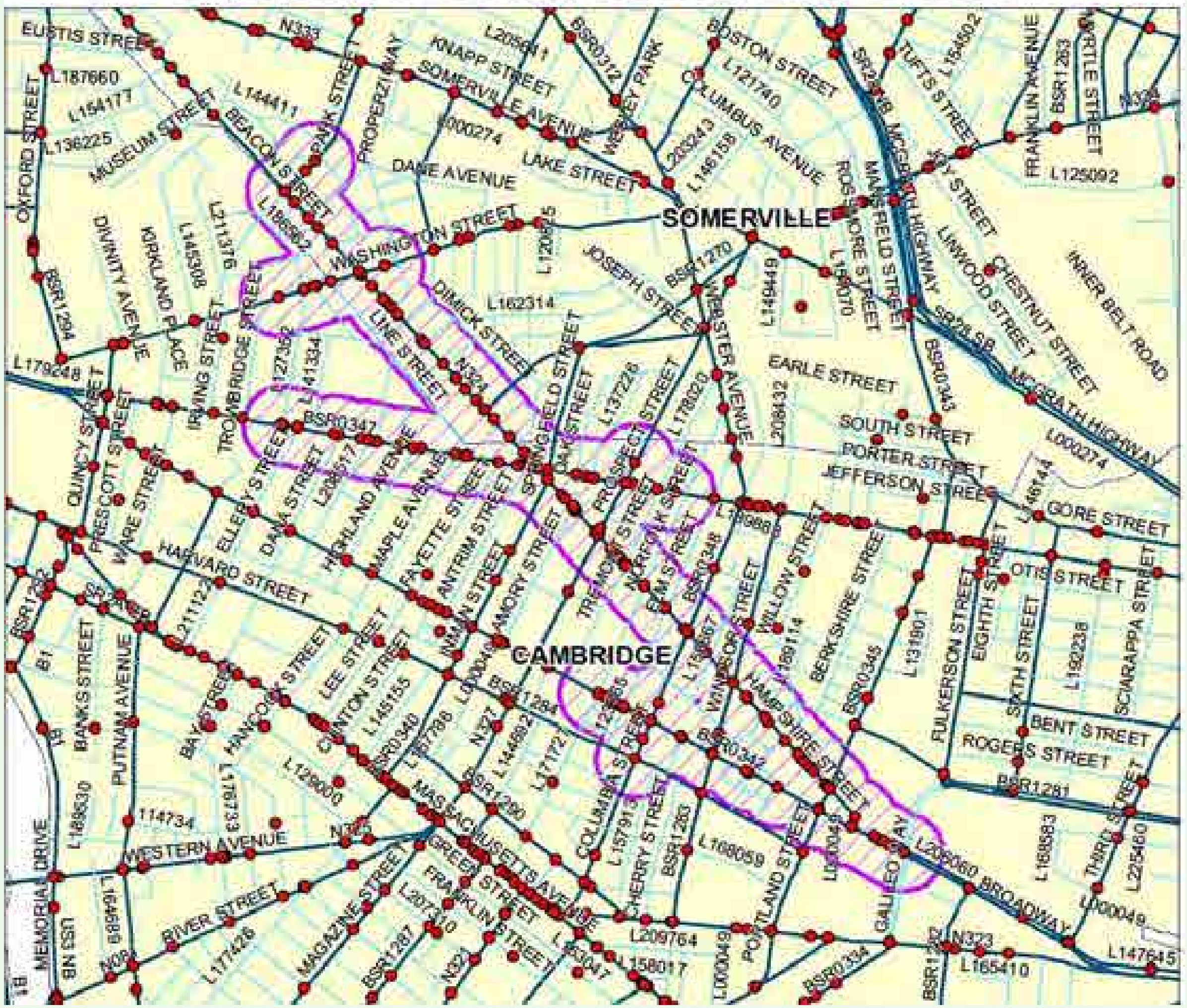
Combined AM and PM peak hour cyclist counts at 17 locations in Cambridge.

- 2002-2012 numbers are from the Cambridge Community Development Department Bicycle Counts report.
- 2014 data is from the bike count data spreadsheets for the 17 locations.

massDOT

BICYCLE SAFETY

Top Bicycle Crash Cluster 2002-2012

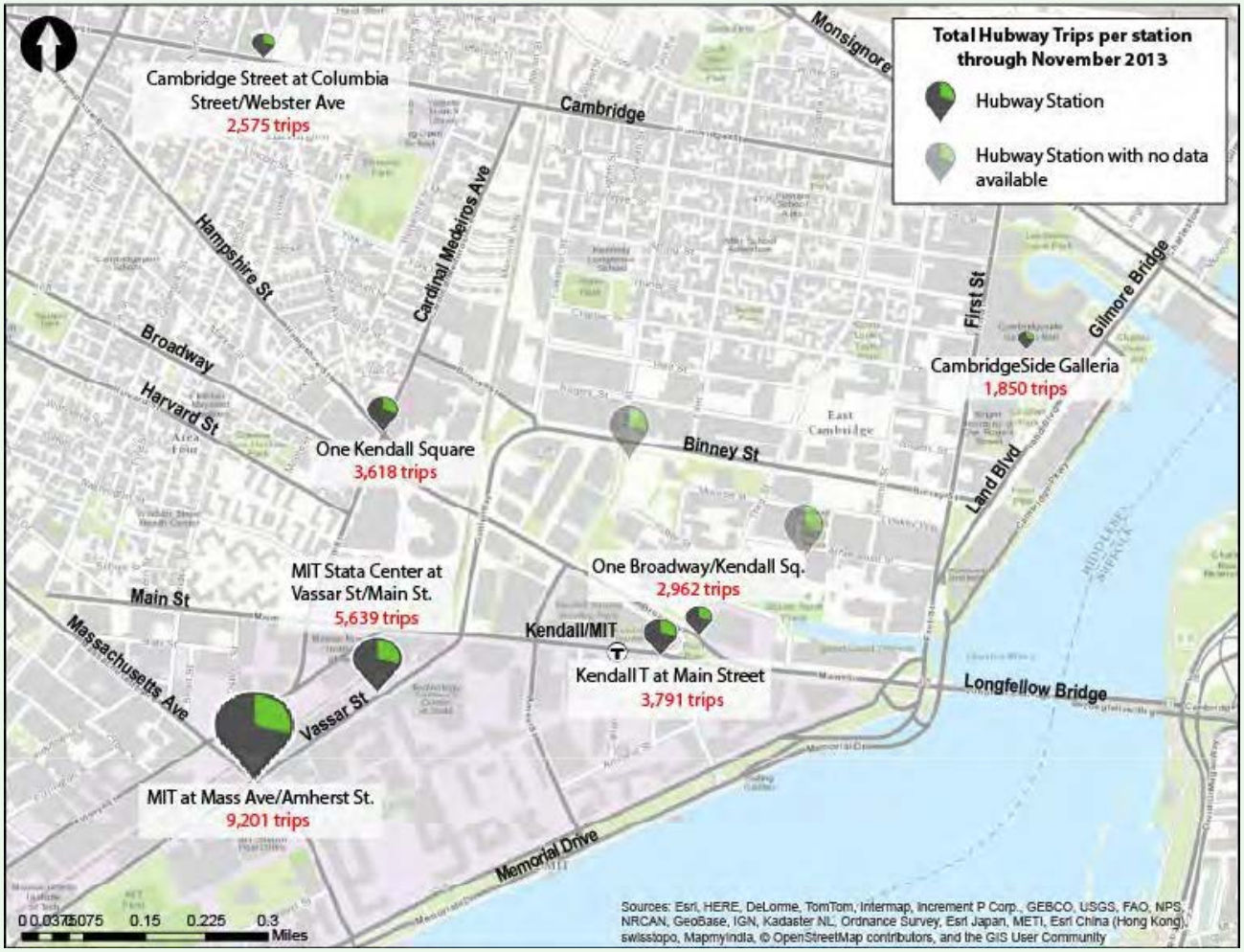


Bicycle Crash Cluster

#2 in statewide MassDOT data

KENDALL SQUARE MOBILITY TASK FORCE

Hubway Trip Patterns



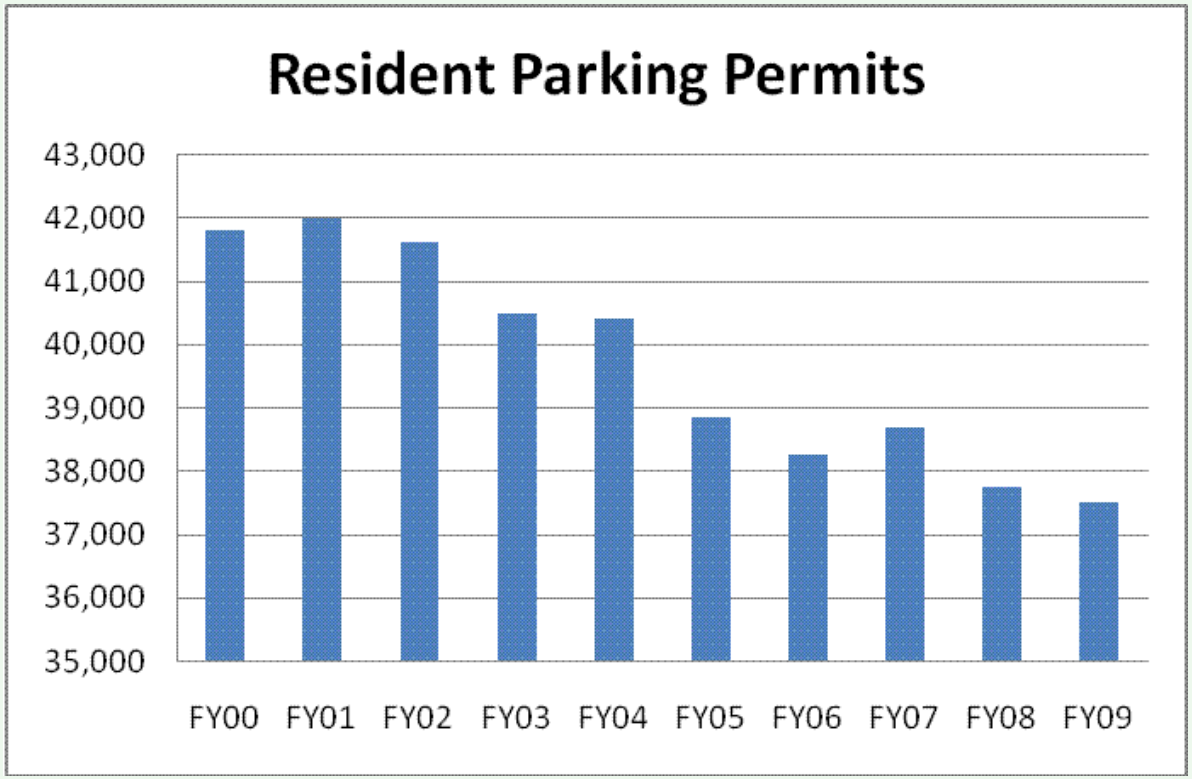
- 64% of Cambridge trips via Kendall
- 52-60% of Kendall trips stay in Kendall
- MIT stations far more used than others in Kendall area

massDOT

Auto Ownership is Declining

Cambridge households without a vehicle increased from 28% to 32% from 2000 -2008

Source, American Community Survey



50% of Cambridge households within ¼ mile of an MBTA station have no car

Source, City of Cambridge CDD and TPT Departments,

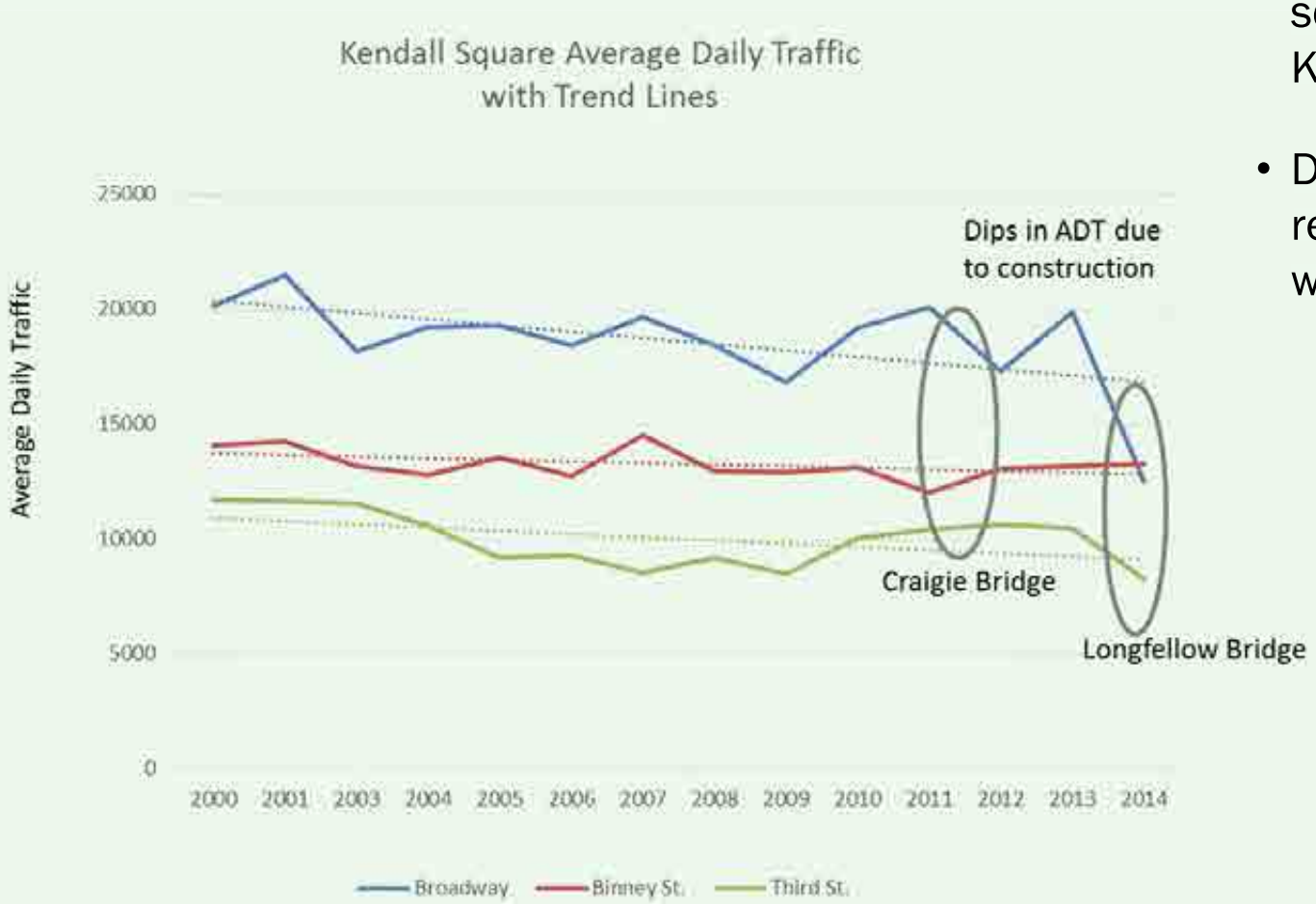
10% decrease in permits issued between 2000 and 2009.

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Development vs. Traffic Growth

- Added almost 4 million square feet in Greater Kendall from 2000-2010
- Daily Traffic Volumes remained consistent or were reduced



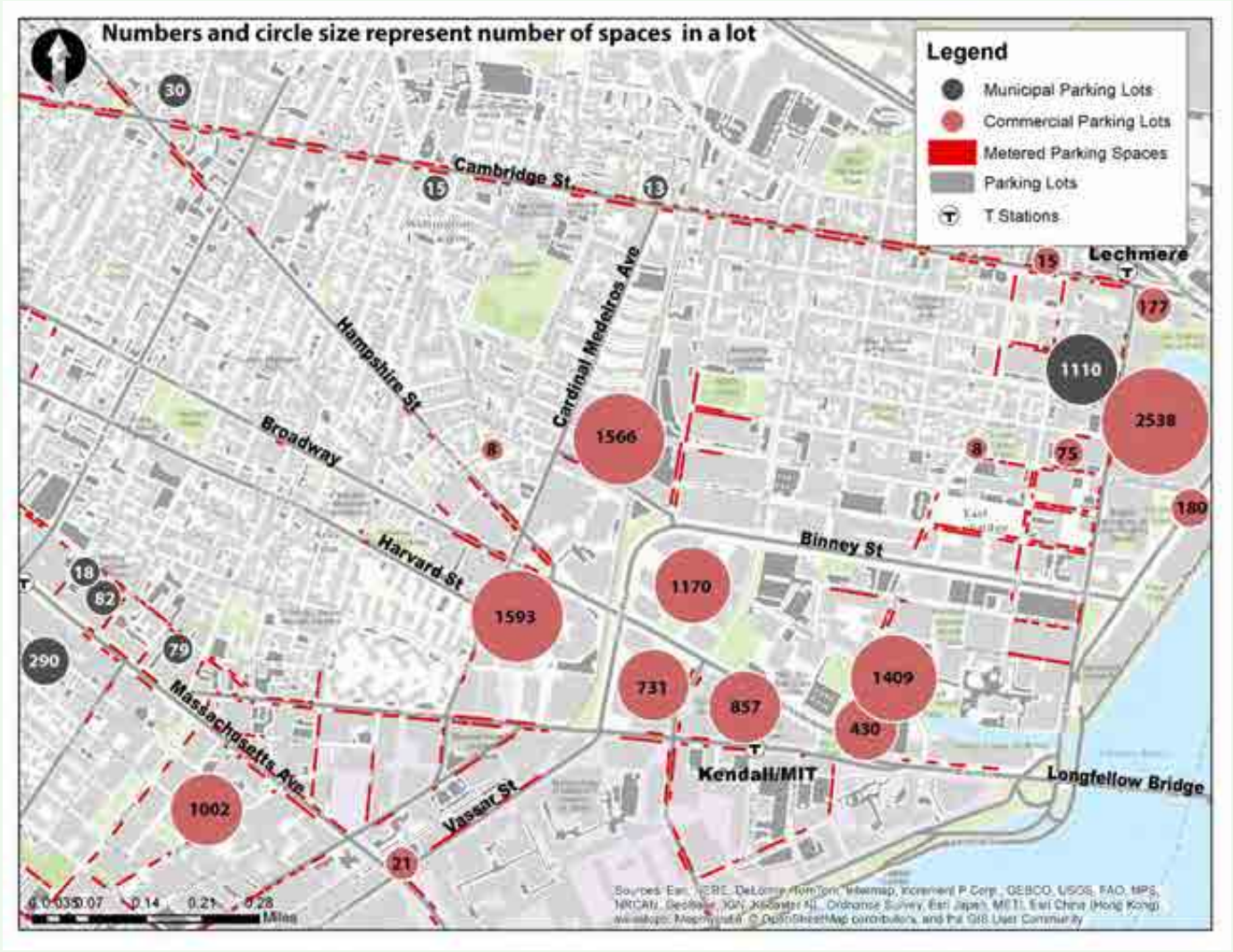

The Boston Globe

Car-free commuting push pays off in Kendall Square

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Parking



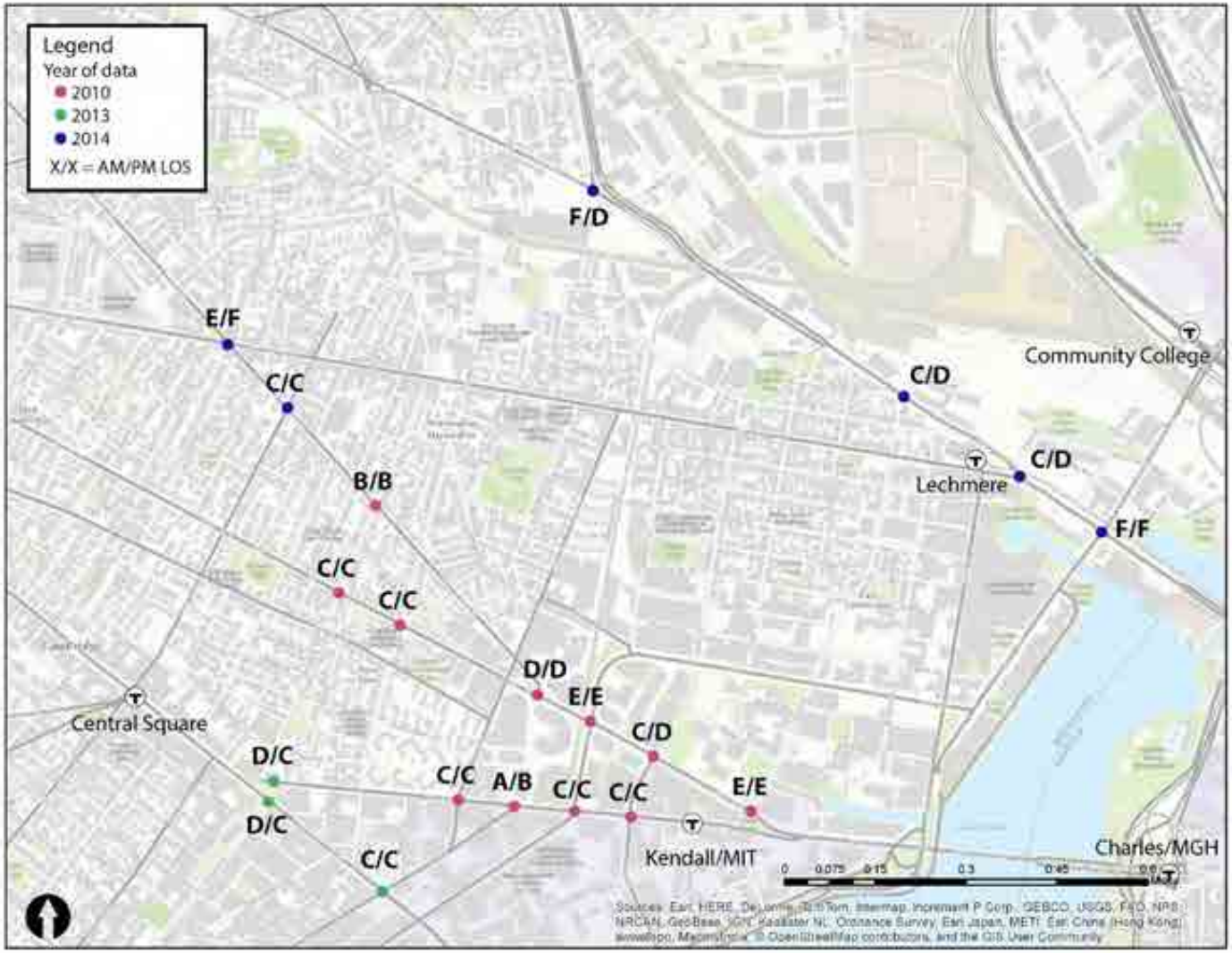
- AM peak-hour trips entering and exiting Cambridge Center parking garages were 8% higher in 2014 than in 2013.
- Average weekday peak number of spaces was up 7% in the same time-frame.

Fay, Spofford & Thorndike, 2014 Annual Traffic Update

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

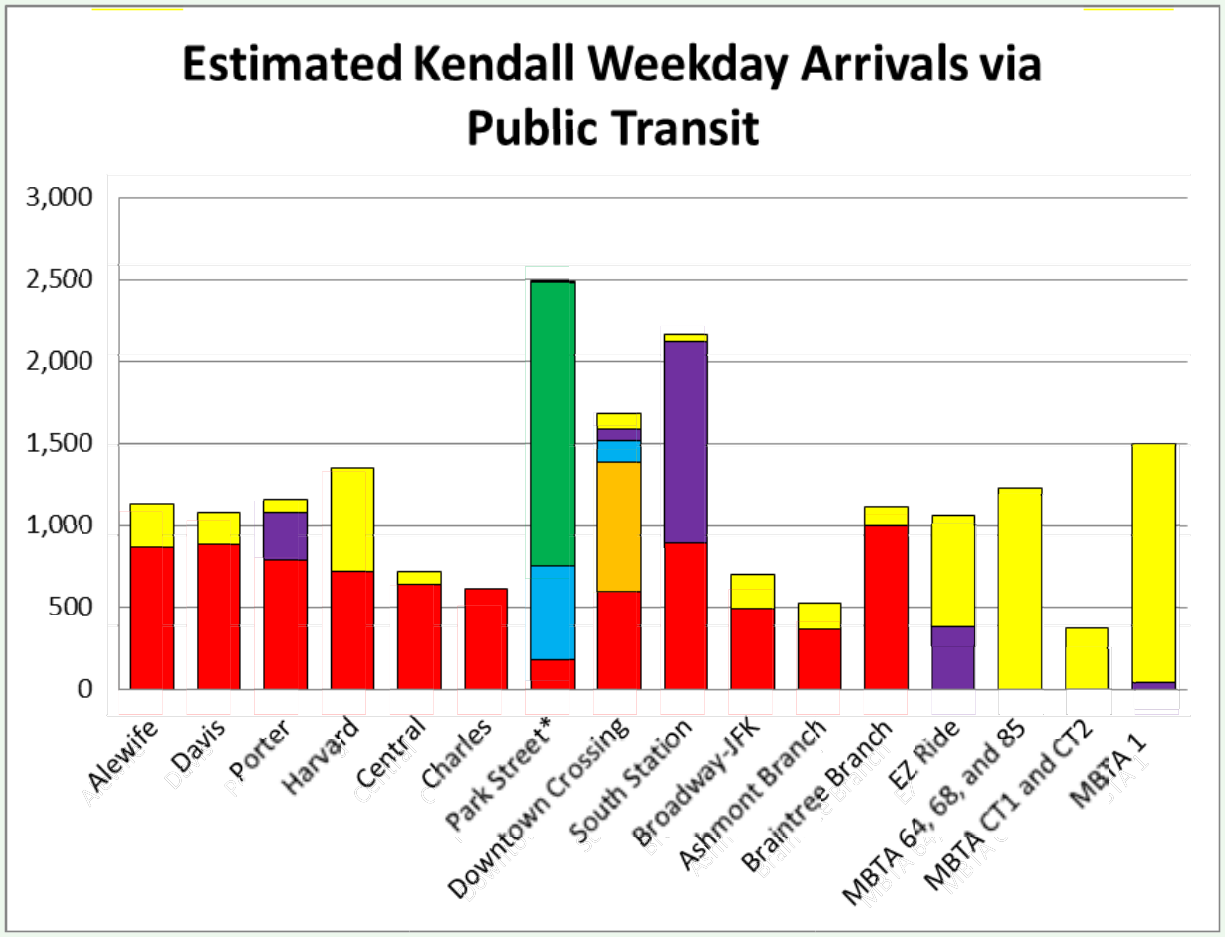
LOS for Key Intersections



- Gateway intersections
  - Bus travel
  - Vehicular travel
  - Pedestrian and bicycle safety

massDOT

Transit Trips



* with Government Center station open

- About 18,900 transit trips to the study area each weekday
- 78% arrive at Kendall on the Red Line (10% by bus, 17% via other rapid transit, 8% from CR)
- 19% directly to Kendall via MBTA bus

massDOT

Transit to Kendall

Route	Total Route Weekday Boardings	Percentage to Kendall
Red Line – North of Kendall	78,546	8%
Red Line – Ashmont Branch	91,248	5%
Red Line – Braintree Branch	102,829	5%
1 – North of Kendall*	1,525	16%
1 – South of Kendall*	11,575	11%
CT 1*	2,500	5%
CT 2 – North of Kendall	1,550	11%
CT 2 – South of Kendall	1,500	17%
64	2,000	39%
68	500	95%
85	650	96%
EZ Ride	1,976	62%

***This route does not serve Kendall/MIT station directly, but does serve trips to/from study area**

massDOT

Transit from Kendall

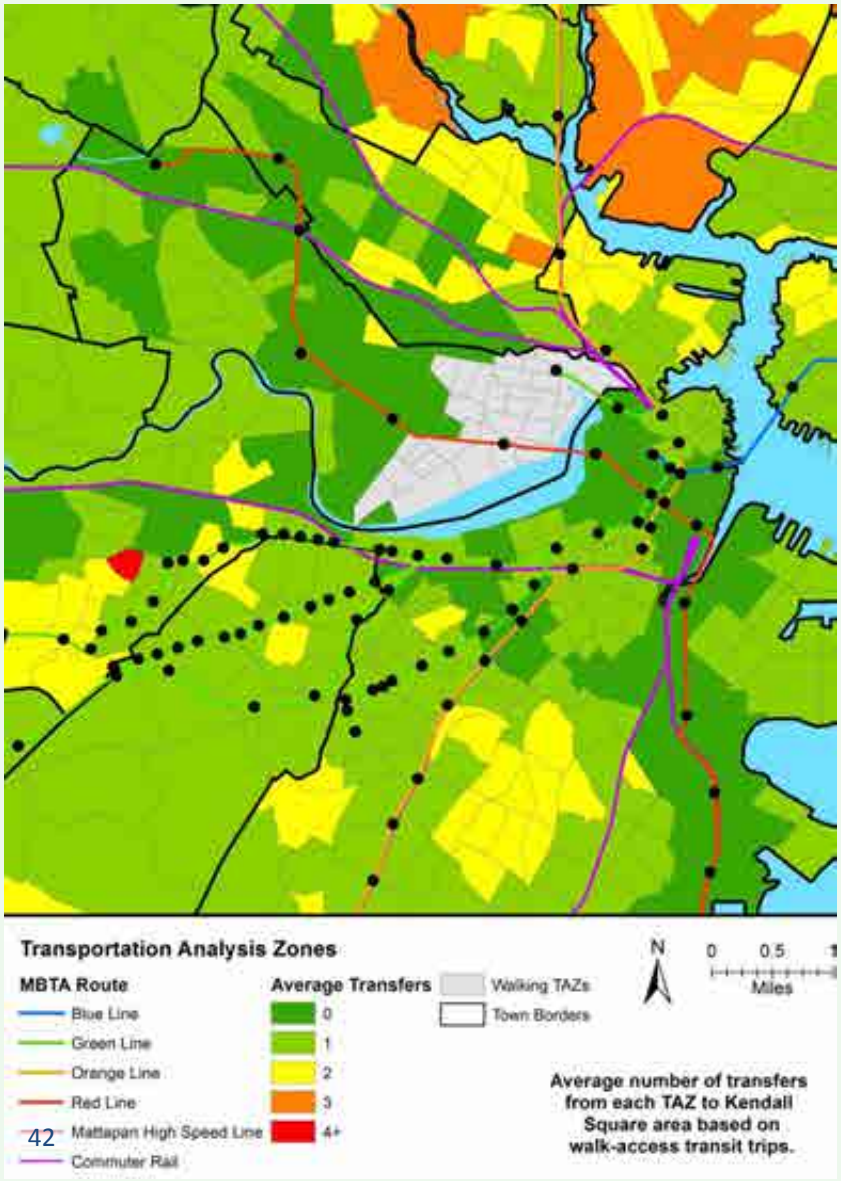
Route	Weekday Boardings from Kendall	Percent of Kendall Boardings
Red Line – North of Kendall	4,308	21%
Red Line – Ashmont Branch	5,894	29%
Red Line – Braintree Branch	5,230	25%
1 – North of Kendall*	250	1%
1 – South of Kendall*	1,250	6%
CT 1*	125	1%
CT 2 – North of Kendall	175	1%
CT 2 – South of Kendall	250	1%
64	775	4%
68	475	2%
85	625	3%
EZ Ride	1,227	6%
TOTAL	**20,584**	**100%**

***This route does not serve Kendall/MIT station directly, but does serve trips to/from study area**

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Transfers - Connectivity



'Pockets' of indirectness:

- Longwood Medical and Academic Area (LMA)
- Roxbury
- Charlestown
- Everett
- East Boston
- Winter Hill (Somerville)
- West Medford

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Red Line Train Load Capacity

CAPACITY

"The maximum number of people that can be carried past a given location during a given time period under specified operating conditions, without unacceptable delay, hazard, or restriction, and with reasonable certainty"

- Transit Capacity and Quality of Service Manual

Physical

57 seats plus standees
Comfortable Car capacity = 225
'Crush' car load = 277

6 cars per train

Theoretical capacity per train = 1,350

Loading and Operational Considerations

- Demand within the peak
- 'Surges' from transfers
- Station and platform configuration
- Regularity of arrivals

Loading diversity factor (PM southbound) → 0.563

Effective capacity per train = 760

massDOT

Delays and Capacity

"A Subway Delay Story"

Published by MTA Info

www.youtube.com/watch?v=eShtZSx4kWc

massDOT

Red Line System Capacity

Factors	MBTA Red Line (PM southbound)
Safe train separation time (seconds)	70
Ruling Dwell Time (seconds)	90
Operating Margin (seconds)	105
Trains per hour at capacity	13.8
Trainload at capacity	760
Person Capacity	10,520
Person Throughput at Maximum Load Point	9,080*

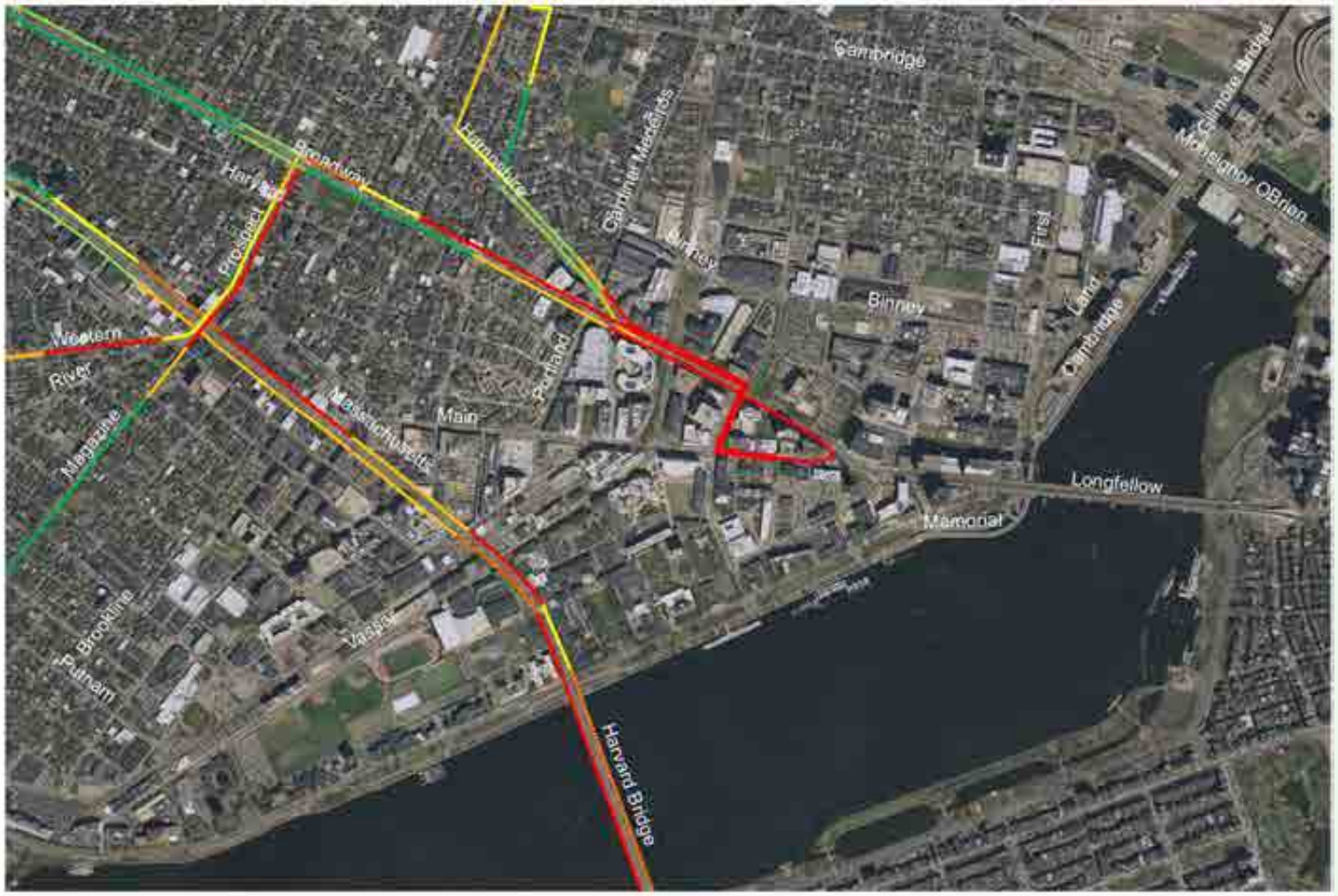
*Indirect estimate from APC data

Minimum Headway includes:

- Longest ('ruling') dwell time on the entire line (*e.g.* Park or Downtown Crossing);
- Safe train separation time enforced by the signal system; and
- An operating margin to provide a 'cushion' to keep random events from causing instabilities in the flow

KENDALL SQUARE MOBILITY TASK FORCE

Bus Route LOS



Local Bus Routes PM Peak

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

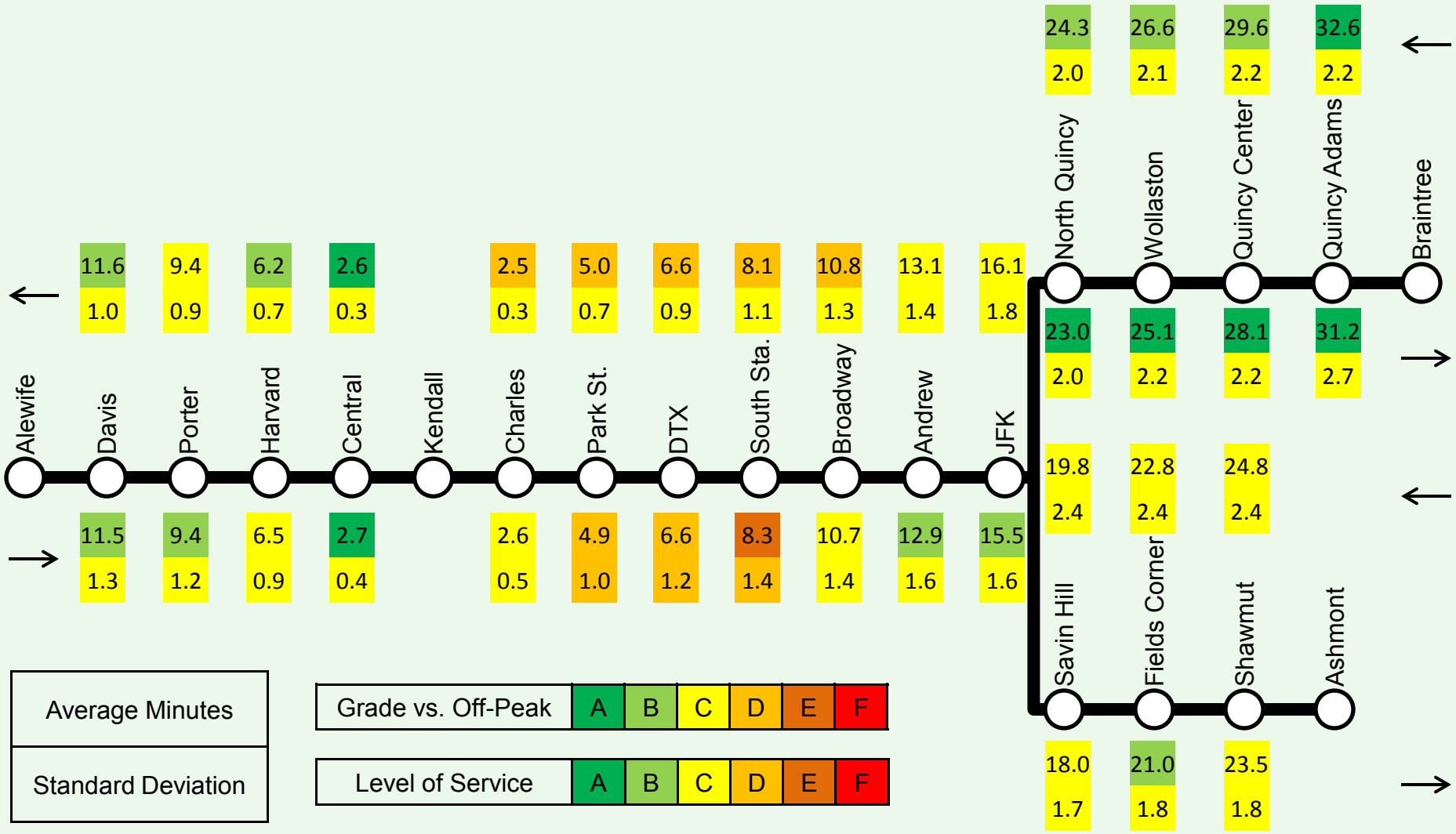
Bus Route LOS

Routes CT1 & CT2 PM Peak

massDOT

KENDALL SQUARE MOBILITY TASK FORCE

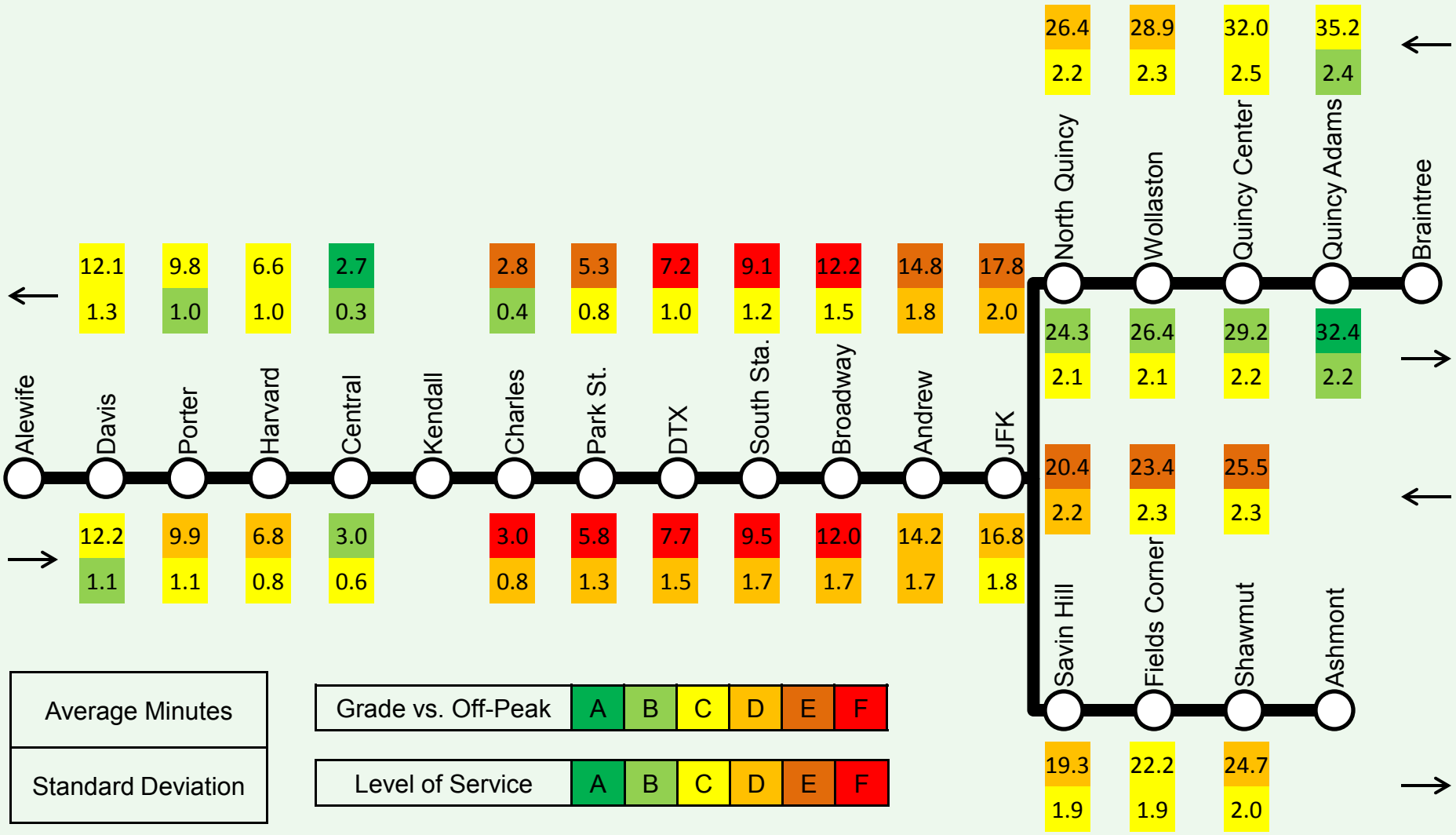
Red Line Travel Time – Off Peak (Times to/from Kendall)



massDOT

KENDALL SQUARE MOBILITY TASK FORCE

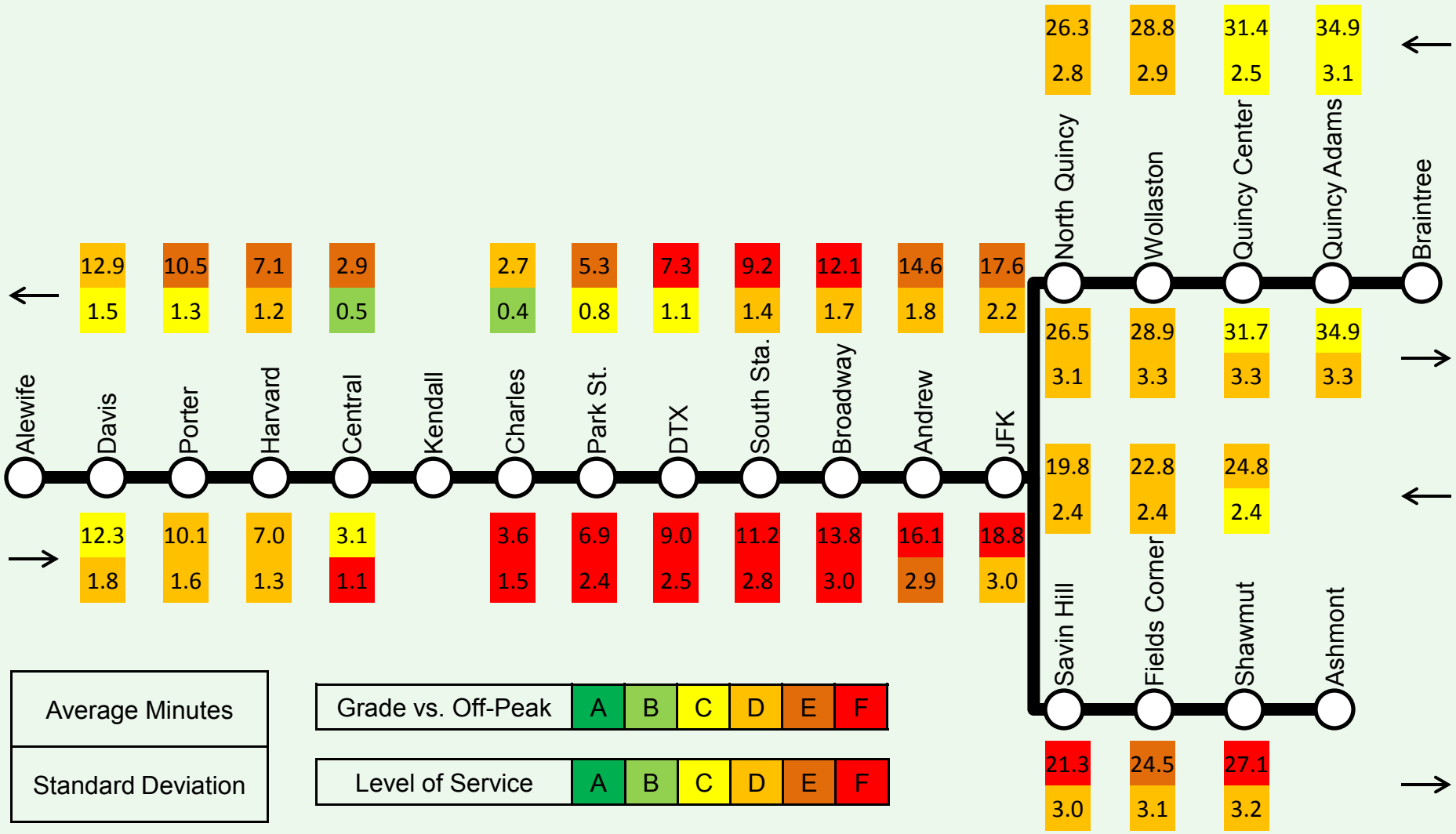
Red Line Travel Time - AM Peak (Times to/from Kendall)



massDOT

KENDALL SQUARE MOBILITY TASK FORCE

Red Line Travel Time - PM Peak (Times to/from Kendall)



massDOT

Overall Transit LOS

- Quality of service impacts ridership
  - Connecting bus services are generally slow (8 mph during peaks) and unreliable (MBTA routes LOS E and F)
  - Red Line is both slow (9.4-11.6 mph) and unreliable with excessive wait times
- Red Line capacity can be improved
- Improving existing services could pay dividends
  - Increased capacity and/or more even passenger loads
  - Increased productivity (passenger miles per transit hour)
- Some areas are poorly connected to transit requiring more transfers than trips to central Boston

massDOT

CONTINUING EXISTING CONDITIONS EVALUATIONS

Continuing Evaluation

- CTPS No Build 2040
- Transit pass usage and subsidies
- New transportation options
  - Uber/Bridj
- Other suggestions

massDOT

SUMMARY/DISCUSSION

PUBLIC COMMENT