

LivableStreets

Connecting People + Places



64 Hours: Closing the Bus Equity Gap

September 2019

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LivableStreets Alliance

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Foreword

Representative Ayanna Pressley

I have often said that everything you need to know about the Massachusetts 7th Congressional District you can learn by riding the 1 bus from Harvard Square to Dudley Square. This four and a half mile trip spans some of the region's highest and lowest income areas, where an individual's quality of life is more likely determined by their zip code than their potential.

I firmly believe that when we design our transportation systems to serve those most in-need, we are better serving everyone in our society. For too long, our transit system has accepted and perpetuated the disparities of our region - many of our low-income neighbors have had to pay more for bus service through cash pay differentials, longer commute times, and lost pay and family time. *64 Hours: Closing the Bus Equity Gap* outlines a roadmap for how our transit system can stop perpetuating these disparities and reverse them for good. Now is the time to make our bus system a vehicle for change that connects our communities and promotes well-being.

Investing in our bus system is not just about buying more vehicles or fixing traffic lights or installing bus shelters. It's about investing in every single person who contributes to our region's largest mobility system. It means getting a high school student to class and to their after school program on time so they can fulfill their potential. It means guaranteeing that our seniors can get to their doctors' appointments and don't have to wait unpredictable amounts of time while they wonder when the next bus will arrive. It means that hourly wage workers are no longer docked pay because their bus didn't arrive on time. It means respecting our bus operators and maintenance crews by providing them with the resources they need to serve us.

It means living our values as a city that believes in fairness, public service, and justice.

Over a year and a half ago, I was proud to stand with my sisters in service on the Boston City Council, LivableStreets, and community partners to launch Getting Boston on Board, which helped catalyze our commitment to fixing our transit system. Since that snowy day, we have proven that we can make meaningful strides when it comes to advancing equity by prioritizing bus service on our city streets because we have worked to connect with bus riders themselves. Now is the time to apply all the tools in our tool kit to make sure the MBTA's bus system is our greatest equity asset.

I look forward to partnering and engaging with each of you to ensure that we are building the transit system Metro Boston deserves.



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Executive Summary

The bus is often called the MBTA's workhorse, but it's much more than that. Serving over one-third of Metro Boston's transit trips, and the highest rate of low-income riders across MBTA services, our public bus network is one of the best resources policymakers, planners, and community members have when it comes to connecting residents to life-changing opportunities.

However, the MBTA does not serve all riders equally. The MAPC's 2017 State of Equity Report estimates that Black bus riders spend, on average, 64 more hours per year aboard MBTA buses when compared to their fellow White passengers.

Without committing to addressing this service inequity head-on, riders will continue to be underserved by public transit at a crucial moment in our region's history.

Congestion on Boston streets is officially the worst in the nation, and, despite strong or consistent ridership trends across subway and commuter rail services and an unprecedented development and employment boom, bus ridership has dropped system-wide. **Failing bus service is one of the greatest disparities threatening the region, and the scope of the crisis requires the full attention of state and local policymakers in order to end transit inequities once and for all in Metro Boston.**

In the past year, we have seen some steps toward a turnaround. Local officials have demonstrated their ability to work hand-in-hand with the MBTA to shorten commute times and boost ridership by implementing bus-only lanes, transit signal priority, and platform-level boarding on city streets. Now is the time to think about how we as a region can accelerate improvements and chart a path forward toward a more accessible, equitable, and reliable transit system on board the bus.

Now is the time to think about how we as a region can accelerate improvements and chart a path forward.



This report outlines a path forward by:

- ◆ Assessing our system today by identifying which bus routes serve the highest rates of people of color and low-income riders and which Environmental Justice communities are most in-need of more transit service.
- ◆ Evaluating roadblocks that prevent the expansion of service and limit opportunities to realize existing transit demands.
- ◆ Providing policy recommendations for equitable expansion that reflects our region's needs.

Based on our analysis of MBTA bus service, ridership data, and national case studies of transit service planning, we arrived at the following key findings:

- ◆ **There are several areas within the MBTA service area that could benefit from new service.** Prioritizing these communities' transit needs during the MBTA's Better Bus Project network redesign process is essential moving forward.
- ◆ **There is a significant need for transit investments in underserved neighborhoods that currently rely heavily on bus service.** Investing in these communities first is crucial from an equity perspective and will likely result in increased ridership and shorter commute times for those who need them most.
- ◆ **The MBTA needs significantly more buses and additional garages to meet present day service needs and growing demand.**
To increase service frequency standards, the MBTA would need to procure nearly 200 additional buses. We have identified several potential locations for new bus garage facilities.
- ◆ Several transit agencies nationwide have recently undergone major bus planning processes with mixed results. **King County Metro's social equity score approach provides the best planning model for how the MBTA can expand bus service while investing in reversing disparities.**

To move Metro Boston forward, especially as the MBTA begins to undertake the bus network redesign for the Better Bus Project, we developed the following three recommendations to state and local policymakers:

- ◆ Invest in a bus fleet that reflects Metro Boston's transit demand.
- ◆ Create planning and service programs that invest in the region's equity needs.
- ◆ Develop state-municipal partnerships that accelerate transit improvements.

To advocate for these necessary improvements, LivableStreets will continue to engage riders and community members through Street Ambassador campaigns and by making direct appeals to state elected officials who have ultimate oversight over MBTA funding and revenue.

Key Findings:

200 additional
buses needed
to improve service

At least **2** new
garages need
to be developed

More service
needed in Roxbury,
Dorchester, Lynn, and
other communities

Introduction

Investing in Metro Boston's bus system is about much more than buying more vehicles or building new garages; it also means investing in the people behind the network: the riders, operators, and communities who keep our region moving. The MBTA bus network is at a crossroads. At a time of growing transit demand and increasing housing costs, ridership has been declining as congestion has worsened.

We have seen some steps toward a turnaround, but now is the time to double down on transit improvements to keep the region moving forward.

In March 2018, we stood alongside our partners in a snow-covered Dudley Square as we launched Getting Boston on Board, LivableStreets' roadmap for tackling the transit crisis gripping Boston bus riders. We proposed three policy recommendations to put transit first on city streets:

- ◆ Prioritize bus upgrades at the city level with a focus on accountability and equity.
- ◆ Improve streets to prioritize bus transit on high ridership corridors.
- ◆ Expand bus service and improve the rider experience system-wide.

Over the past year, we have seen considerable progress in tandem with our advocacy efforts. The City of Boston has hired its first-ever Transit Team to work hand-in-hand with the MBTA to implement priority improvements like bus-only lanes along the system's most traffic-snarled streets.

In partnership with LivableStreets' community engagement campaign, the City of Boston implemented its first bus-only lane in over ten years along Washington Street in Roslindale, resulting in a 20–25% reduction in travel times during the morning rush hour. Similar surface improvements have recently been implemented along Brighton Avenue in Allston, following a year-long advocacy partnership between LivableStreets, Allston-Brighton Health Collaborative, and Allston Village Main Streets that focused on reaching



Several communities have implemented elements of bus priority to speed up routes serving their residents.

out to bus riders, merchants, and small business customers. LivableStreets is now working to address the remaining highly congested corridors, including Blue Hill Avenue and Warren Street, which service an estimated 45,000 bus riders each weekday.

Beyond Boston, several communities have implemented elements of bus priority to speed up routes serving their residents. With the support of grants from the Barr Foundation, Arlington, Watertown, Cambridge, and Everett tested bus-only lanes, queue jumps, transit signal priority, and platform-level boarding throughout 2018. Despite these advancements, continued work is needed to not just fix today's problems but also to chart a course forward toward a bus system that meets the ongoing and growing needs of Metro Boston.

State lawmakers have repeatedly passed the buck on meaningful transportation investments, favoring a "reform before revenue" deferment rather than building the kind of transit network their constituents need. A recent MassINC poll among Boston area commuters found that two-thirds of respondents believed immediate action is required to fix Greater Boston's transportation woes, and an overwhelming majority (80%) supported the idea of providing more funding to address roadway congestion and MBTA service needs.

We cannot continue to defer the kind of action our region needs. We are at a breaking point where we need to think big about investing and expanding service rather than prioritizing approaches that work within the current status quo.

According to the Focus40, MassDOT's long-term plan for the MBTA, the bus system serves the highest rates of low-income and people of color riders compared to the MBTA's other services. And yet the bus system continues to serve our region's communities inequitably, reflecting the metropolitan region's historic and ongoing segregation.

Despite these challenges, there are clear steps that can be taken to move forward. Several processes in peer transit systems provide lessons for Boston transit planners and policymakers. The MBTA's ongoing Better Bus Project provides a once-in-a-generation opportunity to make our bus system a defining vehicle for social change that removes barriers for riders of all backgrounds, rather than build up long-entrenched disparities. Embarking on this process requires a proactive commitment to investing in communities that are most in-need, to ensure that we close the 64 hour disparity between Black and White bus riders.

We are at a breaking point where we need to think big about investing and expanding service rather than prioritizing approaches that work within the current status quo.

Pitting equity versus expansion is a false choice. As a state and a region, we have the tools and resources we need to do this work today. Developing a vision for the future of the bus system will require MBTA officials, state lawmakers, and local policymakers to adopt new planning and investment approaches that deal with this inequity head-on.

This report outlines a path forward by:

- 1. Assessing our system today by identifying our most vulnerable bus routes and communities.**
- 2. Evaluating roadblocks to expanding service and opportunities for realizing existing transit demand.**
- 3. Providing policy recommendations for equitable expansion that reflects our region's needs.**

Now we need to develop the will among policymakers to bring these solutions to Metro Boston. Our policy recommendations will serve as LivableStreets' advocacy agenda in the years to come, especially throughout the Better Bus Project network redesign.

Pitting equity versus expansion is a false choice. As a state and a region, we have the tools and resources we need to do this work today.

Equity

Overview & Challenges

In May 2019 the MBTA's governing board, the Fiscal and Management Control Board (FMCB), approved 36 cost-neutral service improvements to the system's bus network to be implemented within a few months. These adjustments are a critical first step for the Better Bus Project, the MBTA's multi-year initiative to overhaul the system's bus service, but considerable challenges remain when it comes to closing the equity gap.

Although the agency's Equity Analysis found that the proposed service changes would not impose considerable disparate impacts on minority populations, we cannot be satisfied by this evaluation alone. In many ways, Title VI of the Civil Rights Act of 1964 provides a low-bar standard by setting requirements for not worsening service but does little to proactively bridge the service equity gap.

Annual Travel Time Disparity Compared to White Riders



Black Riders +64 hours



Latinx Riders +10 hours

Source: MAPC Regional Indicators, 2014

We need to shift our focus from not exacerbating inequities to ending them for good. Without that mandate, we will never reverse the travel time disparities between White riders and other people of color ("POC") populations. Closing this gap is about investing in the system and its riders, not finding more cost-neutral fixes.



Closing this gap is about investing in the system and its riders, not finding more cost-neutral fixes.

Addressing these service inequities now is exceedingly important as more research indicates that access to transportation is intimately linked to socio-economic mobility. Providing safe, affordable, and reliable transit is essential for ensuring better access to education, workforce opportunities, and services.

Today, disparities within the MBTA's bus system are endemic, with POC and low-income bus riders suffering significantly longer and more unreliable commutes compared to White, affluent passengers. These inequities are not a recent phenomenon, and organizations such as Alternatives for Community and Environment (ACE) and GreenRoots have long fought for initiatives to shorten bus commute times for POC and low-income riders.

It should be noted that past MBTA efforts to implement bus improvements have been met with pushback. In 2009, MBTA and state transportation officials proposed the 28X, which would have brought bus rapid transit to the 28 bus route through a federally funded Transportation Investment Generating Economic Recovery (TIGER) grant. According to the federal grant application, the 28X would have increased ridership by 8.4% while decreasing travel times by about 4 minutes per rider in communities home to some of the highest rates of Black and low-income residents in the region. Concerns were raised over the speed of the planning timeline, community process, engagement with elected officials, and parking loss. State agencies withdrew the project application and few improvements to this day have been implemented along the 28 route, aside from the installation of more bus shelters.

These challenges should not deter policymakers and planners from engaging community members in overhauling our bus system; rather, they demonstrate the need for more meaningful engagement in tandem with fast operational improvements to build trust between underserved neighborhoods and public officials.

Today's transit crisis requires us to tackle the root causes of transit inequities and respond with an appropriate response. Systemwide, there was an 8% drop in MBTA bus ridership between 2015 and 2016, but this decline is even worse when looking at the top ten busiest routes, which all primarily operate in Boston – including the 28.

There are also indications that service demands within the bus system are changing as some populations have been displaced from the MBTA's core service area and into outer-lying neighborhoods and suburbs. For instance, some of the bus routes that have seen the highest rates of growth have been those connecting suburban communities with MBTA rapid transit stations, and several local routes now have higher weekday ridership than some Key Bus Routes, traditionally the MBTA's highest ridership routes with the most frequent service levels (dispatches every 10 minutes during peak weekday service), and Silver Line routes.

Today, disparities within the MBTA's bus system is endemic, with POC and low-income bus riders suffering significantly longer and more unreliable commutes compared to White, affluent passengers.

Route	Average Weekday Boardings in 2012	Average Weekday Boardings in 2018	Change in Ridership
34/E	4,030	6,540	62.28%
70/A	5,255	6,540	24.45%
117	4,981	5,450	9.42%

Addressing equity for the bus system today needs to be both place-based and tied to the riders themselves in order to make meaningful strides in bridging the bus system's equity gap.

To better understand these trends, we analyzed current ridership trends, identified locations where there is evidence of an equity gap in service, and reviewed national best practices to understand how the MBTA could work with its service area municipalities to bridge these disparities.

"Many mornings the buses are too full and skip my stop at Cummins Highway. It's very frustrating and makes me late."

~ Ronnie, Roslindale

EQUITY CASE STUDY: SAN FRANCISCO

How have other transit systems looked to close the equity gaps in their communities? Amid San Francisco-wide investment expansion, the Muni Service Equity Strategy has funneled additional resources to improve bus routes serving what SFMTA, the city's transportation department and transit agency, calls "Equity Neighborhoods." SFMTA aims to ensure that underserved riders "see equal or better improvement as the system as a whole" in the short- and long-term.

The Service Equity Strategy evolved from extensive rider engagement, community input, and data-driven assessment. In 2016, SFMTA formed a working group – with government, neighborhood, and advocacy representatives – to develop and advise the strategy. **Based on populations of people of color, low-income or zero-car households, people with disabilities, and seniors, SFMTA named eight Equity Neighborhoods. Collectively, they targeted bus routes in Equity Neighborhoods that serve over 450,000 weekday riders.**

Neighborhood residents described their challenges with transit service in public forums, focus groups, meetings at community organizations, and online surveys, reaching a total of 65,000 participants between 2016 and 2018. From this process, SFMTA officials determined deliberate, localized solutions to improve those issues within two years.

Solutions include increasing service frequency, expanding bus lanes, upgrading to longer buses, active dispatching to combat gaps, and improving sidewalks and lighting near stops. After implementing fixes, SFMTA monitors service performance annually; recommended treatments are adjusted accordingly in each two-year budget process.

SFMTA aims to ensure that underserved riders "see equal or better improvement as the system as a whole"...

64 Hours: Closing the Bus Equity Gap

Through FY2018, SFMTA invested \$21 million in capital improvements in Equity Neighborhoods and \$2.6 billion in citywide projects that benefit the neighborhoods. Service and operational changes have been cost-neutral. A transportation sales tax and a Caltrans grant contribute funding to the strategy.

At a quarter of major stops on Equity Neighborhood routes, on-time performance and service gaps improved by at least 10%; travel time improved between nearly half of key destinations.

A comparison of 2016 and 2017 data for targeted routes indicates mixed results. At a quarter of major stops on Equity Neighborhood routes, on-time performance and service gaps improved by at least 10%; travel time improved between nearly half of key destinations. By the same token, on-time performance worsened at nearly 40% of major stops, and service gaps worsened at 20% of major stops.

The Service Equity Strategy's underwhelming results stem from shortcomings in its implementation. It succumbs to the pitfall of "too much talking, not enough doing." The prolonged engagement effort – though successful at connecting with hard-to-reach riders – has, by nature, delayed acting on the issues it identifies. By 2018, the needs of 5 out of 31 routes hadn't been addressed. Updated recommendations for half of all routes are devoid of direct action (e.g. "explore" rather than "implement" transit-only lanes) and thus kick actual service improvements down the road. Some solutions like "reliability improvement projects" are too vague to address service issues. Catering to squeaky wheels hobbles SFMTA's investment in transformational changes – like transit-only lanes – that are controversial but also more effective at addressing riders' needs.

Overall, the strategy's intentions, design, and outreach are commendable, but more urgency in implementation – and action beyond cost-neutral investments – are needed to achieve the extent of the envisioned improvements.

"I rely on buses to get to work and get my kids to school. But with the unpredictability of the buses and the traffic I'm often late! Please help make this system more reliable!"

~ Leise, Roslindale

METRO BOSTON ANALYSIS

Existing Service

Our partners at TransitCenter analyzed route-level MBTA rider demographics to determine the most important bus routes for transit access to underserved riders using the Central Transportation Planning Staff's (CTPS) 2015–17 survey data. This analysis can inform where the MBTA and policymakers should start targeting bus service improvements through the Better Bus Project in order to directly invest in at-need riders.

Top Priority Routes: Underserved riders by percentage of total ridership

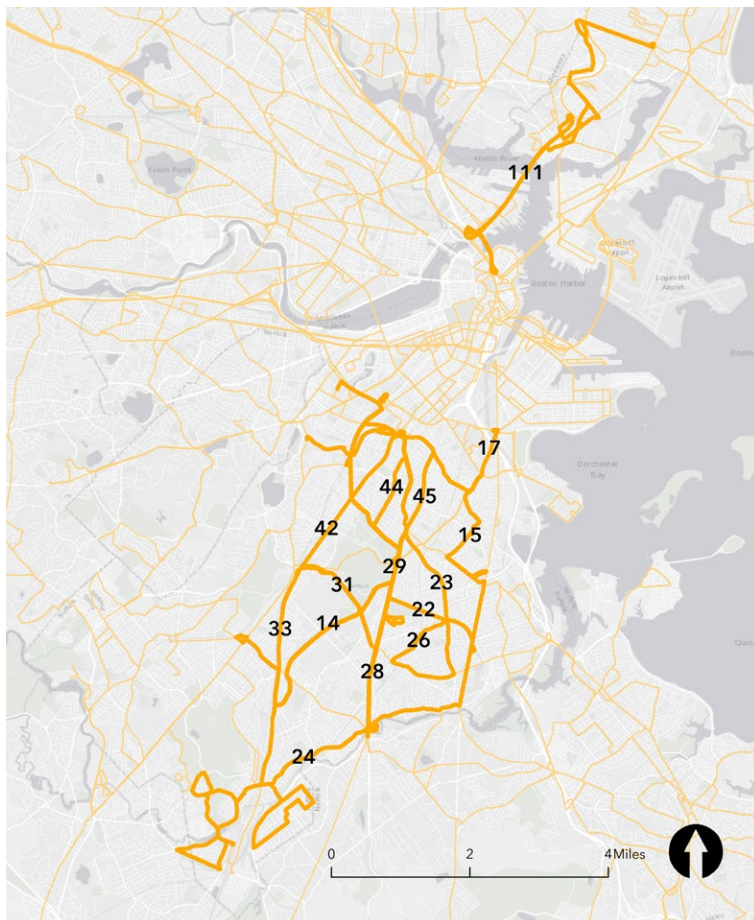
Route	Riders (%)			2018 Average Weekday Ridership	Ridership Rank	EJ Population	
	Low-Income	Very Low-Income	People of Color			Per Route Mile	Per Square Mile
22*	69.6	21.4	96.2	8,015	12	6,411	20,989
29	69.6	21.4	96.2	2,254	60	7,489	17,522
15*	67.2	31.1	96.2	5,808	21	8,190	16,184
45	69.5	27.1	94.6	3,142	41	7,841	16,987
28*	65.0	23.0	97.8	12,880	1	7,532	16,304
44	66.0	23.6	94.2	3,453	36	6,657	17,882
42	66.0	23.6	94.2	2,564	54	7,109	15,830
17	68.9	13.3	94.9	3,091	43	8,532	18,410
23*	59.0	27.6	96.3	11,808	5	7,627	18,508
31*	57.7	24.4	95.9	6,096	19	5,788	9,964
26	66.7	25.0	90.4	1,585	84	9,591	16,886
111*	59.7	20.4	92.6	12,037	3	4,952	12,908
24	55.9	25.4	92.9	1,672	76	4,751	9,040
33	55.9	25.4	92.9	1,356	96	4,689	8,859
14	NA	NA	91.2	1,293	100	5,737	14,213

* Current Key MBTA Bus Route

For each route, an index value was assigned based on percentages or absolute numbers of POC, low-income (household incomes less than \$43,500 per year), and very low-income riders (annual household incomes less than \$14,500). Routes with the highest index values were identified as the most important for underserved riders. **In Metro Boston, these groups are more likely to use public transit as a primary mode of transportation but simultaneously have worse access to fast, frequent transit service.**

Based on the analysis, 15 routes have been identified for service improvements. The routes connect communities such as Chelsea, Roxbury, Dorchester, and Mattapan with the subway system, and include Key Bus Routes, as well as more local, neighborhood routes running an average of one bus every 30 minutes.

"The bus system is wack after 5pm! I have missed numerous job interviews because buses were so late!"
~ Erline, Dedham



MBTA Bus Routes

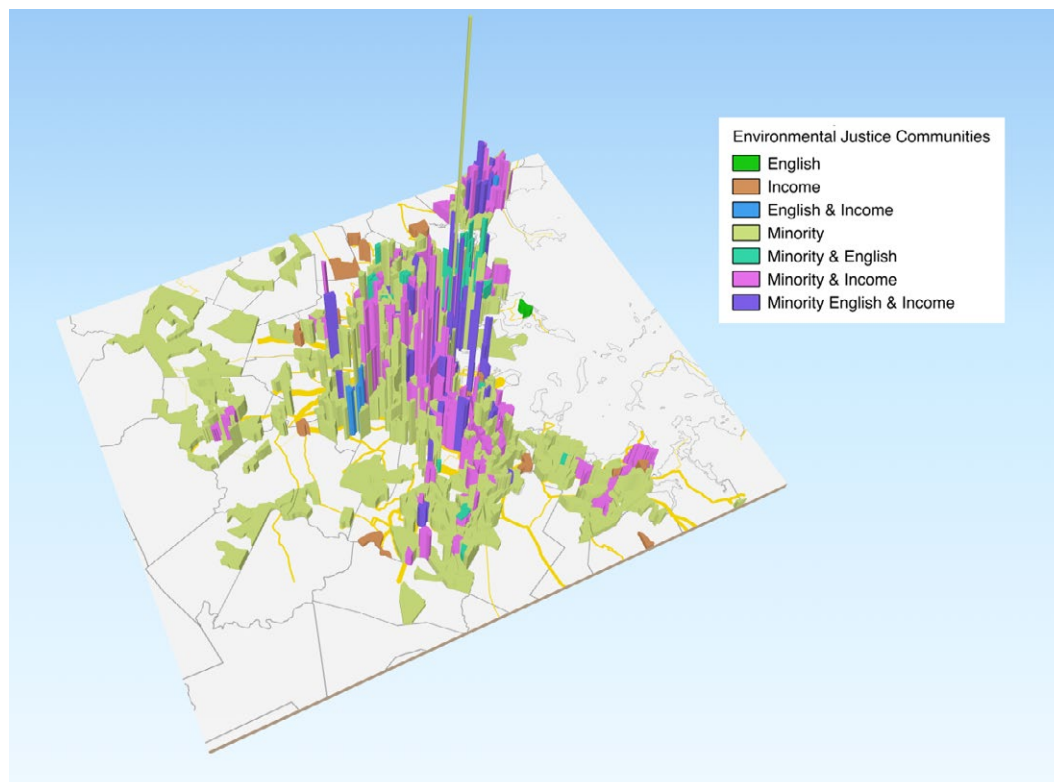
Top Priority Routes

- 22 Ashmont Station**
Ruggles Station via Talbot Ave
- 29 Mattapan Station**
Jackson Square Station
- 15 Kane Square/Fields Corner**
Haymarket Station
- 45 Franklin Park Zoo**
Ruggles Station
- 28 Mattapan Station**
Ruggles Station
- 44 Jackson Square Station**
Ruggles Station
- 42 Forest Hills Station**
Dudley Station
- 17 Fields Corner**
Andrew Station
- 23 Ashmont Station**
Ruggles Station via Washington St
- 31 Mattapan Station**
Forest Hills Station
- 26 Ashmont Station**
Norfolk & Morton Belt Line
- 111 Woodlawn**
Haymarket Station
- 24 Wakefield Avenue & Truman Highway**
Mattapan Station
- 33 Dedham Line**
Mattapan Station
- 14 Roslindale Square**
Heath Street Station

Top Priority Bus Routes

Taking a deeper dive on these selected routes allowed us to better understand their potential to serve more riders, especially those most in need of public investment. These high-priority routes overlap with several high-demand transit neighborhoods and existing Environmental Justice communities, including Roxbury, Dorchester, Mattapan, and Chelsea. Looking at this analysis in the context of where there are the highest rates of residents considered a part of Massachusetts' definition of Environmental Justice (EJ) communities reveals the likelihood of considerable latent demand in Roxbury, Dorchester, Chinatown, and Lynn.

Where New Bus Service Should Be Expanded:



Increasing service frequency and reliability for riders will be crucial for meeting these neighborhood demands.

Spatial analysis featuring density of EJ community members in the MBTA service area, with high concentrations in Roxbury, Dorchester, Chinatown, and Lynn. Spatial analysis by Ari Ofsevit.

As the MBTA prepares for the second phase of the Better Bus Project, which will include a network redesign and the potential for new service, it will be crucial to increase service frequency and reliability for riders in order to meet these neighborhoods' demands.

Increasing frequency along the 15 routes we have identified here, by upgrading existing local routes to Key Bus Route service levels and implementing bus priority surface improvements for all, could benefit more than 110,000 people living along these lines who are largely low-income, people of color, and limited in English proficiency. Expanding bus service along these routes would be a sure-fire way of getting more bus passengers on board.

EQUITY TAKEAWAYS

Despite changes in ridership, the bus system continues to serve high rates of at-need riders.

- ◆ Although there have been decreases in systemwide ridership in recent years, there are areas where ridership remains strong and some routes where it is growing. High ridership is not just contained to the Key Bus Routes, despite lower service standard levels on local routes. There also needs to be a strategy that accounts for shifting service needs on current local routes while maintaining high frequency on key transit corridors. Although many Key Bus Routes serve high rates of POC and low-income riders, there are also many lower frequency routes that do as well. Developing a more equitable approach to service planning needs to also provide improvements for these routes.

High ridership is not just contained to the Key Bus Routes, despite lower service standard levels on local routes.

Certain communities are underserved, and place-based strategies are still needed to tackle service inequities.

- ◆ Approaches such as SFMTA's Equity Neighborhoods could prove to be a helpful model for Boston, so long as they have sustained and meaningful community engagement and solutions are backed with swift, adequate action.

Process and implementation are key.

- ◆ Muni's Service Equity Strategy had an equitable vision but it did not translate into the kind of success these communities needed. This challenge echoes past planning efforts in Boston, such as the 28X. Transit officials need to work closely with community members, local elected officials, and advocates to ensure that planning processes build trust with underserved riders and lead to meaningful improvements in service. SFMTA's strategy of identifying short-term fixes on a one-year timeline could prove a useful model for building trust with community members.

Expansion

Overview & Challenges

Throughout 2017, LivableStreets teamed up with the Longwood Area Cyclists to conduct a multimodal transportation survey with 1500 employees, students, patients, and visitors traveling to and from the Longwood Area's healthcare and educational facilities. Among those surveyed, there was evidence of substantial latent demand for greater public transit access. Of a subgroup of motorists driving from neighborhoods and inner suburbs serviced by the MBTA, 36% of respondents said that they would like to switch to another mode – mass transit being the leading option.

Without appropriate action from policymakers and planners, the Longwood Area will continue to be gripped by gridlock despite the potential for more transit ridership. According to the MBTA's market analysis for the Better Bus Project, the Longwood Area is one of the top three origin points for trips generated within the entire MBTA service area, and by 2030 an estimated 13,200 more employees will be traveling to the district. This fast-paced development can be found elsewhere in neighborhoods just beyond the core service area of Downtown Boston, including Kendall Square, the Seaport District, and the Lower Mystic area.

It is simply no longer an option to not meet these transit demands. Transportation emissions remain the largest single contributor to greenhouse gases in Massachusetts, despite the passage of the Global Warming Solutions Act in 2008, and according to Inrix's 2018 report, Boston has become the most congested city in the United States. Without action from policymakers and planners, the region's economy and access to opportunity will be stifled while pollution increases.

Even under ideal circumstances, the MBTA's current service delivery policy is limited in its ability to meet existing transit demands, contributing to chronic overcrowding



Without action from policymakers and planners, the region's economy and access to opportunity will be stifled while pollution increases.

on critical routes. Local service, which includes the majority of MBTA's bus routes, is supposed to run every 30 minutes during rush hours and once an hour the remainder of the day. Key Bus service, some of the highest ridership routes in the system, should have 10 minute headways during rush hours, followed by 15-20 minutes the rest of the day. Even outside of rush hour, routes like the 111 and 66 have chronic overcrowding, and the overall lack of service frequency continues to be a leading reason why riders do not depend on the bus, according to MBTA surveys.

In addition to congestion, which can be addressed through improvements such as bus-only lanes and transit signal priority, the MBTA's service standards are hamstrung by the size of its vehicle fleet. Establishing the service goals that meet our growing region will require procuring more buses, especially higher capacity buses, to transport riders at greater frequency rates.

There are major barriers when it comes to dramatically expanding the size of the bus fleet. The MBTA currently has nine bus garages located within close proximity to the core service area; however, many of these sites are currently unable to meet today's needs. Only four garages have been built or repaired since 1980, and nearly all are at capacity, preventing any substantial net increases in the size of the bus fleet.

Without addressing the bedrock issue of the MBTA's bus fleet size and garage facilities, all riders will continue to be underserved. The MBTA's 2017 Integrated Fleet and Facilities Plan charts a course for how the agency can update its aging vehicle stock while also investing in improved facilities for bus maintenance and storage.

What still remains undetermined is how or where the MBTA will come by increased garage capacity to store a fleet size that reflects our region's transit demand. Estimating these numbers can help us weigh the opportunities and challenges that come with redesigning the bus network, as several transit systems have recently done. In our case study, we look to Houston to evaluate METRO's 2015 network redesign.

To envision some future possibilities for addressing these challenges, we have conducted a preliminary analysis to determine the following:

- ◆ What is the ideal number of buses the MBTA would need to provide higher frequency to at-need areas?
- ◆ Where is there potential for new or upgraded bus garage facilities?

There are major barriers when it comes to dramatically expanding the size of the bus fleet.

EXPANSION CASE STUDY: HOUSTON

In August 2015, Houston METRO launched their redesigned bus network. The redesigned bus network was created to make the system more useful to Houston's growing population while better integrating the bus system with Houston METRO's expanding light rail network.

In redesigning the bus network, Houston METRO weighed two goals of transit service planning against each other: the ridership goal and the coverage goal. The ridership goal aims to maximize a system's productivity by designing routes to serve the needs of the most passenger-dense areas. The coverage goal seeks to provide greater geographic access to transit, even in hard-to-reach locations. Houston METRO chose to design more toward the ridership goal and to increase the number of routes with a high frequency of service, especially in areas with a high number of transit riders.

The existing hub-and-spoke system was transformed into a grid system. The number of routes that followed circuitous itineraries or provided redundant service was reduced and resources were re-allocated toward high demand corridors. The route changes were significant and meant that 72% of existing riders were near a bus route with headways of 15 minutes or less, up from 49.5% before the redesign. Over 99% of existing riders were able to access service within walking distance, including 94% who could access service at the same stop.

In the year after the redesign, Houston METRO saw an 6.8% increase in ridership on its bus and light rail lines. Local bus ridership increased 1.2% while light rail ridership increased 16.6%. Weekend bus service was expanded to midday-weekday levels following the redesign, resulting in significant ridership increases: Houston METRO reported 13% more riders on Saturdays and 34% more on Sundays.

The redesign was successful in many regards but some concerns remain regarding the persistence of transit gaps within Houston METRO's service area. A UT-Austin study found that the redesign did not improve access to transit in some underserved areas. LINK Houston, local advocates for transportation equity, have pushed Houston METRO to further address the needs of underserved populations.

While LINK Houston commends the gains achieved through the redesign, they have called for the creation of more frequent transit routes, the expansion of service hours on twelve key routes, an increase in the reliability of service, and an increase in accessible facilities. While equity was not an explicit goal of Houston's redesign project, a willingness to work with the community could have helped to ensure that vulnerable populations were not left behind by network expansion.

Houston METRO is currently seeking public input for its METRONext regional transit plan, which will provide a plan to expand Houston's transit system and to provide increased

In the year after the redesign, Houston METRO saw a 6.8% increase in ridership on its bus and light rail lines.

service to Houstonians.

METRO BOSTON ANALYSIS

Service Capacity

The MBTA’s existing service delivery policy provides a framework for understanding how many buses would be ideally need to meet protocol. Currently, the MBTA bus fleet consists of approximately 1,067 buses, making it relatively small and with one of the highest rates of ridership per vehicle in the country. By comparison, Seattle’s system has 1,459 buses, New York City has 4,611, Philadelphia has 1,473, and DC has 1,514.

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Service Delivery Policy	Key Bus Routes (Buses per hour)		Local Bus Routes (Buses per hour)		Additional Buses Required	
	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak
Current MBTA service delivery policy ¹	6	4	2	1	67	17
CTA service delivery policy ²	6	4	3	2	193	125
Key route service every 12 min. (“walk-up service”) ²	6	5	3	2	193	144
Frequent service, all routes, all day ³	6	4	6	4	366	564

1: Low service scenario. 2: Medium service scenario. 3: High service scenario.

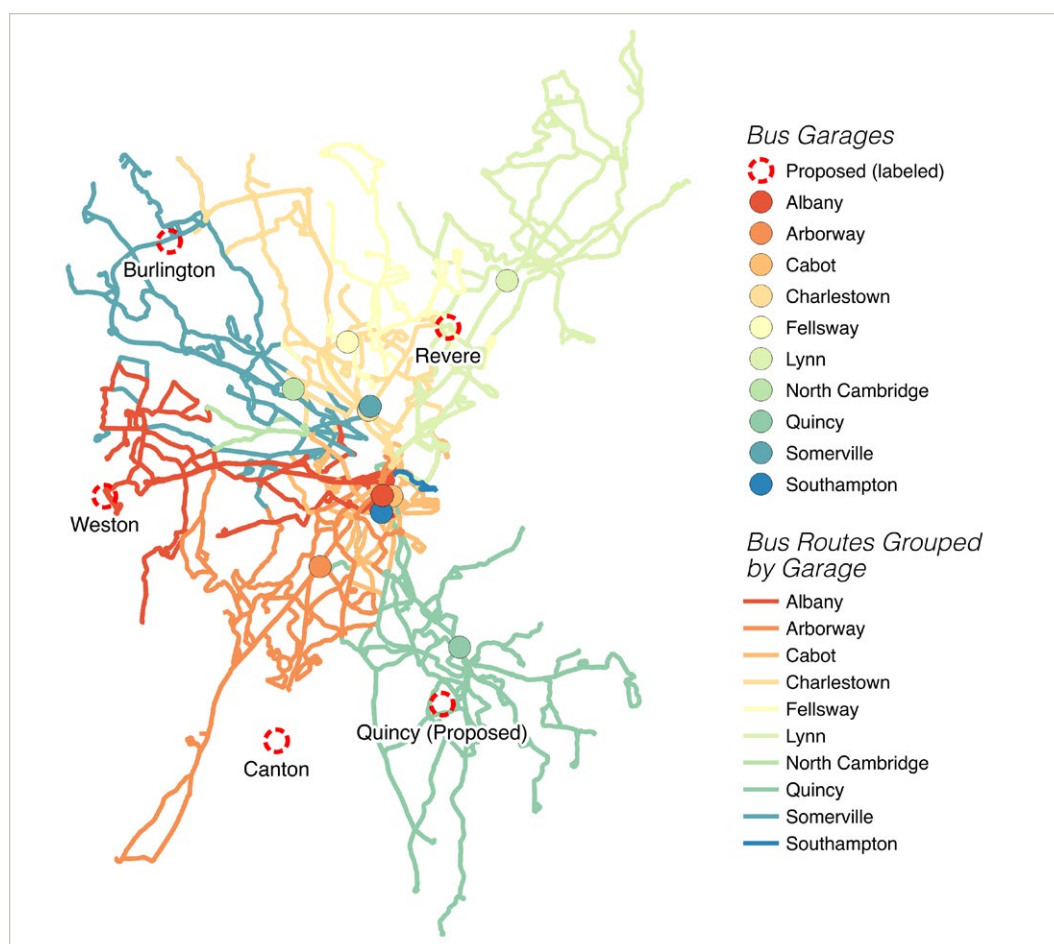
In order to build a system for the future, we need to exceed the MBTA’s guidelines and aim for higher frequencies and more trips to grow ridership. To evaluate new potential service standards, we reviewed service delivery policies from Seattle and Chicago and applied CTA’s guidelines: for high-frequency routes, six buses per hour during peak travel periods, with three buses per hour for less frequent local routes at peak hours. **Under these parameters, we conclude that the MBTA would need to procure at least 200 more buses, ideally as many as 366, to provide peak level service on all current routes.**

Buying new buses is not the main obstacle for the MBTA. The issue is figuring out where to store them. For that, we need to consider opportunities for expanding existing garage capacities.

Garage Facilities

Working with existing bus facilities will pose considerable hurdles for the MBTA, given that many of their garages are located in proximity to dense neighborhoods where real estate prices are rising like the South End, Roxbury, Charlestown, and Jamaica Plain. In addition to exploring purchasing new sites for garages, officials should also consider state-owned properties not far from existing service routes.

Proposed Possible Garage Sites on Existing MBTA or MassDOT Owned Land:



Developing new garages requires examining state-owned properties within striking distance of most service routes near the heart of the service area.

64 Hours: Closing the Bus Equity Gap

To do this, we analyzed state-owned parcels in and around Route 128 and adjacent highways, particularly Route 1, Route 3, Interstate 90, and Interstate 95. The advent of all-electronic tolling along the Massachusetts Turnpike, which dramatically reduced the footprint of tolling plazas, and the historical precedent of state right-of-way for unbuilt highways abandoned in the 1970s, provide two sources for redeveloping presently untapped land.

Based on this spatial analysis, we identified five highway sites in the region which could be repurposed for bus fleet facilities:

Municipality	Potential State-owned Location	Potential Bus Storage Capacity
Burlington	In the proposed location for the Route 3 interchange	50 buses
Revere	Within the Squire Road Circle (intersection of Route 1 and Route 60)	157 buses
Weston	In the former footprint of the Turnpike toll plaza on Interstate 90	71 buses
Canton	In the proposed location for the Southwest Expressway	35 buses



A proposed site by Squire Road Circle in Revere where Route 1 and Route 60 meet could allow for considerably more bus storage capacity in a service area seeing growing transit demands.

In particular, the Burlington and Revere locations could, when combined, potentially accommodate the additional 200 buses we propose for adequately meeting the region's service needs.

EXPANSION TAKEAWAYS

We need considerably more buses and additional garage facilities to meet even today's needs.

- ◆ According to our analysis, at the very least, 200 additional buses should be procured, and at least two new garage sites should be developed, possibly in Revere and Burlington. State officials need to approve new garage sites and interim solutions for storing necessary buses in order to provide riders with adequate service levels. There also needs to be an investment in the human capital of the MBTA's bus network by teaming up with municipalities and non-profit organizations to provide more job-training opportunities to recruit more bus operators.

According to our analysis, approximately 200 additional buses should be procured, bringing the MBTA bus fleet to approximately 1,300.

The ridership and the coverage goals are critical for redesigning bus networks, but we have to also think about commute times and which riders are affected by service changes.

- ◆ CTPS' recent 2015–2017 MBTA passenger survey provides a detailed route-by-route overview of riders' demographics. Moving forward, policymakers should apply this information to ensure they understand how service changes could affect different communities.

Cost-neutral solutions have their limits.

- ◆ Although the first phase of the Better Bus Project is a critical step in the right direction, cost-neutral solutions alone are unlikely to lead to significant gains in ridership. Making investments in an expanded bus fleet during the second phase, the network redesign, will be crucial for developing meaningful increases in ridership.

Vision for Equitable Expansion & Policy Recommendations

To tackle the dual needs of investing equitably in our riders and expanding our system to meet the needs of more riders, we need to develop a cohesive vision for equitable expansion. Moving our bus system forward needs to mean both increasing ridership and making commutes shorter, more reliable, and more accessible for at-need riders.

In Metro Boston, the City of Everett has led this charge with a series of fast, targeted improvements to benefit buses on city streets. Since 2016, Everett's mayor and city planners have successfully tested out a suite of bus priority treatments through quick, responsive pilots rather than traditional project planning timelines.

The results have been remarkable in one of the region's most transit-dependent communities. After implementing a mile-long rush hour bus-only lane along Broadway, the city's main commercial corridor, travel times for bus routes shortened by 20 to 30%. These benefits have built momentum for more bus upgrades, and city officials are now exploring expanding the priority lane down Broadway and elsewhere in the city.

Everett's successes point to the need for MBTA officials and municipal leaders to rethink transit planning to prioritize cost-effective surface improvements in tandem with service upgrades.

There now needs to be a regional approach that encourages municipalities, community organizations, and the MBTA to work together to ensure we are making the concerted strides we need to close the equity gap and provide Boston area residents with more reliable, sustainable transit. Approaching improvements from a pilot-oriented process



We need to develop a cohesive vision for equitable expansion.

that could take weeks to implement as opposed to years-long capital construction is critical in order to respond to the breadth and depth of the region's transit crisis.

As Jay Monty, Everett's transportation planner, frames it, "the pilot is the process." Rather than proposing improvements abstractly, officials should first look for ways to provide community members with direct opportunities to experience bus priority first-hand. Leading community engagement through pilots with clear evaluation criteria should become the main outreach tool for Metro Boston planners, especially in bus-dependent communities, in order to catalyze transit improvements.

EQUITABLE EXPANSION CASE STUDY: SEATTLE

King County Metro's Service Planning Guidelines include social equity as a factor in annual system evaluations performed by the agency. This ensures that the service planning process will not ignore the needs of the Seattle metro area's most vulnerable communities as King County Metro expands the bus network to meet growing demand. The inclusion of social equity in system evaluations aligns King County Metro's planning procedures with the City of Seattle's goal of advancing social justice through equitable transportation planning.

King County Metro conducts annual system evaluations to identify whether routes are providing sufficient service and if route restructures, additions, or reductions are necessary. Corridor analyses and route performance analyses are used to determine this. Route performance analyses measure if a route meets operations goals such as passenger loads and reliability. Corridor analyses look at geographic and social attributes to measure whether a route serves dense areas or includes target populations.

These corridor analyses include a social equity score that make up 25% of a corridor's evaluation. Corridor productivity (proximity to households and jobs) and geographic value make up the remaining 50% and 25% of the service level score, respectively. Corridors receive their social equity score according to their proportion of boardings in census tracts with above average to just below average levels of low income (200% of the federal poverty level) or POC riders. Corridors receive 5 points if they have above average to average levels, 3 points if they have average to just below average levels, and 0 points if they have below average levels. They are scored separately on both measures and can receive up to 10 social equity points.

Social equity scoring helps King County Metro ensure that service planning decisions consider the needs of vulnerable communities. Each service planning decision is made with social equity as an inherent part of the process. Despite these efforts, however, King County Metro has found that the percentage of both low-income and minority census tracts within a quarter-mile walk to a transit declined in 2017. 71% of low-income tracts were within a quarter-mile walk in 2017, compared to 73% in 2015.

Social equity scoring helps King County Metro ensure that service planning decisions consider the needs of vulnerable communities.

65% of minority-census tracts were within a quarter-mile walk in 2017, compared to 68% in 2015. King County Metro attributes these declines to displacement of low income and minority populations. Efforts to increase service to these populations may need to take a different form if King County Metro hopes to provide equitable transportation to all.

The City of Seattle has committed itself to filling transportation gaps for its low-income and POC residents. In 2017, the Seattle Department of Transportation began its Transportation Equity Program with the aim of improving access to for all. Its current activities include working with King County Metro to provide pre-loaded reduced fare cards to low-income residents and convening a Transportation Equity Workgroup to help create a framework for equitable transportation goals for Seattle.

POLICY RECOMMENDATIONS

In reviewing our analysis of existing bus service needs and national case studies, we have developed the following three recommendations for state and local lawmakers, MBTA policymakers, and community members as the roll-out for the Better Bus Project continues over the next few years:

Create planning and service programs that invest in the region's equity needs:

- ◆ Develop a social equity scoring framework like Seattle's to guide the second phase of Better Bus Project. Establish tools for measuring the MBTA's progress when it comes to minimizing service disparities among riders.
- ◆ Develop an Equity Neighborhoods framework, similar to SFMTA's approach. Work with municipal partners, advocates, and community organizations to create meaningful ways to engage with riders, identify issues on the ground, and prioritize fast, operational improvements to demonstrate the benefits of better buses.
- ◆ Redefine the Key Bus Routes program and adopt more flexible guidelines to allow for greater service frequency for routes with high rates of underserved riders.

Invest in a bus network that reflects the transit demands of the region:

- ◆ In order to provide better service for Metro Boston residents, more vehicles will be needed to deliver higher frequency standards. Expand the bus fleet by procuring **at least 200 additional buses** to meet existing transit demand. Increase frequency on local routes serving high rates of low-income and people of color riders, including the 29, 45, 44, 42, 17, 31, 26, 24, and 33, by upgrading them to Key Bus Route service standards (10 minute headways

during rush hours).

- ◆ Renovate existing garage facilities that have not been improved in the last 25 years and prepare sites for the transition to an electric fleet. Develop a plan for building additional garages by procuring new land close to the bus service core or by redeveloping state-owned parcels. For new land acquisitions, ensure that any potential facilities do not disproportionately impact Environmental Justice communities, especially those already home to existing garages. For redeveloping state-owned parcels, consider sites in the following municipalities: Burlington, Revere, Weston, Canton, and Quincy.
- ◆ Invest in bus operators themselves. Partner with service area municipalities to promote job career opportunities as MBTA bus operators, especially within Equity Neighborhoods. For example, New York City and Los Angeles have high schools dedicated to training students for the public transit job sector. In the Twin Cities, Metro Transit has developed an apprenticeship program to attract and train bus operators and mechanics. Similar programs in Boston can further workforce development for the MBTA and provide pathways to opportunity for Metro Boston residents.

Develop state-municipal partnerships that accelerate transit improvements:

- ◆ MBTA and MassDOT should develop better grant-based initiatives, similar to the Complete Streets program, to incentivize municipalities to invest in bus priority improvements (bus-only lanes, transit signal priority, bus stop improvements, etc.) on Key Bus routes and proposed Equity routes. MBTA and MassDOT should dramatically increase investments in capital funds that provide communities with the resources they need to improve regional transit on major transit corridors within the next two years. Such programs could be made statewide (outside the MBTA service area) by addressing similar transit needs for communities serviced by RTA's.
- ◆ To accelerate bus upgrades on local streets, cities and towns within the MBTA service area also need to do their part by allocating dedicated funding and staffing to work with state transit officials during the Better Bus Project and beyond.
- ◆ Develop a more meaningful role for bus-dependent communities on the Fiscal & Management Control Board (or future MBTA governance body) by dedicating a seat for a rider or municipal representative from Equity Neighborhoods such as Roxbury, Dorchester, Chinatown, Chelsea, and Lynn. Consider having a board placement for a representative of Boston / Cambridge, and a separate rotating placement for commuter rail service area.

MBTA and MassDOT should dramatically increase investments in capital funds that provide communities with the resources they need to improve regional transit on major transit corridors within the next two years.

Advocacy Agenda & Conclusion

Throughout the first phase of our Better Buses campaign, few tactics proved more effective than engaging with riders in-person at bus stops, where they are grappling with our region's transit crisis first-hand. By connecting with riders, sharing their voices with policymakers, and providing them with the resources to more effectively advocate for themselves, we have seen clear instances of service improvements.

To advocate for these policy recommendations, LivableStreets will continue to train, mobilize, and coordinate Street Ambassadors to meet riders where they are and develop avenues for changing our bus system for the better.

State and local elected officials also play a major role in shaping planning priorities, cultivating support for improvements, and appropriating funding for operational and capital expenditures. LivableStreets will reach out directly to regional leaders, particularly state lawmakers, to promote the benefits of bus priority in Boston and encourage appropriate funding and political support to ensure bus improvements reach everyone in Metro Boston, starting with those who need them most.



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