

Bus Rapid Transit: Costs and Benefits of a Transit Alternative

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Pioneer would like to acknowledge the contributions of Ana Rijal



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Introduction

Prior to the arrival of the pandemic in March 2020, Boston drivers experienced the worst rush-hour traffic congestion in the country. According to the 2018 Global Traffic Scorecard by INRIX,¹ Boston was the only city in the United States to make the list of the top 10 worst cities in the world for congestion, along with Moscow, Istanbul, and Bogota at the top of the list. INRIX produced these rankings after analyzing over five million miles of road data across the world. The methodology had a particular focus on the difference in average commute time during normal road conditions to traffic during rush-hour. The report² cited an astonishing average of 164 hours in extra commute time during rush-hour traffic for drivers in Boston compared to a much lower average of 97 hours for Americans overall.

While the hours lost sitting in traffic was a huge headache for Boston commuters, it did not capture the full picture of the detrimental effects that traffic congestion was having on the city. In 2018, congestion resulted in an average cost of up to \$2,291 per driver and an overall \$4.1 billion cost to the city. At the time, a MassInc Polling Group survey sponsored by the Barr Foundation found that up to 30 percent of employed voters surveyed “considered changing jobs for a better commute.”³

The COVID-19 pandemic has, of course, significantly altered commuters’ attitudes and the traffic landscape of the Boston metropolitan area. In the 2020 INRIX Global Traffic Scorecard, Boston slipped from the most congested metropolitan area in America to the fourth. Year-over-year daily miles traveled by Boston commuters decreased by 26 percent and hours lost in congestion dropped by 68 percent.⁴ In the second half of 2020, Massachusetts had the third highest rate of remote work in the nation.⁵ Before the pandemic, the loss of productivity due to travel was a major problem for the wider Boston economy. Today, as more of the workforce resumes their commutes, the window of opportunity to mitigate roadway congestion is narrowing. In June, Highway Administrator John Gulliver noted that while some traffic patterns have shifted, traffic as a whole has returned to pre-pandemic levels.^{6, 7}

An often suggested way to alleviate transit stress is bus rapid transit (BRT), a generally cost efficient system of bus travel designed to shorten the time commuters spend on the road. In 2019, the MBTA released their “Focus40” plan which detailed the long-term investments they see as vital to the future health of the T. Among the priorities listed in the Focus40 plan is to “incrementally upgrade bus priority treatments in high demand, high delay corridors to more comprehensive bus rapid transit” as one of their key priorities for improving bus service.⁸ An example of Focus40 in action is the MBTA’s installation of New England’s first center-running bus lane on Columbus Avenue from Franklin Park to Jackson Square.⁹ In the last six years, the MBTA has constructed over 11 miles of new bus lanes.¹⁰ These newly constructed lanes could serve as a foundation for expanded BRT service, beyond the T’s already successful BRT pilots. This paper will explore the facets and functions of BRT, the study of BRT in the MBTA service area, and detail both costs and benefits of expanding BRT.

What is Bus Rapid Transit (BRT)?

Bus Rapid Transit (BRT) is a form of bus-based transit that incorporates unique features such as dedicated bus lanes to provide fast and reliable service. BRT includes many features of transit that are normally associated with subways, such as raised (level) boarding platforms, automated fare collection, fast boarding, bus stations with turnstiles (fare gates), and also priority in traffic to create fast, reliable service. These are elaborated below.

Created by the Institute for Transportation and Development Policy (ITDP), the BRT standard establishes uniform criteria to specifically evaluate the efficiency of bus rapid transit networks across the world. The ITDP is an international organization that works to design and implement transport and urban development systems.¹¹ According to the ITDP standard, there are five features a transit system must incorporate to be classified as a BRT system.

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BRT buses must have:

1. A dedicated right of way in bus-only lanes to provide space required to transport passengers quickly, by avoiding traffic, even during peak hours.
2. These dedicated bus lanes should be in the center of a roadway to cut transport time for passengers by avoiding cars that are parking or making turns.
3. Off-board fare collection should be incorporated to cut down on bus standby or “dwell time” resulting from passengers being required to pay one-by-one inside of the bus once it has arrived.
4. Intersection treatment such as prohibiting traffic from turning into bus lanes reduces delays that may occur.
5. Level boarding that lets passengers enter the bus easily while being inclusive of those with disabilities.

These five essential features all contribute to BRT providing service that is superior to a traditional bus and comparable to light rail. Bus transit systems that include all five features are classified as basic BRT. In the rating system developed by the ITDP, basic BRT is the lowest designation for a BRT system. BRT routes can be classified as a bronze, silver, or gold on top of the basic BRT based on the additional features incorporated. The ITPD website lists the other features that can further improve a BRT system. BRT networks can earn more points on the “scorecard” when they adopt more BRT elements. Examples of these features include communicating the unique branding, characteristics of the physical bus or station, and integration with other forms of transportation.

International Use of BRT

The use of BRT began internationally and has slowly made its way to the United States. Curitiba, a city with the largest population and economy in Southern Brazil, served as the initial inspiration for BRT¹². In 1971, the Brazilian dictatorship selected an architect, Jamie Lerner, to serve as Curitiba’s Mayor. When Lerner found building a subway system would be too costly and take decades to accomplish, he decided to revolutionize an old form of transit: the bus.¹³ The cost of assembling a BRT system was 50 times less than building a subway system from scratch.¹⁴ As the Curitiba BRT system grew older, more features were added to maximize its efficiency. The 340 bus routes and 2,100 buses carry about two million passengers every day.¹⁵ While car ownership and per capita income is higher in Curitiba than other parts of Brazil, 70 percent of the city’s commuters use the bus system.¹⁶ As of 2013, the ITPD has classified six of the Curitiba corridors as silver standard BRT and one, Linha Verde, as gold standard BRT.

Mexico City provides a prime example of BRT in North America. Mexico City’s Metrobus BRT system did not open until 2005.¹⁷ Mexico City adopted BRT long after the city built its subway and commuter rail lines in the 1960s.¹⁸ The installation of the Metrobus and Mexibus BRT systems offer hope to large cities hoping to develop BRT to complement their rail systems. The Metrobus in Mexico City has five corridors. Four of these corridors are classified by the ITPD as silver standard BRT and the fifth one is classified a bronze standard BRT¹⁹.

BRT has spurred the city’s economy, according to a 2013 study at El Colegio de Mexico.²⁰ With empirical data from the Secretary of Finance of the Federal District, a researcher obtained significant results that the value of property near BRT corridors has increased with the expansion of BRT into the area. An analysis of property within 500 meters of Metrobus Line 1 indicates that land value increased between 14.6 to 15.8 percent two years after the line began operating.²¹ The study controlled for other issues by comparing with similar “control zones” that did not have a significant difference in price before and after. As the transit system expands, the benefits for Mexico City will continue to grow.

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BRT in the United States

There are currently eight networks in the United States that have received enough points to be classified a BRT system by the ITDP standard.²² This could grow, as investment in BRT is taking off. The Federal Transit Administration awarded a record \$375 million to states and localities for BRT in 2020 and another 18 projects were funded with \$185 million from the American Rescue Plan.²³ More funds for BRT could be awarded with the passage of the Bipartisan Infrastructure Framework, which includes an \$8 billion grant program transit agencies could use towards a BRT system.²⁴

One such system, the HealthLine in Cleveland Ohio, has been successful for both commuters and residents since its opening in 2008.²⁵ The HealthLine, a 6.9 mile long corridor, has 76 on the ITDP scorecard and is classified as silver BRT. It has adopted many BRT features, including dedicated lanes, level boarding, and off-board fare collection. Michael Schipper, vice president for engineering and project management at the Cleveland Regional Transit Authority, estimated that the \$200 million invested in the HealthLine has led to \$9.5 billion in development along the corridor over 10 years.²⁶ This resulted in the ITPD declaring the HealthLine as the best return on investment for any transit project. One study showed that two-thirds of jobs created in Cuyahoga County, home to Cleveland, were located within a block of a HealthLine BRT station.²⁷

Finally, BRT offers a cost effective alternative to building more rail and subway lines. A study by Boston BRT found “on average, BRT can be seven times more affordable than light rail.”²⁸ By this metric, twenty-five miles of BRT lines can be built at the same cost of under four miles of rail.²⁹

Bus Rapid Transit in MBTA Service Area

While the HealthLine is a great example of BRT implementation, the United States does not have a gold standard BRT system. In 2013, BostonBRT was formed with grant funding from the Barr Foundation and the ITDP.³⁰ BostonBRT is a research and community engagement effort that supported three \$100,000 grants from the Barr Foundation. These grants enabled communities in the greater Boston Area to collaborate with the MBTA and test some BRT features.³¹ Three pilot BRT projects were launched on existing T bus routes in Everett, Arlington, and Cambridge/Watertown. Improvements were made to each route to incorporate elements of BRT to be surveyed for future use. Each pilot project began by Fall 2018 and was completed before 2020.

Arlington’s project created a dedicated bus lane along Massachusetts Avenue, where the 77 bus would travel from Arlington to Porter Station, a stop on the MBTA’s Red Line.³² Arlington, a grant recipient, adopted elements such as a dedicated bus lane, signal prioritization, and queue jumping at traffic signals during weekdays from 6:00 a.m. to 9:00 a.m. Queue jumping is a practice where buses receive an advance green light from the boarding lane. Figure 1 displays an example of queue jumping in practice.

While the Arlington project lacked some key elements of gold standard bus rapid transit, the results of a bus lane and signal timing were measurable. Riders in Arlington saved up to 10 minutes on their commutes, 58 percent of residents supported an extension of the bus lanes, and 70 percent supported making the existing lanes permanent, which was signed off on by the Town of Arlington Select Board in October 2019.³³

Cambridge and Watertown’s pilot moved to bring BRT features, namely bus lanes and signal timing, to the MBTA 71 and 73 bus routes.³⁴ The project sought to improve traffic conditions on Mount Auburn Street, where even though only 3 percent of vehicles on the road are publicly operated, 60 percent of commuters on the road travel in public vehicles.³⁵ Riders once again saved time on their commutes, and the portion of residents who approved of Mount Auburn Street traffic patterns was 38 percentage points higher after the bus lanes. Both Cambridge and Watertown have made these improvements permanent, and both are continuing to install additional bus lanes to expand access to BRT.³⁶

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Figure 1: Queue Jumping in Practice³⁷

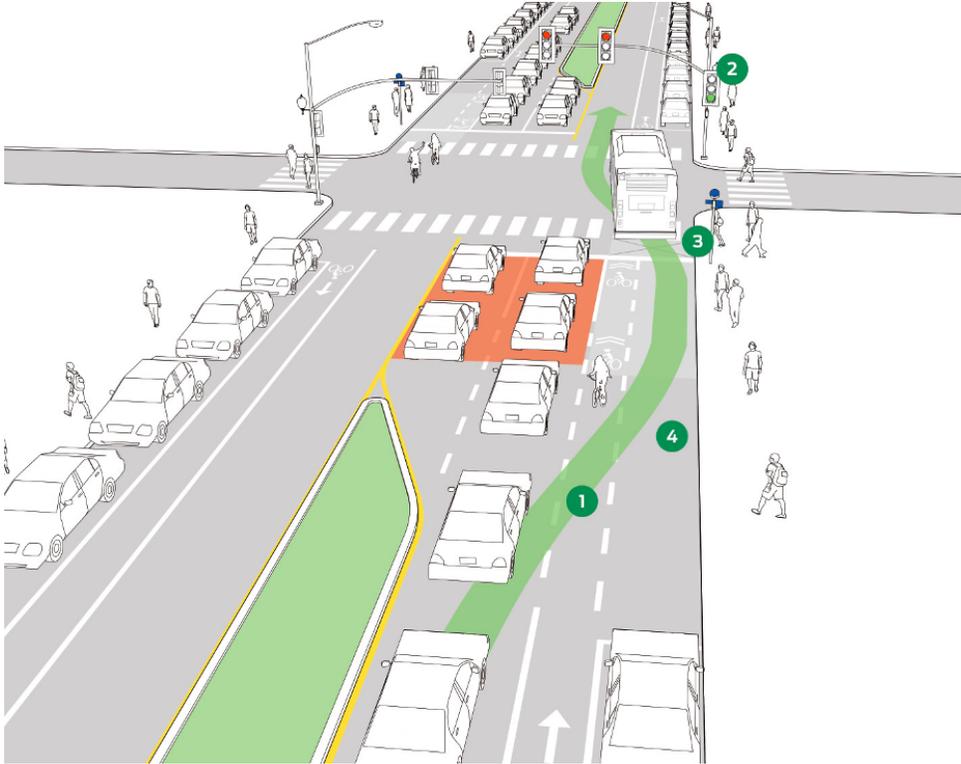


Figure 2: A Photo of the bus lane on Massachusetts Ave in Cambridge³⁸



Cambridge City Manager Louis DePasquale said, “The Mt. Auburn St. Bus Priority Pilot reinforces our commitment to our Vision Zero and Complete Streets missions...By improving bus reliability on one of Cambridge’s most congested corridors, we are helping more people commute to their homes, jobs, and other destinations safely and sustainability.”³⁹

Of the three projects, Everett’s impacted the most MBTA bus lines and was the most ambitious, thanks largely to their local leadership. Everett Mayor Carlo DeMaria, wants his city to be the first in the United States to have a gold standard BRT system. In July 2019, Mayor DeMaria explained during the opening of the new casino:

“Transportation is huge on everyone’s mind — how to get people in and out of this facility (Encore Boston Harbor),” he said. “There are ways. One of them is Bus Rapid Transit (BRT), gold-standard BRT. You see it in Mexico City, you see it in other countries. It’s center lane with on-street boarding, air conditioned, that can go from Glendale Street in Everett right down 99 to Rutherford Avenue and into North Station. I’m going to work my hardest to get that.”

Figure 3: Means of Transportation by City (2019)⁴⁰

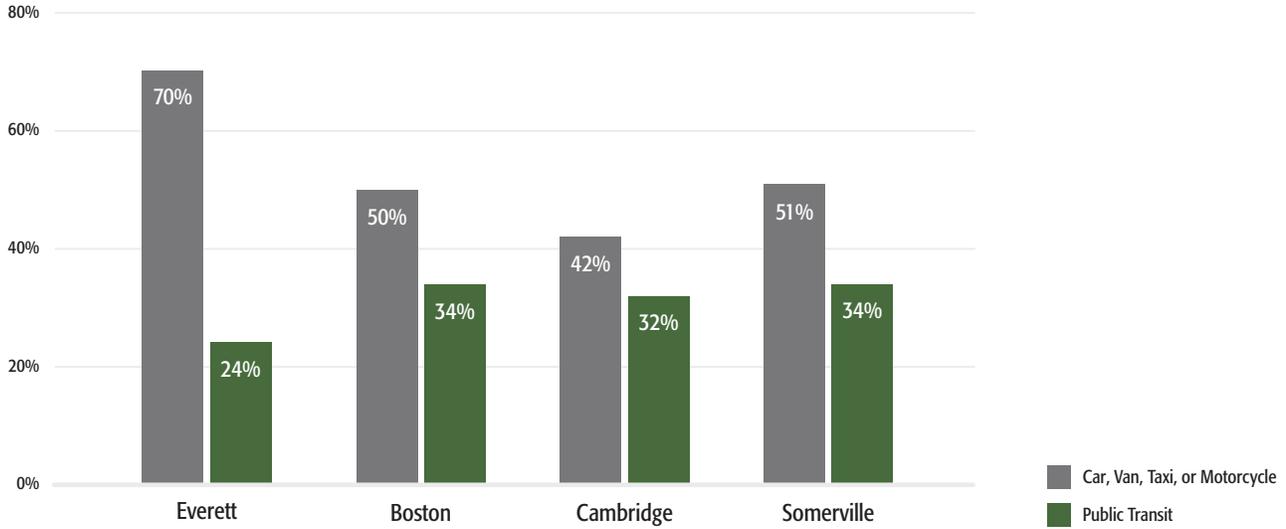


Figure 4: Housing Prices by City⁴¹

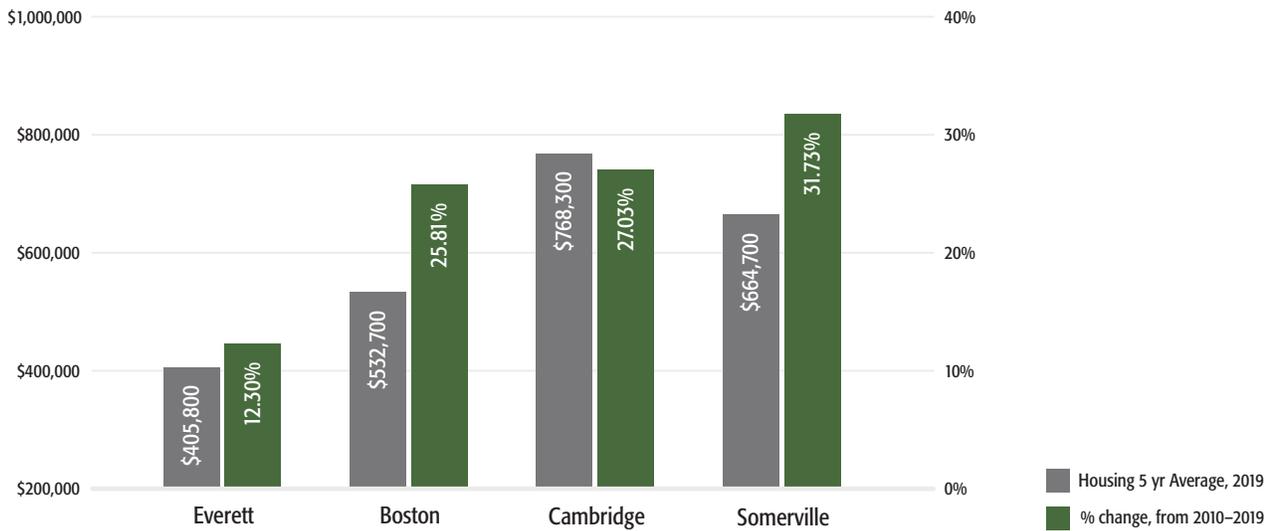
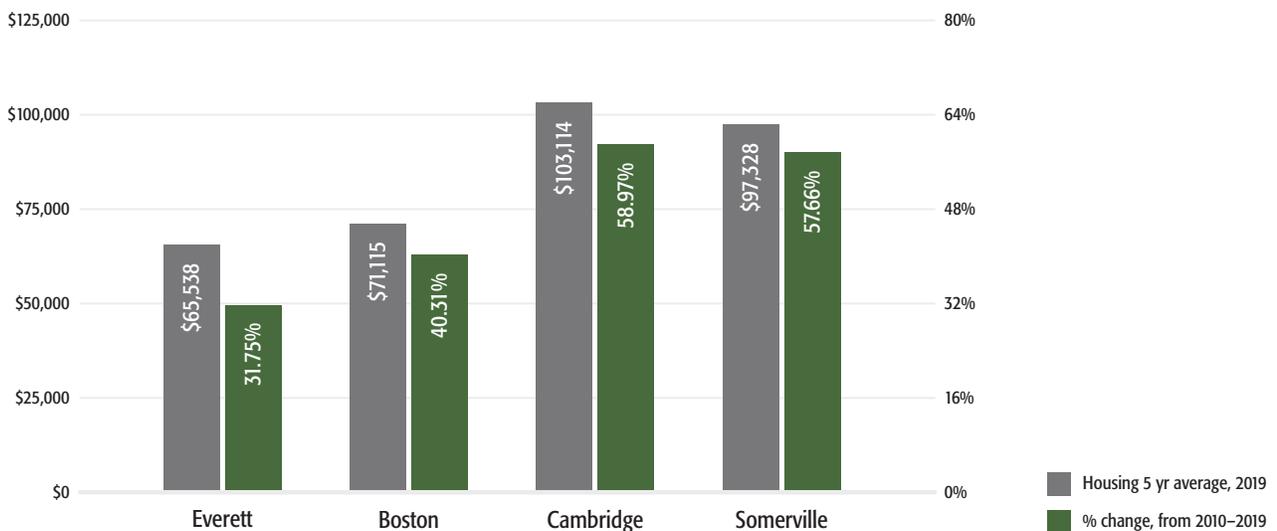


Figure 5: Median Household Income (2019) & Change from 2010-2019⁴²



Everett is characterized by the plan as a core community lacking in rapid transit. Cities receive that designation if they are only served by bus or commuter rail and have a large percentage of low-income or transit dependent residents. Despite being only two miles from downtown Boston, Everett has neither a subway stop on the Orange Line nor a commuter rail stop.⁴³ Local buses that serve the area typically sit in the same rush hour traffic as cars — with the exception of the newly piloted bus-only lane. This disincentivizes people from using public transit, resulting in increased congestion. Figure 3 shows that car usage in Everett is higher than other cities in the region, per data from the American Communities Survey.

There are consequences to Everett’s history as a transportation desert. Home prices have increased more slowly and wages have not grown at the rate of neighboring municipalities.⁴⁴ More cars on the road also is an environmental concern, as cars emit far more greenhouse gases than any form of public transit.⁴⁵

Mayor DeMaria has moved with all deliberate speed to install bus rapid transit in Everett. In 2018, Everett added a bus lane on Broadway in the 1.1 miles between Henry Street and Route 16, as well as first-step level boarding platforms.⁴⁶ The existing designs of MBTA buses make full level boarding difficult, however Everett creatively moved to build platforms to eliminate one step inside the bus. Routes 97, 104, 109, 110, and 112 were reserved for first-step level boarding when they travel on Broadway Avenue.⁴⁷ Mayor DeMaria has set the goal of having a gold-standard BRT system in Everett by 2023.⁴⁸ To be accredited with the gold standard though, Everett would need to add prepayment for riders, as well as make additional improvements to their BRT network.

Figure 6: Bus Rapid Transit Boarding Platform in Everett⁴⁹



The Everett BRT project is a part of a greater “Reimagine Broadway” campaign in Everett. In 2020, residents were surveyed to gauge their opinions of BRT in Everett. Most residents strongly approved of the transit changes BRT brought. Sixty percent of residents were satisfied by the new bus lanes and 77 percent wanted the line to continue on to Sullivan Square.⁵⁰ Residents felt their buses were less crowded and made it more possible to practice social distancing while riding public transit.⁵¹

In addition to enjoying the climate and transit benefits of BRT, Everett also sought to creatively link their BRT system to the larger economic community. Everett’s “Love Your Neighborhood” project worked to show the relationship between transit and vibrant communities. The

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“Love Your Neighborhood” project gave residents an opportunity to nominate local eateries to be highlighted. BostonBRT used grant funding to give participating residents opportunities to win \$30 Nift gift cards and \$25 MBTA bus passes.⁵²

As a whole, the BRT pilots were large successes, saving commuters a significant amount of time on their daily trips in all zones. The service during the pilot studies was also more reliable. There was 64 percent less variance against the time table in Arlington and 69 percent less variance in Cambridge and Watertown. Every community that tested BRT features was so satisfied with the pilot that they decided to keep the features.

To tackle transit issues such as congestion, the Lower Mystic Regional Working Group was brought together by the Massachusetts Department of Transportation in 2016. The group was chaired by former Secretary of Transportation Stephanie Pollack and aimed to study and propose new transportation interventions to support redevelopment of the area.⁵³ The group included elected officials and staff from the Lower Mystic Area of Boston, Everett, and Somerville. Other participants in the working group include representatives from the Executive Office of Housing and Economic Development, the Massachusetts Attorney General’s Office, the Massachusetts Gaming Commission, the Massachusetts Port Authority, the Wynn Everett Casino, and the office of Congressman Capuano while he served in Congress.⁵⁴

In Spring 2019, the Lower Mystic Regional Working Group issued a final report of their findings.⁵⁵ After years of research, public input, and outreach, the working group concluded in their final report that improving public transit is the most effective method to reduce traffic congestion. When commuters are provided a comparable alternative to driving, there is a larger incentive to get off the road.

“The report’s analysis indicates that the greatest benefits to traffic congestion can be achieved by reducing the amount of auto travel to and from the area, through a combination of improved transit services and transit-oriented parking policies.”⁵⁶

The report confirmed many earlier findings concerning Bus Rapid Transit, that busing changes take less time to implement, reduce car traffic, and can create transit equity. Specifically, the working group recommended extending Silver Line busing to connect with existing lines to link Everett, Chelsea, Kendall Square, and North Station.⁵⁷ Additionally, the report stressed the need for BRT to offset bus ridership to Sullivan Square and along the Orange Line.

Challenges for BRT

Land use and land costs are key factors in evaluating BRT. There are significant externalities involved in all transportation systems and BRT is no exception. The following issues are critical to resolve in order to develop more areas for BRT:

- a. **Removing existing mixed traffic lanes for exclusive BRT** can work, but doing so comes at a cost. The land is not “free,” as trucks, buses, motorists, and others use lanes that are turned into dedicated bus lanes. This is a cost to the drivers and vehicles who now have to fit onto the other available lanes or move to alternative routes.
- b. **Finding additional land is sometimes required. Not every roadway will be able to host a BRT route.** Here, BRT advocates must consider that business leaders may be reluctant to give up the parking spaces their clientele relies on. If lanes cannot be removed from existing traffic or repurposed from parking spaces, the road may not be suitable for BRT. In some cases, localities must acquire land that is either dormant or used for other purposes. This can be as costly as buying land for a new train line.
- c. **Proper Planning is required with pilot studies.** If the BRT service continues to be successful, it should encourage commuters to switch from driving private cars and using ride hailing services. This would bring significant transit, economic, and environmental benefits. However, congestion could be exacerbated for drivers who cannot switch to the new BRT service. This is why pilot studies are needed to test the actual impact of a BRT route on the overall traffic pattern, as the MBTA did in their three studies.

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An example of when these challenges worked to deter BRT development occurred in Boston in 2009. At the time, Governor Deval Patrick's administration attempted to use federal stimulus funding to construct what would have been Boston's first BRT project on Blue Hill Avenue from Mattapan to Grove Hall.⁵⁸ The project quickly ran into community opposition; Roxbury, Dorchester, and Mattapan residents were concerned about impacts on trees, flowers, and parking spaces.⁵⁹ In Mattapan, where public transportation is sparse, parking spaces are all the more essential.⁶⁰

Furthermore, the Patrick administration's proposal faced issues beyond project design or opposition from business owners. In the communities along Blue Hill Avenue, opposition to the project was also a matter of trust. The project was developed at break speed and without a concerted effort to persuade the community of BRT's benefits. As James Aloisi, then Massachusetts secretary of transportation noted, "communities that have been neglected, or given sub-optimal transit, or felt like they'd been lied to for many years about the T were skeptical and wanted to kick the tires on it."⁶¹ The timeline pursued in 2009 did not give the Patrick administration time to kick the tires in the Blue Hill Avenue community; it assumed the community's needs, instead of gathering input, feedback, and support.

In 2019, former Boston Mayor Marty Walsh took steps to renew the shelved plan to install bus lanes at the center of Blue Hill Avenue. Unlike the previous attempt, where many local officials opposed the project, the Walsh administration's grant included substantial support from elected officials; Councilors Andrea Campbell and Michelle Wu supported the project and highlighted their support in their mayoral campaigns.⁶² Local officials took time to stage open houses and hold community meetings to "kick the tires," persuade residents, and evaluate if the project's objectives met the desires of commuters who use Blue Hill Avenue.⁶³ Currently, the project's development is on hold, as in 2020, the federal government rejected the funding request made by the city and MBTA.⁶⁴

Currently, the MBTA and the Merrimack Valley Transit Authority (MVTA) are piloting using the breakdown lane of I-93 for bus travel.⁶⁵ The MBTA and MVTA are evaluating the potential of a bus lane on a seven-mile portion of I-93 between Somerville and the I-95 interchange. Before deciding whether the plan has long-term benefits, the transit authorities are running empty buses on that stretch of the I-93 shoulder.⁶⁶ While not a traditional BRT project, the transit authorities are demonstrating the importance of pilots in bus transit, anticipating the coming need to balance broader traffic dynamics, community desires, and competing interests.

Compromises may have to be made for BRT to gain community support. However, previous BRT pilots have demonstrated ways to balance competing interests. For example, some of the bus lanes on Broadway in Everett are only used during peak hours; during other times, they can continue to be used for parking spaces. Such compromises could help gain the buy-in of small business owners and work to reduce rush-hour congestion.

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Pandemic Changes in Mass Transit Usage in MBTA Service Area

The COVID-19 pandemic brought structural change to the way mass transit is utilized in Massachusetts and across the country. Seventy-one percent of Americans were able to work remotely during the pandemic.⁶⁷ More people working from home brought changes to both traffic patterns and mass transit usage. Hours lost to traffic in the Boston area decreased by 68 percent in 2020.⁶⁸ Nationwide, CO₂ emissions from transportation dropped by 15 percent.⁶⁹ While the pandemic brought relief on the roads, its implications were a cause for concern on public transit.

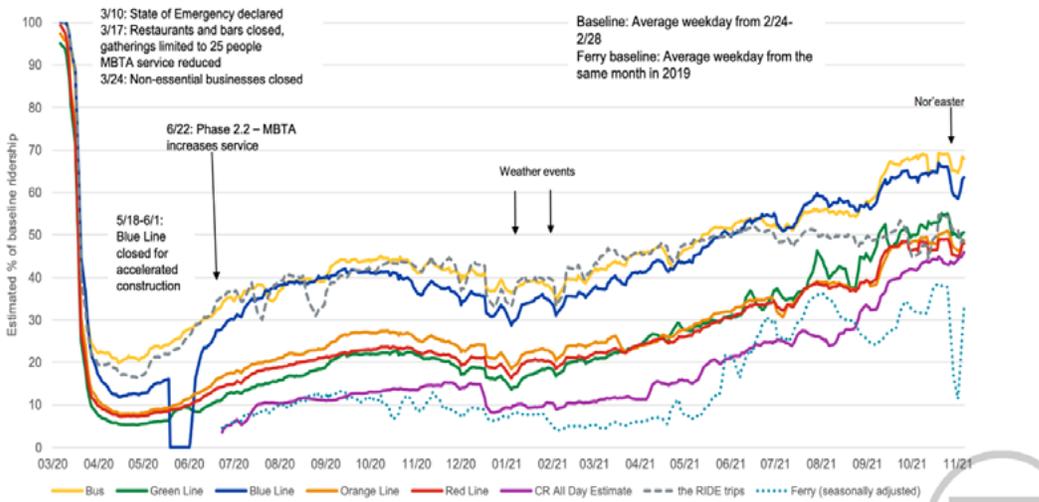
All the MBTA's service options experienced significant declines in ridership during the pandemic. Figure 7 displays the sharp decrease in usage in 2020.

As Figure 7 displays, all MBTA lines experienced massive dips in usage in 2020. The beginning of the chart displays where usage rates were in February 2020 before the pandemic. MBTA ridership declined heavily in March, rebounding a bit throughout the summer, and declined again in the late fall, coinciding with the pandemic's second wave. Throughout the year, some lines were utilized significantly more than others. The RIDE and bus services retained far more of their ridership than other services, most notably the Green Line and the Commuter Rail.

Figure 7: Weekday Ridership from March 2020 to November 2021, Indexed to Week of 2/24⁷⁰

Report from the General Manager

Weekday Ridership by Line and Mode - Indexed to Week of 2/24 (5-day Rolling Avg.)



Sources: Faregate counts for subway lines, APC for buses, manual counts for Commuter Rail, RIDE / Ferry vendor reports
 Notes: Recent data preliminary.



Public data has demonstrated that lower-income individuals were more likely to continue using the MBTA during the height of the pandemic. Early in the pandemic, when remote work was most utilized, the rate of MBTA users riding with reduced fare validations was twice as high as it was the year before.⁷¹ Surveys indicated those using public transit during the pandemic were lower income, unable to work from home, and did not have access to a car.⁷²

Even within the same public transit lines, usage rates greatly varied. MBTA bus lines retained far more of their riders than their counterparts during the pandemic. As a whole, MBTA buses retained 37.1 percent of their ridership from March 1, 2020 through the end of the year, as indexed to the week of February 24, 2020.⁷³ However, some bus lines had far higher ridership than others. Some—including the 192 and 216 lines—retained over 60 percent of their ridership. Other bus lines—many of which pass through higher-income areas—retained riders at rates similar to the Orange, Red, or Green Lines.

By and large, the Everett MBTA bus lanes fared far better than their counterparts during the pandemic. From March 2020 through the end of the year, the Everett BRT Lines retained 50.1 percent of their ridership, over 14 points higher than the average of all other bus lines (bus ridership retention is 36.6 percent when the Everett BRT lines are excluded).

In the seven-week period after the CDC revised their public health recommendations for vaccinated individuals from the week of May 16, 2021 through the week of June 28, 2021, public transit usage began to rebound. MBTA bus ridership ticked up to 53.3 percent of the amount of riders that used the bus in the same seven-week period in 2019. However, the Everett BRT bus lines reached 77.4 percent of their summer 2019 ridership, over 25 points above all other bus lines (52.4 percent once the Everett BRT lines are excluded).

On the other hand, the BRT pilot routes in Arlington and Cambridge/Watertown did not enjoy Everett’s levels of rider retention and recovery. During the pandemic, ridership in Arlington dipped to 29 percent of pre-pandemic levels and recovered to 48 percent in that post-pandemic period. In Cambridge and Watertown, ridership dipped to 28 percent and recovered to 41 percent. Nonetheless, this is likely more indicative of socioeconomic circumstances than dissatisfaction with service.

The RIDE and bus services retained far more of their ridership than other services, most notably the Green Line and the Commuter Rail.

Figure 8 displays how many individuals are employed by workforce sector in the three municipalities where BRT is being utilized. Category A is composed of those who work in professional, scientific, or technological services, information, finance, real estate, and public administrations. This category reflects those whose professions are more compatible with telework. Category B reflects those who work in retail, food services, manufacturing, construction, waste management, remediation services, warehousing, and transportation. Members of the workforce employed in Category B professions are less likely to be able to telework.

Figure 8: Category A and Category B Employment Composition in Arlington, Cambridge, and Everett⁷⁴

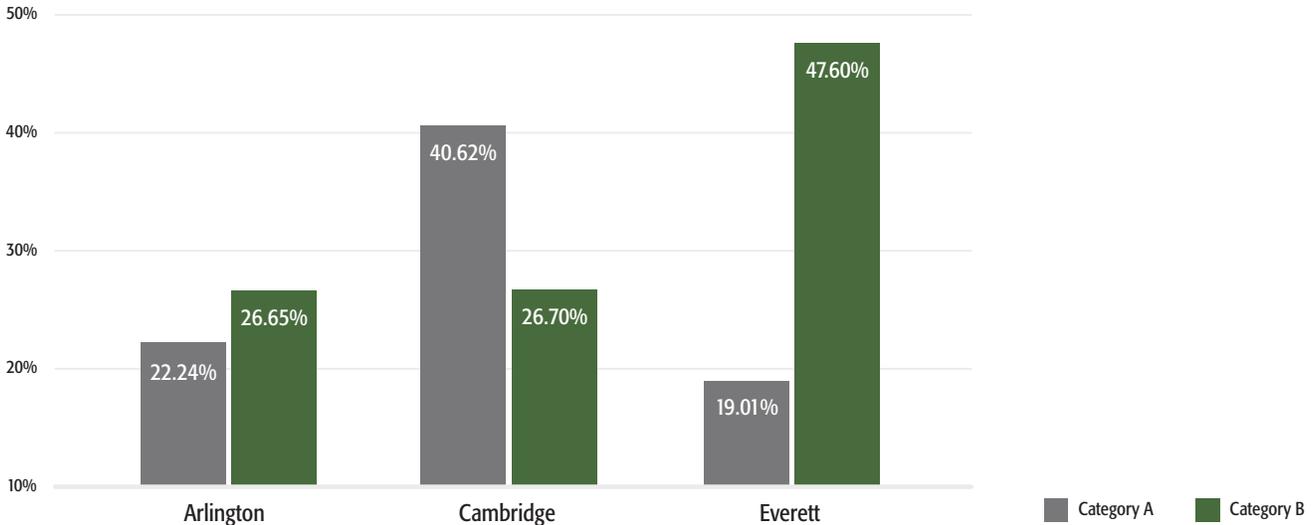


Figure 8 demonstrates that Everett’s workforce has a far higher concentration of employees who work in professions that are less likely to be amenable to remote work. The nature of Everett’s labor market required those who worked in Everett to commute there during the pandemic. On the other hand, those who commuted to Arlington or Cambridge were less likely to need to commute. As a result, the divergence in retention rates of the BRT routes can likely be attributed more to divergent needs to commute to work during the pandemic than issues with the service itself.

Bus Lanes and Climate Impact

Public buses are one of the best ways to reduce CO2 emissions on the road. A 2010 US Department of Transportation study found that even when buses are only a quarter occupied, they emit 32 percent less greenhouse gases than if riders were driving a regular passenger vehicle.⁷⁵ Higher occupied buses result in even greater emissions reductions. Incentives to ride the bus, such as Lawrence, Massachusetts’ plan to make several of the city’s bus lines free, are one way to boost ridership.⁷⁶ Waiving fares for BRT buses would likely only add to their popularity. Nonetheless, further study is needed to weigh the costs and benefits of free MBTA bus lines.

Additionally, the Bipartisan Infrastructure Framework’s investment in electric buses has the potential to make buses even more eco-friendly. One study in Norway found that a partial implementation of hybrid and electric buses reduced bus emissions by another 37 percent.⁷⁷ A popular, efficient, and partially electric bus system has the potential to go a long way towards reducing rush-hour emissions.

Public buses are one of the best ways to reduce CO2 emissions on the road.

Conclusion

As a whole, the COVID-19 pandemic has offered Massachusetts the opportunity to reimagine rush hour. From this study of Bus Rapid Transit, three recommendations emerge:

- The pandemic pause in Boston's rush-hour traffic is over. While traffic patterns may have changed, overall traffic congestion is back to pre-pandemic levels. With obvious bumps in the road, we expect that commuters will increasingly return to mass transit options. Given the environmental and time-savings benefits, policymakers should not wait until the pandemic has fully played out to examine new and potentially important innovations such as BRT.
- Given BRT's potential benefits for the environmental quality, we urge the MBTA to develop an environmental impact study that quantitatively examines BRT's environmental effectiveness in comparison to other modes of transportation. A successful environmental impact study would be helpful to build support for BRT. Additionally, environmental data would further aid policymakers and communities in understanding whether BRT is the right fit for the route in question. An environmental impact study could also lead to a study framework from which plans for future BRT expansion can be evaluated.
- In expanding BRT, municipalities and transit authorities need to engage the community impacted by a new bus route. The mishaps in the 2009 Blue Hill Avenue planning demonstrates a need to kick the tires in local areas before diving in with plans that lack community input and support. Nonetheless, the second effort for BRT on Blue Hill Avenue that began in 2019 shows that thorough community engagement is a pathway to persuading previously reform-hesitant communities to consider BRT.

As a whole, the COVID-19 pandemic has offered Massachusetts the opportunity to reimagine rush hour.

Endnotes

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Mission

Pioneer Institute develops and communicates dynamic ideas that advance prosperity and a vibrant civic life in Massachusetts and beyond.

Vision

Success for Pioneer is when the citizens of our state and nation prosper and our society thrives because we enjoy world-class options in education, healthcare, transportation and economic opportunity, and when our government is limited, accountable and transparent.

Values

Pioneer believes that America is at its best when our citizenry is well-educated, committed to liberty, personal responsibility, and free enterprise, and both willing and able to test their beliefs based on facts and the free exchange of ideas.

