

Neponset Valley Route 1/1A Corridor Mobility Study

December 2021



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Neponset River Suburban Mobility Working Group

ACKNOWLEDGEMENTS

This study was completed by the Metropolitan Area Planning Council (MAPC). MAPC is Greater Boston's regional planning agency whose mission is to promote smart growth and regional collaboration.

Professional technical assistance provided MAPC was led by Travis Pollack AICP, with support from Liana Banuelos, Eric Bourassa, Alyssa Kogan, and Lily Perkins-High.

MAPC would like to thank project partner Karen Dumaine of the Neponset Valley Transportation Management Association (Neponset Valley TMA) as well as the members of the Neponset Valley Suburban Mobility Working Group for their assistance and input throughout the entirety of this study.

This study was completed for the Neponset Valley TMA and the Neponset Valley [Suburban Mobility Working Group](#) (SMWG). The SMWG was established by the Neponset Valley TMA in 2018, bringing together representatives from the public and private sector to take a comprehensive look at mobility issues and develop a transportation strategy to address local and regional mobility needs. The municipalities in this working group represent over 185,000 residents in the communities of Canton, Dedham, Foxborough, Norfolk, Norwood, Sharon, Walpole, Westwood, and Wrentham.

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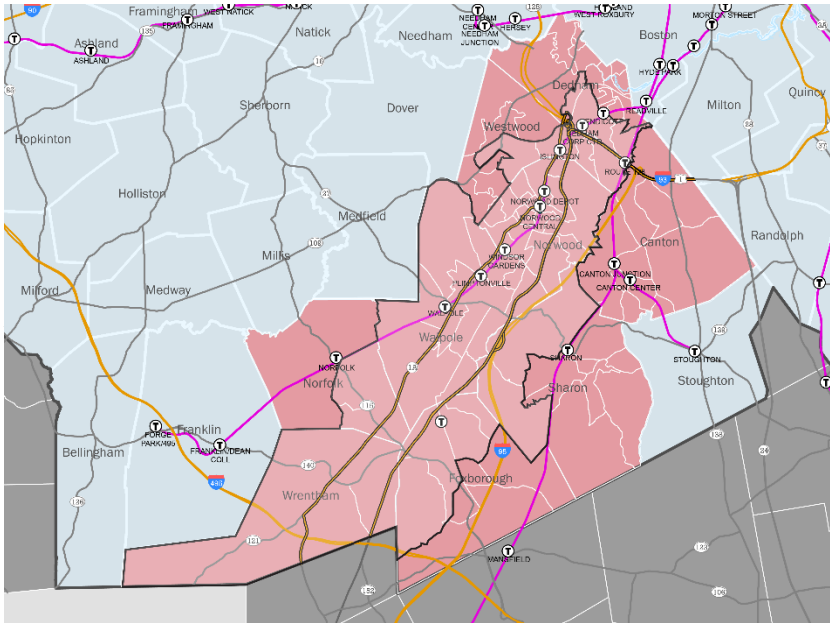
Executive Summary

This study identified potential paths to improve transit options within the Route 1A and Route 1 corridors. The municipalities included in this study area are Canton, Dedham, Foxborough, Norfolk, Norwood, Sharon, Walpole, Westwood, and Wrentham. The goals of the study are:

- 1. Identify improvements to first and last mile connections to existing and potential future transit, primarily for work trips, including both shuttles and bicycle/pedestrian connections
- 2. Collect information on local needs on transit issues to help shape ongoing transit planning processes
- 3. Consider ways to improve transit for non-employment trip needs

Because the primary goal of the study is for connections for employment, a corridor “focus area” was developed to include Census tracts extending north and south primarily along Route 1 and 1A from Route 128 to I-495, west primarily to the Franklin commuter rail line, and east primarily to the Providence/Stoughton commuter rail line. **Figure ES-1** shows the municipalities in the study area as well as the corridor focus area.

Figure ES-1. Study Area and Corridor Focus Area



The Route 1/1A survey results found that most respondents anticipate returning to the worksite all or most days. This finding may be due to the higher concentration of retail, healthcare and education employment in the study area, and these jobs are not as conducive to remote work.

Most people stated that, prior to the pandemic, they drove to work and did not have problems getting to work, although some did note concerns with traffic congestion and being late.

While most did not believe that a new shuttle would be useful, those that did were more likely to be transit riders prior to the

pandemic. Connecting to the Route 128 station was the most popular proposed connection, with Norwood second.

An analysis was conducted to determine which areas within the Neponset Valley Route 1/1A study area would be the best candidates for local public transportation improvements. This analysis was conducted at the Census block group level and run for three scenarios—commutes into Boston, reverse flow commutes (from Boston), and intra-corridor commutes.

Based upon the suitability analysis and review of existing conditions, as well as a review of the survey results of residents and workers in the corridor, the **study proposes a near term recommendation of new and expanded microtransit services, as well as a long-term revitalization and redesign of Route 1.**

Near Term Microtransit Pilots: The areas that scored as most or more suitable for new transit services were in Dedham and Norwood. A microtransit pilot centered along Route 1 and connecting to the commuter rail stations in Dedham, Westwood and Norwood (as well as the MBTA bus 34E) would provide key first-mile/last mile connections to jobs along Route 1/Providence Highway as well as the University Avenue corridor in Westwood and Norwood.

A possible expansion of this microtransit service could include further south along Route 1 in Walpole, connection with Walpole station and extending to Patriots Place in Foxborough. This would allow for connection to key retail, health care, and other employment in Walpole and Foxborough, as well as connect with the GATRA Go microtransit services.

The current GATRA Go microtransit option provides good service in Norfolk, Wrentham, and Foxborough. An expansion of GATRA service to Walpole to connect with the MBTA 34E bus will provide a more affordable connection with the MBTA bus and subway, and an expanded service after 6 PM and weekends will also help

connect workers with jobs such as retail and health care where shifts are beyond the typical 9-5 weekday schedule.

Although a fixed-route shuttle with timed stops could serve portions of the proposed service area, microtransit may be a better fit and is recommended for the following reasons:

- The greatest concentration of employment is along the Providence Highway/Route 1, which is not designed to safely serve pedestrians and transit.
- As the COVID-19 pandemic continues, work schedules, including work-from-home and “hybrid” office patterns are still developing. A microtransit service can be more flexible to serve differing shifts and be scaled to meet demand. The service geography also can be easily modified to meet demand.
- Because microtransit uses advanced software to collect trip origins and destinations, over time the trip data can be used to determine if a fixed-route bus would be more efficient to serve some geographies.
- The microtransit service can be developed to ensure that riders who request trips that can be served by existing fixed-route bus or rail are routed to those services.

To create a successful pilot, the communities and businesses in the Neponset Route 1/1A corridor should take the following steps to review the data and recommendations from this study and create a program and funding strategy.

1. Determine the core needs and goals of the service.
2. Ensure the new service addresses equity needs.

3. Based upon the goals and needs developed under the first two steps, determine geographic, time of day/week and other parameters of the service.
4. Determine the performance measures.
5. Create a funding and operating plan, preferably one that is two or more years.
6. Find a lead agency to manage and champion the pilot.

Figure ES-2 illustrates the microtransit pilot recommendations.

Long-term, the municipalities and MassDOT should develop a vision to transform Route 1 to a complete street designed for all users that will safely support bus transit, pedestrians, and cyclists and other rollers. This transformation will likely include narrowing travel lanes and/or reducing the travel lanes in some areas to reduce vehicular speeds, walking/rolling infrastructure including sidewalks, trails and safe crosswalks, and locations for transit stops that connect with cross-streets and employment. The design should also include street trees and other shade makers to create cool space for transit riders and others.

To evaluate the feasibility of the long-term multi-modal changes to the corridor, the municipalities along Route 1 should apply with MassDOT and/or the [Boston MPO](#) to conduct a feasibility study for a portion or the entire corridor. The study would determine the infrastructure changes along Route 1 that would be best to allow for better pedestrian, rolling, and transit connections to employment along the corridor.

Figure ES-2. Mobility Study Recommendations

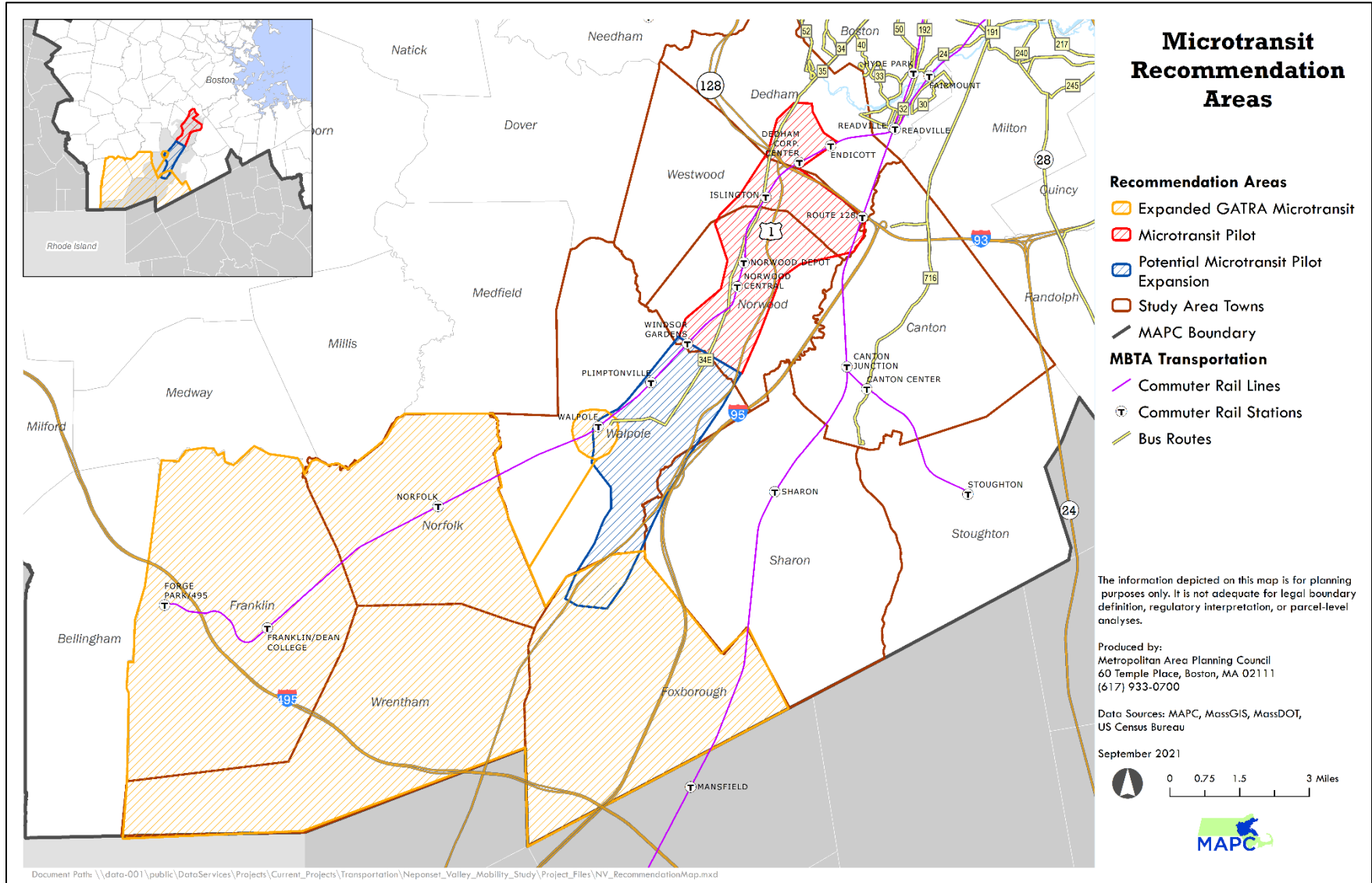


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1 Existing Conditions and Emerging Trends

1.1 Introduction

1.1.1 Overview

This study identified potential paths to improve transit options within the Route 1A and Route 1 corridors in the Neponset River area southwest of Boston (Figure 1.1). The goals of the study are:

1. Identify improvements to first and last mile connections to existing and potential future transit, primarily for work trips, including both shuttles and bicycle/pedestrian connections
2. Collect information on local needs on transit issues to help shape ongoing transit planning processes
3. Consider ways to improve transit for non-employment trip needs

The Neponset Valley Transportation Management Association (NVTMA) hosted a forum on March 28, 2018 at Gillette Stadium on Bridging Transportation Gaps in the Neponset Valley. An outcome from this forum was the formation of a Suburban Mobility Working Group (SMWG), whose mission is “to address mobility challenges in the suburban Neponset Valley region through multimodal infrastructure improvements. The group will collaborate and advocate for reliable, affordable, cost-effective, efficient and accessible innovative transportation solutions that serve all needs.” Since the March 2018 forum, the SMWG has worked on identifying the transportation gaps in the Neponset Valley area and possible best practices to address those needs. In a 2019 letter to MAPC, the SMWG requested assistance from MAPC on ways to support the SMWG efforts, including conducting

a feasibility study of transit connections for Route 1 and Route 1A.

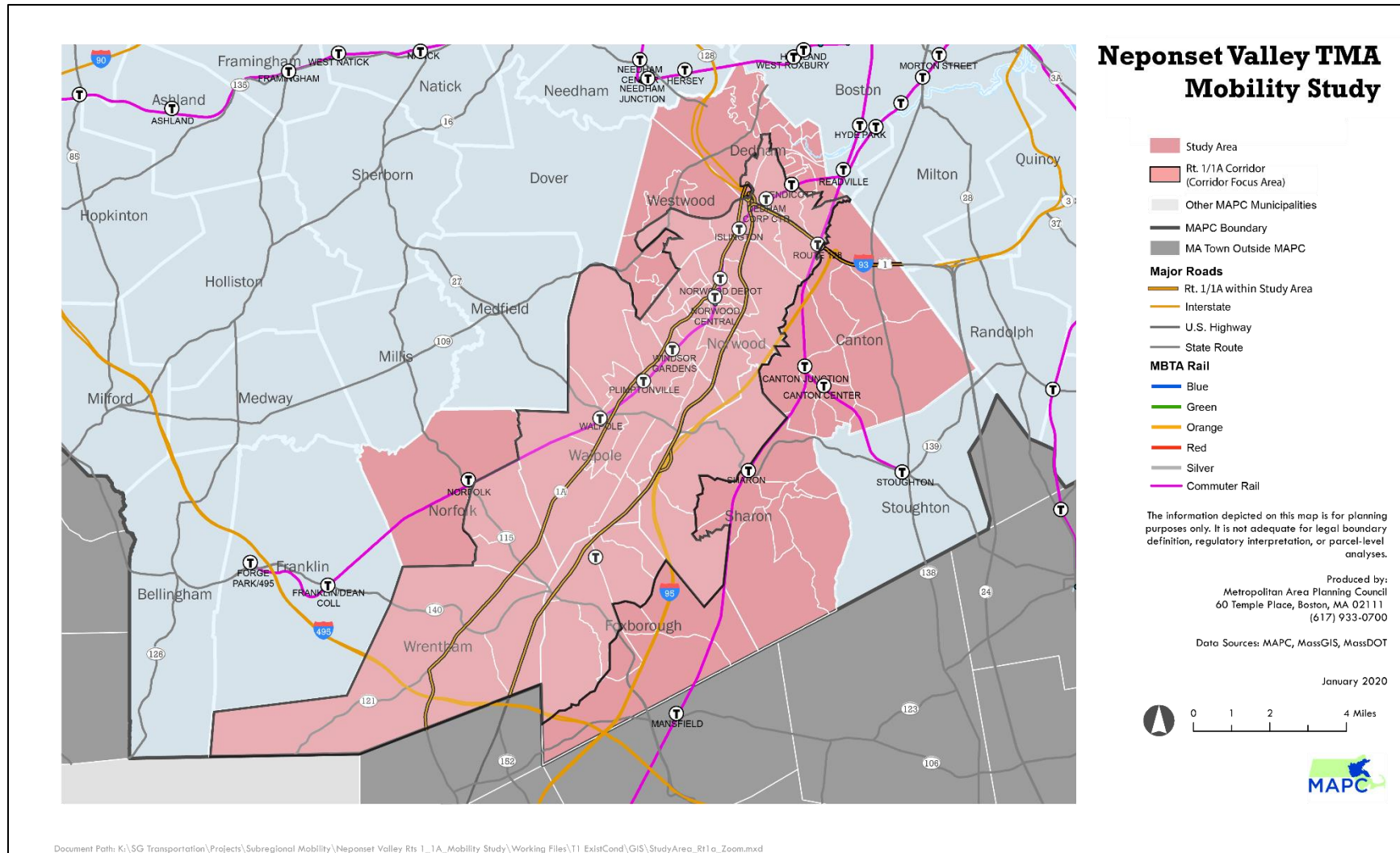
1.1.2 Project Study Area and Study Participants

The municipalities included in this study area are Canton, Dedham, Foxborough, Norfolk, Norwood, Sharon, Walpole, Westwood, and Wrentham. Norfolk and Wrentham are within MAPC’s South West Advisory Committee (SWAP) subregion, while the remaining are within the Three Rivers Interlocal Council (TRIC) subregion. All these municipalities are members of the Boston Region Metropolitan Planning Organization (MPO). Representatives from these municipalities attended SMWG meetings to provide input during the study process.

Because the primary goal of the study is for connections for employment along the Route 1/1A area, a corridor “focus area” was developed to include Census tracts extending north and south primarily along Route 1 and 1A from Route 128 to I-495, west primarily to the Franklin commuter rail line, and east primarily to the Providence/ Stoughton commuter rail line.

Figure 1.1 on the following page shows the project study area and corridor focus area.

Figure 1.1: Study Area/Corridor Focus Area Map



1.1.3 Project Tasks

The study was divided into four tasks:

1. Inventory of existing conditions and emerging trends in population, employment, and travel patterns
2. Survey of workers, residents, and employers in the study area
3. Analysis to determine areas that might be most suitable for new transportation services
4. Recommendations and potential pilot projects to meet the needs identified

The COVID-19 pandemic occurred while the study was underway, and MAPC suspended tasks in 2020. When the study was re-started in 2021, the resident and employer survey and inventory of existing conditions were modified to attempt to capture emerging patterns in employment and workplace commutes in Greater Boston.

1.2 Existing Demographics

As an early step in the mobility study, MAPC analyzed municipal and study area demographics to look for trends and patterns in population, employment, and travel. Where possible, MAPC evaluated the Route 1/1A corridor for more specific trends along this corridor. MAPC also compiled data, where available, for the MAPC region and the Commonwealth for comparison.

1.2.1 Population

Table 1.1 lists the population for the study area as measured by the US Census in 2010 and 2020. Norwood, Dedham and Walpole lead the study area in total population, while Westwood, Canton and Wrentham have been the faster growing communities in the study area. The overall population growth between 2010-

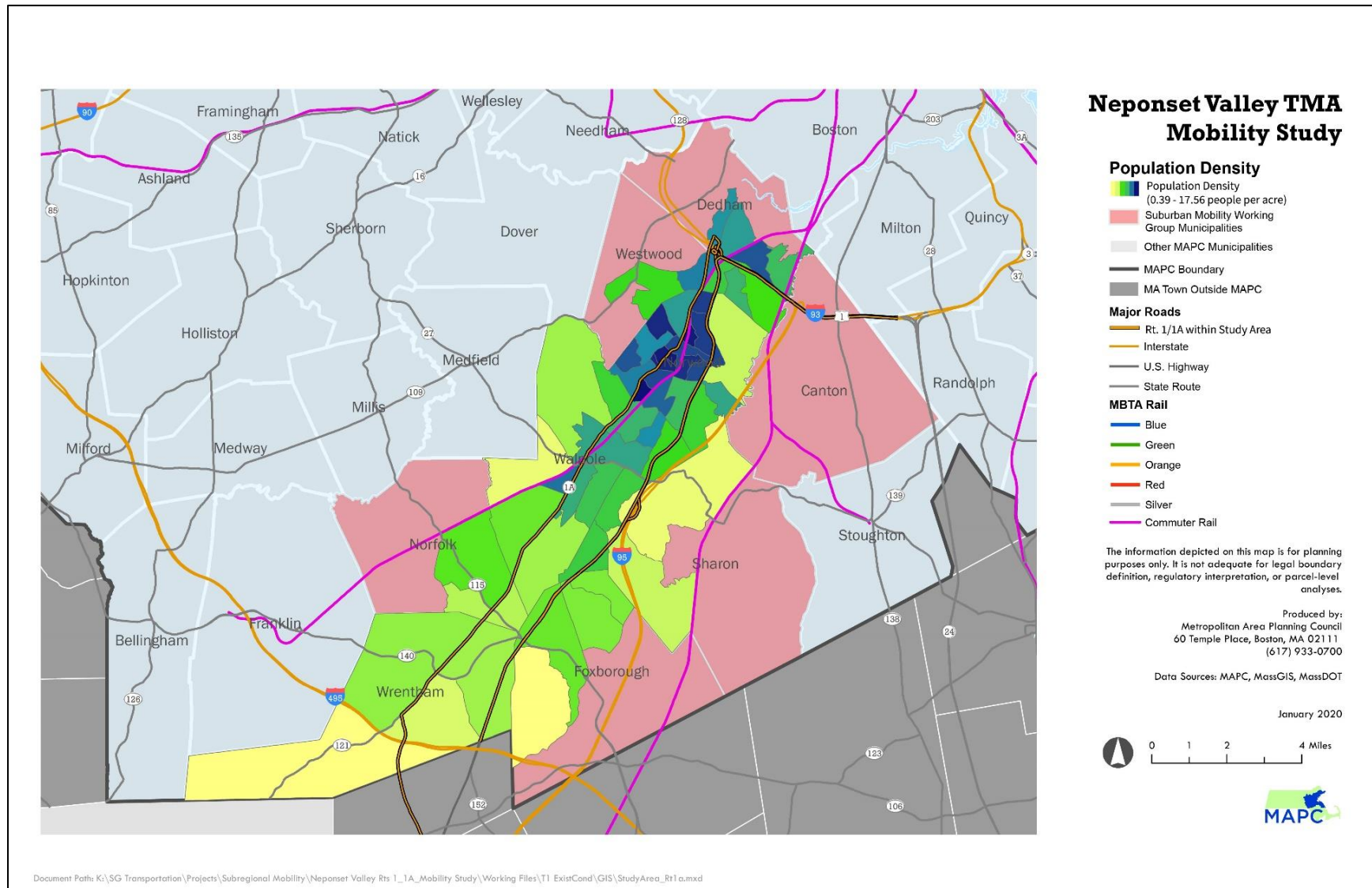
2020 for the study area is similar to the MAPC region, but higher than the Commonwealth. **Figure 1.2** shows the population density within the corridor focus area.

Table 1.1: Study Area Population

Municipality	Population, 2010	Population, 2020	Percent Change 2010-2020
Canton	21,561	24,370	13.0%
Dedham	24,729	25,364	2.6%
Foxborough	16,865	18,618	10.4%
Norfolk	11,227	11,662	3.9%
Norwood	28,602	31,611	10.5%
Sharon	17,612	18,575	5.5%
Walpole	24,070	26,383	9.6%
Westwood	14,618	16,266	11.3%
Wrentham	10,955	12,178	11.2%
Totals	170,239	185,027	8.7%
MAPC Region	3,161,712	3,435,759	8.7%
Massachusetts	6,547,629	7,029,917	7.4%

Sources: US Census, compiled by MAPC

Figure 1.2: Population Density



Because this study primarily examined improvements for transit work trips, MAPC also looked at the change in population for those aged 25 and 64, the population group most likely to be employed. As seen in **Table 1.2**, the study area has seen the largest percentage growth in those over the age of 65, and a slight decrease in those 25-64 years old. However, the population under 25 years old has seen a five percent increase. This indicates that the most of study area is primarily experiencing growth in the number of resident retirees and working seniors, which likely include some who require transit for continued mobility. New transit options should also accommodate users of various mobility and technology skill levels, especially for an aging work force.

Table 1.2: Study Area Population Change 2009-2017

Municipality	Percent Change, 2009-2017			
	Total Population	25-64 years old	Under 25 years old	Over 65 years old
Canton	4.4	-4.2	8.2	8.6
Dedham	4.4	-4.8	4.4	20.3
Foxborough	6.1	-7.6	6.5	39.4
Norfolk	6.4	4.8	-0.3	71.5
Norwood	2.7	0.1	4.2	2.5
Sharon	5.1	1.0	1.7	31.7
Walpole	7.7	1.4	7.4	23.3
Westwood	11.1	7.0	13.4	12.2
Wrentham	4.4	1.0	-1.0	49.4
Totals	5.5	-0.7	5.1	20.0
MAPC Region	6.0	2.8	4.7	19.4
Massachusetts	4.3	0.6	3.1	20.7

Source: American Community Survey estimates, 2005-2009 and 2013-2017, compiled by MAPC

1.2.2 Employment

Table 1.3 shows employment snapshots in the study area in 2001, 2010, and 2017. Some of largest employment increases have been in Westwood and Foxborough, primarily in the Health Care, Retail, and Professional/Technical Services sectors in Westwood and in the Arts, Entertainment and Recreation sector in Foxborough.

Table 1.3: Study Total Employment, 2001, 2010, 2017

Municipality	2001	2010	2017
Canton	21,097	20,492	22,735
Dedham	14,089	16,081	17,362
Foxborough	9,434	11,948	15,621
Norfolk	3,190	2,975	3,599
Norwood	25,059	23,594	24,312
Sharon	4,049	3,493	3,752
Walpole	9,677	10,407	11,913
Westwood	9,273	8,876	12,801
Wrentham	5,246	6,177	7,024
Totals	101,834	104,043	119,119
MAPC Region	1,877,353	1,797,048	2,041,507
Massachusetts	3,245,353	3,114,879	3,493,112

Source: Massachusetts Executive Office of Labor and Workforce Development (EOLWD), compiled by MAPC

Most of the employment in the study area is in the corridor focus area, primarily within these sectors:

Corridor Focus Area Total Jobs: 76,925

- Retail Trade (18.0%)
- Health Care (11.3%)
- Accommodation & Food Services (9%)
- Professional, Scientific, & Technical Services (7.4%)
- Manufacturing (7.2%)
- Administration & Support, Waste Management (6.7%)
- Wholesale Trade (5.5%)
- Educational Services (5.4%)
- Construction (5.4%)

Figure 1.3 shows the employment density within the corridor focus area.

1.2.3 Automobile Ownership and Use

Table 1.4 shows a snapshot of vehicle use and ownership for municipalities in the study area and **Figure 1.4** shows the vehicles per household within the corridor focus area. Households in the study area have a higher average number of vehicles and drive more than the statewide average, and generally areas further away from MBTA bus and commuter rail services have more vehicles per household.

Table 1.4: Study Area Vehicle Ownership and Use

Municipality	Vehicles Per Household	Household Miles per Day	CO2 per Day per Household
Canton	1.8	53.7	0.024
Dedham	1.8	46.6	0.021
Foxborough	2.0	66.5	0.030
Norfolk	2.4	79.3	0.037
Norwood	1.7	44.8	0.019
Sharon	2.0	63.6	0.027
Walpole	2.0	61.2	0.028
Westwood	2.0	56.8	0.025
Wrentham	2.4	80.1	0.037
Study Area	2.0	61.4	0.028
Massachusetts	1.7	48.9	0.022

Source: Massachusetts Vehicle Census (2014) compiled by Massachusetts Registry of Motor Vehicles and MAPC

Figure 1.3: Employment Density

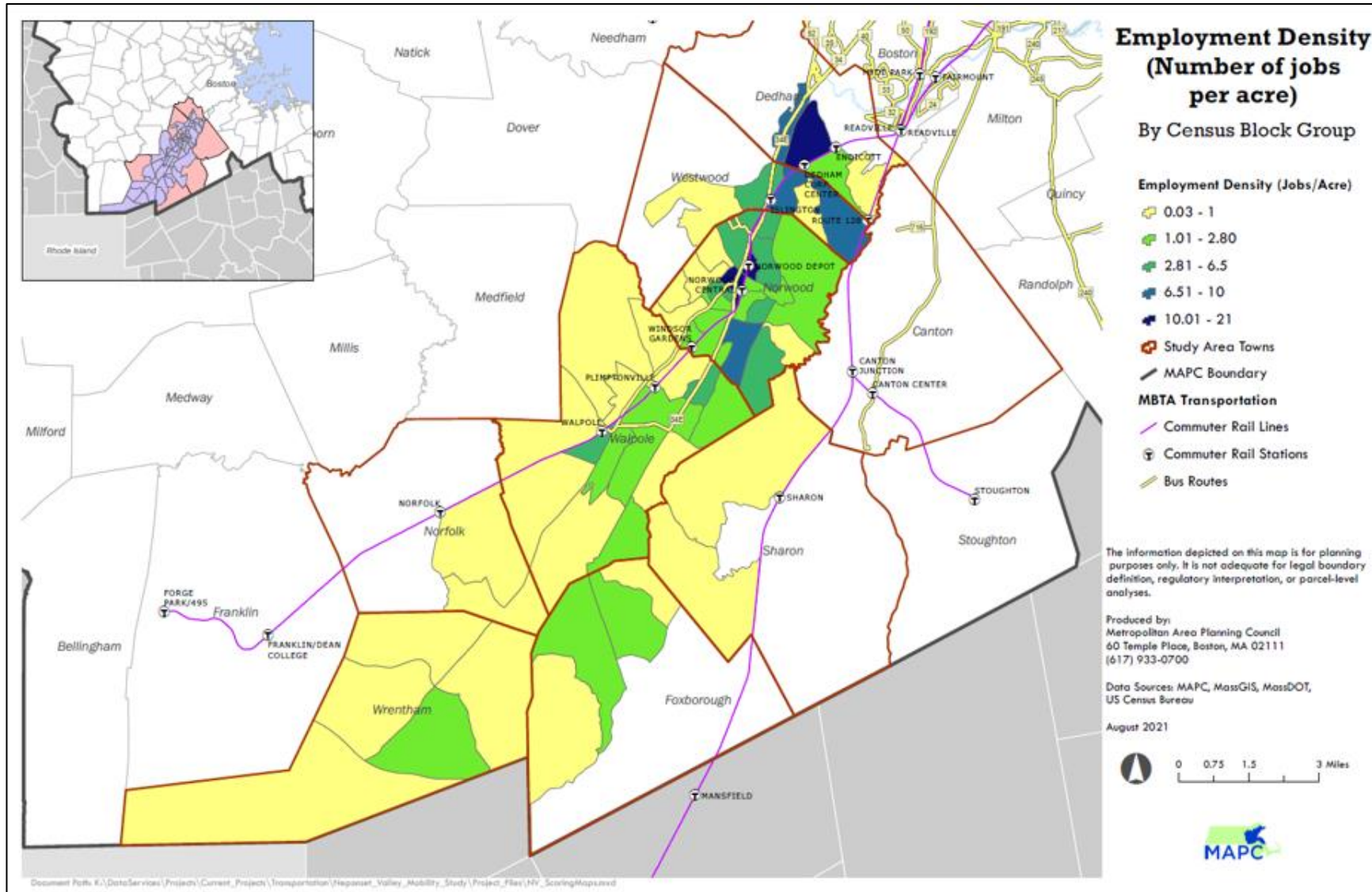
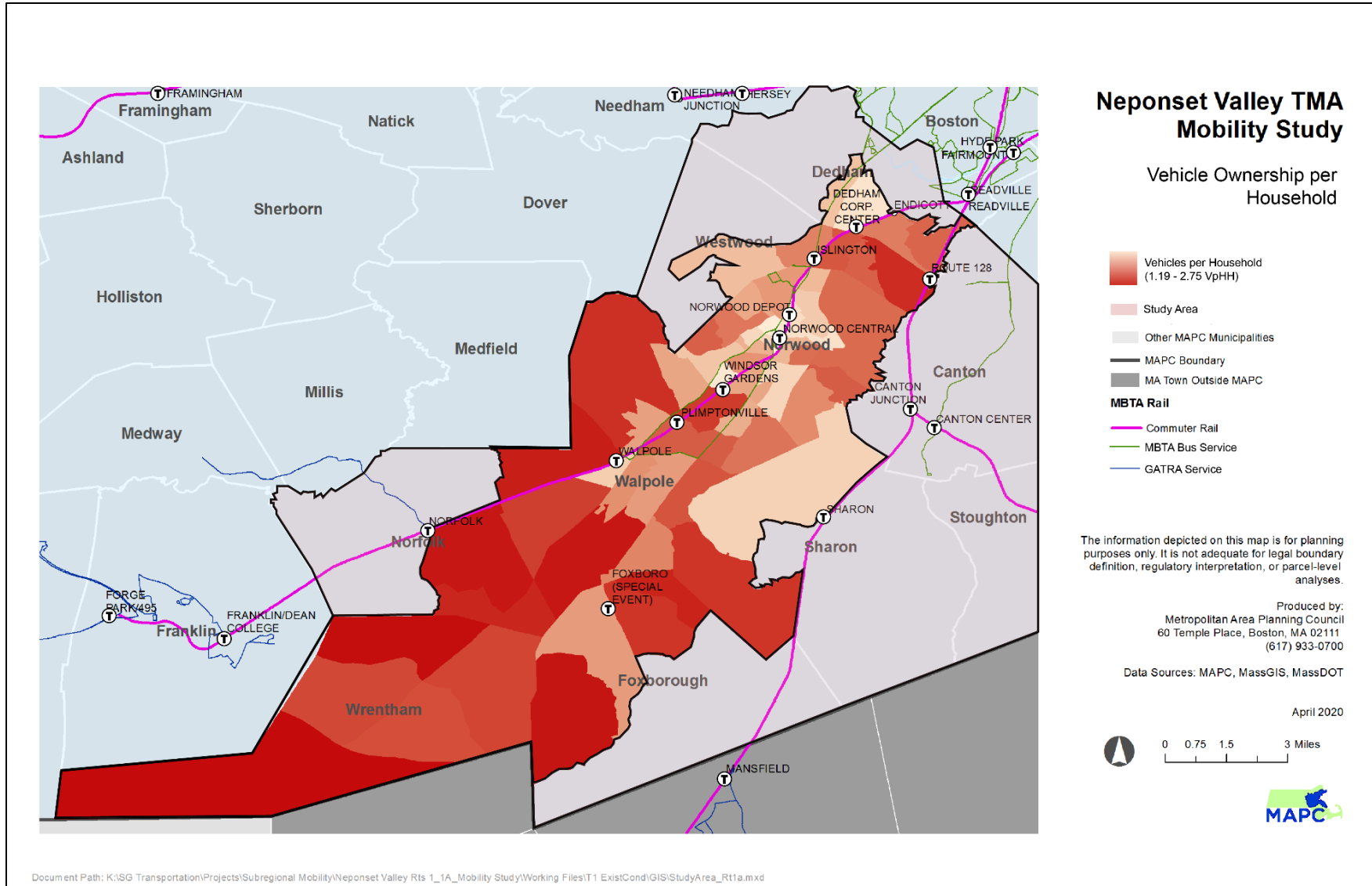


Figure 1.4: Vehicle Ownership per Household



1.2.4 Commuting Patterns

Prior to the 2020-2021 COVID-19 pandemic, a vast majority of the study area’s workers (80%) drive to work, with around 11% taking transit. **Table 1.5** shows the breakdown for commuting in the study area.

the home locations of workers by municipality who work within the corridor focus area. The top municipalities where workers commute from include Boston, Norwood, Walpole, and Foxborough.

Table 1.5: Study Area Journey to Work

Municipality	Workers	Percent Drive	Percent Transit	Percent Other
Canton	11,809	80.4%	13.6%	6.0%
Dedham	13,103	79.1%	10.8%	10.1%
Foxborough	9,137	88.3%	4.4%	7.3%
Norfolk	4,804	78.0%	11.2%	10.8%
Norwood	15,640	83.8%	9.1%	7.1%
Sharon	9,409	72.9%	18.4%	8.7%
Walpole	12,624	83.7%	8.9%	7.4%
Westwood	7,638	72.4%	17.2%	10.4%
Wrentham	6,022	84.9%	7.9%	7.2%
Totals	90,186	80.4%	11.28%	8.3%
MAPC	1,754,661	68.3%	17.6%	14.1%
Massachusetts	3,454,047	78.1%	10.2%	11.7%

“Other” includes taxi, motorcycle, walk, working from home, and other means. Source: American Community Survey 5-year averages, 2013-2017, compiled by MAPC

Figure 1.5 shows the commute locations for those living in in the corridor focus. As seen in the figure, the major commuting destinations are not only into Boston, but also include Newton, Norwood, and Walpole, as well as Dedham, Canton, and Foxborough.

For those working in the corridor focus area, many commute from Boston as well as from within the study area. **Figure 1.6** shows

Figure 1.5: Study Area Residents Commute

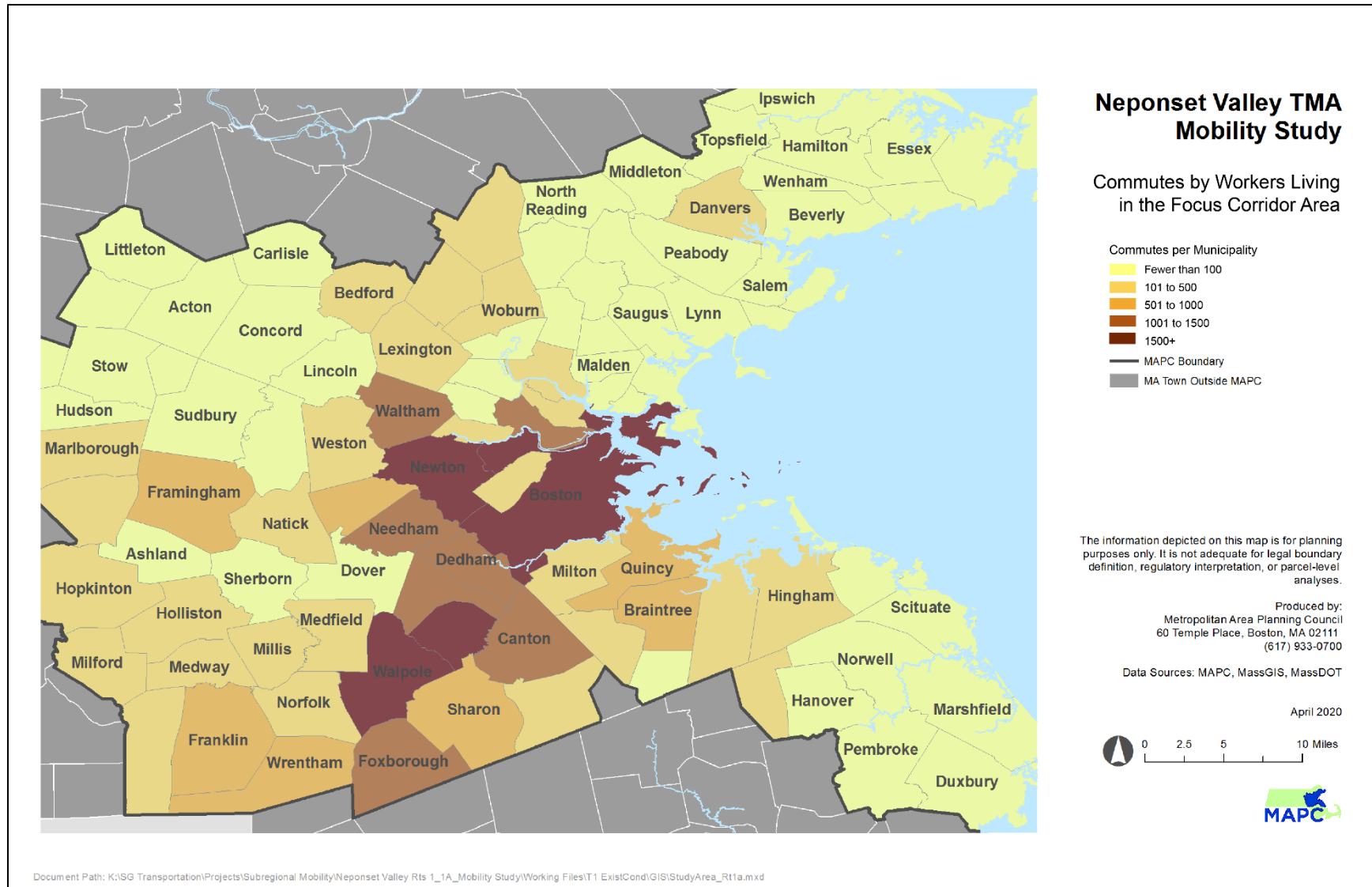
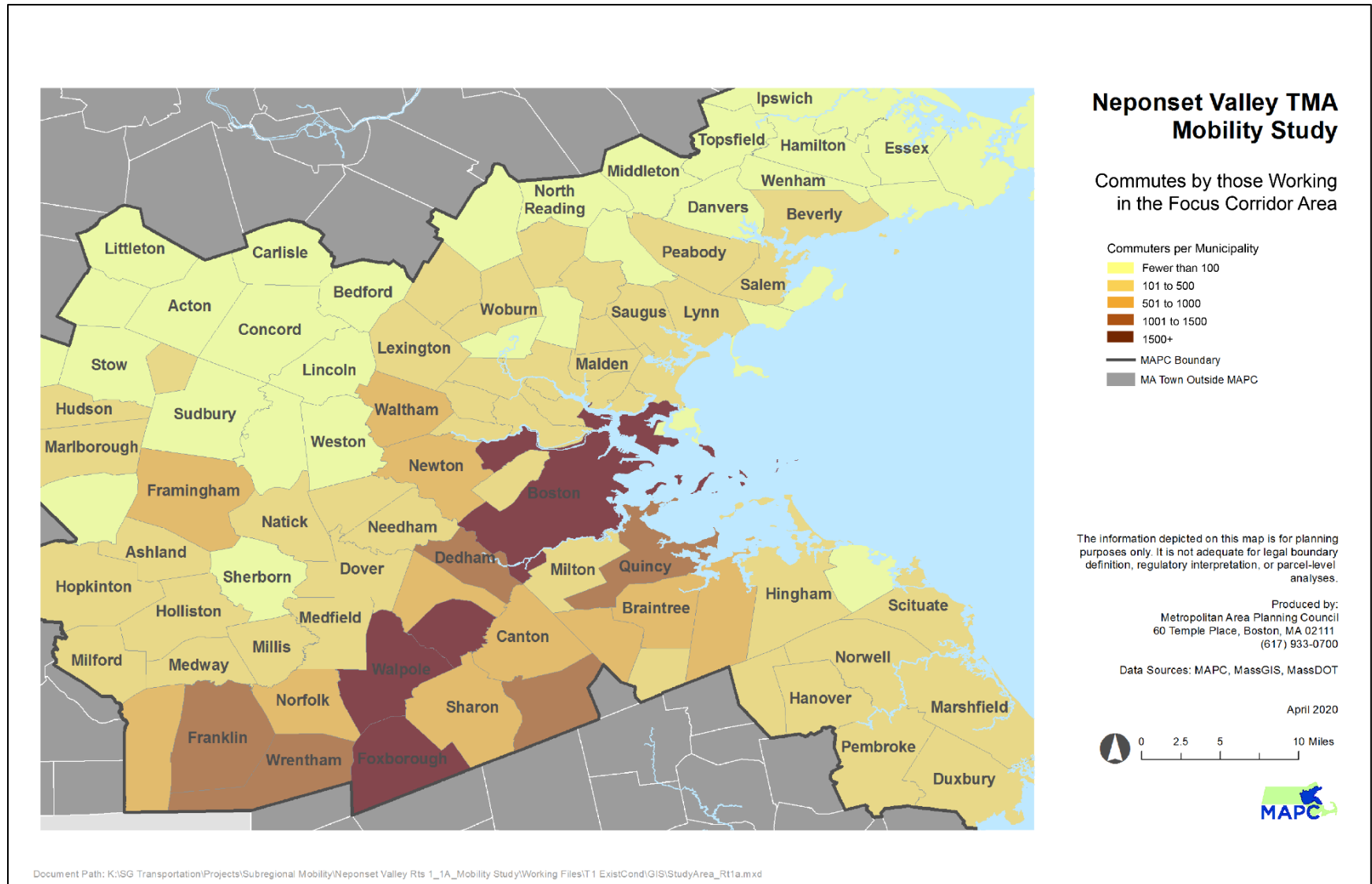


Figure 1.6: Corridor Focus Area Workers Commute



1.2.5 Environmental Justice Communities

MAPC evaluated the distribution and density of populations that are more likely to be dependent on transit for work trips and other daily needs – lower-income households (defined as households below the Federal poverty level), households with limited English speakers, non-white populations, and residents with disabilities. While these populations are in denser areas of Norwood and Dedham, there are also concentrations in Sharon, Walpole, Norfolk, Foxborough, and Wrentham. **Figures 1.7 through 1.10** show the distribution of these environmental justice populations in the corridor focus area.

Figure 1.7: Households Below Poverty

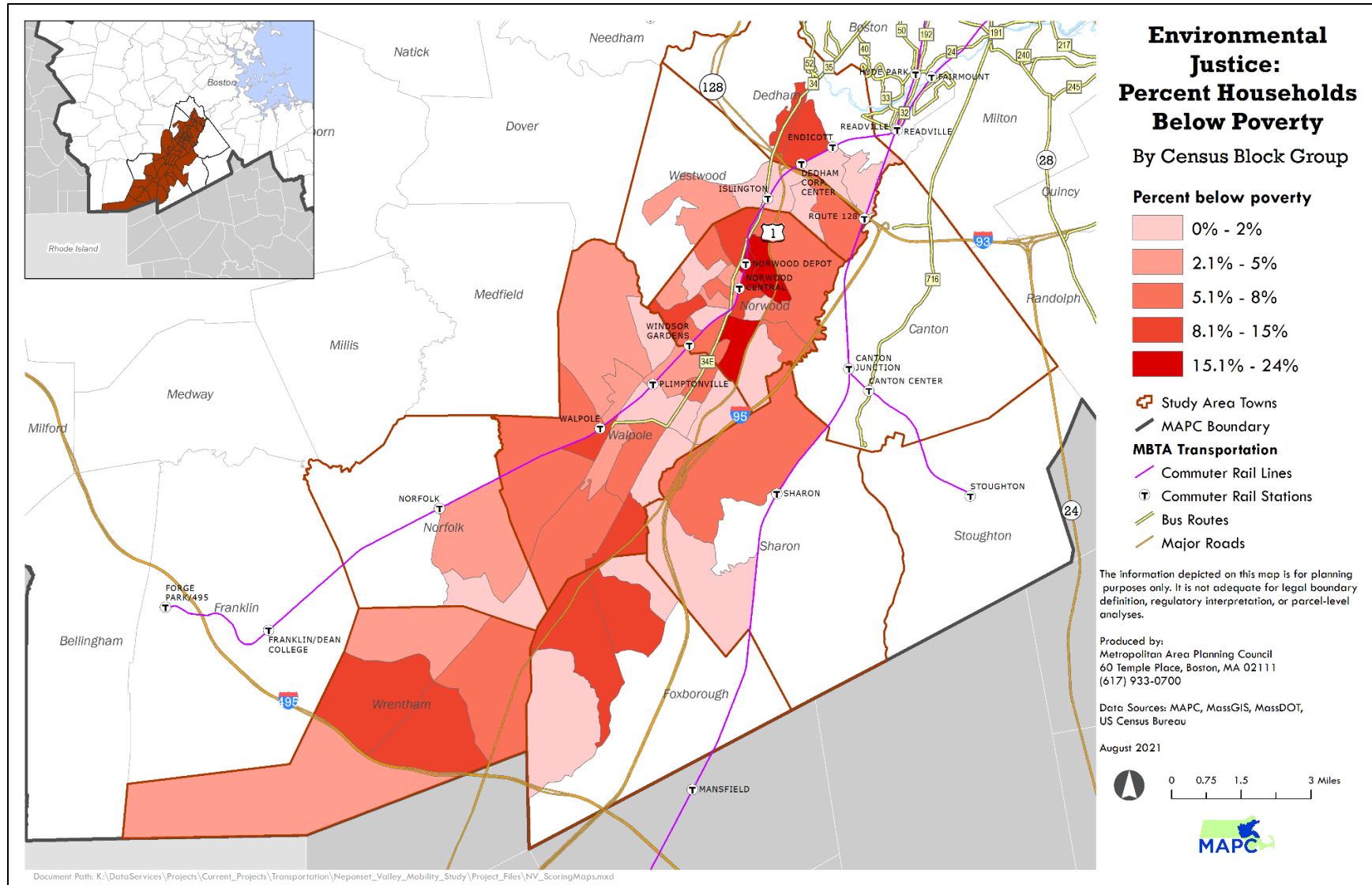


Figure 1.8: Percent Limited English Speaking Households

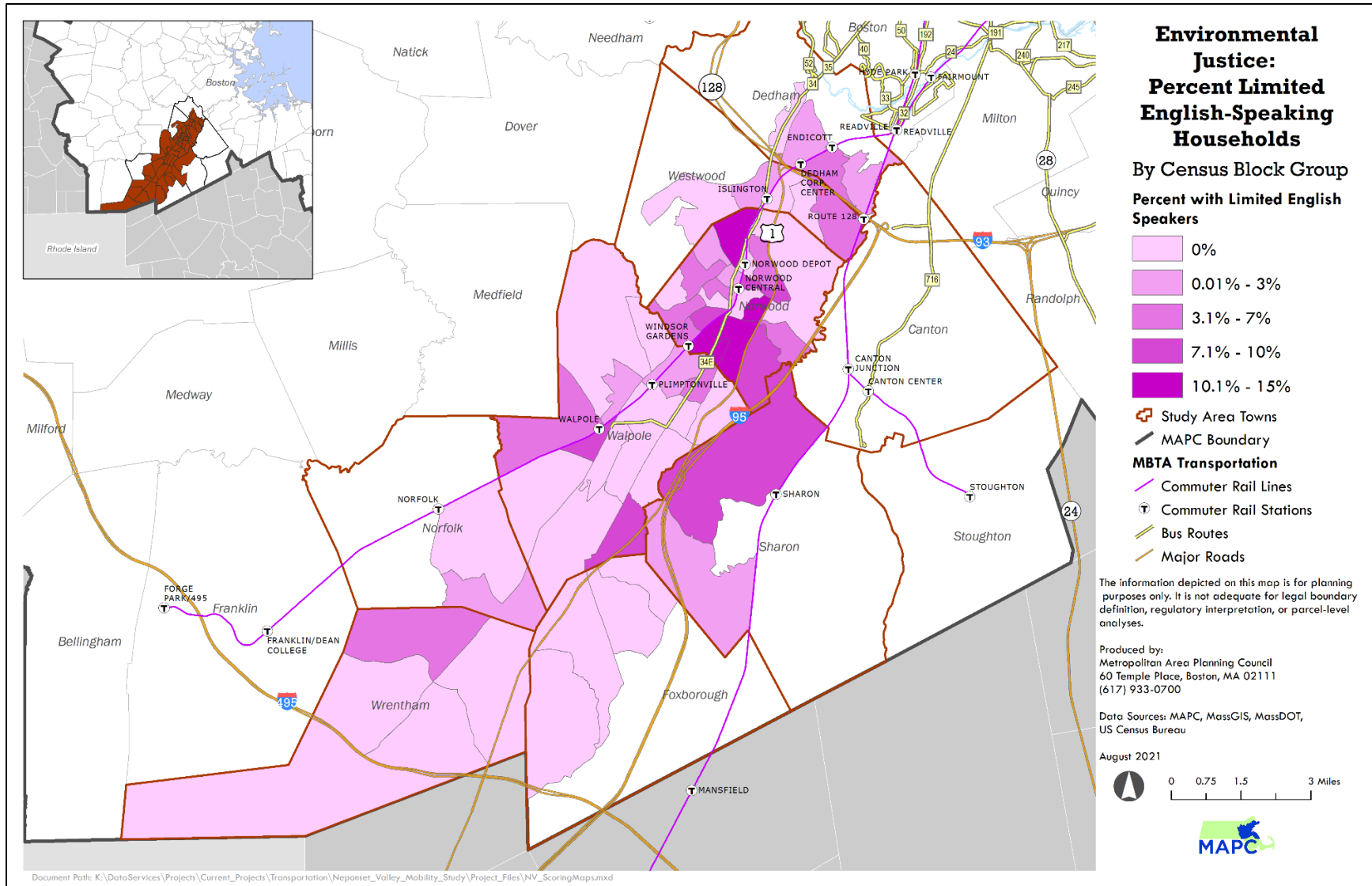


Figure 1.9: Percent Population Non-White

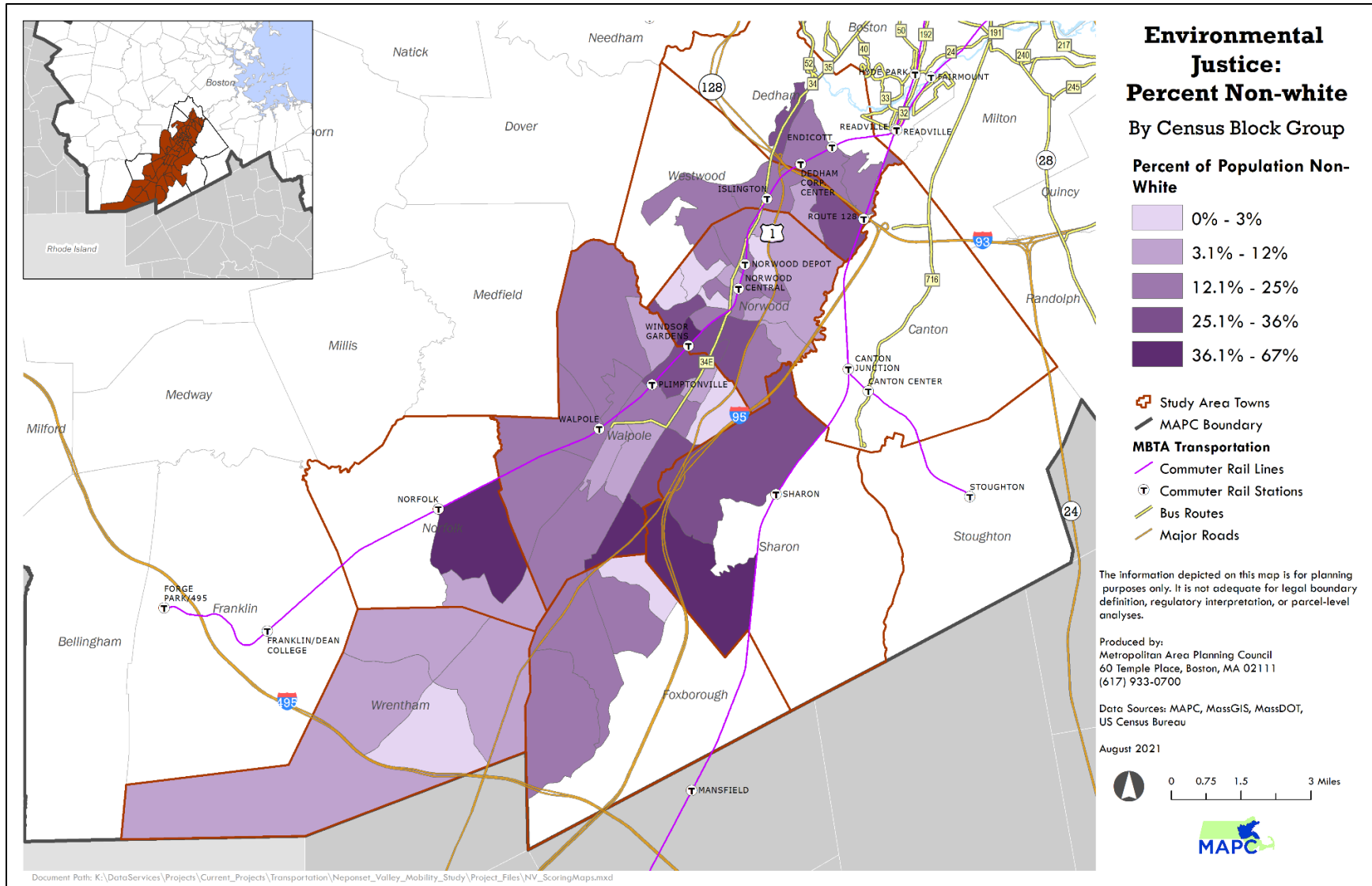
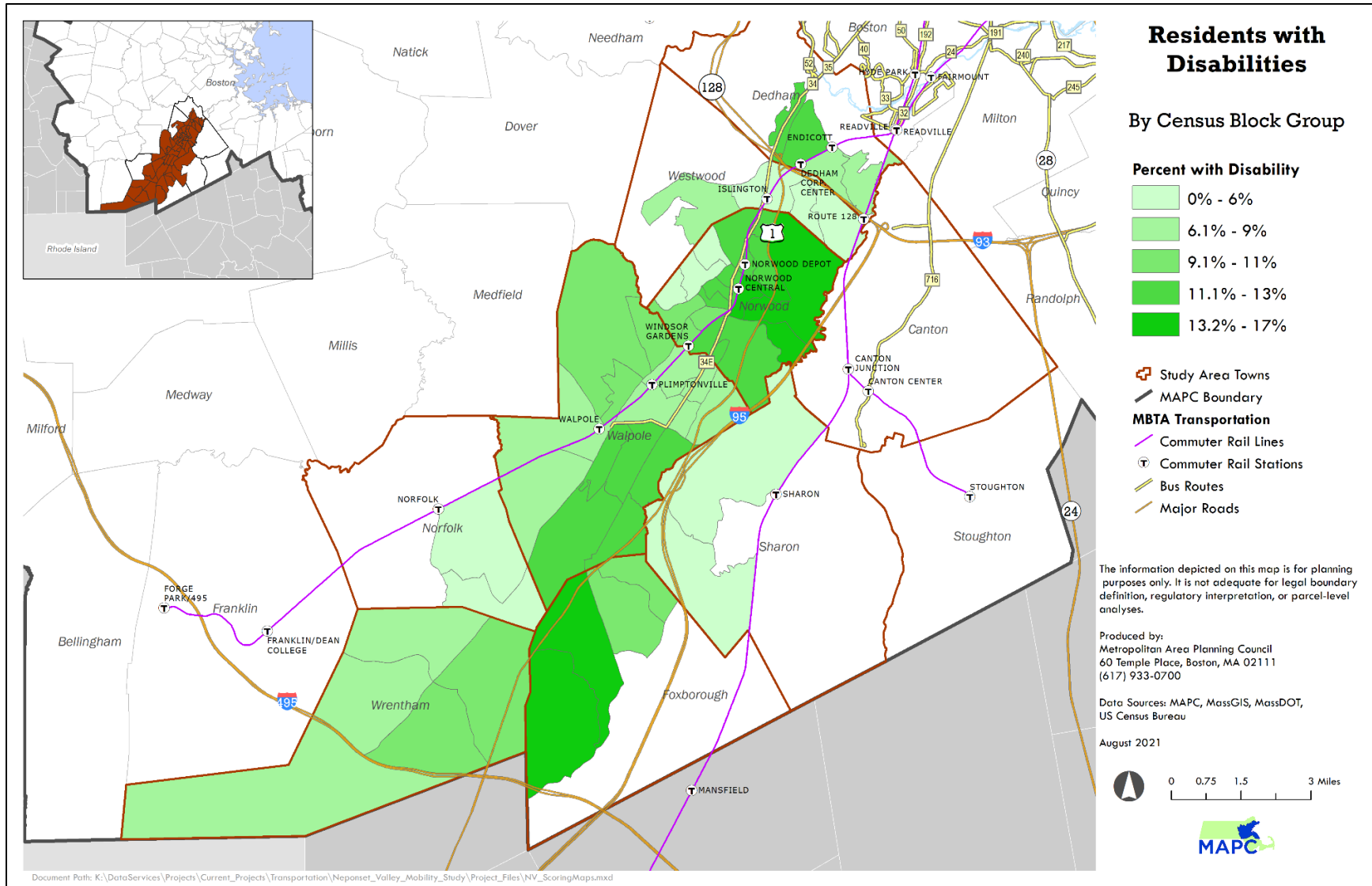


Figure 1.10: Percent Population with a Disability



1.3 Existing Transit Services

To better understand the transit needs for the study area, MAPC collected information on the existing transit services (public and private) in the study area. Because of changes in public travel demand during the COVID-19 pandemic, bus and rail services in Greater Boston were curtailed, suspended, and ultimately revised in 2020 and 2021. The services described below are accurate as of June 2021.

1.3.1 MBTA Bus

The MBTA Bus Route 34E serves Dedham, Westwood, Norwood and Walpole, connecting with the MBTA's Orange Line in Boston (Forest Hills station) as well as rail stations in Walpole and Norwood. The 34E is also within walking distance to the Islington station in Westwood. This MBTA revised this route in early 2020 to remove a loop in Walpole and other route variants as part of the Better Bus Project. There have been discussions with the Town, the MBTA, and others to possibly loop the 34E into Legacy Place; the route may also be revised under the MBTA's Bus Network Redesign process underway in 2021. As of this writing, no decisions have been made on revised routing or frequency for the 34E.

The only other bus route serving the study area is route 716, which connects parts of Canton with MBTA's Mattapan Station (Red Line Trolley).

1.3.2 MBTA Commuter Rail

The study area is served by the Franklin Line (Dedham, Norwood, Walpole, Norfolk) and Providence/ Stoughton Line (Canton, Westwood, Sharon). Both lines terminate in Boston at South Station. In Fall 2021 the services were revised in the Franklin Line to operate approximately every 30 to 60 minutes on

weekdays (depending on direction and peak/off-peak), as well as service every two to three hours on weekends and holidays. The Providence/Stoughton Line provides weekday service approximately every hour to two hours all day (depending on direction), and around every two hours all day on weekends and holidays.

1.3.3 GATRA

The Greater Attleboro Taunton Regional Transit Agency (GATRA) in December 2020 launched GATRA GO United, a flexible microtransit service that operates within the towns of Foxborough, Franklin, Norfolk, and Wrentham. GATRA Go Connect also serves Foxborough, Mansfield and Plainville. Under this service, riders can select bus origins and destinations within these communities using a smartphone app or by calling GATRA's customer service. This new service expanded the microtransit service piloted in Foxborough in 2018 and replaced the TriTown Connector fixed route bus service in Norfolk.

1.3.4 Neponset Valley Transportation Management Association

The Neponset Valley TMA operates a shuttle ("University Ave Shuttle") connecting the Route 128 rail station with Eversource other major employment centers in Westwood. The service is available weekdays to workers of employers who help fund the shuttle. The TMA is also planning to begin operations on two additional shuttles connecting employment centers along Royall Street connecting with the Route 128 rail station or the MBTA Red Line (Mattapan, Quincy Adams, and Ashmont). These new shuttles will serve employees of Campanelli, Dunkin Brands, Boston Mutual, Point32Health (Tufts Health Plan and Harvard Pilgrim Health Plan), as well as the public. The new shuttles are planned to begin operation in Fall 2021.

1.3.5 Other Transit Services

Each municipality in the study area offers shuttle transportation services through volunteers or via shuttle services through their local Council on Aging. These senior services are typically not used for work trips, but instead are provided to ensure seniors and others with mobility challenges have transportation to medical appointments, shopping, banking, etc. Paratransit services are provided by the MBTA (the RIDE) and GATRA for those who have a disability that prevents them from using fixed-route transit. (This service is also known as ADA transportation.) GATRA provides paratransit/ADA services in Foxborough, Norfolk, and Wrentham, while MBTA/The RIDE provides the service for the other municipalities in the study area. **Table 1.6** lists the FY 2022 assessments paid by each municipality in the study area to either the MBTA and/or GATRA.

Source: FY 2022 Cherry Sheet Estimates, Division of Local Services, Massachusetts Department of Revenue
<https://dls.gateway.dor.state.ma.us/reports/rdPage.aspx?rdReport=CherrySheet.s.CSbyProgMunis.MuniBudgEst>

Table 1.7 lists the existing transit services in the study area. **Figure 1.11** shows the fixed-route bus service and commuter rail line/stations in the study area.

Table 1.6: Transit Assessments, FY2022

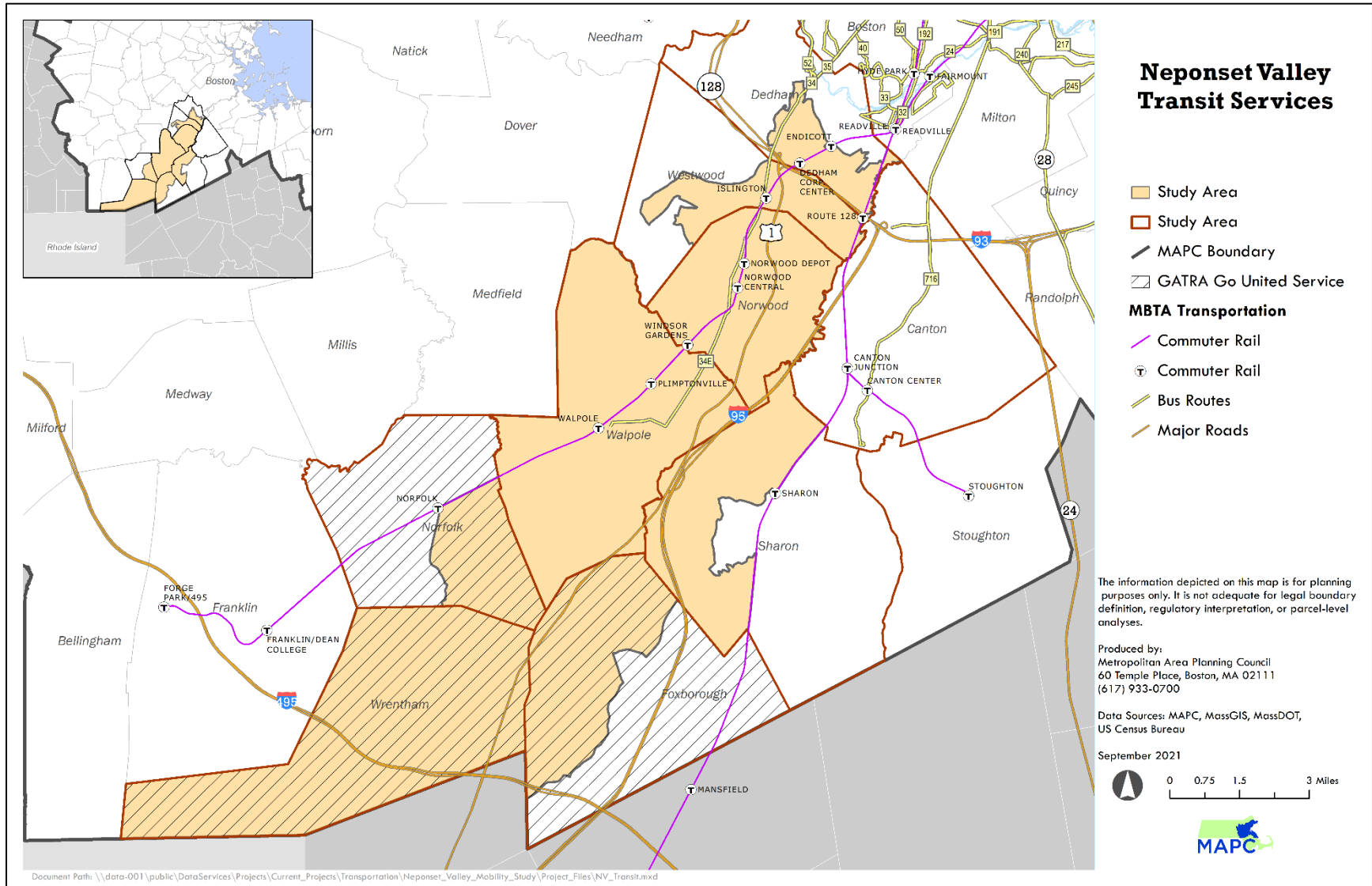
Municipality	Assessment to MBTA	Assessment to GATRA
Canton	\$539,141	--
Dedham	\$571,141	--
Foxborough	--	\$134,635
Norfolk	\$147,790	\$123,981
Norwood	\$673,219	--
Sharon	\$427,938	--
Walpole	\$570,736	--
Westwood	\$371,431	--
Wrentham	--	\$91,775

Table 1.7: Existing Fixed Route Bus Services in Study Area

Service	Route	Route Service Endpoints	Municipalities Served (in Study Area)	Service Days and Approx. Service Hours	Average Headway (minutes)
MBTA Bus	34E	Forest Hills (Orange Line) – Walpole Center Station	Dedham, Westwood, Norwood, Walpole	M-F, 5:40 AM to 1:00 AM, Sat/Sun 6:00 AM – 1:00 AM (as of June 2021)	M-F 20-60 min; Sat/Sun 35-45 min
	716	Mattapan Station – Cobb Corner	Canton	M-F, 6:00 AM – 7:00 PM; Sat. 8:00 AM – 5:00 PM	M-F 80 min; Sat. 60 min
GATRA	GATRA Go United	Microtransit (flexible on-demand transit service)	Wrentham, Norfolk, Foxborough	M-F 7:00 AM - 6:00 PM; Sat 9:00 AM - 6:00 PM	On-demand (average wait time 10 min)
GATRA	GATRA Go Connect	Microtransit (flexible on-demand transit service)	Foxborough	M-F 6:30 AM – 8:00 PM; Weekends Noon-8:00 pm	On-demand
MBTA Commuter Rail	Franklin Line	Boston South Station - Forge Park/495	Dedham, Norwood, Norfolk, Walpole, Westwood	M-F 5:45 AM – 11:30 PM; no weekend service	M-F 30 min (AM/PM peak) 60 min (off-peak)
	Providence/Stoughton Line	Boston South Station – Stoughton/Wickford Junction	Canton, Sharon, Westwood	M-F 5:00 AM – 11:00 PM; Weekends 7:00 AM – 9:00 PM	M-F 60 min; Weekends 60-90 min

Sources: MBTA.com; GATRA

Figure 1.11: Existing Transit in Study Area



As seen in Table 1.7, hours of service range from 17 hours for rail services to 9 hours for some bus routes. Any service that operates fewer than 12 hours per day can hinder the ability of a traditional worker to have flexible hours and run errands after work. Service less than seven hours per day can be effective for some work trips, if the service is provided in the peak morning and afternoon commutes. Service at four or fewer hours a day requires riders to plan their days around the service schedule.¹

Frequency (headways) is another metric that helps measure the availability or convenience of a transit service. Most headways in the study area are between 20-30 minutes weekdays and 60-90 minutes on the weekends. Such headways suggests that passengers will (at a minimum) check the schedule to minimize their wait time, and may need to adapt their arrival or departure times to be less than optimal for their personal schedules.¹ However, these frequencies are mostly similar throughout the day which provides greater flexibility people who work-from-home during certain portions of the day or work week, and is better suited for shift workers, who are more likely to be in manufacturing, health care, and retail sectors.

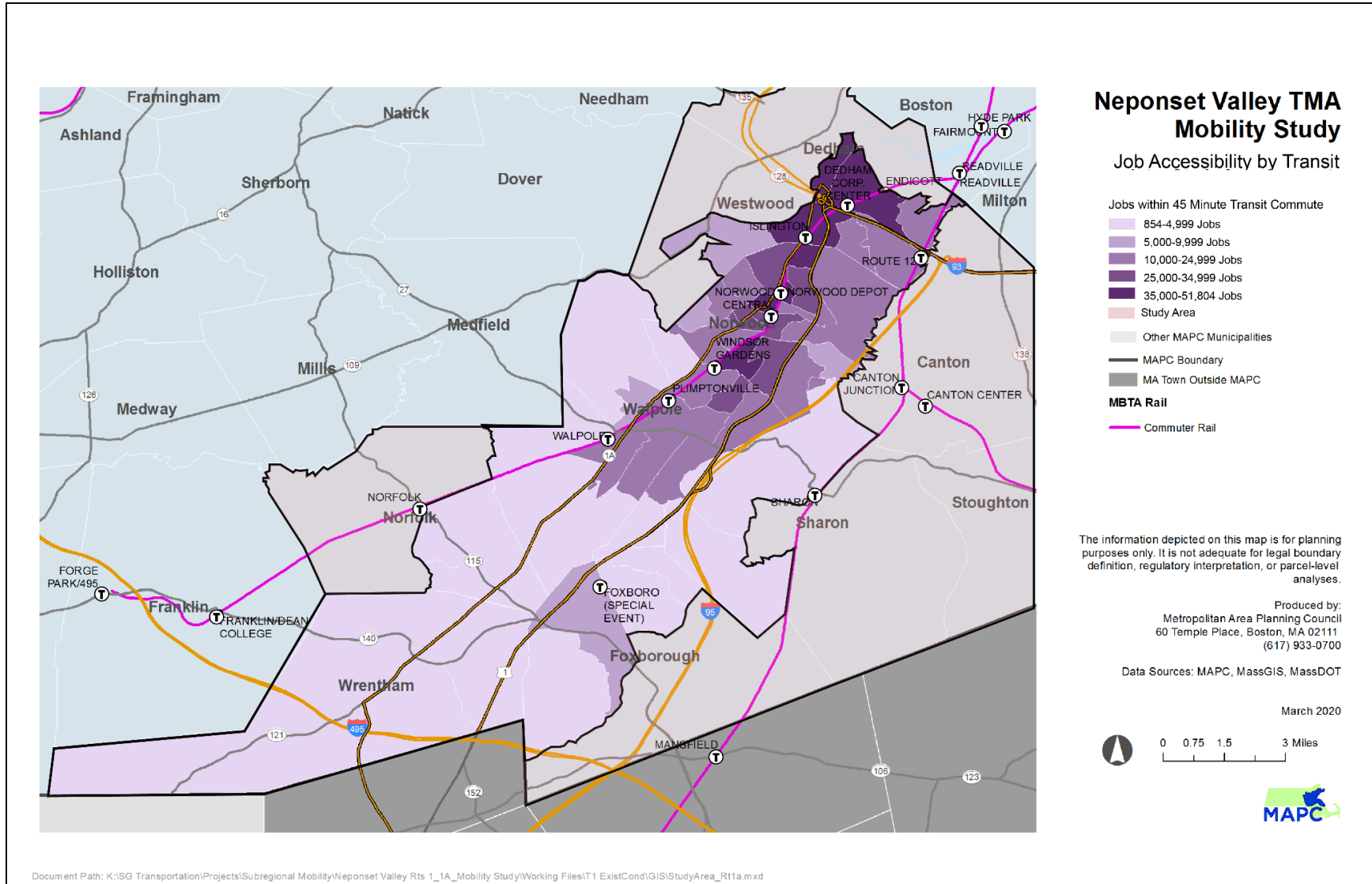
The final measure for transit availability is to measure the spatial coverage and access of the transit service. MAPC evaluated this by measuring the number of jobs that are within a 45-minute commute by morning peak-period transit.² As seen in **Figure 1.12** areas that are darker have a greater number of jobs within 45 minutes of transit, mostly in areas of Dedham, Westwood, and Norwood.

A further assessment of transit needs, along with recommendations for new services to meet those needs, are explored in chapter 3.

¹ Exhibits 5-2 and 5-3, *Transit Capacity and Quality of Service Manual 3rd Edition* (2013).

² This analysis was prior to the COVID-19 pandemic using 2019 transit service data. This concept was developed by the U.S. EPA Office of Sustainable Communities. See *Access to Jobs and Workers via Transit*, <https://www.epa.gov/smartgrowth/smart-location-mapping#Trans45>

Figure 1.12: Intensity of Employment with a 45 Minute Transit Commute in Study Area



1.4 Transportation Network Companies (TNC)

Transportation Network Companies (TNCs) like Uber and Lyft play an increasing role in the region’s transportation network. According to recent studies, some riders use the services to link to transit while others use them as an option when driving or transit are not feasible. As such, understanding their usage can help reveal where there might be gaps in transit services.

Per capita TNC usage in the study area nearly doubled from 2017-2019 (90%). Municipalities with the highest TNC per capita rides are Dedham, Norwood, Westwood, and Canton, all of which have the highest number of jobs in the study area. Dedham, Norwood, and Canton are also the top three population centers in the study area and have slightly lower number of vehicles per household than the rest of the study area.

TNC ridership decreased substantially across Massachusetts in 2020 due to the COVID-19 pandemic, but at a slower rate of decline in the Neponset Valley study area than the statewide average (-55% versus -62%). Norwood, with the highest number of jobs in the study area, also had the smallest TNC decrease at -48%.

The numbers in **Table 1.8** suggest that the municipalities with higher employment, and with lower vehicles per household, were more likely to have riders use Uber and Lyft. These same municipalities (particularly Norwood, Canton, and Dedham) had workers and residents who were more likely to continue to use TNCs during the pandemic when transit services were reduced.

Table 1.8: TNC Usage in Study Area

Municipality	2017 Rides/Capita	2018 Rides/Capita	2019 Rides/Capita	2020 Rides/Capita	Percent Growth, 2017-2019	Percent Decline, 2019-2020
Canton	3.0	4.4	5.5	2.7	87%	-52%
Dedham	6.1	8.2	10.6	4.9	75%	-54%
Foxborough	2.7	4.1	4.9	1.7	80%	-65%
Norfolk	0.4	0.7	0.9	0.4	129%	-61%
Norwood	3.5	5.2	6.7	3.5	93%	-48%
Sharon	1.1	1.7	2.2	0.8	94%	-64%
Walpole	1.3	2.3	3.1	1.4	134%	-53%
Westwood	3.6	5.6	7.2	2.8	99%	-62%
Wrentham	1.0	1.6	2.3	1.0	131%	-59%
Totals	2.8	4.2	5.3	2.4	90%	-55%
Massachusetts	9.9	12.4	13.9	5.4	41%	-62%

Originating rides; per capita trips based upon 2010 Census population

1.5 Relevant Planning Studies

MAPC reviewed recent transportation and master planning studies to find what transit needs and possible solutions had been identified for the study area. The recommendations and findings from these transportation studies were reviewed during the needs assessment this mobility study, as well as during development of the recommendations and pilot projects.

The study area's transportation and master plan studies share these common identified needs:

- More frequent rail service
- Better transit service, particularly that serves local needs
- Better and safer pedestrian and bicycle infrastructure, especially connecting to employment and transit

Short summaries of each study are provided below.

1.5.1 MBTA 2040 Rail Vision

In 2019, the Fiscal Management and Control Board (FMCB) adopted the MBTA 2040 Rail Vision, with a resolution recommending the commuter rail network be transformed into a regional rail system “to be more similar to rapid transit,” with trains operating every 15 to 20 minutes all day on its most dense corridors, and running on largely electrified trains with ADA-accessible stations. While no precise timeline was adopted, the MBTA took a first step towards this process in 2021 by revising the commuter rail schedule on many lines to operate on 30 to 60 minute frequencies all day (see Table 1.7).

1.5.2 MBTA Better Bus Project and Bus Network Redesign (ongoing)

As noted in section 1.3, in 2019 the MBTA Better Bus Project revised several bus routes (include route 34 and 34E that operate in the study area) to simplify routes and improve services. As of 2021, the MBTA is undertaking the Bus Network Redesign process to examine the entire bus network to be simpler, more equitable, more competitive to driving, and to maximize access to opportunities (such as employment). The process and the recommendation for a new bus network is anticipated to be completed by 2022.

1.5.3 GATRA

GATRA's last regional plan update was completed in 2015. However, as noted in section 1.3, GATA in 2020 replaced its fixed-route bus service in Wrentham, Norfolk, and Foxborough with a new microtransit service (GATRA Go United, which includes Franklin and parts of Plainville). GATRA is studying the impacts of this new transit service to determine if it should continue in these areas, and if the service could expand to other municipalities in its service area.

1.5.4 Greater Boston Workforce Planning Blueprint

The 2018 study on workforce in greater Boston noted that the “dual challenge of transportation and housing...are tightly intertwined.” As housing costs in greater Boston have increased, workers seek housing further from employment centers, creating longer commutes (and more likely, commutes that cannot be served by transit, walking, and cycling). The report recommends better transportation and land use policies, as well as more

coordinated transit services through regional transit authorities, TMAs, and others.

1.5.5 Local Planning Studies

Canton

Canton completed its a 2035 Master Plan in 2020. Recommendations in that plan include working with the Neponset Valley TMA to connect businesses with TMA services, exploring creation of a local shuttle (possibly using the Canton Senior Shuttle vehicles during periods when not in use for senior transportation), and exploring creating public-private service possible via a shuttle or via a ride-hail service partnership (taxi, Uber, Lyft, or microtransit). These recommendations are similar to those noted in the 2017 report Creating Transit Links in Canton, MA.

Dedham

The Town of Dedham is currently updating its Master Plan. Relevant draft transportation goals from the current Master Plan process include creating better pedestrian and bicycle connections to between the rail stations and major employment destinations (particularly Dedham Corporate Center near Legacy Place and nearby office buildings), as well as improving bus service for the 34/34E bus route.

Foxborough

The Foxborough 2015 Master Plan noted the need to connect the growing office, retail, and entertainment nodes near Gillette Stadium, as well as the smaller businesses and residences around the Town Center via multimodal path or transit service parallel to the CSX rail corridor, with daily rail service to Gillette Stadium or a connection to existing rail service in Mansfield. A

pilot rail service at Gillette stadium operated in 2019 and 2020, but was suspended in 2020 during the COVID-19 pandemic.

Norfolk

Norfolk's 2007 Master Plan recommended better pedestrian facilities and other changes to help resolve conflicts at the grade crossing of Rt 115 and the commuter rail line at the Norfolk Station. The Master Plan noted that there were approximately 500 parking spaces at the station, with demand for over 1,000 vehicles. Data collected in 2017-2018 indicated 619 spaces in three lots, with 82 percent occupied. The Master Plan did not recommend shuttle or other transit services. Since the 2007 Master Plan, GATRA began operating public transportation service in Norfolk, and in 2020 changes the service from fixed-route to microtransit demand response.

Norwood

Norwood's downtown Master Plan recommends better pedestrian and bicycle connections to the two commuter rail stations in town, while the Vanderbilt Area Commercial District Plan (2013) recommends joining/create a TMA and other efforts to connect the area with nearby bus and rail transit.

Sharon

Sharon's Master Plan recommendations include evaluating a shuttle connecting key destinations in-town with the rail station, including using Council on Aging vehicles for employment shuttle when not used for senior transportation. The Plan also recommends the Town continue to work with the Neponset Valley TMA and the Suburban Mobility Working Group.

Walpole

The 2004 Walpole Master Plan recommendations include traffic calming to reduce speeds and improve pedestrian safety, including along Route 1A, as well as more parking at the Norfolk rail station.

Westwood

Westwood’s Comprehensive Plan (adopted 2020) includes recommendations of exploring a shuttle bus service along High Street/Pond Street to University Station and possibly Dedham Corp. Center/Legacy Place, as well as consideration of a cross-town connection between the High Street and Islington villages. These could be fixed-route or on-demand (microtransit). Where possible, these new services should be coordinated with adjacent communities, including the SMWG.

Wrentham

Wrentham’s 2004 Master Plan noted that the lack of transportation was a liability for the community. The plan’s vision statement includes a recommendation for a “regional transportation service connecting businesses and commercial areas with downtown and residential areas, as well as linking Wrentham with neighboring communities” – which appears to be met in part by GATRA’s new microtransit service in Wrentham.

1.6 Emerging and Best Practices on First Mile, Last Mile and Community Transportation

MAPC, through regular discussions with MassDOT, MBTA, MassMobility, and CTPS, and through discussions with municipalities and regional transit agencies, has found the following practices used to fill transit gaps and provide better community transportation:

- Employment shuttles
- Local fixed-route transit
- Flexible, on-demand local transit (also known as microtransit)
- Shared mobility with ride hailing and taxis

TMA/Employer Shuttles: Currently Massachusetts has 14 TMAs, seven of which operate primarily outside of the inner core of Boston. TMAs are membership based public-private partnerships of businesses, institutions, and municipalities joined together in a legal agreement to provide and promote commuter transportation options that reduce traffic congestion and improve air quality.³ Services provided by all or most TMAs include:

- Transportation advocacy
- Bicycle/walking promotions and incentives
- Emergency/guaranteed ride home
- Ridesharing, carpooling, vanpooling
- Ridematching

Several of the TMAs also operate shuttle services for their members. Of these seven suburban TMAs, three (**128 Business Council, Middlesex 3, and Neponset Valley**) operate employer shuttles. Most of the shuttles operate only during the morning and late afternoon peak periods, providing bus or van service

³ <http://www.masscommute.com/what-is-a-tmatmo/>

from a central point (such as a commuter rail or subway stop) to employment centers a few miles away. The TMA operates or hires a transportation company to operate the shuttle, which is paid by businesses served by the shuttles. Employees must show a valid employee ID to board.

The [Neponset Valley TMA operates](#) the University Avenue Shuttle, which funded by Eversource and 690 Canton Street and 1010 Station Drive for their employees and tenants. The service connects with the Route 128 rail station. The service operates weekdays in the morning and late afternoon evenings, connecting with five trains in the morning and four in the afternoon/evenings. The TMA also to launch in late 2021 two shuttles for businesses and the public along Royall Street, connecting with the Route 128 rail station and the MBTA Red Line (Mattapan, Quincy Adams, and Ashmont). The shuttles are pilots that are in part funded by a grant from MassDOT.

Local fixed route public transportation: Several towns in the MAGIC subregion formed a Transportation Management Association known as [CrossTown Connect](#). The TMA operates fixed route services to the South Acton Commuter Rail station that connect to various parts of Acton and Maynard, as well as a shuttle that connects to the Littleton/495 rail station. In Acton and Maynard, the vehicles are used for the fixed-route service connecting to the rail station in the morning and late afternoons, and are used for local transportation for residents in the mid-day. The towns of Acton, Boxborough, Littleton, Maynard also offer a dial-a-ride service available to anyone 12 year or older to or from any destination in these towns. (It should be noted that some services have been suspended during the COVID-19 pandemic.)



The shuttle and van services are funded through a variety of sources, primarily local municipal funds. Acton, which has two shuttles, has used revenue from their commuter rail parking lot and local prepared meals tax (over \$180,000 in FY2020) to fund their local transit services. Prior to the pandemic, the service provided over 3,000 trips a month (per the Action Town Annual Report).

Marlborough piloted a [local shuttle in 2019](#) that operated between Marlborough and the Southborough rail station weekday mornings and afternoons. In the mid-day, the shuttle was used for senior transportation. The shuttle was managed by the Marlborough Economic Development Corporation, but was suspended in 2020 due to the COVID-19 pandemic. The one-year service was funded by a \$200,000 transfer from the city's economic development account.

Another example of a successful local fixed route transit system is [Lexpress in Lexington](#). Operating since 1979, the service now includes six routes, operating Monday–Friday. The service is

funded locally, at around \$470,000 annually with 65,000 trips per year (pre-pandemic). In 2020, Lexpress revised its service to four routes with simplified routing and hourly service.

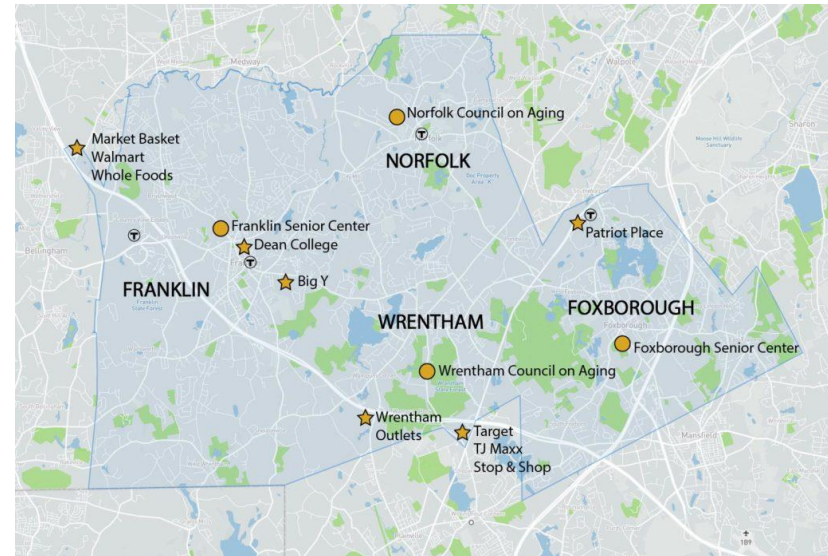
In 2015 the Town of Lexington partnered with the Town of Bedford and the 128 Business Council TMA to operate the [REV Bus](#), a reverse commute shuttle that serves both residents (typically traveling to Boston) and TMA member businesses in the Harwell Avenue area (connecting employees from the Red Line Alewife station for reverse commutes). The REV bus is funded in part by property owners served by the bus who can market the service to their residents.

Microtransit: Microtransit is demand-driven flexible transit service, using technology similar to ride hailing services (Uber, Lyft). Microtransit operations are within a set geography, with riders hailing the service via a smart phone app or by calling a dispatcher. Vehicles are usually smaller buses, and riders must share rides with others hailing the service. The service is a 21st century version of dial-a-ride transit, where rides can be hailed within a few minutes instead of the typical 24- to 48-hour advance reservation requirement of most dial-a-ride transit today. These microtransit pilots also have goals to make transit more efficient and flexible while maintaining equitable service for the entire community, particularly those with limited access to automobiles, lower-income communities, riders with disabilities, and residents and workers with limited access to credit cards and smart phones.

Several microtransit pilots have begun operating in Massachusetts, including the **GATRA Go United** services in Norfolk/Wrentham/Foxborough/Franklin, as well as the **Salem Skipper**.

The [GATRA Go](#) United service is one of four microtransit services now offered by GATRA. Some services, such as the GATRA Go Connect (serving Mansfield, Foxborough and Plainville) provide transit in a new service area, while the GATRA Go United (serving

Foxborough, Franklin, Norfolk, and Wrentham) replaced fixed-route bus service. The GATRA Go United services provides on-demand service in the four communities Monday-Friday, 7 am to 6 pm and Saturday, 9 am to 6 pm. One-way fares are \$2. Vehicles are wheelchair accessible. Riders can hail the vehicle either via a smartphone app or by calling a 800 number. In conversations with GATRA, the microtransit pilots are suitable alternative for areas that may not have enough riders or density to support fixed-route services; moreover, microtransit provides greater geographic coverage and more options for trip origins and destinations than fixed-route buses or shuttles.



GATRA GO United Service Area (source: GATRA)

The [Salem Skipper](#) is microtransit service offered by the City of Salem within the City limits. The service operates Mondays through Saturday, with four vehicles, two of which are wheelchair accessible. Rides cost \$2 one-way. The service is funded in part

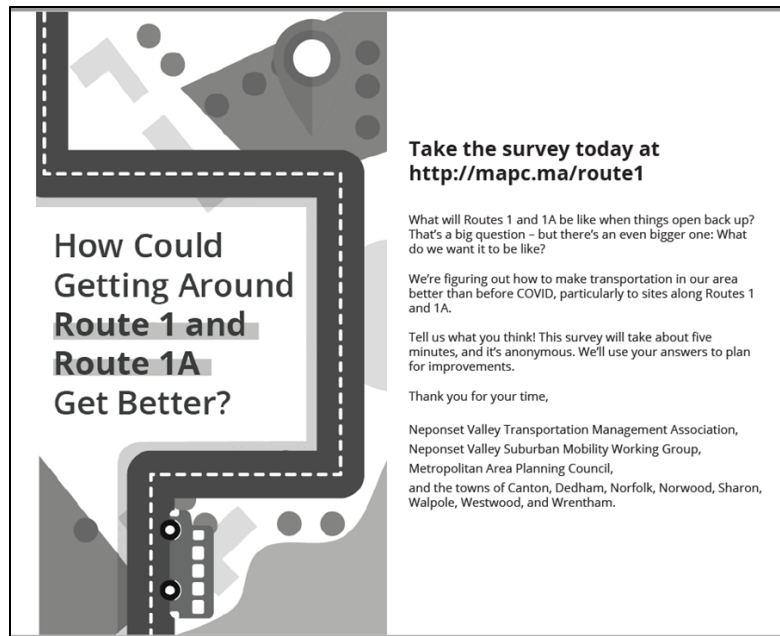
by a \$175,000 Workforce Transit Grant, with the remainder from local and other partnership funds.

Shared mobility with ride hailing companies and taxis: Several transit providers in the US have formed partnerships with ride hailing companies such as Lyft and Uber, while others have partnered with taxis. The [North Shore Community College](#) has partnered with Uber for some student trips to their Danvers campus since 2017. Students can receive up to a \$10 discount on rides to the campus from the North Shore Mall or the Beverly Depot, both of which are transit hubs in the North Shore. Several non-profits in the Attleboro area partner with Uber for the [Community Accessing Rides](#) program to provide transportation for locations and times when fixed-route or other transit is not available. Other transit agencies, non-profits, and municipalities are also now partnering with local taxi companies to provide transportation. **Franklin RTA**, for example, is using a livery company to provide transportation for 2nd and 3rd shift workers in their region when FRTA bus service is not operating.

2 Corridor Survey

2.1 Survey of Residents, Workers, and Employers

In addition to the input from members of the Suburban Mobility Working Group and discussions with staff in the municipalities in the study area, a public survey on commuting and transportation needs of residents, employees, and businesses was developed. The purpose of the survey was to get a better idea of destinations and specifically which areas and businesses have unmet transit needs.



Just as the survey was being developed, the COVID-19 pandemic hit, which severely changed work commutes and other

transportation habits. Travel patterns changed as some workers were able to work from home and/or had children enter remote learning. Other workers – specifically in the hospitality and retail sectors for example – may have lost employment. Therefore, the draft survey was revised to note what issues existed prior to the pandemic, as well as potential transportation needs as people return to work.

The survey was open from late January through May 2021, and was advertised on social media by MAPC, the Neponset Valley TMA, and members of the Suburban Mobility Working Group.

The survey had a series of questions that varied whether the survey taker identified as a corridor resident, worker, or employer. Responders could select more than one option. Over 1,500 people took the survey, with over 1,200 completing most of the survey questions. Most (over 900) identified as corridor residents; around 300 identified as workers in the corridor, and around 40 identified as employers.

Most people who took the survey work in Boston. If working in the study area, the most common places were Norwood, Walpole, and Dedham.

A slight majority of residents (51%) said that they currently work from home, while 38% worked on-site. For those who work in the corridor, 55% said they work most days in the office/on-site, while 34% said they currently work remotely (e.g., from home) most days.

When asked “in the future, when everything is fully open again, how much do you expect to work from home/remotely versus onsite?” almost 45% of corridor residents said they expected to be in the office/on-site most days, while only 17% expected to be

remote most or all days. For those working in the corridor study area, 57% said they expected to be on-site all workdays, while only 14% said they expected to do remote work all or most workdays. Employers in the study area noted a similar mixed of anticipated on-site versus remote work.

Most of both workers and residents said they would drive to work. Corridor residents slightly more likely to take the train, likely because most rail and bus service is aimed at employees commuting into the Boston, Cambridge, and Brookline.

When asked about their commute before COVID, most workers (60%) said they did not have a problem getting to work, but around one-third said they worried about being late due to traffic congestion. Residents within the corridor had similar responses.

Around one-half of employers within the corridor noted that transit did not connect to their business. Other factors noted were that employees could not safely or easily walk to work, transit took too long, and employees were late due to traffic congestion.

When asked about potential shuttles, most workers and residents said that they would not use a shuttle. However, around 13% of residents and 11% of workers said a shuttle would help them get places. The most popular transit connections requested were Route 128 and Norwood Central rail stations. Similarly, most employers were not interested in helping to pay for a shuttle; 31% said that a shuttle might help their employees get to work with Walpole, Foxborough, and Norwood as the most requested transit connections.

For those who never drive to work, a 25% said a shuttle would help them get them to work, with Route 128 and Sharon stations as the most popular connections. Interestingly, 53% of those who do not drive to work stated that they did not have problems getting to work prior to the pandemic. Non-drivers also stated that when everything is open again, 55% would use the train, while

35% would work from home and 7% said they would walk or bike to work.

Finally, the survey noted that most employers offer “free” parking for their employees and more will offer more flexible work schedules and work-from-home options once they reopen.

2.2 Other Recent “Return to Work” Area Survey Findings

A March 2021 [survey](#) of 670 Boston area workers by MassInc found that 30% would prefer to work from home every day, while the same amount would prefer to go in the office a few days a week. 12% said they do not wish to work from home (17% noted they had jobs where work-from-home was possible). The survey also found that 27% said once restrictions were lifted, they anticipated they would drive more, while approximately 30% noted they would take transit less often. Interestingly, the survey found no increase in car or bike ownership of respondents since the pandemic.

A 2021 [survey](#) of employees by the Harvard Business School found that most employees are looking forward to returning to the office, at least part of the week. The survey of 1,500 employees who worked remotely from March 2020 to March 2021 found that 27% hope to work remotely full-time, while 61% would like to work 2 or 3 days a week from home and 18% want to go back to the office full-time. The survey did not ask about commuting decisions for those who wanted to return part- or full-time to the office.

The Baker-Polito Administration commissioned the “[Preparing for the Future of Work in the Commonwealth Of Massachusetts](#)”, conducted by McKinsey & Company and released in July 2021. The study surveyed Boston area employers and reviewed other economic and demographic data and developed three alternative

scenarios for how much automation and commute/workplace trends might continue post-COVID-19 pandemic. The report notes that with more remote/hybrid work, fewer workers will commute into the “urban core” but more will be spending more time working locally. These changes will mean fewer workers on transit (particularly commuter rail) and more local congestion as workers spend more time closer to home. This might mean more localized retail and food spending for downtowns and neighborhoods. However, the hybrid work will also mean reduced business travel that could translate to an overall loss in the retail, food, and hospitality sectors.

The report also notes that the pandemic “exacerbated pre-existing inequalities” and that the changes due to remote/hybrid work will not be felt equally. For example, Black workers in Massachusetts had unemployment at much higher rates than other racial groups. Moreover, the job recovery for women and for those with lower incomes, with the lack of affordable (and flexible) daycare being a significant barrier.

2.3 Summary

Recent surveys and studies suggest that the COVID-19 pandemic has accelerated existing employment and commuting trends. For example, in the U.S, remote work had already overtaken transit nationwide by 2019. As greater Boston continues to recover, municipalities and employers will need to find flexible options for employees and possible retraining as the growth in remote work and other trends continue.

The Route 1/1A survey results found that most respondents anticipate returning to the worksite all or most days, which is different from the responses in other “return to work” surveys in the area. These differences may be due to the higher concentration of retail, healthcare and education employment in the study area; these jobs are not as conducive to remote work.

Most people stated that, prior to the pandemic, they drove to work and did not have problems getting to work, although some did note concerns with traffic congestion and being late.

While most did not believe that a shuttle would be useful, those that did were more likely to be transit riders prior to the pandemic. Connecting to the Route 128 station was the most popular proposed connection, with Norwood second.

3 Suitability Analysis and Recommendations

Using the data collected in the study, MAPC mapped areas of unmet transit needs, and develop recommendations for possible services and pilot programs.

3.1 Suitability Analysis Process

To identify areas where existing transit service could be improved, or where new types of service may be implemented, MAPC conducted a transit needs assessment and suitability analysis for the Route 1/1A study area. The process was based upon the procedures used in the several previous mobility studies completed by MAPC, updated to reflect local conditions and new data sources.

A suitability analysis ranks places according to how well they meet a set of criteria for a specific intervention or action. In this case, MAPC used a suitability analysis to determine which Census tracts or Census block groups would be the best sites and most suitable candidates for additional or improved public transit and other first/last mile connections.

3.1.1 Calculation Methods and Criteria

MAPC's Data Services department conducted an analysis to determine which areas within the Neponset Valley Route 1/1A study area would be the best candidates for local public transportation improvements. This analysis was conducted at the census block group level and run for three scenarios—commutes into Boston, reverse flow commutes, and intra-corridor

commutes. Each of the criteria listed for the scenarios below were assembled into a single feature class. Each measure is normalized so that they can be combined on the same scale and applied their respective weights, to create an overall score for each scenario.

Traditional (Boston-Centered) Commute Screening Criteria

1. Population Density - Number of residents per acre. A higher density resulted in a higher rating. (Source: Census 2020)
2. Vehicles per Household - A lower number of vehicles per household resulted in a higher rating. (Source: Mass Vehicle Census, 2014 quarter 4)
3. Commuters traveling to Boston - Percent of working-age residents of each Census block group who work in Boston. A higher percentage of commuters resulted in a higher rating. Weighted at 10. (Source: LEHD Origin-Destination Employment Statistics (LODES) 2018)
4. Proximity to MBTA Service- Census block groups which have close proximity to commuter rail stations received a higher rating. (Source: MAPC analysis)
 - a. Distance from Census block group centroid to nearest Commuter Rail station. Weighted at 10.
 - b. Distance from Census block group centroid to nearest MBTA bus station or GATRA bus service. Weighted at 5.

5. Environmental Justice: Minority population, limited English speaking households, low income households, – Census block groups with high proportions of residents who identify as a race other than non-Hispanic White, limited English speaking households, or households in poverty receive a higher score. (Source: MassGIS/MAPC)
 - a. Percent population that identifies as a race or ethnicity other than non-Hispanic White (Source: ACS 5-year estimates 2015-2019)
 - b. Percent of Households considered Limited English speaking households (Source: ACS 5-year estimates 2015-2019)
 - c. Households in Poverty - A higher percentage of households that are in poverty resulted in a higher rating. (Source: ACS 5-year estimates 2015-2019)
6. Residents with Disabilities - Census tracts which have a high percentage of disabled residents received a higher rating. (Source: ACS 5-year estimates 2015-2019)

Reverse Commute Screening Criteria

1. Employment Density - Number of employees per acre. A higher density resulted in a higher rating. (Source: LEHD Origin-Destination Employment Statistics (LODES) 2018)
2. Boston Residents Commuting to Study Corridor – Percent of workers in each block group who do not work at home who commuted from Boston. A higher number of workers commuting from Boston results in a higher rating. (Source: LEHD Origin-Destination Employment Statistics (LODES) 2018)

3. Proximity to MBTA Service- Census block groups which have close proximity to commuter rail stations received a higher rating. (Source: MAPC analysis)
 - a. Distance from Census block group centroid to nearest Commuter Rail station using street networks. Weighted at 10
4. Residents with Disabilities - Census tracts which have a high percentage of disabled residents received a higher rating. (Source: ACS 5-year estimates 2015-2019)

Intra-Corridor Commute Screening Criteria

1. Population Density - Number of residents per acre. A higher density resulted in a higher rating. (Source: Census 2020)
2. Employment Density - Number of employees per acre. A higher density resulted in a higher rating. (Source: LEHD Origin-Destination Employment Statistics (LODES) 2018)
3. Vehicles per Household - A lower number of vehicles per household resulted in a higher rating. (Source: Mass Vehicle Census, 2014 quarter 4)
4. Commuters within Study Corridor – Percent of working-age residents of each Census block group who work within the study area. A higher percentage of commuters resulted in a higher rating. Weighted at 10. (LEHD Origin-Destination Employment Statistics (LODES) 2018)
5. Proximity to MBTA Service- Census block groups which have close proximity to commuter rail stations received a higher rating. (Source: MAPC analysis)
 - a. Distance from Census block group centroid to nearest Commuter Rail station. Weighted at 10.

- b. Distance from Census block group centroid to nearest MBTA bus station or GATRA bus service. Weighted at 5.
- 6. Environmental Justice: Minority population, limited English speaking households, low income households, – Census block groups with high proportions of residents who identify as a race other than non-Hispanic White, limited English speaking households, or households in poverty receive a higher score. (Source: MassGIS/MAPC)
 - a. Percent population that identifies as a race or ethnicity other than non-Hispanic White (Source: ACS 5-year estimates 2015-2019)
 - b. Percent of Households considered Limited English speaking households (Source: ACS 5-year estimates 2015-2019)
 - c. Households in Poverty - A higher percentage of households that are in poverty resulted in a higher rating. (Source: ACS 5-year estimates 2015-2019)
- 7. Residents with Disabilities - Census tracts which have a high percentage of disabled residents received a higher rating. (Source: ACS 5-year estimates 2015-2019)

3.2 Suitability Assessment Results

3.2.1 Boston-Centered (Traditional) Commute Assessment Results

As seen in **Figure 3.1**, the analysis determined that the most suitable areas were around Dedham’s Legacy Place and Dedham Corporate Center station, plus locations near the commuter rail stations in Norwood as well as areas around downtown Walpole and in Foxborough (Patriots Place). These areas had higher concentrations of population and employment, and are served by

MBTA commuter rail and the MBTA 34E bus, with the exception of Foxborough, which has the concentration of employment along Route 1 and is served by GATRA. These also have higher concentrations of households below the poverty line and with fewer vehicles per household.

3.2.2 Reverse Commute Suitability Assessment Results

The Reverse Commute analysis (**Figure 3.2**) indicate that areas in Dedham near Legacy Place and downtown Norwood were most suitable due to their proximity to existing transit services (commuter rail and bus), their higher concentrations of employment, and the higher number of workers who commute from Boston.

3.2.3 Intra-Corridor Suitability Assessment Results

The Intra-Corridor analysis (**Figure 3.3**) has similar findings to the Boston (traditional) commute, but with larger areas in Norwood and the area around Patriots Place in Foxborough scoring higher, likely due to the larger number of workers both living and working in the study area.

Figure 3.1: Traditional Commute Suitability Analysis Results

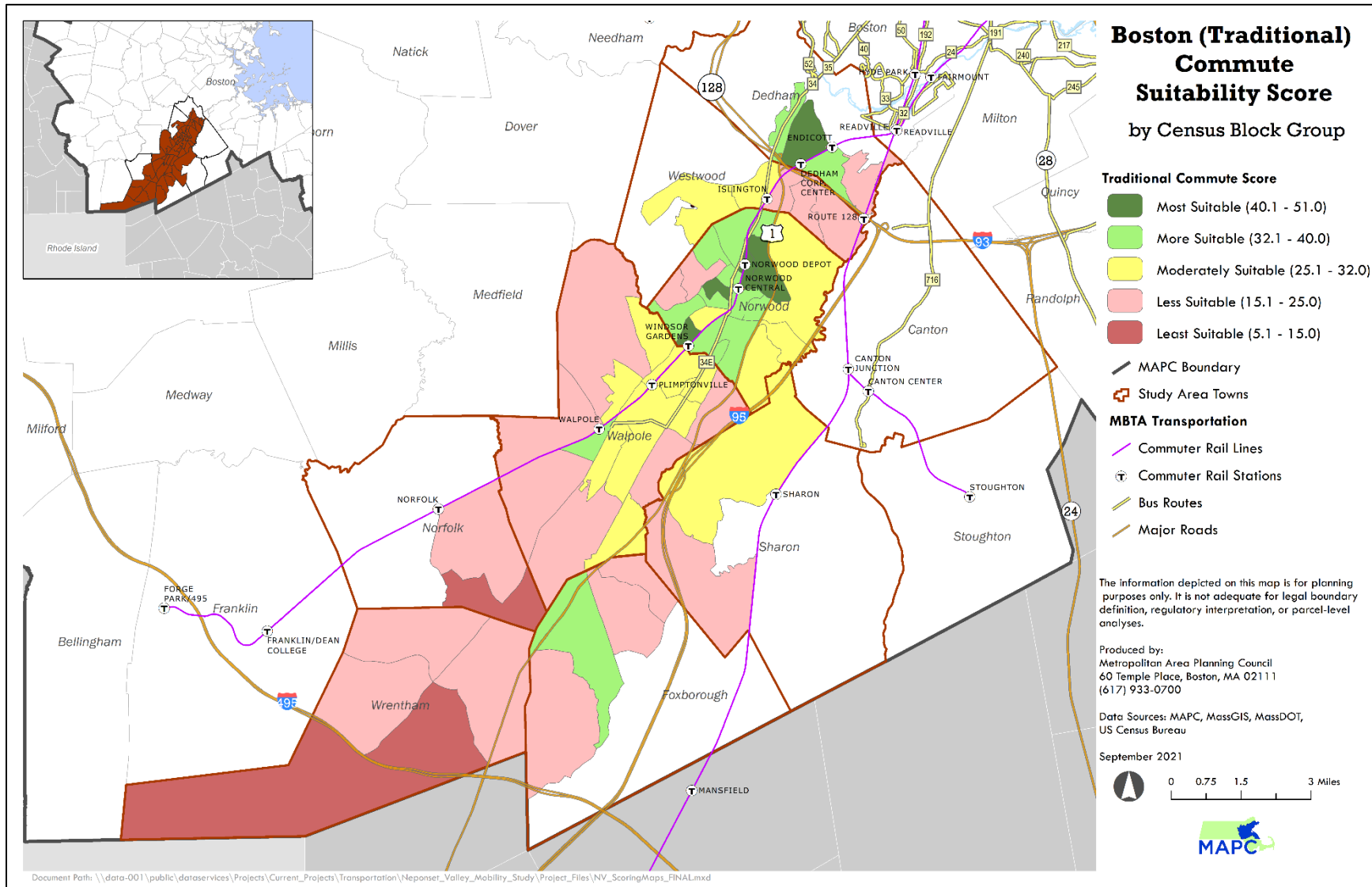


Figure 3.2: Reverse Commute Suitability Analysis Results

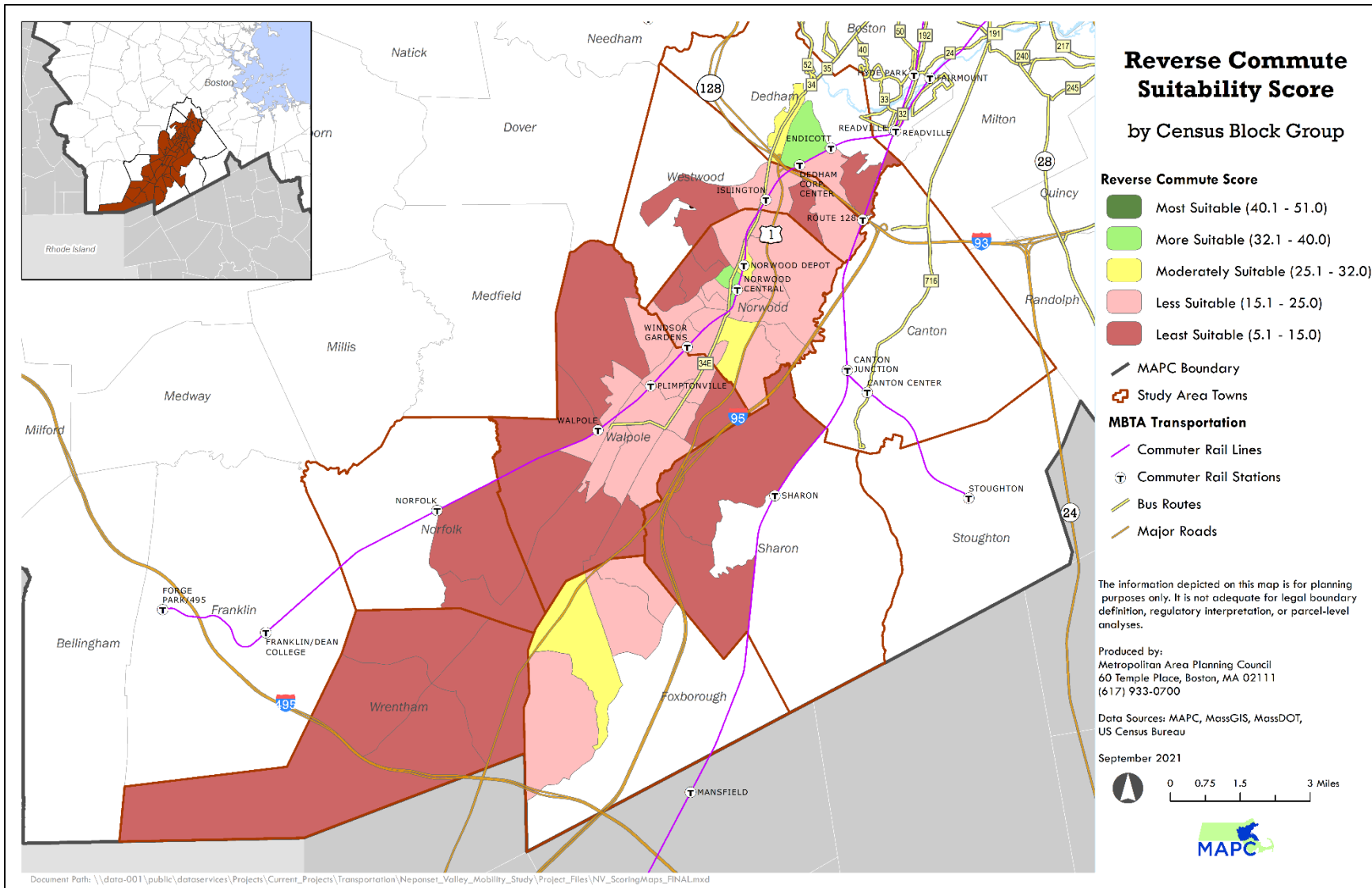
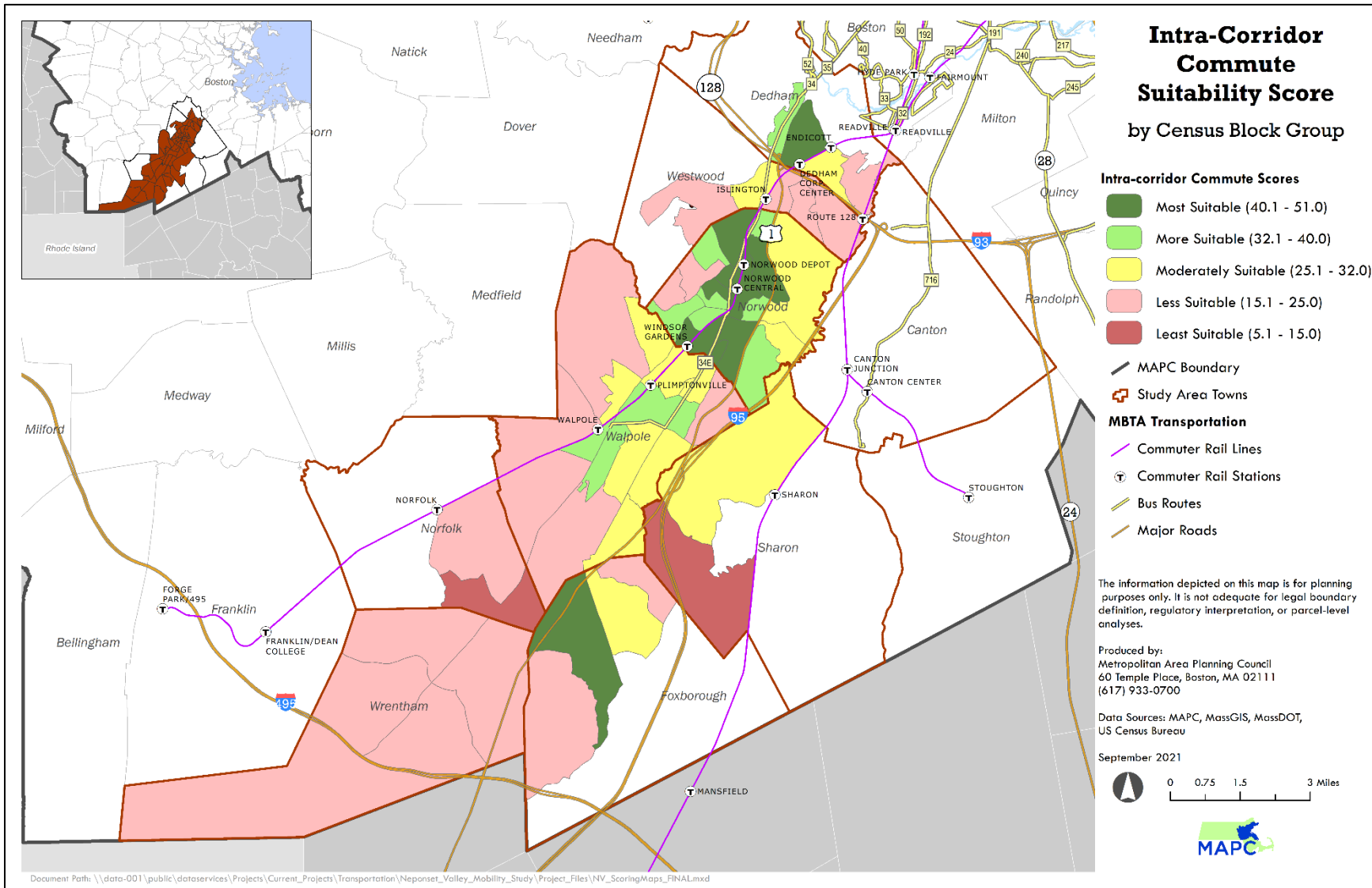


Figure 3.3: Intra Corridor Suitability Analysis Results



3.2.4 Retail and Health Care Employment Suitability Analysis

Because retail and health care were the two largest employment sectors in the study area, separate analyses were completed for these sectors.

As seen in **Figures 3.4 and 3.5**, the concentrations of these jobs are in Dedham, Norwood, and Foxborough along Route 1/Boston Providence Highway. Parts of Walpole also scored more suitable for the Intra-Corridor commute for retail jobs, likely due to the retail along Main Street.

For the health care employment analysis, areas in Dedham, Norwood, Walpole and Foxborough scored nearly identical as the retail analysis for the intra-corridor commute, likely due to the higher concentration of medical employment around Patriots Place in Foxborough, Legacy Place in Dedham, downtown and Route 1 in Norwood, as well as smaller medical offices in Walpole (**Figure 3.6**). For the reverse commute analysis (**Figure 3.7**), only the area around Norwood Hospital scored as more suitable, with Legacy Place (Dedham) and Patriots Place (Foxborough) as scoring moderately suitable.

Figure 3.4: Intra-Corridor Commute Retail Suitability Analysis

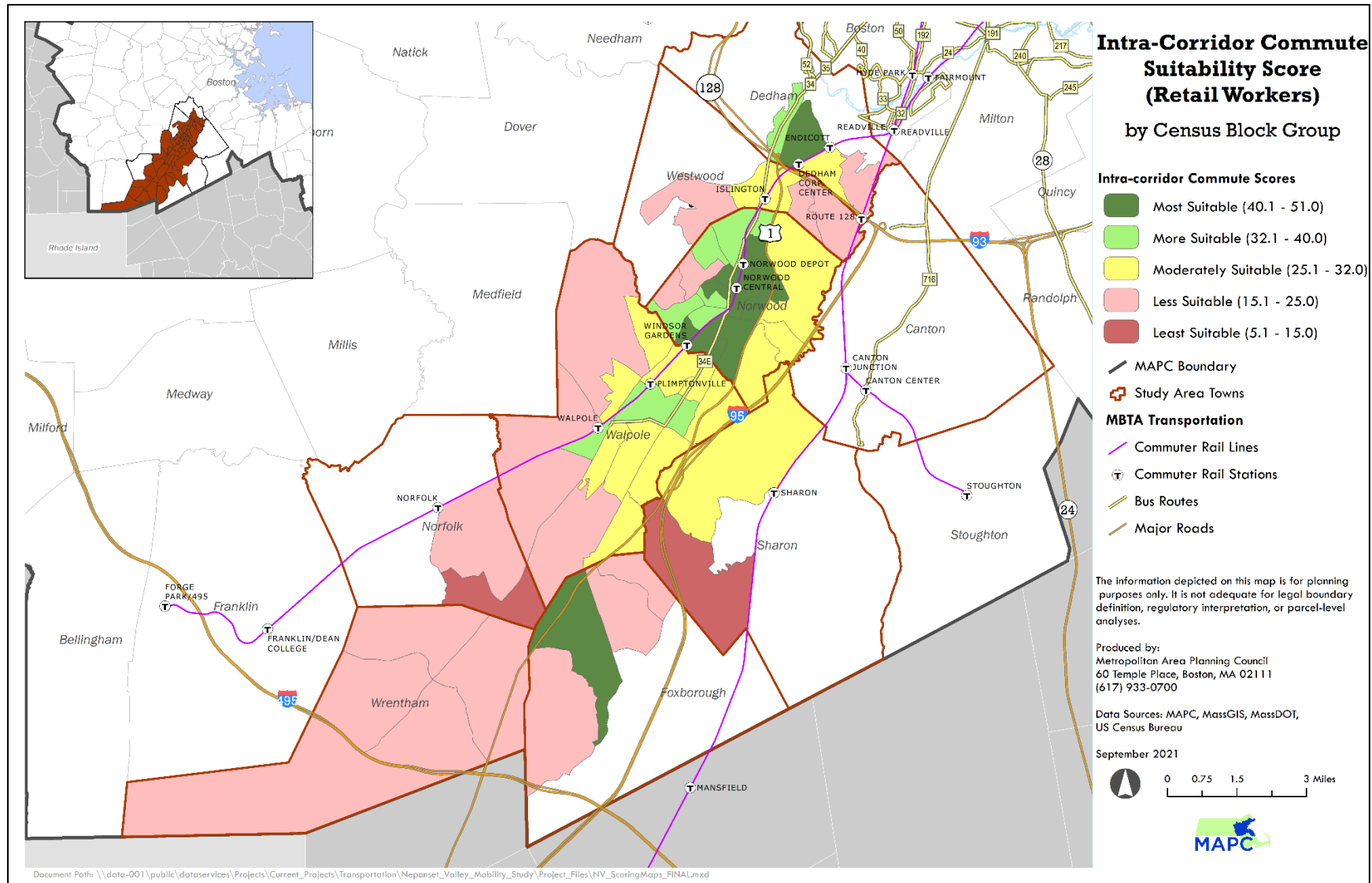


Figure 3.5: Reverse Commute Retail Suitability Analysis

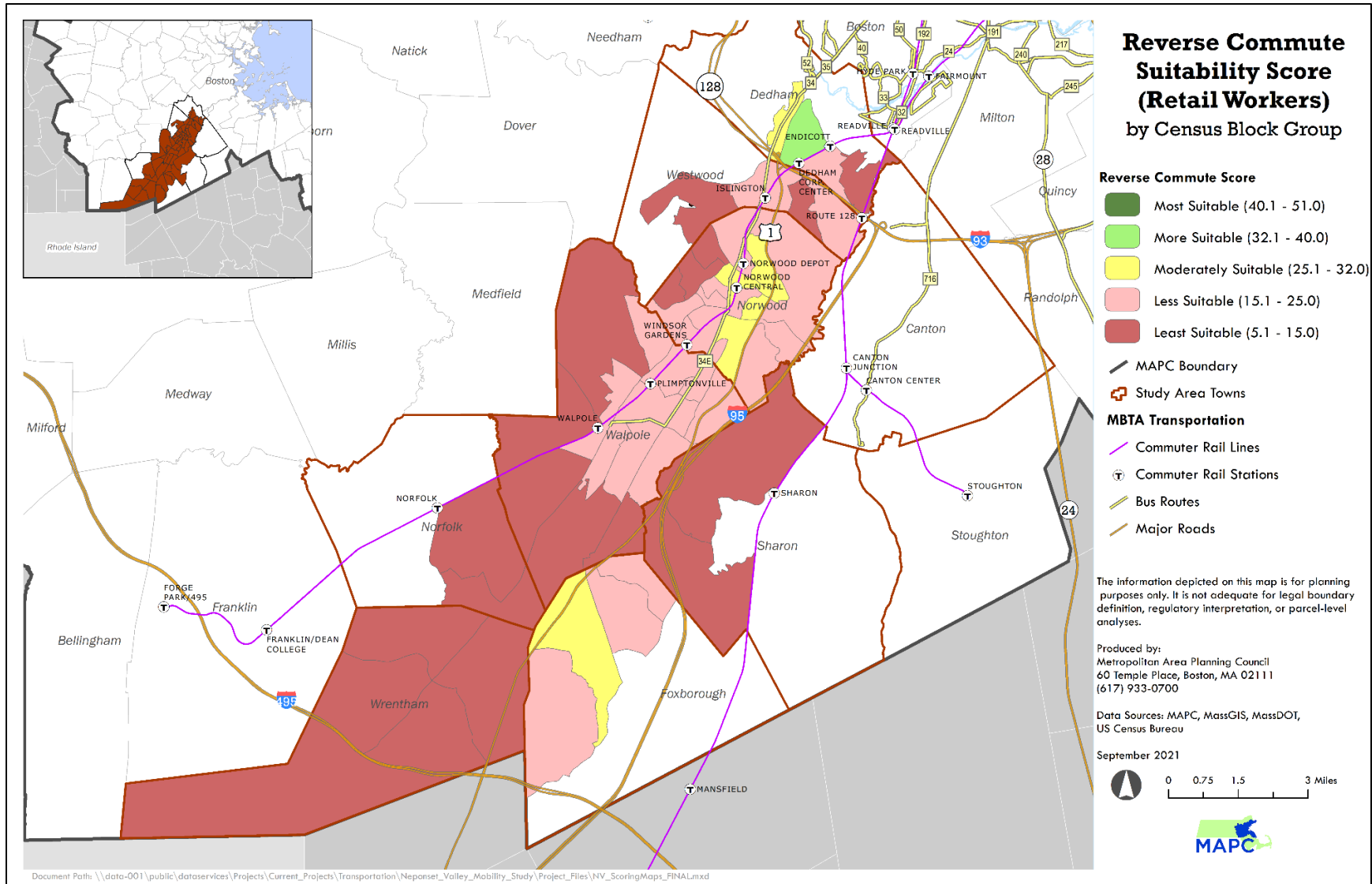


Figure 3.6: Intra-Corridor Commute Health Care Suitability Analysis

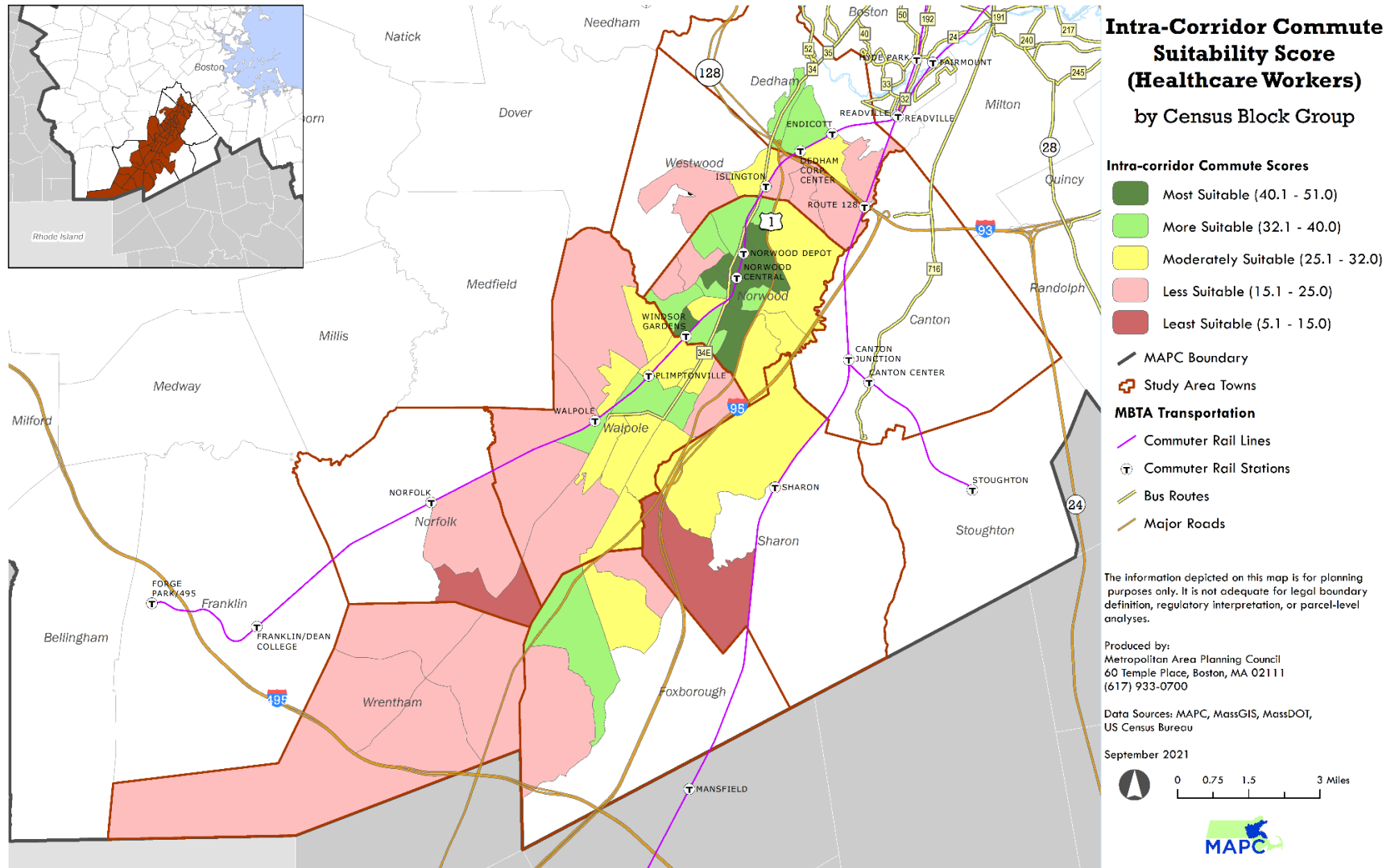
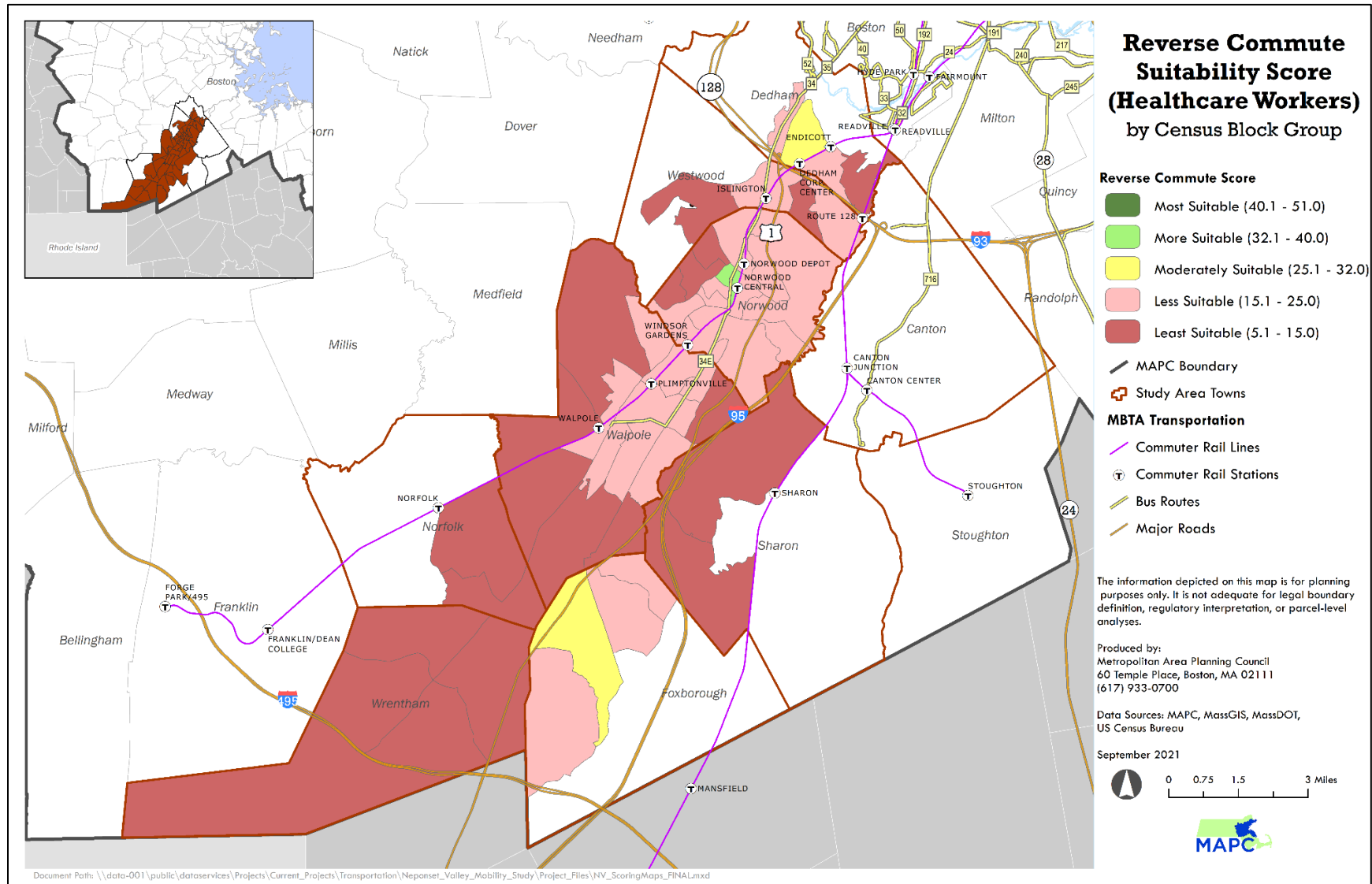


Figure 3.7: Reverse Commute Health Care Suitability Analysis



3.3 Recommendations

Based upon the suitability analysis and review of existing conditions, as well as a review of the survey results of residents and workers in the corridor, the study recommends a near term recommendation of new and expanded microtransit services, as well as a long-term revitalization and redesign of Route 1.

3.3.1 Microtransit Pilot

The areas that scored as most or more suitable for new transit services were in Dedham and Norwood. Portions of Westwood along Route 1 scored moderately suitable in the traditional and intra-corridor commute analyses. A microtransit pilot centered along Route 1 and connecting to the commuter rail stations in Dedham, Westwood and Norwood (as well as the MBTA bus 34E) would provide key first-mile/last mile connections to jobs along Route 1 and Providence Highway as well as the University Avenue corridor in Westwood and Norwood (**Figure 3.8**).

A possible expansion of this microtransit service could include areas further south along Route 1 in Walpole, connection with Walpole station and extending to Patriots Place in Foxborough. This would allow for connection to key retail, health care, and other employment in Walpole and Foxborough, as well as connect with the GATRA Go microtransit services. This expanded service could be part of a Phase 2 pilot, or could be done as part of a larger Phase 1 pilot.

Although a fixed-route shuttle with timed stops could serve portions of the proposed service area, microtransit may be a better fit and is recommended for the following reasons:

- The greatest concentration of employment is along the Providence Highway/Route 1, which is not designed to safely serve pedestrians and transit. Much of the Route 1

corridor lacks sidewalks and pedestrian scale lighting, with few crosswalks; moreover, the few signalized crosswalks typically require pedestrians to cross seven or more travel lanes. A microtransit service could safely pick up and drop off riders curbside at their destinations.



Much of Route 1 lacks sidewalk, bicycle infrastructure, shade trees, and safe crossings (Image: Google)

- As the COVID-19 pandemic continues, work schedules, including work-from-home and “hybrid” office/WFH patterns are still developing. Even retail hours and work shifts have evolved during the pandemic, with stores becoming small fulfillment centers where online orders are compiled for curbside pickup or delivery. A microtransit service can be more flexible to serve differing shifts and be scaled to meet demand.
- Because microtransit uses advanced software to collect trip origins and destinations, over time the trip data can be used to determine if a fixed-route bus would be more efficient to serve some geographies. If the microtransit service becomes popular enough with key destinations, a fixed-route shuttle or bus could replace the microtransit

service, allowing the microtransit service area to shift to serve other destinations.

- With microtransit, the service geography can be easily modified to meet demand. GATRA, for example, has been able to quickly modify their microtransit service boundaries in Foxborough and Plainville to serve trip requests that were just beyond the original microtransit service area.
- The microtransit service can be developed to ensure that riders who request trips that can be served by existing fixed-route bus or rail are routed to those services. The microtransit software will instruct riders to use the existing bus and rail services for those trips, ensuring that the microtransit service does not “cannibalize” existing transit services. The software can also be programmed to point users to bikeshare, scooter, or other “micro mobility” services that might be available.

3.3.2 Expansion of GATRA Go Microtransit

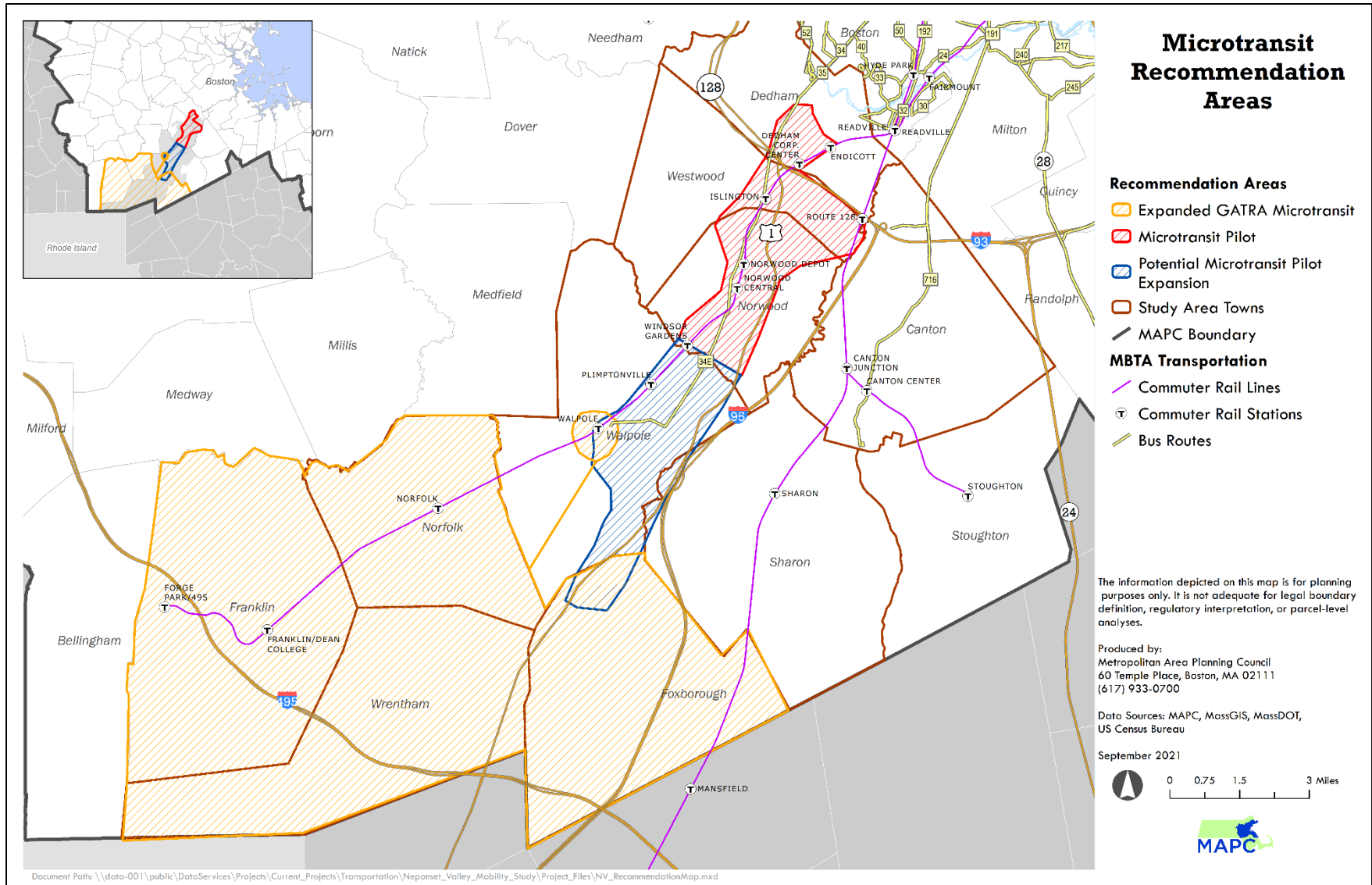
The current GATRA Go microtransit option provides good service in Norfolk, Wrentham, and Foxborough. However, the service does not operate after 6 PM nor on weekends, nor does it connect with MBTA bus services.

An expansion of GATRA service to Walpole to connect with the MBTA 34E bus would provide a more affordable connection with the MBTA bus and subway. It should be noted that Walpole’s transit assessment is paid to the MBTA, and not GATRA. This expanded service to Walpole may require an agreement between Walpole and GATRA, and possible with the MBTA. One way to minimize the conflicts and additional costs would be to have the expanded GATRA Go service serve only trips between Norfolk, Wrentham, and Foxborough and downtown Walpole where the

34E currently terminates, thus minimizing the additional trip costs and service area.

Perhaps more important to meet some of the needs noted in this study would be expanding the hours of GATRA’s service. An expanded service after 6 PM and weekends would help connect workers with jobs such as retail and health care where shifts are beyond the typical 9 to 5 weekday schedule. The night and weekend service could be completed with a reduced number of GATRA vehicles, or via a third-party contract with Uber/Lyft or taxi provider, similar to the Franklin RTA pilot partnership providing work trips for 2nd/3rd shift workers. The exact costs of this expanded service would depend on the specifics of the additional span of service; however, GATRA’s current costs for demand response service as noted in the National Transit Database is about \$63 per revenue hour.

Figure 3.8: Recommendations for New Transit Services

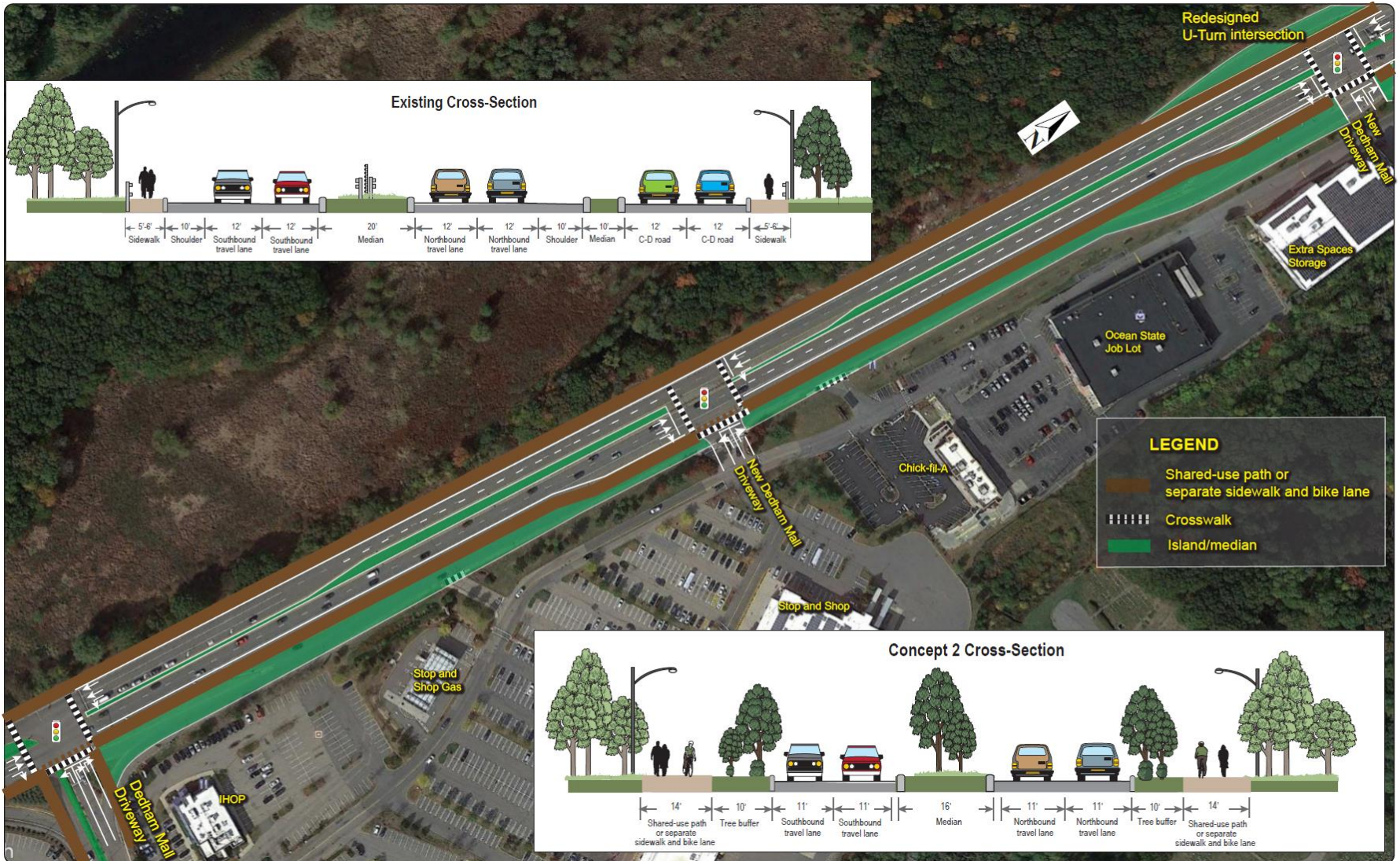


3.3.3 Complete Street Transformation of Route 1

Long-term, the municipalities in the study area and MassDOT should develop a vision to transform Route 1 to a complete street designed for all users that will safely support bus transit, pedestrians, and cyclists and other rollers. This transformation will likely include narrowing travel lanes and/or reducing the travel lanes in some areas to reduce vehicular speeds, walking/rolling infrastructure including sidewalks, trails and safe crosswalks, and locations for transit stops that connect with cross-streets and employment. The design should also include street trees and other shade makers to create cool space for transit riders and others.

Figure 3.9 shows an example of a proposed complete street reconstruction of the Providence Highway in Dedham. The reconstruction includes creating a landscaped median to replace the guardrail, multiuse trails for rolling/cycling/walking, narrower lanes to have safer vehicular speeds, shade trees, and more signalized crossings at key locations, including bus transit stops. The proposed corridor also provides connectivity with proposed regional trails that will help create a walking/rolling network that will support future bike-share and other micro mobility.

Figure 3.9: Proposed Complete Street Corridor, Providence Highway (Dedham)



3.4 Operational and Funding Options for Pilots

3.4.1 Other Microtransit Operations

Table 3.1 describes the various microtransit pilots that are currently in operation in Massachusetts. Because most of these

are pilots, ridership and other operating has not yet been fully reported to MassDOT or others. It should be noted that ridership on all transit systems in Massachusetts in 2020 and 2021 has been lower than previous years due to the COVID-19 pandemic.

Table 3.1: Existing Massachusetts Microtransit Pilots

Pilot	Description	Pilot Funding
FRTA Access	On-demand flexible service in four distinct zones, seven days a week. The service began on weekdays in October 2019 in two zones. After the initial pilot, service was expanded to four zones in 2020 and weekends in 2021. FRTA gives priority to riders who have a disability, veterans, residence in a nursing home, or participation in a home care program. After these priority riders reserve their trips, the FRTA Access program opens up available seats to the general public. FRTA plans to collect data during the pilot in hopes of being able to provide additional bus service in the future.	\$278,365 from 2020 MassDOT Workforce Transportation Grant. ⁴
Westborough & Shrewsbury (Worcester RTA)	On-demand transportation that replaced fixed route bus in Westborough, weekdays, launched in September 2020. Service expanded to Shrewsbury in April 2021. Service connects with commuter rail stations in Southborough and Westborough.	Funding source unknown.
MetroWest RTA CATCH Connect	Two pilots began in 2021, one in Wellesley and the other in portions of Natick and Framingham. The Wellesley service replaces a low-ridership fixed-route. The Natick/Framingham offers weekend service only. The Wellesley service connects with the Green Line, and both services connect with commuter rail and MWRTA services.	Partially funded through a \$80,000 MassDOT Community Transportation Grant to develop a mobile app.
CATA On Demand	On-demand transportation pilot that started in 2021 operating weekdays within the city limits of Gloucester. Some employers provide fare-free trips for their employees. Pilot created as partnership between CATA and the Gloucester Economic Development and Industrial Corporation to connect commuter rail and other trip origins to employment destinations.	Funded though \$175,000 MassDOT Workforce Transportation Grant.
SmartDART (Cape Cod RTA)	Two on-demand transportation pilots in Barnstable (began late 2020) and Yarmouth (began early 2021). The Barnstable pilot also works with the local Council on Aging to supplement the COA transportation options; the fares are covered by the COA and the	Funding unknown.

⁴ The MassDOT Workforce Transportation Grant has been eliminated as of 2021.

Pilot	Description	Pilot Funding
	COA helps seniors book the trips.	
GATRA Go (Four pilots)	GATRA Go consists of four microtransit services. GATRA Go Connect provides transit service in Mansfield, Foxborough and Plainville, while the GATRA Go United (serving Foxborough, Franklin, Norfolk, and Wrentham) replaced fixed-route bus service. The two other microtransit pilots serve Plymouth and Pembroke.	Funded in part through a \$215,000 MassDOT Workforce Transportation Grant as well as existing funding (where replacing prior fixed-route services).
Newton NewMo– senior transport pilot and commuter pilot	NewMo senior service started in June 2019 and replaced a voucher-based taxi ride program. Rides can be to anywhere in Newton and select medical facilities outside Newton; the service is available weekdays. Service operates door to door. The commuter pilot operates weekdays and is open to all, operating corner to corner.	Funded in part by two \$100,000 MassDOT Community Transportation Grants (first phase) and Community Connections grant of \$727,000.
Salem Skipper	Weekday on-demand transportation within the city limits, open to anyone 13 years old and older. Connects with MBTA bus and commuter rail.	Funded in part by a \$250,000 MassDOT Workforce Transportation Grant and other partners, including Salem State University.

Descriptions collected from agency websites, news articles, and MassMobility Newsletters.

3.4.2 Potential Funding and Partnerships

Many of the above described pilot microtransit services, as well as other pilot fixed-route shuttles are funded via grants. Below are grant programs available to provide funding, depending on the program goals and needs.

- [Community Connections](#): funded by the Boston MPO this program is for “first- and last-mile solutions, community transportation, and other small, nontraditional transportation projects” This program is partially funding the Royall Street shuttles operated by the Neponset Valley TMA.
- [Community Transit Grant Program](#): administered by MassDOT, this is an annual grant that provides funds for vehicles, and operating costs to meet the nobility needs of

seniors and individuals with disabilities. The program is funded by both federal and state funds. Community Connections will fund up to three years, but requires an increased local match each year, and a full local funding plan for year four and beyond.

- [Efficiency and Regionalization Grant Program](#): This program provides “financial support for entities interested in implementing regionalization and other efficiency initiatives.” The program has funded regional transportation initiatives across multiple municipalities.
- [Community Compact Best Practices Grant Program](#): This program provides an opportunity where “a community will agree to implement at least one best practice that they select from across a variety of areas. The community’s chosen best practice(s) will be reviewed between the Commonwealth and the municipality to ensure that the best practice(s) chosen are unique to the municipality and

reflect needed areas of improvement.” Practice areas include regionalization/shared services, safe mobility, and active transportation.

Even with grant funding for a pilot project, a successful local transportation program will require sustained local funding to maintain operations. Many new transportation pilots require two or three years to get started and make people aware of the new service, with typically lower ridership in the first year that grows as the service becomes more efficient and well known. Acton started its shuttle service using funds generated by the Town’s commuter rail parking lot. Other municipalities have worked to use local funds for senior transportation and opened up seats for non-seniors for workforce or other transportation. Municipalities have also worked through their local TMA to partner with businesses to fund shuttles that serve their employees as well as provide seats for the public.

From research of typical operating parameters of on-demand transportation in Massachusetts, most operate at a minimum of 10 hours per day, 5 days a week per vehicle, or 2,600 hours of service a year per vehicle. From a review of on-demand transportation costs for RTAs operating microtransit in Massachusetts, the average hourly rate is \$71. Therefore, the typical cost to operate a single wheelchair accessible vehicle for a microtransit pilot would be \$185,000 annually. A microtransit pilot will require at least two vehicles, possibly four or more; thus the typically annual operating costs of the microtransit service would be \$370,000 to \$740,000, or higher, depending on the number of vehicles, service area, and span of service. If a service uses smaller vehicles that do not require a wheelchair lift and a Commercial Driver’s License (CDL), or with fewer vehicles in a smaller geography, the costs could be lower. Likewise, a larger geographic service area will require more vehicles, with higher operating costs.

3.5 Next Steps and Development of Pilot Programs

To create a successful pilot, the communities and businesses in the Neponset Route 1/1A corridor should take the following steps to review the data and recommendations from this study and create a program and funding strategy.

1. **Determine the core needs and goals of the service.** This study concentrated on employment along and near the Route 1/1A corridors, with an additional focus on health care and retail employment; as such it concentrated on links to those jobs and to existing bus and rail services. A shuttle that serves primarily daily needs (shopping, school) or medical trips for seniors, persons with disabilities will have different key destinations.
2. **Ensure the new service addresses equity needs.** For example, a service along Route 1/1A would help access jobs along a very auto-centric corridor, which will help workers cost-burdened when requiring owning their own vehicle to access work. The service should include an option for those who are unbanked (i.e., don’t have access to a credit or debit card) as well as those who do not have access to a smart phone. Larger vehicles should be used to provide a way for parents to use the service without the need to carry and use a child car seat, similar to how children and parents ride on fixed-route buses.
3. **Based upon the goals and needs developed under the first two steps, determine geographic, time of day/week and other parameters of the service.** This will help determine whether the service will be within a single municipality or may require work through the TMA or transit agency (MBTA, GATRA).
4. **Determine the performance measures.** This step is critical in everyone understanding how well the service is meeting the goals. These can be ridership, service reliability and average wait time, costs, and customer satisfaction, as well as other metrics.

5. **Create a funding and operating plan, preferably one that is two or more years.** The first year or two of a pilot can be funded by grants, but a local funding stream will be needed to ensure long-term success. Furthermore, a new service will often take at least two years for riders to become knowledgeable and comfortable using it. As noted earlier, Community Connections, for example, will fund up to three years, but requires an increased local match each year, and a full local funding plan for year four and beyond.
6. **Find a lead agency to manage and champion the pilot.**

The [Operating a Successful Community Shuttle Program](#) guidebook by CTPS is an excellent resource for creating a pilot community transit service.

