Boston In 2030

Understanding Needs

Boston in 2030

Boston's ongoing transformation will continue over the next 15 years. A strengthening economy, an increase in population, the effects of climate change, and changes in technology will all place new and greater demands on the city's transportation systems to reach more places, adapt to new pressures, and keep users safe. Measuring broad trends and understanding their impact on the capacity of today's infrastructure and mobility choices to provide economic opportunity, equitable access, and climate resiliency in the future is necessary to help identify what projects and policies may be needed over the next several decades.

This chapter is a two-part needs assessment. First, it projects the expected changes over the next 15 years in population, jobs, travel patterns, and transportation-related emissions for Boston's neighborhoods based on a standard transportation model. Second, it assesses the current performance of our existing transportation systems relative to the aspirational targets identified in the Go Boston 2030 Vision Framework in order to establish a clear baseline. In both sections, the needs assessment and analysis point to the types of strategies and actions needed to address the identified gaps and shortfalls.

By 2030, the number of daily trips starting in Boston on buses and trains will increase by a third, from approximately 500,000 to 675,000, straining a transit system that is at capacity today.

By 2030, the number of daily trips from the region into Boston will increase by 6%, to a total of approximately one million. Without new transit connecting Boston to the region 70% of these trips will be in congestion-creating private vehicles.

There are an average of over 20 fatalities and 200 serious injuries on Boston's streets every year. To eliminate these by 2030 every new transportation project will need to adopt safety as its primary design criteria.

Today very low income families in sections of Roxbury, Dorchester and Mattapan bear a transportation cost burden of 33% of their incomes compared to 13% citywide. This disparity will persist without proactive transit investments in these neighborhoods.

By 2030 Boston is expected to gain more than 50,000 jobs, many of them in fast-growing areas such as the Seaport and the LMA. Without expanded high-capacity transit access to these districts, Boston's technology, life-sciences and financial sectors will be impacted.

The current citywide bicycling mode-share of 2% will remain flat without new stress-free bike infrastructure to catch up with neighborhoods such as Jamaica Plain, Fenway, and Allston that already have shares above 6%.

As early as the 2050's, 7% of Boston's land area will be exposed to more frequent 24-hour rain events and 10-year floods, impacting unprotected transit service and major thoroughfares.

Even though GHG emissions in Boston are expected to decrease by 25%, vehicle miles traveled in Boston will increase by 5% by 2030 due to growth in population and jobs.

Projecting Transportation Needs for Boston

Projecting Boston's Growth

The *Boston Today* chapter identified gaps in Boston's existing transportation systems that contribute to inequities, lost economic opportunity, and a lack of preparation for the impacts of climate change. If there were no policy changes or new projects, many of these gaps would pose even greater challenges in the future; though a small number of gaps would improve as population, jobs, and travel preferences shift over time. To understand how these gaps might change, the Boston Transportation Department (BTD) commissioned the state agency responsible for transportation modeling, the Central Transportation Planning Staff (CTPS), to develop a regional travel model of potential travel flows for the year 2030. The CTPS regional model projected where in Boston and the surrounding region people will likely live and work, where the number of residents and workers will increase or decrease, and the estimated number of people moving by car, transit, bike, and on foot between each of Boston's neighborhoods and throughout the larger region. This regional travel model assumes that policies remain unchanged and assumes the completion of a limited number of projects that are already budgeted, such as new higher-capacity Orange Line railcars or the completion of the Green Line extension to Medford. The *Go Boston 2030 Action Plan* recommends additional policies and projects to fill the remaining gaps, beginning on p127.

Meeting Go Boston's 2030 Aspirational Targets

The *Goals and Targets* chapter established 35 aspirational targets to improve transportation in an equitable, economically supportive, and climate resilient manner. The targets are derived from the public's goals of improving the access, safety, and reliability of Boston's transportation system along with experiential quality, the use of technology, affordability, resiliency, governance, and health. Every target can be tracked over time, providing a "scorecard" by which to measure progress towards the goals of the Vision Framework. Since they are aspirational, the targets provide an objective that may not be achieved by 2030; however, they still provide a clear guide for future planning and programming and ensure that implementing the policies and projects in the Action Plan will work to realize the Vision, from the smallest signal timing decisions to large-scale transit investments.

Accommodating a Growing Population

Population Projections

By 2030, the population of Boston is projected to grow by approximately 15 – 17%, to a city with 710,000 to 724,000 residents. More than a third of this population growth is anticipated in the Seaport, the South End, Downtown, East Boston, and Dorchester. The combined growth in these neighborhoods will be approximately 37,000 people—roughly the same as the total population of East Boston in 2017.

The Seaport's population will nearly triple, many new residents will move into Downtown, and new residents settling in traditional neighborhoods will move into areas closer to the core, such as Dorchester, East Boston, and Roxbury. With the notable exception of Brighton, the neighborhoods further from Downtown will experience relatively modest growth.
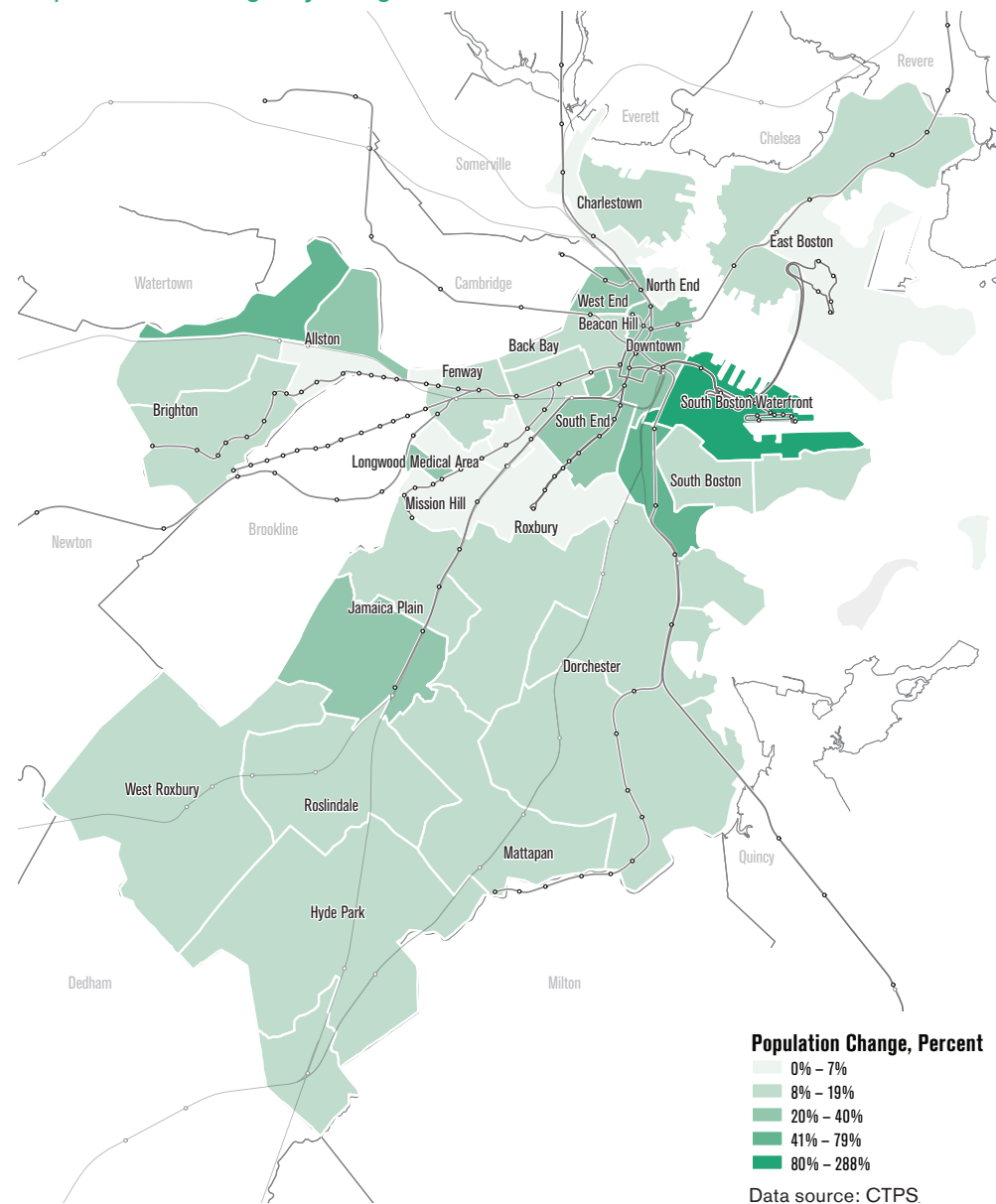
Where Actions Are Needed

Dorchester is projected to have over 10,000 additional residents in 2030 and residents already experience commute times above the city average today. The Red Line and the Fairmount Line traverse the neighborhood, but stations are only within easy walking distance for a fraction of the residents. Though the Fairmount Line runs through the neighborhood's geographic center, its infrequent

> **Though the Fairmount Line runs through the geographic center [of Dorchester], its infrequent service and poor pedestrian access currently limit its utility.**

service and poor pedestrian access currently limit its utility. Bicycle routes are limited and mostly link to local destinations. Service improvements to existing rail lines complemented by additional crosstown bus connections are needed to move residents within the neighborhood and to growing job centers such as the LMA and the Seaport. Investments in safer cycling facilities

Brighton residents rely heavily on the Green Line, with frequent stops for passenger pick up and traffic lights, and on a limited number of hilly bike routes. Largely separated from the rest of Boston by Brookline, the current residents and the 8,000 new projected residents need better bus service, particularly from Oak Square, and improvements to the Green Line that make a trip from Cleveland Circle to downtown faster. A protected bike corridor through the neighborhood and better local connections to existing bike routes are also needed.
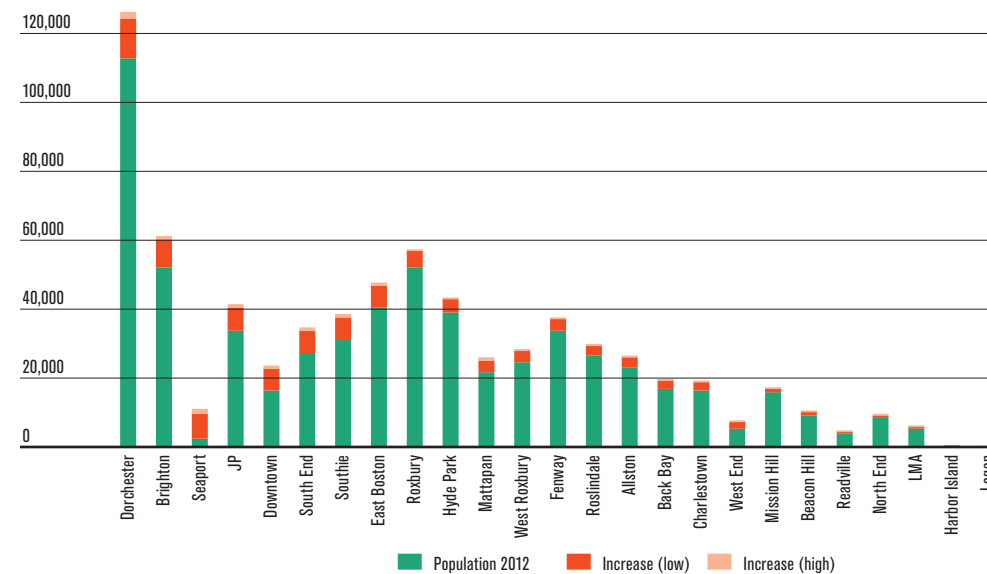
The rapid rate of population growth in the **Seaport** requires new and improved connections to other neighborhoods and the broader region for all modes. The *South Boston Waterfront Sustainable Transportation Plan* projected substantial roadway congestion if multimodal improvements are not made and recommended a number of specific strategies. To support walking, cycling, and transit riding at high rates among the growing residential population, the neighborhood needs an improved public realm with a particular focus on gateway

are needed to improve conditions for families making trips to Main Street Districts and to support commutes from and across the area.

intersections to the district, bicycle accommodations with connections through Southie and over the Fort Point Channel bridges, and new transit service that includes local circulator service and ferry connections across the Harbor.

While new and existing residents of **Downtown** and the **South End** are close to growing jobs centers in the LMA and the Seaport, the relatively short trip can be difficult for cyclists due to the lack of a continuous protected bike route and a handful of complex intersections that are unfriendly to people walking and biking. Though residents are close to transit, those who commute to areas like the Seaport or the LMA often have a long walk at one end of the trip or a transfer, often to a bus. Better cycling connections into and out of these neighborhoods, improved pedestrian connections around freeway access points, and more frequent transit service to reduce wait times at transfer points are needed.

East Boston also has longer than average commute times. The Blue Line provides good connections to Downtown, but reaching the LMA, the Seaport, and Kendall Square requires one or more transfers. Bikes are not allowed on the Blue Line during peak commuting periods and there are no bridges to downtown, so few residents can bike to jobs or destinations elsewhere in Boston. Finally, even drivers are challenged by peak hour congestion in the Ted Williams Tunnel and on Route 1. To support population growth in East Boston, last mile connections to the Blue Line need to be improved, a way to support commuter cycling is needed, and transit links that reduce the total number of transfers are critical.

Population Change by Neighborhood 2012 – 2030

Population Change, Percent
- 0% – 7%
- 8% – 19%
- 20% – 40%
- 41% – 79%
- 80% – 288%

Data source: CTPS

Arina's Trip

Arina lives in East Boston. Each morning she walks to the Blue Line at Airport Station, rides in to State, walks to North Station, and takes a MASCO shuttle to the Longwood Medical Area. She chooses to walk to North Station as she does not trust the Orange Line connection to be consistent. As part of her job, she helps people find alternatives to driving to the LMA, so she is very aware of the need for improved transportation options to the medical district.

Population Growth by Neighborhood

Legend: ■ Population 2012   ■ Increase (low)   ■ Increase (high)

Data source: CTPS and Imagine Boston

Getting More People to Work

Jobs Projections

By 2030, Boston is projected to gain almost 50,000 jobs—13,000 of which will be in the Seaport. Roughly nine million new square feet of commercial development is anticipated in the Seaport by 2030, in addition to the redevelopment of existing commercial space, new housing construction, and expansion of convention and hotel space. The Metropolitan Area Planning Council (MAPC) also projects that the Longwood Medical Area (LMA) will add almost four million square feet of commercial development.[1] In both areas, there are also speculative projects in the early phases of the planning 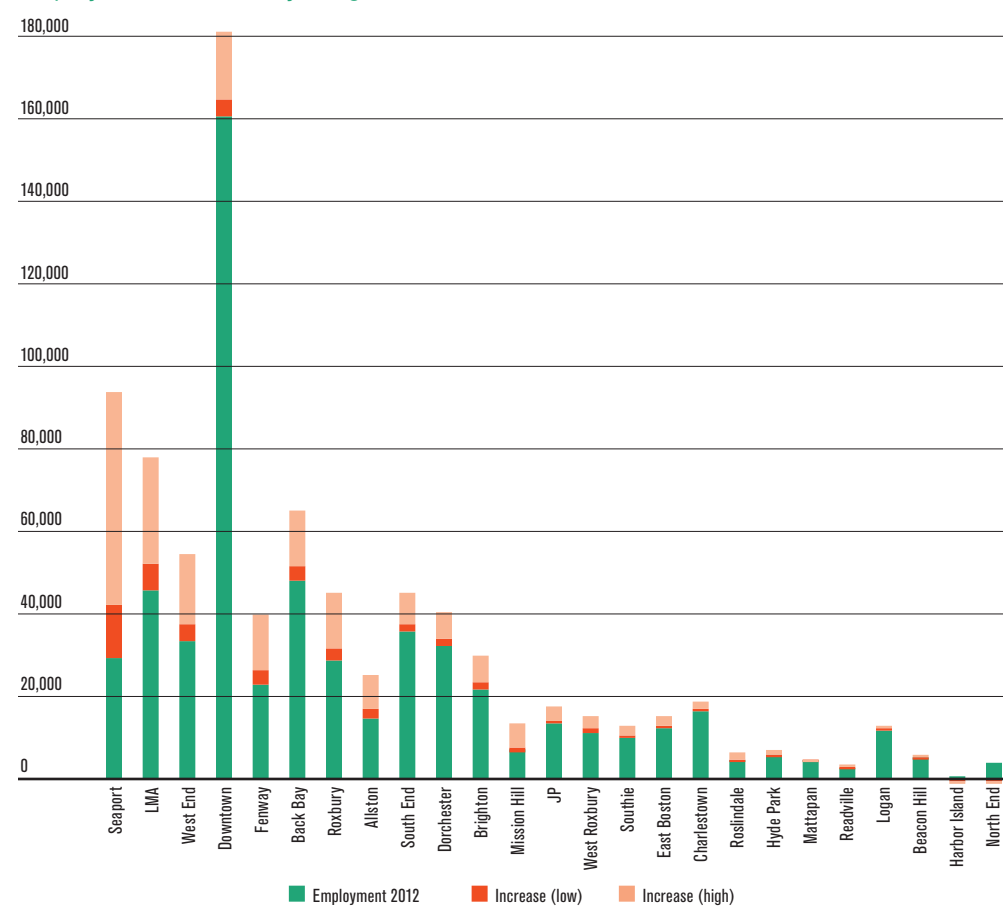process that could accommodate thousands of additional jobs. The transportation infrastructure should be prepared to accommodate a high concentration of workers in districts that are already attracting a large workforce today. Beyond these job centers and the downtown, new commercial growth areas have been identified by Imagine Boston 2030 in the Widett/Newmarket area, Beacon Yards, Suffolk Downs, Sullivan Square, and Readville.

> *… transportation infrastructure should be prepared to accommodate a high concentration of workers in [the Seaport and LMA] that are already attracting a large workforce today.*

Where Actions Are Needed

While the **Longwood Medical Area** and the **Seaport** continue to grow as significant employment hubs, they are not well aligned with the historic radial transit pattern which is concentrated and interlocking in the Downtown, a job center that is well-served. Although the Orange Line and multiple branches of the Green Line serve the edges of the LMA, only buses and shuttles serve its core. The relatively new Silver Line runs through the center of the Seaport, but is often at capacity and connects only to the Red Line. To support continued job growth at such high density, new and improved direct transit and bicycling connections from densely populated neighborhoods are needed, particularly from Dorchester, Mattapan, and Hyde Park. To be most effective and improve transfers where needed, routes should connect hubs like Dudley Square, Uphams Corner, Cleary Square, and Widett Circle to get into the Seaport or LMA. (See box on p105)

Allston has significant projected job growth relative to its current employment base at Harvard University, and based on the expected commercial development in Beacon Yards and Allston Landing. Both new areas are relatively isolated today due to the barriers formed by the Charles River, the rail yards, and the Mass Pike. To connect these areas to the surrounding neighborhood fabric, new north-south streets are needed along with high-quality bicycle and pedestrian accommodations linking to
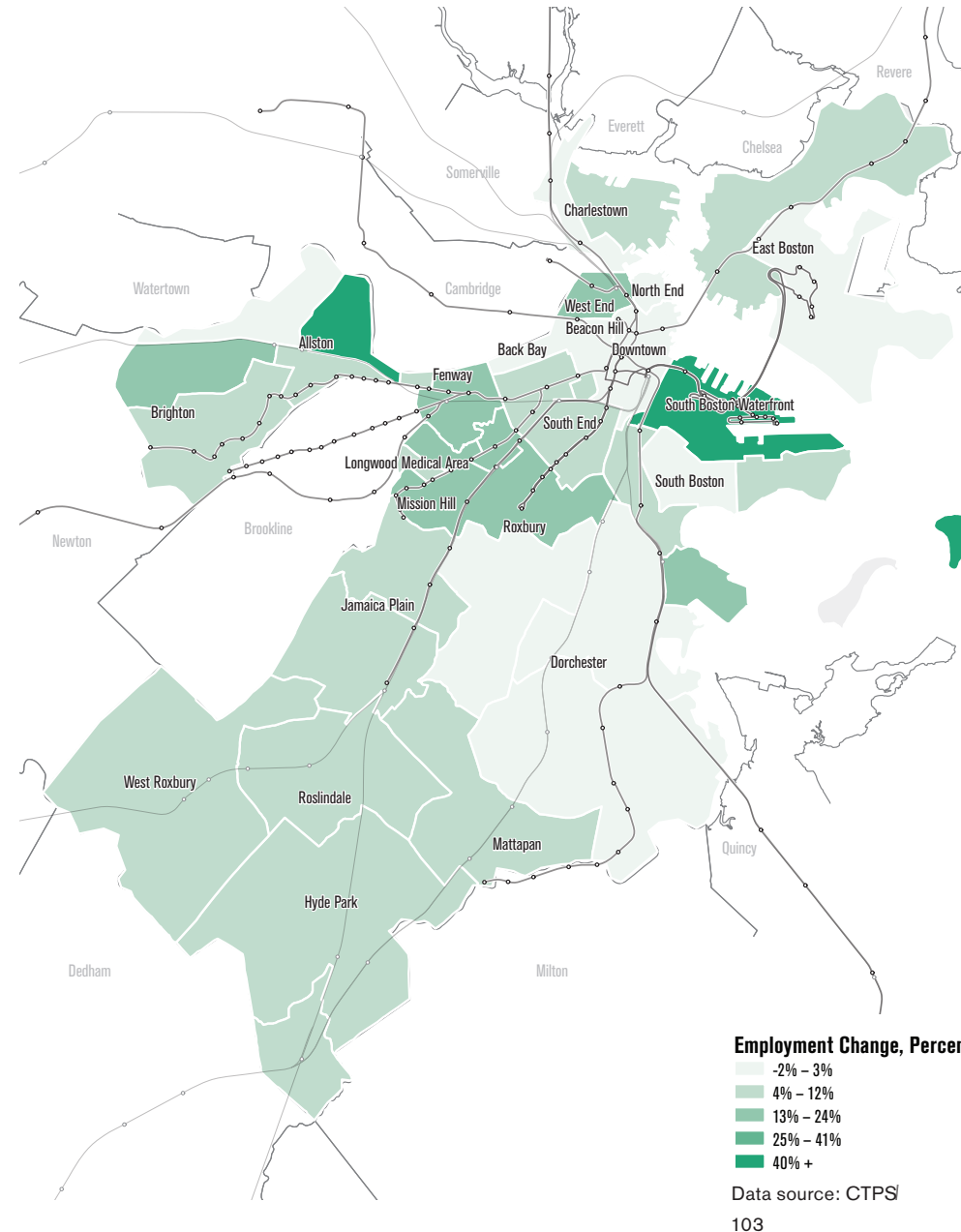
Commonwealth Avenue/North Beacon Street and Cambridge. In addition to new train stations for commuter rail service, more frequent rail service and improved radial bus connections are also needed.

The **West End** and the area around Bulfinch Triangle are well-served by North Station and the Charles River bike path, but these connections only benefit northern commuters. To support the projected job growth in the West End, connections from the south are needed including transit connections from South Station, the Blue Line, and Silver Line. A cycle track is under construction on Causeway Street, but protected bike connections to and through downtown are needed to improve cycling access from most Boston neighborhoods.

Much of the remaining projected job growth will occur in the existing commercial neighborhoods that lie within a triangle between North Station, South Station, and the Fenway—areas well-served by the historic subway system. The only other notable job growth area is at Columbia Point near UMass-Boston, where cross-town transit connections and safe bicycle access from Dorchester and Roxbury need improvement. Some degree of job growth is also projected in several growth areas selected by Imagine Boston 2030 as concentrations of future development. These include Readville, Widett Circle, and Suffolk Downs, where additional transit service and an extension of the protected bicycle network will be needed to accommodate sustained growth past 2030.

Employment Increase by Neighborhood

Data source: CTPS and Imagine Boston

Legend: ■ Employment 2012 ■ Increase (low) ■ Increase (high)

Employment Growth by Neighborhood, 2012 – 2030

Employment Change, Percent
- -2% – 3%
- 4% – 12%
- 13% – 24%
- 25% – 41%
- 40% +

Data source: CTPS

Matt's Trip

Matt lives in the North End. Matt has the kind of trip that wasn't possible 15 years ago, or even five—he walks down the Greenway with his son "Chewie" to take him to daycare and then grabs a Hubway bike to finish his commute to Black Falcon Pier–no matter the weather.

Matt questions whether street signs can be moved from the sidewalk to allow people in wheelchairs, with strollers and/or with groceries to walk on narrow North End streets. For his commute into the Seaport, he would like to see protected bicycle facilities to help him get to work safely.

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[1] This land use model falls short of new growth projected by other organizations; however, it should be noted that projected land use often includes many speculative projects and some are likely to be delayed past 2030. Also, net change is calculated after accounting for demolition or conversion of existing floor area. Therefore, the total new growth is likely to be larger than the net change, especially in districts with large amounts of industrial or obsolete buildings.

The CTPS Regional Model

Projections of future population growth can be influenced be a wide variety of factors beyond the control of the City, from simple decisions by local property owners to the unpredictable effects of global policy changes. Developers, institutions, municipal government, the State, banks, universities, and the Federal government all project different numbers for how Boston might change over the next 15 years. The Boston region is fortunate to have a single agency, the Metropolitan Area Planning Commission (MAPC), which works to reconcile these disparate voices and project growth in a balanced manner. For Go Boston 2030, MAPC's projected growth for 2030 was used given the regional nature of Boston travel; however, future growth may exceed or be less than these projections.*

Anticipating Growth

Go Boston 2030 land use model, net change in nonresidential square footage, 2010 – 2030		Other Possible Growth Projections
Seaport	8,820,000	The South Boston Waterfront Sustainable Transportation Plan projected a net increase of 12,000,000 non-residential square feet of new buildings by 2035.[2]
Longwood Medical Area (LMA)	3,770,000	The Medical and Scientific Community Organization (MASCO) projected that the Longwood Medical Area (LMA) will add 6.9 million square feet.[3]
All Boston (including areas above)	32,862,686	

* MAPC noted that its model falls short of the new growth projected in the Seaport and the LMA; however, projected land use often includes many speculative projects, and some are likely to be delayed past 2030. Also, net change was calculated after accounting for demolition or conversion of existing floor area. Therefore, the total new growth is likely to be larger than the net change, especially in districts with large amounts of industrial or obsolete buildings that will be removed.

[2] South Boston Waterfront Sustainable Transportation Plan, 2015. Retrieved from *www.massdot.state.ma.us/Portals/17/docs/Studies/SBostonWaterfrontFullReport_jan2015.pdf*

[3] MASCO, Annual Report FY2015, Retrieved from *www.masco.org/system/files/downloads/masco/masco_annualrpt_fy2015_final.pdf*

Targeted Mixed-Use Growth Areas

Imagine Boston 2030 outlined three types of growth for different areas of the city.

Existing Neighborhoods → Enhance Neighborhoods

In predominantly residential neighborhoods, improvements to the public realm and context-sensitive new construction will be focused on neighborhood vitality, local services, and housing affordability. Investments should enhance the quality of life in the community, increase access to opportunity, and affirm a distinct sense of neighborhood identity.
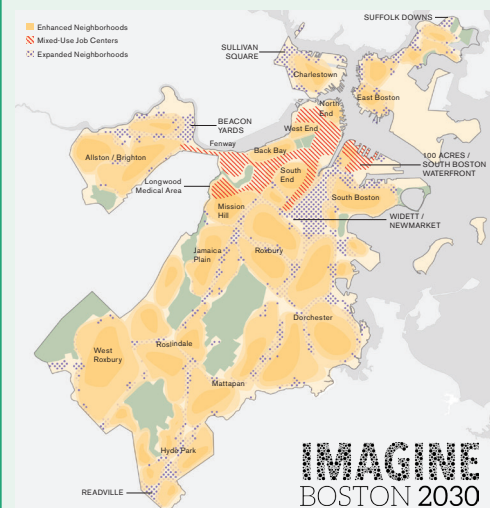
Commercial Core → Encourage Mixed-Use Cores

In industrial, institutional, and commercial centers where walking and transit use are already supported and dense, high rise buildings fit into the fabric, growth will continue to densify. Mixed-use buildings and districts will foster a mix of job and housing growth while providing sufficient amenities to support residents, workers, and visitors.

Edge Areas → Expand Neighborhoods

Boundaries between commercial cores and existing neighborhoods that are currently occupied by a mix of industrial and transportation infrastructure and vacant land can be developed to stitch together the city fabric. Mixed-use development here can reduce housing pressure in existing neighborhoods and be transformed into transit-accessible districts.[4]

With housing and job growth, open-space and public realm investments, and thoughtful transportation improvements, these edge areas can become **Expanded Neighborhoods** and potentially **Mixed-Use Cores**.

These areas are constrained today and will require significant transit investments to serve the concentrated mixed-use developments that are underway and planned:
- Beacon Yards is near but not connected to one of the most congested bus corridors in Boston and to the B Green Line.
- The South Boston Waterfront relies mostly on the Silver Line, which is nearing capacity.
- The Newmarket/Widett area is primarily served by local buses with infrequent commuter rail service.

These areas are served by transit today, but they lack adequate connections for people traveling on foot and by bike:
- Sullivan Square is served by the Orange Line and 12 bus lines but it is difficult and unpleasant to walk to or from Charlestown.
- Suffolk Downs is served by the Blue Line, but like the rest of East Boston, people cannot walk or bike to the rest of the city without a circuitous trip on unfriendly bridges.
- Readville has regular commuter rail service, but does not have protected biking connections to most other neighborhoods.

[4] Adapted from Imagine Boston 2030 Expanding Opportunity DRAFT p.24

Planning in the Seaport

The *South Boston Waterfront Transportation Plan* projected growth, identified capacity constraints, and provided a detailed needs assessment for the area. The principal objectives of the recommendations included in the plan included:


- Improve regional access—improve connectivity to the regional highway system that could reduce travel delays and the number of vehicles that are diverted from the regional highway system to the local street network
- Expand community connections—improve the connectivity between the waterfront and adjacent communities such as the traditional South Boston neighborhood and the South End
- Enhance internal waterfront mobility—improve the connectivity between key destinations within the Seaport district
- Improve public realm—make improvements to the physical environment that are visible and accessible to the public throughout the district
- Implement supportive management strategies and policies—improve the strategy and policy decisions that affect transportation infrastructure within the district
- Maintain a state of good repair—ensure that all capital assets are fully functioning and are rehabilitated or replaced before the end of their design life

Specific recommendations included transit, street, pedestrian, and bicycle strategies. Go Boston 2030 incorporates key findings and projects from the plan, focusing on those that best meet the goals and targets outlined in the Vision.

Planning in the Longwood Medical and Academic Area

MASCO, a non-profit supported by Longwood Medical and Academic Area (LMA) institutions, pursues programs that promote a sense of community among its members for the benefit of those who live, work, study, or receive care in the area.
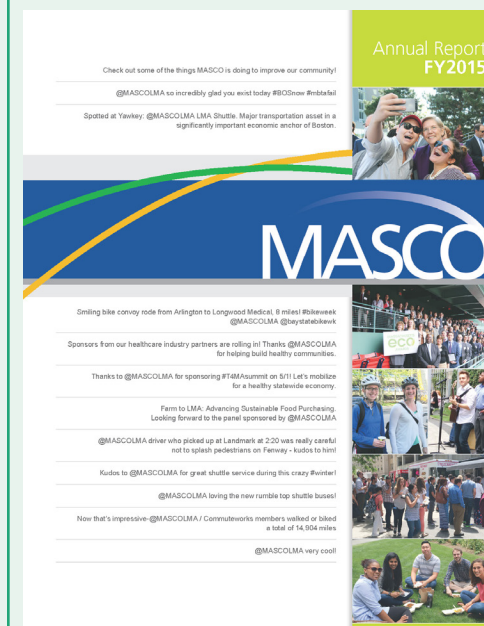
MASCO estimates that over 46,000 people from throughout the state work in the district and generate over $134 million in income tax revenue each year. In its 2015 annual report, MASCO highlights how the area is in the process of growing significantly by 2030 and identifies transportation challenges that will need to be addressed in order to sustain growth beyond the capacity of the robust existing shuttle service. They recommend particular transit investments including the use of a federal grant to expand Ruggles Station and the development of a transit hub within the district. MASCO is also addressing issues such as winter weather conditions, truck deliveries, and the need to maintain a safe walking, bicycling, and driving environment. Go Boston 2030 has incorporated key transportation strategies identified by LMA institutions and include them in its project and policy recommendations.
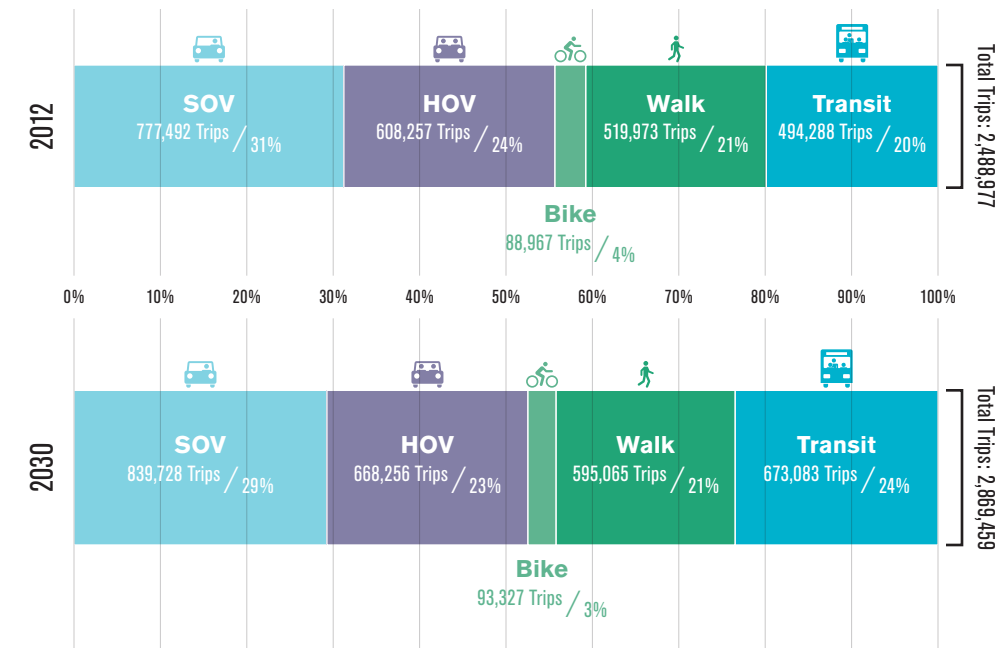
Changing Travel Patterns and Modes

Boston's transportation systems need to be prepared for the increased number of residents, workers, and trips projected for 2030. Drawing on data from travel surveys, land use projections, socioeconomic trends, and calculations of travel times and delays, the regional travel model estimated how people might choose to travel between home and work, school, errands, and other destinations in the future.

For 2030, the regional travel model projected that the number of daily trips originating in Boston each weekday will increase 15% from about 2.5 million to almost 2.9 million, with about half of these trips ending in places outside the city. According to the projections, nearly a quarter of all daily trips will be on transit. If the ratio of commute trips to daily trips remains constant into 2030, 41% of all Bostonians will commute on transit, 37% will drive alone, and only 2% will ride a bicycle—all well below the targets for 2030. Go Boston 2030's projects and policies must shift nearly 400,000 trips per day from single occupancy vehicles to another mode in order to achieve the targets laid out in the Vision Framework for 2030.

Overall, daily trips originating in each neighborhood are projected to increase, and many of those new trips are forecasted to be on transit. The absolute number of trips on bicycles is expected to increase in most neighborhoods outside of Boston's inner core, such as Roxbury, Jamaica Plain, and Hyde Park. The model shows almost all neighborhoods producing an increase in overall trips in private vehicles, with the exception of the North End, Downtown, and Back Bay.

Daily Trips Originating in Boston

2012
- SOV 777,492 Trips / 31%
- HOV 608,257 Trips / 24%
- Walk 519,973 Trips / 21%
- Transit 494,288 Trips / 20%
- Bike 88,967 Trips / 4%

Total Trips: 2,488,977

2030
- SOV 839,728 Trips / 29%
- HOV 668,256 Trips / 23%
- Walk 595,065 Trips / 21%
- Transit 673,083 Trips / 24%
- Bike 93,327 Trips / 3%

Total Trips: 2,869,459

According to the CTPS regional model, the share of trips in private vehicles will decrease slightly from 56% to 53%, but the absolute number of people traveling in private vehicles will increase by 2030 unless the City can significant change travel patterns.
Data source: CTPS

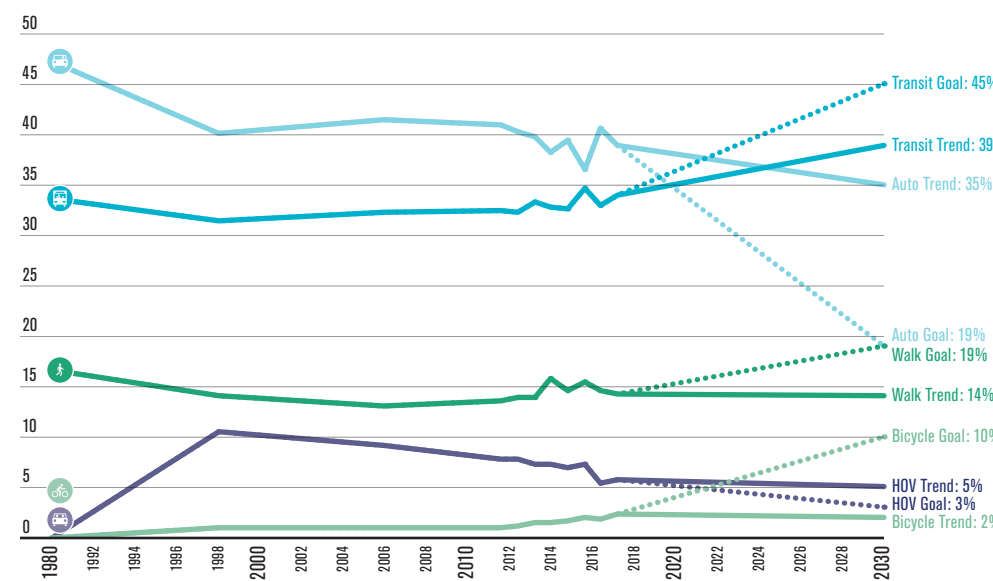## Growth in Total Number of Trips for Each Mode by Neighborhood

	SOV	HOV	Bike	Walk	Transit	Total Person Trips
Allston	7%	8%	8%	17%	45%	17%
Back Bay	-2%	1%	-3%	5%	32%	10%
Beacon Hill	1%	0%	-7%	14%	28%	13%
Brighton	8%	11%	13%	15%	38%	15%
Charlestown	4%	7%	5%	8%	30%	12%
Dorchester	7%	11%	6%	11%	37%	13%
Downtown	-3%	0%	-4%	14%	26%	10%
East Boston	6%	9%	-3%	33%	24%	14%
Fenway	9%	6%	6%	7%	43%	15%
Hyde Park/Readville	10%	16%	11%	4%	22%	12%
Jamaica Plain	9%	11%	10%	11%	36%	14%
LMA	9%	7%	11%	7%	38%	14%
Mattapan	14%	19%	15%	13%	33%	17%
Mission Hill	14%	12%	14%	16%	43%	21%
North End	-1%	-2%	-8%	18%	24%	10%
Roslindale	8%	12%	5%	-4%	35%	11%
Roxbury	13%	14%	10%	19%	46%	20%
Seaport	67%	74%	50%	133%	88%	82%
Southie	9%	9%	5%	20%	48%	18%
South End	6%	6%	3%	19%	44%	18%
West End	6%	6%	6%	22%	42%	19%
West Roxbury	5%	9%	1%	-4%	31%	7%
Boston Average	**8%**	**10%**	**5%**	**14%**	**36%**	**15%**

Change in Daily Trips, 2012 – 2030

Seaport

Mattapan

Legend: Trips in 2012 / Additional trips in 2030
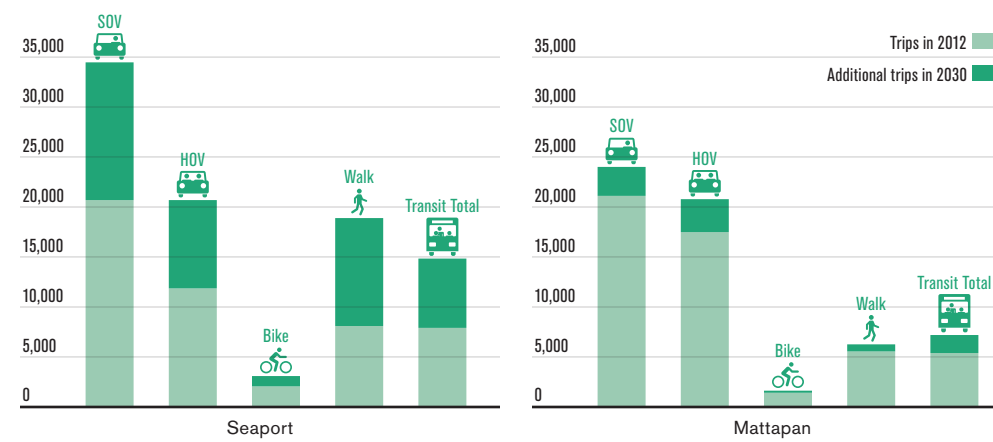
The number of daily trips originating in the Seaport is projected to increase significantly. Without infrastructure improvements, modeling shows that many of these new trips will be in private vehicles; however, the projected demand for walking and transit is also significant. The City will need to work to shift more of the vehicular demand to these modes, as well as bicycling. In contrast, overall trips in Mattapan are projected to increase only slightly, but most of the increase will be trips in private vehicles.

Bostonian Commute Mode Share Trends and Goals (percent)

Transit Goal: 45%
Transit Trend: 39%
Auto Trend: 35%
Auto Goal: 19%
Walk Goal: 19%
Walk Trend: 14%
Bicycle Goal: 10%
HOV Trend: 5%
HOV Goal: 3%
Bicycle Trend: 2%

If commute trips change proportionally to daily trips in 2030, Boston will not reach its commute mode share goals without new policies and projects. Commutes in single occupancy vehicles and by carpool are projected to decline slightly but are not anticipated to meet the target of decreasing by half. In the meantime, transit trips are projected to increase slightly but not by the target increase of one third. Bicycling trips as a share of commute trips may even decline rather than increasing by the target magnitude of 400%.

Change in Daily Mode Share by Neighborhood

	SOV	HOV	Bike	Walk	Transit
Allston	-3%	-2%	0%	0%	4%
Back Bay	-2%	-2%	0%	-1%	6%
Beacon Hill	-2%	-2%	-1%	0%	5%
Brighton	-2%	-1%	0%	0%	3%
Charlestown	-2%	-1%	0%	-1%	4%
Dorchester	-2%	-1%	0%	0%	3%
Downtown	-3%	-2%	0%	1%	4%
East Boston	-2%	-1%	-1%	3%	2%
Fenway	-1%	-1%	0%	-3%	5%
Hyde Park/Readville	-1%	1%	0%	-1%	1%
Jamaica Plain	-2%	-1%	0%	0%	3%
LMA	-1%	-1%	0%	-2%	4%
Mattapan	-1%	0%	0%	0%	1%
Mission Hill	-1%	-2%	0%	-1%	4%
North End	-2%	-2%	-1%	2%	3%
Roslindale	-1%	0%	0%	-2%	2%
Roxbury	-2%	-1%	0%	0%	4%
Seaport	-3%	-1%	-1%	5%	1%
Southie	-2%	-2%	0%	0%	4%
South End	-2%	-2%	-1%	0%	5%
West End	-3%	-2%	0%	0%	6%
West Roxbury	-1%	1%	0%	-1%	1%
Boston Average	**-2%**	**-1%**	**0%**	**0%**	**4%**

Overall, all neighborhoods are projected to have a decrease in their daily vehicle mode share, with almost all seeing an increase in the share of trips on transit. The share of people walking in the Seaport daily is expected to grow significantly.

Changing Travel Patterns and Modes

Driving

Projections

Based on the CTPS regional model, if the City does not support alternative mobility options, over half (1.5 million) of all daily trips in 2030 will be in private vehicles. The Seaport is projected to see the largest relative increase in drive alone trips, with about 13,000 new daily trips in single occupancy vehicles beginning there each weekday—a noticeable growth in local vehicle traffic that will worsen existing congestion. Only Back Bay, Downtown, and the North End are projected to see a decline in drive alone trips. Overall, these increases show a significant gap between projected driving patterns and the Go Boston 2030 aspirational target of reducing the auto commute mode shares by half to a total of 25%.

Where Actions Are Needed

Very little additional vehicle lane capacity can be added to Boston's historic streets and existing urban fabric, so strategies that address traffic congestion should be focused on making existing streets operate more efficiently while simultaneously encouraging travelers to make as many trips as possible by more efficient modes of transportation. Smarter traffic signal technologies may be deployed on congested corridors in areas such as the Seaport and Downtown, as well as along major cross-town corridors throughout the city that connect to other jobs areas, including streets such as Melnea Cass Boulevard, Morton Street, Columbia Road, and Dorchester Avenue. Accommodating bus priority and shared transportation also offers increased efficiencies in moving passengers and can increase the capacity of existing roads. The expansion of autonomous vehicle technologies may also improve capacity over the coming decade and a half. Today's high-occupancy-vehicle lanes could become tomorrow's high-tech lanes, carrying shared autonomous cars and buses without delay into and around the city.

Transit

Projections

The total number of projected daily trips starting in Boston on buses and trains will increase by a third, from approximately 500,000 to 675,000, straining a transit system that is congested today—though only 23% of all daily trips are projected to be on transit. New trips to and from the downtown hub will account for 13% of this growth, or roughly 23,000 new trips, burdening to the "core transit system" where the highest ridership segments of the Silver, Blue, Orange, Red, and Green lines already face significant constraints.[5]

> … trips starting in Boston on buses and trains will increase by a third… straining a transit system that is congested today.

Where Actions Are Needed

The regional travel model, as well as the *South Boston Waterfront Sustainable Transportation Plan,* indicated that there is a near-term need for increased transit capacity between the Seaport and Downtown's transit hubs, particularly connections from North Station and Back Bay. Similarly, anticipated job growth in the LMA necessitates better direct transit connections to these same hubs. While these areas do have transit access, the Green Line and Silver Line do not have additional passenger capacity within the LMA and Seaport today and additional service at peak times is needed to meet demand. Meanwhile, both jobs centers lack direct single-seat transit access from the growing neighborhoods of Dorchester, Mattapan, and Hyde Park, where residents often rely heavily on transit to get to work. To close all of these gaps, new rail and rapid bus lines connecting across the city to the Seaport, the LMA, and other growing job centers are needed.

Implementing policies that encourage commuters to travel outside peak hours to take advantage of spare capacity in the system is one of several opportunities to expand the capacity of transit to meet the projected and targeted demand. Additionally, infrastructure investments should streamline bus service to improve frequency and reliability while decreasing delays at transfer points. With new funding, trains and buses should receive necessary maintenance along with upgrades to signals, vehicles, and weather protection. Transit will also be easier to use with improvements to walking and bicycling access to existing stations and bus stops throughout Boston's neighborhoods.

Change in Daily Transit Trips, 2012 – 2030

Neighborhoods projected to have more than 500 new transit trips traveling between them each day in 2030 are shown here. Many of these trips occur in Boston's transit core of Downtown and Back Bay, an area that is often congested at peak travel times today.

Change in Daily Transit Trips, 2012 – 2030

→ +500 – 1,000

➔ +1,000 – 1,700

➔ +1,700 – 3,300

Data source: MassGIS, City of Boston, CTPS

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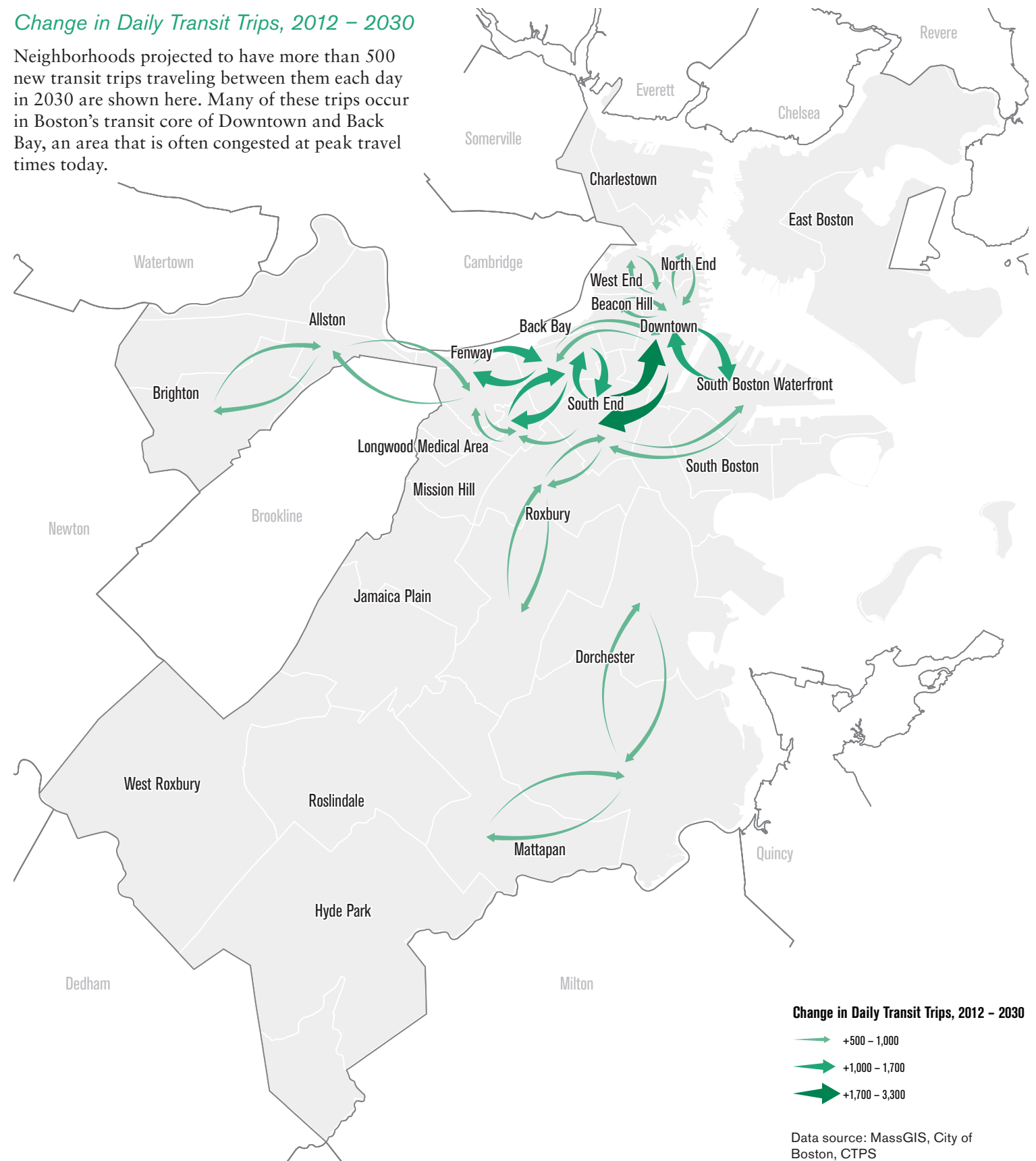
[5] Dukakis Center for Urban and Regional Policy at Northeastern University. (2012). *Hub and Spoke: Core Transit Congestion and the Future of Transit and Development in Greater Boston. Boston*, MA: Stephanie Pollack.
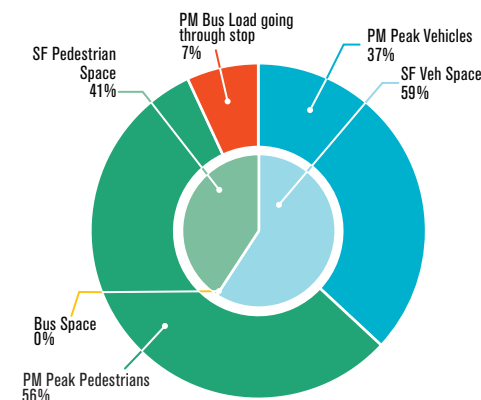
Changing Travel Patterns and Modes

Walking

Projections
The regional travel model projected that walking trips beginning in Boston will increase by 14% to become 21% of all daily trips by Bostonians. The Go Boston 2030 aspirational target set the goal of increasing the proportion of commute trips made entirely on foot by nearly 50%.

Walking is an essential mode of travel in Boston for many trips, and the model shows that almost 90% of transit trips in Boston will be taken by people who walk to a transit stop. Moreover, even people who drive to destinations become pedestrians once they have parked their car, so an emphasis on improving walking conditions across the city benefits everyone.

2030 Access to Transit Trips by Mode

Drive Access

11%

89%

Walk Access

In 2030, almost 90% of all transit trips will be accessed by people on foot.
Data source: CTPS

Water Street at Congress/Pearl PM Peak Volumes and Dedicated Street Space Today

PM Bus Load going through stop 7%

SF Pedestrian Space 41%

PM Peak Vehicles 37%
SF Veh Space 59%

Bus Space 0%

PM Peak Pedestrians 56%

Road space is not always allocated proportionately amongst road users. In many places in Boston, pedestrians outnumber vehicles, as is evident at Water and Pearl Streets downtown, but capacity is still oriented towards vehicles.
Data source: Congress Square PNF 2014 Counts, 2012 MBTA Load Profiles

Where Actions Are Needed
Although Boston has basic walking infrastructure such as sidewalks, crosswalks, and pedestrian signals in every neighborhood, additional improvements need to be made. This is particularly true for access to Boston's Main Streets districts. The continued prioritization of improved safety for walking is a major focus of Boston's Vision Zero initiative and of the Green Links initiative that connects neighborhoods to the city's greenways and parks. The City needs to ensure that pedestrians are safe walking on sidewalks and crossing streets, particularly during and after snow events, at rush hour, and in places where vehicle traffic dominates the speed and design of intersections and roadways.
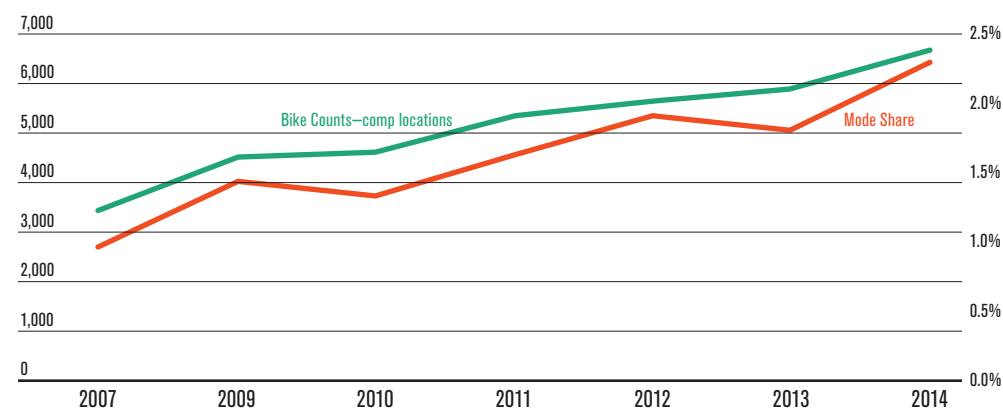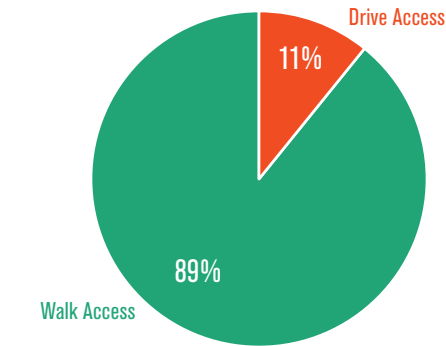
Bicycling

Projections
Bicycling is projected to grow to just under 3% of all trips originating in Boston according to the regional travel model. If projected growth aligns with the rates today, this means that only 2% of commute trips will be by bicycle in 2030. This is minimal compared to the Go Boston 2030 target, which set the goal of a fourfold increase in bicycling to 8% of all commute trips. The increase in bicycling over the past few years—particularly in neighborhoods such as Jamaica Plain, which already has a mode share of 6%—does suggest that it is reasonable to expect a steeper rate of growth than what was projected by the model.

Boston Bicycle Counts vs. Mode Share

Bike Counts—comp locations

Mode Share

2007   2009   2010   2011   2012   2013   2014

Each year, Boston Bikes' volunteers count people on bikes at locations throughout the City. The counts are increasing at a similar rate to Boston's mode share, showing that more and more people are choosing to travel by bicycle each year.
Data source: 2007 – 2009 ACS 3-year estimates, Census 2010, 2011 – 2014 ACS 1-year estimate. Boston Bikes.

Where Actions Are Needed
Boston can attract more bicycling trips by creating a citywide network where people of all ages feel safe and secure on bicycles. While Boston's off-street bike path network is extensive compared to most cities, it has critical gaps that need to be resolved by protected on-street links. For example, the Southwest Corridor connects portions of Jamaica Plain, Mission Hill, and Roxbury to the Back Bay, but it lacks connections further into Downtown. This protected path needs extensions south to the Neponset River and north to the West End. The paths along the Charles River are a great resource for the Back Bay and Beacon Hill, but connections to Allston, Brighton, and Downtown are indirect. Significant portions of Dorchester and Mattapan do not have protected bike lanes to connect residents to adjoining neighborhoods or to facilitate commutes into Downtown. These neighborhoods need protected bike routes that link the Emerald Necklace through Dorchester to Boston Harbor, make it easier to access rail stations along the Fairmount Line, and connect to jobs in the LMA and Seaport. Finally, bike improvements are needed along streets with significant bicycle and vehicle traffic such as Massachusetts Avenue.

Significant portions of Dorchester and Mattapan do not have protected bike lanes to connect residents to adjoining neighborhoods or to facilitate commutes into Downtown.

The continued expansion of the bikeshare network into Boston's neighborhoods and additional education and enforcement around safe driving and riding are needed to comprehensively support the growth of cycling.

Shared Transportation

Projections
Shared rides in a variety of forms are a rapidly growing option for getting around—new ride-hailing services, pop-up shuttles, and carpool services are emerging to leverage technology and offer expanded choices for commuting and other trips. While the regional travel model accounted for some trips by ride-hailing services, such as traditional taxis or smartphone app "hailed" rides, it lacks metrics for making a strong prediction about how these services, or fully autonomous vehicles, will impact Boston and the surrounding region. The best data from national sources suggests a range of adoption rates for these new travel options, so the regional travel model assumed that the growth of these services would increase the average number of people riding in each vehicle and therefore could contribute to easing congestion.

Where Actions Are Needed
To help alleviate congestion impacts in the Seaport and other job centers, policies that incentivize more shared travel are needed to increase the average occupancy of every car. For example, as the number of automobile trips to the Seaport is projected to grow, the model suggests that a significant portion of the trips could have two or more people per car. Today, carshare and ride-hailing services are mostly concentrated near Downtown where shorter and more frequent trips are made, but in order to increase vehicle occupancy and alleviate congestion across the city, these services need to reach out further to Boston's neighborhoods where work trips originate. Ride-hailing and carshare need to serve neighborhoods equitably to expand driving alternatives to more neighborhoods. Pop-up shuttles and carpools need to connect with pockets of workers in places such as Dorchester, Hyde Park, Mattapan, Roslindale, and West Roxbury who lack direct transit connections to workplaces outside of downtown in order to fill gaps in areas where larger transit solutions are still evolving. As autonomous shared services emerge, City policies need to incentivize higher vehicle occupancy rates so they do not worsen congestion thereby passing on the savings to residents in a manner that serves all of Boston's neighborhoods equitably.

Regional Travel into Boston

Boston is the economic engine of the region and is interconnected with the surrounding communities. The city's economic success depends on ensuring transportation access for its residents and for the people making nearly one million work and non-work trips that cross municipal boundaries into Boston over the course of every weekday.

Regional Projections
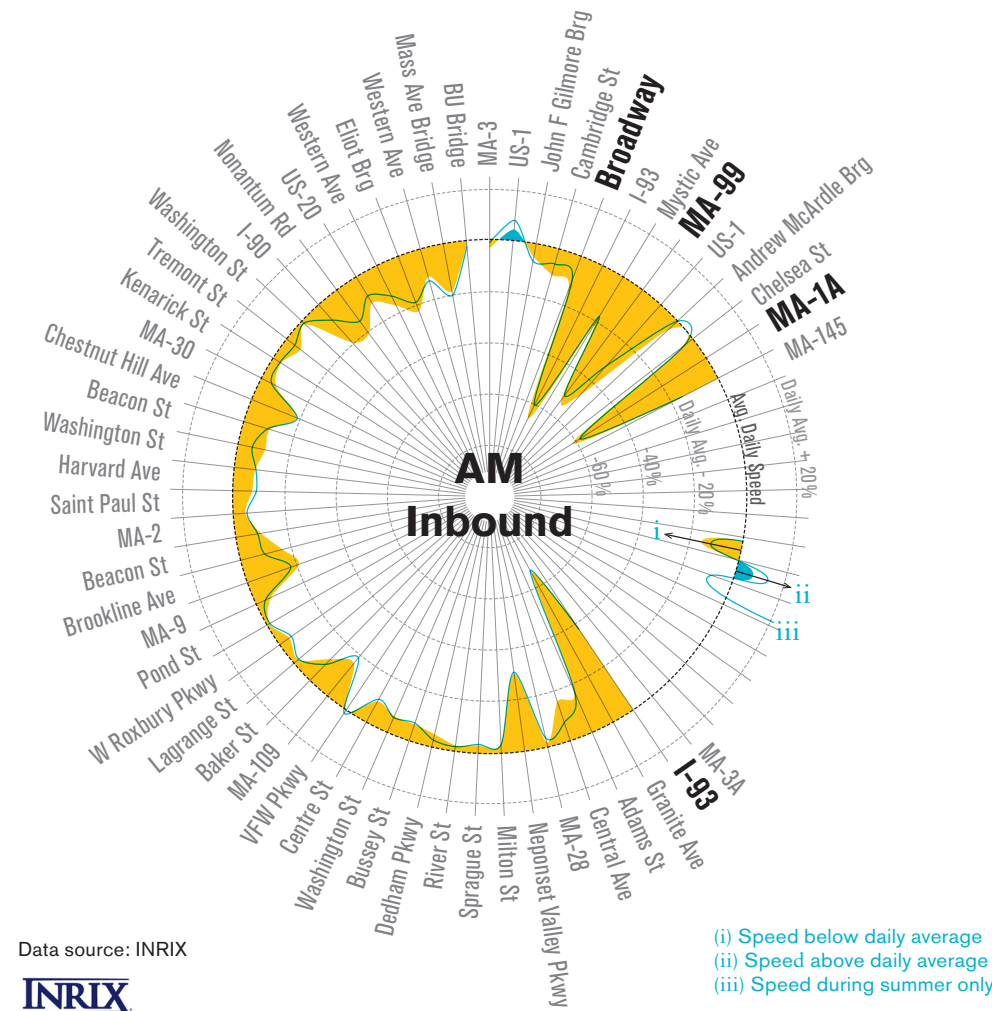By 2030, the number of daily trips into Boston from the region is projected to increase by 6%, to a total of approximately one million. Over 75% of daily regional trips are projected to originate beyond the neighboring communities of Cambridge, Somerville, and Brookline, making it unlikely that people will travel on foot and potentially challenging to travel by bike. Nearly 70% of daily regional trips are forecasted to be people in private vehicles, while only about 20% will be on transit, compared with 50% and 25%, respectively, for Bostonians. The regional travel model projected that almost half of these vehicle trips will be shared—whether because commuters use carpools, on-demand ride-hailing companies, and other private services, or because other drivers travel with family members or friends while visiting and doing errands.
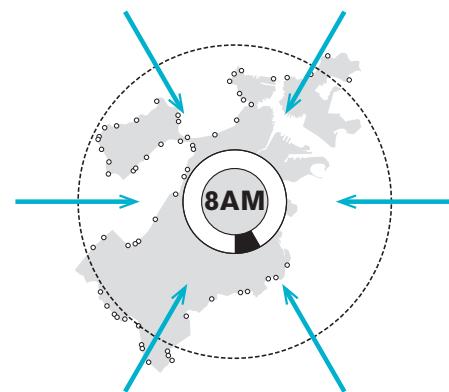
By 2030, the number of daily trips into Boston from the region is projected to increase by 6%, to a total of approximately one million.

Where Actions Are Needed to Support Regional Travel
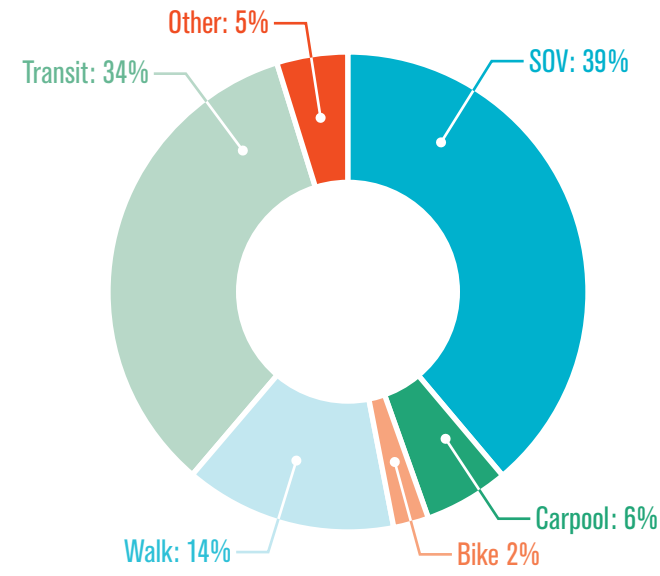In order to combat vehicle congestion and reduce vehicle miles traveled, more regional trips into Boston need to be made on transit, by bicycle, or by foot. Already, today's peak-hour commutes on regional roads like I-93, I-90, and Route 2 move slowly, and adding more single occupant vehicle trips will only exacerbate the existing congestion. Promoting higher vehicle occupancy rates with more high-occupancy vehicle lanes or shared transportation can help increase effective highway capacity.
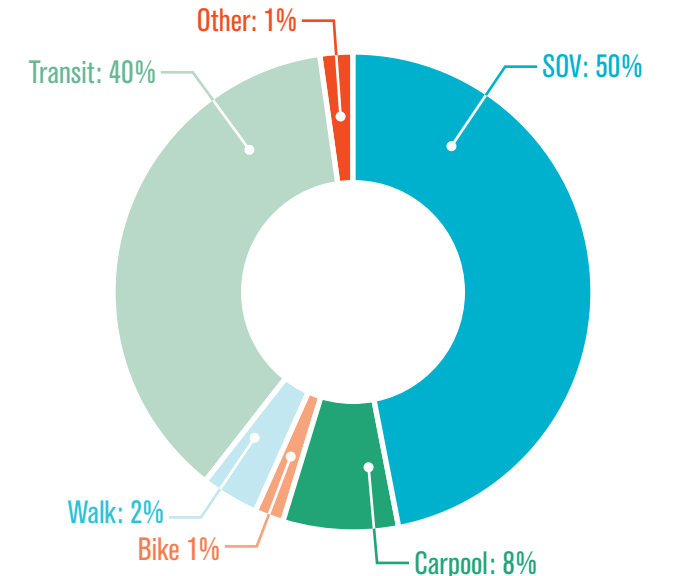
Peak vs. Average Roadway Travel Speed at Select Road Crossings into Boston

AM Inbound

(i) Speed below daily average
(ii) Speed above daily average
(iii) Speed during summer only

Data source: INRIX

Commutes that Begin in Boston

Other: 5%
Transit: 34%
SOV: 39%
Walk: 14%
Carpool: 6%
Bike 2%

Data source: 2014 ACS 1-year estimate

Commutes into Boston

Other: 1%
Transit: 40%
SOV: 50%
Walk: 2%
Bike 1%
Carpool: 8%

Data source: 2010 ACS 5-year estimates, via CTPP

New and improved connections from the region into Boston are needed, particularly for access to the LMA, the Seaport, Allston, and Dudley Square. Long protected bike routes for commuters, as well as transit services, need to be improved to these areas. "Last mile connections" that link transit stations within and outside of Boston to homes and jobs are needed to support walking, bicycling, ride-hailing, or carshare as alternatives to driving and parking at transit stations. All of these alternatives to private vehicles must be convenient enough to encourage transit and bike riding. Last mile connections can be particularly important for non-commute trips so that travelers know that it will be convenient to reach their destinations outside of peak hours.

There are many projects in other municipalities that do not directly connect to Boston and can nonetheless reduce driving trips. Encouraging bicycling connections within bordering cities will help regional travelers embrace this mode for more of their local trips and support long distance commuting into Boston by providing connected and protected routes. Transit improvements beyond Boston are needed to support feeder routes that connect to existing radial lines to Boston. Transit service outside the core of the system should be frequent enough off-peak to serve non-work trips and take advantage of existing capacity. Shared transportation improvements and the advent of autonomous vehicles can provide more options for regional travelers where housing density is lower and there is little or no transit service. Supporting a regional approach to strategic transportation investments can enable more trips without a private vehicle. Regional coordination efforts, such as the Lower Mystic Working Group, will be integral to advancing these projects.

More Mileage with Lower Emissions

Boston is vulnerable to climate change impacts that are likely to damage transportation infrastructure and impact travel with coastal flooding, extreme heat, and severe storms later in this century.

… if Superstorm Sandy had arrived in Boston during high tide… approximately 7% of all land area—would have flooded.

Studies have determined that if Superstorm Sandy had arrived in Boston during high tide, much of the Seaport, parts of downtown, and segments of the Red Line—approximately 7% of all land area—would have flooded.[6] Significant reductions in greenhouse gas (GHG) emissions are necessary to reduce the pace of climate change and limit the rate of sea level rise.

In Boston, transportation accounts for over a quarter of the GHG emissions.[7]
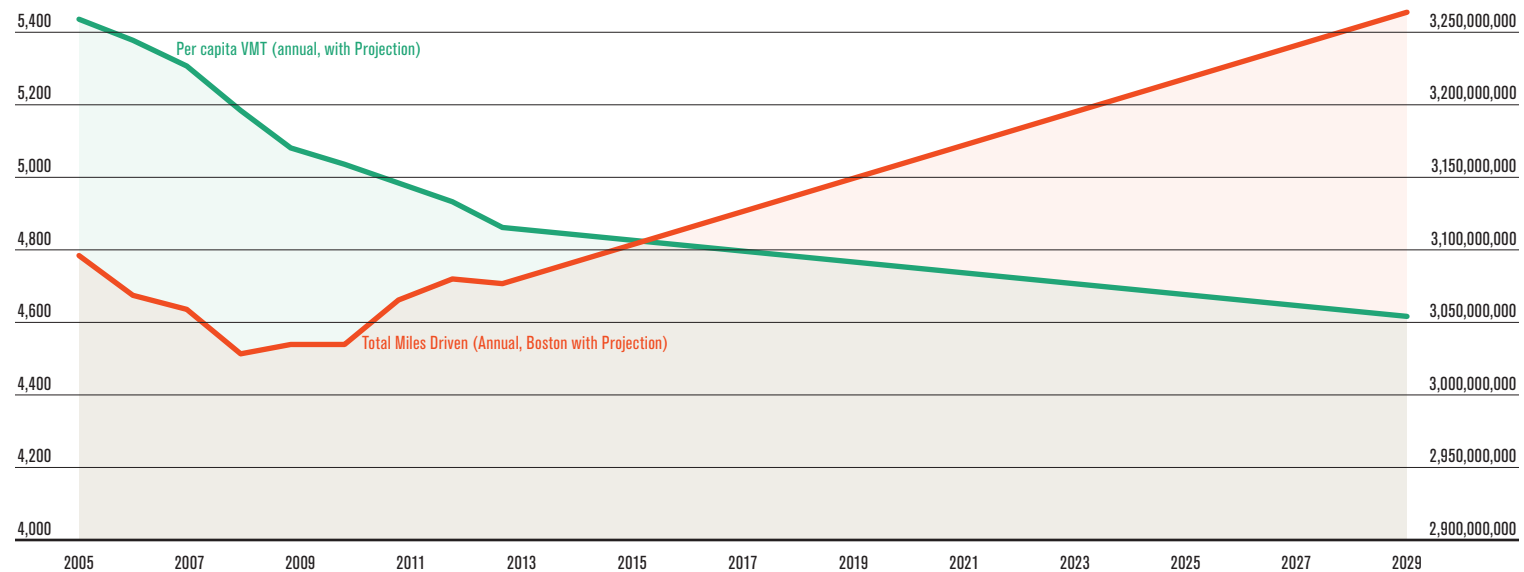
To model these emissions, the regional travel model considered a wide range of contributing factors that are likely to evolve over the next 15 years—the use of electric and hybrid cars, improved gas mileage on new cars and trucks with internal combustion engines, and more efficient aircraft engines.

Emissions Projections

According to the regional travel model, the primary GHG emissions in Boston—carbon dioxide (CO_2)—are projected to decrease by 32% by 2030, even as the distance traveled and number of trips increases. Much of this anticipated decline in emissions can be attributed to federally-mandated fuel efficiency standards. CO_2 emissions at Logan Airport in 2030 are projected to be half of what they are today. East Boston, the North End, Back Bay, Jamaica Plain, and Roslindale are also projected to have slightly above average reductions in CO_2 emissions. While these reductions maintain Boston's long-term progress towards meeting the City's internal GHG reduction targets, municipalities outside of Boston will see an average decline of less than 25%—well below projections for what is needed to slow the pace of global warming.

Vehicle Miles Traveled Projections

Even though the percentage of all trips that will be taken by car is projected to decline… the total number of miles traveled on Boston's roads will increase 5% by 2030…
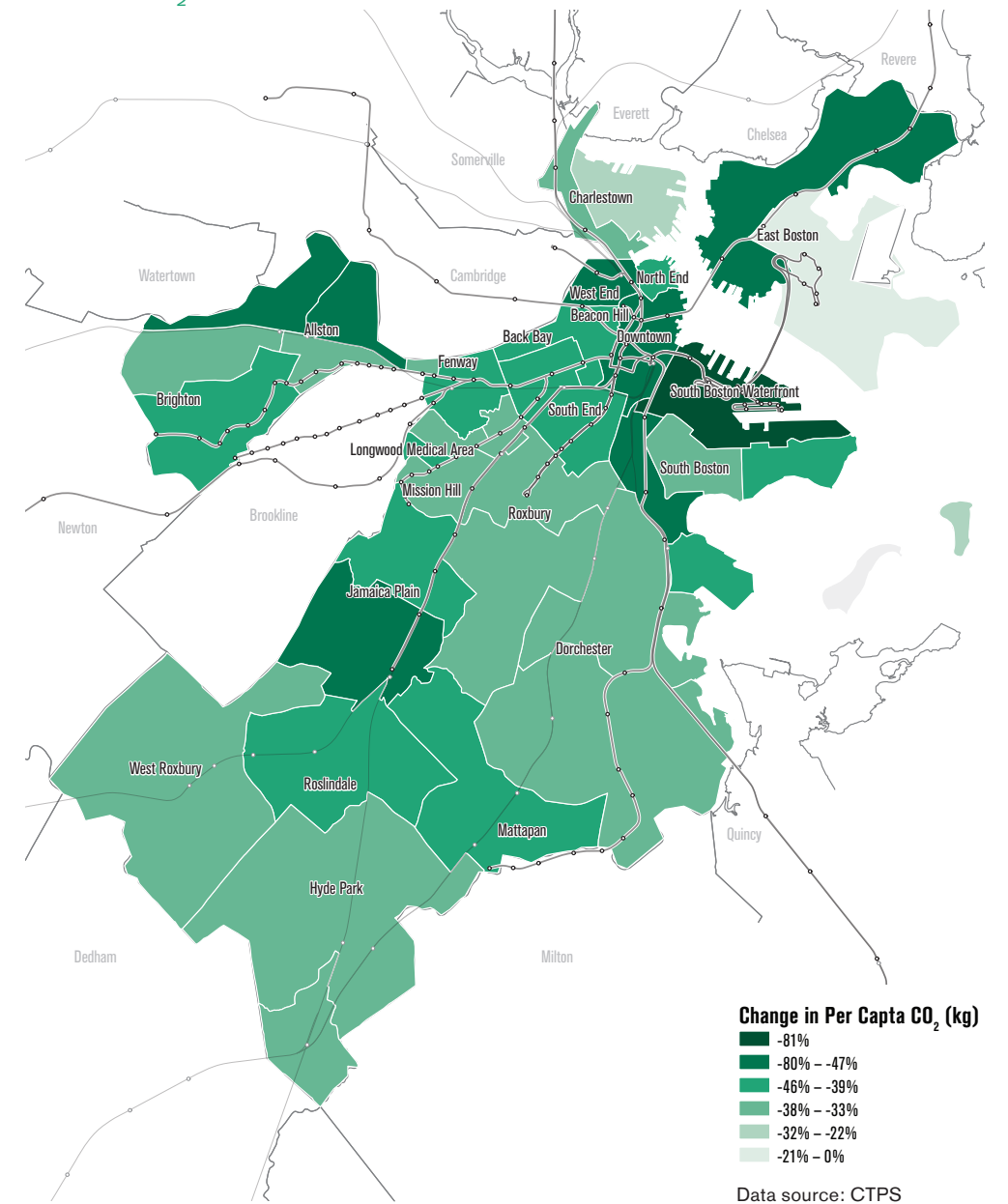
Even though the percentage of all trips that will be taken by car is projected to decline and the average number of miles each person will drive is projected to decrease by 9.4%, data from the regional travel model still showed that the total number of miles traveled on Boston's roads will increase 5% by 2030 due to overall population and employment growth. This projection exceeds the Go Boston 2030 target of reducing the total number of vehicle miles traveled (VMT) to a level that is 5.5% below 2005 levels. In particular, VMT to and through the Seaport, Dorchester, Downtown, Charlestown, Allston, Brighton, and West Roxbury is projected to increase, though slight decreases are projected elsewhere. VMT is an issue distinct from GHG emissions because it represents a likely increase in congestion and negative health impacts due to poor air quality. Where VMT increases point to more congestion, this can lengthen travel times and create longer commuting delays on roads like I-93 where speeds decrease sharply at peak times as a result of excessive vehicle demand (see speeds chart on p112).

Where Actions Are Needed

The Go Boston 2030 aspirational targets include the goal of reducing GHG emissions by 25%. While the regional travel model shows that the City can meet this target, the lack of change in the surrounding region offsets Boston's gains and illustrates the challenge of addressing climate change on a global scale. Boston needs to work beyond its borders to reduce emissions and VMT. The easiest place to start is by supporting low-emission and shared alternatives for regional travel into Boston to reduce the projected proportion of people traveling into Boston in private vehicles. Relying only on mileage improvements and electric vehicle technologies will not compensate for regional population growth if private and single-occupancy vehicles continue to be the primary choice for many travelers. Boston can proactively work with surrounding communities to enhance regional transit connections through improved bus and rail service as well as new stations connecting to Boston's growing job areas in the Seaport and the LMA. Emerging districts like Widett/Newmarket, Beacon Yards, and Sullivan Square also need transit access that works for regional travelers. Regional cyclists need connections to and between multiuse paths and bicycle corridors that cross through multiple cities and towns such as the Claire Saltonstall and Minuteman Bikeways.

VMT Over Time

Per capita VMT (annual, with Projection)

Total Miles Driven (Annual, Boston with Projection)

Data source: CTPS

[6] Massport, Preparing for the Rising Tide (2013). Boston, MA: Ellen Douglas, Paul Kirshen, Viven Li, Chris Watson, Julie Wormser.
[7] City of Boston, Greenovate Boston: 2014 Climate Action Plan Update (2014). Boston, MA

Boston CO_2 Reduction: 32%, 2012 − 2030

Change in Per Capta CO_2 (kg)
- -81%
- -80% – -47%
- -46% – -39%
- -38% – -33%
- -32% – -22%
- -21% – 0%

Data source: CTPS

Meeting Go Boston 2030's Aspirational Targets

The Go Boston 2030 Vision Framework established 35 aspirational targets as benchmarks for improving transportation in Boston in equitable, economically supportive, and climate resilient ways. Each target is associated with one of the nine themes of the Vision Framework and their associated goals. With ongoing community feedback throughout the Go Boston 2030 process and parallel planning efforts, some themes resonated the most with the public: Expanding Access, Ensuring Reliability, Improving Safety, Securing Affordability, Building for Resiliency, and Advancing Transparent Governance.

Go Boston 2030 identified measures for each target so that all of them can be tracked over time, providing a "scorecard" to gauge progress. The aspirational nature of these targets means that not all will be met by 2030, but making progress toward each of them provides a clear direction for future transportation planning and programming as policies are established and projects are funded.

Several targets that represent the most important themes and can be analyzed geospatially to identify clearly defined gaps in Boston's existing transportation systems were identified as top targets. They have been used to conduct a needs assessment and identify the types of projects and policies that would be most effective in filling the gaps. These priorities can pinpoint needed interventions at multiple scales, from the smallest signal timing decisions to large-scale transit investments.
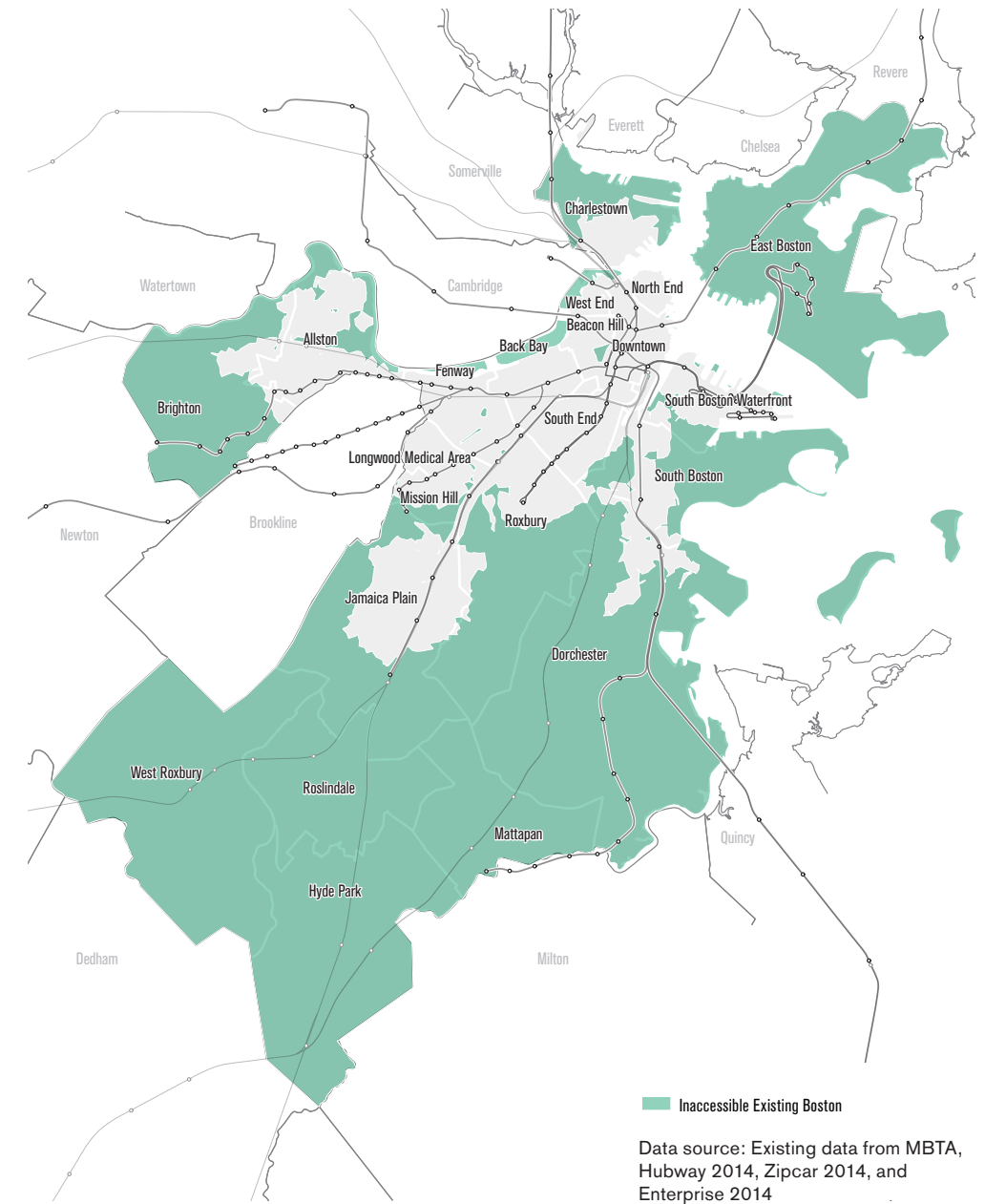
Expanding Access

Every home in Boston will be within a 10 minute walk of a rail station or key bus route stop, Hubway station, *and* carshare.

Expanded choices for ways to travel from all neighborhoods are measured by this metric. Bostonians and those traveling within Boston should be able to choose from a range of options depending on their needs at any time of day or year. As of 2014, only 41% of Boston households had access to rapid transit, Hubway, and carshare within a 10-minute walk. These households are concentrated closest to downtown, with some pockets of good access extending into Roxbury, northern Dorchester, and parts of Jamaica Plain. Unfortunately, the majority of Boston's residents lacked access to at least one of these three alternatives to driving a private vehicle.

Where Actions Are Needed
Most of Brighton and Dorchester, as well as all of South Boston, Hyde Park, Mattapan, Roslindale, and West Roxbury need improved access to rapid transit, bikeshare, and shared vehicles over the next 15 years to meet this target. Even if this target is met by infrastructure, these areas must have good walk access including quality sidewalks and crosswalks in order to make it convenient to access train stations, key bus route stops, and carshare spots. The bikeshare stations need to be linked to protected and connected bike facilities in order to provide access that feels safe for all who want to bike. Co-locating transportation options would allow residents to make travel decisions for each trip based on cost and convenience.

Limited Transportation Choices

■ Inaccessible Existing Boston

Data source: Existing data from MBTA, Hubway 2014, Zipcar 2014, and Enterprise 2014

As of 2015, only 41% of Boston's households were within a 10 minute walk of a rail station or key bus route, a Hubway station, and carshare.

Ensuring Reliability

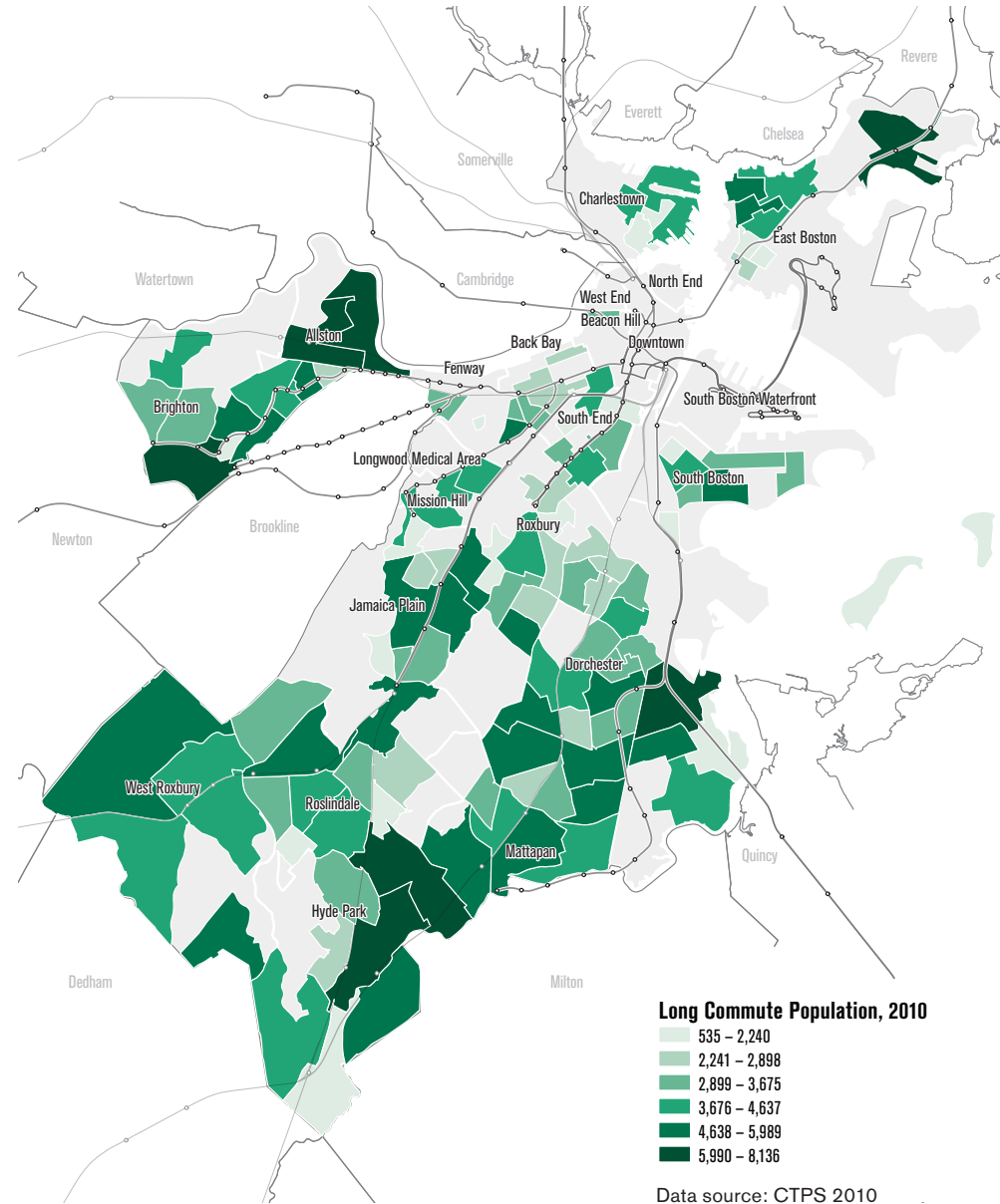## Bostonians' average commute to work time will decrease by 10%

Commute time is a complex function with many factors—a personal decision weighing time, cost, and experiential qualities. The Go Boston 2030 Share Your Trip with BTD process demonstrated how some people choose to walk across downtown mid-commute to avoid lengthy subway transfers while others spend extra time walking across three legs of an intersection to feel safe while crossing. For some people a long commute is primarily due to vehicle congestion, whether they drive or take the bus, and there are no faster or more reliable alternatives. For others, a longer commute is valuable personal time—a chance to walk or a chance to work on the train, even if an alternative is faster.

Where Actions Are Needed
Inefficient infrastructure and long transfers that lead to commutes that are longer than the current citywide average need to be improved in underserved neighborhoods such as Mattapan, portions of Dorchester, Roslindale, and West Roxbury. Strategies are needed to increase the speed and frequency of transit-reliant commute trips by creating priority bus service separate from congested travel lanes on major corridors and by providing more efficient transfers. Timely transfers are particularly important at key hubs like Forest Hills and Dudley Square where many bus routes come together but wait times vary.

In addition to the time cost of long commutes, this metric has implications for the financial cost of transportation. Roslindale, Dorchester, and Brighton are among the neighborhoods that spend a disproportionate amount of time commuting and their residents also spend a disproportionate share of household income on transportation costs. Despite the fact that these neighborhoods are

closer to Boston's job centers than West Roxbury and Hyde Park, these neighborhoods lack direct rapid transit options and have fewer alternatives to personal vehicles. Improved transit

options in each of these neighborhoods are needed along with local connections that can reduce total transportation costs for their residents.

Longer than Average Commutes

Long Commute Population, 2010
- 535 – 2,240
- 2,241 – 2,898
- 2,899 – 3,675
- 3,676 – 4,637
- 4,638 – 5,989
- 5,990 – 8,136

Data source: CTPS 2010

Today, 72% of Bostonians live in a neighborhood with a longer than average commute.

Ensuring Reliability

MBTA customers will experience waits and travel times that are longer than what is scheduled only 10% of the time

Reliability is important to all travelers, though a lack of reliability is particularly stressful for transit users. Today, the average on time performance for buses is 68% and for subway lines it is 87%.[8] The map below provides an overview of on time performance by bus route.

The MBTA is in the process of overhauling its internal and external reporting and data analysis to improve their performance and share their results more clearly with customers. Tracking this target will be made easier by that process, and reframing the data around

rider experience instead of vehicle location will also shift the focus towards users.

Where Actions Are Needed
Crosstown bus routes near the city center are particularly vulnerable to on time performance issues with delays affecting access to jobs in the Longwood Medical Area, the Seaport, and Kendall Square. Dense development areas like these foster innovation and intra-sector collaboration, and they require transit service that can efficiently move large groups of people in the same vehicle. Reliability improvements along cross-town bus routes and their nearby rail lines will be needed to accommodate job growth in more areas.

Routes across Brighton and Allston, through Dorchester, and on Washington Street leading to Roslindale are also infrequently on time. Residents in these neighborhoods face sluggish and unreliable bus service and have limited rail alternatives. To meet not only reliability targets but also to achieve equity goals, these bus routes need improvements that separate them from traffic congestion, collect riders more efficiently, and ensure that they consistently arrive at regular intervals.

Bus Routes by On Time Performance

On Time Performance
- 0% – 32%
- 33% – 42%
- 43% – 57%
- 58% – 66%
- 67% – 75%

Data source: MBTA 2014 – 2015
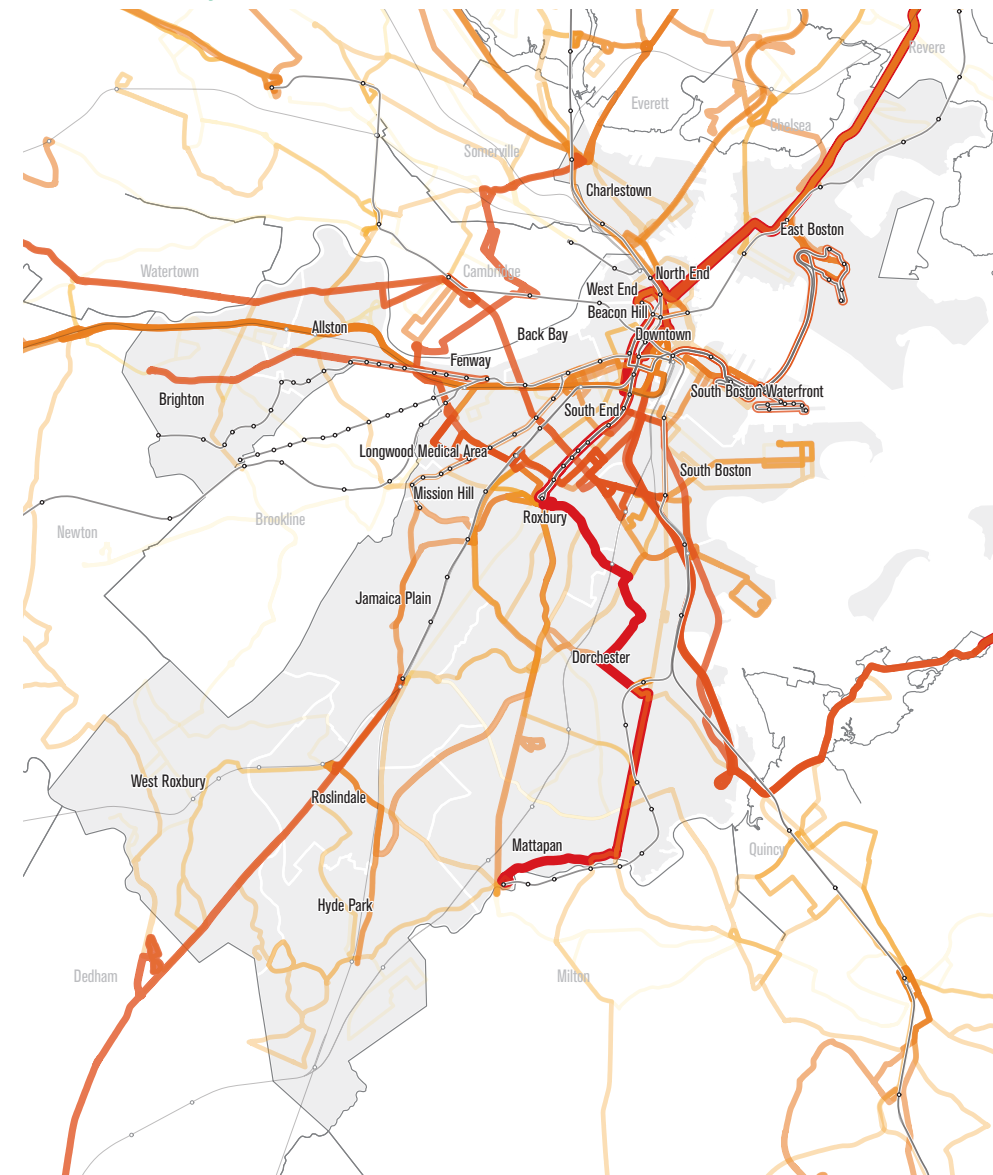
[8] All bus and subway data is from March 1 – December 14, 2016. The bus data tracks how often buses arrive on schedule to key bus stops. Subway data tracks how often passengers waited longer than expected for a train. For more information, see *massdot.app.box.com/v/dashboard-data-dictionary*

Improving Safety

## Eliminate traffic fatalities and severe injuries in Boston

Boston's Vision Zero initiative is our commitment to focus the city's resources on proven strategies to eliminate fatal and serious traffic crashes in the city by 2030. While Boston has a relatively good record on traffic safety compared to many other cities, we see more than 20 fatalities and 200 serious injuries on our streets every year.

BTD, EMS, and BPD collaborate in tracking data from serious crashes and identifying crash "hot spots" or trends. The locations of injury crashes are shared on the Vision Zero website. The map to the right offers a look at citywide injury-related crashes from mid-2014 through late 2016. The Vision Zero Task Force also looks beyond crashes to understand where people feel unsafe on streets and sidewalks. Projects should improve safety and the feeling of comfort for people walking, bicycling, taking transit, and driving on Boston's streets—helping the City meet its mode share and greenhouse gas reduction goals.

Where Actions Are Needed

Every new transportation project in Boston needs to be built with safety in mind. The City will focus resources to improve locations where the highest crash rates occur. Many crashes occur in the busiest parts of Downtown and the Back Bay and on major arterials that run throughout the City, such as Massachusetts Avenue, Blue Hill Avenue, and Columbia Road. Other concentrations of crashes occur around complicated intersections, such as Melnea Cass Boulevard at Massachusetts Avenue, as well as large roundabouts like Sullivan Square. New projects focused on safe design need to prioritize corridors with dense clusters of crashes that have caused fatalities and injuries.

Citywide Injury-Related Crashes for all Modes, Mid-2014 – Late 2016

Crashes Requiring EMS

Crash Density
Low
High

Data source: Boston EMS
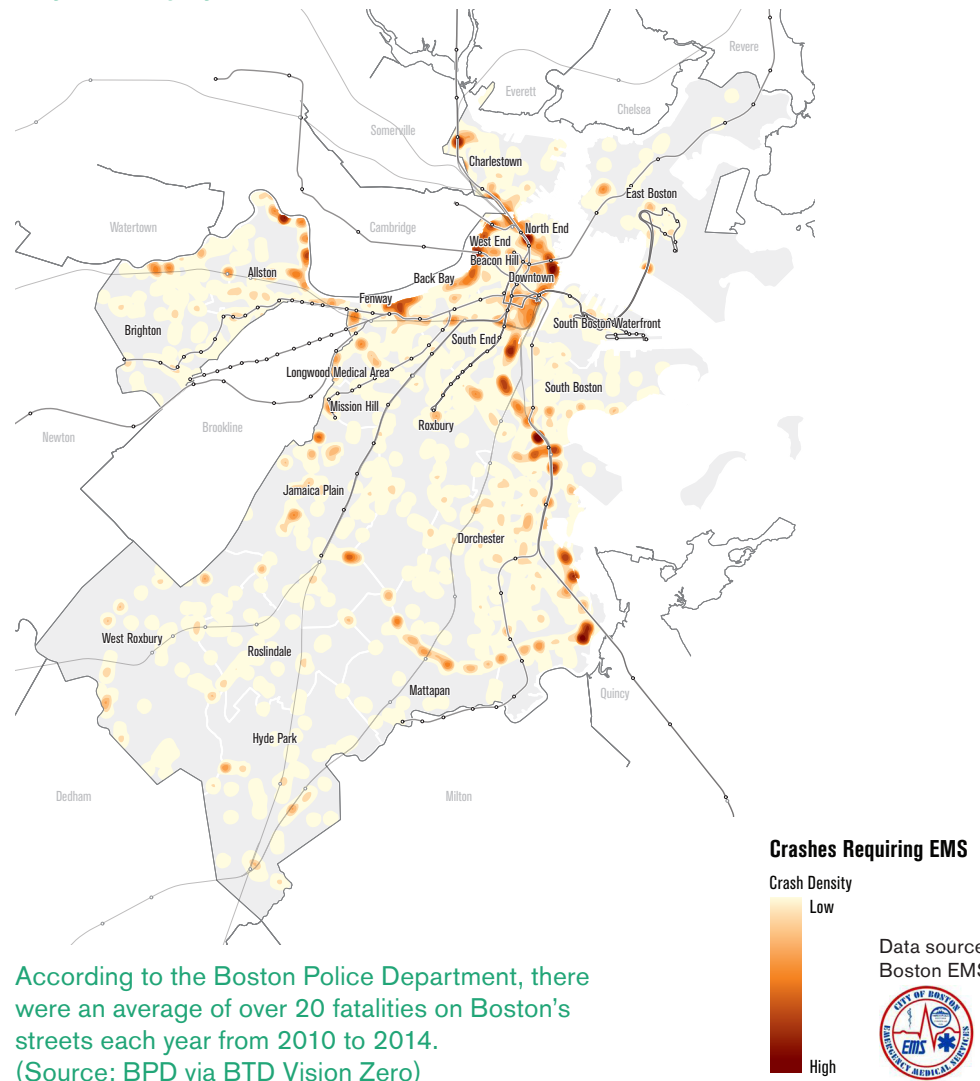
According to the Boston Police Department, there were an average of over 20 fatalities on Boston's streets each year from 2010 to 2014. (Source: BPD via BTD Vision Zero)

More focused projects are also needed to proactively address locations with a higher numbers of vulnerable people—older adults, children, people walking, people using transit, and people bicycling. These projects need to improve the safety and comfort of streets near elderly housing, schools, parks, and bus stops. Busy commercial areas—including Main Streets districts—need special attention since they have the highest density of people on foot, even in neighborhoods where most people drive. In addition, education needs to accompany improvements on streets and help create a new culture of safety.

… projects are also needed to proactively address locations with a higher numbers of vulnerable people—older adults, children, people walking, people using transit, and people bicycling.
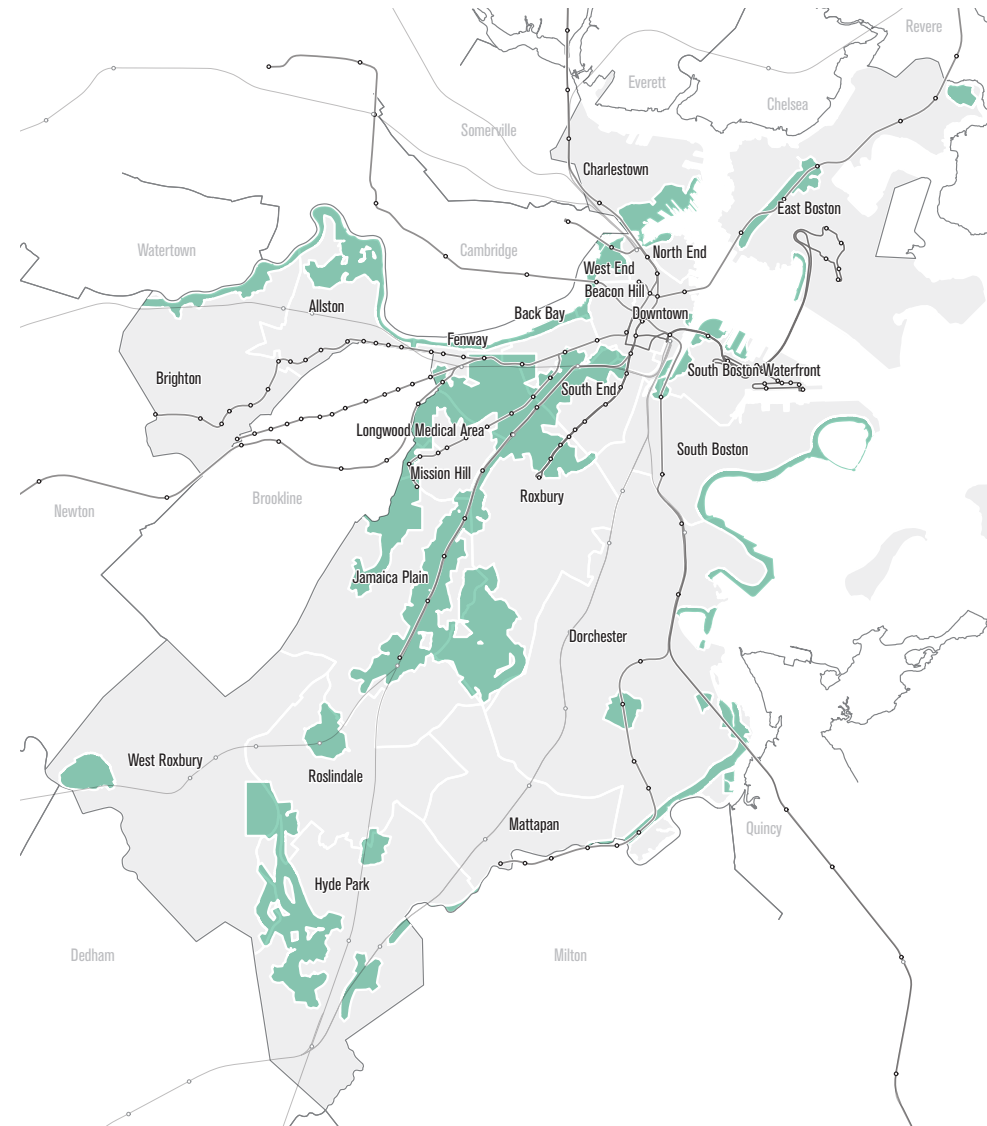

Improving Safety

All households will be within a five-minute walk of a protected bicycle facility or shared use path

At every phase of the public engagement process, people emphasized the need for protected bicycle facilities that are comfortable for children and grandparents to ride. Ongoing academic research and engineering practice demonstrate the transformative potential of a network of protected bicycling infrastructure to improve safety and expand the number of people who use bicycles as a way to travel or for fun. More bicycling helps Boston meet its targets for mode share and greenhouse gas reduction and supports improved public health.

Achieving this target requires improving existing bike routes and constructing new routes, with the aim of equitable access across the city's neighborhoods. A connected network of protected bike lanes, off-street paths, and low-stress local routes will better serve residents who currently bike and those that are interested in biking in the future.

Where Actions Are Needed to

Boston has miles of off-street paths, including the Southwest Corridor and the Neponset River Greenway, but most Bostonians do not live near these facilities or other comfortable on-street routes. Additionally, these routes do not often connect to each other. A larger, connected network will allow more people to access Boston's abundant open spaces, waterfront areas, and its current and emerging job areas.

Expansion of protected bike facilities across much of the city is important, with a particular need to provide connections to job centers and open space. Priority improvements include connecting the Southwest Corridor to Downtown, linking the Seaport to South Boston and Downtown, and making bicycle access to the LMA more comfortable. Additionally, new links need to be created for people in Boston's southern neighborhoods. The City and state agencies need to collaborate on creating an equitable, connected system.

Access to Bicycling Infrastructure, 2015

Areas within a five min walk of protected bike lane

Data source: Bicycle information adapted from Boston Bikes, August 2015

Today, only 20% of Boston Household are within a 5-minute walk of a protected bicycle facility or shared use path.

Securing Affordability

Reduce the transportation cost burden for very low income individuals to the citywide average for a median household

Transportation Cost Burden
(Percent of HH Income)

Transportation and housing are usually the two greatest costs for any household. In Boston, the average "transportation cost burden"—the percentage of household income that goes towards transportation costs—is 13%. For very low income households however, transportation costs represent an average of 33% of their household budget. This metric provides a way for Boston to track its investments relative to the benefits that new infrastructure and policies provide to low-income neighborhoods.

Where Actions Are Needed
To improve equity in Boston, transportation investments and programs need to target low-income

To improve equity in Boston, transportation investments and programs need to target low-income populations.

populations. The neighborhoods and census tracts where large numbers of households live below the median income tend to be located beyond the reach of the MBTA's subway system. These residents are concentrated near the geographic center of the city along bus corridors in Roxbury and Dorchester, extending south to Mattapan and around the edges of Charlestown and East Boston. East Boston stands out as an exception—a neighborhood with good subway service and a significant low-income population.
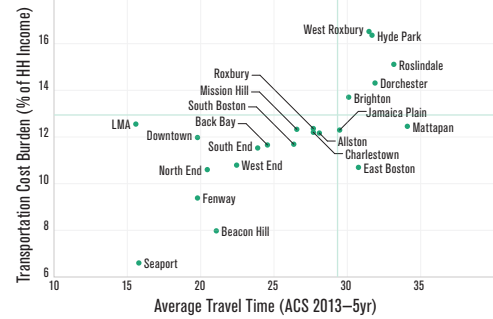
To reduce the transportation cost burden where it is most severe, new transit and
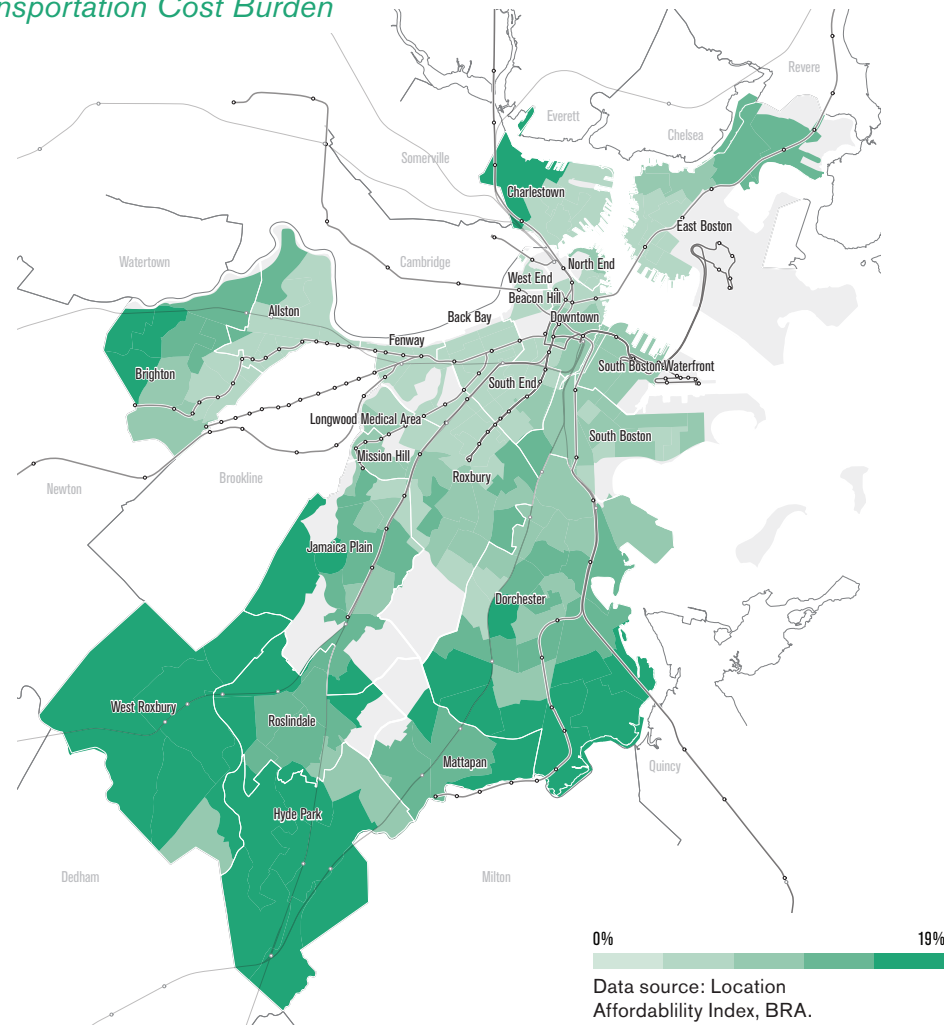
cycling infrastructure and significant improvements to existing bus and rail services are needed. Additionally, citywide policies that provide transit fare subsidies or discounts are further needed to mitigate the transportation costs for the households with the highest burden.

Land use planning decisions can also play a role. For example, Imagine Boston 2030's efforts to expand mixed-use centers beyond Boston's traditional downtown core with new job and commercial areas can provide opportunities for employment, childcare, shopping, and other essential services closer to homes.

Transportation Cost Burden

0%   19%

Data source: Location Affordability Index, BRA.

Advancing Transparent Government

A larger share of capital improvement dollars will be assigned to underserved communities to achieve equitable distribution of investment in transportation infrastructure

Boston's transportation system today reflects many decades of uneven investment across neighborhoods and communities. Piecemeal decisions about what and where to build or rebuild infrastructure are influenced by cost, complexity, and political will. The culmination of these decisions has left many Bostonians without adequate transportation options for generations. This metric seeks to ensure that, rather than simply spreading transportation
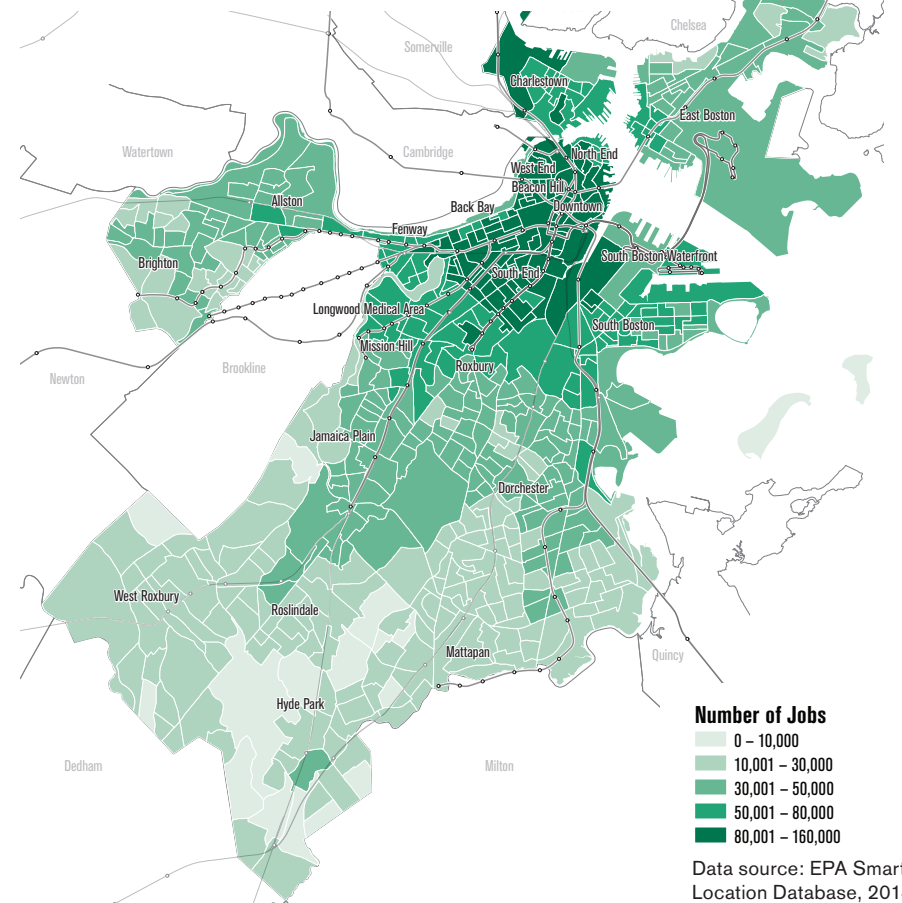
spending evenly across the city in the years to come, transportation improvements are focused on increasing equity by directing investments and services towards those populations that have been chronically underserved.

Where Actions Are Needed
Infrastructure improvements are needed in areas that currently have aging infrastructure, poor transit access, and unsafe conditions. Large portions of

Dorchester, Mattapan, and Hyde Park have no access to either protected bicycling facilities or high-quality transit. Many parts of these neighborhoods have poorly marked crosswalks, outdated traffic signals, and missing sidewalks. Other areas outside downtown with high rates of walking, such as Roxbury and South Boston, have not seen the same level of investment in wider sidewalks, shorter crosswalks, and public plaza spaces as the Back Bay. In order for many of Boston's existing Main Streets districts and planned mixed-use areas to succeed, a more equitable distribution of transportation investments is necessary.

In some instances, transportation investments will be located outside of or adjacent to an underserved neighborhood to improve its connectivity with jobs, amenities, and other communities. For example, Silver Line improvements through the South End and in Downtown are needed to expedite service to and from Roxbury, and other improved bus corridors would similarly serve other neighborhoods. In other cases, investments will be made in policies and programs that expand the affordability and choice of mobility options for an underserved neighborhood. For example, improved transit fare policies and payment tools are needed to provide greater access to transit, ride-hailing, and bikeshare for low-income residents. The City will also need to define clear standards for underserved areas and track which neighborhoods have the greatest need as development and investment reshape the demographics of an evolving Boston.

Jobs Within a 45 Minute Transit Commute

Number of Jobs
0 – 10,000
10,001 – 30,000
30,001 – 50,000
50,001 – 80,000
80,001 – 160,000

Data source: EPA Smart Location Database, 2014

Building for Resiliency

Reduce greenhouse gas emissions from transportation by 50% of 2005 levels by 2030

About a third of Boston's greenhouse gas emissions today are generated by transportation sources.[9] Emissions from cars, trucks, buses, and trains account for over five million kilograms of CO_2 emitted annually within the city. Changes in fuel efficiency and continued improvements in vehicle engine technology are projected to greatly reduce the transportation emissions produced within Boston and would enable the City to meet its GHG emissions reduction targets before 2030. Despite these local gains, the surrounding region is projected to offset these gains with a continued reliance on driving.
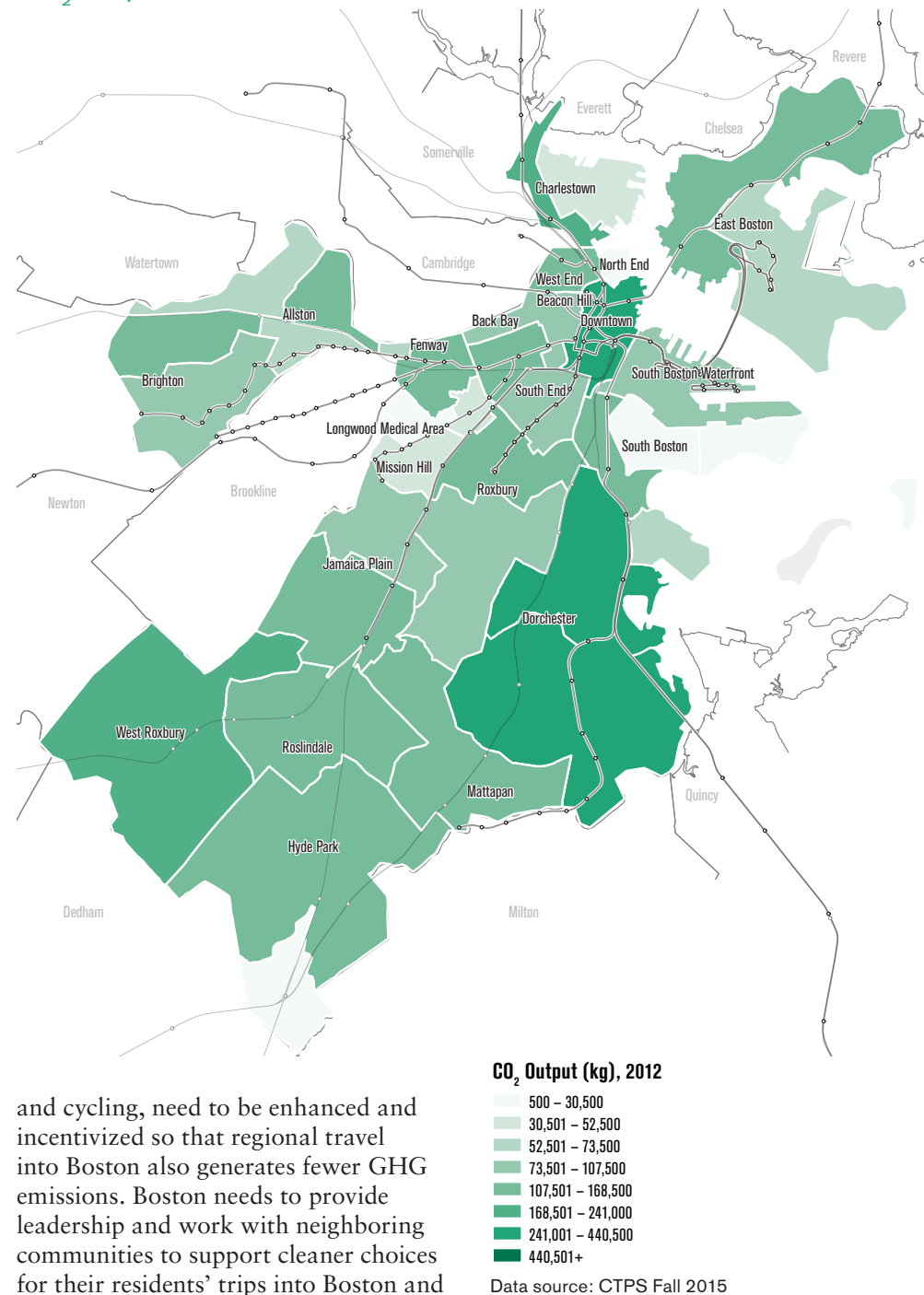
Where Actions Are Needed
To offset the effects of a growing population and achieve the historically low emissions rates needed to curb climate change, shifting people to more efficient or zero-emission modes will be imperative. Although the map shown here indicates the current level of emissions for each area of the city, GHG emissions rates need to decline citywide. Bicycling and walking are zero-emission transportation options, and support for each walk and bike trip is needed.

Electric vehicles also have the potential to reduce total GHG emissions, but expanding their use is not a comprehensive solution since they are recharged using a mix of clean and fossil-fuel-based energy and because they do not reduce driving. Nonetheless, the development of electric vehicles or other alternative fuel technologies for buses and other transit vehicles will make these options even more energy efficient and clean.

Connections into Boston with lower emissions alternatives, like transit and cycling, need to be enhanced and incentivized so that regional travel into Boston also generates fewer GHG emissions. Boston needs to provide leadership and work with neighboring communities to support cleaner choices for their residents' trips into Boston and around the region.

CO₂ Output, 2012

CO₂ Output (kg), 2012

- 500 – 30,500
- 30,501 – 52,500
- 52,501 – 73,500
- 73,501 – 107,500
- 107,501 – 168,500
- 168,501 – 241,000
- 241,001 – 440,500
- 440,501+

Data source: CTPS Fall 2015

[9] Greenovate Boston, 2014 Climate Action Plan Chart Explorer: *plan.greenovateboston.org/measuring-progress/chart-explorer/*

Building for Resiliency

All transportation systems will be able to operate or have sufficient alternatives during a flood or snow event
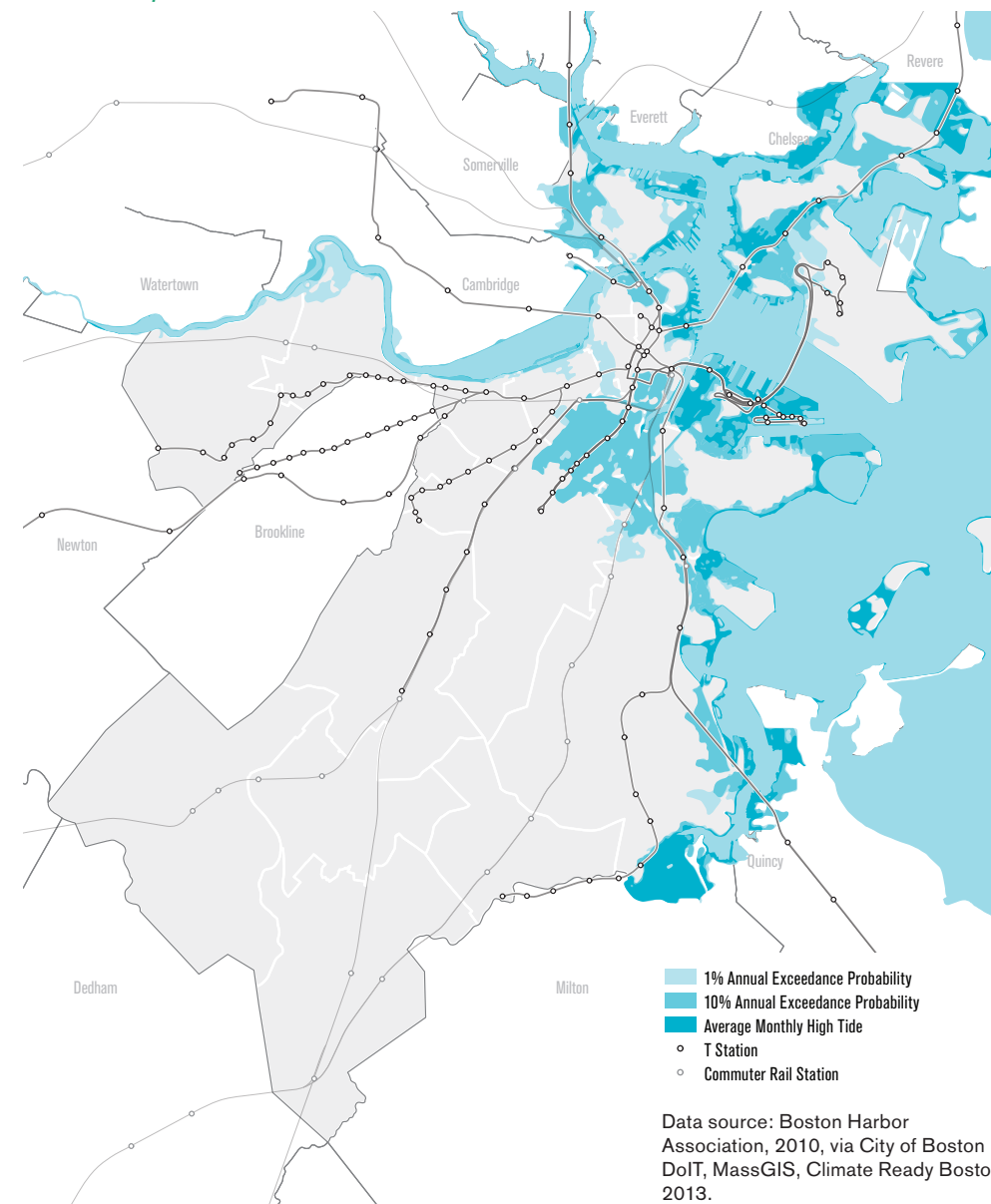
Large storms and very high tides already impact Boston by flooding certain areas of the City, particularly in areas that were constructed on filled land constructed by previous generations. As climate change continues to affect the planet, the frequency and severity of flooding is projected to continually increase. Boston is leading the country in its examination of the impact of climate change and sea level rise on its shores. The City has led sophisticated modeling exercises to determine the most likely climate scenarios and the transportation infrastructure that is most likely to be affected. A parallel process by MassDOT is analyzing projected flooding impacts on the Central Artery and harbor tunnels.

The planning process for *Climate Ready Boston* identified the pieces of the street and transit networks that are most in jeopardy of flooding due to rising tides and storm events. The results of this report and other studies will be used to integrate climate aware planning into the design of new and ongoing projects to ensure that they can withstand higher tides and more stormwater.

Where Actions Are Needed
Many stations and track segments on the Blue Line and Silver Line are at risk of flooding in the most likely projections of climate change scenarios. These stations, along with Sullivan Square, JFK/UMass, a proposed Widett/Newmarket stop, and several commuter rail lines, will need to be flood-protected, especially if they are to serve the growing residential and employee populations that are anticipated. Retrofitted stations are needed for heavily used transit lines where passengers on either end of a flooded section would be cut off from the system. This is particularly true for the Blue Line in East Boston, which serves as a lifeline to the city for a transit-dependent population that includes a significant population of low-income residents.

Interstate highways that run through Boston also face significant flood risks, as do arterial links such as Morrissey Boulevard, Tremont Street, and Rutherford Avenue. These roadways need to be retrofitted to include green infrastructure and stormwater accommodations where possible and flood-proofing where necessary.

Flood Map, 36 Inches of Sea Level Rise (2070s or Later)

- 1% Annual Exceedance Probability
- 10% Annual Exceedance Probability
- Average Monthly High Tide
- T Station
- Commuter Rail Station

Data source: Boston Harbor Association, 2010, via City of Boston DoIT, MassGIS, Climate Ready Boston 2013.