2040 Trends

In order to design a transit system for the year 2040, we need to understand how Massachusetts may change over the next 25 years. The following trends explore shifts in demographics, land use, and rider behavior that we're already beginning to see in 2016, and can project into our future scenarios.

CLIMATE CHALLENGES

Sea levels have risen. Storm surges frequently flood Boston's downtown and low-lying inland regions. Weather is increasingly chaotic (hot, cold, and stormy).

WHICH MEANS

New infrastructure will be needed to mitigate flooding. Demand for water transport will increase as riders seek shorter and faster routes. Storms, extreme heat and cold, and other significant weather events will necessitate a variety of transit options to provide travelers with alternatives when systems are disrupted.

IN BOSTON TODAY

Duckboats have provided land-water transport around Boston since 1994. As neighborhoods in the Seaport and East Boston grow, demand for inner-harbor ferry service is increasing to serve growing coastal populations. In response to storm surges such as Hurricanes Sandy and Katrina, many cities are fortifying their coastlines with hard and soft infrastructure.

FURTHER EXAMPLES

- **Projections of sea-level rise for Boston range from 2 feet to as much as 6 feet by the end of the century (Sea Level Rise Projections for Boston, City of Boston and NOAA)**
- **Temperatures and precipitation levels will continue to rise over the next century, with increases in "heavy downpours" and severe storms (Regional Climate Change Effects: Useful Information for Transportation Agencies, US Highway Administration)**

SMART SYSTEMS

Sensors, personal technology, connectivity, and data access are ubiquitous.

WHICH MEANS

Accurate, real-time data generated by individuals, city systems, vehicles, weather, and more will provide a basis for more robust, personalized digital tools to aid travelers in the city. This information will also make municipal systems more resilient in the wake of weather events and other disruptions, and support predictive analytics. Most transactions will happen digitally via personal devices, allowing for seamless payments in all contexts.

IN BOSTON TODAY

GPS data from vehicles currently powers services from Uber to municipal traffic prediction, while crowdsourced data from social media has been used to aid crime fighting and community awareness efforts. As innovation leaders like MIT continue to partner with municipal services, increasing data collection has begun to aid transit users with real-time vehicle position and arrival information.

FURTHER EXAMPLES

- **In 2015 Massachusetts led the nation in technology sector concentration – the most tech sector jobs (manufacturing and others) located in closest proximity (Quarterly Census of Employment and Wages 2015, U.S. Bureau of Labor Statistics)**
- **In 2015, 72% of Americans owned a smartphone, with 92% ownership among people 18-29 years old. Overall, smartphone ownership in the US has doubled between 2011 and 2015. 15% of smartphone owners rely on their phones for internet access, particularly young adults and low-income users (US Smartphone Use in 2015, Pew Research Center)**

INCOME INEQUALITY

Economic disparity is increasing throughout the region.

WHICH MEANS

As populations continue to rise in the urban core, demand for affordable housing options will increase in response to economic disparities among residents. Suburban residents seeking affordable housing outside the core will need greater access to inexpensive transit options.

IN BOSTON TODAY

Historically immigrant neighborhoods in Boston such as Chinatown, East Boston, and the North End are changing due to gentrification and increasing costs in the urban core. These communities and others are creating new cultural hubs from Lowell to Quincy.

FURTHER EXAMPLES

- **Many communities in Boston are car-dependent today, despite increasing demand for public transit options (Boston 2030 Report, American Community Survey, 2009-2013)**
- **The number of households headed by seniors is growing, increasing demand for affordable housing for retirees on a fixed income (MAPC Population and Housing Demand Projections for Metro Boston)**
- **People earning significantly less than the area's median income will make up 25-50% of new households in Metro Boston by 2040 (MAPC Population and Housing Demand Projections for Metro Boston)**

HYPER URBANISM

Urban areas are hyper-dense, supporting more residents and workers in less space.

WHICH MEANS

Air rights and other currently under-utilized urban areas will be developed into dense, multi-use spaces, encouraging population growth along transit corridors. Demand for walkable, bikeable communities will increase, as personal vehicle ownership declines and residents seek shorter commutes that require fewer resources. Mixed-use spaces will support greater schedule flexibility, allowing more commuters to work from home or travel during off-peak hours.

IN BOSTON TODAY

Property values and demand for housing in Boston's urban core continue to rise, requiring creative use of space to accommodate increasing demand for housing and business development. This has resulted in new projects from mixed-use spaces in the Seaport to the Boston Public Market now housed above the Haymarket Orange Line stop.

FURTHER EXAMPLES

- **Metro Boston's population will grow by 6-12% by 2040 and urban core communities will attract more than 50% of new housing. (MAPC Population and Housing Demand Projections for Metro Boston)**
- **Singe-occupancy car travel has decreased to less than 50% of total commutes in Boston since 1990, and this trend is expected to continue. (Imagine Boston 2030 Report, Central Transportation Planning Staff, 2010).**
- **The population of school-age children will increase in the urban core, while falling in most suburbs (MAPC Population and Housing Demand Projections for Metro Boston)**

FLEXIBLE ECONOMIES

Resource-sharing is required for financial and environmental sustainability.

WHICH MEANS

More households rely on shared and public resources for transportation and other basic necessities. Consumers will expect an expanding shared economy built on access to on-demand services. Seamless trips will remain a goal for travelers, increasing demand for affordable services that offer personalized, modular, and multi-modal transit options. As congestion increases in urban areas, street parking may diminish, repurposing roadways for vehicles other than cars.

IN BOSTON TODAY

Options for ride-sharing in Boston are expanding quickly to meet growing demand, including Uber Pool, HOV/carpool lanes on major highways, and bike access and sharing initiatives such as Hubway in congested areas. Multi-mode vehicles such as the Silver Line can already negotiate the change between dedicated lanes/tunnels and driving with other traffic on the street.

FURTHER EXAMPLES

- **In Boston, individual trips on Hubway bicycles increased 8-fold between 2011 when the service was introduced, and the end of 2015. During the same period, annual Hubway memberships increased more than 4-fold. (The Hubway, https://www.thehubway.com/about/media-kit)**
- **In the United States, the number of Uber drivers increased 3-fold between 2012 and 2015. In Boston today, Uber has nearly 10,000 drivers – nearly 5 times more vehicles than the city's licensed taxis. (An Analysis of the Labor Market for Uber's Driver-Partners in the United States, Uber)**

ACCESS CHALLENGES

Physical and cognitive diversity among the city's residents and workforce will increase as the population ages

WHICH MEANS

Population centers will not be segregated by age, increasing demand for services that integrate accommodations for residents with a range of physical and cognitive challenges. ADA accessibility will be universally implemented, providing options for a larger commuter population.

IN BOSTON TODAY

An increasing number of seniors are choosing to receive care and services at home. Organizations such as Beacon Hill Village provide neighborhood-based services to aid seniors who wish to remain in their homes and communities. Multi-generational senior housing options (such as Lasell Village on the campus of Lasell college) are also increasing in popularity.

FURTHER EXAMPLES

- **By 2030, metro Boston's over-65 population will be above 1 million — 174% of what it was in 2010. The number of households headed by someone over 65 will nearly double by 2040, with the number of retirees increasing by 54%. (MAPC Population and Housing Demand Projections for Metro Boston)**
- **As the over-65 population increases, suburban areas will be disproportionately affected, with a median population age increase of 7-8 years in some developing areas (MAPC Population and Housing Demand Projections for Metro Boston)**