Allston Early Action Transit Study

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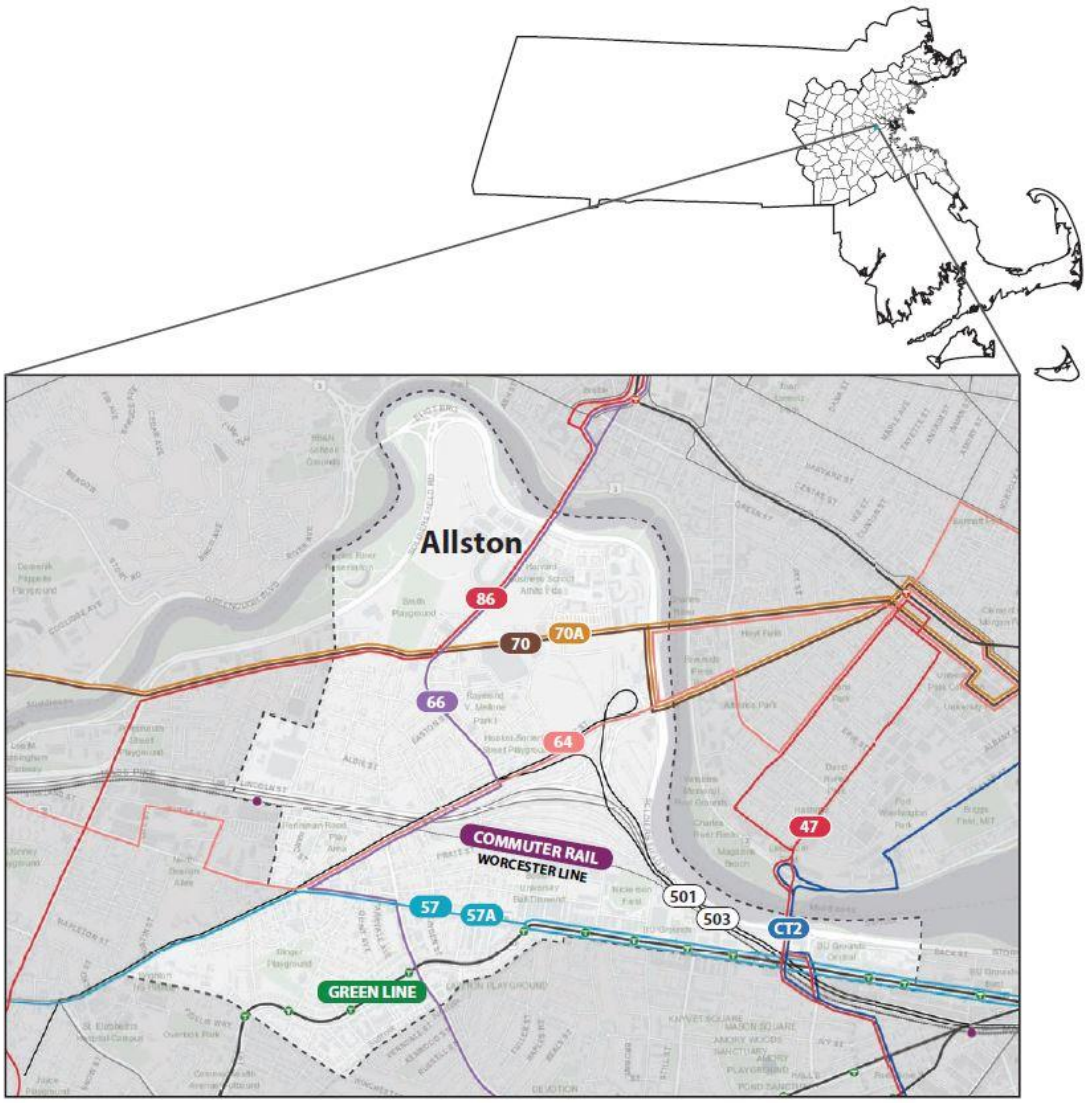

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Abstract

The purpose of the Allston Early Action Transit Study was to review and document the existing conditions of transit service in the Allston neighborhood of Boston, Massachusetts, and to recommend potential changes and improvements to service. Transit service in Allston includes Massachusetts Bay Transportation Authority (MBTA) bus routes 47, 57/57A, 64, 66, 70/70A, 86, 501, 503, and CT2; the Boston Landing commuter rail station on the MBTA's Worcester Line; 11 stops on the Boston College (B) branch of the MBTA Green Line; and several private shuttles.

This study analyzed ridership data, passenger comfort and service reliability metrics as defined by the MBTA's Service Delivery Policy, bus travel speeds and locations of delay, the conditions of rail and bus stops and stations, and recent passenger survey data for MBTA transit services.

Several recommendations are proposed based on the review. The recommendations address potential bus schedule changes, the identification of locations where bus lanes could improve the reliability of existing service, and bus stop locations that should be improved for accessibility.

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ES.1 INTRODUCTION

The Allston neighborhood in the City of Boston is growing in both residential population and in number of employment opportunities. Given the expectation of continued growth under both existing and future land-use scenarios, the Massachusetts Department of Transportation (MassDOT) requested a review of the existing public transit services in Allston.

The Allston neighborhood of Boston is defined in this study by the boundaries of the Boston University Bridge to the northeast, the Charles River to the north, Everett Street and Warren Street to the west, and the border of Boston and Brookline to the southeast. (See Figure 1.)

Currently, public transportation service in Allston is provided by eight local Massachusetts Bay Transportation Authority (MBTA) bus routes, two MBTA express bus routes, 11 stations on the Boston College (B) branch of the MBTA Green Line light rail system, and a recently opened MBTA commuter rail station at Boston Landing on the Worcester commuter rail line. Several private shuttles operated by institutions and employers in the area also provide service in Allston.

The 2010 Census identified over 20,000 residents in Allston. Approximately 78 percent of them worked in Boston, Cambridge, or Brookline. The 2016 American Community Survey data shows that for all working residents age 16 or older in Allston zip code 02134, 40.3 percent commuted via transit, 30.6 percent drove alone, 12.6 percent walked, 4.5 percent worked at home, and 12 percent used other means to commute.

The 2010 Census identified more than 36,000 people who worked in Allston. Fifty-nine percent of them—almost 20,000 people—lived in Boston, Brookline, Cambridge, or Somerville (the four municipalities with the most commuters to Allston). The commute mode shares for non-drive-alone modes, including transit and walking, for people who lived in these municipalities and worked in Allston range from 55 percent in Somerville to 71 percent in Boston.

ES.2 EXISTING CONDITIONS OF MBTA BUS NETWORK

The existing MBTA bus network provides coverage to most of the study area in Allston. Most of the areas of Allston not covered by the bus network are either served by the Green Line on Commonwealth Avenue or are undeveloped. The undeveloped section of Allston is near the former Beacon Park rail yard.

ES.2.1 Scheduled Service

The MBTA operates 10 bus routes that provide service in Allston:

- Route 47 Central Square—Broadway
- Route 57 Watertown—Kenmore with additional peak service provided by Route 57A Oak Square—Kenmore
- Route 64 Oak Square—University Park, Cambridge, or Kendall Square
- Route 66 Harvard—Dudley
- Route 70 Waltham (Cedarwood or Market Place Drive)—University Park, Cambridge
- Route 70A North Waltham—University Park, Cambridge
- Route 86 Reservoir—Sullivan Square
- Route 501 Brighton Center—Downtown Boston
- Route 503 Brighton Center—Copley Square
- Route CT2 Sullivan—Ruggles

Routes 57 and 66 are key bus routes as defined by the MBTA's Service Delivery Policy. Routes 501 and 503 are express bus routes. Routes 47, 57, 64, 66, 70, and 86 all operate seven days a week. Route 70A operates Monday through Saturday, while Routes CT2, 501, and 503 only operate Monday through Friday. All bus stops in Allston are served seven days per week, as there are no unique stops in Allston served by only the 70A, 501, 503, or CT2.

There has been a slight increase in the total number of weekday bus trips scheduled on routes serving Allston in the 12 years between 2005 and 2017.

ES.2.2 Ridership

Total ridership on bus routes that serve Allston has declined nine percent in the five years between 2012 and 2017, but remains 14.5 percent higher than 12 years earlier in 2005. This percentage reflects all riders on all routes, including those riders who do not board or alight in Allston but travel through Allston. In a presentation to the MBTA Fiscal and Management Control Board (FMCB) on November 26, 2018, MBTA staff stated that the drop in total MBTA ridership in recent years has been in line with national trends.

ES.2.3 Passenger Comfort and Crowding

The MBTA evaluates passenger comfort using the performance measure for passenger hours of comfortable travel experienced by bus passengers during all time periods. A review of fall 2017 passenger comfort data from the MBTA's Office of Performance Management and Innovation (OPMI) indicates that Routes 47, 57/57A, 64, 66, and 501 are below the acceptable comfort level on

weekdays, while Route 86 is below the target level but within the acceptable range.

Table E1
Passenger Comfort on MBTA Bus Routes Serving Allston

Route	Percent of Passenger Hours in Comfortable Conditions
47	89.0%
57 and 57A	87.8%
64	90.6%
66	91.3%
70 and 70A	96.2%
86	93.5%
CT2	96.9%
501	92.3%
503	96.5%

Source: MBTA's Office of Performance Management and Innovation.

ES.2.4 Reliability

The MBTA's target for bus reliability, as defined in the Service Delivery Policy, requires buses to arrive on time at 75 percent of time-point stops on non-key bus routes and 80 percent of time-point stops on key bus routes. Based on a review of data from the MBTA's Performance Dashboard for weekdays in fall 2017, all of the MBTA bus routes serving Allston have weekday reliability which is below the established targets. However, some routes perform better than the bus system as a whole, as weekday reliability in fall 2017 systemwide was 64 percent and reliability on key bus routes was 75 percent.

Table E2
Weekday Reliability for MBTA Bus Routes Serving Allston

Route	Percent of Time Points On Time
47	53%
57	77%
57A	67%
64	59%
66	73%
70	58%
70A	50%
86	61%
501	73%
503	72%
CT2	43%

Source: MBTA's Office of Performance Management and Innovation.

ES.2.5 Travel Speed and Delay

In 2016, as part of MassDOT and the MBTA's *Focus40* project, Central Transportation Planning Staff (CTPS) reviewed travel time data for the entire MBTA bus network to help identify segments that would potentially benefit from the implementation of exclusive bus lanes. This effort was limited to corridors with high volumes of bus riders (1,500 riders or more per day in one direction) and was weighted by the amount of travel delay from congestion for each individual rider's journey. From this previous study work, Brighton Avenue between Cambridge Street at Union Square and Harvard Avenue was identified as the corridor in Allston that could benefit the most from the implementation of bus lanes in peak periods. During AM and PM peak periods, bus passengers on Routes 57/57A and 66 comprised 33 to 42 percent of the total roadway users (in motor vehicles) on this segment of Brighton Avenue.

During 2018, as part of the MBTA's Better Bus Project, the MBTA evaluated peak travel times for all MBTA bus routes and categorized operating speeds for roadway segments in six categories, from *very good* to *very poor,* as the speeds relate to the operating environment of each segment. Areas of significant delay were found on bus routes in Allston along Brighton Avenue and at all three river crossings between Allston and Cambridge.

ES.2.6 Bus Stop Conditions and Accessibility

The MBTA evaluated bus stop accessibility as part of the Plan for Accessible Transit Infrastructure (PATI) project. All bus stops in the entire MBTA system were reviewed to determine if there were barriers that would affect access or impede passengers from boarding or alighting from buses. Each stop was ranked as either

- *compliant* (no barriers found);
- *low* (negligible barriers noted);
- *medium* (at least one significant barrier noted);
- *high* (multiple barriers noted); or
- *critical* (barriers so significant that boarding or exiting from the street is required).

None of the 61 bus stops in Allston were rated as *critical*. Two bus stops were rated as *high*, 38 as *medium*, 19 as *low*, and two as fully *compliant*.

ES.2.7 Passenger Characteristics

CTPS conducted a systemwide passenger survey for the MBTA between 2015 and 2017. Data about passenger demographics and trip characteristics for services in Allston are summarized in this study.

ES.3 EXISTING CONDITIONS FOR RAIL AND NON-MBTA SHUTTLES

Allston is served by Boston Landing Station on the Worcester Line of the commuter rail network and by several stops on the Boston College (B) branch of the Green Line. Several non-MBTA shuttles also operate in Allston.

ES.3.1 Boston Landing Station

Boston Landing Station opened on May 22, 2017. MassDOT collected ridership data and surveyed passengers at Boston Landing on April 24, 2018. There were 1,153 passengers observed utilizing the station—594 boardings and 559 alightings. The most significant pattern observed were riders boarding inbound trains to Boston in the AM peak period and alighting outbound trains from Boston in the PM peak period. Passenger surveys indicated that 80 percent of riders utilized the station three or more days per week and 80 percent walked to the station. More than 56 percent of riders reported having previously used another mode of public transit (principally bus and subway) prior to the opening of the station.

ES.3.2 Green Line Boston College (B) Branch

There are 11 stops on the B branch of the Green Line located in or directly adjacent to Allston: Warren Street, Allston Street, Griggs Street, Harvard Avenue, Packard's Corner, Babcock Street, Pleasant Street, Saint Paul Street, Boston University West, Boston University Central, and Boston University East. Only the stops at Harvard Avenue, Boston University Central, and Boston University East are accessible to passengers utilizing wheeled mobility devices. Weekday inbound boardings at Green Line stations in Allston ranged from 683 at Boston University East to 1,864 at Warren Street. Outbound boardings ranged from 180 at Griggs Street to 1,255 at Boston University Central.

ES.3.3 Other Shuttle Bus Services

Several shuttle services, not run by the MBTA, operate in Allston. These shuttles are funded by large employers or institutions: Harvard University, the Boston Landing office complex, the Arsenal on the Charles complex in Watertown, Boston University, and The Medical Academic and Scientific Community Organization (MASCO).

ES.4 RECOMMENDATIONS

Several near-term recommendations could improve transit service in Allston. These recommendations are detailed below.

ES.4.1 Recommendations for MBTA Bus Service

ES.4.1.1 Ongoing Bus Initiatives

All bus-related recommendations from this study were developed in coordination with the Better Bus Project and the Bus Network Redesign process and will be used as inputs into these ongoing initiatives. Both initiatives are described in detail below.

The Better Bus Project was launched in early 2018 to identify and implement routing and service improvements to meet service delivery standards that were developed based on the existing bus network. The Better Bus Project will recommend a range of budget neutral short- to mid-term service delivery improvements, as well as multiple investment strategies to improve the frequency and reliability of the MBTA's system. Service delivery improvements will also include municipal partnerships to improve speed and reliability. Customers should expect to see service changes and improvements, related to the Better Bus Project, between now and 2020.

The Bus Network Redesign, which launched in late 2018, will go beyond the Better Bus Project's route level analysis and recommendations and focus on network level improvements. The Network Redesign will take a holistic look at the entire bus network and develop recommendations for a new network that will better serve the region's changing travel needs—focusing on routes, frequency, span of service, and service coverage.

ES.4.1.2 Transit Priority Improvement Opportunities

As part of the *Focus40* project, CTPS conducted the *Prioritization of Dedicated Bus Lanes* study, which prioritized segments of Greater Boston roadways where the installation of dedicated bus lanes could reduce travel times for buses that currently experience delays. The study identified Brighton Avenue between Cambridge Street (Union Square) and Harvard Avenue in Allston as a roadway segment that could benefit from implementation of a bus lane for use by Routes 57/57A and 66. As part of this study, MassDOT and the MBTA are now collaborating with the City of Boston to pilot a bus lane on Brighton Avenue between Cambridge Street and Harvard Avenue during the AM peak period in the spring of 2019 in order to improve the speed and reliability of bus Routes 57 and 66.

In addition to Brighton Avenue, the Better Bus Project's review of bus travel times showed that the most significant delays in bus service in Allston are at the river crossings between Allston and Cambridge; buses on Routes 66 and 86 are delayed crossing the Anderson Memorial Bridge, while buses on Routes 64 and 70/70A are delayed crossing the Western Avenue Bridge westbound and, even more significantly, the River Street Bridge eastbound. When design work begins

on the Western Avenue span, consideration should be given to creating a contraflow lane on the rebuilt Western Avenue Bridge for use by Route 70/70A buses traveling eastbound. As the rebuilding of the bridge is a long-term capital project, MassDOT is actively working with the MBTA, the Department of Conservation and Recreation, and the Highway District 6 Office to design and implement a bus lane and transit signal priority on Soldiers Field Road in spring 2019 to improve speed and reliability on Route 70 (which will also help Route 64). This effort will be evaluated for bus speed and reliability improvements.

ES.4.1.3 Service Planning Improvements

Routes 70 and 70A presently carry higher total passenger loads than some of the existing key routes in the MBTA's bus network. Upgrading the trunk section of the routes (from Central Square to University Park in Waltham to Cambridge) to key route standards should be considered, based on the already existing high demand.

Route 86 presently carries higher total passenger loads than some of the key routes in the MBTA bus network. Because of the high demand on Route 86, consideration should be given to upgrading it to key route status.

The review of Route 57 data indicated that at least one inbound trip during the AM peak period has passenger loads greater than 140 percent of seating capacity before reaching Packard's Corner. Adding a short-turn trip between Brighton Center and Kenmore Square during the 30 minutes of the morning with heaviest maximum passenger loads could reduce this crowding.

Recent service changes on Route 47 have increased capacity during peak periods. These changes should be monitored to determine if additional peak service is required to reduce overcrowding.

The MBTA will be implementing new running times and schedules for Route 66 in winter 2019. Once in place, these running times should be monitored to determine if a significant improvement in reliability follows.

Route CT2 is extremely unreliable. Changes to the running time became effective when the fall 2018 quarterly schedule change went into effect. The new running times should be monitored to determine if additional changes are required to improve reliability.

The MBTA should continue its ongoing effort to reduce the number of dropped bus trips. One to three percent of all weekday trips on Routes 47, 57/57A, 66, 70, and 86 were dropped in 2016, primarily because there were not enough bus operators available. These trips represent a small percentage of the total daily trips operated. However, dropped trips usually occur during peak periods when it can be most difficult for the MBTA to field enough bus operators to fully cover the scheduled service; as a result, these dropped trips can affect more riders than

trips that are dropped during off-peak times. One bus eliminated during a peak period can represent five percent or more of the total peak trips scheduled on a route. Dropped trips, particularly during peak periods, contribute to crowding and delays.

ES.4.1.4 Additional Recommendations to Consider

Additional real-time bus location and wait-time data at high-volume bus and rail stops would aid passengers and improve the overall riding experience.
The MBTA is also testing E Ink solar-powered electronic real-time arrival signs that could be deployed at Allston's bus stops and surface Green Line stations. Currently being piloted at some stations on the Green Line D branch, the E Ink signage is being tested for a number of factors that include weather resistance. If proven to be durable during extreme weather conditions this winter season, these signs will be deployed at Allston's Green Line stations and experimentally at certain Allston bus stops.

Bus stop improvements identified by the MBTA's PATI review should be implemented. There may be opportunities to work with the City of Boston and private developers to provide the capital necessary to implement these upgrades.

Stops rated in the PATI review as *medium* and that have 400 or more combined boardings and alightings per day should be prioritized for improvements:

- Brighton Avenue opposite Quint Avenue
- Brighton Avenue at Cambridge Street
- Harvard Avenue at Commonwealth Avenue (inbound)
- Brighton Avenue at Harvard Avenue
- Cambridge Street opposite Hano Street
- Cambridge Street at Dustin Street
- Brighton Avenue at Allston Street
- North Harvard Street at Western Avenue
- Brighton Avenue at Commonwealth Avenue
- Brighton Avenue at Linden Street

ES.4.5 Recommendations for MBTA Rail and Other Shuttle Services

The MBTA's long-term capital reviews of both commuter rail and Green Line operations will affect future transit service in Allston. Capital projects identified in *Focus40*, including the procurement of additional bi-level coaches for the commuter rail network and larger Type 10 vehicles for the Green Line under the Green Line Transformation Program, will increase capacity on the rail system. The planned reconstruction of the Green Line Boston College (B) branch stations between Babcock Street and Boston University West will provide accessibility along this roadway segment.

The MBTA’s ongoing Rail Vision study will identify cost-effective strategies to transform the MBTA's existing commuter rail system to better support improved mobility and economic competitiveness in the Boston region, including in Allston.

In the shorter term, the MBTA is working to improve transit signal priority along the Green Line B branch line as part of the larger Green Line Transformation Program and is reviewing where and how to implement these improvements.

Since Harvard University’s Allston shuttle service overlaps with the most crowded segments on Routes 66 and 86, the MBTA should explore strategies for increasing awareness among Allston residents that they are permitted to use those Harvard services at no cost.

Chapter 1—Introduction

1.1 BACKGROUND

The Allston neighborhood is growing in both residential population and in number of employment opportunities. Given the expectation of continued growth under both existing and future land-use scenarios, the Massachusetts Department of Transportation (MassDOT) requested a review of the existing public transit services in Allston.

Currently, public transportation service in Allston is provided by eight local Massachusetts Bay Transportation Authority (MBTA) bus routes, two MBTA express bus routes, 11 stations on the Boston College (B) branch of the MBTA Green Line light rail system, and a recently opened MBTA commuter rail station at Boston Landing on the Worcester commuter rail line. Several private shuttles operated by institutions and employers in the area also provide service in Allston.

The neighborhood has recently benefited from the opening of Boston Landing Station, as well as adjustments to bus schedules resulting from the MBTA Service Planning staff's on-going review of MBTA bus routes. However, until now, a full review of existing conditions and possible deficits in transit service has not been conducted.

The objective of this study was to review and document the existing conditions of the public transportation network serving Allston and to identify and recommend improvements to service based on the findings of the existing conditions review.

1.2 STUDY AREA

The Allston neighborhood of Boston is defined in this study by the boundaries of the Boston University Bridge to the northeast, the Charles River to the north, Everett Street and Warren Street to the west, and the border of Boston and Brookline to the southeast. Figure 1 shows the study area and existing MBTA transit service in Allston.

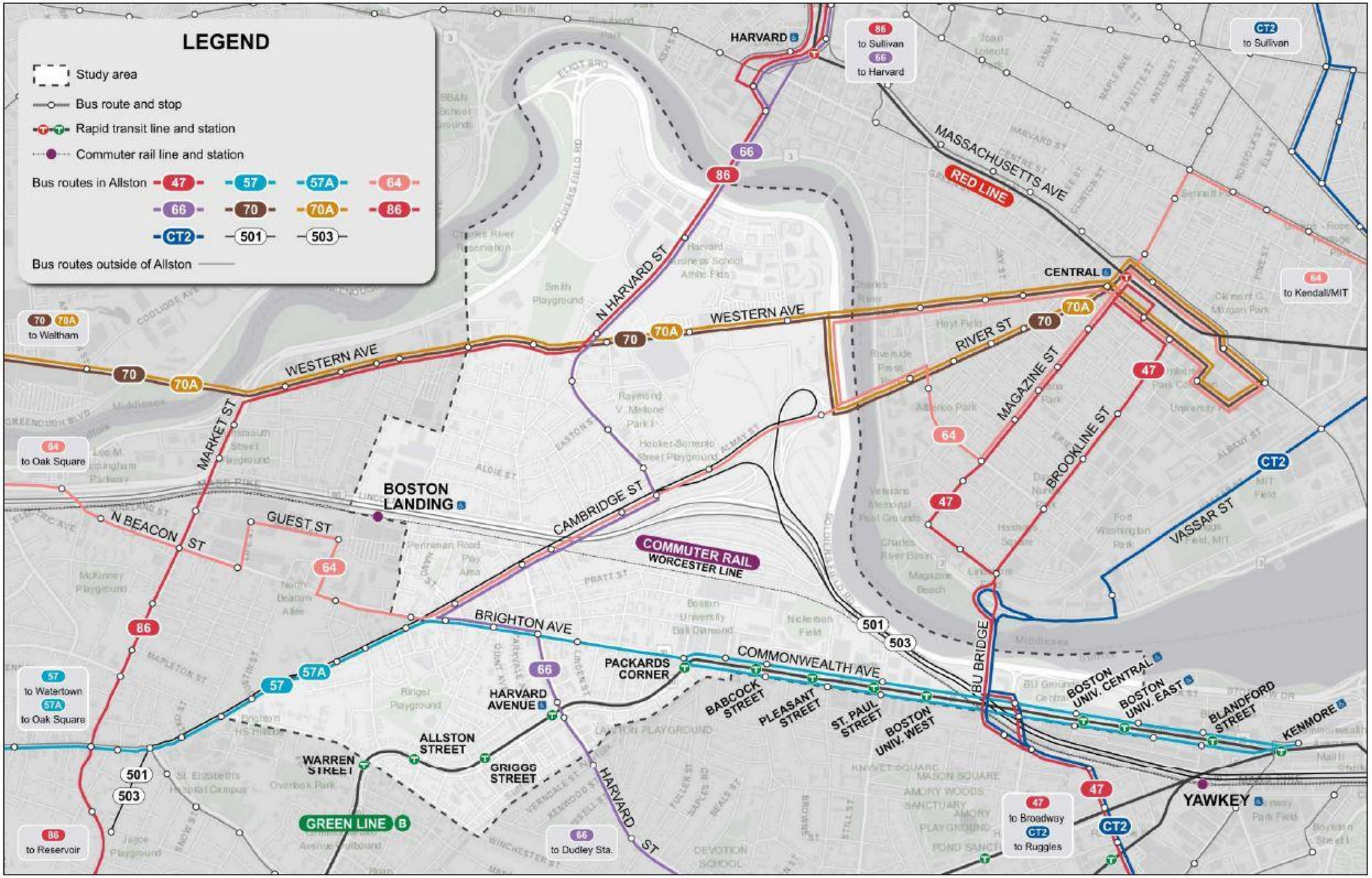

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FIGURE 1
Existing MBTA Transit Service in Allston

Allston Transit Access Study

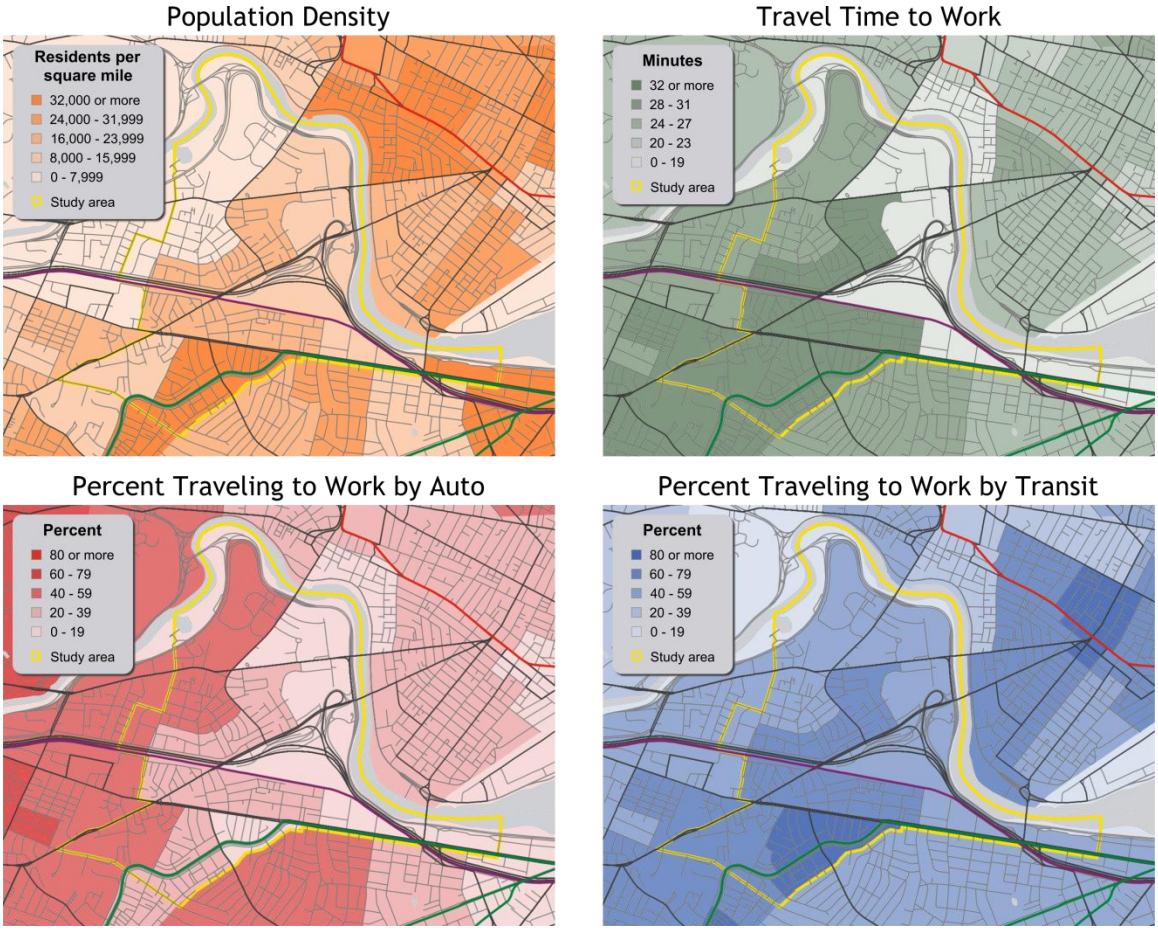
1.3 DEMOGRAPHICS OF THE STUDY AREA

Both the population and number of jobs in Allston have increased in recent years. The Boston Planning and Development Agency's (BPDA) 2017 neighborhood review of Allston states that the population increased 17 percent from 2000 to 2010 and that the amount of occupied housing increased by five percent during that same time period. Payroll jobs in Allston doubled between 2011 and 2014. Since 2010, BPDA states, 1,857 new housing units have been approved for construction in Allston. In 2016, approval was given for the construction of 1.17 million square feet of new development in Allston.

The 2010 Census identified over 20,000 residents in Allston. The median age for residents of Allston zip code 02134 (which comprises most of the study area) in 2010 was 26.1 years. Persons age 62 or older represented 6.1 percent of residents, while 14.3 percent of residents were under age 21. The census identified 65.3 percent of the Allston population as Caucasian and 18.5 percent as Asian. Thirteen percent identified as Hispanic or Latino. The median household income from the 2012-16 American Community Survey five-year estimates was $47,485.

The 2016 American Community Survey data for all working residents age 16 or older in Allston zip code 02134 shows that 40.3 percent commuted via transit, 30.6 percent drove alone, 12.6 percent walked, 4.5 percent worked at home, and 12 percent used other means to commute. Figure 2 shows the population density, travel time to work, and commute mode shares for residents in Allston. The greatest population density and the highest percentage of people using transit in Allston were found along Commonwealth Avenue where the Green Line's B branch operates. Residents in this section of Allston had some of the longest travel times to work experienced by Allston residents. The average travel time to work for Allston residents ranged from 20 to 40 minutes, depending on residential location and travel mode.

Figure 2
Population Density, Commute Travel Time, and Travel Modes



Source: 2010 United States Census.

Figure 3 displays the number of Allston residents who worked in each municipality in the region. As shown in Figure 3, Boston, Cambridge, and Brookline attracted the largest numbers of Allston workers. Bus routes serving Allston provide direct service to the Back Bay, downtown Boston, and Roxbury, as well as to the municipalities of Cambridge, Brookline, Newton, Watertown, and Waltham. The Green Line provides direct service from Allston to the Back Bay and downtown Boston.

Table 1 shows the cities and towns in which Allston residents worked and the mode share for commute trips to each of these municipalities. Approximately 78 percent of people who lived in Allston worked in Boston, Cambridge, or Brookline. The combined transit, walk, and bicycle mode share for people who commuted from Allston to these municipalities ranged from 78 percent for

workers in Brookline to 85 percent in Boston. Approximately six percent of Allston residents worked in Newton, Watertown, or Waltham. Commuters who drove alone represented over 50 percent of the commutes from Allston to Newton, Watertown, or Waltham.

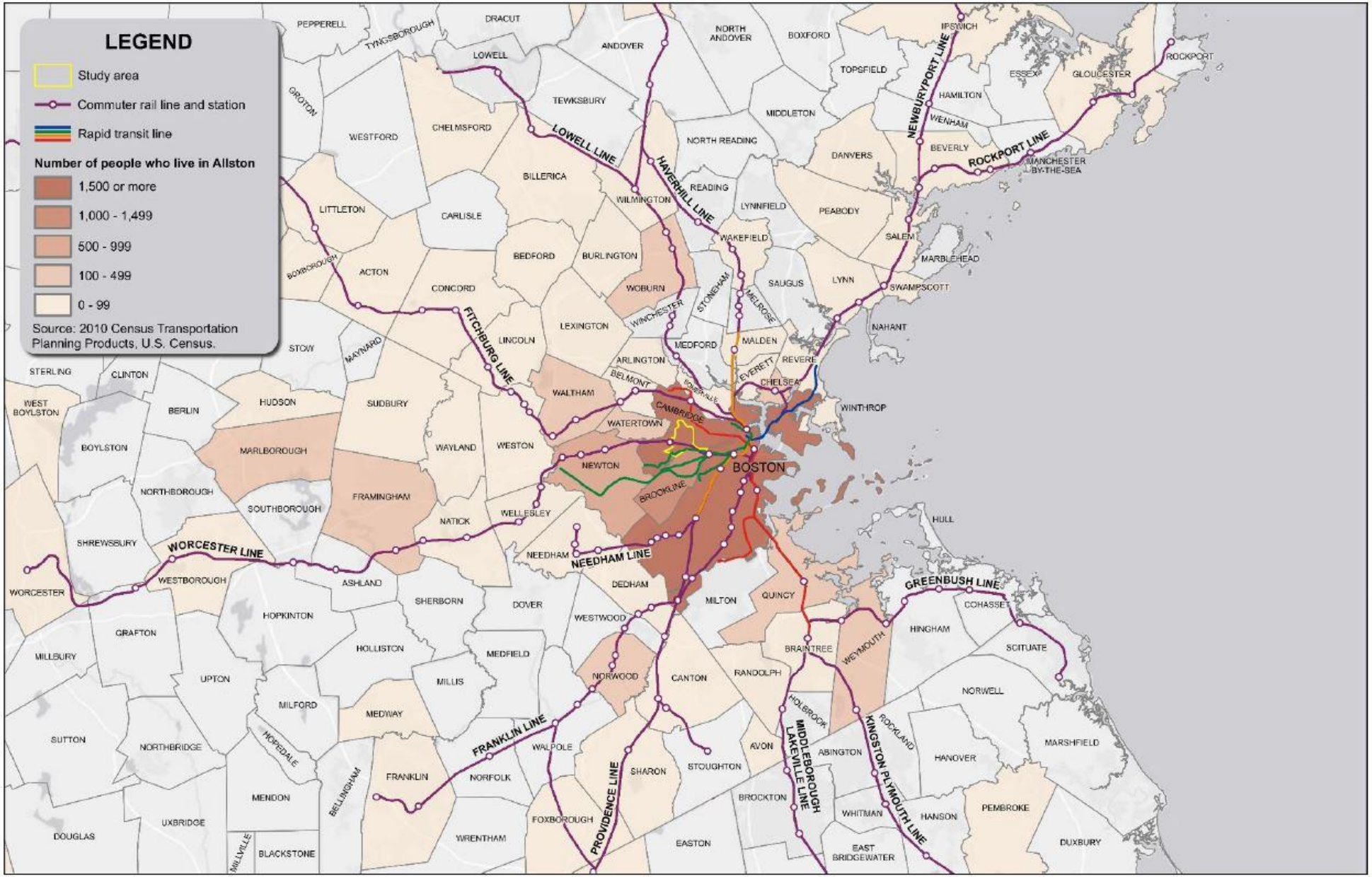


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FIGURE 3
Work Location of Allston Residents

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Table 1
Commute Mode Shares for Allston Residents

Municipality of Employment	Number of Commuters	Drive Alone Mode Share	Bus Mode Share	Rapid Transit Mode Share	Bike Mode Share	Walk Mode Share	Other Mode Share
Boston	13,395	15%	13%	33%	3%	24%	12%
Cambridge	1,719	17%	25%	25%	13%	18%	2%
Brookline	1,128	22%	18%	9%	3%	46%	2%
Newton	701	59%	10%	14%	3%	9%	5%
Watertown	314	53%	37%	0%	0%	0%	10%
Waltham	273	62%	14%	0%	0%	0%	23%
Framingham	226	95%	0%	0%	0%	0%	5%
Total*	**20,724**	**25%**	**13%**	**25%**	**3%**	**20%**	**14%**

* Note: The table shows data for municipalities from which 200 or more trips were generated. The total figure includes commutes from municipalities from which fewer than 200 trips were generated.
Source: 2010 United States Census.

The 2010 Census identified more than 36,000 people who worked in Allston. Large employment and activity areas in Allston include part of Boston University's campus along Commonwealth Avenue, the Harvard University Business School, and part of the New Balance complex on Guest Street at the border of Brighton and Allston. A number of small businesses, including many dining establishments, are located along Commonwealth Avenue, Harvard Avenue, Brighton Avenue, and Cambridge Street. Western Avenue also includes many small businesses.

The map in Figure 4 shows the number of Allston workers who lived in each municipality in the Boston region. Table 2 shows the cities and towns in which Allston workers resided and the mode share for commute trips from each municipality.

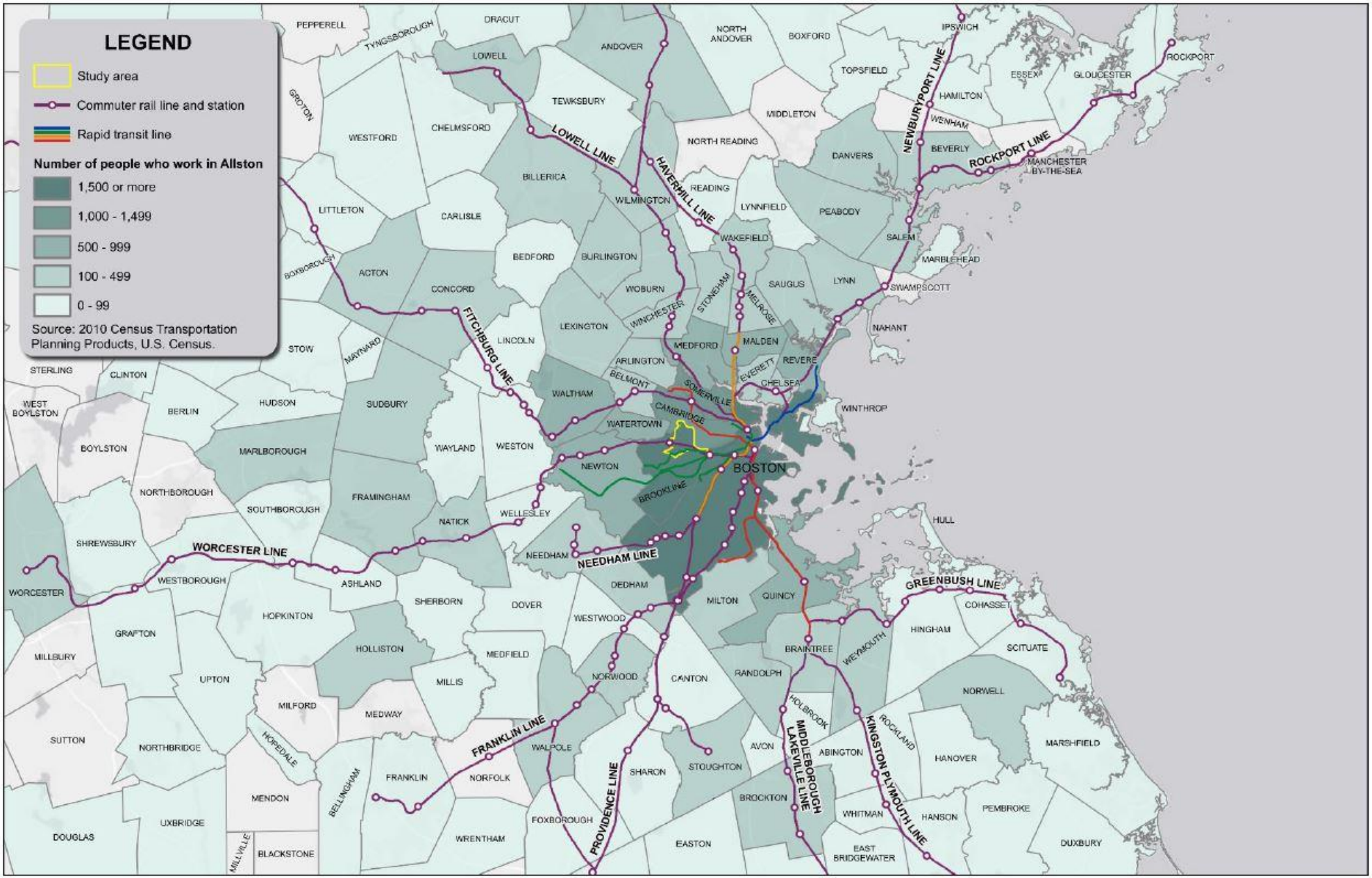

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FIGURE 4
Home Location of Allston Employees

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Table 2
Commute Mode Shares for Allston Employees

Residency	Number of Commuters	Drive Alone Mode Share	Bus Mode Share	Rapid Transit Mode Share	Bike Mode Share	Walk Mode Share	Other Mode Share
Boston	15,477	29%	9%	15%	0.5%	29%	17.5%
Brookline	1,553	33%	6%	22%	1%	22%	16%
Cambridge	1,496	38%	5%	11%	1%	20%	25%
Somerville	1,109	45%	2%	16%	1%	2%	34%
Newton	874	84%	3%	6%	0%	0%	10%
Quincy	763	48%	2%	37%	0%	0%	13%
Watertown	672	65%	10%	5%	0%	0%	20%
Malden	589	49%	12%	34%	0%	0%	5%
Revere	548	57%	3%	16%	0%	0%	24%
Waltham	536	46%	21%	3%	0%	0%	30%
Medford	516	58%	12%	10%	0%	0%	20%
Total*	**36,136**	**49%**	**7%**	**12%**	**0%**	**14%**	**18%**

*Note: The table shows data for municipalities from which 500 or more trips to Allston were generated. The total figure includes commutes from municipalities that generated fewer than 500 trips.
Source: 2010 United States Census.

Of those working in Allston, 59 percent—almost 20,000 people—lived in Boston, Brookline, Cambridge, or Somerville. The commute mode shares for travel means other than driving alone, including taking transit and walking, for people who lived in these municipalities and worked in Allston ranged from 55 percent for Somerville residents to 71 percent for Boston residents. There were 500 to 900 people commuting each from Newton, Quincy, Watertown, Malden, Revere, Waltham, and Medford to Allston.

Chapter 2—Existing Conditions of the MBTA Bus Network

The existing MBTA bus network provides coverage to a majority of the study area in Allston. Most of the areas of Allston not covered by the bus network are either served by the Green Line on Commonwealth Avenue or are undeveloped. The undeveloped section of Allston is near the former Beacon Park rail yard. Figure 5 shows the existing transit coverage in Allston.

This chapter describes the scheduled MBTA bus service in Allston and the existing conditions of the bus network. More detailed information about the existing conditions of the specific bus routes is in Chapter 3.

2.1 SCHEDULED SERVICE

As shown in Figure 1, the MBTA operates 10 bus routes that provide service in Allston:

- Route 47 Central Square—Broadway
- Route 57 Watertown—Kenmore with additional peak service provided by Route 57A Oak Square—Kenmore
- Route 64 Oak Square—University Park, Cambridge or Kendall Square
- Route 66 Harvard—Dudley
- Route 70 Waltham (Cedarwood or Market Place Drive)—University Park, Cambridge
- Route 70A North Waltham—University Park, Cambridge
- Route 86 Reservoir—Sullivan Square
- Route 501 Brighton Center—Downtown Boston
- Route 503 Brighton Center—Copley Square
- Route CT2 Sullivan—Ruggles

Routes 47, 57, 64, 66, 70, and 86 operate seven days a week. Route 70A operates Monday through Saturday, while Routes CT2, 501, and 503 only operate Monday through Friday. All bus stops in Allston are served seven days per week, as there are no unique stops in Allston served by only the 70A, 501, 503, or CT2.

Routes 57 and 66 are key bus routes as defined by the MBTA's Service Delivery Policy. Key bus routes have a minimum span of service, operating from 6:00 AM to midnight Monday through Saturday and 7:00 AM to midnight on Sunday. Service must operate at least every 10 minutes during the weekday AM and PM peak periods, every 15 minutes during the midday on weekdays, and every 20 minutes Monday through Saturday evening and all day Sunday. The Service

Delivery Policy for local routes requires service to be provided at least every 30 minutes during the weekday peak period and every 60 minutes during all other periods. The minimum span of service for local routes is 7:00 AM to 7:00 PM weekdays. In high density areas, the minimum span of service is 8:00 AM to 6:30 PM on Saturdays and 10:00 AM to 6:30 PM on Sundays. There is no policy requirement for local bus service in low-density areas on weekends.

Routes 47, 66, and evening and weekend service on Route 57 are operated from the MBTA's Cabot Garage in South Boston. The bus fleet is comprised of diesel-electric hybrid and compressed natural gas (CNG) powered buses built in 2016-17. These buses have 36 seats.

Routes 57/57A (weekdays), CT2, 501, and 503 are operated from the MBTA's Albany Street Garage (located in Boston's South End) weekdays. The bus fleet is comprised of diesel-powered buses built in 2004-05. These buses have 38 seats. The MBTA has ordered 194 additional hybrid buses to replace the older fleet; the new buses are expected to be delivered in 2019-20.

Routes 64, 70, 70A, and 86 are operated from the MBTA's bus maintenance facility in Charlestown (located near Sullivan Square). The bus fleet is a mix of 39-seat, diesel-powered buses built in 2006-07; 37-seat, hybrid buses built in 2014-15; and 36-seat, hybrid buses built in 2016-17.

Routes 501 and 503 are express bus routes. Both routes only serve Allston in the reverse direction of peak travel (operating from downtown Boston to Allston in the AM peak and from Allston to downtown Boston in the PM peak period). In the peak direction of travel, both routes operate via Brighton and Newton. These two routes are included in this analysis, however, as they provide an option for traveling to and from employment locations and schools in Allston.

Routes 47 and CT2 only serve Allston in one direction (towards Cambridge) at one stop (Commonwealth Avenue at the Boston University Bridge). The nearest stop in the opposite direction is located in Brookline.

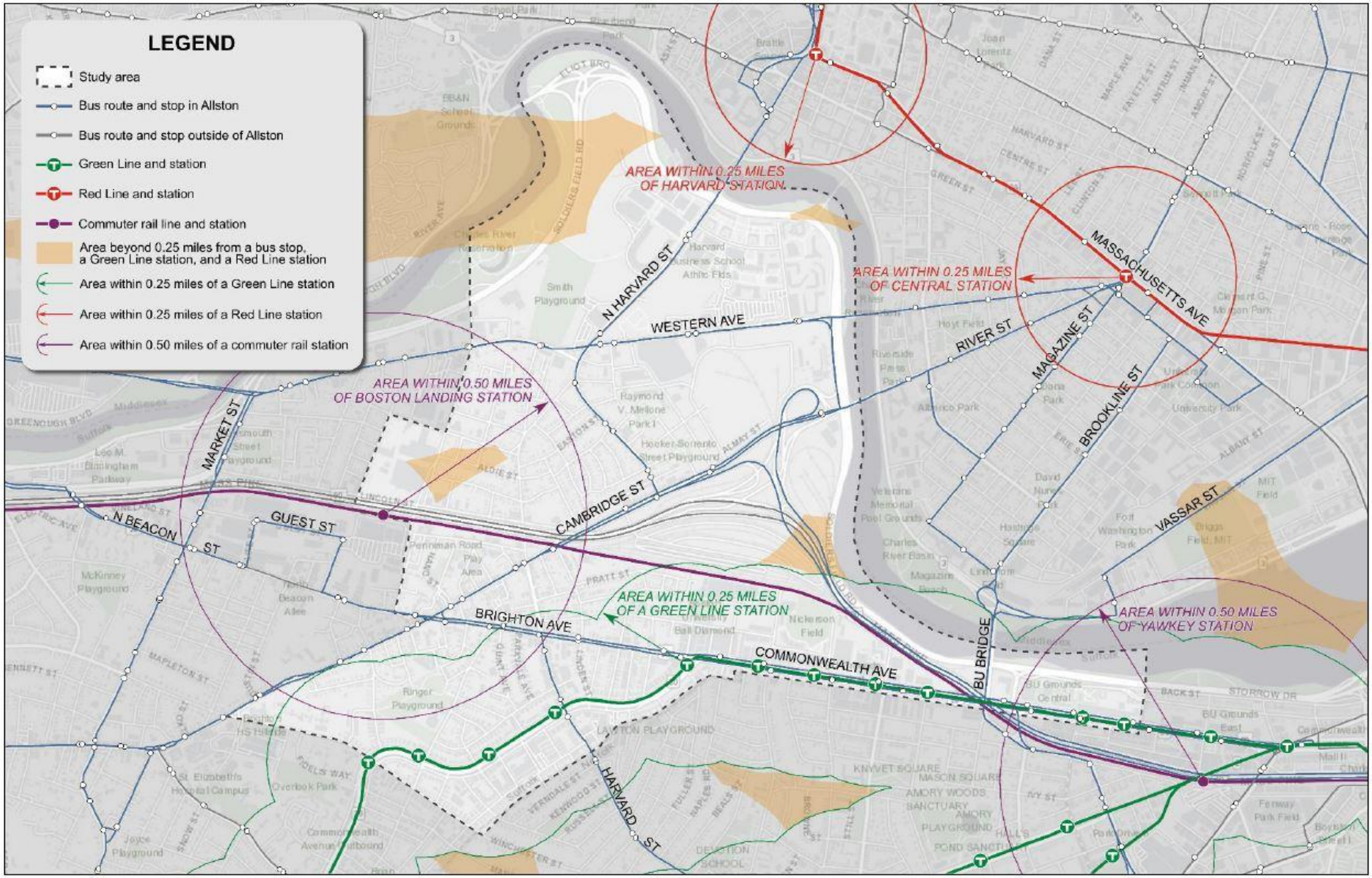

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FIGURE 5
Transit Coverage in Allston

Allston Transit Access Study

The MBTA bus services in Allston are long established. The following significant changes were made to Routes 64, 66, 70A, and 86 in 1989:

- Route 64 was extended from Central Square, Cambridge, to Kendall Square, Cambridge, on weekdays.
- Route 70A was established by merging a formerly independent route serving North Waltham (Route 61) with additional service in the corridor between Waltham and Cambridge, supplementing the previously established Route 70.
- Route 86, which formerly operated between Sullivan Square, Charlestown, and Union Square, Allston, was rerouted and extended to Reservoir Station in Brookline along the alignment of a route which was subsequently discontinued (Route 63).
- Route 66, which prior to 1989 operated only between Dudley Station and Union Square, Allston, was extended along the former alignment of Route 86 from Union Square, Allston, to Harvard Square, Cambridge.

The most recent significant change to MBTA bus service in Allston was the establishment of Route 503 in 2005.

Table 3 shows the number of scheduled weekday trips for bus routes serving Allston in 2005 and 2017. The MBTA began compiling ridership data by using an automated passenger counter (APC) system in 2012; the APC data is presented as a composite day. Previously, data was collected manually; 2005 was the last year that data was collected entirely by ride-checkers.

As shown in Table 3, there has been a slight increase in the total number of weekday bus trips scheduled on routes serving Allston during the 12 years between 2005 and 2017. For some routes, service during off-peak periods may have been slightly reduced in the last 12 years, while service was increased during peak periods with little or no change in the total number of weekday trips operated.

Table 3
Scheduled Weekday Trips of MBTA Bus Routes Serving Allston, 2005 and 2017

Route	2005 Inbound	2005 Outbound	2005 Total	2017 Inbound	2017 Outbound	2017 Total
47	46	48	94	49	51	100
57 and 57A combined	135	132	267	130	127	257
64	38	37	75	37	35	72
66	99	108	207	98	107	205
70 and 70A combined	74	74	148	77	78	155
86	54	51	105	56	55	111
CT2	31	33	64	29	30	59
501	51	49	100	43	40	83
503	0	0	0	13	12	25
Total	**528**	**532**	**1060**	**532**	**535**	**1067**

Source: MBTA timetables.

2.2 RIDERSHIP

Table 4 shows the total weekday ridership for MBTA bus routes serving Allston in 2005 and between 2012 and 2017 (excluding 2013, for which data are not available). Total ridership on bus routes that serve Allston has declined nine percent in the five years between 2012 and 2017, but remains 14.5 percent higher than 12 years earlier in 2005. These data show the total of all riders on each route, including those riders who do not board or alight in Allston but travel through Allston. In a presentation to the MBTA Fiscal and Management Control Board (FMCB) on November 26, 2018, MBTA staff stated that the drop in total MBTA ridership in recent years has been in line with national trends.

Table 4
Total Weekday Ridership on MBTA Bus Routes Serving Allston, 2005, 2012, and 2014 to 2017

Route	2005	2012	2014	2015	2016	2017
47	2,997	5,035	5,099	5,016	4,464	4,800
57 and 57A	8,879	12,059	12,360	11,494	10,350	10,554
64	1,608	1,976	1,913	2,005	1,760	1,810
66	11,088	13,932	13,457	12,653	12,157	12,230
70 and 70A	6,859	7,357	7,545	7,679	6,862	6,540
86	5,139	5,617	5,811	5,918	5,558	6,140
CT2	1,636	2,814	2,673	2,432	2,098	2,259
501	2,268	1,689	1,664	1,706	1,574	1,657
503	N/A	564	464	456	421	394
Total	**40,474**	**51,043**	**50,986**	**49,357**	**45,244**	**46,384**

Source: The data for 2012-17 are composite day counts from the MBTA's automated passenger counters. The 2005 data are from manual counts conducted by Central Transportation Planning Staff.

2.3 PASSENGER COMFORT AND CROWDING

The MBTA evaluates passenger comfort using the performance measure for passenger hours of comfortable travel experienced by bus passengers during all time periods. The maximum comfortable passenger load is expressed as a ratio of the number of passengers on the vehicle to the number of seats on the vehicle. During high-volume time periods, the maximum comfortable passenger to seat ratio is 140 percent; during low-volume periods it is 125 percent. The MBTA's passenger comfort target for the bus mode is 96 percent of passenger hours in comfortable conditions, with 92 percent being considered acceptable. A review of fall 2017 passenger comfort data from the MBTA's Office of Performance Management and Innovation (OPMI) indicates that Routes 47, 57/57A, 64, 66, and 501 are below the acceptable comfort level on weekdays, while Route 86 is below the target level but within the acceptable range. Table 5 shows the passenger comfort metric by route for the bus routes that serve Allston.

Table 5
Passenger Comfort on MBTA Bus Routes Serving Allston

Route	Percent of Passenger Hours in Comfortable Conditions
47	89.0%
57 and 57A	87.8%
64	90.6%
66	91.3%
70 and 70A	96.2%
86	93.5%
CT2	96.9%
501	92.3%
503	96.5%

Source: MBTA's Office of Performance Management and Innovation.

The MBTA's OPMI has developed a tool to identify bus crowding by source. This tool was used in the review of Allston routes presented in Chapter 3.

2.4 RELIABILITY

Under the MBTA's Service Delivery Policy, to be considered on time, buses should depart their origin within three minutes after scheduled departure time and must leave mid-route time points between one and six minutes after scheduled departure time. The bus must arrive at its destination no later than five minutes after its scheduled arrival time. For high-frequency routes, a bus must leave a time point no later than the scheduled headway (frequency) plus three minutes. The MBTA's target for bus reliability, as defined by the Service Delivery Policy, aims for buses on non-key bus routes to be on time at 75 percent of time-point stops and for buses on key bus routes to be on time at 80 percent of time-point stops.

Based on a review of weekday data from fall 2017, obtained from the MBTA's Performance Dashboard (www.mbtabackontrack.com/performance), all of the MBTA bus routes serving Allston have weekday reliability measures below the established targets. However, some routes perform better than the bus system as a whole. In fall 2017, weekday reliability systemwide was 64 percent and reliability on key bus routes was 75 percent. Table 6 shows the weekday reliability for bus routes that serve Allston.

Table 6
Weekday Reliability for MBTA Bus Routes Serving Allston

Route	Percent of Time Points On Time
47	53%
57	77%
57A	67%
64	59%
66	73%
70	58%
70A	50%
86	61%
501	73%
503	72%
CT2	43%

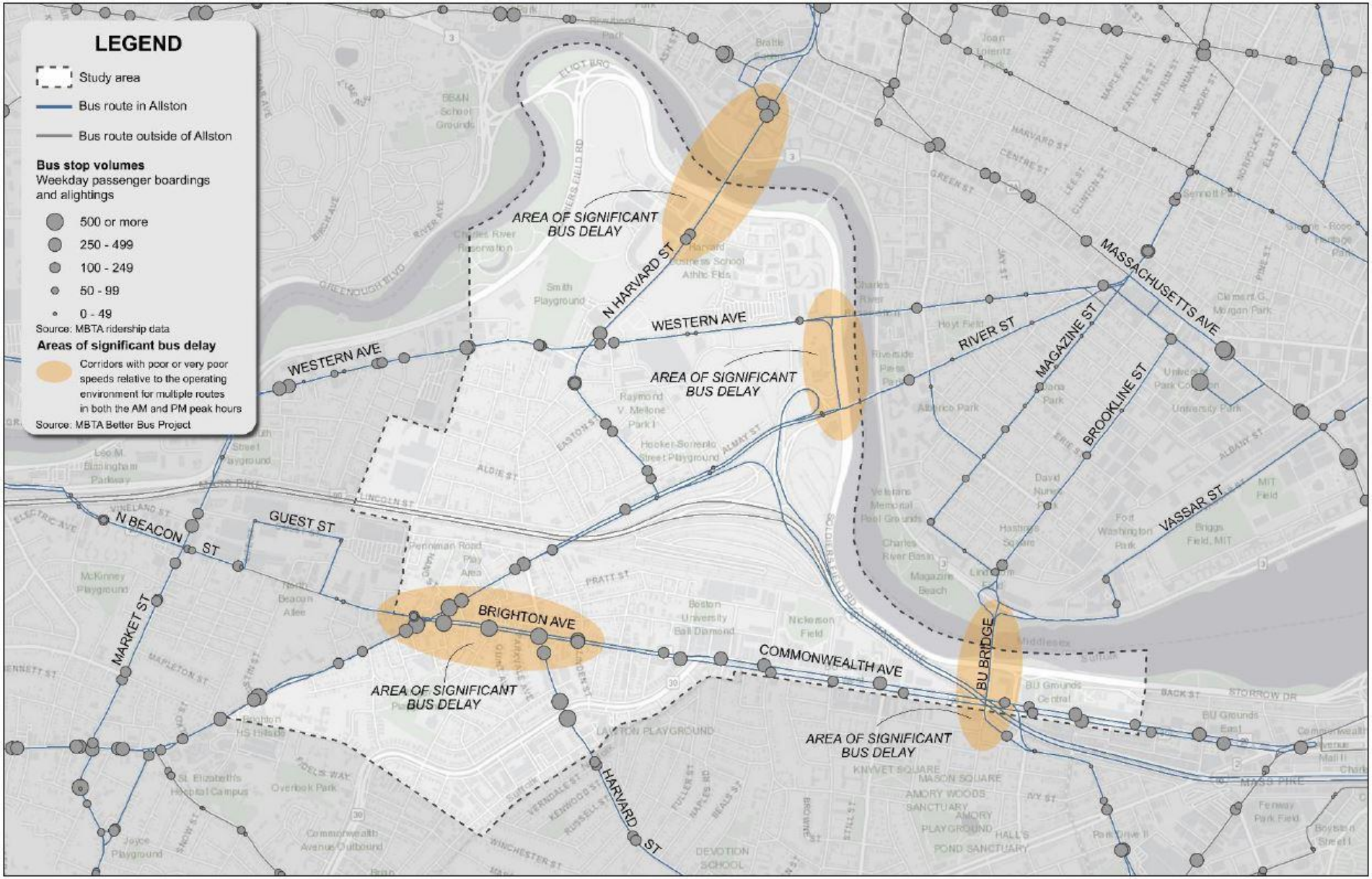
Source: MBTA's Office of Performance Management and Innovation.

2.5 TRAVEL SPEED AND DELAY

Travel time data for all trips on all MBTA bus routes is automatically collected from the automatic vehicle location (AVL) systems installed on all MBTA buses as well as from the APC systems installed in much of the MBTA bus fleet. The data collected by these systems can be analyzed to determine average vehicle speeds by route segments and by times of day.

In 2016, as part of the *Focus40* project, CTPS reviewed travel time data for the entire MBTA bus network to help identify route segments that would potentially benefit from the implementation of exclusive bus lanes. This effort was limited to corridors with high volumes of bus riders (1,500 riders or more per day in one direction) and was weighted by the amount of travel delay from congestion for each individual rider's journey. From this previous study, Brighton Avenue between Cambridge Street at Union Square and Harvard Avenue was identified as the corridor in Allston that could benefit the most from the implementation of bus lanes in peak periods. During the AM and PM peak periods, bus passengers on Routes 57/57A and 66 comprise 33 to 42 percent of the total roadway users (in motor vehicles) on this segment of Brighton Avenue.

During 2018, as part of the MBTA's Better Bus Project, the MBTA evaluated peak travel times for all MBTA bus routes and categorized operating speeds for roadway segments in six categories, from *very good* to *very poor,* as the speeds relate to the operating environment of each segment. Figure 6 shows locations where areas of significant delay were found on bus routes in Allston.



CTPS

FIGURE 6
Areas of Significant Bus Delay in Allston

Allston Transit Access Study

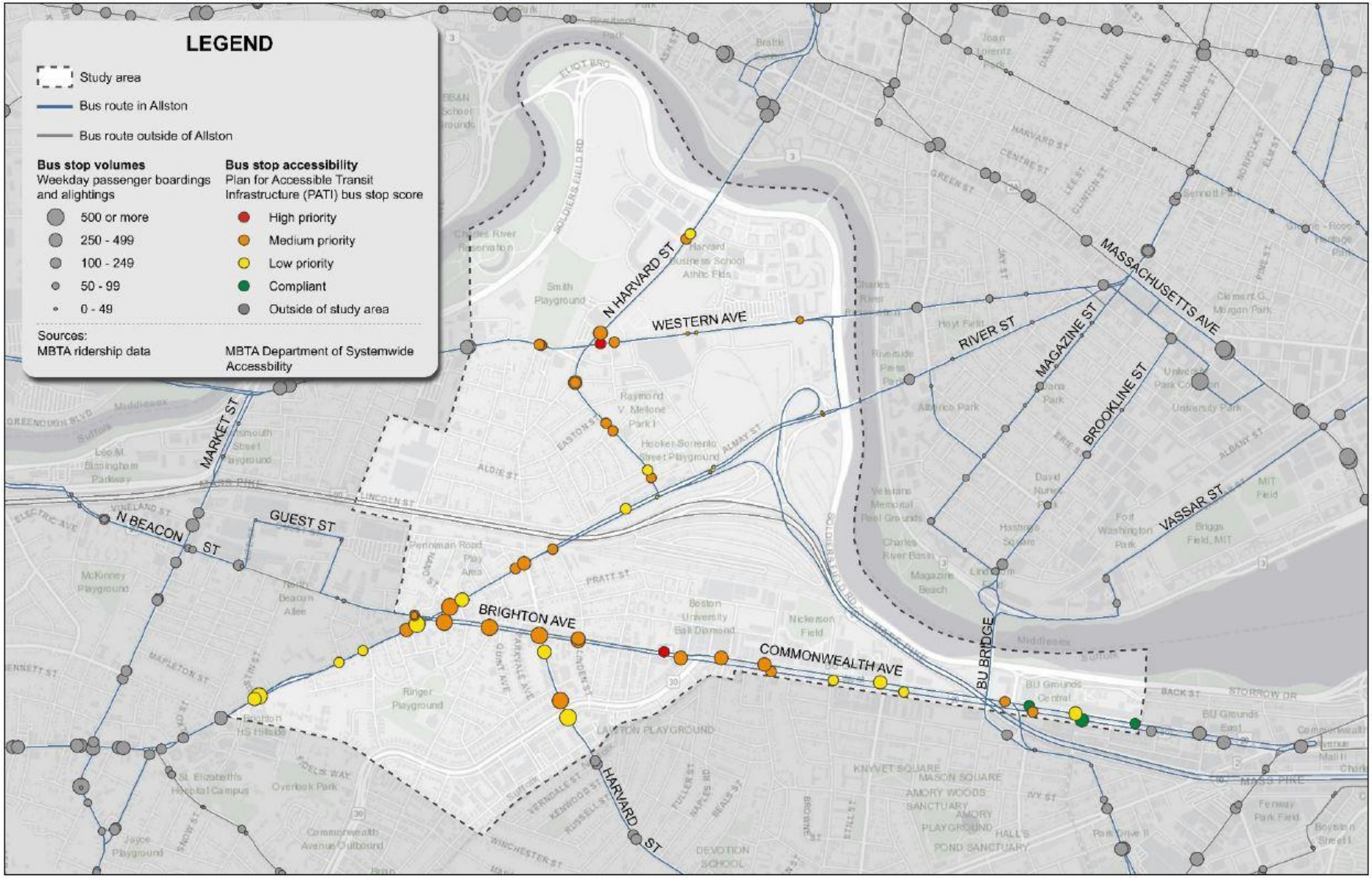
2.6 BUS STOP CONDITIONS AND ACCESSIBILITY

In 2016, the MBTA completed a review of all bus stops in the MBTA system to identify barriers that would affect access or impede passengers from boarding or alighting from buses and developed an initial Plan for Accessible Transit Infrastructure (PATI). Each stop was ranked as either

- *compliant* (no barriers found);
- *low* (negligible barriers noted);
- *medium* (at least one significant barrier noted);
- *high* (multiple barriers noted); or
- *critical* (barriers so significant that boarding or exiting from the street is required).

As part of the PATI review, stops were rated on conditions that affect the usability of the stop, including the location and condition of bus stop signs, the width and condition of landing pads (the space utilized when a bus ramp is deployed), the availability and condition of bus stop shelters, the width of the sidewalk at the stop, barriers on the path connecting the stop to nearby locations, and the availability of amenities such as trash cans and bike racks.

Figure 7 shows the PATI accessibility score and weekday passenger volumes for the bus stops in Allston. None of the 61 bus stops in Allston were rated as *critical*. Two bus stops were rated as *high*, 38 were rated as *medium*, 19 as *low*, and two as fully *compliant*. The two bus stops rated as *high* were stops with relatively low-ridership. Ten of the stops rated as *medium* were high-volume stops with 400 or more passengers per day boarding or alighting. Tables A1 through A9 in Appendix A include PATI scores by stop for each route serving Allston.



CTPS

FIGURE 7
Passenger Volumes and PATI Accessibility Scores for MBTA Bus Stops in Allston

Allston Transit Access Study

2.7 PASSENGER CHARACTERISTICS

CTPS conducted a systemwide passenger survey for the MBTA between 2015 and 2017. The survey was conducted to meet the requirements of Federal Transit Administration (FTA) Title VI Circular (C 4702.1B) and to obtain other information essential for transportation planning purposes. The results of the survey are available online at www.ctps.org/apps/mbtasurvey2018/.

Respondents were asked to report information about the most recent trip they made using the MBTA and provide demographic information. The survey collected data including trip purpose and frequency; fare type; access mode to reach the service; alternative modes used to make the reported transit trip; auto availability; income; race and ethnicity; and age and gender. The survey results were summarized by bus route and rail station. Data for services in Allston are summarized in in Chapters 3 and 4 of this report.

2.8 EXISTING TRIP PATTERNS AND TRANSFER ACTIVITY

The MBTA's OPMI uses an origin-destination-transfer (ODX) model to identify the trip patterns of bus and rapid transit riders. The model uses data from the automated fare collection (AFC) systems on buses, light rail vehicles, and in rapid transit stations, as well as vehicle location data from global positioning systems (GPS) on buses and light rail cars. For this study, ODX data was utilized to identify potential opportunities to alter routes or schedules based on existing stop activity and transfer patterns. More detail can be found in Chapter 3.

Chapter 3—Existing Conditions of MBTA Bus Routes

The existing conditions of bus routes are reviewed in numerical order in this chapter for Routes 47, 64, 66, 86, CT2, 501, and 503 individually; for Routes 57 and 57A combined; and for Routes 70 and 70A combined.

3.1 ROUTE 47 CENTRAL SQUARE, CAMBRIDGE—BROADWAY STATION

Route 47 operates between Central Square, Cambridge, and Broadway Station in South Boston. It only stops in Allston when traveling in the outbound direction (towards Cambridge) at the Boston University Bridge. The route operates seven days per week with a span of service from 5:15 AM to 1:31 AM weekdays, 5:00 AM to 1:40 AM Saturdays, and 7:30 AM to 1:25 AM Sundays. Service operates every 10 minutes during the weekday AM peak period, every 23 to 24 minutes during midday on weekdays, every 10 to 15 minutes during the weekday PM peak period, every 45 minutes weekday and weekend evenings, every 24 minutes during midday on Saturdays, and every 40 to 45 minutes all day on Sundays.

3.1.1 Ridership

Table 7 shows the ridership on Route 47 during the fall of 2017 by direction and type of day for the whole route and for the stops in Allston. Route 47's ridership ranked as the 25th highest for weekdays, the 33rd highest for Saturdays, and the 31st highest for Sundays of all 175 MBTA bus routes in fall 2017. Detailed ridership data for the Route 47 stops in Allston can be found in Table A1 in Appendix A.

Table 7
Route 47 Ridership, Fall 2017

Direction	Day	Total Passengers	Allston Ons	Percent of Total	Allston Offs	Percent of Total
Inbound	Weekday	2,340	N/A	N/A	N/A	N/A
Inbound	Saturday	920	N/A	N/A	N/A	N/A
Inbound	Sunday	530	N/A	N/A	N/A	N/A
Outbound	Weekday	2,460	94	4%	51	2%
Outbound	Saturday	890	37	4%	19	2%
Outbound	Sunday	510	24	5%	19	4%
Total	**Weekday**	**4,800**	**N/A**	**N/A**	**N/A**	**N/A**
Total	**Saturday**	**1,810**	**N/A**	**N/A**	**N/A**	**N/A**
Total	**Sunday**	**1,040**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Automated passenger counter data.

3.1.2 Passenger Comfort and Crowding

During the fall of 2017, 89.9 percent of weekday passenger minutes on Route 47 were in comfortable conditions. This comfort metric is below the minimum standard set in the MBTA Service Delivery Policy of 92 percent for bus routes. APC data from the fall of 2017 showed inbound trips with average crowding above 140 percent of seating capacity departing Central Square at 7:22 AM inbound and departing Broadway at 2:55 PM, 3:35 PM, and 4:05 PM. The MBTA added one AM peak trip and one PM peak trip to Route 47 with the summer schedule change of June 2018 to relieve crowding during the peak period. Data from 2016 indicate that one percent of Route 47's trips were dropped on weekdays.

3.1.3 Reliability

The MBTA's target for bus reliability, as defined in the Service Delivery Policy, requires buses to arrive on time at 75 percent of time-point stops on non-key bus routes and 80 percent of time-point stops on key bus routes. In fall 2017, the weekday reliability score for Route 47 was 53 percent. Late departures from origins were observed on multiple trips consistently in the AM peak period, middays on weekdays, and the PM peak period. In summer 2018, changes were made to the schedules and travel running time for Route 47 with a goal to improve on-time performance and reliability.

3.1.4 Travel Speed and Delay

A review of travel speeds on Route 47, completed by the MBTA for the Better Bus Project, for the entire route in both directions during the AM and PM peak periods indicated segments where speeds were *poor* or *very poor* relative to the operating environment. In Allston, *poor* to *very poor* speeds were identified in the AM and PM peak periods when the buses crossed the Boston University Bridge.

In addition to the segments in Allston, peak period delays on Route 47 were identified along Brookline Avenue in the Longwood Medical Area; near Dudley Station; leaving Central Square, Cambridge; from Park Drive to Brookline Avenue; along Ruggles Street to Ruggles Station; leaving Ruggles Station; along Albany Street near the Boston University Medical Center; and approaching Broadway Station.

3.1.5 Bus Stop Conditions and Accessibility

The one Route 47 bus stop in Allston received a score of *medium* in the PATI review of accessible stop conditions.

3.1.6 Passenger Characteristics

The survey results for Route 47 from the MBTA's systemwide passenger survey revealed the following:

- 77 percent of passengers reported home-based-work trips and eight percent reported home-based-school trips;
- 74 percent of passengers made their reported trips using the route five days or more per week and 85 percent of riders utilized a monthly pass for fare payment;
- 39 percent of passengers did not have access to a personal vehicle and 16 percent did not have a driver's license;
- 26 percent of riders were classified as low-income, 33 percent were classified as minority, and 56 percent were under age 35; and
- 73 percent of riders reported that they will sometimes use an alternative mode instead of Route 47 for their reported trips: 60 percent of those riders will utilize a different MBTA service, 26 percent will walk, and 24 percent will use a rideshare service or taxi.

3.2 ROUTE 57 WATERTOWN YARD—KENMORE STATION AND 57A OAK SQUARE—KENMORE STATION

Route 57 is considered a key bus route. It operates between Watertown Yard in Watertown and Kenmore Square in Boston via Newton Corner, Brighton, and Allston. It operates in Allston along Cambridge Street, Brighton Avenue, and Commonwealth Avenue.

The span of service is 4:33 AM to 1:30 AM weekdays; 4:33 AM to 12:55 AM Saturdays; and 6:00 AM to 1:10 AM Sundays. Service operates alternating between every 10 and 11 minutes in the AM peak period between Watertown and Kenmore Square with additional AM peak service alternating between every 10 and 11 minutes as Route 57A between Oak Square and Kenmore Square. Midday service on weekdays operates every 10 minutes. Weekday PM peak service alternates between every 11 and 12 minutes between Kenmore Square and Watertown, with additional Route 57A service alternating between every 11 and 12 minutes between Kenmore Square and Oak Square. Evening service on weekdays operates every 13 minutes, midday service on Saturday operates every 10 minutes, and service on Sunday operates every 15 minutes.

3.2.1 Ridership

Table 8 shows the ridership on Route 57/57A during the fall of 2017 by direction and type of day for the whole route and for the stops in Allston. Route 57's ridership ranked as the 9th highest for weekdays, the 8th highest for Saturdays, and the 9th highest for Sundays of all 175 MBTA bus routes in fall 2017.

Detailed ridership data for Route 57 stops in Allston can be found in Table A2 in Appendix A.

Table 8
Route 57/57A Ridership, Fall 2017

Direction	Day	Total Passengers	Allston Ons	Percent of Total	Allston Offs	Percent of Total
Inbound	Weekday	5,221	2,195	42%	1,553	30%
Inbound	Saturday	3,120	1,160	37%	960	31%
Inbound	Sunday	2,210	810	36%	650	39%
Outbound	Weekday	5,333	1,894	35%	1,903	35%
Outbound	Saturday	2,960	1,080	37%	910	31%
Outbound	Sunday	2,195	820	37%	630	28%
Total	**Weekday**	**10,554**	**4,089**	**39%**	**3,456**	**33%**
Total	**Saturday**	**6,080**	**2,240**	**37%**	**1,870**	**31%**
Total	**Sunday**	**4,390**	**1,630**	**37%**	**1,280**	**29%**

Source: Automated passenger counter data.

3.2.2 Passenger Comfort and Crowding

During the fall of 2017, 87.8 percent of weekday passenger minutes for Routes 57 and 57A combined were in comfortable conditions. This comfort metric is below the minimum standard set in the MBTA's Service Delivery Policy of 92 percent for bus routes.

APC data from the fall of 2017 showed inbound trips with average crowding above 140 percent of seating capacity as follows:

- Route 57 trips departing Watertown at 7:15 AM, 7:26 AM, 7:36 AM, 7:46 AM, and 9:20 AM inbound
- Route 57A trips departing Oak Square at 8:01 AM, 8:22 AM, and 8:32 AM inbound
- Outbound trips departing Kenmore Square on Route 57 or 57A at 4:00 PM, 4:46 PM, 5:09 PM, 5:32 PM, 5:39 PM, 5:45 PM, 5:52 PM, 6:21 PM, 6:28 PM, and 9:14 PM

Although eight out of 25 Route 57 or 57A inbound trips departing Watertown or Oak Square between 7:15 AM and 9:20 AM had total passenger maximum loads exceeding 140 percent of seating capacity, seven of those eight trips only exceeded this amount (53 passengers on a 38-seat bus) after departing the stop at Brighton Avenue and Commonwealth Avenue (Packard's Corner). This stop is also served by the Green Line B branch. When there is a delay in Green Line service, some passengers may choose to ride the Route 57 bus if it arrives at the stop ahead of a Green Line train. Only the 7:46 AM Route 57 inbound trip from Watertown had a maximum load exceeding 140 percent of capacity before

reaching Packard's Corner. Crowded conditions occurred when this trip reached the stop at Cambridge Street and Gordon Street.

3.2.3 Reliability

Data from 2016 indicate that three percent of all weekday Route 57/57A trips were dropped. This is a large percentage of dropped trips compared to other routes in the MBTA network.

The MBTA's target for bus reliability, as defined in the Service Delivery Policy, requires buses to arrive on time at 75 percent of time-point stops for non-key bus routes and 80 percent of time-point stops for key bus routes. Weekday reliability in fall 2017 was 77 percent for Route 57 and 67 percent for Route 57A trips.

3.2.4 Travel Speed and Delay

A review of travel speeds on Route 57/57A, completed by the MBTA for the Better Bus Project, for the entire route in both directions during the AM and PM peak periods indicates *very poor* speeds relative to the operating environment in the AM peak period along Brighton Avenue at Harvard Avenue and in the PM peak period along Brighton Avenue from Union Square to Commonwealth Avenue.

In addition to the locations in Allston, delays were also identified in segments in Brighton Center, portions of Commonwealth Avenue, and Newton Corner.

3.2.5 Bus Stop Conditions and Accessibility

The MBTA rated the stop at 19 Brighton Avenue as of *high* concern in the PATI review of bus stop accessibility, as there are multiple barriers to accessibility. There are 12 stops on Route 57 in Allston which are rated as *medium*. Two of the outbound stops (Brighton Avenue at Quint Avenue and Cambridge Street at North Beacon) had over 500 Route 57/57A passengers boarding or alighting. The stop at Brighton Avenue at Quint Avenue is also served by Route 66 and is a major transfer point between the two routes. A summary of PATI scores for the Route 57/57A stops in Allston can be found in Table A2 in the appendix.

3.2.6 Passenger Characteristics

The survey results for Route 57/57A from the MBTA's systemwide passenger survey revealed the following:

- 67 percent of passengers reported home-based-work trips and eight percent reported home-based-school trips;

- 63 percent of passengers made their reported trips using the route five days or more per week and 72 percent of riders utilized a monthly pass for fare payment;
- 39 percent of passengers do not have access to a personal vehicle and 19 percent do not have a driver's license;
- 43 percent of riders were classified as low-income, 28 percent were classified as minority, and 69 percent were under age 35; and
- 59 percent of riders reported that they will sometimes use an alternative mode instead of Route 57: 61 percent of those riders will utilize a different MBTA service, 17 percent will walk, and 24 percent will use a rideshare service or taxi.

3.3 ROUTE 64 OAK SQUARE—UNIVERSITY PARK OR KENDALL/MIT

Route 64 operates between Oak Square in Brighton and Kendall Square in Cambridge during weekday peak hours and to University Park in Cambridge during off-peak hours. In Allston, the route operates on North Beacon Street and Cambridge Street, and outbound buses also operate for a short distance along Soldiers Field Road. The span of service is weekdays from 5:31 AM to 1:13 AM; Saturdays from 5:20 AM to 1:15 AM; and Sundays from 8:18 AM to 6:59 PM. Service operates every 13 to 18 minutes during the weekday AM peak periods, every 35 minutes midday during the weekdays, every 30 minutes during the weekday PM peak periods, every hour during weekday evenings, and every hour throughout Saturday and Sunday.

In Brighton, near Allston, Route 64 has been operating on a long-term detour for several years because of construction on Guest Street, operating direct via North Beacon Street. From 1998 until this detour was put in place, Route 64 operated via Guest Street between Arthur Street and Life Street. As construction in this roadway segment comes to a conclusion, the MBTA plans to restore operations on Guest Street. Guest Street provides close access to Boston Landing Station, which opened in May 2017.

3.3.1 Ridership

Table 9 shows the ridership on Route 64 during the fall of 2017 by direction and type of day for the whole route and for the stops in Allston. Route 64's ridership ranked as the 66th highest for weekdays, the 87th highest for Saturdays, and the 87th highest for Sundays of all 175 MBTA bus routes in fall 2017.

Detailed ridership data for Route 64 stops in Allston can be found in Table A3 in Appendix A.

Table 9
Route 64 Ridership, Fall 2017

Direction	Day	Total Passengers	Allston Ons	Percent of Total	Allston Offs	Percent of Total
Inbound	Weekday	1,070	287	27%	131	12%
Inbound	Saturday	335	80	25%	50	16%
Inbound	Sunday	200	50	27%	30	16%
Outbound	Weekday	740	116	16%	182	25%
Outbound	Saturday	235	50	20%	70	28%
Outbound	Sunday	120	20	20%	30	24%
Total	**Weekday**	**1,810**	**403**	**22%**	**313**	**17%**
Total	**Saturday**	**570**	**130**	**22%**	**120**	**21%**
Total	**Sunday**	**320**	**70**	**22%**	**60**	**19%**

Source: Automated passenger counter data.

3.3.2 Passenger Comfort and Crowding

During the fall of 2017, 90.6 percent of weekday passenger minutes on Route 64 were in comfortable conditions. This comfort metric is below the minimum standard set in the MBTA's Service Delivery Policy of 92 percent for bus routes. The 7:45 AM inbound trip on Route 64 had an average maximum load of 50.6 passengers, just above 140 percent of the seating capacity of a 36-seat bus. APC data from the fall of 2017 shows that there were multiple inbound Route 64 trips during the AM peak period with maximum loads just below 140 percent of seating capacity. These loads contribute to the percentage of uncomfortable passenger minutes that are below the measures set in the MBTA's Service Delivery Policy standards.

3.3.3 Reliability

The MBTA's target for bus reliability, as defined in the Service Delivery Policy, requires buses to arrive on time at 75 percent of time-point stops on non-key bus routes and 80 percent of time-point stops on key bus routes. Weekday reliability for Route 64 in fall 2017 was 59 percent.

Running-time data from the MBTA shows that, in the fall of 2017, Route 64 weekday trips departed from origin points five minutes late on average. However, the 8:55 AM inbound trip departure was 8.8 minutes late on average, while the 8:14 AM outbound trip departed 11 minutes late and the 4:05 PM outbound trip departed seven minutes late on average.

3.3.4 Travel Speed and Delay

A review of travel speeds on Route 64, completed by the MBTA for the Better Bus Project, for the entire route in both directions during the AM and PM peak periods indicates *poor* or *very poor* speeds relative to the operating environment in the following locations in Allston:

- Union Square, Allston, inbound in the AM peak period
- River Street bridge crossing, inbound from Allston to Cambridge in the AM and PM peak periods
- Cambridge Street near North Harvard Street, outbound in the PM peak period

In addition to the locations in Allston, peak period delays were also identified in Central Square, Cambridge, on Magazine Street; along Broadway in Cambridge; and on North Beacon Street to Brooks Street in Brighton.

3.3.5 Bus Stop Conditions and Accessibility

Nine stops on Route 64 in Allston were scored as of *medium* concern in the PATI review of bus stop accessibility, while four were identified as of *low* concern. A summary of PATI scores by stop for Route 64 can be found in Table A3 in the appendix.

3.3.6 Passenger Characteristics

The survey results for Route 64 from the MBTA's systemwide passenger survey revealed the following:

- 80 percent of passengers reported home-based-work trips and six percent reported home-based-school trips;
- 71 percent of passengers made their reported trips on the route five days or more per week, and 77 percent of riders utilized a monthly pass for fare payment;
- 36 percent of passengers did not have access to a personal vehicle, and 16 percent did not have a driver's license;
- 25 percent of riders were classified as low-income, 30 percent were classified as minority, and 62 percent were under age 35; and
- 70 percent of riders reported that they will sometimes use an alternative mode instead of Route 64: 53 percent of those riders will utilize a different MBTA service, 26 percent will walk, and 23 percent will use a rideshare service or taxi.

3.4 ROUTE 66 HARVARD SQUARE—DUDLEY STATION

Route 66 is considered a key bus route. The service operates between Harvard Square in Cambridge and Dudley Square in Roxbury via Allston and Brookline.

Buses travel along North Harvard Street, Cambridge Street, Brighton Avenue, and Harvard Avenue in Allston. On school days, additional service is operated between Dudley and Brighton Center in the AM peak period and PM base period (2:00 PM to 3:00 PM) to accommodate students. The span of service is weekdays from 4:45 AM to 1:34 AM; Saturdays from 4:40 AM to 1:36 AM; and Sundays from 5:50 AM to 1:34 AM. Service operates every nine minutes during the weekday AM peak period (with additional service from Dudley to Brighton Center); every 16 minutes middays during weekdays; every 10 minutes during the weekday PM peak period; every 20 minutes during weekday evenings; alternating between every 16 and 17 minutes Saturdays; and ranging from every 17 to 20 minutes on Sundays.

3.4.1 Ridership

Table 10 shows the ridership on Route 66 during the fall of 2017 by direction and type of day for the whole route and for the stops in Allston. Route 66's ridership ranked as the 2nd highest for weekdays, the 4th highest for Saturdays, and the 5th highest for Sundays of all 175 MBTA bus routes in fall 2017.

Detailed ridership data for Route 66 stops in Allston can be found in Table A4 in Appendix A.

Table 10
Route 66 Ridership, Fall 2017

Direction	Day	Total Passengers	Allston Ons	Percent of Total	Allston Offs	Percent of Total
Inbound	Weekday	5,990	2,162	36%	1,429	24%
Inbound	Saturday	3,570	1,230	34%	950	27%
Inbound	Sunday	2,875	940	33%	770	27%
Outbound	Weekday	6,240	1,455	23%	2,190	35%
Outbound	Saturday	3,530	1,000	28%	1,140	32%
Outbound	Sunday	2,855	780	27%	920	32%
Total	**Weekday**	**12,230**	**3,617**	**30%**	**3,619**	**30%**
Total	**Saturday**	**7,100**	**2,230**	**31%**	**2,090**	**29%**
Total	**Sunday**	**5,730**	**1,720**	**30%**	**1,690**	**29%**

Source: Automated passenger counter data.

3.4.2 Passenger Comfort and Crowding

During the fall of 2017, 91.3 percent of passenger minutes on Route 66 were in comfortable conditions. This comfort metric is just below the minimum standard set in the MBTA's Service Delivery Policy of 92 percent for bus routes.
APC data from the fall of 2017 showed trips with average crowding above 140 percent of seating capacity departing Harvard Station at 5:08 PM and 5:18 PM

inbound and departing Dudley Station at 7:42 AM, 7:51 AM, 8:00 AM, and 4:50 PM outbound. Data from 2016 indicates that two percent of Route 66 trips during weekdays were routinely dropped.

3.4.3 Reliability

Weekday reliability for Route 66 in fall 2017 was 73 percent, thus the route does not meet the reliability standard set in the MBTA's Service Delivery Policy that calls for buses on key bus routes to arrive on time at 80 percent of time-point stops.

Running-time data for Route 66 from the fall of 2017 indicates that multiple outbound trips in the AM peak period, AM midday, and early evening departed Dudley Station five minutes late or more. However, inbound departures from Harvard Station departed on time much more consistently. The MBTA will be implementing new schedules and running times for weekday Route 66 service in the winter of 2019 to address delays and reliability.

3.4.4 Travel Speed and Delay

A review of travel speeds on Route 66, completed by the MBTA for the Better Bus Project, for the entire route in both directions during the AM and PM peak periods indicates *poor* or *very poor* speeds relative to the operating environment in the following locations in Allston:

- Brighton Avenue from Cambridge Street to Harvard Avenue in Allston, inbound in the PM peak period
- Commonwealth Avenue crossing, outbound in the PM peak period
- Anderson Memorial Bridge crossing, from Cambridge to Boston, inbound and outbound in the AM and PM peak periods

In addition to the locations in Allston, *poor* speeds during the peak periods were also identified in Harvard Square, Brookline Village, along Huntington Avenue from South Huntington Avenue to Tremont Street, and along Tremont Street approaching Columbus Avenue.

CTPS's 2016 *Prioritization of Dedicated Bus Lanes* study, which was part of the *Focus40* effort, prioritized Brighton Avenue between Cambridge Street (Union Square) and Harvard Avenue as a location where the installation of a dedicated bus lane could reduce travel times for buses on Routes 57/57A and 66. Outside of Allston, the study also identified the Route 66 segment on Huntington Avenue between South Huntington Avenue and Tremont Street as another location that could benefit from the implementation of a bus lane. This roadway segment is also shared by MBTA bus Route 39 (Forest Hills—Back Bay) and the Heath Street (E) branch of the Green Line.

3.4.5 Bus Stop Conditions and Accessibility

There are 17 stops on Route 66 in Allston which were rated as of *medium* concern in the PATI review of bus stop accessibility. Over 500 passengers that traveled on Route 66 boarded or alighted at each of four stops: Brighton Avenue at Quint Avenue; Cambridge Street opposite Hano Street; Brighton Avenue at Cambridge Street; and Harvard Avenue at Commonwealth Avenue. The stops at Brighton Avenue at Quint Avenue and Brighton Avenue at Cambridge Street are also served by Route 57 and are major transfer points between the two routes. A summary of PATI scores for each Route 66 stop in Allston can be found in Table A4 in the appendix.

3.4.6 Passenger Characteristics

The survey results for Route 66 from the MBTA's systemwide passenger survey revealed the following:

- 69 percent of passengers reported home-based-work trips, and eight percent reported home-based-school trips;
- 72 percent of passengers made their reported trips on the route five days or more per week, and 71 percent of riders utilized a monthly pass for fare payment;
- 55 percent of passengers did not have access to a personal vehicle, and 28 percent did not have a driver's license;
- 40 percent of riders were classified as low-income, 40 percent were classified as minority, and 66 percent were under age 35; and
- 66 percent of riders reported they will sometimes use an alternative mode instead of Route 66: 48 percent of those riders will utilize a different MBTA service, 31 percent will walk, and 27 percent will use a rideshare service or taxi.

3.4.7 Possible Route Changes for Route 66

Route 66 could be altered significantly in Allston by being routed to operate direct via Harvard Avenue between Brighton Avenue and Cambridge Street instead of operating through Union Square via Brighton Avenue and Cambridge Street. When Route 66 was first extended to Harvard Square in Cambridge in 1989, the service did operate direct via Harvard Avenue, but the route was altered after a short period to operate via Brighton Avenue and Cambridge Street because of requests from the riding public. Prior to 1989, the route terminated at Union Square in Allston and since 1962, the route serviced Brighton Avenue between Harvard Avenue and Cambridge Street.

Route 66's combined weekday inbound and outbound activities on the roadway segment along Brighton Avenue and Cambridge Street from Cambridge Street at

Franklin Street to Brighton Avenue west of Harvard Avenue includes 1,135 boardings and 1,088 alightings. Origin-destination-transfer (ODX) data indicated that transfers from Route 57 account for 144 of the originating passengers and 132 of the alighting passengers. Although the number of transfers per day is high, the majority of Route 66 passengers utilizing these stops are not transferring to or from other routes.

If Route 66 were rerouted to operate direct via Harvard Avenue between Brighton Avenue and Cambridge Street, the closest existing Route 66 stops to the bypassed segment would be Harvard Avenue at Brighton Avenue and Cambridge Street at Linden Street outbound and Cambridge at Lincoln Street and Harvard Avenue at Commonwealth Avenue inbound. It would be necessary to establish new stop locations inbound on Harvard Avenue between Cambridge Street and Brighton Avenue as the closest inbound stop otherwise south of Cambridge Street is Harvard Avenue at Commonwealth Avenue. It would not be necessary to establish a new stop outbound, as the stop on Harvard Avenue at Brighton Avenue would suffice. However, the walking time for passengers transferring to outbound Route 57 service would be three to four minutes to Brighton Avenue at Linden Street or Brighton Avenue opposite Quint Street, unless a new stop was added on Route 57 outbound closer to Harvard Avenue.

A review of APC data from the fall of 2017 showed that 1,562 outbound Route 66 riders and 1,463 inbound riders traveled through the segment between Cambridge Street and Harvard Avenue at Brighton Avenue. These riders would benefit if Route 66 operated direct via North Harvard Street between Cambridge Street and Brighton Avenue. This route is estimated to save 4.5 minutes of travel time each way during the peak periods and 3.5 minutes during off-peak times. For both directions of travel combined, there were almost 1,700 riders during off-peak times and 1,300 riders during peak periods who would benefit from faster travel times, for a savings of almost 12,000 total passenger travel minutes (200 hours). Based on 60 off-peak round trips and 35 peak-period round trips, scheduled vehicle hours on weekdays would decrease by 12 hours and 25 minutes per day.

For the approximately 2,000 daily riders who utilize Route 66 stops on Brighton Avenue and Cambridge Street, including those transferring between Routes 57 and 66, each rider would have up to six minutes additional walking time. Cumulative daily travel time would increase by as much as 12,000 minutes (200 hours). Bus lanes placed on Brighton Avenue could reduce the Route 66 travel time in this segment and achieve at least a portion of the travel-time savings that rerouting could achieve, but without causing disruption for existing riders who use those stops. Then Route 66 service could be maintained to serve a location near the Boston Landing development.

As part of the Bus Network Redesign process, MassDOT and the MBTA will examine how the bus network can better serve emerging employment centers, such as Boston Landing. One scenario that could be explored as part of the Network Redesign process is a realignment of Route 66 to better connect to Boston Landing Station. The new service could run through the Allston segment of the route, between Union Square (Brighton Avenue at Cambridge Street) and Barry's Corner (Western Avenue at North Harvard Street), via a new alignment of North Beacon Street, Everett Street, and Western Avenue.

This rerouting would provide service closer to Boston Landing and would introduce direct bus service on Everett Street between North Beacon Street and Western Avenue. Everett Street, however, is a narrower street than North Harvard Street and bus stop placement along the street could present a challenge as there is only one travel lane in each direction and no parking for most of its length. Some residences on or near Everett Street are slightly more than a quarter-mile walk to Route 70/70A and Route 86 service on Western Avenue and Route 64 service on North Beacon Street. Rerouting Route 66 service to this alignment would remove Route 66 on Cambridge Street between Union Square and North Harvard Street, although Route 64 and "reverse peak" Route 501 and Route 503 service would remain on this segment. This rerouting would remove all bus service on North Harvard Street between Cambridge Street and Western Avenue.

Existing ridership on the roadway segment that would be bypassed between North Harvard Street at Kingsley and Cambridge Street at Harvard Avenue includes 500 boardings and 446 alightings in the outbound direction (toward Harvard Station) and 456 boardings and 386 alightings in the outbound direction (toward Dudley Station). Passengers boarding or alighting at the two stops on North Harvard Street closest to Western Avenue (282 inbound and 138 outbound) would be within a quarter-mile walk to the rerouted Route 66 service on Western Avenue. Those boarding between North Harvard Street at Empire Street and Cambridge Street at Harvard Avenue (218 inbound and 318 outbound) would either have longer walks, ranging from a quarter mile to a half mile to Route 66 service at Brighton Avenue at Harvard Avenue, or they would have to use Route 64 service and transfer to Route 66 at Union Square. The travel distance and likely travel time on a reconfigured route via Everett Street would be comparable to the existing travel distance and travel time.

3.5 ROUTE 70 CEDARWOOD OR MARKET DRIVE—UNIVERSITY PARK AND ROUTE 70A NORTH WALTHAM UNIVERSITY PARK

Routes 70 and 70A operate between Waltham and Cambridge via Watertown, Brighton, and Allston. The two routes share a long common segment between Waltham Center and Cambridge. The routes operate along Western Avenue in Allston, with inbound trips also operating for a short distance along Soldiers Field Road. The span of service for both routes combined is 4:31 AM to 1:19 AM weekdays, Saturdays from 5:00 AM to 1:10 AM, and Sundays from 6:00 AM to 1:23 AM. The combined frequency of both routes is every six to 17 minutes in the weekday AM peak period; every 10 to 25 minutes during midday on weekdays; every 10 minutes during the PM peak period; every 15 to 40 minutes during weekday evenings; every 10 to 15 minutes during midday on Saturdays; and every 20 minutes during the Sunday base period (11:40 AM to 7:40 PM).

3.5.1 Ridership

Table 11 shows the ridership on the combined Route 70/70A during the fall of 2017 by direction and type of day for the whole route and only the stops in Allston. Route 70's ridership ranked as the 24th highest for weekdays, the 19th highest for Saturdays, and the 14th highest for Sundays of all 175 MBTA bus routes in fall 2017. Route 70A's ridership ranked as the 71st highest for weekdays and the 57th highest for Saturdays of all 175 MBTA bus routes in fall 2017. The combined ridership of Route 70/70A on weekdays is the 13th highest in the network, while the combined Saturday ridership is the 14th highest. The combined route's ridership is greater than seven existing key bus routes, and the ridership on Saturdays and Sundays is greater than six existing key bus routes. Detailed ridership for Route 70/70A stops in Allston can be found in Table A5 in Appendix A.

Table 11
Route 70/70A Ridership, Fall 2017

Direction	Day	Total Passengers	Allston Ons	Percent of Total	Allston Offs	Percent of Total
Inbound	Weekday	2,970	247	8%	227	8%
Inbound	Saturday	1,840	110	6%	150	8%
Inbound	Sunday	1,340	100	7%	120	9%
Outbound	Weekday	3,570	282	8%	223	6%
Outbound	Saturday	1,940	160	8%	100	5%
Outbound	Sunday	1,515	150	10%	100	6%
Total	**Weekday**	**6,540**	**529**	**8%**	**450**	**7%**
Total	**Saturday**	**3,780**	**270**	**7%**	**250**	**7%**
Total	**Sunday**	**2,855**	**250**	**9%**	**220**	**8%**

Source: Automated passenger counter data.

3.5.2 Passenger Comfort and Crowding

The overall comfort metric for Routes 70 and 70A combined in the fall of 2017 was 96.2 percent. APC data from the fall of 2017 showed weekday inbound trips with average crowding above 140 percent of seating capacity departing Waltham at 7:00 AM inbound. Data from 2016 indicates that one percent of weekday Route 70 trips were routinely dropped.

3.5.3 Reliability

Weekday reliability in fall 2017 was 58 percent for Route 70 and 50 percent for Route 70A. The reliability standard set in the MBTA's Service Delivery Policy requires buses on non-key bus routes to arrive on time at 75 percent of time-point stops.

Running-time data from fall of 2017 indicates that inbound Route 70 trips departing Waltham at 12:45 PM and 2:46 PM and Route 70A trips departing at 9:00 AM and 6:30 PM left more than five minutes late on average. Outbound Route 70 trips at 7:15 AM, 8:20 AM, 11:40 AM, 6:40 PM, and 7:00 PM, and Route 70A trips at 8:00 AM, 8:55 AM, and 5:40 PM departed five minutes late or more on average.

3.5.4 Travel Speed and Delay

A review of travel speeds on Route 70/70A, completed by the MBTA for the Better Bus Project, for the entire route in both directions during the AM and PM peak periods indicates *poor* or *very poor* speeds relative to the operating environment in the following locations in Allston:

- *Very poor* speeds inbound in the AM and PM peak periods along Soldiers Field Road and at the River Street Bridge crossing from Allston into Cambridge
- *Poor* speeds outbound on Western Avenue approaching North Harvard Street in the PM peak period

In addition to the locations in Allston, peak period delays were also identified near Central Square in Waltham, in Watertown Square, at the crossing from Watertown into Boston along Arsenal Street, and on River Street approaching Central Square in Cambridge.

3.5.5 Bus Stop Conditions and Accessibility

The MBTA's PATI review of bus stop accessibility identified the stop at North Harvard at Western Avenue as of *high* concern, as it has multiple barrier issues. There are seven other stops that were rated as of *medium* concern, while one

was rated as of *low* concern. A summary of PATI scores for each Route 70/70A stop in Allston can be found in Table A5 in the appendix.

3.5.6 Passenger Characteristics

The survey results for Route 70/70A from the MBTA's systemwide passenger survey revealed the following:

- 79 percent of passengers reported home-based-work trips, and four percent reported home-based-school trips;
- 72 percent of passengers made their reported trips using the route five days or more per week, and 71 percent of riders utilized a monthly pass for fare payment;
- 44 percent of passengers did not have access to a personal vehicle, and 28 percent did not have a driver's license;
- 36 percent of riders were classified as low-income, 35 percent were classified as minority, and 50 percent were under age 35; and
- 60 percent of riders reported that they will sometimes use an alternative mode instead of Routes 70 or 70A: 42 percent of those riders will utilize a different MBTA service, 17 percent will walk, and 21 percent will use a rideshare service or taxi.

3.6 ROUTE 86 SULLIVAN SQUARE STATION—RESERVOIR STATION (CLEVELAND CIRCLE)

Route 86 operates between Sullivan Square Station in Charlestown and Reservoir Station in Brookline via Somerville, Cambridge, Allston, and Brighton. The route operates along Western Avenue and North Harvard Street in Allston. The span of service is weekdays from 5:00 AM to 1:15 AM; Saturdays from 5:00 AM to 1:03 AM; and Sundays from 7:30 AM to 10:11 PM. Service operates every 10 to 11 minutes in the AM peak period; every 20 to 40 minutes midday during weekdays; every 12 to 19 minutes during the PM peak period; every 35 minutes during weekday evenings; every 27 minutes midday during Saturdays; and every 35 minutes during most of the day on Sundays.

3.6.1 Ridership

Table 12 shows the ridership on Route 86 during the fall of 2017 by direction and type of day for the whole route and for the stops in Allston. Route 86's ridership ranked as the 16th highest for weekdays, the 18th highest for Saturdays, and the 19th highest for Sundays of all 175 MBTA bus routes in fall 2017. The ridership on Route 86 was greater than the ridership of five existing key bus routes for weekdays and greater than three existing key bus routes for Saturdays and Sundays. Detailed ridership for Route 86 stops in Allston can be found in Table A6 in Appendix A.

Table 12
Route 86 Ridership, Fall 2017

Direction	Day	Total Passengers	Allston Ons	Percent of Total	Allston Offs	Percent of Total
Inbound	Weekday	3,040	152	5%	250	8%
Inbound	Saturday	1,455	70	5%	120	8%
Inbound	Sunday	890	50	6%	70	8%
Outbound	Weekday	3,100	366	12%	126	4%
Outbound	Saturday	1,585	150	9%	60	4%
Outbound	Sunday	950	80	9%	40	4%
Total	**Weekday**	**6,140**	**518**	**8%**	**376**	**6%**
Total	**Saturday**	**3.040**	**220**	**7%**	**180**	**6%**
Total	**Sunday**	**1,840**	**130**	**7%**	**110**	**6%**

Source: Automated passenger counter data.

3.6.2 Passenger Comfort and Crowding

During the fall of 2017, 93.5 percent of weekday passenger minutes on Route 86 were in comfortable conditions. This comfort metric is above the minimum standard set in the MBTA's Service Delivery Policy of 92 percent for bus routes.

APC data from the fall of 2017 showed weekday inbound trips with average crowding above 140 percent of seating capacity departing Sullivan Square at 5:42 PM inbound and departing Reservoir at 7:09 AM, 7:22 AM, 7:44 AM, 8:04 AM, 8:15 AM, and 8:28 AM outbound. Data from 2016 indicates that one percent of weekday Route 86 trips were routinely dropped.

3.6.3 Reliability

Weekday reliability for Route 86 in fall 2017 was 61 percent. Therefore, the route fails the reliability standard set in the MBTA's Service Delivery Policy that requires buses on non-key bus routes to arrive on time at 75 percent of time-point stops.

Running-time data from the fall of 2017 indicates that inbound departures at 7:06 AM, 7:26 AM, 9:22 AM, 12:15 PM, 1:28 PM, 3:20 PM, 4:13 PM, 4:32 PM, 5:23 PM, 5:42 PM, 6:00 PM, 6:18 PM, 8:04 PM, and 8:32 PM left five or more minutes late on average. Outbound departures at 8:04 AM, 8:28 AM, 8:45 AM, and 7:00 PM left five or more minutes late on average. The scheduled running times for Route 86 were updated in winter 2018 and will be reviewed for future schedules.

3.6.4 Travel Speed and Delay

A review of travel speeds completed by the MBTA for the Better Bus Project indicates that speeds for Route 86 buses traveling inbound and outbound over the Anderson Memorial Bridge, between Cambridge and Allston, during the AM peak periods were *poor* or *very poor* relative to the operating environment.

In addition to this location in Allston, Route 86 buses were delayed on the approach to Sullivan Square Station, at Union Square in Somerville, and on multiple locations in Harvard Square. A major construction project underway at Sullivan Square Station will eventually create a more direct path for Route 86 buses to access the station busway to Cambridge Street. This improvement is expected to reduce some of the delay the buses encounter in that segment of the route.

3.6.5 Bus Stop Conditions and Accessibility

There are seven Route 86 stops in Allston which were rated as of *medium* concern in the MBTA's PATI review of bus stop accessibility and one stop that was rated as of *low* concern. A summary of PATI scores for each Route 86 stop in Allston can be found in Table A6 in the appendix.

3.6.6 Passenger Characteristics

The survey results for Route 86 from the MBTA's systemwide passenger survey revealed the following:

- 74 percent of passengers reported home-based-work trips, and five percent reported home-based-school trips;
- 63 percent of passengers made their reported trips using the route five days or more per week, and 72 percent of riders utilized a monthly pass for fare payment;
- 47 percent of passengers did not have access to a personal vehicle, and 26 percent did not have a driver's license;
- 36 percent of riders were classified as low-income, 26 percent were classified as minority, and 68 percent were under age 35; and
- 65 percent of riders reported that they will sometimes use an alternative mode instead of Route 86: 63 percent of those riders will utilize a different MBTA service, 21 percent will walk, and 22 percent will use a rideshare service or taxi.

3.7 ROUTE 501 BRIGHTON CENTER—DOWNTOWN BOSTON

Route 501 is an express bus route operating between Brighton Center and downtown Boston via the Massachusetts Turnpike. Route 501 operates weekdays only and primarily provides service to Brighton and Newton. Allston is

only served by trips operating outbound from downtown Boston in the AM peak period and by most trips operating inbound to downtown Boston after 2:00 PM. Service in Allston is provided along Cambridge Street outbound in the AM peak period and inbound in the PM peak period. Service in both directions operates every eight minutes in the morning and every nine to 20 minutes in the afternoon. The span of service is 6:34 AM to 9:24 AM outbound and 3:38 PM to 6:10 PM inbound.

3.7.1 Ridership

According to APC data, total weekday ridership for Route 501 in the fall of 2017 amounted to 862 inbound boardings and 795 outbound boardings. Activity in Allston included 41 inbound boardings during the PM base period (1:30 PM to 3:59 PM) and peak period (five percent of total inbound boardings) and 163 outbound alightings in the AM peak period (20 percent of total outbound alightings). Route 501's ridership ranked as the 75th highest for weekdays of all 175 MBTA bus routes in fall 2017.

The most significant location for AM peak activity in Allston was at Cambridge Street at Dustin Street near Brighton High School, where 120 alightings occurred. Detailed ridership data for Route 501 stops in Allston can be found in Table A7 in the appendix.

3.7.2 Passenger Comfort and Crowding

During the fall of 2017, 92.3 percent of passenger minutes on Route 501 were in comfortable conditions. This comfort metric is higher than the minimum standard set in the MBTA's Service Delivery Policy of 92 percent for bus routes.

3.7.3 Reliability

Weekday reliability for Route 501 in fall 2017 was 73 percent. The reliability standard set in the MBTA's Service Delivery Policy requires buses on non-key bus routes to arrive on time at 75 percent of time-point stops.

3.7.4 Travel Speed and Delay

There were no significant delays identified for Route 501 segments in Allston.

3.7.5 Bus Stop Conditions and Accessibility

There are six Route 501 stops in Allston that were rated as of *medium* concern in the PATI review of bus stop accessibility and eight that were rated as of *low* concern. A summary of PATI scores for each Route 501 stop in Allston can be found in Table A7 in the appendix.

3.7.6 Passenger Characteristics

The survey results for Route 501 from the MBTA's systemwide passenger survey revealed the following:

- 89 percent of passengers reported home-based-work trips, and four percent reported home-based-school trips;
- 86 percent of passengers made their reported trips on the route five days or more per week, and 79 percent of riders utilized a monthly pass for fare payment;
- 13 percent of passengers did not have access to a personal vehicle, and 10 percent did not have a driver's license;
- 13 percent of riders were classified as low-income, 21 percent were classified as minority, and 68 percent were under age 35; and
- 55 percent of riders reported that they will sometimes use an alternative mode instead of Route 501: 60 percent of those riders will utilize a different MBTA service, four percent will walk, and 28 percent will use a rideshare service or taxi.

3.8 ROUTE 503 BRIGHTON CENTER—COPLEY

Route 503 is an express bus route operating from Brighton Center to Copley Square via the Massachusetts Turnpike. Route 503 only operates on weekdays and primarily provides service to Brighton and Newton. Allston is only served by trips operating outbound from Copley in the AM peak period and inbound to Copley in the PM peak period. Service in Allston is provided along Cambridge Street outbound in the AM peak period and inbound in the PM peak period. Service in both directions operates every 20 minutes in the morning and every 33 to 37 minutes in the afternoon and evening. The span of service is 7:04 AM to 8:41 AM outbound and 4:55 PM to 6:35 PM inbound.

3.8.1 Ridership

According to APC data, total weekday ridership on Route 503 during the fall of 2017 amounted to 217 inbound boardings and 177 outbound boardings. Activity in Allston included six inbound boardings in the PM peak period (two percent of total inbound boardings) and 31 outbound alightings in the AM peak period (17 percent of total outbound boardings). Route 503's ridership ranked as the 148th highest for weekdays of all 175 MBTA bus routes in the fall of 2017.

The primary location for alightings in the AM peak period is Cambridge Street at Dustin Street near Brighton High School. Detailed ridership data for Route 503 stops in Allston can be found in Table A8 in the appendix.

3.8.2 Passenger Comfort and Crowding

During the fall of 2017, 96.5 percent of passenger minutes on Route 503 were in comfortable conditions. This comfort metric is above the minimum standard set in the MBTA's Service Delivery Policy of 92 percent for bus routes.

3.8.3 Reliability

Weekday reliability for Route 503 in the fall of 2017 was 72 percent. The reliability standard set in the MBTA's Service Delivery Policy requires buses on non-key bus routes to arrive on time at 75 percent of time-point stops.

3.8.4 Travel Speed and Delay

There were no significant delays identified for Route 503 segments in Allston.

3.8.5 Bus Stop Conditions and Accessibility

There are six Route 503 stops in Allston that were rated as of *medium* concern in the MBTA's PATI review of bus stop accessibility and eight that were rated as of *low* concern. A summary of PATI scores for each Route 503 stop in Allston can be found in Table A8 in the appendix.

3.8.6 Passenger Characteristics

The survey results for Route 503 from the MBTA's systemwide passenger survey revealed the following:

- 93 percent of passengers reported home-based-work trips, and three percent reported home-based-school trips;
- 75 percent of passengers made their reported trips on the route five days or more per week, and 82 percent of riders utilized a monthly pass for fare payment;
- 10 percent of passengers did not have access to a personal vehicle, and eight percent did not have a driver's license; and
- 13 percent of riders were classified as low-income, 28 percent were classified as minority, and 76 percent were under age 35.

Surveys of Route 503 riders provided insufficient data to determine alternative modes that riders might utilize.

3.9 ROUTE CT2 SULLIVAN SQUARE STATION—RUGGLES STATION

Route CT2 operates between Sullivan Square Station in Charlestown and Ruggles Station in Roxbury. Route CT2 buses only stop in Allston when traveling in the outbound direction (towards Cambridge); the stop is at the Boston University Bridge. The route operates on weekdays only and the span of service

is from 5:55 AM to 7:36 PM. Service operates every 20 minutes in the AM peak period, every 35 minutes midday during the weekdays, and every 25 minutes in the PM peak period. There is no evening or weekend service.

3.9.1 Ridership

According to APC data, total weekday ridership in the fall of 2017 amounted to 1,131 inbound boardings and 1,128 outbound boardings. Activity in Allston included 66 outbound boardings (six percent of total outbound boardings). Route CT2 only serves a stop in Allston in the outbound direction; the nearest inbound stop is located in Brookline. Route CT2's ridership ranked as the 56th highest for weekdays of all 175 MBTA bus routes in the fall of 2017. Route CT2 operates on weekdays only.

Detailed ridership data for Route CT2 in Allston can be found in Table A9 in the appendix.

3.9.2 Passenger Comfort and Crowding

During the fall of 2017, 96.9 percent of passenger minutes on Route CT2 were in comfortable conditions. This comfort metric is above the minimum standard set in the MBTA's Service Delivery Policy of 92 percent for bus routes.

APC data from the fall of 2017 showed inbound trips with average crowding above 140 percent of seating capacity departing Ruggles Station at 5:00 PM. Data from 2016 indicates that one percent of weekday Route CT2 trips were routinely dropped.

3.9.3 Reliability

During the fall of 2017, Route CT2 was reliable 43 percent of the time. Therefore, the route fails the reliability standard set in the MBTA's Service Delivery Policy that requires buses on non-key bus routes to arrive on time at 75 percent of time-point stops. The MBTA implemented schedule and running time changes for Route CT2 in the fall of 2018 to improve reliability.

3.9.4 Travel Speed and Delay

A review of travel speeds completed by the MBTA for the Better Bus Project indicates that speeds for Route CT2 buses traveling inbound and outbound over the Boston University Bridge were *poor* during the AM and PM peak periods. No other segments of Route CT2 in Allston were identified as having *poor* or *very poor* speeds relative to the operating environment.
In addition to this location in Allston, delays were also identified along the entire route from Sullivan Square Station to Kendall Station, from Massachusetts

Avenue to Cambridge Street in Cambridge, along Brookline Avenue between Park Drive to Longwood Avenue, along Huntington Avenue, and along Longwood Avenue.

3.9.5 Bus Stop Conditions and Accessibility

The one Route CT2 bus stop in Allston was rated as of *medium* concern in the MBTA's PATI review of bus stop accessibility.

3.9.6 Passenger Characteristics

The survey results for Route CT2 from the MBTA's systemwide passenger survey revealed the following:

- 80 percent of passengers reported home-based-work trips, and five percent reported home-based-school trips;
- 64 percent of passengers made their reported trips using the route five days or more per week, and 78 percent of riders utilized a monthly pass for fare payment;
- 41 percent of passengers did not have access to a personal vehicle, and 89 percent did not have a driver's license;
- 21 percent of riders were classified as low-income, 33 percent were classified as minority, and 59 percent were under age 35; and
- 77 percent of riders reported that they will sometimes use an alternative mode instead of Route CT2: 71 percent of those riders will utilize a different MBTA service, 22 percent will walk, and 17 percent will use a rideshare service or taxi.

Chapter 4— Existing Conditions of MBTA Rail and Other Shuttles

Allston is served by Boston Landing Station on the Worcester Line of the commuter rail network and by several stops on the Boston College (B) branch of the Green Line. Several shuttles, not operated by the MBTA, also serve Allston.

4.1 BOSTON LANDING STATION

Boston Landing Station opened on May 22, 2017. Boston Landing is served weekdays by 20 eastbound trains traveling to Boston and 18 westbound trains terminating at either Framingham and Worcester, as well as nine eastbound and nine westbound trains operating between Boston and Worcester on Saturday and Sunday. Boston Landing is located in fare zone 1A; the fare to Boston costs $2.25 one-way, which is the same fare as the rapid transit system, and a monthly pass costs $84.50.

Eastbound trains serving Boston Landing during the AM peak period (six trains between 6:42 AM and 9:23 AM) originate at Framingham. Passengers traveling from locations west of Framingham on the Worcester Line must transfer at Framingham Station to board an eastbound train that will stop at Boston Landing. During the PM peak period, the three westbound trains that arrive at Boston Landing between 4:46 PM and 6:06 PM only travel as far west as Framingham. Passengers traveling to points farther west on the Worcester Line must transfer at Framingham Station to Worcester-bound trains that travel express from Yawkey Station in Boston.

Four westbound trains that depart Boston Landing in the AM peak period between 7:03 AM and 9:06 AM do not make any stops until Wellesley Farms, as the present track and station layout in Newton does not allow for “reverse peak” trains to service the Newton stops. The same is true for eastbound trains that arrive at Boston Landing between 3:07 PM and 7:09 PM, as these trains make no stops between Wellesley Farms and Boston Landing. It is not possible for commuters who desire to travel from Allston to Newton in the AM peak period and return in the PM peak period to make use of the Worcester commuter rail line.

MassDOT collected ridership data and surveyed passengers at Boston Landing on April 24, 2018. There were 1,153 passengers observed utilizing the station—594 boardings and 559 alightings. Passenger access to the station was found to be equally split between the two entrances at Everett Street and Gust Street. The most significant pattern observed was associated with riders boarding inbound

trains to Boston in the AM peak period and alighting from outbound trains from Boston in the PM peak period. Passenger surveys indicated that 80 percent of riders utilized the station three or more days per week and 80 percent walked to the station. More than 56 percent of riders reported having previously used another mode of public transit (principally bus and subway) prior to the opening of the station.

Of the 594 boarding passengers, 472 boarded inbound trains. Of these 472 passengers, 350 boarded the five AM peak trains that departed from Boston Landing between 6:42 AM and 8:39 AM; 122 of these passengers boarded the train with the 8:28 AM inbound departure. During the PM peak period, 310 passengers alighted the five trains that arrived between 4:46 PM and 7:01 PM.

Passenger equipment utilized on Worcester Line trains is a mixture of bi-level coaches built between 1991 and 2014 with seating capacity for 173 to 185 passengers, and single-level coaches built between 1979 and 1990 with seating capacity for 94 to 127 passengers. The MBTA's Capital Investment Program has programmed funding for the purchase of 181 new bi-level coaches to replace the 222 single-level coaches in the active commuter rail fleet. Although the total number of new vehicles will be less than the total number of coaches being replaced, the total number of seats available will increase.

4.2 GREEN LINE BOSTON COLLEGE (B) BRANCH

There are 11 stops on the B branch of the Green Line located in or directly adjacent to Allston: Warren Street, Allston Street, Griggs Street, Harvard Avenue, Packard's Corner, Babcock Street, Pleasant Street, Saint Paul Street, Boston University West, Boston University Central, and Boston University East. Only the stops at Harvard Avenue, Boston University Central, and Boston University East are accessible to passengers utilizing wheeled mobility devices. There are plans to consolidate the stops at Babcock Street, Pleasant Street, Saint Paul Street, and Boston University West into two accessible stops. These stops will be built in conjunction with MassDOT's Commonwealth Avenue Phase 2A project. Work is expected to begin in 2019 and be completed in 2021.

Green Line B branch service operates every 5.5 minutes during the weekday AM and PM peak period, every 7.5 minutes during midday on weekdays, every eight minutes weekday evenings, every 7.5 minutes during most of the day on Saturdays, and every 8.5 minutes during most of the day on Sundays. B branch service operates as far east as Park Street.

The present Green Line fleet consists of 103 Type 7 cars built between 1986 and 1997 and 94 Type 8 cars built between 1999 and 2007. There are 24 new Type 9

cars on order for delivery in 2018 and 2019. These cars will provide enough equipment to accommodate the Green Line Extension to Somerville and they will be utilized on all Green Line branches, including the B branch. The MBTA has initiated the design process for a new Type 10 car that will eventually replace the Type 7 and Type 8 fleets. The Type 10 is envisioned as a larger size vehicle than the vehicles in the current fleet. These larger vehicles will increase in Green Line's capacity when they are put into service after 2030.

The MBTA is working to improve transit signal priority along the B branch, as part of the larger Green Line Transformation Program and the MBTA is reviewing where and how to implement these improvements.

Table 13 shows the number of weekday boardings at the 11 Green Line stops in Allston.

Table 13
Green Line B Branch Boardings in Allston

Station	Inbound	Outbound
Warren Street	1,864	183
Allston Street	1,232	205
Griggs Street	1,023	180
Harvard Avenue	2,739	863
Packard's Corner	2,117	537
Babcock Street	1,133	254
Pleasant Street	960	207
Saint Paul Street	990	306
Boston University West	595	199
Boston University Central	939	1,255
Boston University East	683	1,064

Source: 2010 Central Transportation Planning Staff counts.

The MBTA systemwide passenger survey results for Green Line B branch stops in Allston show the following (with some variation by stop):

- 62 to 72 percent of passengers reported home-based-work trips and six to nine percent reported home-based-school trips;
- 55 to 61 percent of passengers made their reported trips using the route five days or more per week, and 69 to 77 percent of riders utilized a monthly pass for fare payment;
- 39 to 63 percent of passengers did not have access to a personal vehicle, and 10 to 21 percent did not have a driver's license;
- 26 to 35 percent of riders were classified as low-income, 19 to 35 percent were classified as minority, and 53 to 84 percent were under age 35; and
- 46 to 60 percent of riders reported that they will sometimes use an alternative mode instead of the Green Line B branch: 35 to 43 percent of

those riders will utilize a different MBTA service, 25 to 36 percent will walk, and 24 to 38 percent will use a rideshare service or taxi.

4.3 OTHER BUS SHUTTLES

The Harvard University shuttle system provides the most coverage of any of the shuttles serving Allston that are not operated by the MBTA. Connections are provided from the main Harvard campus in Cambridge to the Harvard Business School campus in Allston. There are two separate routes: the Allston Campus Express and Barry's Corner. Data provided by Harvard University indicates that the Allston Campus Express shuttle carries 400 to 490 passengers per average weekday (depending on the day of the week) while the Barry's Corner shuttle carries an average of 32 to 41 riders per day. These services are exclusively for the use of Harvard students, faculty, and staff with the exception that Allston residents may utilize the shuttles.

The Medical Academic and Scientific Community Organization (MASCO) operates some trips on its Route M2 Cambridge-HMS shuttle via Coolidge Corner in Brookline in the evening. These shuttles travel through Allston but do not have scheduled stops in Allston.

Boston University operates a shuttle connecting the university's Student Village with other parts of the campus along Commonwealth Avenue as well as Kenmore Square, Huntington Avenue, and the Boston University Medical Center in Boston's South End. While the shuttle serves the portion of Boston University's campus in Allston, it does not provide access to residential areas in Allston.

The management company that operates Boston Landing runs a shuttle for the employees of tenants, which connects the development to Harvard Square in Cambridge and Kenmore Square in Boston. The service has a limited schedule of two peak-period trips to and from Kenmore Square and two peak-period trips to and from Harvard Square.

The Arsenal on the Charles complex in Watertown, which includes the offices of Athena Health, operates a peak-period shuttle that provides service to and from Boston Landing Station for employees who work at the complex.

Chapter 5—Recommendations

5.1 RECOMMENDATIONS FOR MBTA BUS SERVICE

5.1.1 Ongoing Bus Initiatives

All bus-related recommendations from this study were developed in coordination with the Better Bus Project and the Bus Network Redesign process and will be used as inputs into these ongoing initiatives. Both initiatives are described in detail below.

The Better Bus Project and the Bus Network Redesign process. The Better Bus Project was launched in early 2018 to identify and implement routing and service improvements to meet service delivery standards that were developed based on the existing bus network. The Better Bus Project will recommend a range of budget neutral short- to mid-term service delivery improvements, as well as multiple investment strategies to improve the frequency and reliability of the MBTA's system. Service delivery improvements will also include municipal partnerships to improve speed and reliability. Customers should expect to see service changes and improvements, related to the Better Bus Project, between now and 2020.

The Bus Network Redesign, which launched in late 2018, will go beyond the Better Bus Project's route level analysis and recommendations and focus on network level improvements. The Network Redesign will take a holistic look at the entire bus network and develop recommendations for a new network that will better serve the region's changing travel needs—focusing on routes, frequency, span of service, and service coverage.

5.1.2 Transit Priority Improvement Opportunities

As part of the *Focus40* project, CTPS conducted the *Prioritization of Dedicated Bus Lanes* study, which prioritized segments of Greater Boston roadways where the installation of dedicated bus lanes could reduce travel times for buses that currently experience delays. The study identified Brighton Avenue between Cambridge Street (Union Square) and Harvard Avenue in Allston as a roadway segment that could benefit from implementation of a bus lane for use by Routes 57/57A and 66. As part of this study, MassDOT and the MBTA are now collaborating with the City of Boston to pilot a bus lane on Brighton Avenue between Cambridge Street and Harvard Avenue during AM peak period hours in the spring of 2019 in order to improve the speed and reliability of bus Routes 57 and 66.

In addition to Brighton Avenue, the Better Bus Project's review of bus travel times showed that the most significant delays in bus service in Allston are at the river

crossings between Allston and Cambridge; buses on Routes 66 and 86 are delayed crossing the Anderson Memorial Bridge, while buses on Routes 64 and 70/70A are delayed crossing the Western Avenue Bridge westbound and, even more significantly, the River Street Bridge eastbound. When design work begins on the Western Avenue span, consideration should be given to creating a contraflow lane on the rebuilt Western Avenue Bridge for use by Route 70/70A buses traveling eastbound. As the rebuilding of the bridge is a long-term capital project, MassDOT is actively working with the MBTA, the Department of Conservation and Recreation, and the Highway District 6 Office to design and implement a bus lane and transit signal priority on Soldiers Field Road in spring 2019 to improve speed and reliability on Route 70 (which will also help Route 64). This effort will be evaluated for bus speed and reliability improvements.

5.1.3 Service Planning Improvements

Routes 70 and 70A presently carry higher total passenger loads than some of the existing key routes in the MBTA bus network. Upgrading the trunk section of the routes (from Central Square to University Park in Waltham to Cambridge) to key bus route standards should be considered, based on the already existing high demand. Key bus route standards require a service span of 6:00 AM to midnight Monday through Saturday and 7:00 AM to midnight on Sunday. Service must operate every 10 minutes in the AM and PM peak periods; every 15 minutes during the early morning, midday, and Saturdays; and every 20 minutes during evenings and on Sundays.

To achieve key route standards, service would primarily need to be added during the off-peak period. Improving coordination of inbound buses on Routes 70 and 70A during the AM peak period would also be necessary to attain frequencies required on key routes. To bring Route 70/70A up to key route standards in the common trunk segment between Central Square, Waltham and Central Square, Cambridge, it will be necessary to add 12 hours of service each weekday, 38 hours on Saturday, and 20 hours on Sunday. All additional service is required to improve frequency, as the span of service already meets key bus route standards.

Route 86 presently caries higher total passenger loads than some of the existing key routes in the MBTA bus network. Based on the existing high demand, consideration should be given to upgrading the route to key route status. To meet key route standards, service would need to be added as follows to improve frequency and span of service: 50 hours of service each weekday, 72 hours of service Saturday, and 60 hours of service Sunday.

The review of Route 57 data indicated that at least one inbound trip during the AM peak period has loads greater than 140 percent of seating capacity before reaching Packard’s Corner. Adding a short-turn trip between Brighton Center and Kenmore Square during the 30 minutes of the morning with heaviest maximum passenger loads could reduce this crowding. In the MBTA’s fall 2018 schedule,

there is a bus that ends its revenue work on Route 19 at Avenue Louis Pasteur at 7:17 AM before returning out of service to Cabot Garage. This bus could instead deadhead to Brighton Center and operate an extra trip on Route 57A, leaving Brighton Center at 8:00 AM. This trip would provide crowding relief to the 7:46 AM Route 57 trip from Watertown. This change would require an additional hour of bus service compared to the existing schedule, but it would not require adding an additional vehicle.

Recent service changes on Route 47 have increased capacity during peak periods. These changes should be monitored to determine if additional peak service is required to reduce overcrowding.

The MBTA will be implementing new running times and schedules for Route 66 in winter 2019. Once in place, bus operating times should be monitored to determine if a significant improvement in reliability follows.

Route CT2 is extremely unreliable. Changes to the running time became effective when the fall 2018 quarterly schedule went into effect. The new running times should be monitored to determine if additional changes are required to improve reliability.

As described in Chapter 3, one to three percent of all weekday trips on MBTA bus Routes 47, 57/57A, 66, 70, and 86 were dropped in 2016, primarily because there were not enough bus operators available. These trips represent a small percentage of the total daily trips operated. However, dropped trips usually occur during peak periods when it can be most difficult for the MBTA to field enough bus operators to fully cover the scheduled service; as a result, these dropped trips can affect more riders than trips that are dropped during off-peak periods. One bus eliminated during a peak period on a route served by several vehicles can represent five percent or more of the total peak-period trips scheduled on a route. Dropped trips, particularly during peak periods, contribute to crowding and delays. The MBTA should continue its ongoing effort to reduce the number of dropped bus trips.

5.1.4 Additional Recommendations to Consider

Additional real-time bus location and wait time data at high-volume bus and rail stops would aid passengers and improve the overall riding experience.
The MBTA is also testing E Ink solar-powered electronic real-time arrival signs that could be deployed at Allston's bus stops and surface Green Line stations. Currently being piloted at some stations on the Green Line D branch, the E Ink signage is being tested for a number of factors that include weather resistance. If proven to be durable during extreme weather conditions this winter season, these signs will be deployed at Allston's Green Line stations and experimentally at certain Allston bus stops.

Bus stop improvements identified by the MBTA's PATI review should be implemented. There may be opportunities to work with the City of Boston and private developers to provide the capital necessary to implement recommended upgrades. Stops rated in the PATI review as of *medium* concern and that have 400 or more combined boardings and alightings per day, should be prioritized for improvements:

- Brighton Avenue opposite Quint Avenue
- Brighton Avenue at Cambridge Street
- Harvard Avenue at Commonwealth Avenue (inbound)
- Brighton Avenue at Harvard Avenue
- Cambridge Street opposite Hano Street
- Cambridge Street at Dustin Street
- Brighton Avenue at Allston Street
- North Harvard Street at Western Avenue
- Brighton Avenue at Commonwealth Avenue
- Brighton Avenue at Linden Street

5.2 RECOMMENDATIONS FOR MBTA RAIL AND OTHER SHUTTLE SERVICES

The MBTA's long-term capital reviews of both commuter rail and Green Line operations will affect future transit service in Allston. Capital efforts identified in *Focus40*, including the procurement of additional bi-level coaches for the commuter rail network and larger Type 10 vehicles for the Green Line under the Green Line Transformation Program, will increase capacity on the rail system. The planned reconstruction of the Green Line B branch stations between Babcock Street and Boston University West will provide accessibility along this roadway segment.

The MBTA's ongoing Rail Vision study will identify cost-effective strategies to transform the MBTA's existing commuter rail system to better support improved mobility and economic competitiveness in the Boston region, including in Allston.

In the shorter term, the MBTA is working to improve transit signal priority along the Green Line B branch as part of the larger Green Line Transformation Program and is reviewing where and how to implement these improvements.

Since Harvard University's Allston shuttle service overlaps with the most crowded segments on Routes 66 and 86, the MBTA should explore strategies for increasing awareness among Allston residents that they are permitted to use those Harvard services at no cost.

Appendix A—Ridership and PATI Scores by Bus Stop

Table A1
Route 47 PATI Scores and Weekday Boardings and Alightings in Allston

Stop ID and Stop Name	Direction	Passengers On	Passengers Off	Total Activity	PATI Rank
1810 - COMMONWEALTH AVE @ UNIVERSITY	Outbound	94	51	**145**	**Medium**
Total		**94**	**51**	**145**	

APC = automated passenger counter. PATI = Plan for Accessible Transit Infrastructure.
Source: APC data and PATI Report.

Table A2
Route 57/57A PATI Scores and Weekday Boardings and Alightings in Allston

Stop ID and Stop Name	Direction	Passengers Ons	Passengers Offs	Total Activity	PATI Rank
953 - COMMONWEALTH AVE @ ST MARYS S	Outbound	289	18	**307**	**Low**
954 - COMMONWEALTH AVE @ UNIVERSITY	Outbound	200	17	**217**	**Compliant**
956 - COMMONWEALTH AVE @ BUICK ST	Outbound	189	134	**323**	**Low**
958 - COMMONWEALTH AVE @ BABCOCK ST	Outbound	121	141	**262**	**Medium**
959 - 1079 COMMONWEALTH AVE	Outbound	128	155	**283**	**Medium**
960 – 19 BRIGHTON AVE	Outbound	97	78	**175**	**High**
962 - BRIGHTON AVE @ LINDEN ST	Outbound	82	320	**404**	**Medium**
964 - BRIGHTON AVE OPP QUINT AVE	Outbound	466	333	**799**	**Medium**
966 - CAMBRIDGE ST @ N BEACON ST	Outbound	252	362	**614**	**Low**
967 - CAMBRIDGE ST @ SAUNDERS ST	Outbound	50	71	**121**	**Low**
969 - CAMBRIDGE ST @ DUSTIN ST	Outbound	20	274	**294**	**Low**

922 - CAMBRIDGE ST OPP DUSTIN ST	Inbound	254	51	**305**	**Low**
924 - CAMBRIDGE ST @ GORDON ST	Inbound	122	39	**161**	**Low**
925 - CAMBRIDGE ST @ BARROWS ST	Inbound	202	113	**315**	**Medium**
926 - BRIGHTON AVE @ CAMBRIDGE ST	Inbound	232	161	**393**	**Medium**
927 - BRIGHTON AVE @ ALLSTON ST	Inbound	181	108	**289**	**Medium**
928 - BRIGHTON AVE @ HARVARD AVE	Inbound	260	173	**433**	**Medium**
929 - BRIGHTON AVE @ LINDEN ST	Inbound	288	50	**338**	**Medium**
931 - BRIGHTON AVE @ COMM AVE	Inbound	291	115	**406**	**Medium**
933 - COMMONWEALTH AVE @ BABCOCK ST	Inbound	148	82	**230**	**Medium**
934 - COMMONWEALTH AVE @ PLEASANT S	Inbound	83	103	**186**	**Low**
935 - COMMONWEALTH AVE @ ST PAUL ST	Inbound	75	92	**167**	**Low**
937 - COMMONWEALTH AVE @ CARLTON ST	Inbound	19	145	**164**	**Medium**
938 - COMMONWEALTH AVE @ ST MARYS ST	Inbound	40	321	**361**	**Compliant**
Total		**4,089**	**3,456**	**7,545**	

APC = automated passenger counter. PATI = Plan for Accessible Transit Infrastructure.
Source: APC data and PATI Report.

Table A3
Route 64 PATI Scores and Weekday Boardings and Alightings in Allston

Stop ID and Stop Name	Direction	Passengers Ons	Passengers Offs	Total Activity	PATI Rank
1189 - CAMBRIDGE ST @ MASS PIKE	Outbound	2	8	**10**	**Medium**
1190 - CAMBRIDGE ST @ SEATTLE ST	Outbound	3	8	**11**	**Low**
1191 - CAMBRIDGE ST @ LINCOLN ST	Outbound	14	16	**30**	**Low**
1193 - CAMBRIDGE ST @ FRANKLIN ST	Outbound	10	60	**70**	**Medium**
1195 - CAMBRIDGE ST @ EMERY RD	Outbound	35	46	**81**	**Low**
1196 - N BEACON ST @ CAMBRIDGE ST	Outbound	52	44	**96**	**Medium**
1110 - N BEACON ST @ CAMBRIDGE ST	Inbound	48	68	**116**	**Medium**
1111 - CAMBRIDGE ST OPP HANO ST	Inbound	93	37	**130**	**Medium**
1112 - CAMBRIDGE ST @ HARVARD AVE	Inbound	42	10	**52**	**Medium**
1113 - CAMBRIDGE ST @ LINDEN ST	Inbound	63	4	**67**	**Medium**
1114 - CAMBRIDGE ST @ N HARVARD ST	Inbound	28	7	**35**	**Low**
1115 - CAMBRIDGE ST @ SEATTLE ST	Inbound	11	3	**14**	**Medium**
1116 - CAMBRIDGE ST @ MASS PIKE EXIT	Inbound	2	2	**4.8**	**Medium**
Total		**403**	**313**	**716**	

APC = automated passenger counter. PATI = Plan for Accessible Transit Infrastructure.
Source: APC data and PATI Report.

Table A4
Route 66 PATI Scores and Weekday Boardings and Alightings in Allston

Stop ID and Stop Name	Direction	Passengers Ons	Passengers Offs	Total Activity	PATI Rank
1378 - HARVARD AVE @ COMMONWEALTH AV	Outbound	302	462	**764**	**Low**
1379 - HARVARD AVE @ BRIGHTON AVE	Outbound	96	208	**304**	**Low**
964 - BRIGHTON AVE OPP QUINT AVE	Outbound	213	359	**572**	**Medium**
1111 - CAMBRIDGE ST OPP HANO ST	Outbound	224	313	**537**	**Medium**
1112 - CAMBRIDGE ST @ HARVARD AVE	Outbound	77	29	**106**	**Medium**
1113 - CAMBRIDGE ST @ LINDEN ST	Outbound	129	28	**157**	**Medium**
2558 - N HARVARD ST @ EMPIRE ST	Outbound	112	121	**233**	**Medium**
2559 - N HARVARD ST @ OXFORD ST	Outbound	80	61	**141**	**Medium**
2560 - N HARVARD ST @ KINGSLEY ST	Outbound	58	148	**206**	**Medium**
2561 - N HARVARD ST @ WESTERN AVE	Outbound	111	180	**291**	**Medium**
2564 - N HARVARD ST OPP HARVARD STAD	Outbound	31	57	**88**	**Low**
966 - CAMBRIDGE ST @ N BEACON ST	Outbound (supplemental trips)	22	69	**91**	**Low**
967 - CAMBRIDGE ST @ SAUNDERS ST	Outbound (supplemental trips)	0	1	**1**	**Low**
969 - CAMBRIDGE ST @ DUSTIN ST	Outbound (supplemental trips)	0	154	**154**	**Low**
2551 - N HARVARD ST @ GATE 2 HARVARD	Inbound	62	16	**78**	**Medium**
2553 - N HARVARD ST @ WESTERN AVE	Inbound	121	118	**239**	**Medium**
2554 - N HARVARD ST @ FRANKLIN ST	Inbound	214	87	**301**	**Medium**

2555 - N HARVARD ST @ COOLIDGE RD	Inbound	68	69	**137**	**Medium**
2556 - N HARVARD ST @ HOOKER ST	Inbound	83	92	**175**	**Low**
1191 - CAMBRIDGE ST @ LINCOLN ST	Inbound	74	14	**88**	**Low**
1193 - CAMBRIDGE ST @ FRANKLIN ST	Inbound	60	185	**245**	**Medium**
1195 - CAMBRIDGE ST @ EMERY RD	Inbound	120	155	**275**	**Low**
926 - BRIGHTON AVE @ CAMBRIDGE ST	Inbound	396	145	**541**	**Medium**
927 - BRIGHTON AVE @ ALLSTON ST	Inbound	183	117	**300**	**Medium**
928 - BRIGHTON AVE @ HARVARD AVE	Inbound	251	119	**370**	**Medium**
1302 - HARVARD AVE @ COMMONWEALTH AV	Inbound	518	312	**830**	**Medium**
922 - CAMBRIDGE ST OPP DUSTIN ST	Inbound (supplemental trips)	12	**0**	**12**	**Low**
Total		**3,617**	**3,619**	**7,236**	

APC = automated passenger counter. PATI = Plan for Accessible Transit Infrastructure.
Source: APC data and PATI Report.

Table A5
Routes 70 and 70A PATI Scores and Weekday Boardings and Alightings in Allston

Stop ID and Stop Name	Direction	Passengers Ons	Passengers Offs	Total Activity	PATI Rank
1067 - WESTERN AVE OPP GENZYME	Outbound	14	47	**61**	**Medium**
1068 - 125 WESTERN AVE	Outbound	11	23	**34**	**Low**
1070 - WESTERN AVE @ N HARVARD ST	Outbound	163	63	**226**	**High**
1071 - WESTERN AVE OPP RIVERDALE ST	Outbound	36	33	**69**	**Medium**
1072 - WESTERN AVE @ EVERETT ST	Outbound	58	81	**139**	**Medium**
1049 - WESTERN AVE @ EVERETT ST	Inbound	89	59	**148**	**Medium**

1589 - WESTERN AVE @ RIVERDALE ST	Inbound	51	89	**140**	**Medium**
1051 - WESTERN AVE @ TRAVIS ST	Inbound	44	59	**103**	**Medium**
1052 - 130 WESTERN AVE	Inbound	18	8	**26**	**Medium**
1053 - WESTERN AVE @ GENZYME	Inbound	21	12	**33**	**Low**
Total		**505**	**474**	**979**	

APC = automated passenger counter. PATI = Plan for Accessible Transit Infrastructure.
Source: APC data and PATI Report.

Table A6
Route 86 PATI Scores and Weekday Boardings and Alightings in Allston

Stop ID and Stop Name	Direction	Passengers Ons	Passengers Offs	Total Activity	PATI Rank
1049 - WESTERN AVE @ EVERETT ST	Outbound	125	48	**173**	**Medium**
1589 - WESTERN AVE @ RIVERDALE ST	Outbound	73	30	**103**	**Medium**
2561 - N HARVARD ST @ WESTERN AVE	Outbound	120	27	**147**	**Medium**
2564 - N HARVARD ST OPP HARVARD STAD	Outbound	48	21	**69**	**Low**
2551 - N HARVARD ST @ GATE 2 HARVARD	Inbound	30	32	**62**	**Medium**
2553 - N HARVARD ST @ WESTERN AVE	Inbound	45	89	**134**	**Medium**
1071 - WESTERN AVE OPP RIVERDALE ST	Inbound	30	38	**67.7**	**Medium**
1072 - WESTERN AVE @ EVERETT ST	Inbound	47	91	**138**	**Medium**
Total		**518**	**376**	**894**	

APC = automated passenger counter. PATI = Plan for Accessible Transit Infrastructure.
Source: APC data and PATI Report.

Table A7
Route 501 PATI Scores and Weekday Boardings and Alightings in Allston

Stop ID and Stop Name	Direction	Passengers Ons	Passengers Offs	Total Activity	PATI Rank
1190 - CAMBRIDGE ST @ SEATTLE ST	Outbound	0	1	**1**	**Low**
1191 - CAMBRIDGE ST @ LINCOLN ST	Outbound	2	1	**3**	**Low**
1193 - CAMBRIDGE ST @ FRANKLIN ST	Outbound	0	3	**3**	**Medium**
1195 - CAMBRIDGE ST @ EMERY RD	Outbound	0	4	**4**	**Low**
966 - CAMBRIDGE ST @ N BEACON ST	Outbound	19	11	**30**	**Low**
967 - CAMBRIDGE ST @ SAUNDERS ST	Outbound	2	25	**27**	**Low**
969 - CAMBRIDGE ST @ DUSTIN ST	Outbound	0	120	**120**	**Low**
922 - CAMBRIDGE ST OPP DUSTIN ST	Inbound	20	0	**20**	**Low**
924 - CAMBRIDGE ST @ GORDON ST	Inbound	10	0	**10**	**Low**
925 - CAMBRIDGE ST @ BARROWS ST	Inbound	2	2	**4**	**Medium**
1111 - CAMBRIDGE ST OPP HANO ST	Inbound	4	2	**6**	**Medium**
1112 - CAMBRIDGE ST @ HARVARD AVE	Inbound	2	0	**2**	**Medium**
1113 - CAMBRIDGE ST @ LINDEN ST	Inbound	2	0	**0**	**Medium**
1114 - CAMBRIDGE ST @ N HARVARD ST	Inbound	1	0	**1**	**Medium**
Total		**64**	**167**	**231**	

APC = automated passenger counter. PATI = Plan for Accessible Transit Infrastructure.
Source: APC data and PATI Report.

Table A8
Route 503 PATI Scores and Weekday Boardings and Alightings in Allston

Stop ID and Stop Name	Direction	Passengers Ons	Passengers Offs	Total Activity	PATI Rank
1190 - CAMBRIDGE ST @ SEATTLE ST	Outbound	0	2	**2**	**Low**
1191 - CAMBRIDGE ST @ LINCOLN ST	Outbound	1	0	**1**	**Low**
1193 - CAMBRIDGE ST @ FRANKLIN ST	Outbound	0	0	**0**	**Medium**
1195 - CAMBRIDGE ST @ EMERY RD	Outbound	0	0	**0**	**Low**
966 - CAMBRIDGE ST @ N BEACON ST	Outbound	4	5	**9**	**Low**
967 - CAMBRIDGE ST @ SAUNDERS ST	Outbound	0	2	**2**	**Low**
969 - CAMBRIDGE ST @ DUSTIN ST	Outbound	0	25	**25**	**Low**
922 - CAMBRIDGE ST OPP DUSTIN ST	Inbound	3	0	**3**	**Low**
924 - CAMBRIDGE ST @ GORDON ST	Inbound	2	0	**2**	**Low**
925 - CAMBRIDGE ST @ BARROWS ST	Inbound	0	0	**0**	**Medium**
1111 - CAMBRIDGE ST OPP HANO ST	Inbound	0	0	**0**	**Medium**
1112 - CAMBRIDGE ST @ HARVARD AVE	Inbound	0	0	**0**	**Medium**
1113 - CAMBRIDGE ST @ LINDEN ST	Inbound	0	0	**0**	**Medium**
1114 - CAMBRIDGE ST @ N HARVARD ST	Inbound	1	0	**1**	**Low**
Total		**11**	**34**	**45**	

APC = automated passenger counter. PATI = Plan for Accessible Transit Infrastructure.
Source: APC data and PATI Report.

Table A9
Route CT2 PATI Scores and Weekday Boardings and Alightings in Allston

Stop ID and Stop Name	Direction	Passengers Ons	Passengers Offs	Total Activity	PATI Rank
1810 - COMMONWEALTH AVE @ UNIVERSITY	Outbound	66	21	**87**	**Medium**
Total		**66**	**21**	**87**	

APC = automated passenger counter. PATI = Plan for Accessible Transit Infrastructure.
Source: APC data and PATI Report.