# Actions to Transform Mobility

TRANSPORT KENDALL

# Navigating the Growth and Transformation of Kendall Square

### Introduction

The Kendall Square has undergone a dramatic transformation over the past 40 years. The scientists, engineers and entrepreneurs in Kendall Square together have created one of the most dynamic innovation districts in the world. Kendall's innovation ecosystem is dependent on the talent and resources of institutions and companies located in close proximity. Close connections to Boston's medical centers, investment resources, and education institutions have likewise been invaluable.

Kendall Square has become central to Massachusetts's economy attracting talent from every corner of the state, however Kendall is not as geographically central within the regional transit system as downtown Boston. Despite this, Kendall has grown from one red line station into a model transit-oriented development district with a truly multi-modal commute pattern, supported by the City of Cambridge's progressive parking and transportation demand policies.

Kendall has spurred the emergence of new districts focused on life science and technology innovation throughout the region. The state's economic growth is dependent on reliable transportation connections between where people live and work. Transport Kendall seeks to maintain and enhance the transit-oriented development model in Cambridge. To do this, Transport Kendall promotes future investment in the transit system to serve this economic hub, while relieving congestion and supporting regional economic growth harnessed by the innovation economy.

# transport kendall

## Supporting a growing region

**FOCUS AREAS**

- **Grand Junction Corridor**
  Maximize transportation benefits for pedestrians, cyclists, and transit riders.
- **Red Line**
  Improve operational capacity and reliability to meet current and future demands
- **Bus Connections**
  Improve and increase direct connections to and from Kendall Square

# grand junction

## A new link within the regional economy

- **Action**
  Convene regional stakeholders to advance a common vision of a regionally connected multi-use path
- **Action**
  Analyze and communicate the benefits of regional bike and pedestrian connections
- **Action**
  Develop grand junction transit concept
- **Action**
  Update Grand Junction transit demand estimations

# red line

## The backbone of the Cambridge transit system

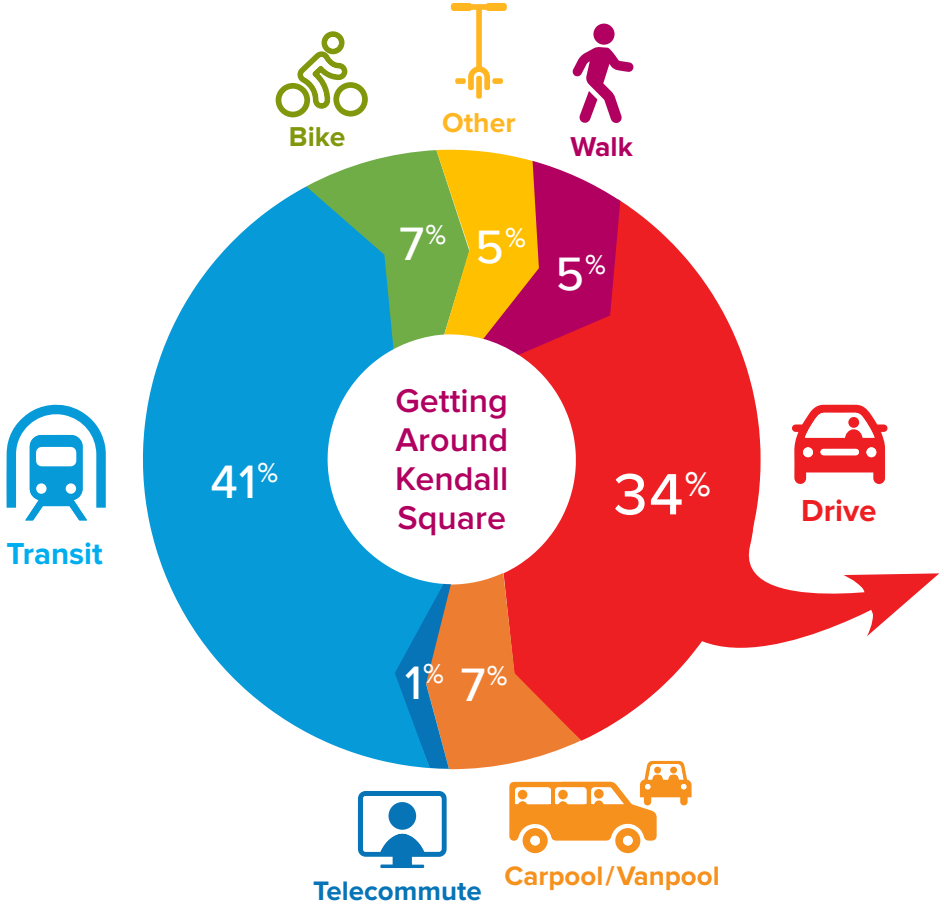
- **Action**
  Advocate for and ensure Red Line capacity increase is delivered
- **Action**
  Implement Kendall Square station improvements
- **Action**
  Make the Red Line resilient to climate change

# buses

## Reinventing bus service for a growing economy

- **Action**
  Study bus priority treatments —Lechmere to Kendall Square
- **Action**
  Improve CT2/85 frequency and reliability
- **Action**
  Extend 64/70/70A into Kendall Square
- **Action**
  Increase EZRide shuttle service
- **Action**
  Implement new CT4 service

# Maintaining Multi-Modal Transportation




## Future Goal for "Drive Alone" Commuters

While the percentage of employees driving to work in Kendall Square is already low, previous Kendall Square planning processes have established a goal to reduce it even further to 30%.

As economic success and growth in Kendall Square continues today and into the future, increased support of commuting trips by sustainable modes such as walking, biking, and public transit will be essential.

Source: 2014 Parking and Transportation Demand Management Data, City of Cambridge

## Supporting a Growing Region

Kendall Square is an internationally recognized innovation hub. This former industrial district is now one of the world's leading centers for life science and technology research and innovation, with an active and diverse civic and business community. Over 65,000 people live, work, learn, and play in the district that is home to over 30 industry sectors and 13 of the top 20 biopharmaceutical companies. Kendall Square is not only an economic driver for Cambridge, but also for the region.

### A Time of Unprecedented Growth

The transformation of Kendall Square, occurring over the last few decades, has spurred an intense demand for commercial development. The area currently has more than 18 million square feet of office space, an increase of 300% since 1980. With the two million square feet of development currently underway, the percentage jumps to 350%.

To sustain its economic growth and continued success, Kendall Square must compete with other economic centers across the country to attract a diverse workforce. Improving the district's accessibility for both its workers and residents is essential to supporting and maintaining this vibrant community where imagination, creativity, curiosity, and ingenuity thrive.


**According to the Kendall Square Development Map (see page 5), there has been more than 7 million square feet of commercial development in Kendall Square since 1980.**

### A Call for Investment

Kendall Square now needs to aggressively pursue transportation solutions to anticipate and meet the needs of this rapidly growing economic area. This document outlines the most critical and urgent improvements needed throughout the multi-mobility systems serving Kendall Square in order to create a livable and sustainable district.

### The Transformation of Kendall Square

The Kendall Square area, which was once a salt marsh along the Charles River, became a manufacturing center during the 19th century. By the 1970s, most factories were abandoned. Around that time, the City of Cambridge with investments by the Cambridge Redevelopment Authority (CRA) and Massachusetts Institute of Technology (MIT) began to revitalize Kendall Square into a leading center for entrepreneurship, research, and development. Its transformation has been fueled by the dynamic interactions of the people living and working in the district.

### Moving in the Right Direction

Despite the dramatic increases in commercial development already noted, the growth in daily traffic on central roadways with Kendall Square has remained roughly flat since 2000. City of Cambridge policies, the ongoing efforts of stakeholders, and the investment in pedestrian, bicycle, and transit facilities have all contributed to mitigating the growth in daily vehicle trips that was predicted in the 1977 Kendall Square Urban Renewal Plan.[1]

Parking and transportation demand management policies established by the City provide the foundation for addressing the impact of development on traffic.[2] For example, today, Cambridge leads the nation in walkability and the percentage of residents who get to work without a car.

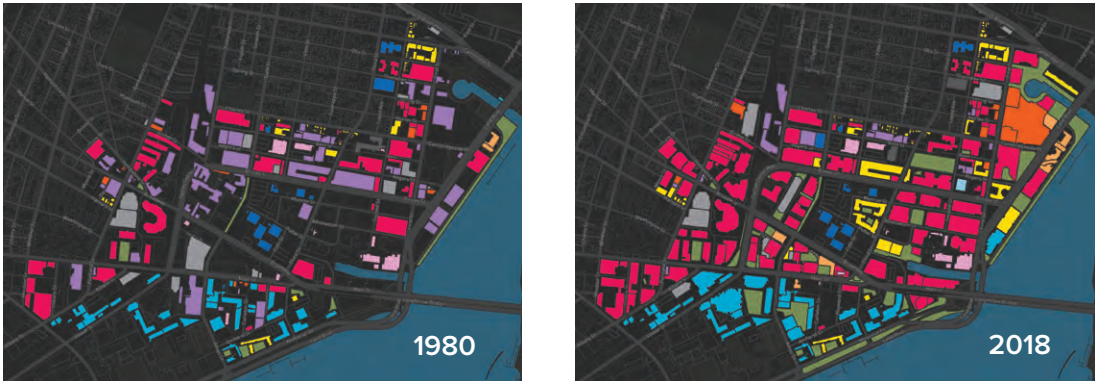
However, even with these positive outcomes, there is a growing awareness of the significant and complex mobility challenges facing the Kendall Square community and an urgent need to address them.

**Since 1980, square footage of office and R&D space has more than quadrupled. Residential space has more than tripled.**

[1] http://www.cambridgeredevelopment.org/interactive-map/
[2] http://www.cambridgeredevelopment.org/infill-development-concept-plan-idcp-1

## Kendall Square Development Map

Development Growth and Shifts in Land Use

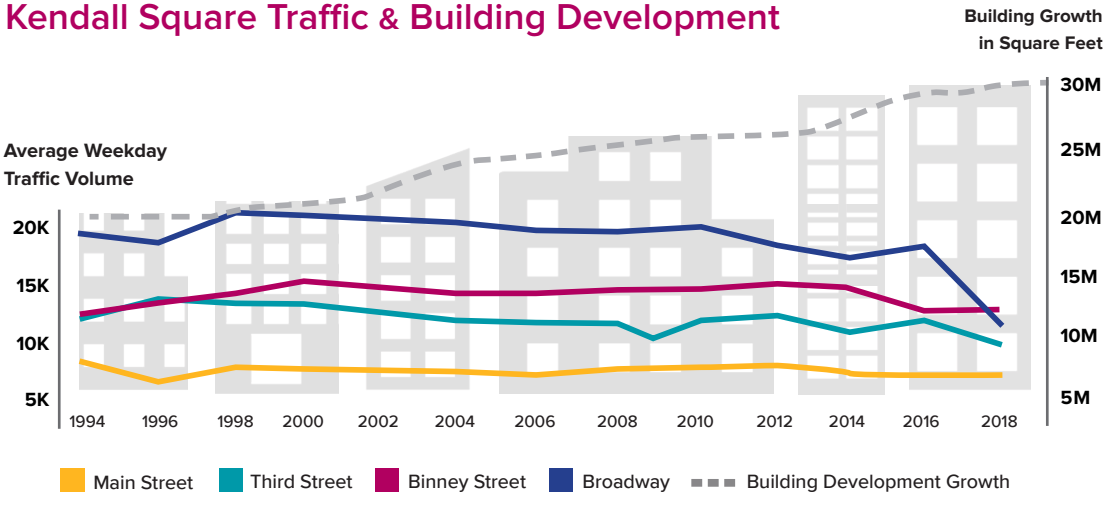



**LAND USE KEY**

- Office / R&D
- Higher Education
- Residential
- Parking & Transportation
- Retail
- Hotel
- Industrial
- Government
- Vacant

Source: Cambridge Redevelopment Authority http://www.cambridgeredevelopment.org/interactive-map/

## Kendall Square Traffic & Building Development




Despite dramatic increases in commercial development, the level of daily traffic in central Kendall has remained roughly consistent since 2000.

Source: Cambridge Redevelopment Authority Kendall Square Urban Renewal Area Section 61 Findings Annual Traffic Update

**The recommended actions from the Kendall Square Mobility Task Force advance a vision of an urban mobility system that is sustainable, supports strong economic development, and improves the quality of life for the people that live, work, learn, and play in Kendall Square.**

## Kendall Square Focus Areas and Opportunity Statements

The Task Force developed the following opportunity statements for improving mobility in Kendall Square. These lead to the actions described in this report and are organized in three priority areas:

- **Grand Junction:** Maximize the transportation benefits of the corridor for pedestrians, cyclists, and transit riders.
- **Red Line:** Improve operational capacity and reliability to meet current and future demands
- **Bus/Shuttle:** Improve and increase direct connections to and from Kendall Square to reduce auto use and improve bus travel times, reliability, and hours of service.

The Task Force explored a fourth priority area related to ride-hailing services and shuttles. Elements of the shuttle discussion are included in the bus section of Transport Kendall. Ride-hailing in Cambridge, like all municipalities, has been evolving at a rapid pace, both during and since the Task Force's work. Rather than focus on the thinking that occurred at a specific point in time in Transport Kendall, the discussion of ride-hailing and other rapidly evolving mobility options is happening through other initiatives, plans and processes, such as the City's upcoming Future of Mobility study.

### Consensus on Needed Investments

To address the mobility challenges facing a growing district, a group of stakeholders, including representatives from the City of Cambridge, state transportation agencies, local institutions, and private organizations, came together in 2015 to form the Kendall Square Mobility Task Force (KSMTF). Working over a two-year period, the KSMTF sought to identify the policy initiatives and projects over the short, medium, and long-term horizons that would support the continued success of Kendall Square. The process included eight task force meetings and two public meetings, extensive gathering of information, and the review of technical analyses and reports.

### Advancing a Vision for Kendall Square Mobility

To guide future investment, collaboration, and policy making, a set of actions for each priority area are summarized in this "Transport Kendall" report. Transport Kendall is grounded in the foundational policies of the City of Cambridge that seek to promote public health, safety, and welfare. It is a vision of an urban mobility system that is sustainable, supports economic development, and improves the quality of life for the people that live, work, learn, and play in Kendall Square. The policy goals and actions within this report were developed by the KSMTF.

*To download the full report, go to:*
**www.transportkendall.org**

## Kendall Square Mobility Task Force

### Co-chairs
**City of Cambridge, Environmental & Transportation Division**
**Kendall Square Association**

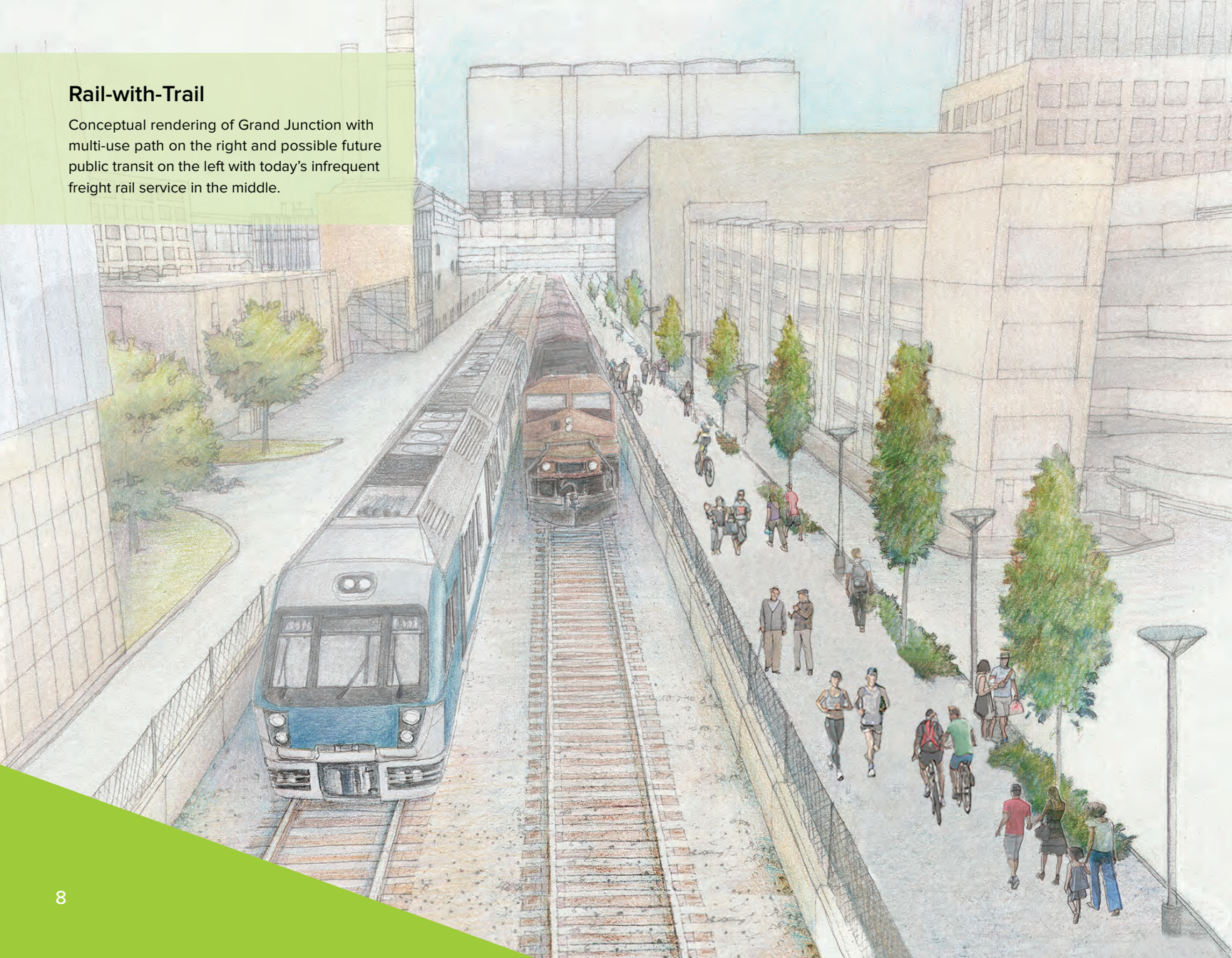
### Agencies
Cambridge Redevelopment Authority
Charles River Transportation Management Association
City of Cambridge Traffic, Parking and Transportation
Massachusetts Bay Transit Authority
Massachusetts Department of Transportation
Volpe National Systems Center

### Businesses/Developers
Biogen
Boston Properties
Cambridge Innovation Center

### Institutions / Associations / Advocates / Other
East Cambridge Business Association
East Cambridge Planning Team
Friends of the Grand Junction
Livable Streets Representatives
Massachusetts Institute of Technology
MIT Investment Management Company

## Rail-with-Trail

Conceptual rendering of Grand Junction with multi-use path on the right and possible future public transit on the left with today's infrequent freight rail service in the middle.



PRIORITY

# grand junction

## A New Link within the Regional Economy

A Grand Junction multi-use path alongside new public transit service connecting West Station in Allston, Kendall Square, and North Station in downtown Boston would provide a transformational link between growing and thriving innovation economies. Currently, people traveling on rail transit between Allston and Kendall Square have long trips with downtown transfers. People travelling between North Station and Kendall face severe congestion on shuttle buses or must transfer through downtown. Grand Junction public transit would relieve pressure on the central subway system by giving people faster and direct routes.

While new Grand Junction public transit is a long-term vision that would have to be led by and built by the state, the design for an adjacent multi-use path, fully funded by the City and private entities, is underway as of late 2018. The Grand Junction multi-use path is envisioned to be an off-street bicycle and pedestrian path from the Boston University Bridge on the Charles River to Somerville. It will provide an ideal link between the Somerville Community Path, the Paul Dudley White Bike Path, and proposed paths in the Allston I-90 Interchange project.

The first segment of the multi-use path has already been built in Kendall Square. When completed, the full path will provide an immediate community and mobility benefit in the near-term while not precluding future passenger transit service along the corridor. In the meantime, the concept for two-track public transit service should be advocated and advanced.

**42%** of jobs in Cambridge (approx. 49,000 jobs) and **33%** of residents (approx. 33,000 people) are within a ½ mile of the Grand Junction.

**Sources: 2010 Census population data; 2014 Longitudinal Employer Household Dynamics Program LODES data**

### Building the Multi-Use Path

Widespread local support and a significant amount of funding are already in place for the multi-use path. Cambridge completed a feasibility study in 2006 and MIT released a study for the portion it owned in 2014.[3] MIT and the CRA funded the first portion of the path, constructed as part of the Grand Junction Park between Main and Broadway. The second portion is being constructed within the Binney Street Park between Broadway and Binney Street.

In 2016, Cambridge set aside $10 million in funding for the design and construction of the northern portion of the path from Binney Street to the Cambridge city line. In 2017, MIT committed $8.5 million towards the design and construction of the portion of MIT owned property southwest of Main Street. In addition, the City and CRA have worked with developers to ensure that right of way is available when it comes time to construct the path.

[3] Feasibility studies can be accessed at the city's project website: http://www.cambridgema.gov/CDD/Projects/Transportation/GrandJunctionPathway

## DECADES IN THE MAKING

**2000**
Cambridge Green Ribbon Open Space Committee

**2001**
Eastern Cambridge Planning Study (ECAPS)

**2002**
Planning Board begins ROW preservation with MIT Brain & Cog design change

**2006**
City completes a Feasibility Study

**2008**
MassDOT includes conceptual design of the path between BU Rail Bridge and Ft. Washington Park as part of the Urban Ring Study

**2012**
MassDOT Grand Junction Transportation Feasibility Study

**2013**
Friends of the Grand Junction path formed

MIT committed $500,000 in construction funds for Grand Junction Park

**2015**
CRA "Forward Fund" grant to study local and regional connections

**2016**
City commits $10M for design and construction north of Binney Park

Grand Junction Park Opens

**2017**
MIT commits $8.5M and land for design and construction on MIT-owned portions

The Task Force recommends advancing Grand junction Path and conceptual future transit

**2018**
Grand Junction prioritized as a regional link in MAPC's Landline Trail and Greenway Plan

**From Opportunity to Action:** Maximize the transportation benefits of the Grand Junction corridor by building the Grand Junction Multi-Use Path, designing a conceptual passenger transit service and advocating for that passenger transit service connecting North Station and a future West Station in Allston.


First section of Grand Junction path now completed

## ▶ACTION

### Convene Regional Stakeholders to Advance a Common Vision of a Regionally Connected Multi-Use Path

Stakeholders should continue to work together to consider regional connection to the path network and possible future transit network, especially in projects such as the Allston I-90 Interchange project in Boston and the Green Line Extension project in Somerville.

## ▶ACTION

### Analyze and Communicate the Benefits of Regional Connections

The City is working with the Metropolitan Area Planning Council to measure and make the case for how the Grand Junction multi-use path will improve access to and from Kendall Square, reduce vehicle use, and benefit businesses in Kendall Square.

## ▶ACTION

### Develop Grand Junction Transit Concept

A passenger transit link between North Station and a future West Station in Allston would increase accessibility to Kendall, support economic development, and relieve pressure on the core of the MBTA system. While there is no commitment from MassDOT to implement transit service on the Grand Junction corridor, the City is developing a conceptual design for two-track passenger service to illustrate that the multi-use path can co-exist with passenger transit and MassDOT is studying options in its Rail Vision Plan.

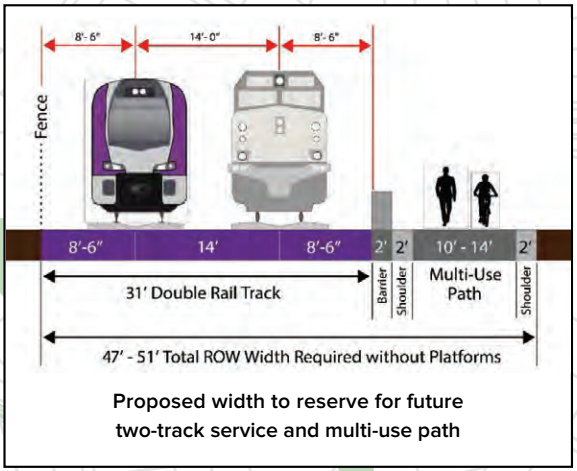
## ▶ACTION

### Update Grand Junction Transit Demand Estimates

The current understanding of the need for transit service along the Grand Junction corridor is based on an out-of-date demand analysis performed for MassDOT's Urban Ring project and needs to be updated to match the new concept.[4]

[4] https://www.massdot.state.ma.us/theurbanring

# Grand Junction Multi-Use Path and Potential Future Transit Corridor




Proposed width to reserve for future two-track service and multi-use path



Cambridge

Ⓣ Future West Station

A

Boston

Future multi-use path and public transit connection which will connect to Paul Dudley White Path and future new Allston path network.

1 inch - 2,400 feet



Future
Multi-Use
Path Connection

To Minuteman
Bikeway

Potential
Future Public
Transit Connection

Indicates conceptual future connection
alignment to be determined

Future Somerville
Community Path Ext.

Lechmere
Green Line
Station

B

C

D

Kendall Square
Redline Station

Paul Dudley White Path

North
Station


KENDAL
MIT
KENDALL

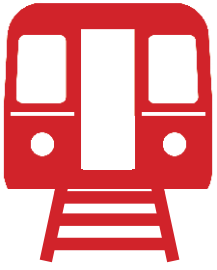
## The Backbone of the Cambridge Transit System

The Red Line is the MBTA's busiest subway line with more than 280,000 passenger trips each weekday. It is a backbone of the transit system, connecting several major economic centers and universities. The Kendall Red Line Station is the eighth busiest station in the MBTA system and the fifth fastest growing station.

Today's Red Line travelers in Kendall Square often find themselves on full trains and crowded platforms, sometimes getting left behind. With current and planned development, the expectation is that more people will want to take the Red Line to and from Kendall Square and regional growth puts more people on the Red Line. The increase of passengers will greatly exacerbate today's problems.

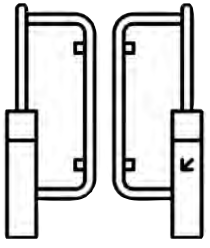
### New Red Line Trains

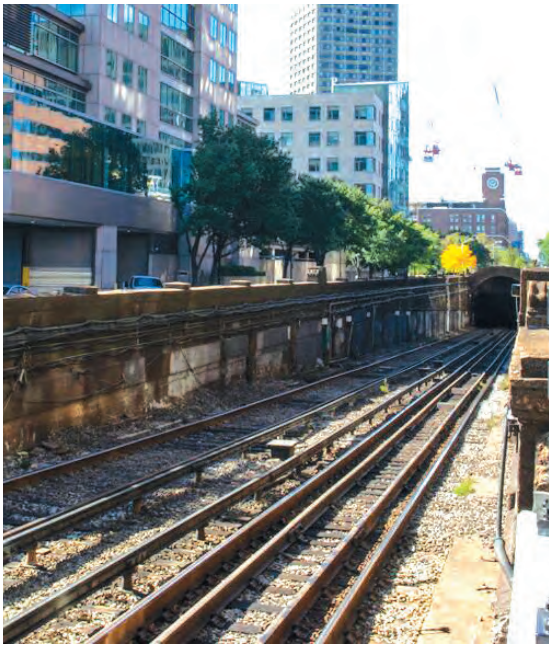
A new fleet of Red Line cars, estimated to be fully operating by 2024, should enable the MBTA to run 50% more capacity at rush hour – a train every 3 minutes. However, even with the new trains and additional signal and trackwork, the question remains as to whether these improvements will fully meet the future growing demands of Kendall Square and the region. This makes other initiatives, like a new Grand Junction public transit link and improvements for bus service on streets so critical. There also remains a need for improvements to the station itself.



Kendall Square station entries increased **34%** from 2007 to 2016.

Station entries are expected to **DOUBLE** from 2012 to 2040.





**Portal of the Red Line in need of serious repair and is vulnerable to flooding**

The current maximum design capacity for the red line is 13 trains or just over 20,000 passengers per hour.[5] In 2016, the average ridership at 8AM was already almost 24,000,[6] which is more than the estimated maximum capacity. Observations made in 2015 showed that in reality there is a range of 10-14 trains per hour arriving in Kendall, which is about a 4 to 6-minute headway. Those trains also are not necessarily evenly spaced, which causes bunching, overcrowding, and passengers being left on the platform.[7] With the new cars, the maximum design capacity will increase to 20 trains or just over 31,000 passengers per hour. With the current demand and additional growth expected in Kendall Square, overcrowding could continue to be a challenge in the future even with the design capacity increase.

**From Opportunity to Action:** Improve the ability of the Red Line to meet current and future demand through station improvements, aggressive planning for climate resiliency, and advocating for additional operational efficiency and reliability investments.

## ▶ACTION

### Advocate for and Ensure Red Line Capacity Increase is Delivered

Promised capacity increases with the new Red Line fleet may only be delivered on a reliable basis with a modernized communications-based train control system. At the time of this report, MBTA has not yet committed to installing this system on any of its lines. This should be included in MBTA's capital plan. In addition, there are other system bottlenecks (at Park Street Columbia Junction where the Ashmont and Braintree lines split and Alewife) that require capacity improvements to benefit the performance of the entire Red Line and should be included in the MBTA's capital plan.

## ▶ACTION

### Implement Kendall Square Station Improvements

Kendall Square Station maintenance backlog is signigicant and impedes people taking public transit every day. Beyond basic maintenance needs, the platform is crowded and in serious decay. The condition of Kendall's transit system needs to enable and reflect its predominant working population, which has been referred to as the #1 bio-tech innovation economy in the United States,

Strategizing with developers and other stakeholders provides the opportunity to make dramatic improvements to both the comfort and safety of the station. These changes are critical in order to accommodate the growing commuter population traveling on the Red Line.

## ▶ACTION

### Make the Red Line Resilient to Climate Change

The Kendall Square portal, where the trains transition between above and below ground, is in disrepair and requires strategies to address repairs and improve vulnerability to flooding. The MBTA should collaborate to carry out a vulnerability assessment for the Red Line. Immediate as well as strategic investments will need to be clearly defined, funded, and implemented.

[5] MBTA State of the System report for the Red Line
[6] MBTA load data
[7] Source MIT Kendall Transit Study for the NoMa/SoMa project


Proposed north head house redesign


Rendering of the new Red Line cars
(Courtesy of China Railway Rolling Stock Corporation)

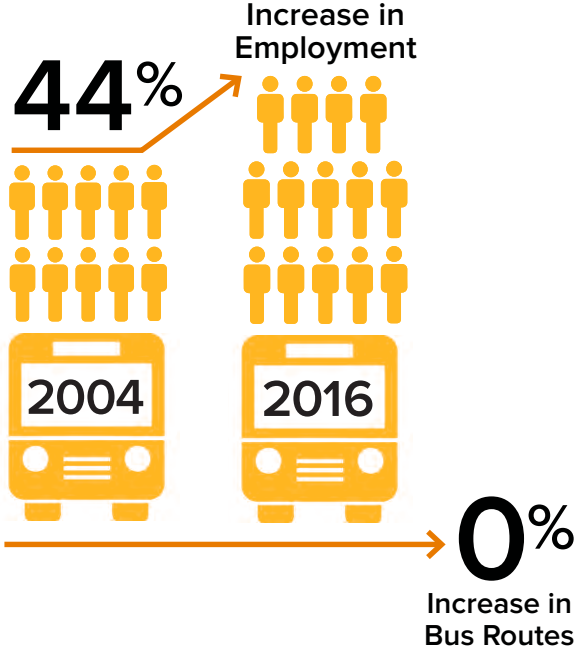

68 KENDALL/MIT

## Reinventing Bus Service for an Innovation Economy

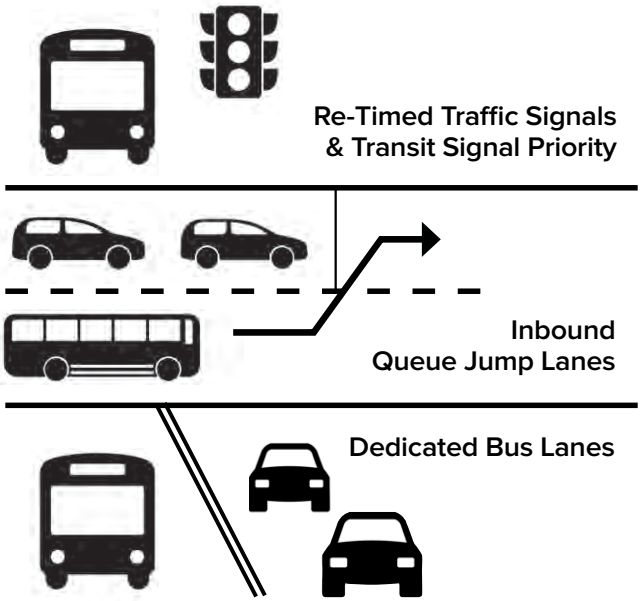
Current bus service provides a third of all MBTA rides—450,000 bus trips—each weekday in the Boston area. Because it is less expensive and more flexible, it offers the opportunity to make connections that can't be made by the core rail system. Yet, the MBTA bus system has been woefully underinvested in at the same time, as buses experience increased delay from street congestion. No comprehensive service planning has been done in 30 years and gaps in connectivity have arisen. The system still operates with route designs based on decades-old travel patterns and outdated Boston economy from the early 90s.

In addition to the limited bus network, a growing number of public and private shuttles have been established to fill gaps in service. Many shuttles have overlapping routes but serve different populations, resulting in inefficient use of already congested streets, yet at the same time, provide important alternatives to driving to Kendall.

While Kendall Square is directly linked to downtown Boston via the Red Line, travel to and from other parts of the metro inner core like Allston/Brighton and Back Bay is slow and indirect. The gaps in connectivity create an ongoing and increasing challenge ensuring that Kendall Square businesses are able to attract the employees they need without increasing traffic. These gaps could be filled by new and imporved bus and/or shuttle services.



## Bus Priority Treatments




### Improving Bus Services

For buses and shuttles to move more efficiently through congested streets and be more attractive to riders, they need priority over other traffic through dedicated lanes and signal priority. Routing changes and increases in bus frequency can fill gaps and better serve existing MBTA riders and draw new riders. In addition, shuttle services can be made more efficient and less impactful on the roadway through consolidating duplicative routing and service.

Buses and shuttles operate on locally-owned streets, so municipalities play the largest role in implementing bus priority with dedicated bus lanes and transit signal priority.

The MBTA has partnered with Cambridge, Watertown, Boston and Everett to implement bus priority demonstration projects. MBTA is also embarking on their Better Bus Project which will propose modest improvements to the MBTA bus network in the near-term.

**From opportunity to action:** Improve and increase direct bus connections travel times, reliability, and hours of service by implementing bus priority, extending existing service into Kendall Square, increasing EZ Ride service, and creating a brand new “CT” type service between Sullivan and Kendall and beyond.

## ▶ACTION Study Bus Priority Treatments — Lechmere to Kendall Square

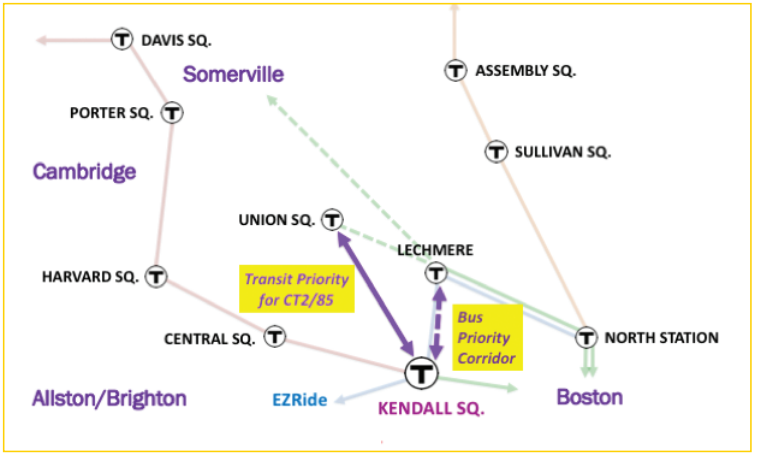
Bus priority treatments between Lechmere and Kendall would both improve EZRide service and provide an enhanced transit corridor for additional bus service. The next step is a full feasibility assessment and design that incorporates safe bicycle facilities and the most needed curb uses.

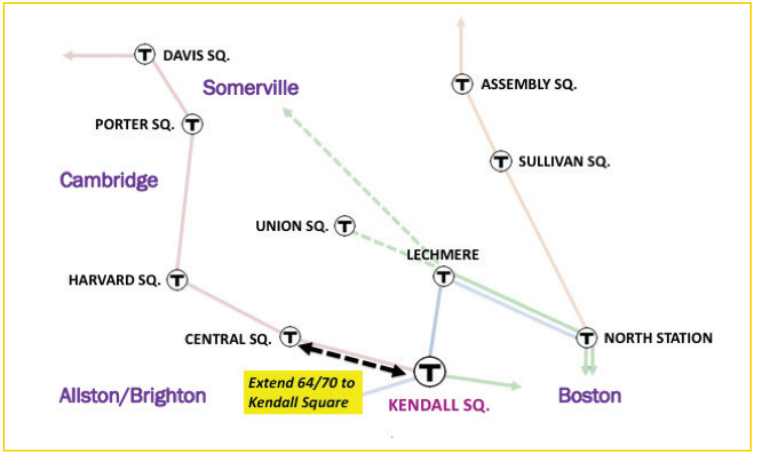
## ▶ACTION Improve CT2/85 Frequency and Reliability

Bus priority measures, like bus stop consolidation, queue jumps, and transit signal priority are cost effective ways to improve Routes CT2 (Sullivan Square to/from Ruggles) and 85 (Union Square to/from Kendall), thereby enabling the MBTA to increase the amount of service on those routes.

## ▶ACTION Extend 64/70/70A into Kendall Square

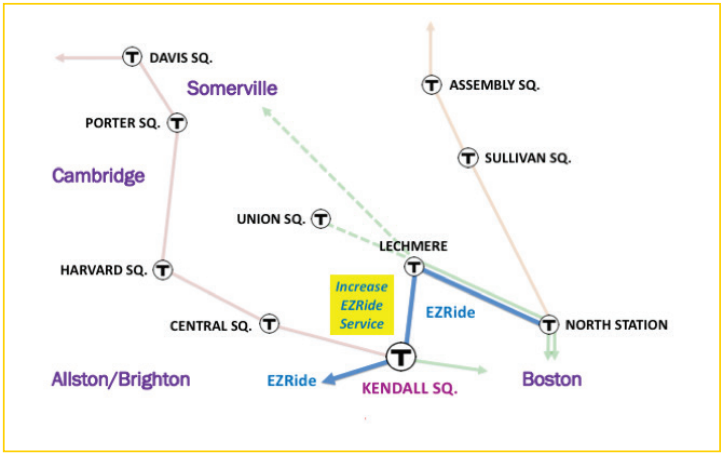
Extending the 64 (Central to/from Brighton) and 70/70A (Waltham to/from Central) routes all day from Central Square into Kendall Square would provide a "one-seat ride" into Kendall from Waltham, Watertown, Allston, and Brighton. In addition, it could reduce Red Line transfers at Central Square, where the Red Line is already overcrowded during peak commuting hours.



## ▶ACTION Increase EZRide Shuttle Service

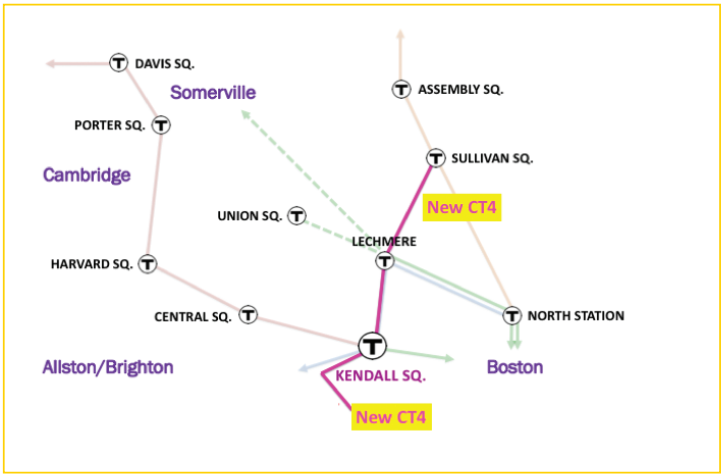
Frequent (approximately every 7 minutes during rush hours) EZRide service, operated by the Charles River Transportation Management Association, connects Boston's North Station and Cambridgeport via Kendall Square, serving North Point, Community College, Lechmere, East Cambridge, and MIT. The service is paid for by members (private entities and the City) and open to the general public. To realize ridership benefits and meet travel demand from North Station, the already frequent EZRide service should run more frequently during peak commuting hours – every 4 minutes.




## ▶ACTION Implement New CT4 Service

This new route would connect Sullivan and Kenmore via Lechmere and Kendall. The route could take advantage of bus priority treatment between Lechmere and Kendall and a proposed future bridge connection between Inner Belt Road and Cambridge Crossing.

The CT4 service could carry one thousand passengers in the morning commuting time for an annual cost of $4-5 million using MBTA vehicles. The service could also be provided through a public-private partnership.

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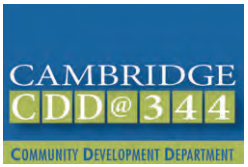
**Our sincere thanks to these valued members of the Kendall Square community who supported the work of Transport Kendall.**









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