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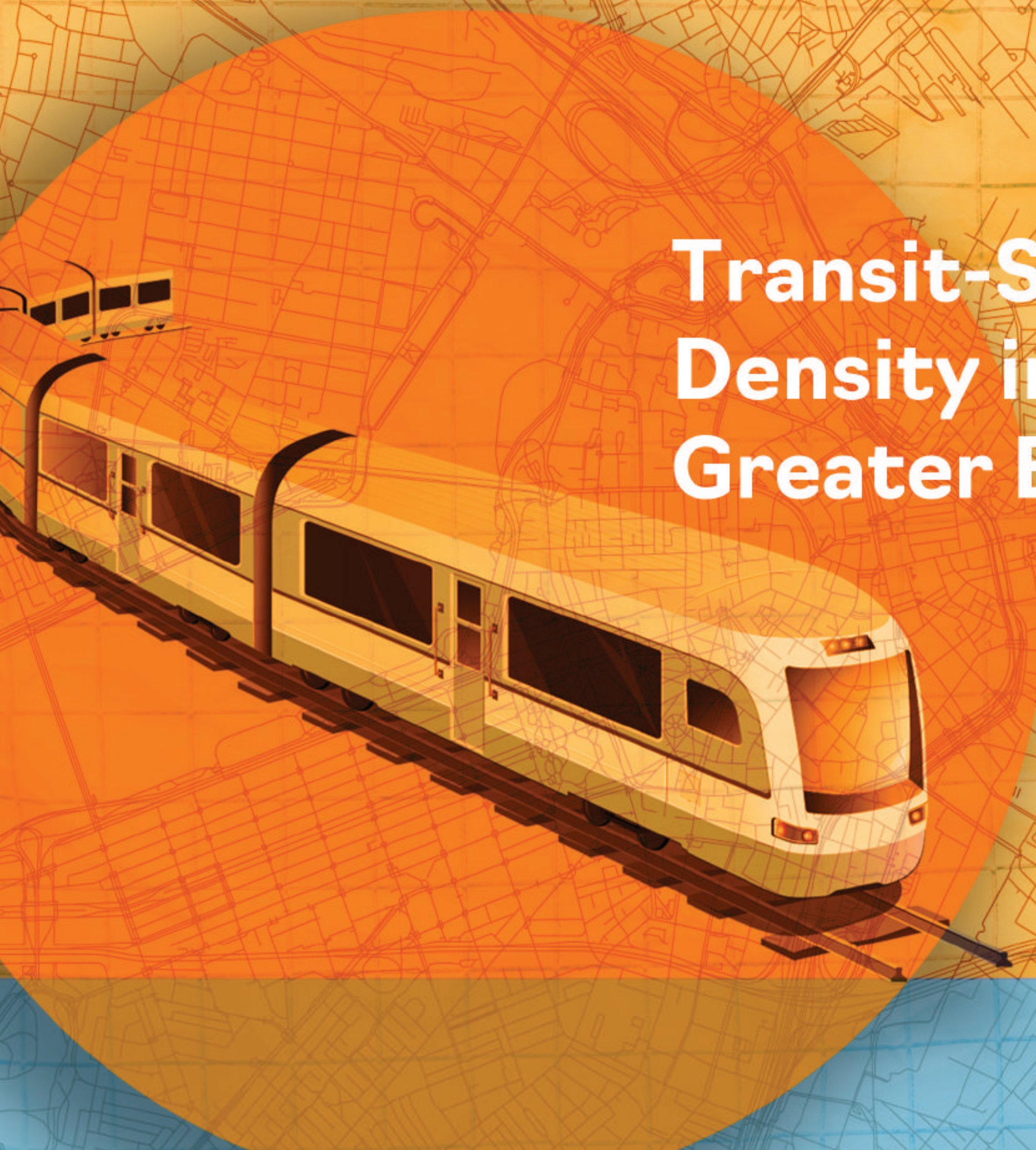
Transit-Supportive Density in Greater Boston



TRANSITMATTERS

BOSTON INDICATORS
MEASURING WHAT WE VALUE

About Boston Indicators

Boston Indicators is the research center at the Boston Foundation, which works to advance a thriving Greater Boston for all residents across all neighborhoods. We do this by analyzing key indicators of well-being and by researching promising ideas for making our city more prosperous, equitable and just. To ensure that our work informs active efforts to improve our city, we work in deep partnership with community groups, civic leaders and Boston's civic data community to produce special reports and host public convenings.

About TransitMatters

TransitMatters is a Boston-based nonprofit dedicated to improving public transit across Massachusetts through research, advocacy, and community engagement. Focused on fostering a reliable, equitable, and sustainable transportation system, TransitMatters champions transformative initiatives like Regional Rail, bus network modernization, and equitable transit-oriented development. By collaborating with transit riders, policymakers, and civic leaders, the organization advances data-driven solutions to enhance accessibility, reduce car dependency, and connect people to opportunity while promoting a thriving, environmentally sustainable region.

Transit-Supportive Density in Greater Boston

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Introduction

While thriving in many ways, Greater Boston faces interconnected challenges: rising housing costs, residential segregation, chronic underinvestment and mismanagement of the MBTA, and climate change impacts resulting from car-centric development patterns. In response, policymakers are increasingly prioritizing the development of dense, walkable neighborhoods. Concepts like "Transit-Oriented Development" and "15-Minute Neighborhoods" reflect this momentum, aiming to reduce housing costs, improve public transit, decrease car dependency, advance environmental sustainability, and support social and economic vitality.

In this report, we use the somewhat lesser-known framing of "Transit-Supportive Density," which highlights the critical role that housing density near transit plays in fostering virtuous cycles of investment and positive-sum growth. A growing body of evidence shows that increasing population density around transit hubs is essential for creating the human capital and economic dynamism that support thriving neighborhoods with reliable, well-funded transit service. We assess the current state and potential of transit-supportive density in Greater Boston by addressing the following key research questions across the subsequent sections:

- **Part 1: Research Benchmarks for Transit-Supportive Density**
  What levels of housing and employment density do researchers and transit agencies think are necessary to support high-functioning transit?
- **Part 2: Regional Comparisons**
  What regions elsewhere in North America have built up good residential density near transit, and what can we learn from them in Greater Boston?
- **Part 3: The State of Transit-Supportive Density in Greater Boston**
  What levels of housing density near transit do we currently have in Greater Boston?
- **Part 4: The State of Density-Supportive Transit in Greater Boston**
  How does our region's current transit system enable and limit density?
- **Part 5: Station Area Case Studies**
  What types of station areas are best situated to embrace and benefit from TSD efforts?
- **Conclusion: Pathways to Transit-Supportive Density**

Fortunately, Greater Boston is operating from a position of strength. We have a thriving, diverse economy with high demand for people to live here. We also have a historic transit system with an extensive rail infrastructure, albeit one that is aging and in need of investment. Throughout much of the region's history, our public transportation system has expanded in line with increases in population and housing density. Today, our network serves Greater Boston and beyond with a combination of rapid transit, Commuter Rail, bus rapid transit, and buses.

Greater Boston also benefits from a strong baseline network of walkable, mixed-use neighborhoods near Commuter Rail stations, many of which were built before the advent of cars. In this respect, pursuing a transit-supportive density strategy is a return to how much of the region was developed before the mid-20th century. By aligning housing and transit policies, Greater Boston can stabilize housing costs, improve transit reliability, reduce car dependency, and make progress toward its climate goals. Pursuing transit-supportive density builds on the region's strengths and lays the foundation for a more connected, equitable, and resilient future.

This focus on housing density and transportation is particularly important for those most vulnerable to the effects of climate change. Environmental justice communities, which are disproportionately low-income communities of color, bear the brunt of climate change despite contributing less to pollution. These groups also rely most on public transportation and are in greatest need of more affordable, multifamily housing. Advancing climate solutions that prioritize density, housing, and transportation not only supports the state's climate targets but also promotes equity by addressing the needs of the communities most affected.

1 Research Benchmarks for Transit-Supportive Density

To analyze the state of transit-supportive density in Greater Boston, we first need to establish a basic understanding of density and its relationship to transportation. While there is no ideal density that can be prescribed for any given neighborhood, various academics and experts have sought to estimate minimum levels of density needed to support different types of transit.

Defining Density

At its core, density is simply the concentration of people in a given area. While it may seem like a straightforward calculation, numerous variables complicate this analysis—especially when evaluating how much density is needed to support public transportation. These variables include:

Population metrics (the numerator)

Metrics such as population, households, jobs, or housing units each highlight different aspects of density:

- **Population Density**: People per area (e.g., per square mile).
- **Employment Density**: Jobs per area.
- **Population + Employment Density**: A combined measure, often weighted for transit use.
- **Household Density**: Households per area, reflecting housing stock and household size.
- **Housing Unit Density**: Housing units per area, valuable for land-use and housing policy.

Geographic units (the denominator)

The size of the area used in calculations dramatically affects results. For instance, small areas (e.g., parcels) show extreme variation, while larger units (e.g., square miles) smooth out differences in the urban form. The result is that different scales of measurement will produce different density figures. Therefore, when exploring transit-supportive density, it is important to focus on a geography that is within a walking distance of transit. For most types of transit service, this is a half-mile radius, although other approaches, such as walksheds[1] , are also often considered.

Transportation type

Different transit modes require varying levels of density if they are to receive the ridership needed to justify service.

- **Buses**: Best suited for moderate density due to flexible route planning and congestion limitations.
- **Light Rail/Streetcar (e.g., the Green Line)**: Effective in medium-density areas and along major corridors due to inflexible routes and congestion limitations.
- **Subways/Rapid Transit (e.g., the Red or Orange Lines)**: Thrive in very high-density areas due to larger capacity and high frequency.
- **Heavy Rail (e.g., Commuter Rail)**: Best suited for higher density due to capacity potential but limited by stop spacing and service frequency.

Defining "support"

Transit-supportive density can mean different things—encouraging ridership for existing systems or justifying transit expansion. Definitions often vary based on these different goals.
Lurking underneath the surface of this report is the fact that density alone does not determine the success of transit systems. Local factors such as wealth and income, attitudes toward public transportation, geography, and land-use patterns significantly influence ridership dynamics. These elements make the relationship between density and transit highly context-dependent.

Despite these complexities, examining the components of density laid out above helps deepen our understanding of density's role in supporting transit, providing a more nuanced approach to assessing transit-supportive density in Greater Boston.

Measuring Transit-Supportive Density

What density levels do researchers suggest are needed to support transit?

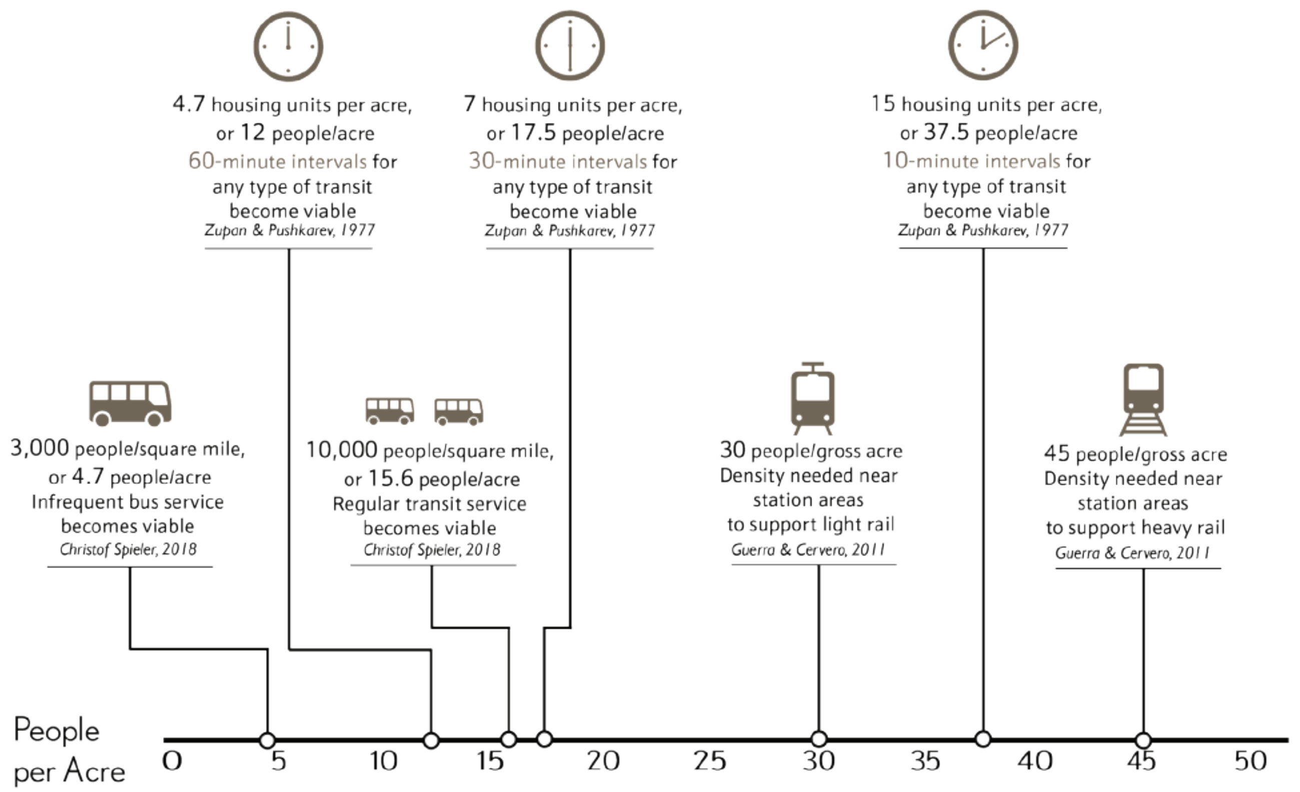
Christof Spieler: In his book *Trains Buses People*[2], transit expert Christof Spieler estimates the minimum density threshold needed for infrequent bus service is **3,000 people per square mile**, while for more frequent public transit of any mode it is **10,000 people per square mile**. Note that the geography is a square mile, a significantly larger geography than benchmarks offered by other researchers.

Zupan & Pushkarev[3]: In one of the earliest estimations of the density needed to support transit, Jeffrey Zupan and Boris Pushkarev based their density estimates on three levels of frequency: 60-minute, 30-minute, and 10-minute. They also used dwellings, or housing units, as the unit of measurement, which, given the change in household size since their research was published in] 1977, would likely produce different results today. Nonetheless, their estimates were that **4.7 housing units per acre** are needed to justify hourly transportation service; **7 housing units per acre** justify 30-minute frequencies; and **15 housing units per acre** justify 10-minute intervals. They did not specify the type of transit being considered.

Guerra & Cervero[4]: Researchers Erick Guerra and Robert Cervero modeled the influence of population densities on transit ridership to put forth two density estimates: **30 people per gross acre** for light rail service and **45 people per gross acre** for heavy rail service. A gross acre, also known as a neighborhood acre, differs from a net acre or residential acre. The former considers all land uses in the area, such as parks, services, and businesses when calculating the residential density, while the latter only looks at the density of residential uses. As a result, the same area will have a lower gross acre density than a net acre density.

The upshot is that when it comes to estimating the density needed to support transit service, researchers tend to reach different figures depending on their research question, scope, methodology, and interpretation of results. Nonetheless, a few general groupings are evident in the research. If one translates the previous research into a consistent "people per acre" benchmark, a cluster emerges at around 15 people per acre as a density at which some moderate level of transit service begins to make sense. Meanwhile, at roughly 2–3 times that density, high-frequency service, such as a subway line with less than 10-minute intervals between trains, becomes plausible as the density is sufficient to produce enough riders to justify said service.

Research Estimates of Density Thresholds for Effective Transit Services



Density metrics that include jobs

Transit not only serves the residents of a neighborhood but also people who commute to it for work. Therefore, some researchers, urban planners, and transit agencies also include job density as a key component of their density analyses. This report focuses on residential density, in part because it helps concentrate the analysis, but it is worth providing a couple of examples for how others include job estimates in density benchmarking. Markus Moos[5], for instance, integrates jobs into his density metrics and identifies thresholds at which different types of transit become viable:

- **15 People + Jobs/acre**: Frequent bus or rail (10-15 minute headways)
- **18 People + Jobs/acre**: Very frequent bus or rail (5-minute headways)
- **29 People + Jobs/acre**: Light rail
- **36 People + Jobs/acre**: Subway

Outside academia, jobs + residential density metrics are also embedded in guidelines and policies crafted by agencies and policymakers. For example, the Metropolitan Area Planning Council (MAPC) in Massachusetts developed a “Normalized Intensity” metric, which was subsequently adopted by MassDOT/MBTA in their Transit-Oriented Development (TOD) Policies and Guidelines[6].

Other density metrics used by agencies and policymakers

A density metric that has garnered significant local attention in recent years is the **15 units per acre requirement** outlined in the MBTA Communities Act[7]. This 2021 law mandates that relevant municipalities designate at least one reasonably sized district where multifamily housing is allowed "as of right." The minimum allowable gross density in these districts must be at least 15 units per acre, although specific requirements vary by town.

Since this is a housing production law, the focus is on housing units rather than population or jobs. While the law has clear implications for transit, as suggested by its name, it is not explicitly a transit-supportive density policy, as the primary goal is to increase the production of multifamily housing, not directly to bolster transit via density. Another important consideration is that the 15-unit per acre threshold applies to zoning *capacity*, not actual development. Zoning rules set a maximum allowable density, and actual build-out often falls below this ceiling due to various factors, including market demand and other development constraints.

Agencies outside Massachusetts have established guidelines tailored to their transit contexts. These highlight the variability in defining “ideal” densities based on location, transit type, and community structure. Two useful examples are:

- **Washington Metro (WMATA)**[8] has set a goal for all half-mile suburban Metro rail station areas having a minimum of 12 households and 19 employees, while urban station areas should aim for 15 households and 75 employees per acre.
- **Toronto’s City Planning Department**[9] had proposed density targets of 150–400 people + jobs per hectare (roughly 60–160 people + jobs per acre) around transit stations, depending on the area's urban form.

Density benchmarks used in the rest of this paper

Despite the nuances in measuring ideal transit-supportive densities, a few rough benchmarks emerge when scanning these research findings. One key benchmark is **15 people per acre**, which supports moderate transit service, such as buses or trains running at 30-minute intervals. This "tipping point," as described by Christof Spieler, marks the density at which providing regular transit service becomes increasingly practical for agencies. Similarly, Zupan and Pushkarev identify this threshold as critical for sustaining moderate transit operations.

For more intensive transit modes, such as subways or high-frequency regional rail, a higher density—**approximately 40 people per acre**—is typically required. This threshold reflects the operational and capacity needs of frequent, reliable service. It's worth emphasizing that these are minimum benchmarks, not maximums or ideal targets. Many vibrant station area case studies in other parts of North America discussed in this report have residential densities far exceeding these levels.

Rough density benchmarks used in the rest of this report

Minimum density levels identified by researchers and transit agencies for supporting high-functioning transit.

Metric	Moderate-Frequency Service	High-Frequency Service
People per acre	15	40
Housing units per acre	6	16

Housing units per acre estimate is established by dividing people per acre by 2.5, the average household size in Greater Boston.

Table: Boston Indicators / TransitMatters • Created with Datawrapper

The analysis in this report leverages data from TODEX[10], a dataset and digital tool developed by the Massachusetts Housing Partnership's Center for Housing Data. Since TODEX reports density in housing units per acre rather than people per acre, these benchmarks are converted accordingly. In Greater Boston, the average household size is approximately 2.5 people. However, in denser urban areas with smaller housing units, this figure tends to be slightly lower (e.g., 2.3 people per household in Suffolk County). Using these averages, the benchmarks translate to **6 housing units per acre** for moderate transit service and **16 housing units per acre** for high-frequency service. While these thresholds are not precise measurements, they provide practical guidelines for evaluating density near transit stations and assessing how well these areas align with transit-

Regional Comparisons

A central inspiration for this paper is the various other North American metropolitan areas that have already built strong levels of transit-supportive density. Walking through some of these examples provides context for an analysis of Greater Boston and helps illustrate what is possible to achieve locally. Some of these regional comparisons have decent density along much of their transit systems, whereas others have achieved density around specific stations or along particular transit corridors. The common thread throughout is that all have gone further than most of Greater Boston.

Northern New Jersey

The urbanized counties in North and Central New Jersey are a prime example of a region making strides in building out significant housing density near its transit nodes. With its proximity to New York City, the region boasts strong economic and transit connections. The strongest such transit connection is the PATH system. This 13.5-mile hybrid regional rail/rapid transit system runs 24 hours a day, 7 days a week and links Newark, Jersey City, and Hoboken to Manhattan.

Jersey City is an excellent example of transit-supportive density in an already-urban context. Jersey City's population grew by nearly 45,000 residents between 2010 and 2020, reaching more than 292,000[11]. Much of this growth has been concentrated near PATH stations such as Journal Square.

Journal Square PATH station and surrounding development in Jersey City, N.J. Photo: Crexi

Historically an underutilized area, Journal Square has seen the development of over 4,000 new residential units across multiple high-rise projects since 2010, with additional developments in the pipeline. These projects integrate retail and office space, creating mixed-use hubs that anchor the area as both a residential and employment center. For example, Journal Squared[12], a multi-phase transit-oriented development project, features over 1,800 residential units in towers rising up to 70 stories, reflecting the scale of density achievable near robust transit access. It is now the most-ridden station on the New Jersey side of the PATH system, with over 16,000 daily riders[13].

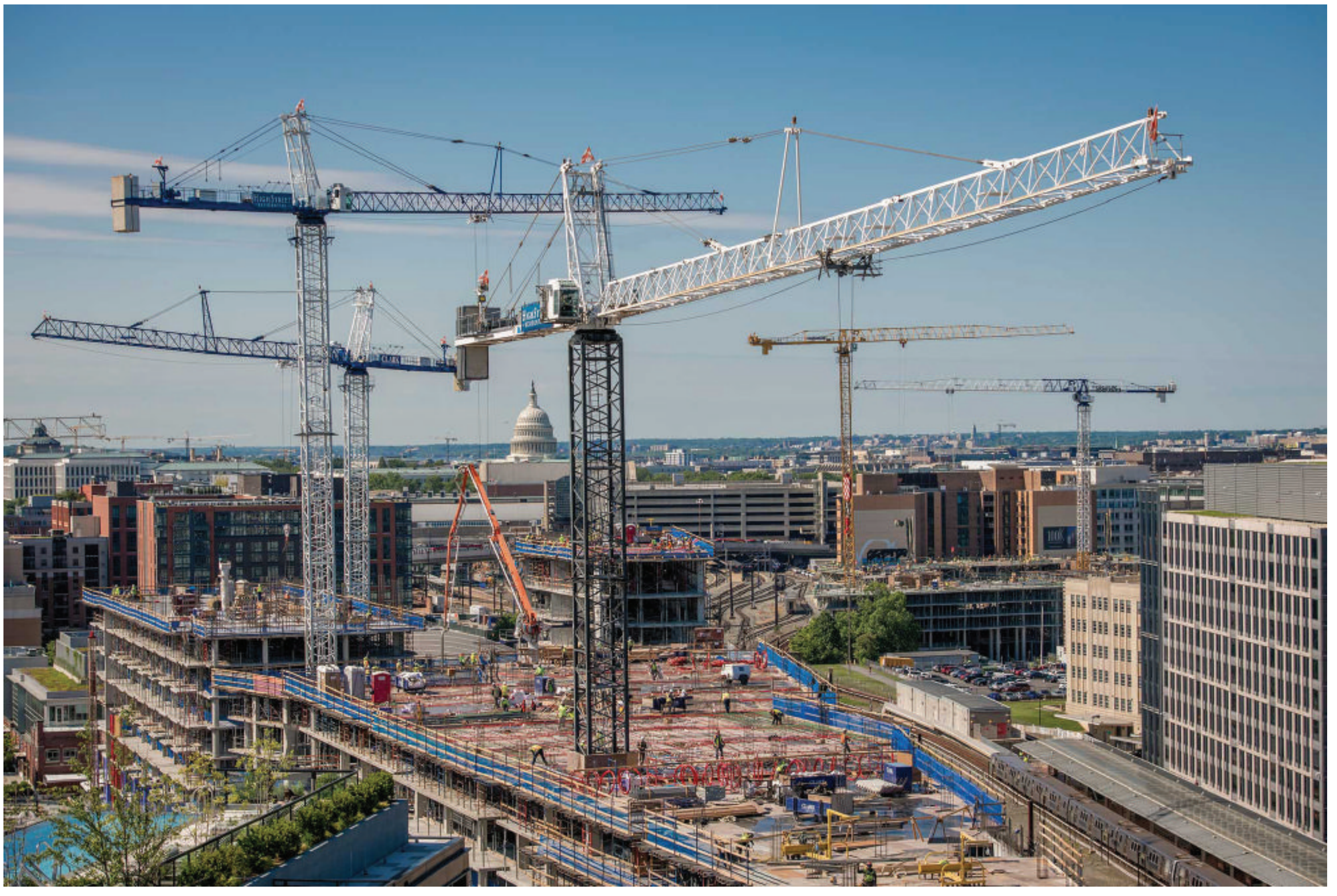
The transformation of a parking lot in the suburban town of Metuchen, N.J. Photo: New Jersey TOD Symposium

While Jersey City demonstrates what is possible in an urban setting along high-frequency rapid transit, New Jersey has also embraced TOD efforts along its suburban commuter network, NJ Transit. Unlike the MBTA Commuter Rail, which operates primarily on peak-focused schedules, NJ Transit provides more robust off-peak and weekend service on its core lines. For example, trains on the Northeast Corridor Line (NJT) and Morris & Essex Line[14] run as frequently as every 20–30 minutes on weekends and late evenings, compared to hourly or worse frequencies on MBTA Commuter Rail. This higher level of service enhances accessibility for a variety of trips, not just traditional commutes. From urban redevelopment in Newark and Harrison centered on both PATH and New Jersey Transit, to suburban downtown infill in places like South Orange, Montclair, and Metuchen, the public transit in Northern New Jersey supports a greater level of transit-oriented developments compared to Greater Boston.

In contrast, Greater Boston struggles to achieve the same scale of development and transit connectivity. While Northern New Jersey has leveraged both PATH and NJ Transit[15] to support dense, mixed-use growth, the areas around Greater Boston's Commuter Rail and even some subway stations often remain underdeveloped. Northern New Jersey demonstrates how combining frequent transit service with proactive development policies can create vibrant, sustainable urban centers while significantly expanding housing supply.

Washington, D.C. Area

The Washington, D.C. metro area is similar to Greater Boston in that it's a highly educated region with a reasonably robust public transit system and an economy highly dependent on tech, service jobs, and education. However, since 2010, the Washington metropolitan statistical area (MSA) has grown more rapidly, increasing its population by 12.4 percent compared to 7.9 percent for the Boston MSA. This is in part due to higher housing production; D.C. builds significantly more housing than Boston. As a result, rent growth has been slower[16] than in Boston, despite growing slightly. And that rent growth is starting out from a drastically cheaper level[17].

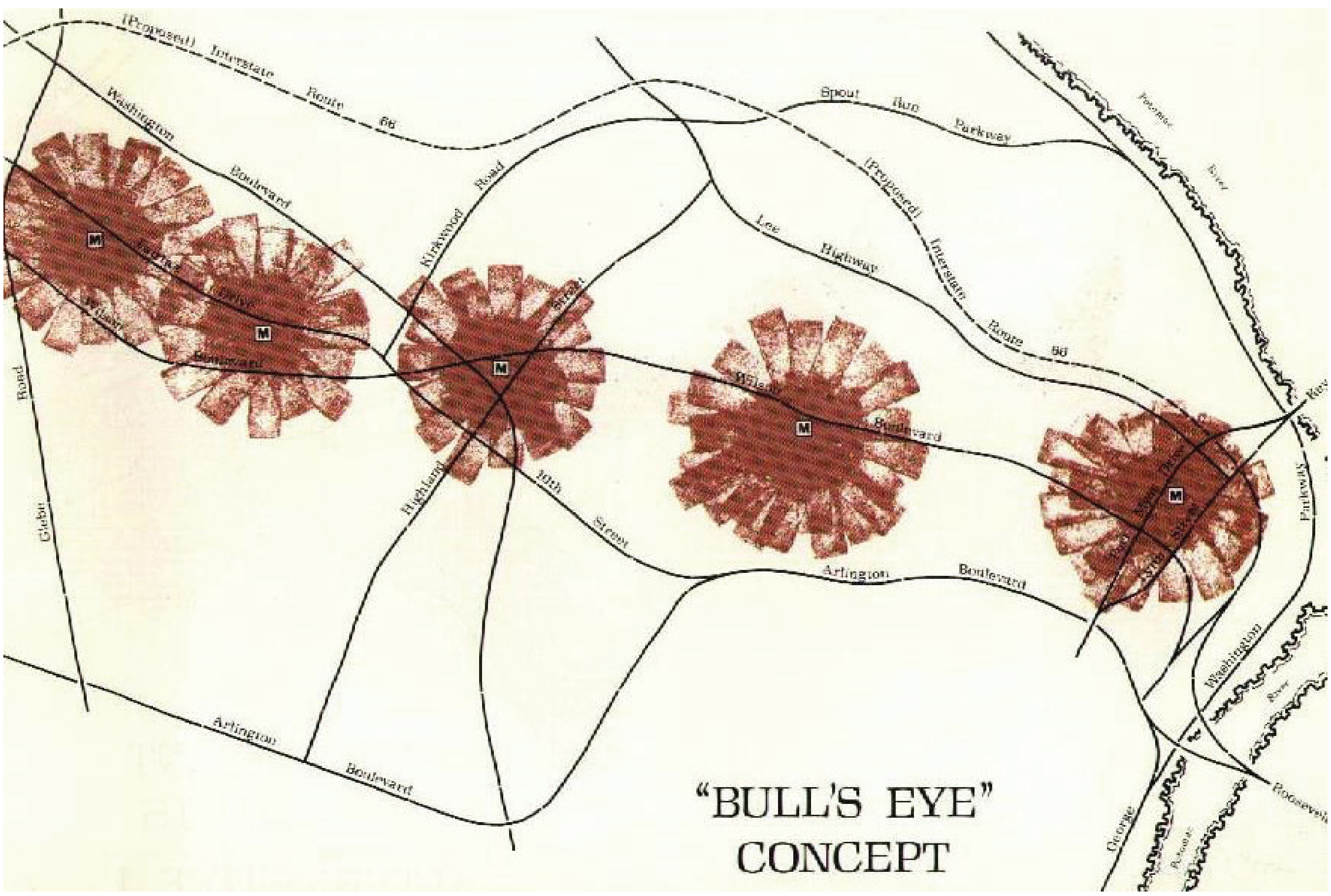


The growing NoMa District in Washington, D.C., centered on the WMATA Red Line and Amtrak Northeast Corridor.
Photo: Sam Kittner

Compared to Greater Boston, Washington, D.C. has pursued and achieved a comparatively high level of transit-oriented growth. One such case is the area around the NoMa–Gallaudet U Metro Station. Opened in 2004 as an infill station, it catalyzed the transformation of an underutilized former industrial area. By the late 2000s, the first wave of housing came online, followed by a surge of multifamily developments in the 2010s, ultimately bringing 7,300 residential units to the neighborhood[18]. Today, NoMa is home to approximately 11,000 residents and serves as a hub for over 40,000 jobs, with $3 billion in private investment fueling its growth. The neighborhood boasts a mix of mid- and high-rise residential buildings, office spaces, and retail amenities, all concentrated within a walkable radius of the station. The infill Metro station is in the top 10 percent of stations by ridership in the system despite being nearly three decades younger than the rest of the Red Line.

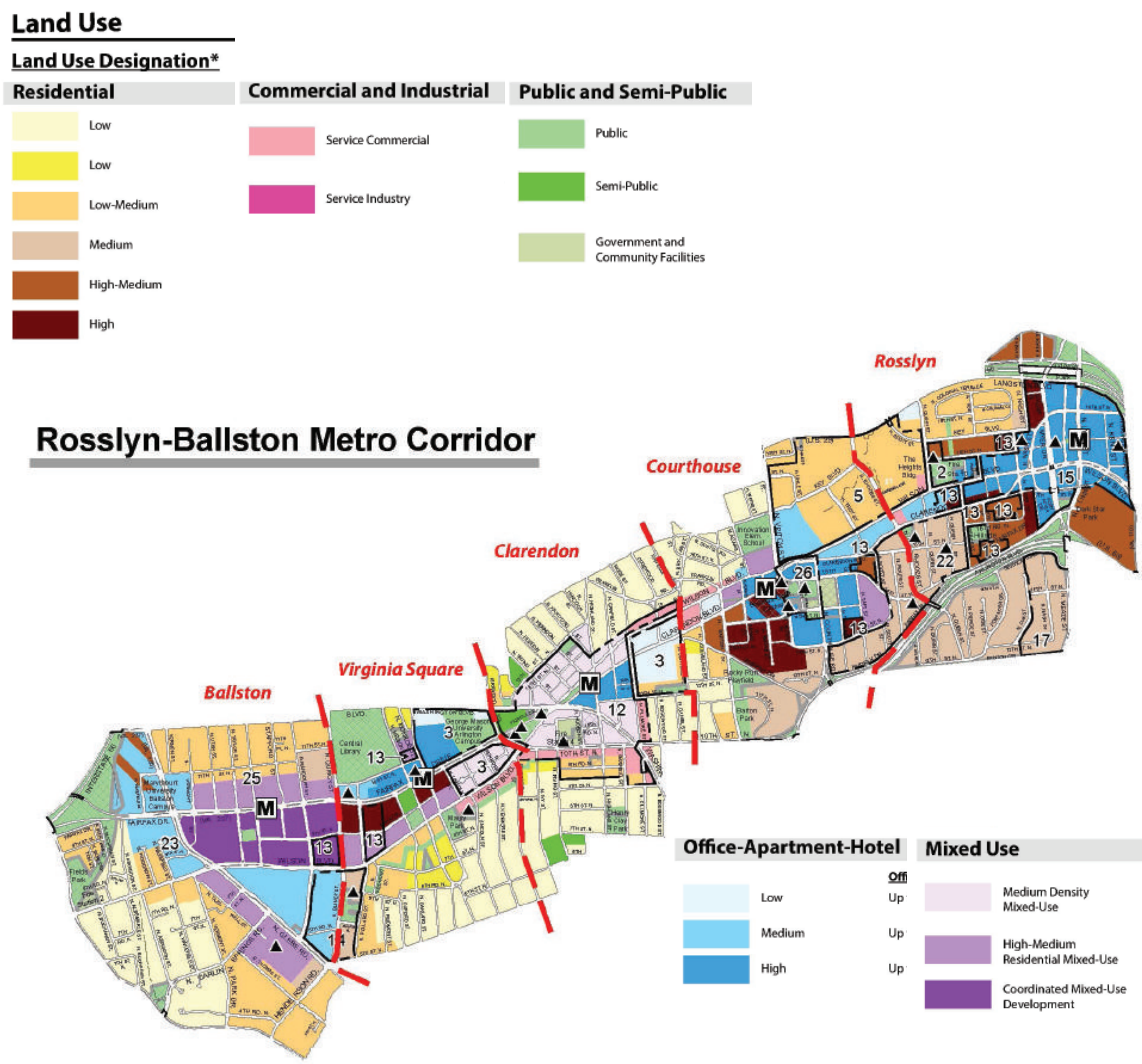
In contrast, Assembly Row in Somerville, developed following the opening of Assembly Station in 2014, is often celebrated locally as a TOD success story despite operating on a smaller scale. The area has added 2,000 residential units alongside a vibrant mix of retail, dining, and entertainment spaces, creating jobs and an active urban environment. However, when compared to NoMa in Washington, D.C.—a neighborhood that has achieved significantly higher housing population density, and is one of several large-scale neighborhood transformations in the D.C. region—Assembly Row's scale underscores the potential for even greater TOD in Greater Boston. And the ridership shows this, 2019 data shows that Assembly has the lowest ridership on the north side of the Orange Line.

NoMa is not an isolated case nor a coincidence of opportunity. The D.C. metropolitan area has a long history of planning for and embracing transit-oriented development at a regional scale. For example, Arlington, Virginia's "bull's-eye" policy[19] dates back to the 1960s. It concentrated high-density growth around transit stations, including 30- to 40-story towers along the Rosslyn-Ballston Corridor of the Washington Metro system. By concentrating development within a quarter to half-mile radius around each station, Arlington aimed to create vibrant, walkable urban centers without disrupting the surrounding low-density neighborhoods. Each station was planned with a distinct character, from Rosslyn's business core to Ballston's mixed-use development. This strategy has been remarkably effective in generating transit ridership, with pre-COVID daily station usage averaging between 5,000 and 13,000[20]. The high-density residential and commercial growth spurred by this policy created strong demand for transit, which in turn increased the capacity of the subway line to support more density.



The "bull's eye" concept in theory (above) and in practice (right). The concept's core principle is the intensification of uses along the Rosslyn-Ballston Metro Corridor. Photos: Arlington County Virginia

In contrast, the northern corridor of the MBTA's Orange Line (Community College to Oak Grove) lacks similarly focused development and regional coordination. While some areas, like Malden Center, feature mid-rise buildings, others remain dominated by low-density housing, car infrastructure, and industrial uses. Pre-COVID ridership at stations like Community College (4,000) and Oak Grove (6,000) reflects these lower densities, averaging 46 percent less than Arlington, Virginia's transit corridor[21]. Despite also having Commuter Rail service, the infrequent trains contribute negligible ridership compared to MBTA or WMATA subways. Arlington's "bull's eye" approach shows how transit-supportive density can create vibrant neighborhoods with high ridership, while the Orange Line corridor exemplifies Greater Boston's missed opportunity to leverage transit for dense urban growth.



Greater Toronto

Across the border in Canada, the Greater Toronto Area (GTA) is undergoing a significant transformation in its transit infrastructure to support its rapidly growing population, projected to increase by 1 million inhabitants every five years[22] in the decades ahead.

The Yonge Street Corridor featuring the downtown Central Business District (CBD) and two of Toronto's four additional CBDs. Photo: ZarlokX, WikiCommons

To support the expected population growth, the Toronto Transit Commission (TTC) is expanding its heavy rail network, including both the expansion of existing lines and the construction of new ones. Several light rail transit projects, such as Eglinton Crosstown and Finch West, are underway to provide faster transit options in underserved areas. On a larger scale, Metrolinx's GO Expansion program aims to electrify and increase the frequency of GO Transit commuter rail services, offering two-way, all-day service every 15 minutes over core segments throughout the broader region. Metrolinx will also add two light rail lines in suburban regions. These comprehensive transit improvements[23] are designed to accommodate the GTA's anticipated population growth and promote transit-oriented communities throughout the region.

While Toronto's subway network anchors much of the city's transit-oriented development, the Greater Toronto Area demonstrates the unique potential of creating high-density, mixed-use communities along commuter rail lines—often far from the TTC's reach. Mimico GO Station, located on the Lakeshore West Line, is a standout example. The area around Mimico GO is in the midst of a transformation from a low-density suburban area to a dense, transit-supportive neighborhood. Developments like Mimico Triangle[24] have introduced more than 1,000 new residential units in mid- and high-rise buildings. In addition, there are more than 7,800 residential units either proposed or under construction in the area, a substantial increase in housing density. These changes highlight the potential of TOD in suburban contexts, even without subway service.

Similarly, Mount Pleasant GO Station, located 20 miles from downtown Toronto on the Kitchener Line, has evolved from a suburban park-and-ride into a thriving transit hub. Starting in 2013, a 96-acre New Urbanist village was built, featuring 1,300 homes ranging from single-family houses to townhomes and multifamily units. Recent years have brought additional density, with 1,000 new units in mid- and high-rise buildings and a proposed 2,801 units in adjacent towers reaching up to 47 stories. In under two decades, Mount Pleasant has become a vital housing node, significantly contributing to Metro Toronto's housing needs.

Both Mimico and Mount Pleasant are set to offer 15-minute service eventually. However, thousands of units are already coming online, with thousands more either permitted or under construction, relying on hourly diesel service. Notably, there are developments of up to 3,900 units underway, even at a less-than-ideal 18-minute walk from a GO station. This demonstrates that substantial development can occur before reaching transit's optimal state.

Mount Pleasant Village and associated transit-oriented development. Photo: The Daniels Corp

Metro Vancouver

Another Canadian city pursuing ambitious TOD efforts is Vancouver, British Columbia. The West Coast city's automated SkyTrain system has been a driving force behind high-density, mixed-use transit-oriented developments that seamlessly integrate housing, retail, and transit.

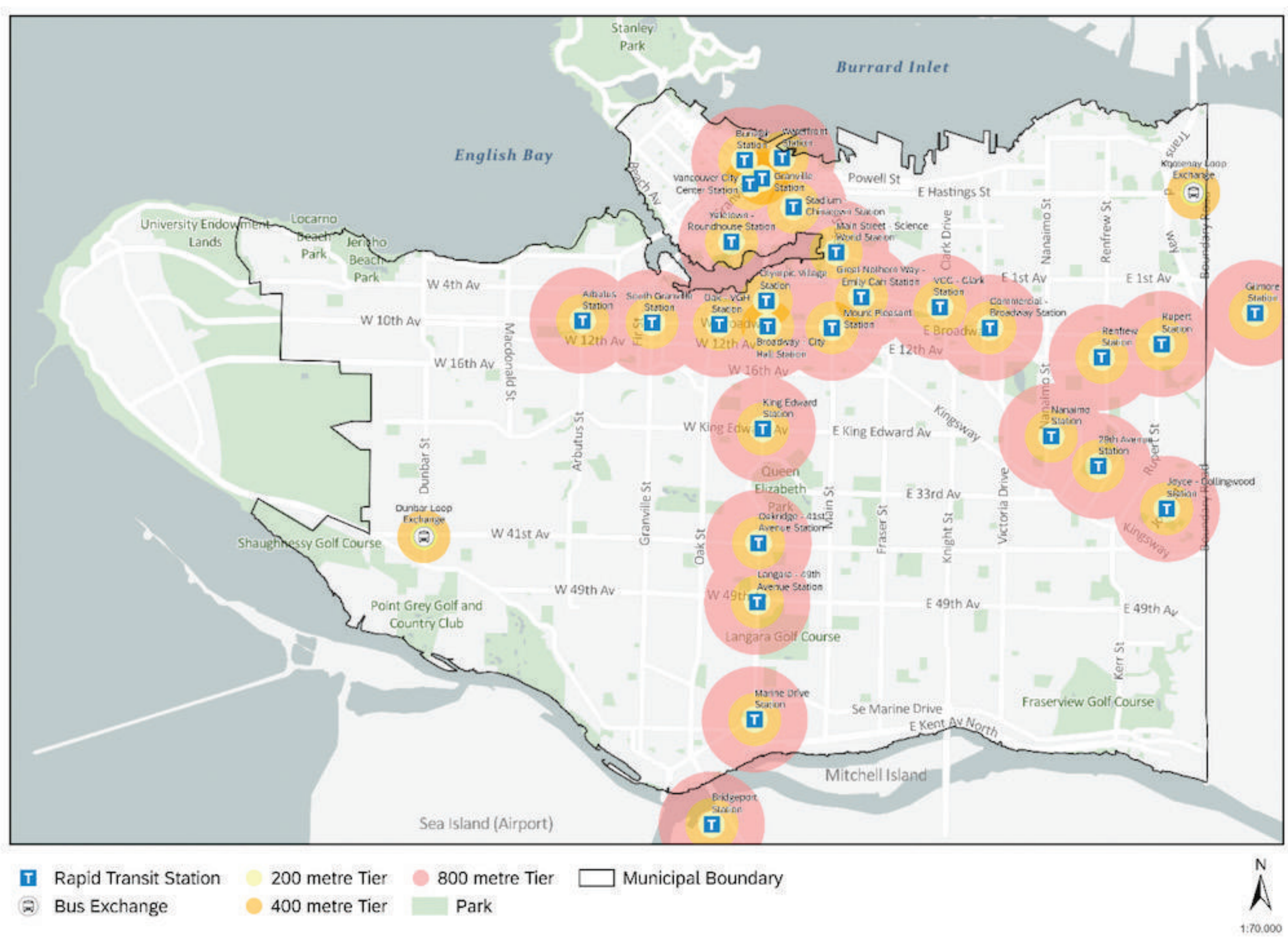
The Vancouver SkyTrain has spurred transformative transit-oriented development, illustrating the potential for high-density growth far from an urban core. Since the SkyTrain opened in 1986, suburbs such as New Westminster have been transformed into thriving urban hubs. New Westminster, located more than 12 miles from downtown Vancouver, has seen its downtown evolve from a low-rise, parking-lot-filled area into a vibrant district of local businesses and mixed-use developments. This transformation began with Plaza 88[25], a landmark project that introduced 1,000 condo units atop retail and entertainment spaces, kicking off the creation of a skyline that resembles a major urban center more than a traditional Vancouver suburb.

Vancouver is full of similar cases. The planning of the Evergreen Extension of the SkyTrain Millennium Line to Port Moody and Coquitlam spurred the creation of Suter Brook Village, a 22-acre master-planned community with 525 residential units integrated with retail and office spaces near Inlet Centre station. Despite its location along an important thoroughfare, the area is set for even more transformation as 2,587 new housing units will replace 59 aging suburban houses[26] in the upcoming Inlet District, demonstrating the impact of Inlet Centre station opening in 2016.

New Westminster skyline with downtown Vancouver in the distance, circa 2022. Photo: City of New Westminster

Marine Gateway, near the Marine Drive SkyTrain Station on the Canada Line, is another exemplary TOD project. Completed in 2015, the development includes two residential towers with more than 400 housing units, combined with retail, restaurants, office spaces, and a cinema, all directly connected to the station. Its mixed-use nature and high density exemplify how proximity to rapid transit supports vibrant, self-contained communities. Developments with as many as 1,000 units and 40 stories[27] are planned for the SkyTrain extension to the southeast suburb of Surrey, 17 miles from downtown Vancouver.

Vancouver is likely to see even more development near SkyTrain stations. The province of British Columbia has adopted a promising zoning reform that will support TOD near SkyTrain stations. The ambitious "Homes for People Action Plan"[28] from 2023, requires municipalities to designate Transit-Oriented Development Areas[29] near transit hubs. These TOD Areas are defined as land within 800 meters of a rapid transit station or 400 meters of a bus exchange; within each are three tiers of density (echoing the tower to single-family home "step-down" seen in Arlington's "bull's eye" concept). This reform aims to address the region's housing crisis by increasing density quickly. The new law bypasses slow rezoning processes, enabling the rapid production of multifamily housing and mixed-use projects in underutilized and low-density areas.



Transit-oriented development areas in the City of Vancouver. Photo: City of Vancouver

The crucial transit component of Vancouver's ambitious densification plans is SkyTrain's automated, fully grade-separated system. By utilizing driverless train cars, Vancouver can easily scale up the frequency of trains without incurring many additional costs. This allows the system to run all-day service with 5–7 minute intervals during peak hours and 8–10 minutes off-peak. The automated train cars have also helped SkyTrain avoid the severe service cutbacks that impacted many North American transit systems, including the MBTA, especially during the COVID-19 pandemic. The system's consistent frequency and reliability make it practical for daily use, allowing thousands of nearby residents to rely on the train system.

In contrast, the MBTA's subway and Green Line lag Vancouver's SkyTrain in both frequency and reliability. SkyTrain relies on smaller train cars, comparable in capacity to the Green Line, but benefits enormously from automation and grade separation. Grade separation, which involves aligning transport routes at different heights to avoid intersections, allows for increased frequency, speeds, and accessibility.

It is stark to see how quickly the system has been built out and to see the level of TOD that has been spurred by the dramatically smaller, if more frequent trains, than the MBTA's rapid transit network. In 40 years, Vancouver has built a system that has more absolute ridership[30] than the Red, Orange, and Blue lines combined and more riders per mile—the high level of transit service and TOD have enabled the conditions for transit-supportive density to thrive in Vancouver.

Lessons for Greater Boston

Across North America, regions like Northern New Jersey; Washington, D.C.; Greater Toronto; and Vancouver demonstrate how strong transit systems and strategic planning can create the conditions needed for higher levels of transit-supportive density. While each of these cities have their challenges, they also have much to teach Greater Boston when it comes to better aligning the crucial relationship between housing and transit. Each case study unpacked in this section has been able to effectively combine frequent, reliable transit with dense, mixed-use growth near stations at levels seldom reached in Greater Boston.

Key strategies include leveraging high-frequency transit service to support both urban and suburban development. This involves aligning zoning with transit expansion and fostering walkable neighborhoods with diverse housing and commercial options. For example, frequent service on Vancouver's SkyTrain, as well as the PATH and NJ Transit, has spurred transformative TOD. In Toronto and Virginia, transit expansion has been paired with concentrated and coordinated densification near transit hubs.

In contrast, Greater Boston struggles with limited service frequency and fragmented development, missing opportunities to fully capitalize on its transit network. By adopting lessons from these regions—such as prioritizing service improvements and enacting zoning reforms—Greater Boston could better integrate transit and housing to address its growing needs.

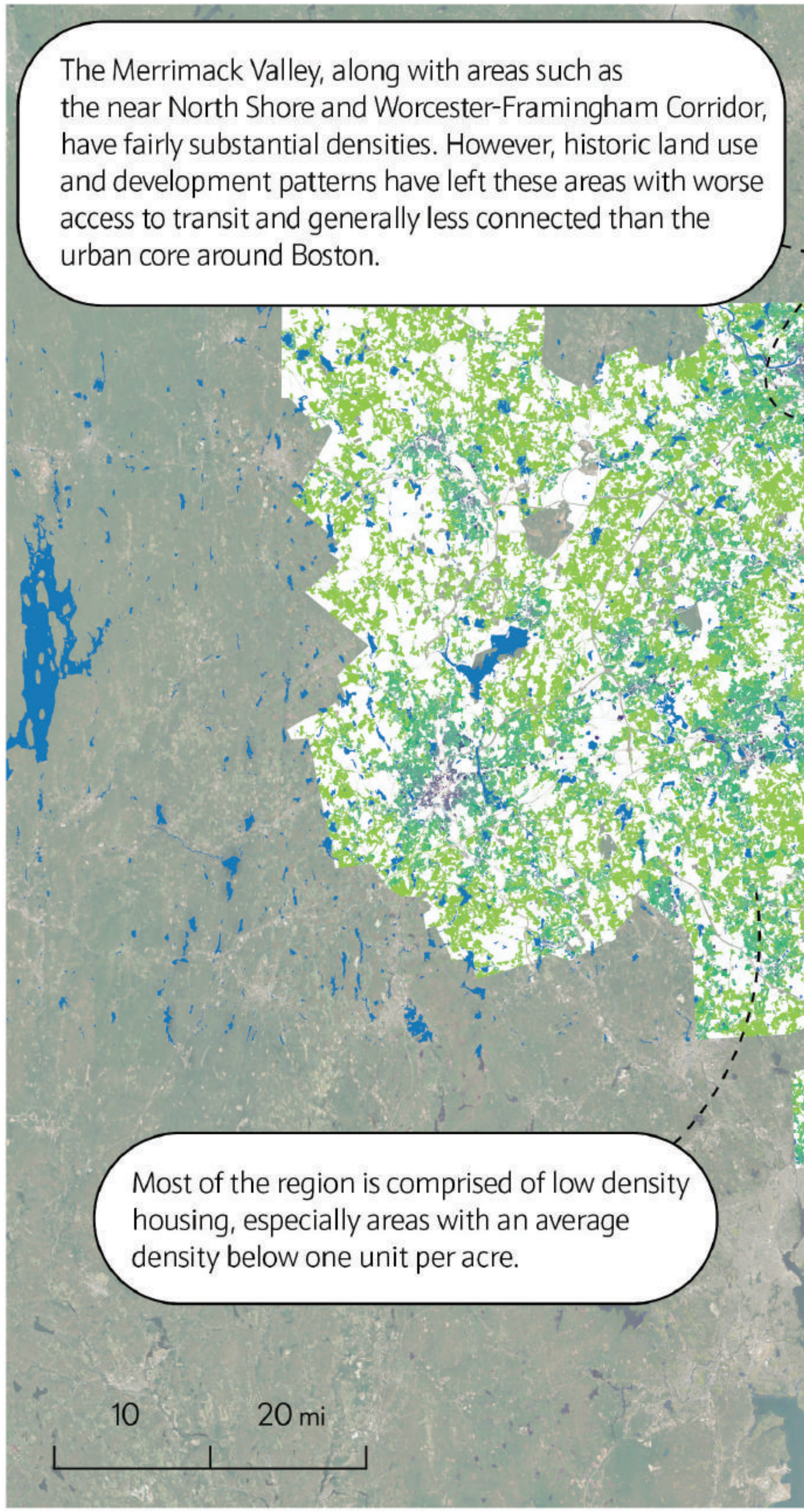
3

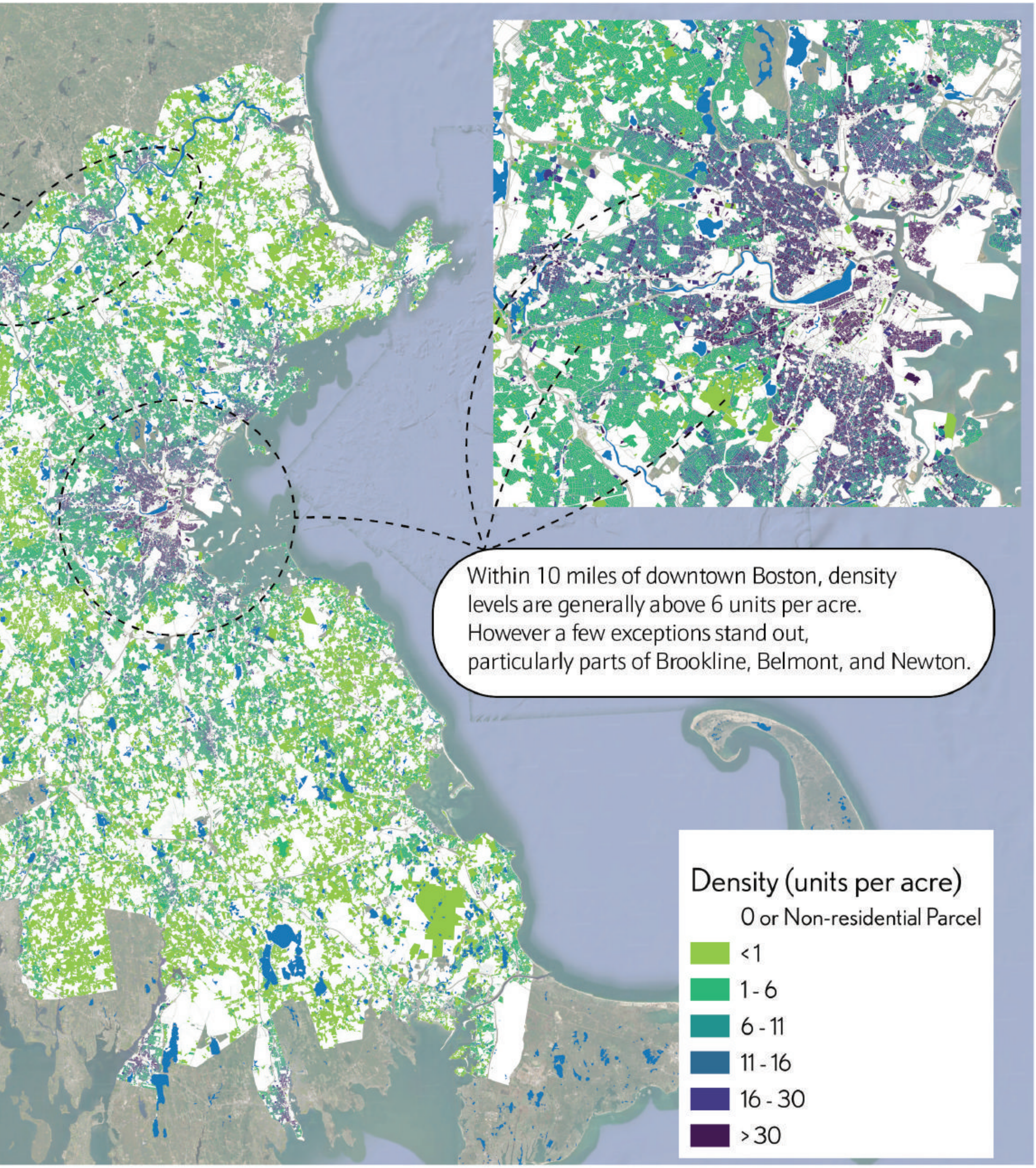
The State of Transit-Supportive Density in Greater Boston

This section analyzes current residential density levels near transit in Greater Boston, comparing them to established benchmarks and density levels in other regions. Using data from Residensity[31], a tool created by the Massachusetts Housing Partnership's Center for Housing Data, we first establish a baseline of housing unit density regionwide, before focusing the rest of our analysis on density levels around transit nodes.

While there are many observations one can draw from this broad perspective of the region's density, a few dynamics stand out. One is how residential density levels fan out from downtown Boston. Average densities in the immediate urban core communities meet or exceed the 6-unit-per-acre threshold for infrequent transit service. However, only Somerville surpasses the 16-unit-per-acre benchmark required for high-frequency transit, reflecting the high demand for projects like the Green Line Extension. It takes only about four miles for a significant scaling down of density to occur, with Brookline, Belmont, and Newton each dipping below the 6-unit-per-acre threshold despite their central locations. Outside the urban core of Boston, the Merrimack Valley stands out as the largest cluster of moderate to high-density housing, yet it suffers from insufficient transit infrastructure, limiting its connectivity. These figures provide a foundation for understanding residential density across the region, which we will explore further in the context of public transportation systems.

Residential Density in Greater Boston




Within 10 miles of downtown Boston, density levels are generally above 6 units per acre. However a few exceptions stand out, particularly parts of Brookline, Belmont, and Newton.
Density (units per acre)
0 or Non-residential Parcel
<1
1 - 6
6 - 11
11 - 16
16 - 30
>30

Density by Transit Mode

A common method for estimating density near transit is to analyze the half-mile radius around each station, roughly equivalent to a 10-minute walking distance. While this approach doesn't account for street grids or geographic obstacles—making it an imperfect measure—it remains useful for comparing stations and identifying those within overlapping radii.

To better understand the relationship between density and transit, we can classify public transportation services into four categories based on surrounding density. These categories are important because the appropriate level of density should vary depending on the quality and frequency of transit service. This analysis assumes a hierarchy of transit modes to avoid duplicating parcels near multiple station types. Rapid transit is prioritized over Commuter Rail, and both are prioritized over bus service. For example, parcels within a half-mile of both Rapid Transit and Commuter Rail (e.g., near Porter Square in Cambridge) are classified as Rapid Transit.

1) MBTA Rapid Transit: Includes the Red, Orange, Blue, Green, and Silver lines.

2) MBTA Commuter Rail: Includes all year-round service stops along the thirteen lines of the Commuter Rail.

3) MBTA Bus Service: Includes all parcels within a half-mile of an MBTA bus route. Routes were chosen instead of stops to simplify the analysis and because stops are easily and frequently moved.

4) Regional Transit Authorities (RTAs): Includes bus services provided by any of the RTAs outside of the MBTA. Any parcel within a half-mile of a bus route is considered for this analysis.

Density levels are low along Commuter Rail and bus lines, but rapid transit station areas also have room to grow.

Average density by type of transit service. Housing units per acre.

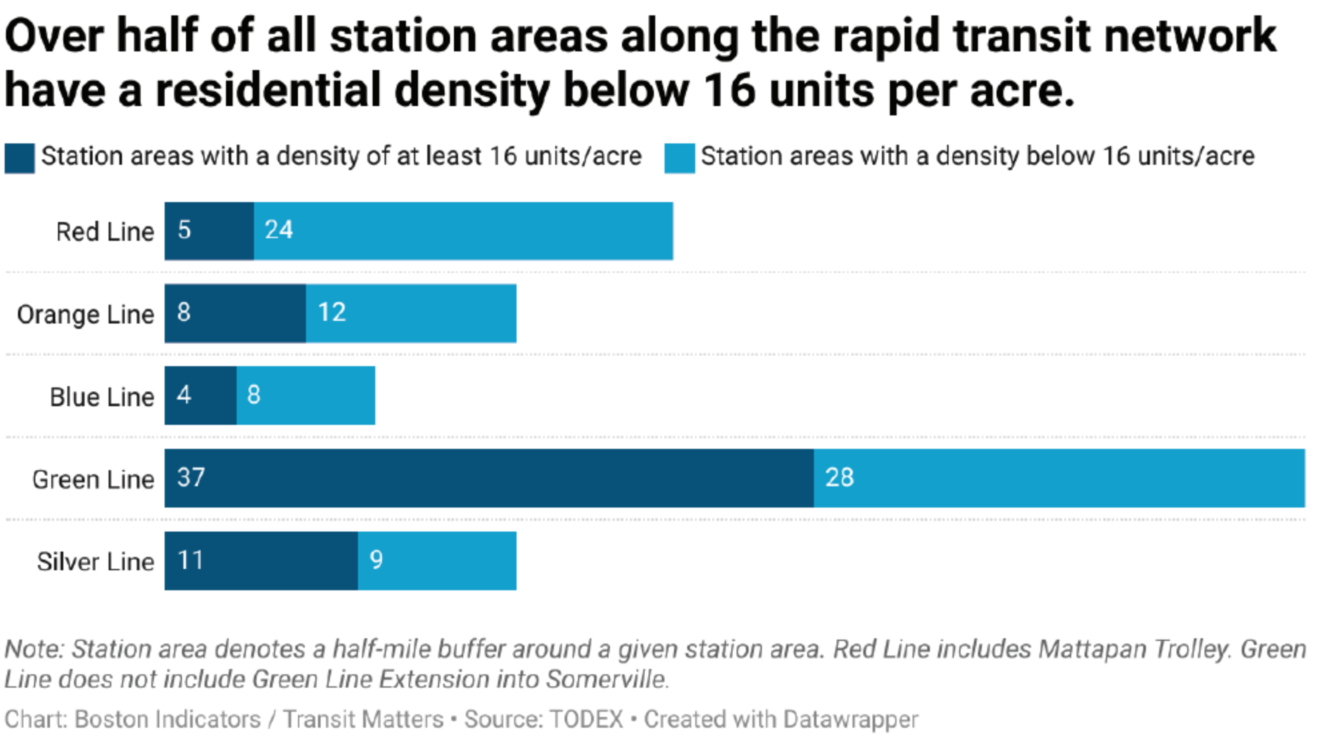
Note: Considers all parcels within a half-mile of a type of service. When a parcel is close to two types of service, they are assigned to one according to the following hierarchy: Rapid Transit supersedes Commuter Rail, Commuter Rail supersedes either type of bus. 6 units/acre is the minimum density required to justify a moderate level of service, while 16 units/acre is the minimum density required to justify a frequent level of transit service.

Chart: Boston Indicators / Transit Matters • Source: Analysis of Residensity • Created with Datawrapper

At a regional level, this analysis reveals that residential densities near all MBTA transit types fall well below established research benchmarks. Rapid Transit station areas have the highest average density at 11.8 units per acre, but this remains significantly below the 16 units per acre required to justify frequent transit service. Commuter Rail and MBTA bus-served parcels average 3.2 and 3.3 units per acre, respectively, while Regional Transit Authority-served areas are even lower at 1.8 units per acre, meaning that all of these neighborhood types fall far short of the 6 units per acre needed to support even basic transit service.

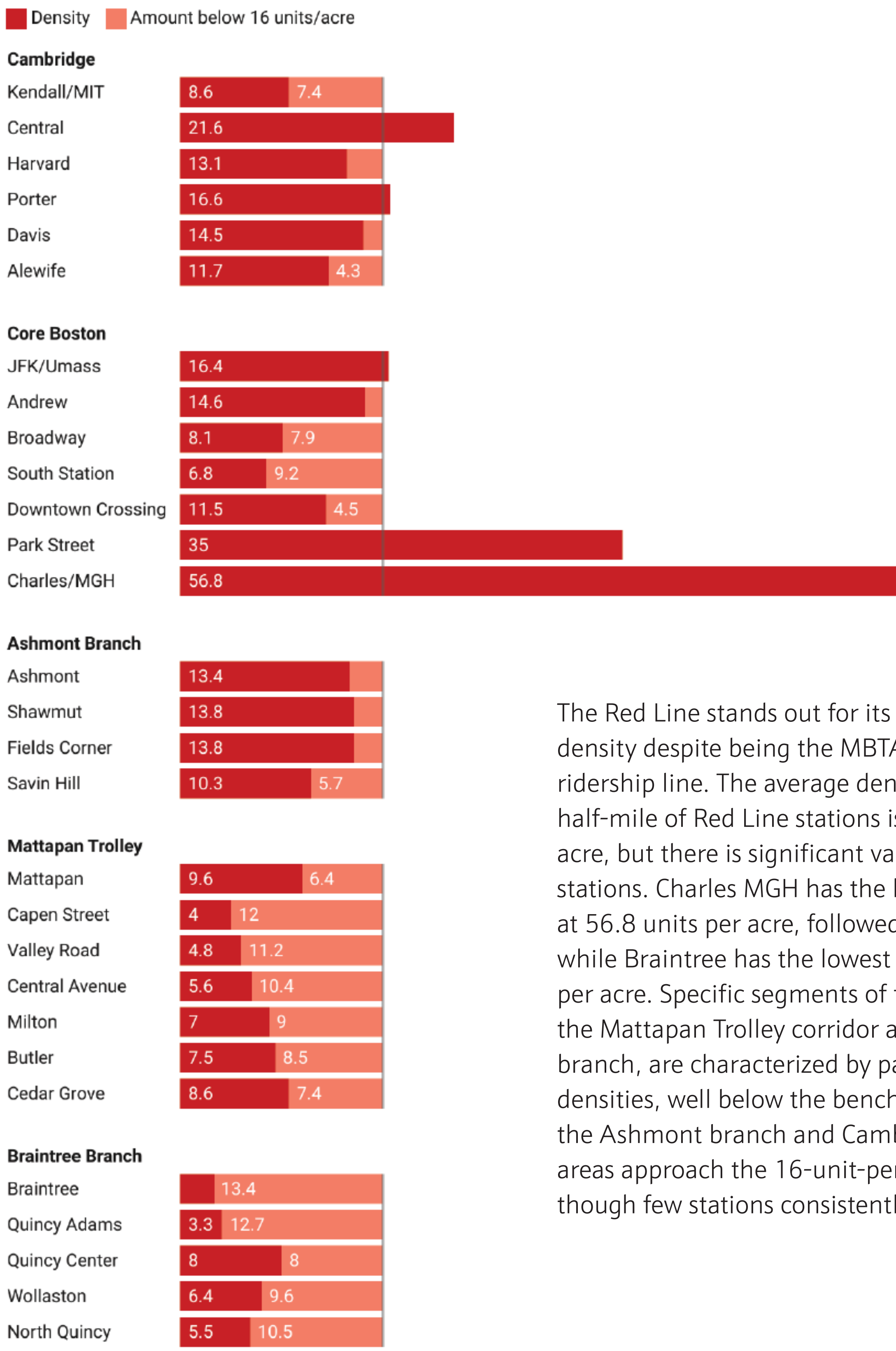
The rest of this section focuses on analyzing density levels near Rapid Transit and Commuter Rail, as these areas are the most prime for increasing transit-supportive density due to their existing infrastructure and potential for more intensive development. While the primary focus is on these transit modes, areas served solely by MBTA bus routes and RTAs also have opportunities for thoughtful density improvements.

Density Near Subway and Light Rail



The Red, Orange, Blue, Green, and Silver lines form the core of the MBTA's transit network, serving many of Greater Boston's densest areas. However, this density has so far proved insufficient for supporting more or better transit service. While residential density within a half-mile of rapid transit stations is relatively high compared to other parts of the region, only about half of these station areas meet the 16-unit-per-acre benchmark necessary to justify high-frequency transit service, according to data from TODEX.

Residential density for Red Line station areas.

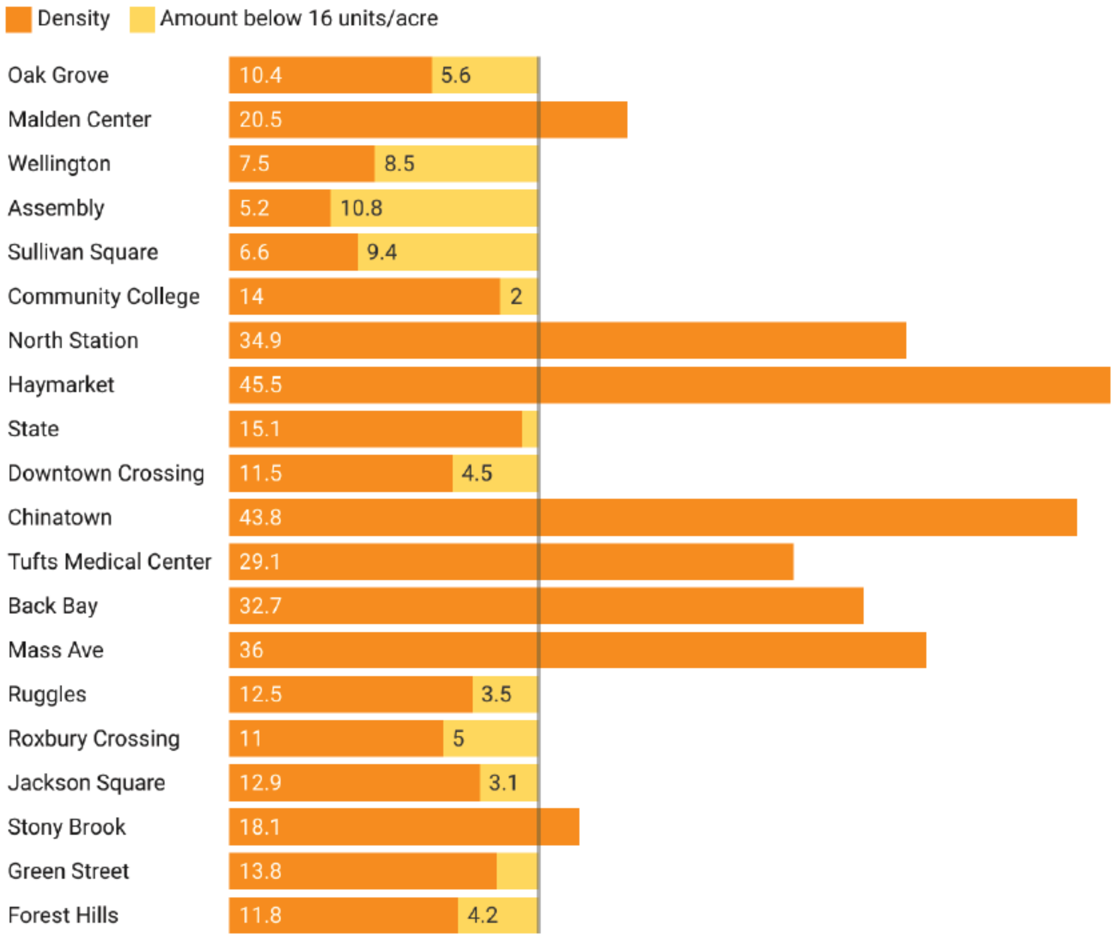


The Red Line stands out for its lack of residential density despite being the MBTA's highest-ridership line. The average density within a half-mile of Red Line stations is 12.4 units per acre, but there is significant variation between stations. Charles MGH has the highest density at 56.8 units per acre, followed by Park Street, while Braintree has the lowest at just 2.6 units per acre. Specific segments of the line, such as the Mattapan Trolley corridor and the Braintree branch, are characterized by particularly low densities, well below the benchmark. In contrast, the Ashmont branch and Cambridge station areas approach the 16-unit-per-acre threshold, though few stations consistently exceed it.

Note: Density is the average residential density within a half-mile of a given station. 2019.

Chart: Boston Indicators / Transit Matters • Source: TODEX • Created with Datawrapper

Residential density for Orange Line station areas.

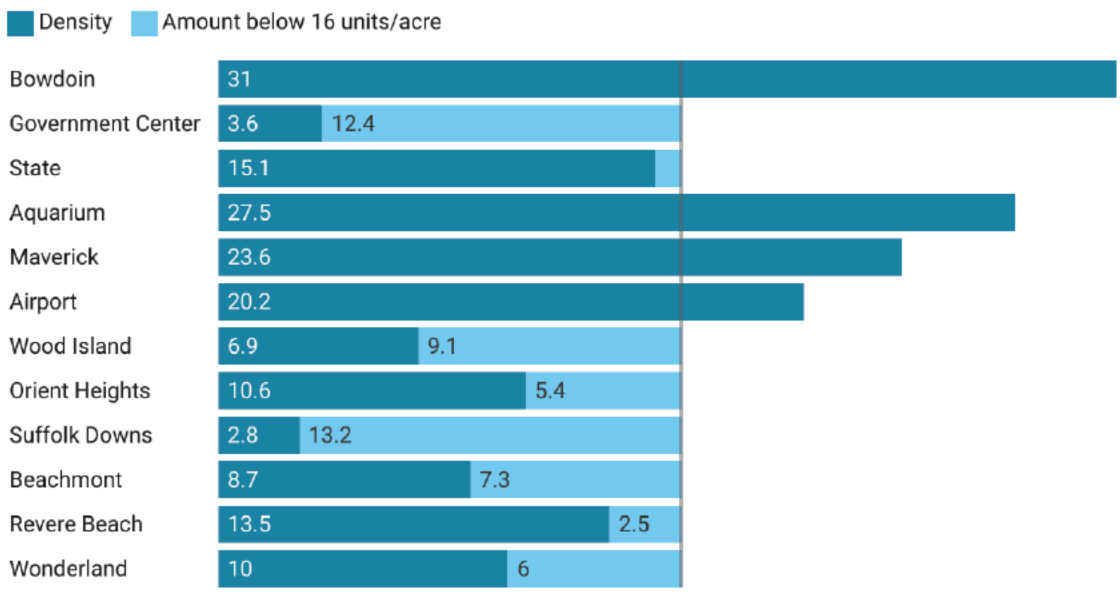


Note: Density is the average residential density within a half-mile of a given station. 2019.
Chart: Boston Indicators / Transit Matters • Source: TODEX • Created with Datawrapper

The Orange Line averages 19.6 units per acre within a half-mile of its stations, significantly higher than the Red Line, thanks to high-density stations like North Station, Haymarket, and Chinatown in central Boston. While 40 percent of Orange Line station areas meet or exceed the 16-unit-per-acre benchmark, there is still considerable room for growth at the remaining 12 stations, particularly those further from the urban core.

The segment between Ruggles and Forest Hills, for example, is dominated by medium-density neighborhoods that mostly fall below 16 units per acre, with limited new development in recent years. These patterns underscore significant opportunities to increase transit-supportive density along the Orange Line. It's also worth noting that stations like Sullivan Square, Assembly, and Wellington have seen considerable new housing development in recent years, and the relatively low levels reported here likely understate true housing density in these places due to a lag in the data.

Residential density for Blue Line station areas.



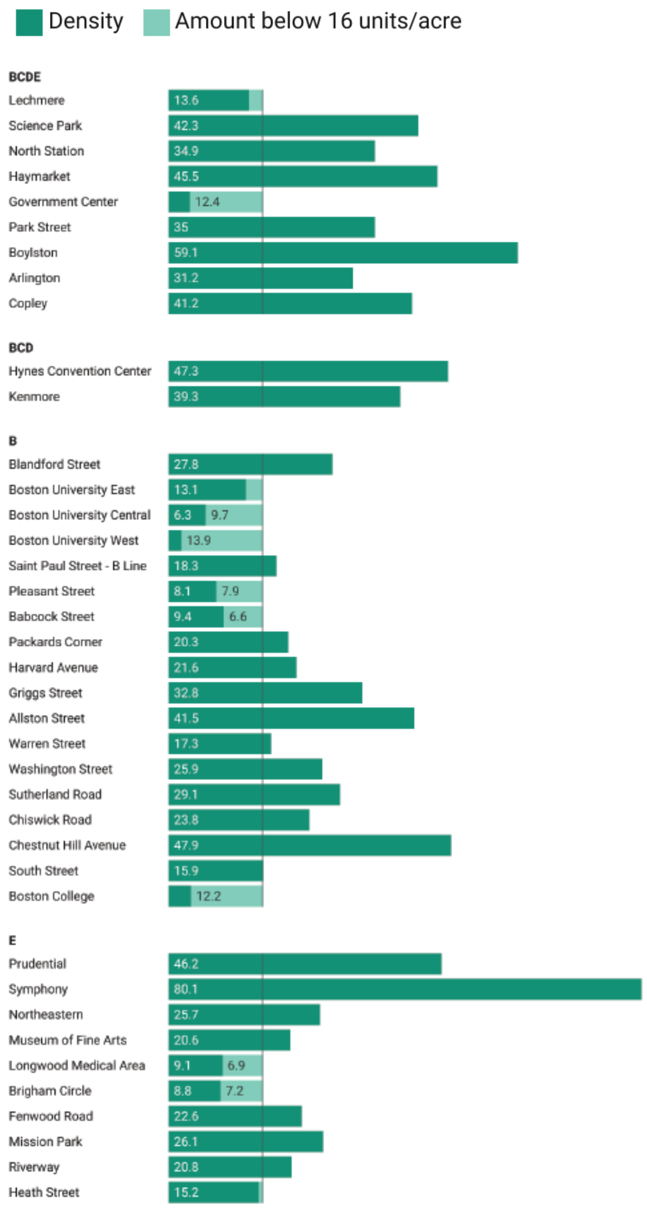
Note: Density is the average residential density within a half-mile of a given station. 2019.

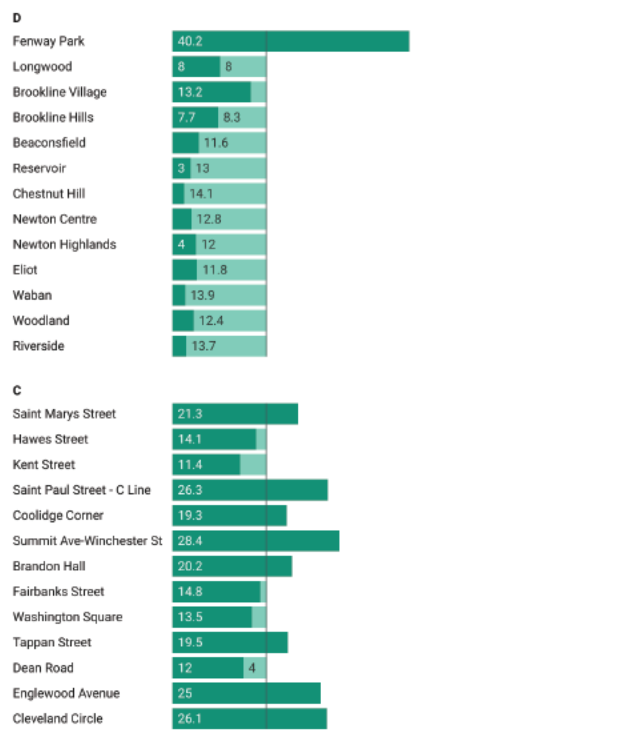
Chart: Boston Indicators / Transit Matters • Source: TODEX • Created with Datawrapper

The Blue Line, the shortest of the MBTA's rapid transit lines, features a mix of high-density downtown and East Boston stations alongside areas with significant potential for increased density on the edges of East Boston and in Revere. The line's average density within a half-mile of its stations is 14.5 units per acre, but there is considerable variation. Bowdoin has the highest density at 31 units per acre, while Suffolk Downs lags far behind at just 2.8 units per acre.

As shown in the graph, only one-third of Blue Line station areas meet the 16-unit-per-acre benchmark, leaving substantial potential for growth in the remaining eight stations. Some, like Wonderland, have seen notable development in recent years. However, the most significant opportunity lies at the former Suffolk Downs site, where planned redevelopment is expected to bring substantial transit-supportive density near both Suffolk Downs and Beachmont stations.

Residential density for Green Line station areas.



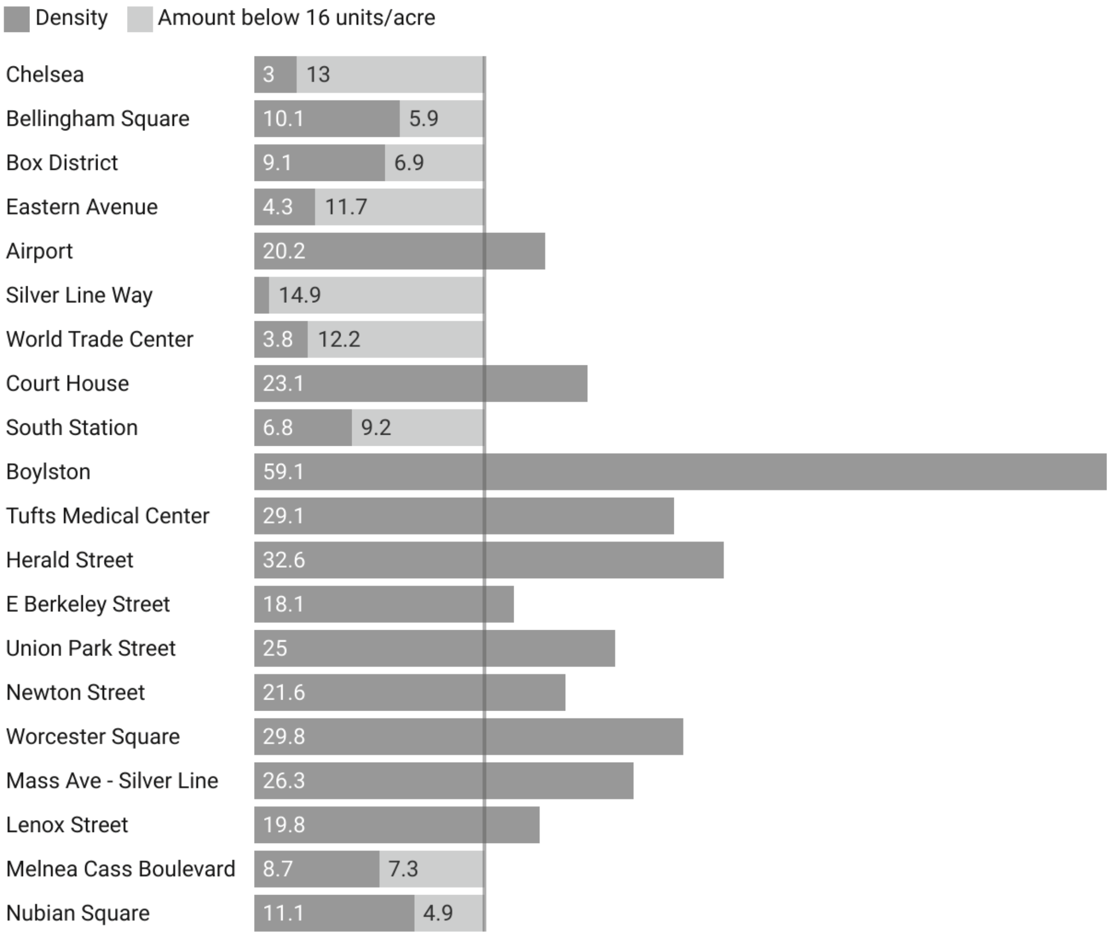


Note: Density is the average residential density within a half-mile of a given station. Data does not include Green Line Extension (GLX) station areas. 2019.
Chart: Boston Indicators / Transit Matters • Source: TODEX • Created with Datawrapper

The Green Line, a light rail system with 65 stations across four branches, presents unique dynamics in its station areas and densities. Unlike the rapid transit lines, Green Line stops are closely spaced, often capturing smaller geographic areas in density estimates. For example, an apartment building 500 meters from one station but 400 meters from another would only be included in the latter's station area. This proximity creates dense corridors, such as Allston, where multiple high-density station areas exist where a rapid transit line might have only one.

While the Green Line's slower speeds and smaller train capacities compared to the Red, Orange, and Blue Lines mean it's reasonable to expect slightly lower densities near its stations, over half of its station areas—55 percent—still meet the 16-unit-per-acre benchmark for high-frequency transit. Even so, key opportunities for growth remain. The D branch, which runs through Brookline and Newton to Riverside Station, stands out for its particularly low average densities compared to the other branches, despite being the longest. Across the system, 28 station areas fall below the benchmark, highlighting significant potential for increased transit-supportive density.

Residential density for Silver Line station areas.



Note: Density is the average residential density within a half-mile of a given station. 2019.

Chart: Boston Indicators / Transit Matters • Source: TODEX • Created with Datawrapper

The Silver Line, while not technically rapid transit, is nonetheless an important piece of the region's transit system, especially with the recent expansion of service to Chelsea. Most of the Silver Line's Boston stops, from Boylston Station to Lenox Street, have densities well above 16 units per acre. The more interesting segment of the Silver Line, at least from a potentially transit-supportive density perspective, is the recent SL3 expansion to Chelsea. The four Chelsea stops all have significant potential capacity to increase their densities. And at least two of them, Box District and Chelsea, have already seen new housing come online since this data was compiled. Chelsea station in particular, because it is serviced by both the Silver Line and Commuter Rail, has enormous potential as a transit-supportive density hub.

Density along the Commuter Rail

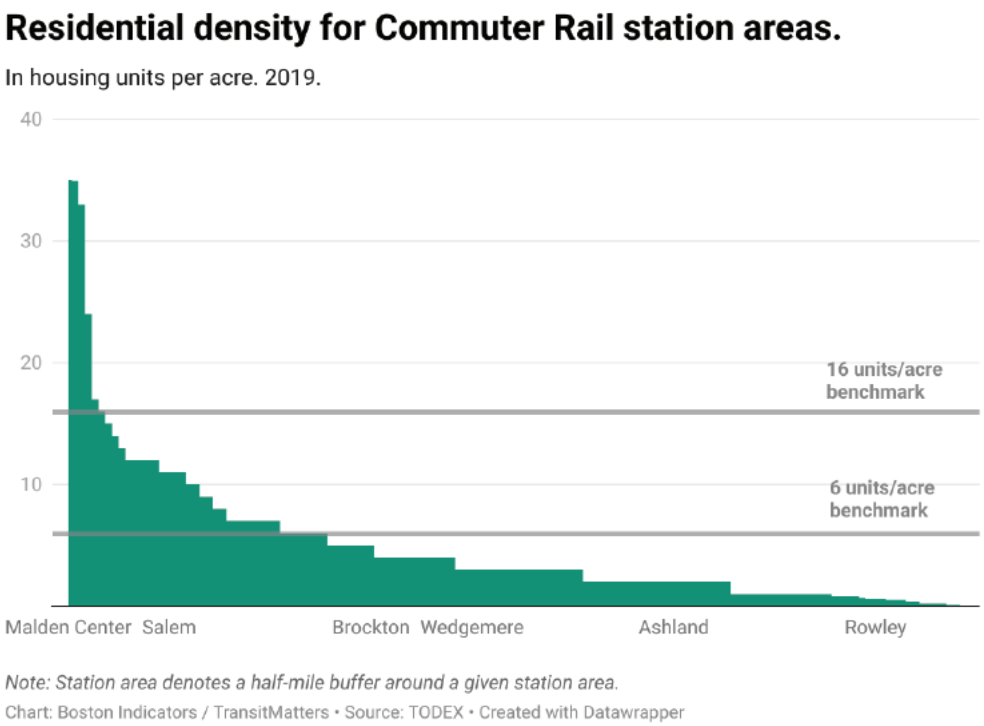
Photo: TransitMatters

While the region's rapid transit station areas already exhibit some decent levels of density, the greatest opportunity for increasing transit-supportive density lies along the Commuter Rail. These suburban neighborhoods benefit from highly valuable transit connections to the rest of the region, yet they often have low residential densities and underwhelming ridership.

This underperformance stands in stark contrast to examples from other North American metro areas, such as Toronto and Washington, D.C., where meaningful residential development has occurred along commuter rail lines. These regions demonstrate how thoughtful planning can unlock the potential of suburban rail networks to drive higher ridership and regional connectivity. For Greater Boston, leveraging the vast, underdeveloped land around Commuter Rail stations represents a crucial opportunity to address housing shortages, reduce car dependency, and better utilize existing transit infrastructure.

The average density within a half-mile of a Commuter Rail station is just 3.2 units per acre—well below the 6 units per acre benchmark for moderate transit service, let alone the 16 units per acre necessary to support frequent, high-capacity service, as envisioned in proposals for a Regional Rail[32] transformation. Of the 134 currently active stations (excluding seasonal and South Coast Rail stations), approximately 102 have an average residential density below 6 units per acre. As the graph below illustrates, density is unevenly distributed, with the bulk concentrated near Boston at stations like North Station, Back Bay, and Porter. However, these stations are also served by rapid transit, meaning residents don't necessarily rely on the Commuter Rail. Beyond this core, densities drop sharply, leaving much of the network significantly underutilized.

Each of the 13 Commuter Rail lines varies in service frequency, distance, and residential density. Shorter lines like the Fairmount and Needham lines primarily serve inner-core communities, while longer lines, such as the Providence/Attleborough and Kingston lines, extend over an hour from downtown Boston. As a result, not all Commuter Rail stations have equal potential for new housing with convenient access to Boston and the broader region. Focusing on station areas with the

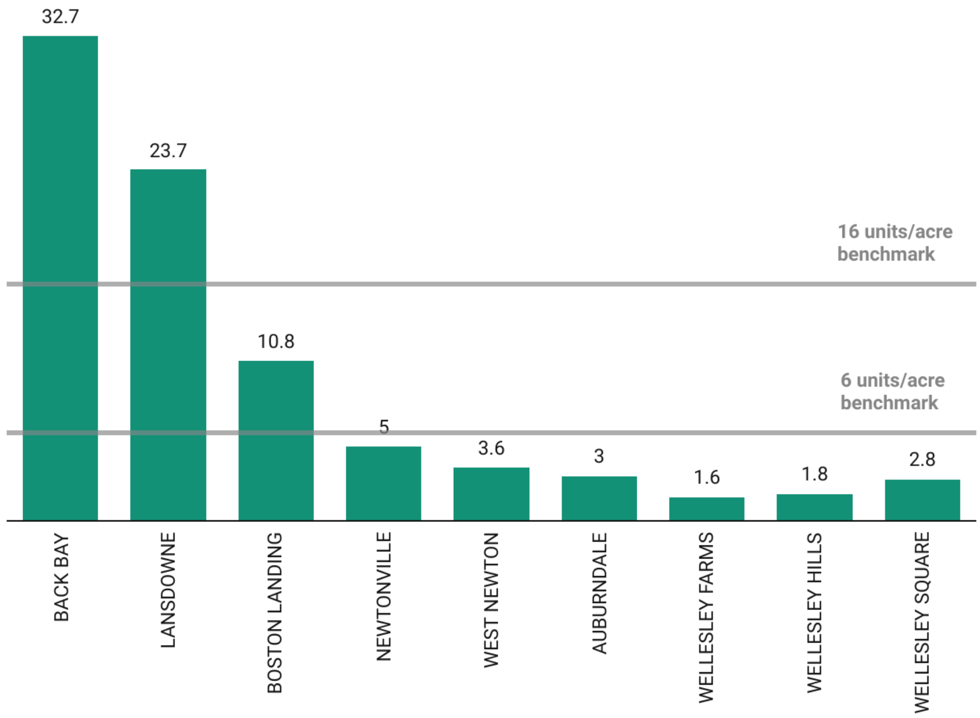


A key subset of stations to consider are those within a 30-minute commute of Boston, where ridership potential and development interest are highest. These stations, typically 10 to 15 miles from downtown, include about 67 station areas with an average residential density of 7.3 units per acre—higher than the system-wide average but still below most rapid transit stations. Within this group, density levels vary significantly. Stations like Boston Landing and Porter approach the 16-unit-per-acre benchmark, while many others fall short of even the 6-unit-per-acre benchmark. Some station areas, such as those in Wellesley, have densities as low as rural parts of the region, despite their high-quality transit access. These low-density, transit-rich areas represent some of the most underutilized opportunities in Greater Boston for transit-supportive growth.

The Worcester/Framingham Line provides a clear example of the untapped potential for transit-supportive density. Within a 30-minute trip of South Station, the line includes nine stations: Back Bay, Lansdowne, Boston Landing, Newtonville, West Newton, Auburndale, Wellesley Farms, Wellesley Hills, and Wellesley Square. Other than the Boston stations, all of them have average densities below the 6-unit-per-acre benchmark. The drop-off begins in Newton, where the three stations are located along the edge of the Mass Pike (I-90). While the Pike's traffic and layout make these stations less ideal for walkable neighborhoods, they do not preclude housing development. For example, a recently completed multifamily development[33] near Newtonville station highlights the potential for new housing in these areas, even if it is not yet reflected in the current data.

Outside of Boston, densities along the Worcester line immediately dip below six units per acre.

Residential density by station area. 2019.

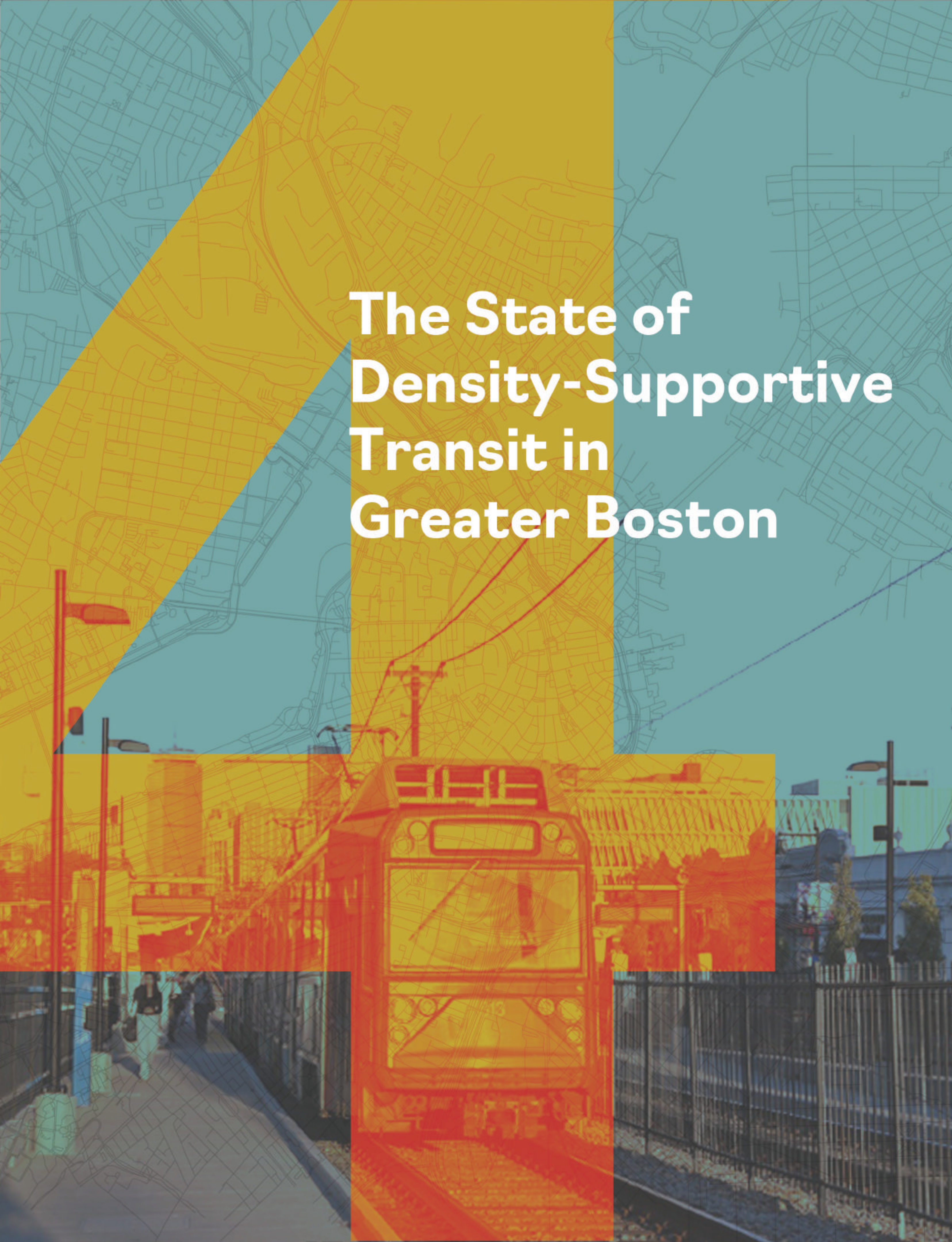


Note: Density along the Worcester Line for stations within 30 minutes of South Station. Units per acre within a half-mile of the respective station area.

Chart: Boston Indicators / Transit Matters • Source: TODEX • Created with Datawrapper

In summary, Greater Boston has made progress toward transit-supportive development, particularly in the urban core along rapid transit lines. However, substantial opportunities remain, especially in transit-rich areas served by rapid transit and Commuter Rail. Increasing density in these corridors can improve accessibility, reduce car dependence, and support sustainable growth. By strategically focusing on these areas, Boston can maximize its existing transit infrastructure, accommodate a growing population, and promote economic development while creating a more livable and affordable region. Next, let's look at the other side of the transit-supportive density equation: the transportation component.

The State of Density-Supportive Transit in Greater Boston



Just as station areas need minimum levels of residential density to support and justify high-functioning transit, the reverse is also true: Vibrant, walkable, dense station areas won't meet their full potential if transit service is not of sufficient quality. The success of density is dependent on robust transit networks and the success of transportation is dependent on thriving dense surroundings; density and transit have a mutually dependent relationship. This part of the report takes a similar approach to Part 3, but flips the script by analyzing the transit side of the relationship. We explore the research to understand key elements of transit quality for supporting dense residential neighborhoods, as well as a topline analysis of how Greater Boston's MBTA network performs on those key quality measures.

Transit quality depends on a number of factors, including frequency, speed, fare affordability, and accessibility. While all these factors are interrelated, frequency stands out as especially important. Therefore, this section will focus primarily on the role that frequency can play in unlocking a region's transit system, while briefly mentioning the importance of a few other factors.

Frequency

Research consistently shows[34] that increasing frequency leads to a greater-than-proportional increase in ridership. When riders trust that a train or bus will arrive reliably and promptly, they are more likely to choose public transit over other modes of transportation. This trust is particularly critical in building a system that encourages habitual use. Opting for public transportation becomes easier when riders are able to use the system and get to their destination without having to look at a schedule or plan for an alternative if they miss their train or bus or it is delayed.

Much like density, there is no universal threshold for transit frequency that applies to all systems. However, as headways—the time between successive trains or buses—shrink to 15 minutes or less[35], riders gain confidence that missing one ride will not result in a lengthy wait. While 15-minute frequencies may not be applicable for all modes such as long distance buses or not enough in the case of rapid transit subway lines, riders do perceive them as reliable. For trips requiring transfers, 15-minute frequencies become even more significant as the uncertainty of extended wait times can discourage transit use altogether. For those who must also contend with infrequent bus connections to complete their journeys, the time cost of relying on transit becomes exponentially greater, driving many to private automobile dependence.

Subway and Light Rail

The MBTA's subway and light rail lines—the Blue, Orange, Red, and Green Lines—are the transit modes designed to offer the most frequent levels of transit service. In high-capacity transit systems, subway and light rail lines can run as often as every 2–3 minutes, maximizing ridership and enabling riders to rely on public transit for any sort of trip.

While the MBTA's subway frequencies are significantly higher than those of the Commuter Rail, they are certainly not optimal. Peak frequencies along the Red Line, for example, tend to max out at about one train every 5–6 minutes[36]. The Blue and Orange Lines also average similar, if not slightly less frequent service. Outside of peak hours, figures fluctuate but can rise to as much as 13-minute headways between trains. Other limitations, such as the lack of late-night service, further depress the efficacy of the system.

Recent projects have ameliorated the MBTA's situation. Through the Track Improvement Program[37], implemented from November 2023 to December 2024, all slow zones across the subway and light rail network were eliminated. This effort has led to significant service enhancements. The Blue Line now operates with better headways than before the pandemic, while the Orange Line, which faced reduced frequencies during 2022 and 2023 due to train replacements, has rebounded to 6-minute peak frequencies. Similarly, the Red Line has increased service with the introduction of new trains and the removal of slow zones. Between December 2023 and December 2024[38], weekday service increased by 53 percent on the Red Line, 36 percent on the Orange Line, 18 percent on the Blue Line, and 12 percent on the Green Line, highlighting the progress made and the potential for further gains with additional investment.

Commuter Rail

Commuter Rail, often referred to as suburban or regional rail in other regions, by definition operates on a less frequent timetable than aptly named rapid transit systems. Nonetheless, good commuter rail systems are designed to cater to a broader consumer base than just 9–5 commuters. These systems are designed to offer frequent, all-day service that enable many types of trips and attract many types of users.

In contrast, the MBTA's 13 Commuter Rail lines operate on frequencies that severely limit their potential daily ridership. While frequencies vary, five of the 13 lines have peak frequencies that are longer than 45 minutes (Fitchburg, Greenbush, Kingston, Middleborough/Lakeville, and Needham). Off-peak frequencies—those outside of typical commuting hours—approach or exceed one hour per train on eight of the region's Commuter Rail lines. While progress has been made—such as introducing 30-minute headways on the Fairmount Line and between Beverly and North Station—most of the Commuter Rail network remains burdened with infrequent service.

There is signficant variation in service frequency within the Commuter Rail network.

Average time between trains by MBTA Commuter Rail Line. 2024.

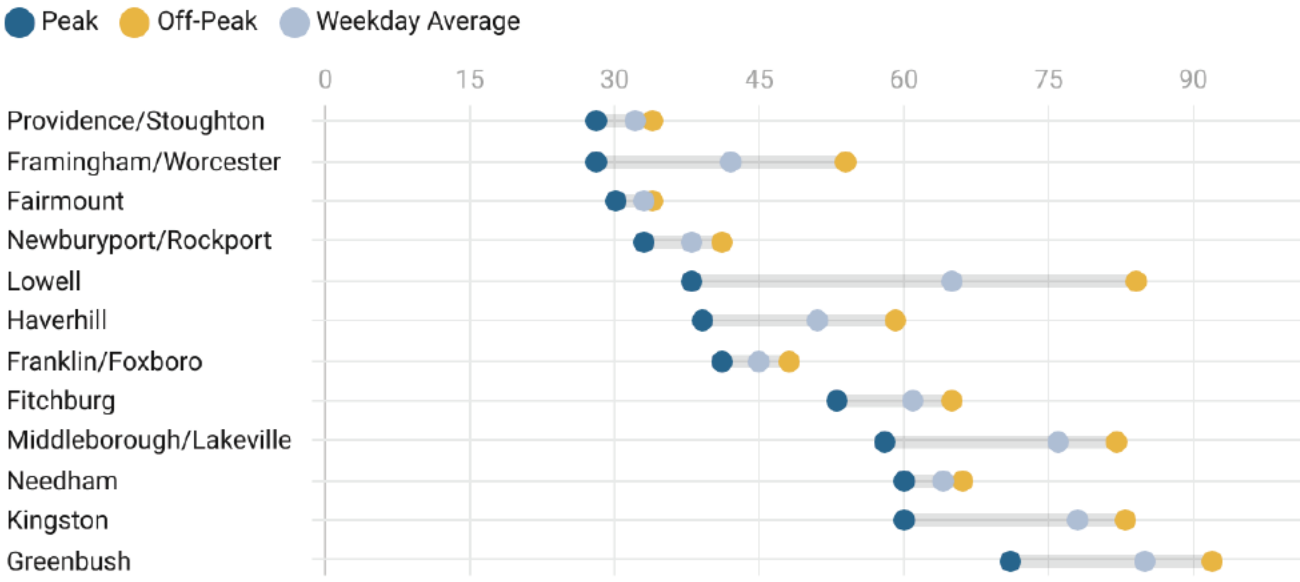


Chart: Boston Indicators / TransitMatters • Source: Boston Indicators compilation of MBTA data. • Created with Datawrapper

Research consistently shows a strong positive correlation between increased service frequency and ridership on commuter and suburban rail systems. Studies of transit data[39] across the US estimate an elasticity of 0.5 for commuter rail ridership with respect to frequency, meaning a 10 percent increase in service frequency typically results in a 5 percent rise in ridership. The effect is particularly pronounced along lower-frequency lines, where riders are more sensitive to improvements in service intervals.

The Fairmount Line shows how increased frequency can be transformative. Over the past four years, service improvements have reduced headways from hourly to 30 minutes, driving remarkable ridership gains. By summer 2024, ridership surged to 95 percent above pre-COVID levels following the introduction of 30-minute service. Today, the line operates at 130–140 percent of its pre-pandemic ridership[40]—outpacing other Commuter Rail lines, most of which remain at around 60–70 percent. While it continues to have capacity for additional ridership, the success of the Fairmount Line demonstrates that frequent, reliable service can attract riders and build consistent demand. Looking ahead, further improvements are planned for the Fairmount Line, including electrification by 2028, which will enable 20-minute headways. These upgrades will bring the service closer to rapid transit standards and solidify the line's role as a model for how enhanced frequency can support housing density and walkable communities.

While 15-minute headways are the gold standard for frequent service and have the greatest impact on travel behavior, not all MBTA Commuter Rail lines are currently suited for such high frequencies. However, TransitMatters identifies[41] several lines, including the Rockport, Newburyport, Haverhill, Lowell, Fitchburg, Worcester, Needham, Franklin, Middleborough/Lakeville, Kingston, and Greenbush lines, as having the capacity to reliably provide 30-minute all-day service. A few lines, such as Fairmount, Providence, and Stoughton are well-suited to provide even more frequent 15-minute all-day service. Increased frequencies would also enhance service at key hubs like Forest Hills and JFK/UMass, where several lines converge, multiplying the benefits of more frequent service for riders across the network.

Bus

Frequent bus service is an essential component of any good public transportation system, especially in regards to closing first-last mile gaps and connecting areas on the fringe of the urban core. However, achieving high levels of frequency along bus lines can be challenging, primarily since buses do not operate on their own right of way and have higher operating costs. The MBTA's Bus Network Redesign, launched in 2024, aims to increase urban core service by 25 percent to address critical gaps for transit-dependent riders, but it largely overlooks outlying regions. Expanding robust, frequent service to these areas is critical to integrating more communities into the transit network and creating a transit network that can support higher levels of density.

Many Commuter Rail stations also depend on Regional Transit Authorities (RTAs) for bus connections, which often face funding constraints and uncoordinated schedules. These challenges weaken the state's transit network, particularly in suburban and rural areas. While the RTA Advancement Bill has recently provided additional resources, significant improvements are still needed to ensure RTAs can deliver frequent, reliable service. Addressing these service gaps and extending frequent bus connections statewide is key to increasing ridership, reducing car dependency, and establishing a strong foundation for transit-supportive density.

Additional Factors: Speed, Cost, and Accessibility

While frequency is arguably the most important factor in creating a transit system that can support higher levels of density, speed, cost, and accessibility are all also noteworthy considerations.

Speed

Closely related to frequency is speed. Faster trains with quicker acceleration naturally cut commute times and help boost ridership. While subway and light rail have limited capacity for additional speed due to station distances and streetscape considerations, the Commuter Rail system has room for improvement.

Currently, MBTA Commuter Rail suffers from slow speeds due primarily to outdated infrastructure. Most lines have maximum speeds of around 70–79 mph, but these are often unattainable. Slow acceleration of diesel trains is another issue; electrification of the Fairmount Line will address this. Even better are Electric Multiple Unit trains (EMUs), which offer faster acceleration and higher speeds. For example, EMUs could cut the Fitchburg to North Station journey from 1 hour 26 minutes to just under an hour[42], dramatically increasing service capacity and competitiveness with cars. In the San Francisco Bay Area, for example, Caltrain electrification shortened travel times and enabled more frequent service. In its first full month of electric operation, Caltrain ridership increased 54 percent[43] over the previous year.

Cost

For many people, a transit system is only as good as it is affordable. While the issue of affordability pertains to the entire MBTA system, it is the Commuter Rail that stands out as having the greatest hurdles to affordability. In Greater Boston, Commuter Rail fares are zone-based and range from $2.40 to $13.25 per trip—monthly passes can cost up to $416. This zone-based pricing structure disproportionately impacts residents of Gateway Cities[44] and areas outside the urban core, diminishing the affordability for potential riders in these areas.

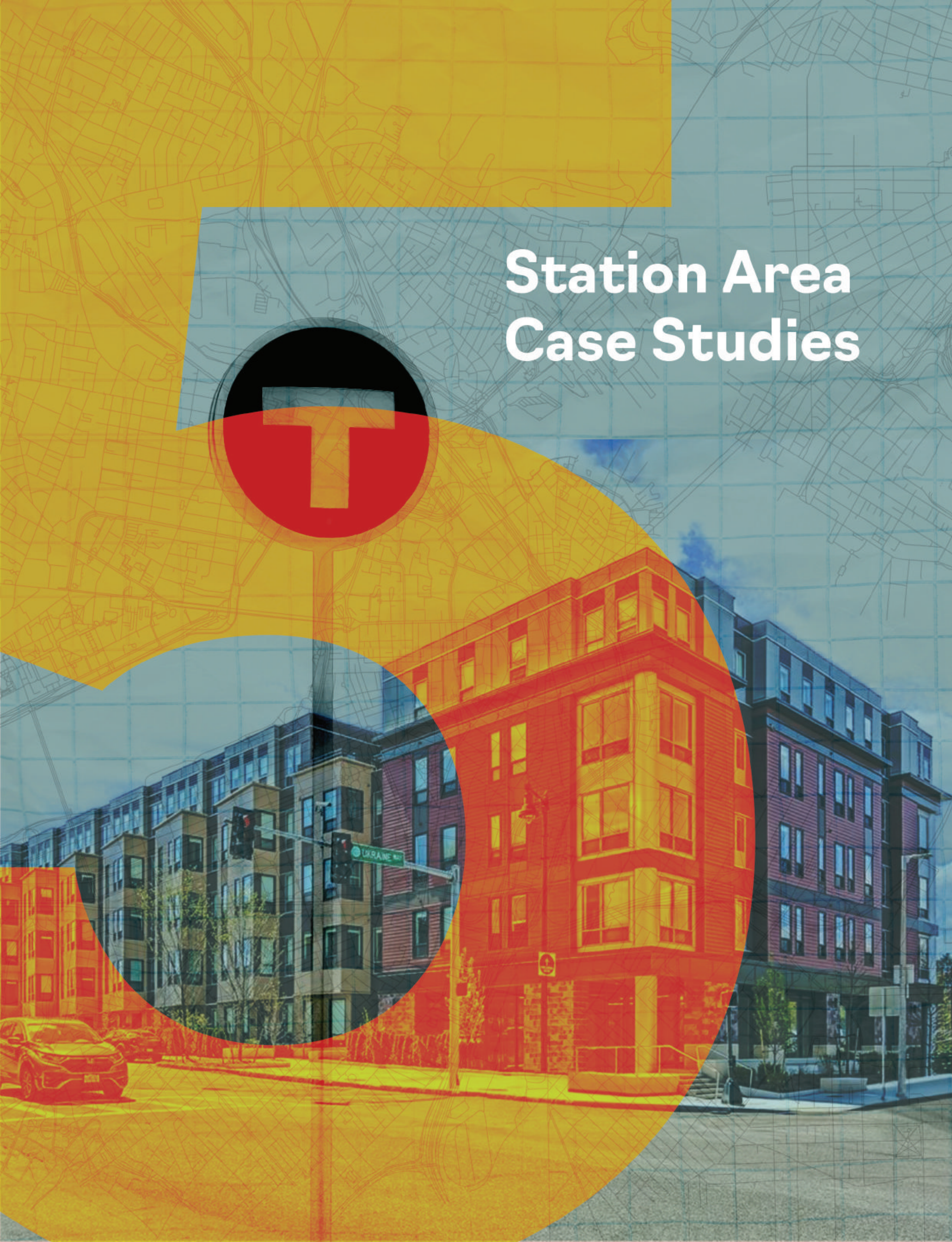
Commuter Rail costs can become prohibitive enough to encourage riders to seek alternatives. For example, riders heading from Brockton to Boston frequently opt for a bus to Ashmont Station, and subsequent transfer to the Red Line, over the direct Commuter Rail connection to South Station. Due in part to the popularity of this route, Brockton Area Transit Authority, or BAT, is currently running a fare-free pilot[45] until June 30, 2025. This program allows riders to reach Boston for the cost of a single MBTA subway fare, which at time of writing is $2.40. For comparison, a single Commuter Rail ticket from Brockton to South Station costs $8.75. Additionally, since transfers between the rapid transit network and the Commuter Rail are not free, any riders who need to switch from the Commuter Rail to another mode of transit thus need to pay two separate fares.

Studies from London[46], several cities in Mexico[47], Philadelphia[48], and Stockholm[49] highlight how fare increases lead to disproportionately greater decreases in ridership due to negative fare elasticity. However, fare reductions alone are not particularly effective at boosting ridership; riders are more responsive to improvements in service quality and frequency than to lower prices. Therefore, while affordability concerns are valid, service and frequency improvements should be prioritized over fare reductions to create a transportation system that supports higher density levels.

Accessibility

Ensuring accessibility for all riders is also important in terms of creating a transit system that can serve and support potential riders. For individuals with mobility limitations or other needs, accessibility is a key factor in their ability to utilize the system effectively. Currently, approximately 30[50] Commuter Rail stations lack accessibility features, such as level platforms for boarding trains without stairs, elevators, and ramps. Numerous stations on the rapid transit system also face accessibility challenges, such as a lack of level-platform boarding on the Green Line. Addressing these accessibility gaps will enable increased ridership and support denser, more transit-oriented communities.

Station Area Case Studies



Building on the prior analyses of housing density and transit quality across Greater Boston, this section explores three types of station areas that appear especially suitable for more intensive transit-supportive density. These station area typologies are loosely defined and do not represent all station area types in Greater Boston. Rather, they highlight a subset of station areas that show strong potential for the development of additional housing in the region.

Greater Boston already has some station areas with moderate housing density, such as Beverly and Lynn to the north and Porter in the urban core, which are not included in this discussion. While these areas have added some housing in recent years and could certainly add more, they are probably not the lowest-hanging fruit, as they already have housing density levels above most of the research benchmarks explored earlier. The region also features numerous station areas located far from the urban core and major job centers, such as Attleboro, Gloucester, and Kingston, which are also omitted from this discussion. Although these areas have low housing densities on average, they should not be the region's top priority for new housing development due to their relatively low locational value.

The following three groupings are intended to highlight the different dynamics and challenges that these areas face while also identifying commonalities between them. They are:

- **Urban neighborhoods with rich transit access but comparatively low density**
- **Suburban neighborhoods with rich transit access but low density**
- **Regional urban centers with decent transit but lower housing demand**

Urban Neighborhoods with Rich Transit Access but Comparatively Low Density

When it comes to building substantial density, areas already integrated into the urban core present many of the most significant opportunities in Greater Boston. These areas possess rich transit access but still have relatively low levels of density. Prime examples include Alewife, Oak Grove, and Forest Hills, all of which experience high daily ridership and serve as crucial transfer points for commuters arriving by a variety of transit modes. While only recently has the region recognized the potential of these locations for transit-oriented development, some, like the area around Alewife Station, are already undergoing transformations and reaping the benefits of increased density. Identifying and best utilizing these station areas is a key strategy toward unlocking the transit-supportive density potential of Great Boston.

While station areas that fall into this category average relatively higher densities than the region as a whole, they also have lower densities than similarly transit-rich and centrally-located station areas in other major metropolitan areas across North America. Many stations, even those that are serviced by multiple modes of transit, have density levels far below their capacity. Their dual function as both a neighborhood and a transit hub makes these areas particularly crucial in the pursuit of transit-supportive density.

While some urban neighborhoods have seen new TOD housing come online in recent years, low-density land uses remain prevalent, such as this commerical strip across from Forest Hills Station. Photo: Transit Matters

Consider the case of **Forest Hills**. Situated between Jamaica Plain and Roslindale, this leafy nexus turned transit hub possesses some of the best transit access in the entire region, with an Orange Line station, three Commuter Rail lines, 18 bus connections, and the popular Southwest Corridor bike path. The planned Bus Network Redesign (BNRD) and corresponding completion of a new Arborway Garage will make Forest Hills even more transit-rich by increasing from two to five the number of bus routes with frequencies of at least 15 minutes. However, with a housing density of 11.8 units per acre, or 28.3 people per acre, Forest Hills still does not meet the density threshold for frequent transit service.

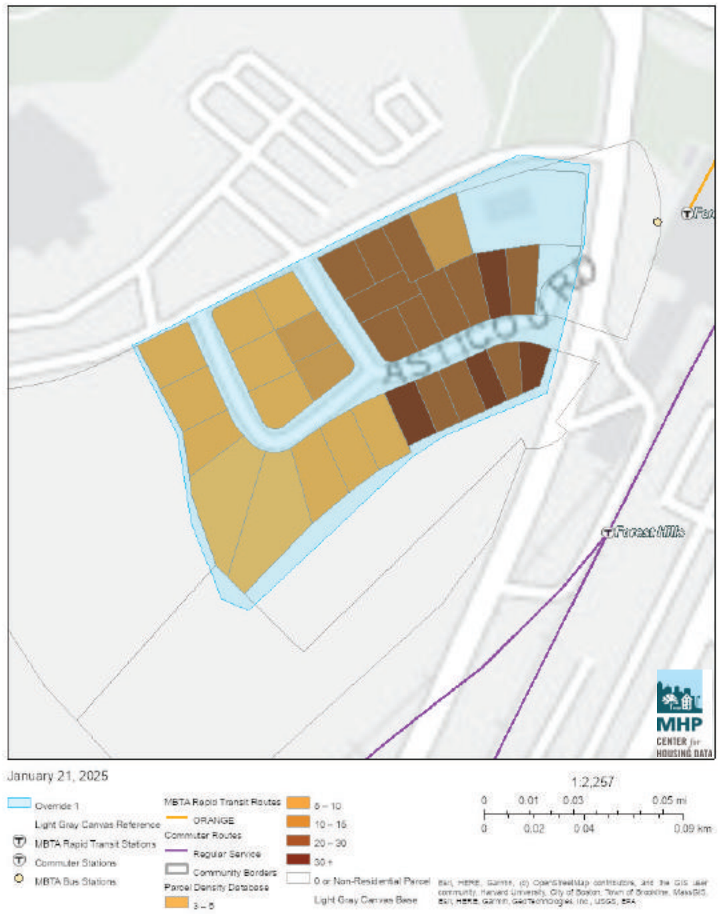
In recent years, transit-oriented development has begun to occur at Forest Hills. Several new housing projects signal how the station area is gradually approaching levels of density that closer align to the abundance of available transit options. In 2020, a 78-unit mixed-income building, AO Flats, was built on a formerly MBTA owned parcel. Located directly adjacent to the station, the new development proudly advertises[51] its location to prospective tenants: "Need to be in downtown Boston in less than 30 minutes? We've got you covered!" And AO Flats is not alone in this regard. Combined with other recent developments such as the 250-unit Velo Forest Hills[52] and the 283-unit MetroMark Apartments[53], among other smaller developments[54], there have been more than 600 new units of housing added to the Forest Hills station areas in the past decade alone.

Directly across from Forest Hills, the 5-acre area around Asticou Road is emblematic of pre-Orange Line development (above). It has an average density of 9.7 units per acre (below). Photos: James Wang (above), Residensity (right)

Despite this recent uptick in development, the area around Forest Hills remains mostly low-density housing, single-story commercial, and some low-intensity industrial uses. Adding density to these neighborhoods without displacing current residents is a key challenge. For example, the area immediately surrounding Forest Hills is a mix of single-family and two-family homes with an average density of 10.32 units per acre, typical of a residential side-street in Boston. These houses were built before the Orange Line and are not integrated with the adjacent train station.

Total Residential Units: 52 Units
Neighborhood Area: 5.36 Acres
Neighborhood Density: 9.69 Units per Acre

Use Description	Residential Units	Parcel Acres	Avg. Parcel Density
Two-family	16	0.75	21.25
Single-family	14	2.00	7.00
Condominium	14	0.55	25.64
Three-family	8	0.18	44.77
Tax-exempt; public; charitable; institutional	0	8.69	0.00



Boston was exempt from the 2021 MBTA Communities Law due to the unique status of the city's existing zoning regulations. Instead, the city's Squares & Streets[55] zoning initiative is being set up as a catalyst to spur growth in neighborhood centers, including Forest Hills. Regardless, significant opportunities for higher density housing remain, as the area around Forest Hills has significant potential to support a higher intensity of uses and evolve from a transit hub to an urban center.

Forest Hills is not alone in being an urban core station area that could support significantly higher levels of density. Other station areas that may be considered in this category include but are not limited to Oak Grove, Chelsea, and Newmarket.

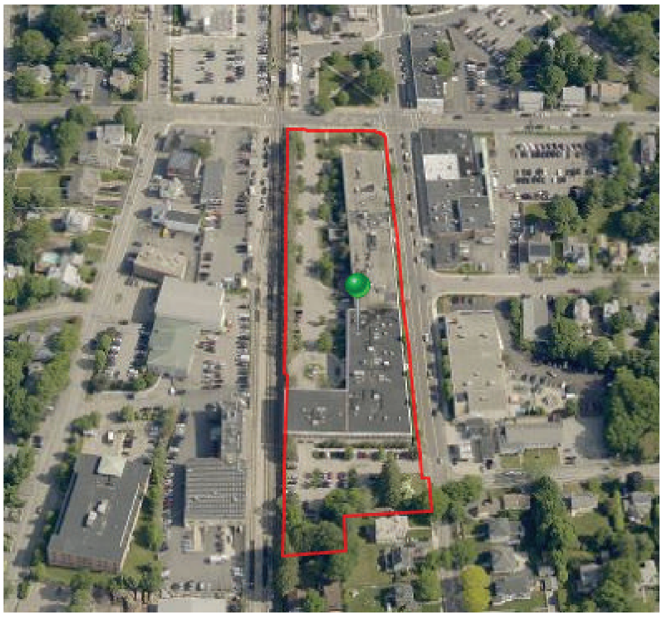
Suburban Neighborhoods with Rich Transit Access but Low Density

Many suburban communities benefit from being located along one of the region's 13 Commuter Rail lines, but the question of how to best leverage this transit resource to enable housing growth has gained urgency in recent years. As Greater Boston's suburbs have become increasingly desirable and unaffordable—in part due to limited multifamily housing development near transit—the need to unlock new housing opportunities near train stations has become more acute. Suburban station areas are often characterized by a mix of low-density residential and commercial uses as well as surface-level parking lots for park-and-ride commuters. However, suburban communities within 30 minutes of downtown Boston have some of the greatest potential to be transformed into neighborhoods lush with transit-supportive density. Yet, while some communities have seen transit-oriented development projects, the overall trend has been one of housing resistance and limited development.

Consider the case of **Needham**. Situated only 10 miles from downtown Boston, Needham has four Commuter Rail stations along the Needham Line: Hersey, Needham Junction, Needham Center, and Needham Heights, the farthest of which is only 45 minutes from South Station. According to TODEX, the average densities within a half-mile of these station areas are 2.9, 2.1, 2.8, and 3.4 units per acre, respectively. These are all significantly below the 6 unit-per-acre benchmark needed to justify even infrequent levels of public transit service, which is the current reality of the Needham

The areas around Needham's four Commuter Rail stations are predominantly a mix of low-density uses and parking. Photo: TransitMatters

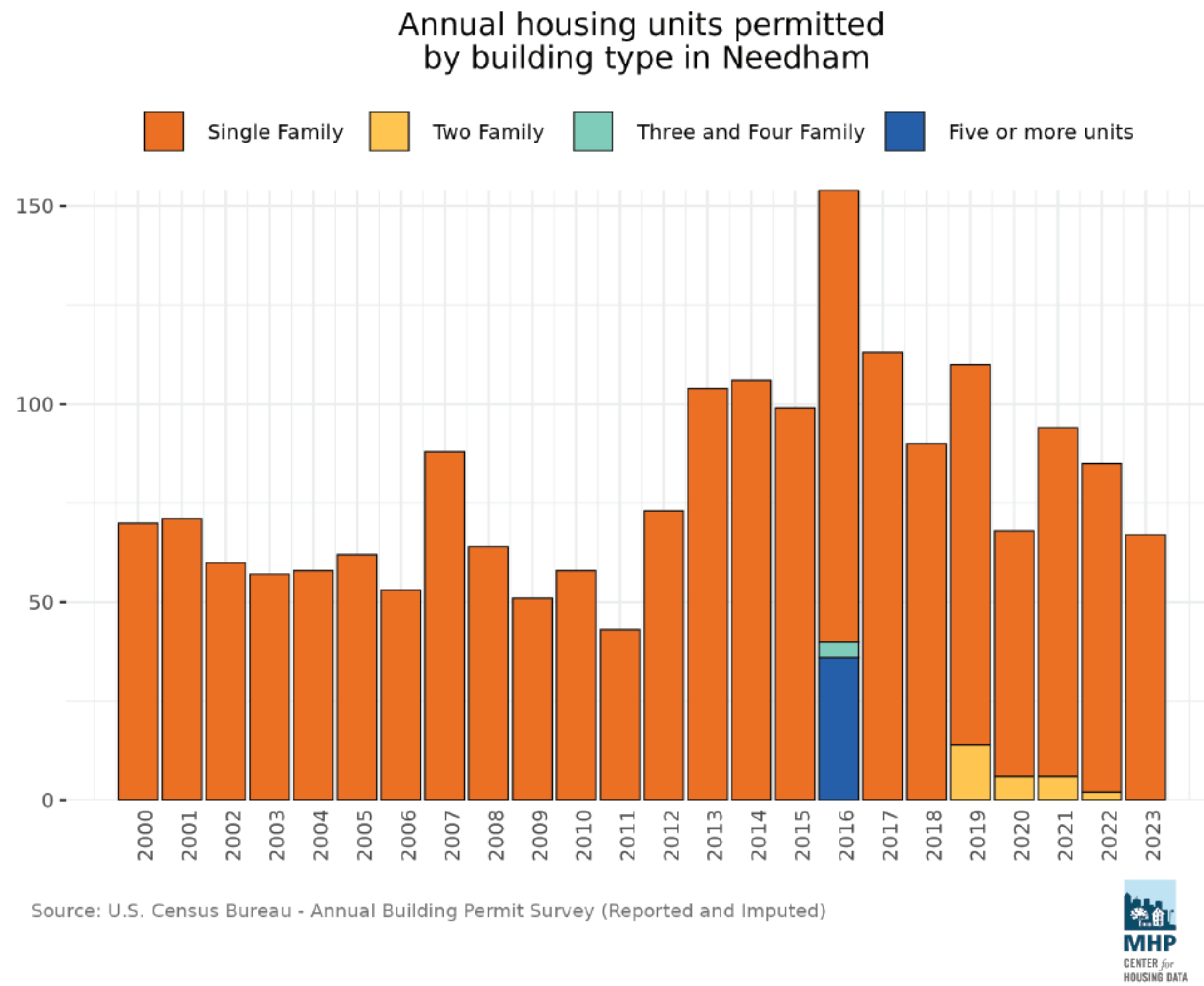
The Needham Line carves its way directly through Needham's sizable yet underutilized downtown. Characterized by larger lots, varied land-use, and significant surface-level parking, Needham Center has a lot of potential to support higher levels of density. For example, the now-vacant former Carter's building at 100 West Street[56] sits directly across from the Needham Heights station. After operating first as a corporate office and then a healthcare facility, the four-acre parcel has sat vacant since 2018. Since then, efforts to rezone the parcel have been unsuccessful. The parcel was even included in Needham's MBTA Communities Compliance plan, which at the time of writing was recently rejected by town referendum. Numerous other underutilized parking lots and low density structures along Chestnut and Highland streets also have significant redevelopment potential.



The 4.3-acre former Carter's building has been vacant since 2018. Photo: Needham GIS

To progress toward a more transit-supportive level of density, pro-growth policies in municipalities like Needham must be paired with improved transit service. Currently, the Needham Line operates on a schedule of one train per hour. As previously discussed, at this level of frequency it is nearly impossible to rely on the train in any meaningful capacity. In the case of the Needham Line, any drastic increase in service frequency is complicated by a myriad of factors, many relating to the merging of the single track with the Northeast Corridor track and Providence/Stoughton and Franklin lines of the Commuter Rail. While not concrete, the idea of converting the Needham Line to either a Green Line or Orange Line extension (OLX)[57] has been floated to open more capacity on the Northeast Corridor. Regardless of any future ideas, though, policies conducive to transit-supportive density are needed in communities like Needham Center to home in on where the largest gaps but most promising future in density lie.

Needham is emblematic of a widespread, two-pronged challenge of unlocking any new housing at all, and unlocking new housing in strategic locations such as near transit. According to estimates from housing expert Amy Dain[58], in the same time period that Needham permitted more than 500 multifamily housing units in the peripheral corners of town, only 10 units have been permitted in the town center. While 500+ units sounds like a lot, most of these units were permitted via Chapter 40B, which allows developers to bypass certain local zoning restrictions if a project includes a high percentage of affordable housing units and a municipality's housing stock is not already composed of at least 10 percent subsidized housing. Outside of Chapter 40B, Needham has not permitted a multifamily housing unit dating back to at least 2016.



There are many wealthy suburban communities throughout Greater Boston that are close to the urban core and are connected to the city via Commuter Rail, yet do not have the corresponding densities to reflect it. Other Commuter Rail station areas that fall into this category include but are not limited to Belmont, East Braintree/Weymouth, Wellesley Square, and Swampscott.

Regional Urban Centers with Decent Transit but Lower Housing Demand

While much of the recent discussion around building housing near transit has focused on the lucrative inner core (e.g., Seaport, Cambridge Crossing, Lansdowne) or on higher-income suburbs grappling with MBTA Communities compliance, significant opportunities also exist in Greater Boston's regional urban centers. These regional centers, or Gateway Cities as they are often referred, boast historic downtowns, valuable Commuter Rail access, and untapped potential for greater levels of density.

A recent report[59] from MassINC found that Gateway Cities have the capacity "to accommodate thousands of new housing units and jobs on the vacant and underutilized land surrounding their Commuter Rail stations." This investment could also benefit the MBTA, with an ambitious transit-oriented development (TOD) strategy in these cities potentially generating upwards of 25,000 additional daily riders—a figure that could rise above 30,000 with a 30 percent increase in service frequency. These findings underscore the potential for Gateway Cities to play a critical role in fostering more sustainable and equitable growth in the region. And yet, for all their potential, Gateway Cities also face unique challenges that limit their ability to capitalize on this opportunity. Decades of underinvestment, economic decline, and the loss of manufacturing jobs have suppressed housing demand and slowed economic growth.

The case study of Brockton exemplifies this dichotomy: Despite being the fifth largest city in Massachusetts and the third closest Gateway City to Boston, its transit infrastructure and development remain disconnected from the urban core. Brockton's Commuter Rail stations—Montello, Brockton, and Campello—average very low densities of 3.6, 4.6, and 3.8 units per acre, respectively. These low densities, combined with infrequent Commuter Rail service on the Middleborough/Lakeville Line (just 13 trains per day, with headways often exceeding one hour), limit ridership and reduce the incentive to improve service.

Brockton's challenges are compounded by financial barriers that deter development. While high construction costs and limited access to capital make it increasingly difficult for developers to undertake new projects across the region, Gateway Cities such as Brockton are particularly vulnerable to volatile market conditions. In many cases, average rents in these cities are too low to cover construction costs, creating a financial gap that private developers are reluctant to fill. Regulatory hurdles and lengthy approval processes further complicate efforts to increase housing density. Without addressing these systemic barriers, the transit-supportive potential of Gateway Cities will remain largely unrealized.

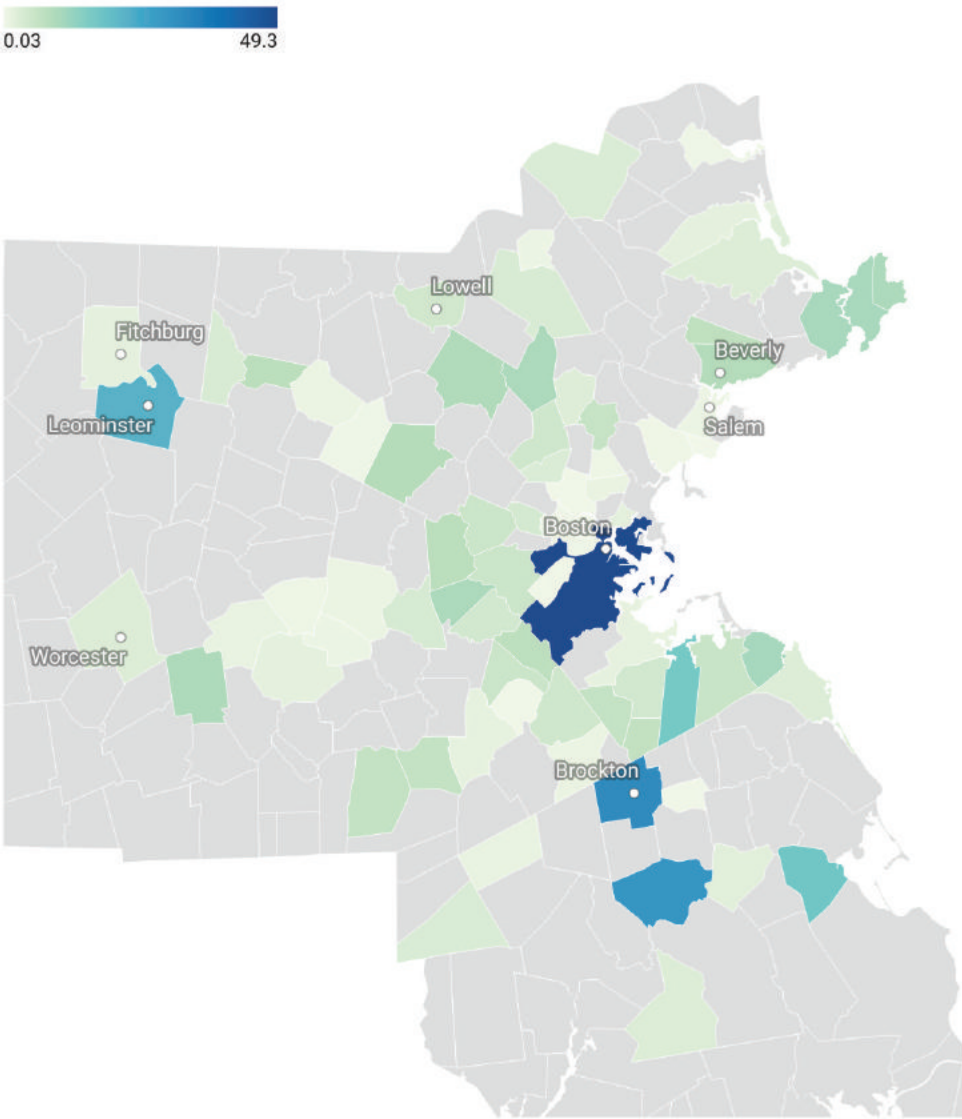
There is an abundance of underutilized land around Brockton's Commuter Rail stations. Photo: TransitMatters

Despite these obstacles, Brockton does have assets that position it for growth. Its historic downtown and three Commuter Rail stations offer excellent transit access, and the city has an estimated 32 acres of developable land—second only to Boston in the region. Approximately 46 percent of downtown[60] is currently dedicated to car infrastructure, such as surface parking lots, which could be repurposed for higher-density housing and mixed-use development. These underutilized parcels represent an opportunity to build more walkable neighborhoods near transit without the complexities of retrofitting already dense areas.

Brockton is one of few Greater Boston municipalities with developable land near their train stations.

Amount of developable within half-mile of a Commuter Rail station. In acres. Residensity. 2024.

0.03 49.3



Developable land is a categorization of the Massachusetts Property Tax Parcels database. Parcels deemed "potentially developable" are those currently vacant but either zoned for residential use or serving as accessories to residential parcels.

Map: Boston Indicators • Source: Residensity • Map data: MassGIS • Created with Datawrapper

Investing in Brockton could also improve opportunities and quality of life for its current residents. As the Massachusetts city with the largest Black population, investments in housing, amenities, and infrastructure would not only help revitalize the community but also promote equity and preserve affordability. Projects like Enso Flats/50-Centre[61] and The Anglim[62] highlight the potential for thoughtful redevelopment in the city's downtown, but scaling these efforts will require additional support. Programs like the Housing Development Incentive Program (HDIP) and funding from the $1.83 billion Affordable Homes Act are essential to helping developers bridge financial gaps and catalyze private investment.

Located across from Brockton Station, Enso Flats is one of only a few recently completed developments in Brockton.
Photo: LoopNet

Brockton's ability to achieve its transit-supportive potential will depend not only on leveraging its assets but also on addressing the systemic challenges that have hindered growth. By prioritizing state-led investments, improving transit service, and streamlining development processes, Brockton can serve as a model for other regional urban centers across Greater Boston. Such efforts will not only enhance ridership on the MBTA and reduce reliance on cars but also demonstrate the critical role of public investment in creating dense, livable, and economically vibrant communities.

Conclusion:

Pathways to Transit-Supportive Density

Greater Boston stands at a crossroads. Rising housing costs, outdated rail infrastructure, and exclusionary zoning rules have hindered the development of sustainable, transit-oriented communities. The cost of living is rising and many families are moving to other parts of the country. And this slowing of population and economic growth make it harder to invest in public transit. But we still have a lot going for us, including the bones of a robust transit system reaching into all corners of the region. Through a literature review and detailed case studies of metro regions in North America, this report identifies several coordinated strategies that could move us toward a model of better transit-supportive density and unlock the true potential for our region:

- **Scale Back Exclusionary Zoning Rules, Especially Near Transit**: Eliminating parking minimums and mandating higher-density zoning near transit hubs will enable the creation of walkable, transit-oriented neighborhoods. Faster permitting processes and incentives for developers can further accelerate progress. Vancouver's bold upzoning near SkyTrain stations offers a model for removing town-by-town zoning fights and better leveraging high-capacity transit.
- **Build Mixed-Income Housing**: Encouraging the development of mixed-income housing within walking distance of transit stations can reduce reliance on cars and ensure equitable access to transit benefits. Policies like inclusionary zoning with density bonuses, investing Community Preservation Act and increasing local Affordable Housing Trust dollars can help make this a reality.
- **Make Public Investments in Lower-Demand Regional Centers**: Directing public investments to support housing development near transit in regional centers with jobs and decent transit access, even if demand is currently lower, can stimulate growth and ensure equitable regional development. These investments could include leveraging underutilized state, MBTA, and municipal-owned land for multifamily housing construction, alongside infrastructure upgrades, financial incentives for developers, and targeted economic development programs. Programs like HDIP have proven to be successful and could be expanded upon or replicated to drive development and investment in Gateway Cities where land is more abundant, yet not as profitable to build on.
- **Secure Long-Term Funding Increases for the MBTA**: Identifying long-term funding mechanisms for transit, such as congestion pricing, Transportation Network Company fees, or regional sales taxes, will ensure the MBTA can maintain and expand its services sustainably. Governor Healey's funding task force, while also filling operating shortfalls, has cited congestion pricing as one of the most robust options and a potential long-term solution. Successfully implemented in London and most recently in New York City, congestion pricing is proven to be a reliable funding source for transit agencies while also helping more people to opt for transit over cars.
- **Electrify the Commuter Rail**: Transitioning to electric trains will not only reduce emissions but also improve reliability and speed. This includes modernizing infrastructure to support electric multiple units (EMUs), which are faster and more efficient than diesel locomotives.

- **Improve Service Frequency**: Increasing Commuter Rail frequencies, especially during off-peak hours, is critical to making transit a viable option for more people. A 15- to 30-minute service interval could be transformative in terms of how useful Commuter Rail service would be for all parts of the region. Realizing the promised 3–5 minute frequencies on the rapid transit lines also has promise for boosting ridership in the urban core. And bus frequencies must be increased to make transfers easier and allow more people to access services like Commuter Rail.
- **Integrate Transit Fares and Allow Free Transfers**: Simplifying fare structures and allowing free transfers between the Commuter Rail, subway, and buses would create a more seamless transit experience. A simplified fare map with equitable pricing can also address barriers for riders in Gateway Cities.
- **Upgrade for Accessibility**: Ensuring universal access with high platforms and level boarding at all stations is essential. These upgrades can be funded through innovative mechanisms like development impact fees or public-private partnerships.
- **Commit to Vision Zero**: Vision Zero goals for communities prioritize the safety of pedestrians, cyclists, and public transit users. While density and transit access are key, they flourish when streets are safe. Eliminating pedestrian fatalities and creating more walkable neighborhoods makes it easier for people to feel comfortable reaching a station on foot, further increasing the potential impact of transit-supportive density.
- **Improve Regional Planning & Coordination**: TSD depends on better integration of MBTA Commuter Rail, rapid transit, buses, and regional transit authorities (RTAs). Transit improvements like dedicated bus lanes and signal upgrades must be coordinated across municipal boundaries to ensure seamless travel and reliable service. Aligning municipal development plans and standardizing zoning processes can further reduce development costs and delays, promoting housing density near transit.

Regions like Northern New Jersey, Toronto, Washington, D.C., and Vancouver illustrate how making transit improvements hand-in-hand with proactive housing development policies can achieve transformative results. These areas have embraced dense, transit-oriented growth at a scale Greater Boston has yet to match. Toronto, for example, is building housing near transit hubs ahead of its network expansion, while New Jersey and Vancouver demonstrate the benefits of frequent, reliable service in advancing development and connectivity. Washington, D.C. shows how targeted density increases ridership, making transit systems more financially sustainable. Together, these examples highlight that Greater Boston's challenges, such as improving service and coordinating development, are surmountable with a bold and comprehensive approach.

Realizing this vision requires immediate action. Electrification, modernized infrastructure, and high-frequency service must align with local land-use reforms that promote walkable, transit-oriented neighborhoods. By linking housing production to transit investment, the MBTA and regional stakeholders can foster communities that are affordable, vibrant, and sustainable.
The path forward is challenging but achievable. A fully integrated Regional Rail system and more robust bus and rapid transit service, paired with dense housing and vigorous economic development around transit hubs, will not only meet the region's transit needs but also directly address Greater Boston's housing crisis and climate goals.

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Recently completed multifamily housing near South Weymouth Station. Photo: Lucas Munson