

Wellesley Townwide Safe Routes Plan

September 5, 2024

Project# 28469

Chapter 1 – Existing Conditions

The Town of Wellesley, Massachusetts prepared this Townwide Safe Routes Plan to develop a network of low-stress routes for people to walk and bike between neighborhood destinations including schools, colleges, parks, and community centers, among others. This chapter summarizes the existing conditions in Wellesley and is organized as follows:

- Relevant Document Review
- Land Use Conditions
- Demographic Analysis
- Roadway Network Inventory
- Pedestrian Gap Analysis
- Bicycle Level of Stress
- Key Existing Conditions Findings

RELEVANT DOCUMENT REVIEW

Table 1 outlines each recent document and includes a short summary of how each document relates to the Safe Routes Plan.

Table 1. Relevant Document Review Summary

Document	Summary
<u>Complete Streets</u> <u>Prioritization Plan (2024)</u>	To qualify for MassDOT Complete Streets Funding Program grants, Wellesley created this Plan that outlines nearly 30 active transportation and transit safety and mobility projects. These projects will inform the Safe Routes Plan development during the network identification process.
<u>ADA Transition Plan (2024)</u>	To comply with and go beyond the requirements of the Americans with Disabilities Act, Wellesley created this Plan to document the Town's public facilities and recommend actions to make these facilities accessible, safe, and comfortable for all users. The inventory informed the multimodal trip generators for the Safe Routes Plan.
<u>Open Space and Recreation Plan (2022 – 2029)</u>	This Plan identified several community needs and actions regarding active transportation and safe routes, which will inform the network identification process for the Safe Routes Plan.
<u>Climate Action Plan (2022)</u>	Transportation is one of the key pathways to reducing the Town's greenhouse gas emissions, and the creation of the Safe Routes Plan will support the strategies outlined in the Climate Action Plan to increase walking and biking as a primary transportation mode for community members.

Document	Summary
<u>Trails Development and Improvement Plan (2022 – 2026)</u>	There are two trails projects underway (Paintshop Pond Trail and Sudbury Path to Natick), as well as several proposed trail projects to increase Wellesley's trail network. These facilities will be important connections to consider for the network identification process in the Safe Routes Plan.
<u>Sustainable Mobility Plan (2020)</u>	This Plan was developed to support multimodal travel in the Town through infrastructure projects and policies geared towards providing safe, convenient, and accessible facilities for pedestrians, bicyclists, and transit users. The Safe Routes Plan is a direct outcome of this Plan and supports the vision, goals, and objectives outlined therein.
<u>Complete Streets Policy (2019)</u>	Complete Streets are streets designed and operated to enable safe use and support mobility for users of all ages and abilities, regardless of whether they are travelling as drivers, pedestrians, bicyclists, or public transportation riders. ¹ Wellesley adopted this Policy to guide the integration of Complete Streets principles throughout all transportation work, including the Safe Routes Plan.

LAND USE

Multimodal Trip Generators

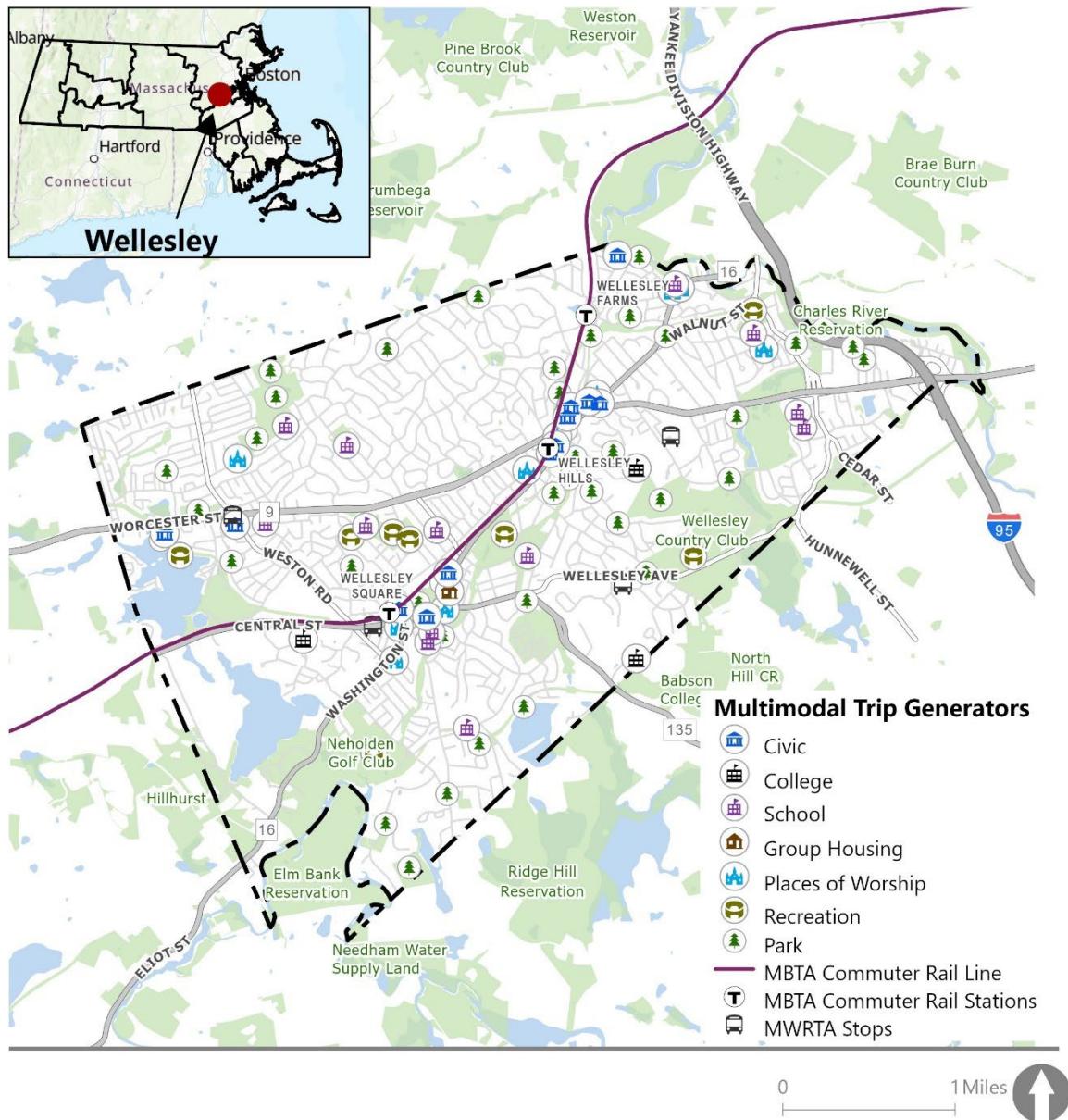
This section summarizes the different existing land uses to identify the locations of multimodal trip generators in the Town of Wellesley. The locations of the following multimodal trip generators are identified for this analysis:

- Civic Buildings
- Schools and Colleges
- Group Housing including College Housing and Senior Centers
- Places of Worship
- Parks and Recreation Areas
- Transit Stops including Massachusetts Bay Transportation Authority (MBTA) Commuter Rail Stations and MetroWest Regional Transit Authority (MWRTA) Bus stops.

Figure 1 shows the locations multimodal trip generators in the Town of Wellesley. As depicted below, multimodal trip generators are concentrated in and around Wellesley Square, Wellesley Hills, and the Overbrook neighborhood.

¹ United States Department of Transportation. (August 2015). *Complete Streets*. <https://www.transportation.gov/mission/health/complete-streets>

Figure 1. Multimodal Trip Generators



Multimodal Trip Generators Wellesley Townwide Safe Routes Plan



DEMOGRAPHIC ANALYSIS

This section presents the demographic analysis for the Town of Wellesley. According to the US Census Bureau's 2022 American Community Survey (ACS) 5-Year Estimates, the population of Wellesley is 29,862 and there are 8,956 households in the Town.² Forty-three percent of the Town's population are workers, and the median household income of the Town exceeds \$250,000, which is the highest income category collected by the US Census Bureau. The following demographic characteristics are discussed in this section:

- Population and Employment Density
- Age
- Zero Vehicle Households
- Means of Transportation to Work
- Environmental Justice Populations

Population and Employment Density

Areas with high population and employment densities often experience greater demand for walking, biking, and transit facilities. Figure 2 displays the population density in the Town of Wellesley by Census block group, based on the 2022 ACS 5-Year Estimates. Wellesley Square, Babson Park, and Wellesley Lower Falls are areas with medium to high population densities. Population density in the Town is also concentrated around major transportation corridors, including the MBTA Commuter Rail line, State Route 9, and State Route 27. This data indicates key areas to prioritize network improvements as part of this Plan to serve as many residents as possible.

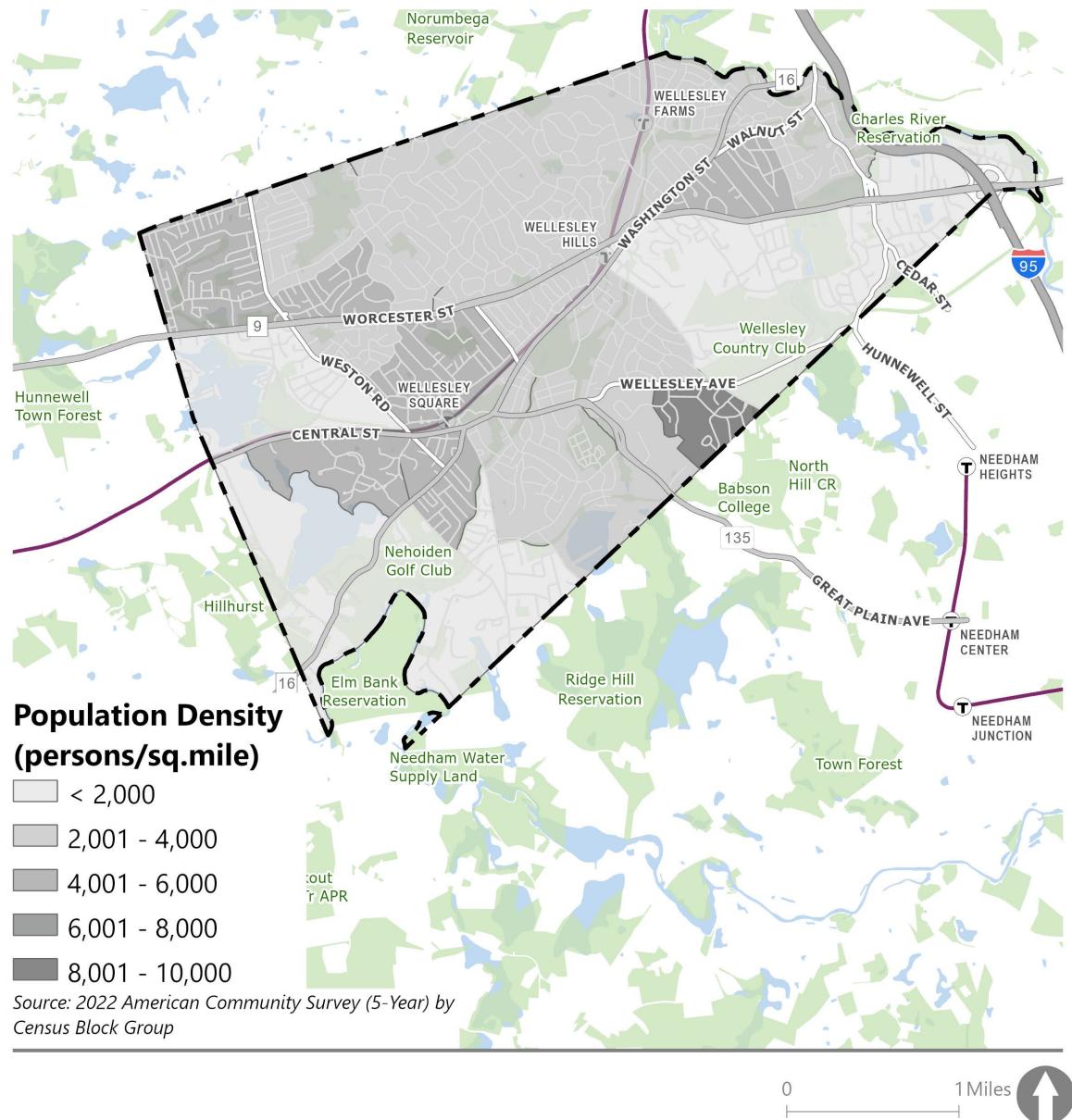
Notably, the areas with high population density also correspond to regions of high employment density in the Town, as shown in Figure 3. The employment density is based on the 2021 Longitudinal Employer-Household Dynamics (LEHD) data, as analyzed through the US Census Bureau's OnTheMap Job Analysis tool.³ As depicted below, employment areas are concentrated around the center and northeast portions of the Town, with job densities ranging from 4,066 to 6,350 jobs per square mile. The OnTheMap tool was also used to perform a Distance/Direction Analysis to assess the proximity between workers' homes and their workplaces. According to this analysis, 42% of the individuals employed in Wellesley lived within 10 miles of their workplace.⁴

² United States Census Bureau. (December 2023). *2022 ACS 5-Year Estimates*. <https://www.census.gov/data/developers/data-sets/acs-5year.html>

³ United States Census Bureau. (N.D.) *U.S. Census Bureau's OnTheMap Tool*. <https://onthemap.ces.census.gov>

⁴ United States Census Bureau. (N.D.) *U.S. Census Bureau's OnTheMap Tool*. <https://onthemap.ces.census.gov>

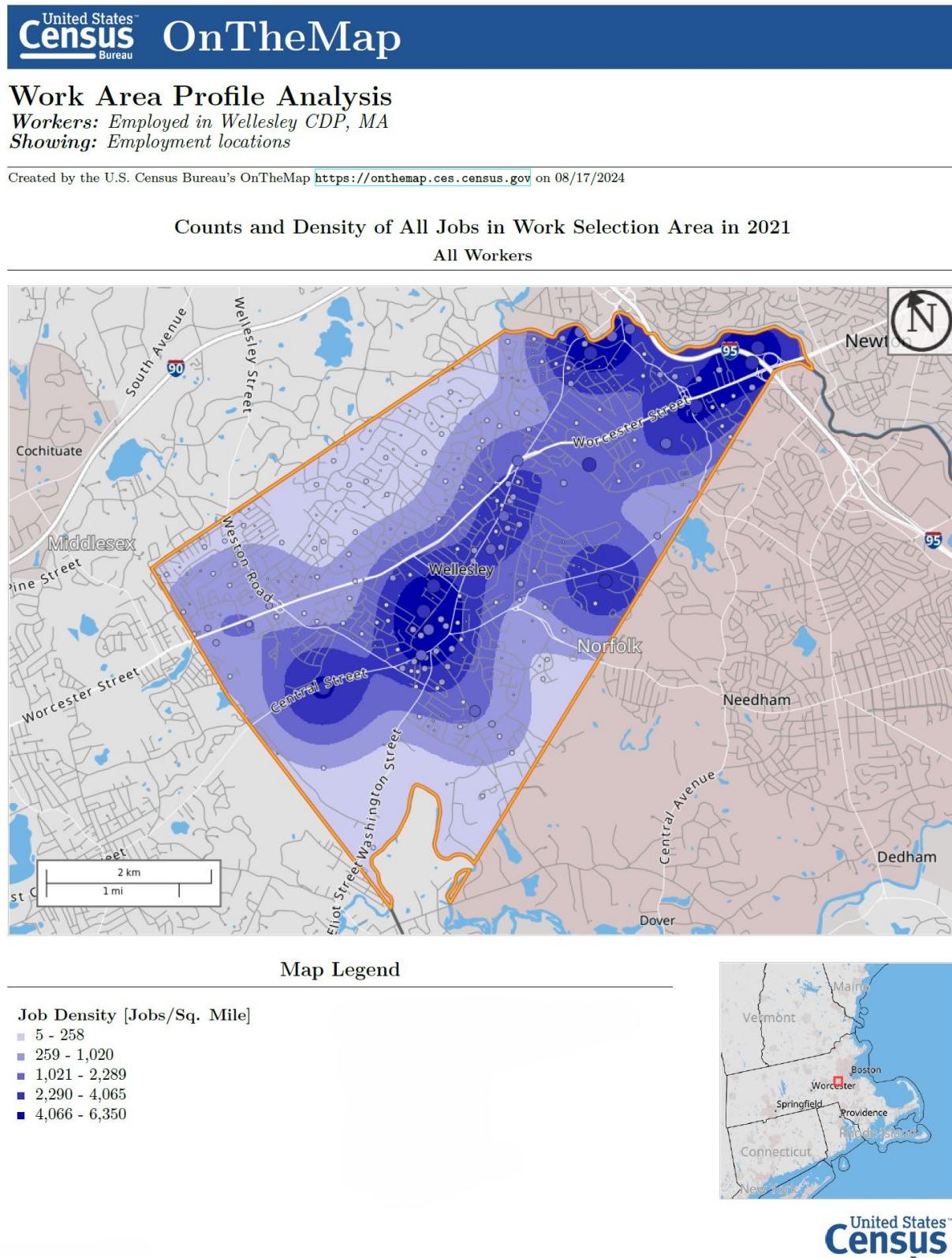
Figure 2. Population Density



**Population Density (persons/square mile)
Wellesley Townwide Safe Routes Plan**



Figure 3. Employment Density

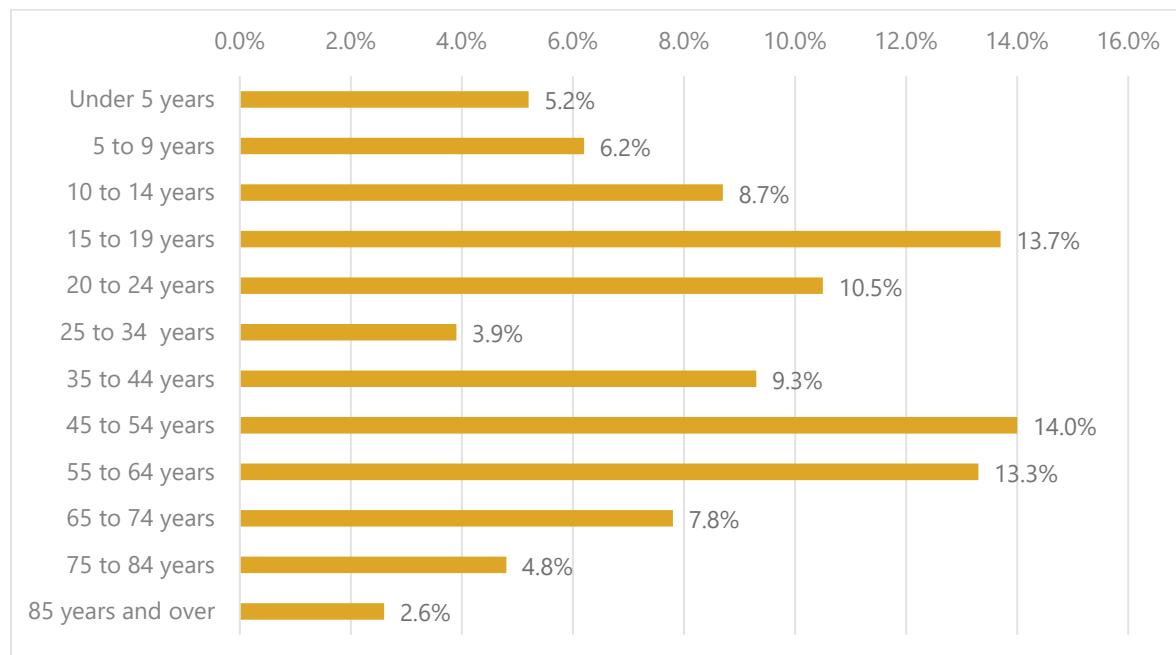


Source: <https://onthemap.ces.census.gov/>

Age

Figure 4 depicts the age distribution in the Town of Wellesley, based on the 2022 ACS 5-Year Estimates. The largest age group in the Town of Wellesley is those aged between 45 to 54 years, comprising 14% of the population. The second-largest group is individuals aged between 15 to 19 years, making up 13.7%. Individuals under 14 years of age represent 19.1% of the population, while those aged 65 years and above make up 15.2%. As the minimum age to obtain a drivers license in Massachusetts is 18 years of age, most of the youthful population (under 19 years of age) either depend on others for transportation, or utilize active transportation modes to access their essential destinations. Similarly, while elderly people (age 65 or older) are permitted to drive, health conditions or financial conditions may increase their dependence on transit, walking, or shared rides. By prioritizing safe routes that are accessible for people of all ages and abilities, Wellesley will better serve these vulnerable populations.

Figure 4. Age of Population

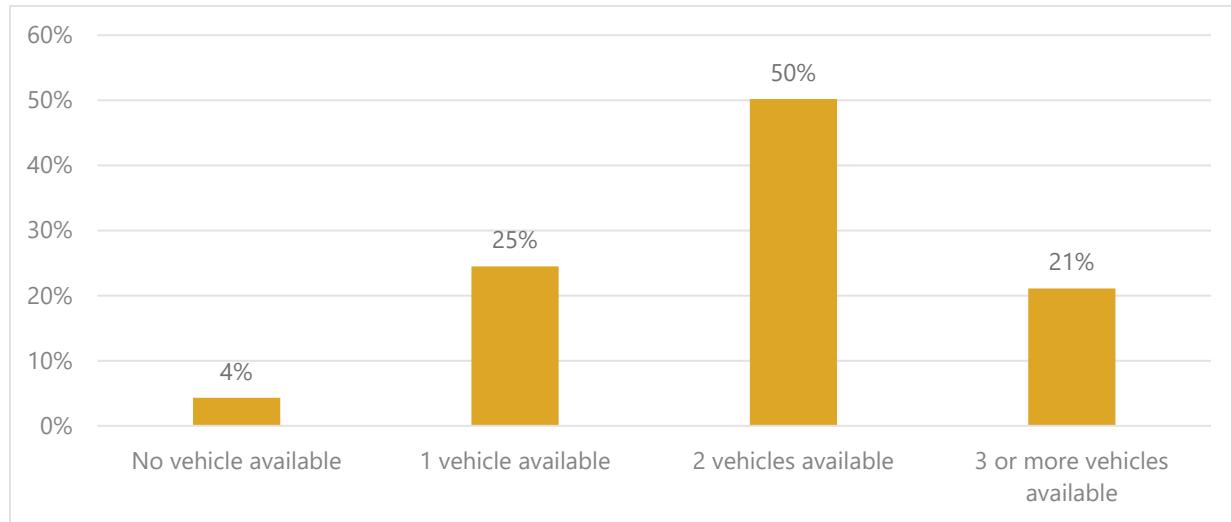


Source: US Census Bureau, 2022 ACS 5-Year Estimates

Zero Vehicle Households

Figure 5 shows the percentage of vehicles available for occupied housing units in the Town of Wellesley. About 4% of the Town's occupied housing units do not own a vehicle, while approximately 96% of occupied housing units have at least one vehicle.

Figure 5. Vehicles Available for Occupied Housing Units



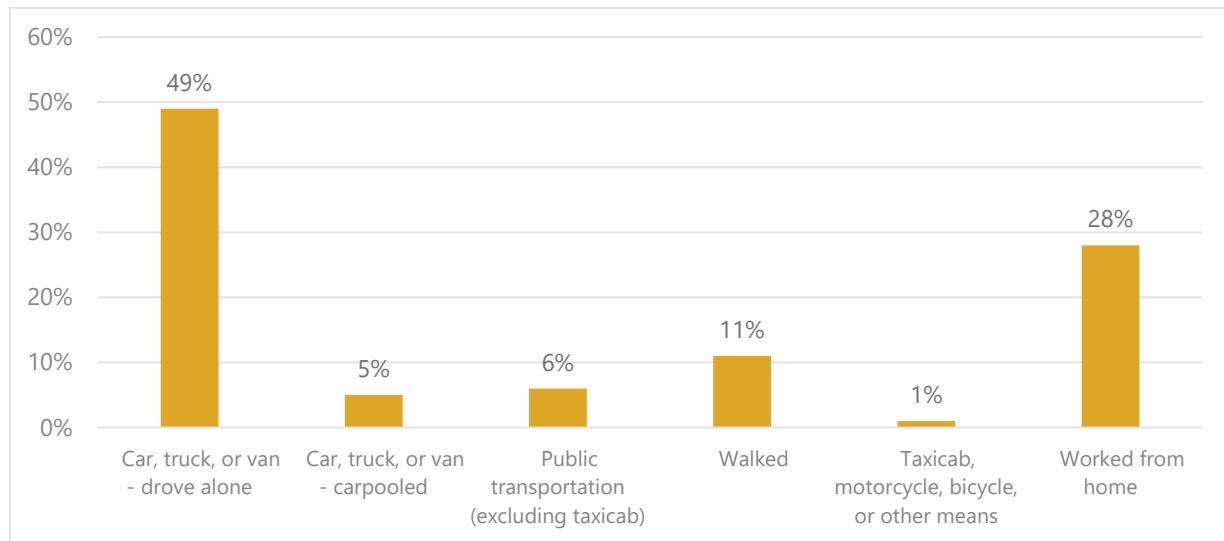
Source: US Census Bureau, 2022 ACS 5-Year Estimates

Figure 7 shows the distribution of zero vehicle households in the Town of Wellesley by census tract. The percentage of zero vehicle households is highest in census tracts to the northeast and southwest of the Town (6%), surrounding Wellesley Farms and Wellesley Square commuter rail stations.

Means of Transportation to Work

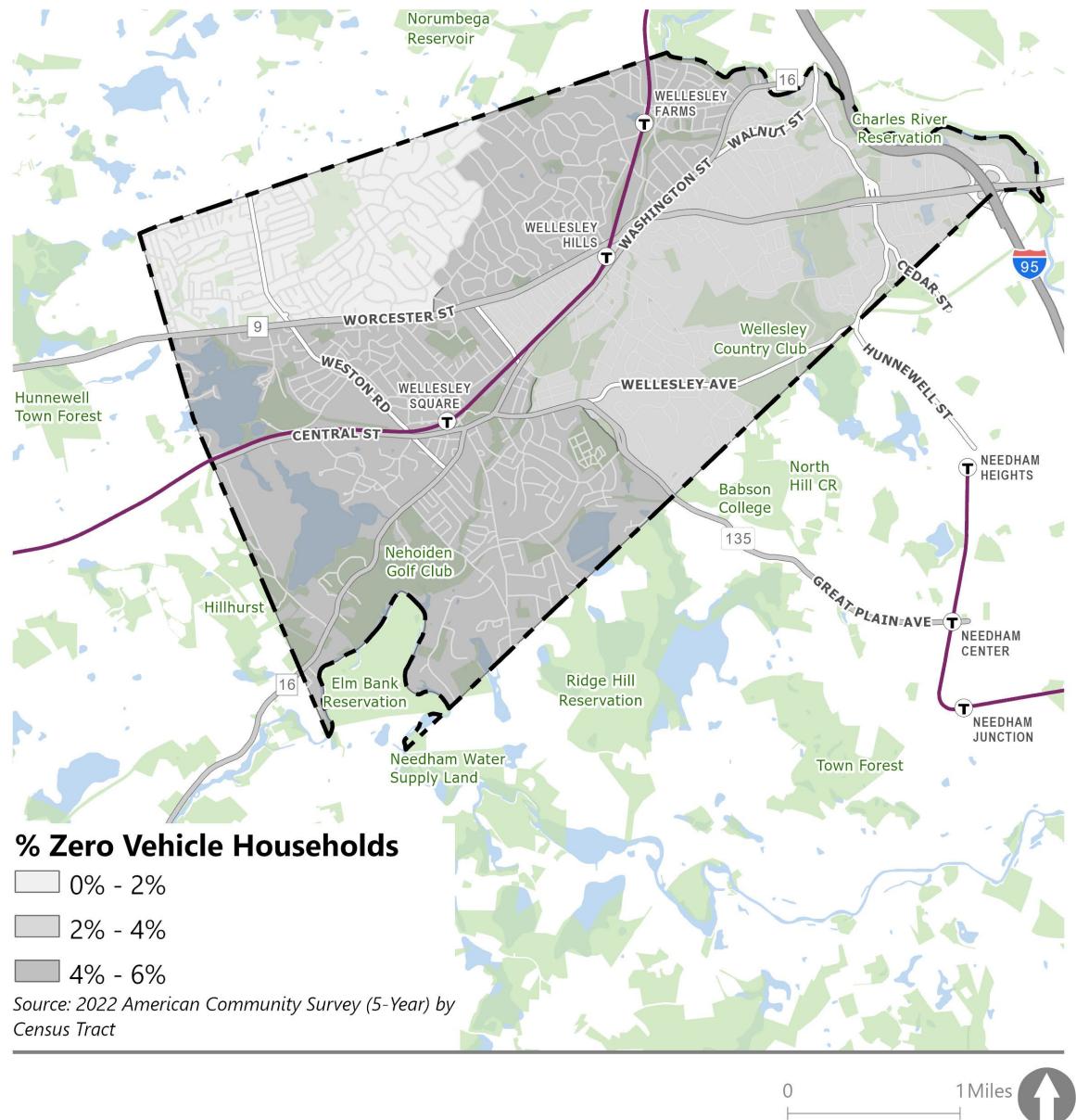
Figure 6 shows the means of transportation to work for workers aged 16 years and above in the Town of Wellesley, based on the 2022 ACS 5-Year Estimates. Nearly half of the Town's workers (49%) drove alone by car, 11% walked to work, and fewer than 1% biked to work. 28% of the Town's workers worked from home, marking a significant increase from the pre-pandemic period, when only 12% worked from home, according to the 2019 ACS 5-Year Estimates.

Figure 6. Means of Transportation to Work



Source: US Census Bureau, 2022 ACS 5-Year Estimates

Figure 7. Zero Vehicle Households



Zero Vehicle Households Wellesley Townwide Safe Routes Plan



Environmental Justice Populations

In Massachusetts, the Executive Office of Energy and Environmental Affairs defines an environmental justice population as a neighborhood where one or more of the following criteria are true⁵:

1. The annual median household income is 65 percent or less of the statewide annual median household income
2. [Racial] Minorities make up 40 percent or more of the population
3. 25 percent or more of households identify as speaking English less than "very well"
4. [Racial] Minorities make up 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.

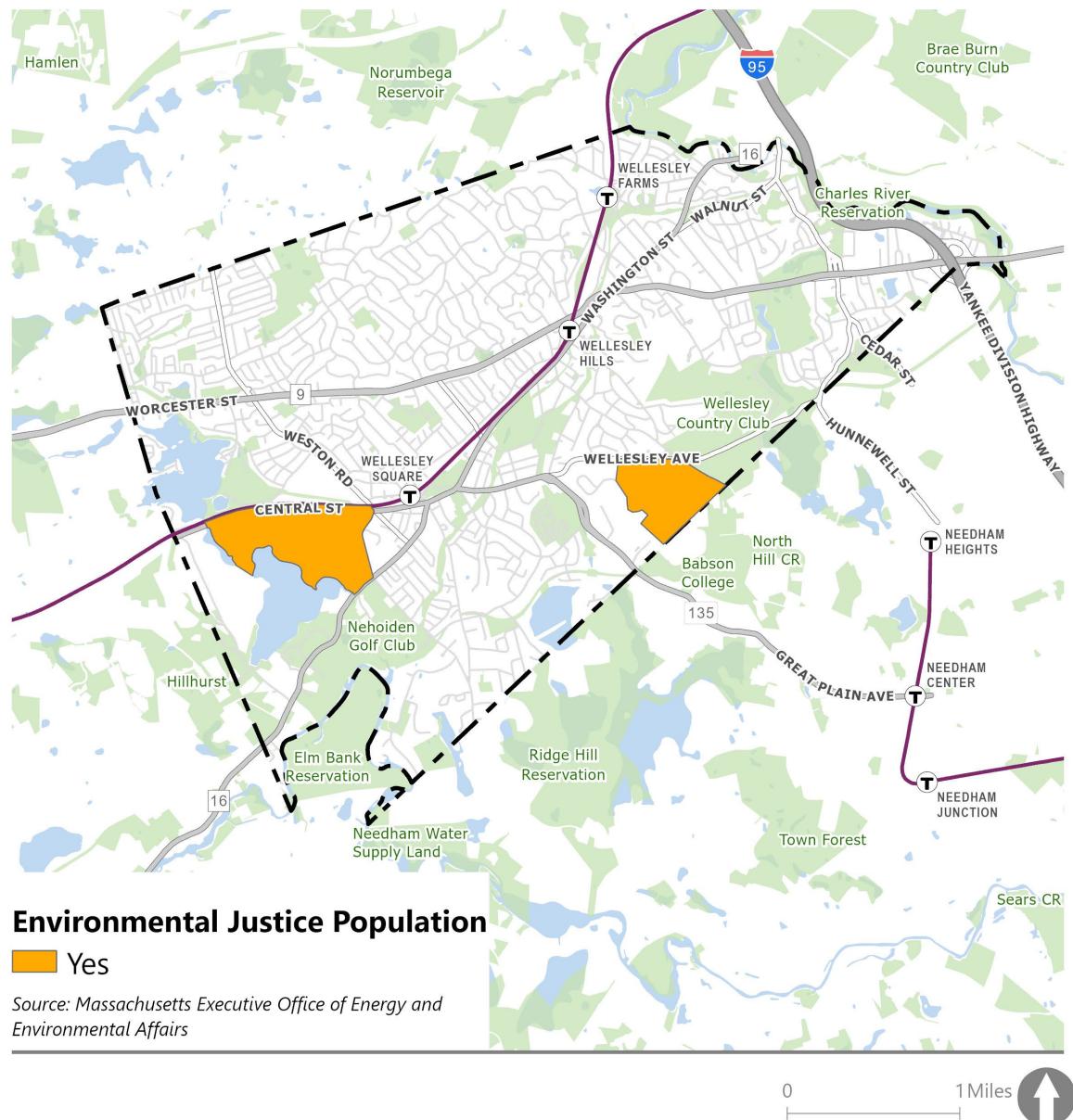
Figure 8 depicts the environmental justice populations in the Town of Wellesley. There are two block groups in Wellesley that meet at least one of the above criteria – one immediately west of Wellesley Square, south of Central Street, and one south of Wellesley Ave and west of the Wellesley Country Club. These areas are priorities for the Safe Routes Plan to ensure equitable access to active transportation. Table 2 delineates the percentage of minority population in the Environmental Justice Areas by census tract and block group. As displayed below, both the block groups have a minority population greater than 45%.

Table 2. Environmental Justice Populations - Percentage of Minority Population

Census Tract	Block Group	Percentage of Minority Population
Census Tract 4044	Block Group 4	54%
Census Tract 4042.02	Block Group 3	49%

⁵ Office of Environmental Justice & Equity. (N.D.) *Environmental Justice Populations in Massachusetts*. Executive Office of Energy and Environmental Affairs. [https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts#what-is-an-environmental-justice-population?>](https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts#what-is-an-environmental-justice-population?)

Figure 8. Environmental Justice Populations



Environmental Justice Population Wellesley Townwide Safe Routes Plan



ROADWAY NETWORK INVENTORY

Walking and biking comfort largely depends on roadway characteristics such as traffic volume and operating speed, which are often influenced by their functional classification (arterial, collector, local), number of lanes, posted speed limit, and vehicular traffic volumes within various land use contexts. This section describes the existing roadway network inventory in the Town of Wellesley. Understanding the existing roadway inventory is crucial for the next phases of the Plan development, as it helps in identifying and prioritizing roadways where active transportation investments will be most impactful. The following roadway network characteristics are discussed in this section:

- Functional Classification and Intersection Control
- Street Width
- Posted Speed
- Vehicular Volumes

Functional Classification and Intersection Control

The roadway functional classification data was obtained from the Town of Wellesley's roadway network database. The number of miles of each roadway functional class is detailed in Table 3. As shown below, Local roads account for over 70% of the total roadway miles, with Principal Arterials and Minor Collectors comprising about 8% of total roadway miles in Wellesley. Other roadway functional classes including Interstates, Minor Arterials, and Major Collectors account for less than 6% each of the total roadway miles in the Town. This information helps to illuminate the overall character of Wellesley's transportation system and can be a key indicator for where active transportation network gaps would be most impactful if addressed.

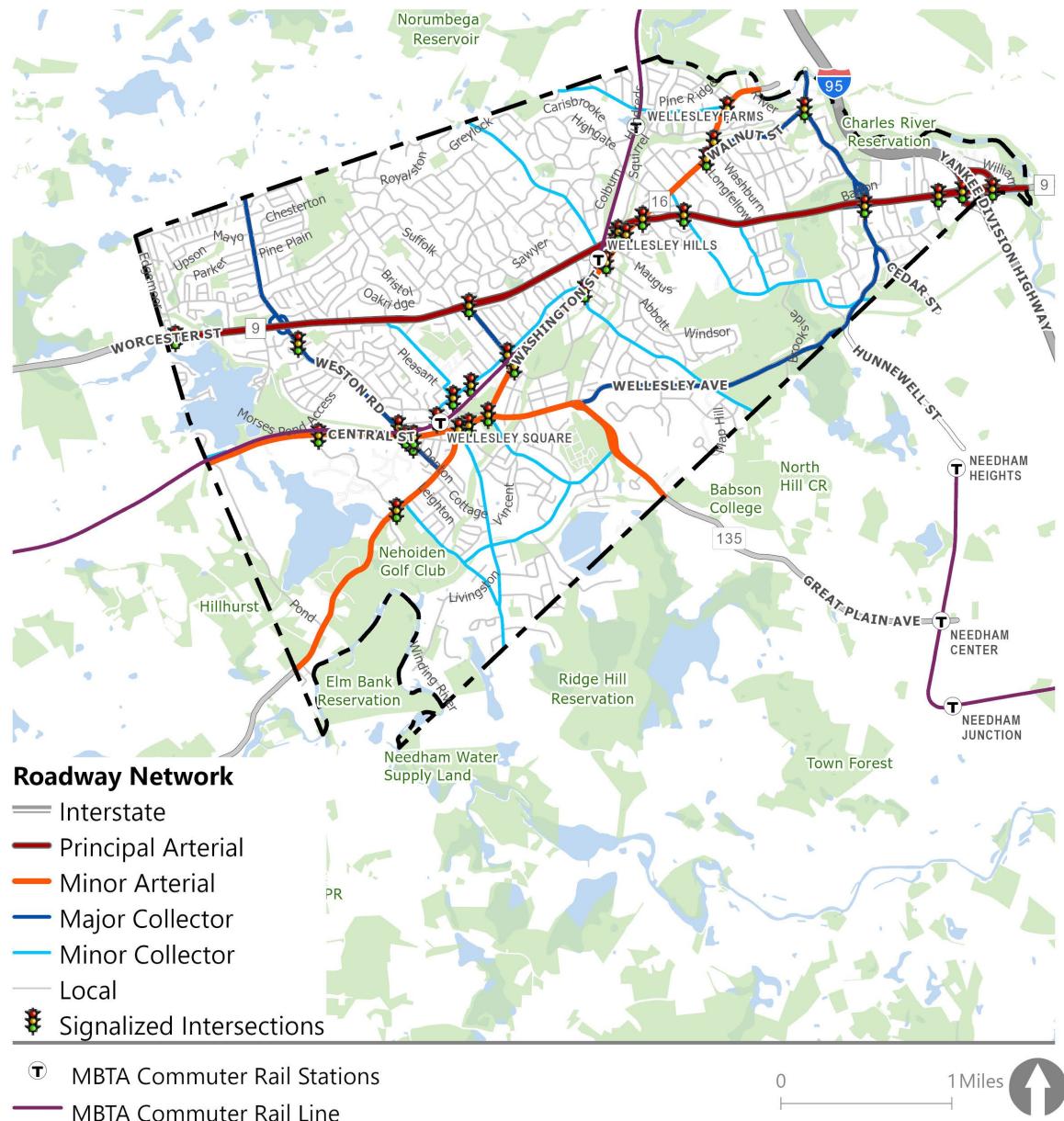
Table 3. Proportion of Total Roadway Miles by Roadway Functional Classification

Roadway Functional Classification	Length (in miles)	% of Total Roadway Miles
Interstate	2.2	1.5%
Principal Arterial	12.1	8.2%
Minor Arterial	7.8	5.3%
Major Collector	7.8	5.4%
Minor Collector	11.6	7.9%
Local	105.1	71.7%
Total	146.5	100%

Figure 9 illustrates the map of Wellesley's roadway network with functional classification and intersection control. As displayed below, the majority of the signalized intersections are located along the following roadways:

- State Route 9 / Worcester Street
- State Route 135 / Central Street / Wellesley Avenue
- State Route 16 / Washington Street
- Weston Road
- Linden Street

Figure 9. Functional Classification and Intersection Control



Roadway Network
Wellesley Townwide Safe Routes Plan



Surface Width

Roadway surface width data was obtained from MassDOT's [Roadway Inventory \(2023\)](#). The roadway surface width is the measurement of the travel way excluding shoulders/auxiliary lanes on the roadway. Figure 10 illustrates the map of roadway surface width for Wellesley's roadways. Roadway surface width is an acceptable method for estimating the number of lanes on a roadway, based on an assumed 12' lane width. This data will help this Plan understand where roadway space could be allocated to ensure safe and comfortable pedestrian and bicycle facilities.

Posted Speed

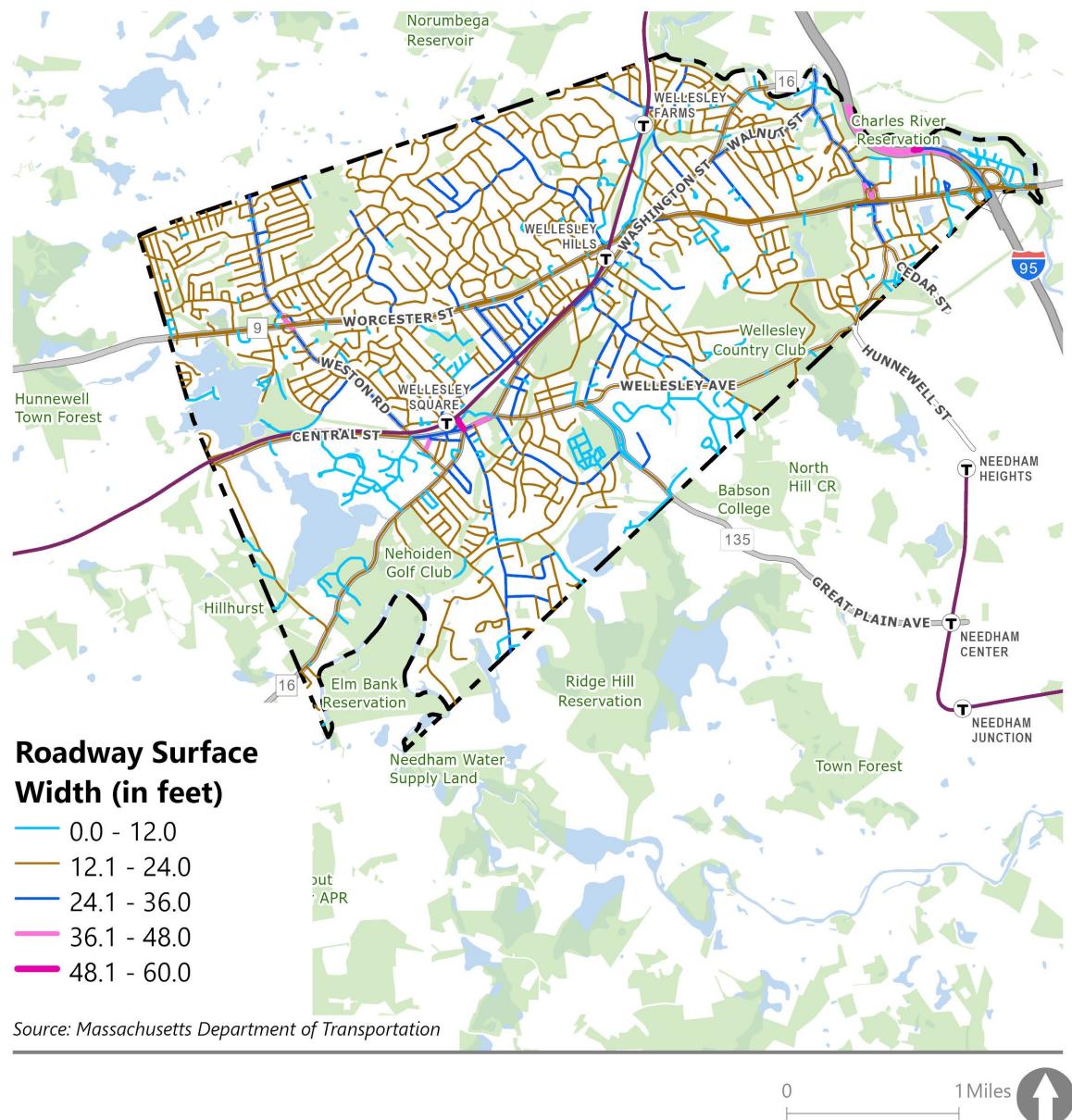
Posted Speed data is obtained from MassDOT's [Roadway Inventory \(2023\)](#). Figure 11 shows the posted speeds, in miles per hour (mph) on Wellesley's roadways. It is important to note that a posted speed limit does not ensure that higher vehicle speeds are not regularly experienced on any given road – rather, this data indicates where roadway design permits and encourages higher vehicle speeds. Those facilities could be key areas where active transportation investments would have a substantial impact on increasing the comfort and safety of people walking and biking. Roadways with posted speed limits in excess of 35 miles per hour include:

- Worcester Street
- Washington Street
- Central Street
- Great Plain Avenue
- Interstate 9

Vehicular Volumes

Vehicular Volume data is obtained from MassDOT's [Traffic Inventory \(2023\)](#). The vehicular volumes are represented as Annual Average Daily Traffic (AADT) with data collection years ranging from 2007 to 2023. Figure 12 illustrates the map of Annual Average Daily Traffic (AADT) for Wellesley's roadways. There are several roadways in the Town that experience daily traffic exceeding 6,000 vehicles, including Worcester Street, Washington Street, Walnut Street, Cedar Street, Central Street, Wellesley Avenue, and Great Plain Avenue. These roads could present barriers to safely and comfortably walking and biking, without the appropriate facilities. Additionally, several roads, including Glen Road, Cliff Road, Forest Street, Linden Street, Oak Street, Dover Road, Grover Street, and Benvenue Street experience between 3,000 and 6,000 vehicles per day, which could also present barriers to all ages and abilities mobility, without the appropriate facilities. This data will help identify where active transportation improvements could be impactful for the Wellesley community.

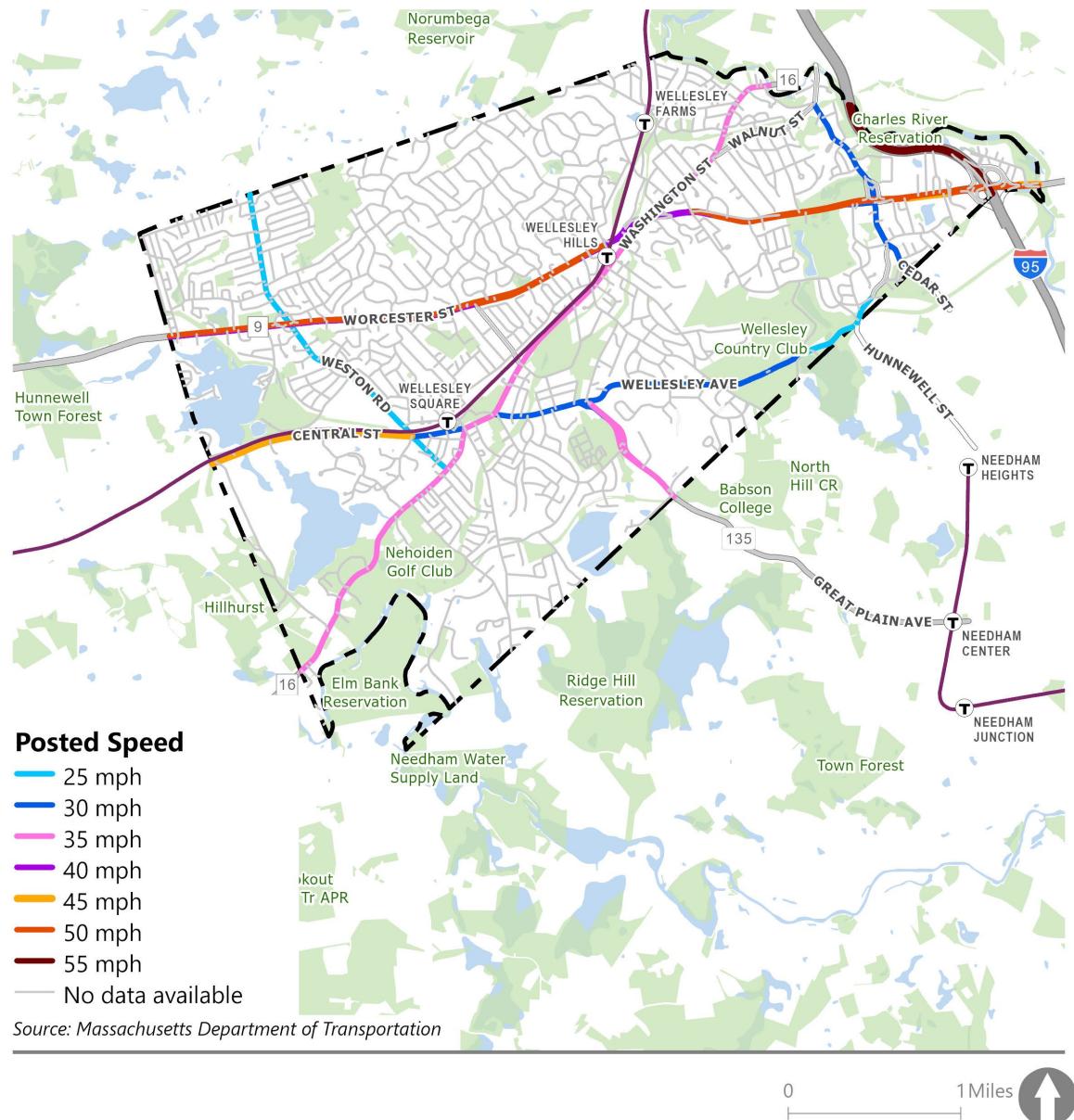
Figure 10. Roadway Surface Width



Roadway Surface Width (in feet)
Wellesley Townwide Safe Routes Plan



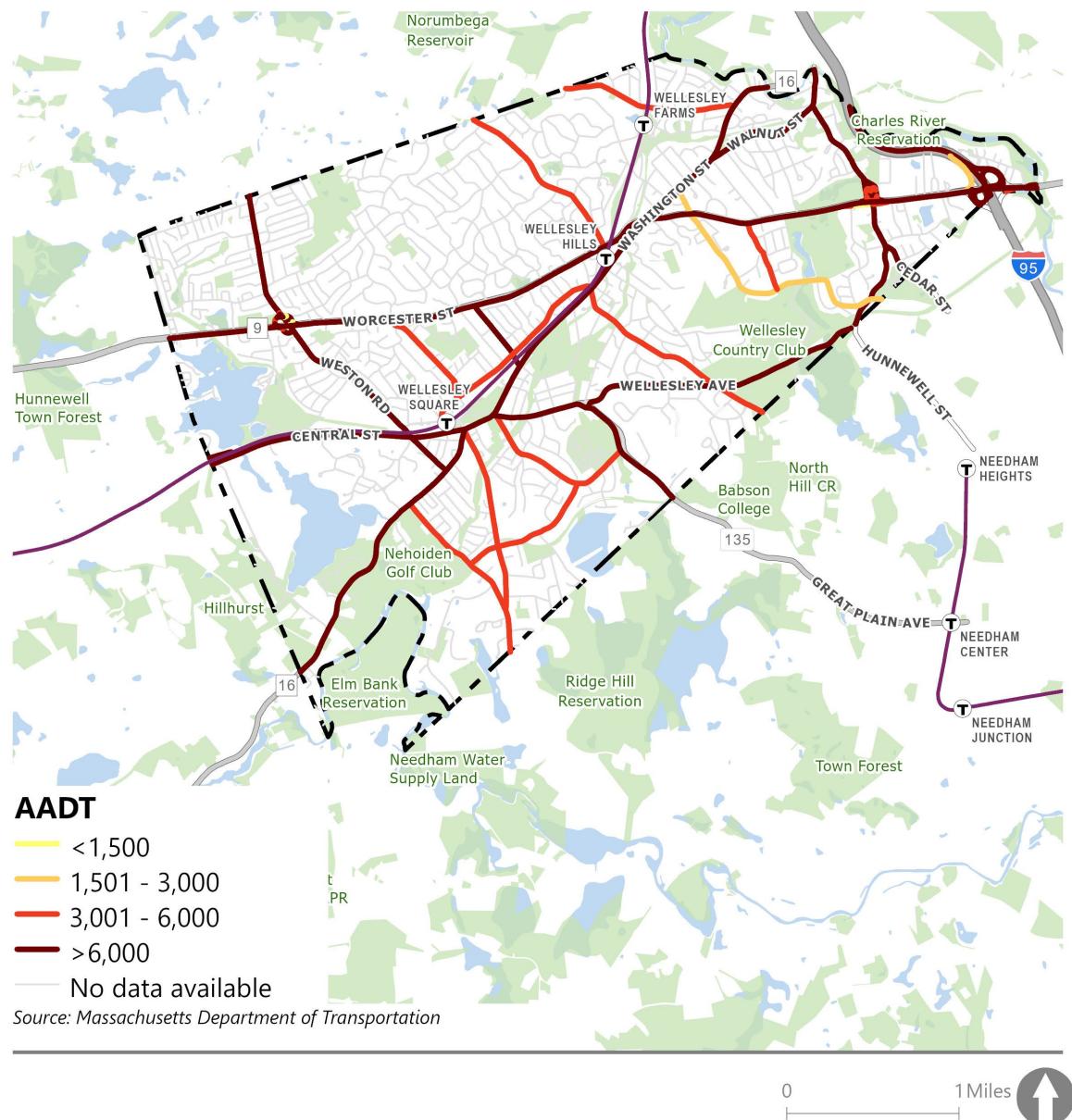
Figure 11. Posted Speed



Posted Speed (mph - miles per hour)
Wellesley Townwide Safe Routes Plan



Figure 12. Annual Average Daily Traffic (AADT)



Average Annual Daily Traffic (AADT) Wellesley Townwide Safe Routes Plan



PEDESTRIAN AND BICYCLE ANALYSIS

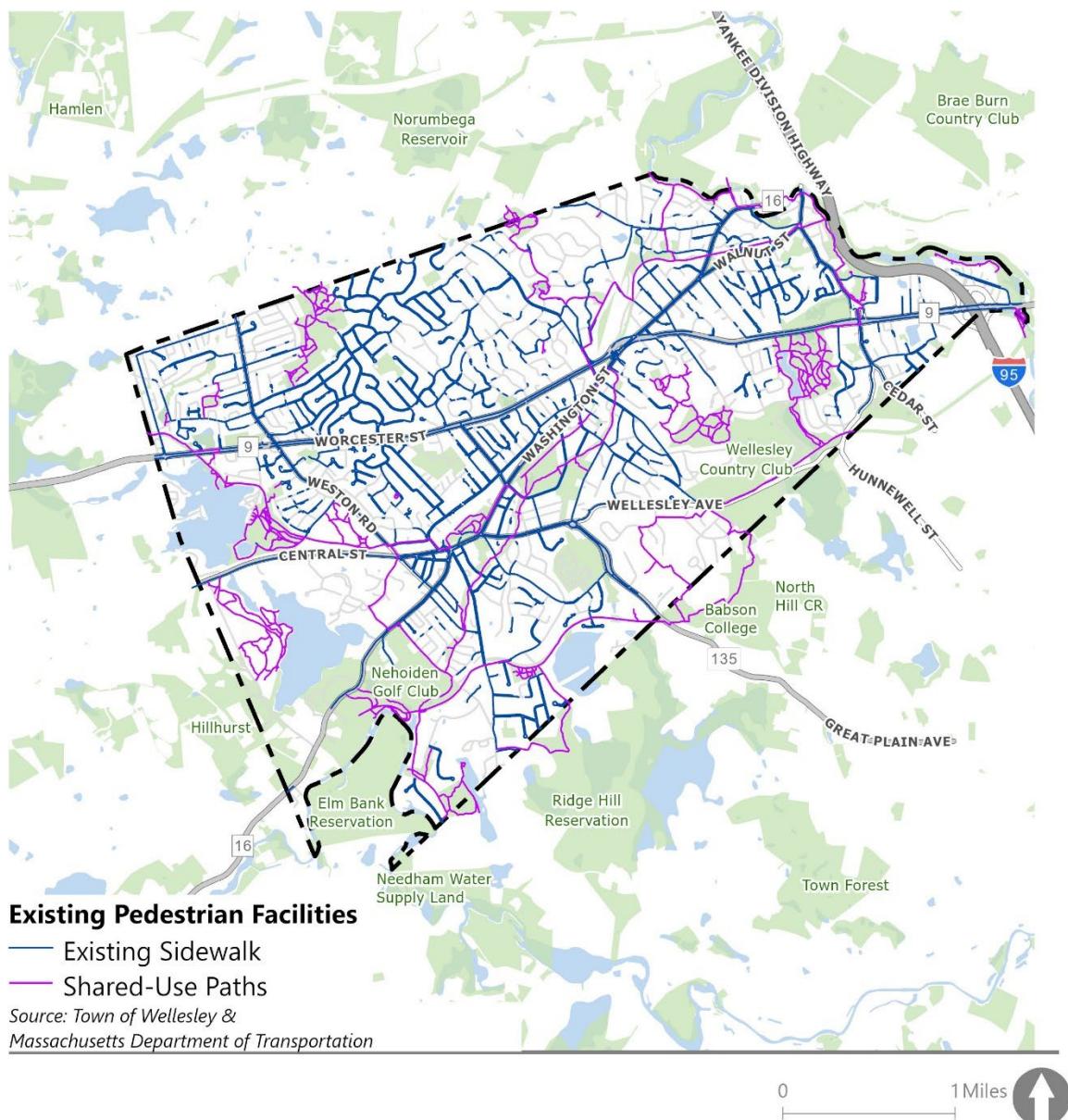
This section outlines the existing pedestrian and bicycle facilities in the Town of Wellesley along with the potential for walking and biking trips, pedestrian network gap analysis, and bicycle level of traffic stress. The insights gained from these analyses will be valuable for subsequent phases of the Plan development, including network identification and improvements.

Existing Pedestrian and Bicycle Facilities

Figure 13 displays the existing pedestrian facilities in the Town of Wellesley, including sidewalks and shared use paths. Most of the arterial and collector roads in the Town include sidewalks on at least one side of the roadway. Figure 14 displays the existing bicycle facilities in the Town, including bike trails and shared use paths. Most of the shared use paths are primarily located in parks and conservation areas, and these facilities are considered to be both pedestrian and bicycle facilities. Notable bike trails and shared use paths in the Town include the following:

- Brook Path
- Crosstown Trail
- Guernsey Path
- Woodland Trail

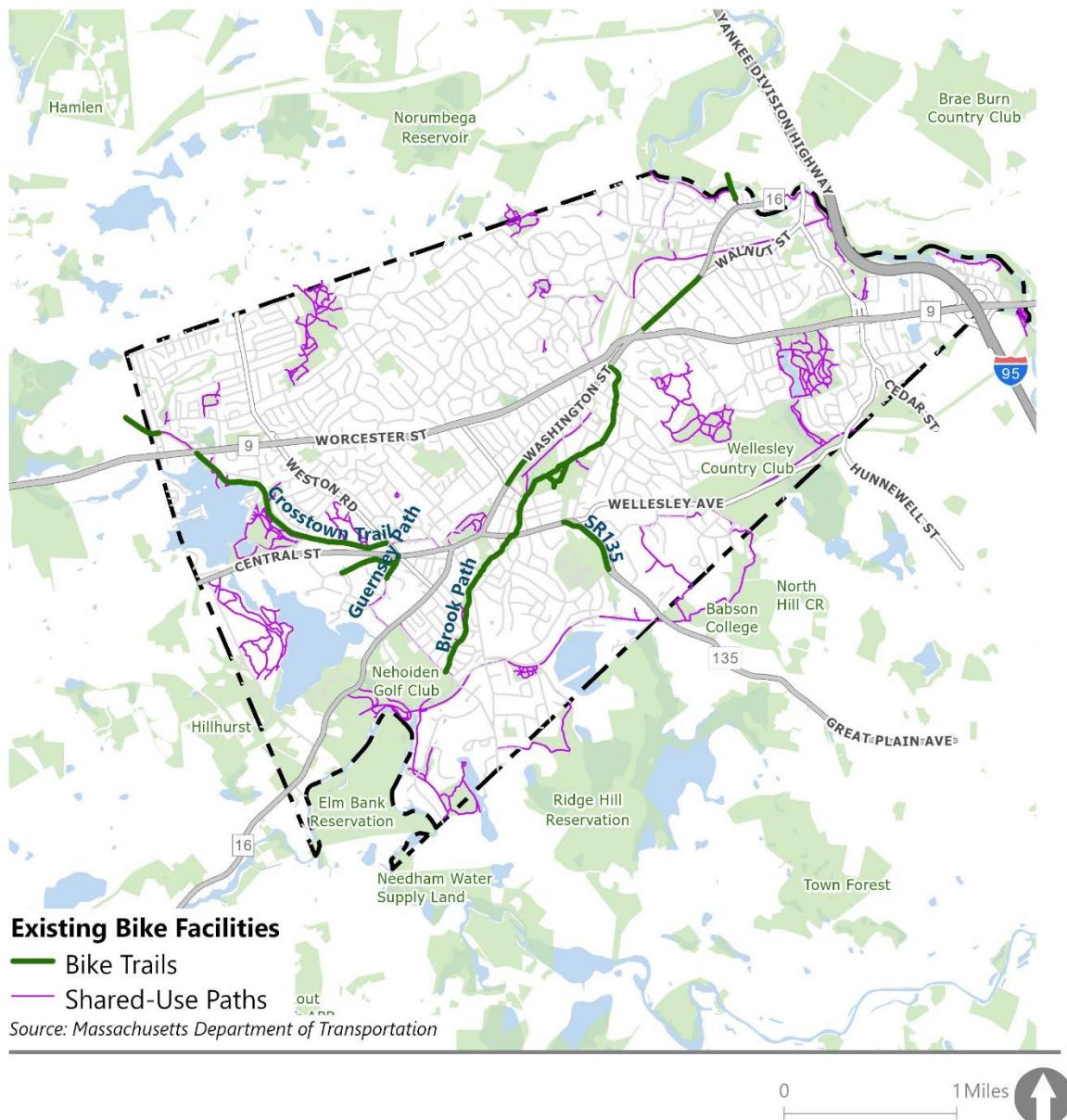
Figure 13. Existing Pedestrian Facilities



Existing Pedestrian Facilities Wellesley Townwide Safe Routes Plan



Figure 14. Existing Bike Facilities



Existing Bike Facilities Wellesley Townwide Safe Routes Plan



Potential for Active Transportation Trips

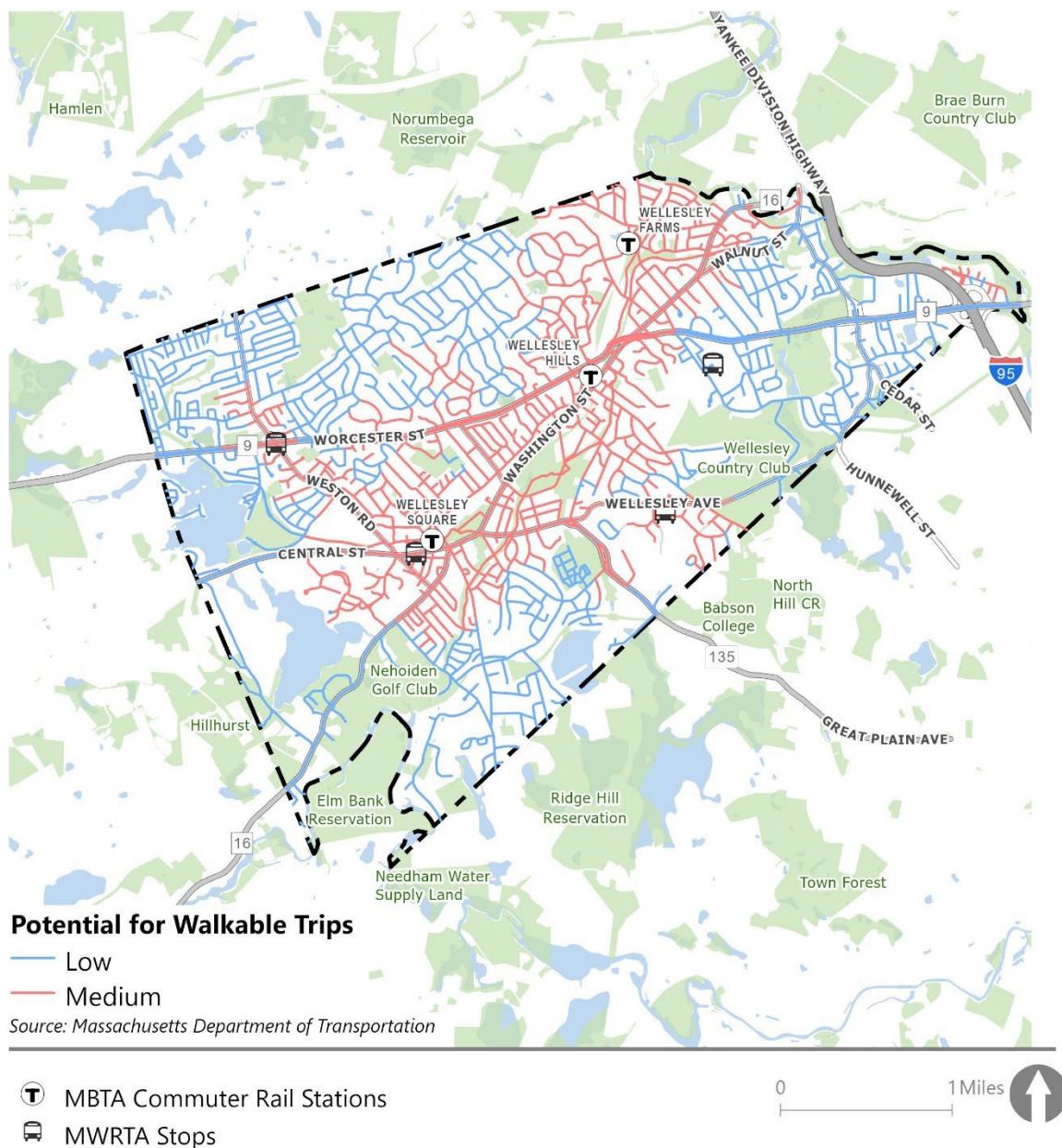
This section illustrates the potential for walking and biking trips in the Town of Wellesley based on MassDOT's Potential for Walkable Trips (2022) and Potential for Everyday Biking (2022) datasets. MassDOT's methodology to determine the potential for walking and biking scores for a roadway uses travel demand data, transit access, and social equity. The roadways are classified as having "high", "medium", or "low" potential as follows:

- Top 10% of the roadways on the score: "High" potential roadway
- Top 60% of the roadways on the score: "Medium" potential roadways
- The remaining roadways: "Low" potential roadways

Figure 15 depicts the roadways with potential for walkable trips in the Town of Wellesley. As shown below, the Town's roadways are classified as having low and medium potential for walkable trips. Roadways with medium potential for walkable trips are concentrated along major arterials in the center of the Town in the neighborhoods of Wellesley Square, Wellesley Hills, Wellesley Farms and Lower Falls. The areas classified as having medium potential for walkable trips coincide with high job density, group housing (college campuses), transit stations, and environmental justice populations in the Town.

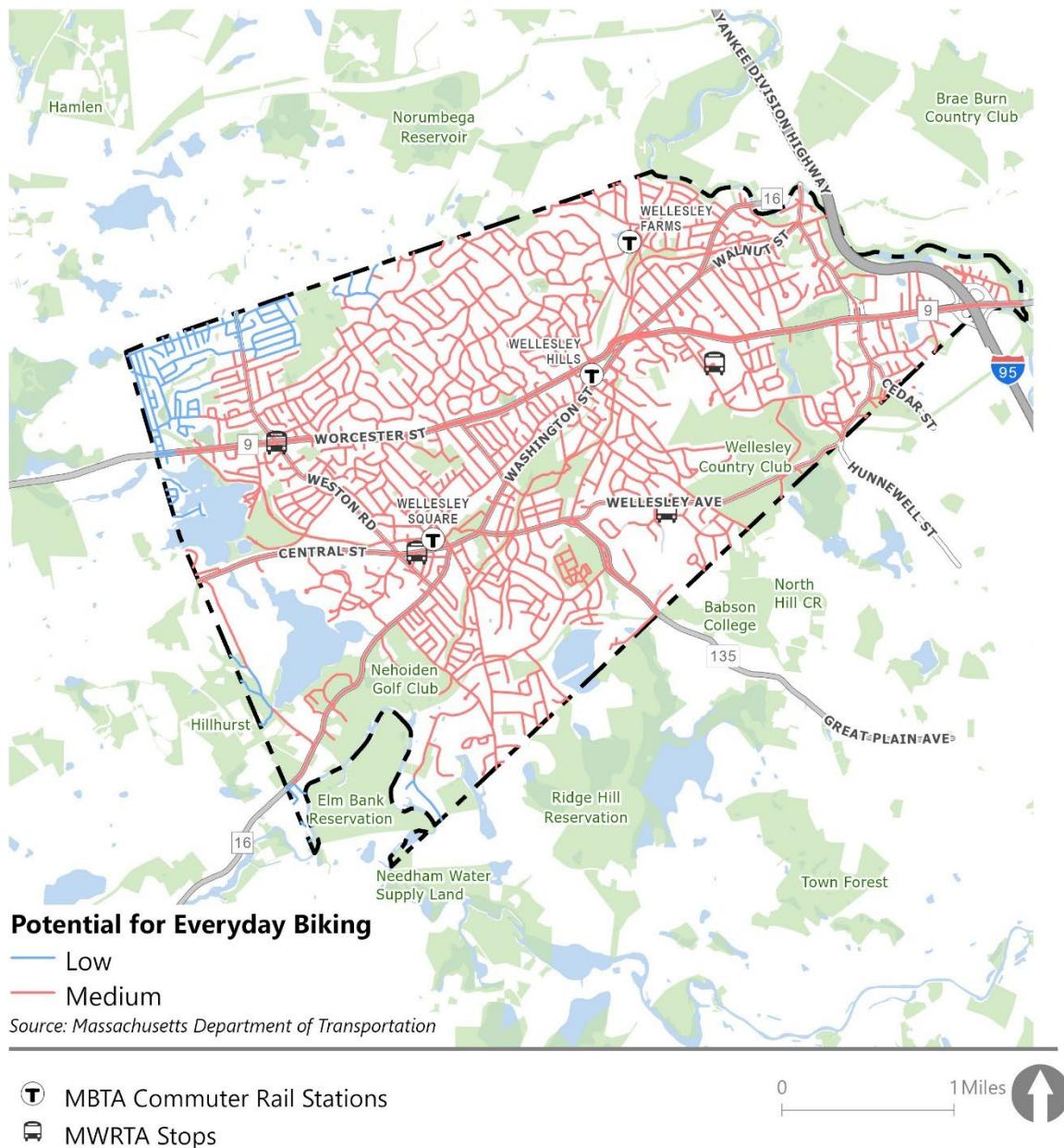
Figure 16 shows the roadways with potential for everyday biking in the Town of Wellesley. As illustrated below, the majority of the Town's roadways are classified as having medium potential for everyday biking. The roadways classified as having low potential for everyday biking are in the northwest corner of the Town.

Figure 15. Potential for Walkable Trips



Potential for Walkable Trips Wellesley Townwide Safe Routes Plan

Figure 16. Potential for Everyday Biking



Potential for Everyday Biking Wellesley Townwide Safe Routes Plan



Pedestrian Network Gap Analysis

This section provides an analysis of pedestrian network gaps in the Town of Wellesley.

METHODOLOGY

The methodology for analyzing pedestrian network gaps involved the following steps:

- 1. Data Collection:** Data sources used for the analysis include the Town of Wellesley's Sidewalk Centerlines and MassDOT's Roadway Inventory (2023).
- 2. Network Mapping:** Existing sidewalks were mapped along with MassDOT's roadway network to establish the current pedestrian infrastructure.
- 3. Gap Identification:** The existing sidewalks were compared against the roadway infrastructure. Gaps were identified under these conditions:
 - Sidewalks are absent on one or both sides of an arterial road,
 - Sidewalks are absent on both sides of a collector / local street,
 - Existing sidewalk is discontinuous along a roadway.
- 4. Exclusions:** The following roadways were excluded from this analysis:
 - Interstate 95 and Ramps: These are classified as limited access roadways and were not included in the pedestrian gap analysis.
 - Streets within college campuses, commercial plazas, and parks/conservation areas: These areas were excluded from the analysis as they typically have their own internal pedestrian infrastructure and access regulations.

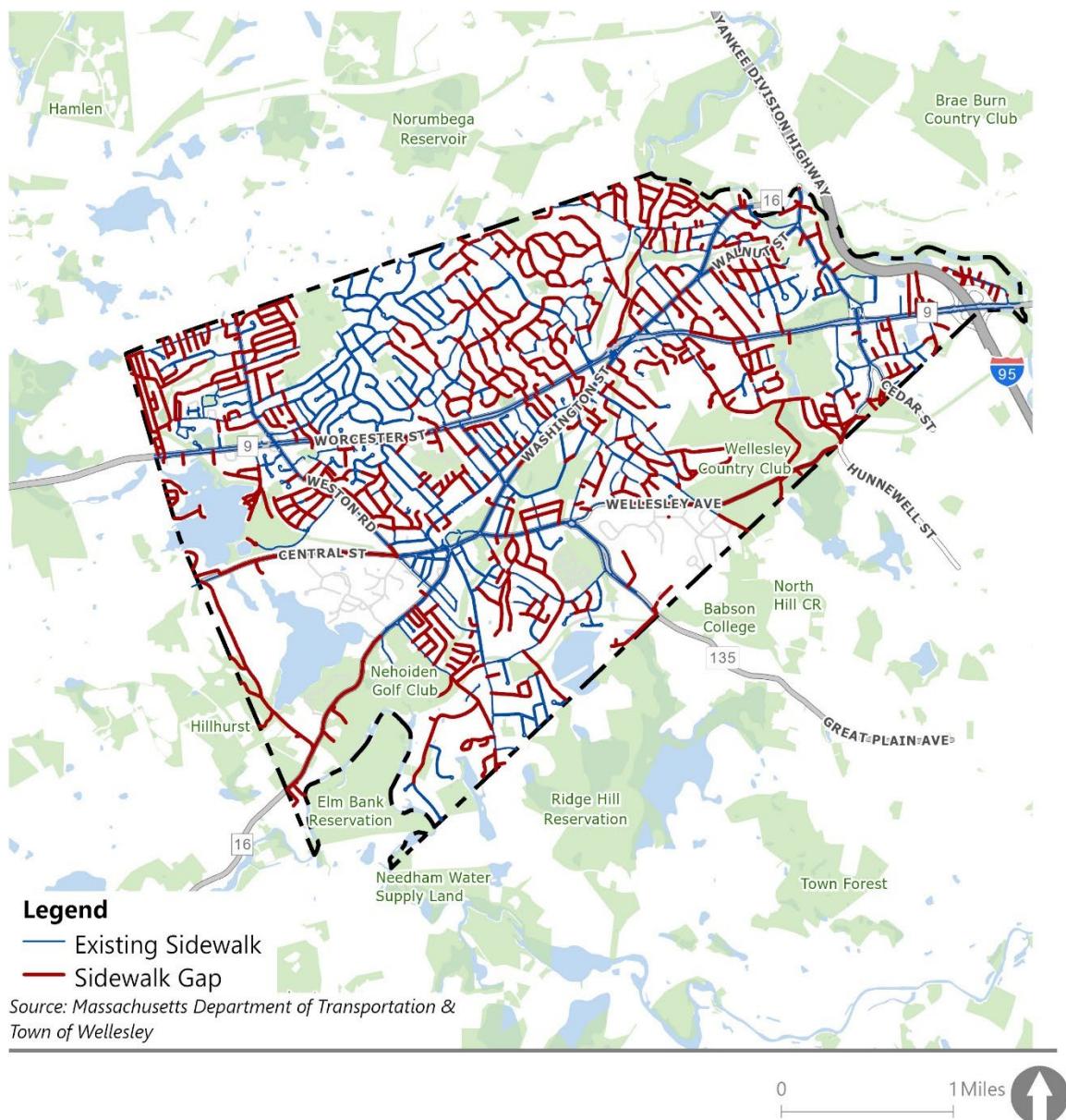
RESULTS

Table 4 shows the length of sidewalk gap in miles by roadway functional classification. It is important to note that 6% of Principal Arterials and 50% of Minor Arterials are missing sidewalks, which indicates significant barriers to pedestrian mobility. Figure 17 depicts the existing pedestrian network and associated sidewalk gaps in the Town of Wellesley. As illustrated below, most of the sidewalk gaps are located north of Worcester Street, particularly in the northeast and northwest parts of the Town. These gaps align with areas of high population and job density, such as Overbrook and Wellesley Farms. Additionally, sidewalk gaps are present on arterials with posted speeds exceeding 35 mph and vehicular volumes greater than 6,000 vehicles per day, including Central Street and Washington Street.

Table 4. Length of Sidewalk Gap (in miles) by Roadway Functional Classification

Roadway Functional Classification	Roadway (miles)	Sidewalk Gap (miles)	Roadway Miles without Sidewalk (%)
Principal Arterial	12.1	0.77	6%
Minor Arterial	7.8	3.87	50%
Major Collector	7.8	1.71	22%
Minor Collector	11.6	3.08	27%
Local	105.1	62.14	59%
Total	146.5	71.57	49%

Figure 17. Pedestrian Network Gap Analysis



Pedestrian Network Gap Analysis Wellesley Townwide Safe Routes Plan



Bicycle Level of Traffic Stress

This section presents the Bicycle Level of Traffic Stress (LTS) analysis for the existing roadway network in the Town of Wellesley. LTS is an approach that quantifies the amount of discomfort that people feel in different bicycling conditions. The LTS methodology adapted for this Plan is described below, followed by the analysis results.

METHODOLOGY

The LTS analysis assigns a numeric “stress level” between 1 and 4 to roadway segments based on roadway attributes such as traffic speed, traffic volume, number of lanes, presence of vehicular parking, ease of intersection crossings and others. LTS 1 is the least stressful, while LTS 4 is the most stressful. The LTS methodology in this Plan is adapted from the City of Boston’s Bicycle Level of Traffic Stress Technical Documentation⁶, which is adapted from the Mineta Transportation Institute’s Low-Stress Bicycling and Network Connectivity Report⁷ and NACTO’s Urban Bikeway Design Guide⁸. A definition of each level of traffic stress score is described below in Table 5, and Figure 18 shows an image of a table from Boston’s documentation that determined the level of traffic stress for each roadway segment.

Table 5. Level of Traffic Stress (LTS) Scores

LTS	Description
1	The corridor is comfortable for all ages and abilities including children. LTS 1 roadways are characterized by protected bike lanes or greenways, and very little to no intermingling with vehicular traffic.
2	Tolerated by most adults. There may be some turning conflicts, but cyclists are mostly separated from traffic through bike lanes. This type of corridor demands more attention from riders than an LTS 1 and is likely not suitable for children.
3	Roadways may have bike lanes next to multilane vehicular traffic with above average traffic volumes or vehicular speeds higher than 25 mph. An LTS 3 may also include shared lanes on streets that are not multilane and experience vehicular traffic speeds with a poster speed limit of 25 mph or lower.
4	Tolerated by only the most experienced and able-bodied riders.

Source: *City of Boston’s Bicycle Level of Traffic Stress Technical Documentation (December, 2020)*

⁶ City of Boston. (December 2020). *Bicycle Level of Traffic Stress: Technical Documentation*. <https://www.boston.gov/sites/default/files/file/2020/12/Bicycle%20Level%20of%20Traffic%20Stress%20Report%20%20Guide%20for%20Large%20Developments.pdf>

⁷ Mekuria, M.; Furth, P.; & Nixon, H. (May 2012). *Low-Stress Bicycling and Network Connectivity*. Mineta Transportation Institute. https://scholarworks.sjsu.edu/cgi/viewcontent.cgi?article=1073&context=mti_publications

⁸ NACTO. (2014). *Urban Bikeway Design Guide, Second Edition*. National Association of City Transportation Officials. <https://nacto.org/publication/urban-bikeway-design-guide/>

Figure 18. Bicycle Level of Traffic Stress Criteria

Vehicle Volumes ¹		Posted Speed			Conflict Factors ²	All Ages & Abilities Treatments		
		20	25	30+		Protected Bike Lane	Shared Street ³	Neighborhood Greenway ⁴
< 1,500	Bike lane	No Parking	LTS 1	LTS 1	LTS 2	Add 1 up to LTS 4	LTS 1	LTS 1
		Parking	LTS 1	LTS 1	LTS 3		LTS 1	LTS 2
	No bike lane		LTS 1	LTS 2	LTS 3			
1,500 - 3k	Bike lane	No Parking	LTS 2	LTS 2	LTS 2			
		Parking	LTS 2	LTS 2	LTS 3			
	No bike lane		LTS 2	LTS 2	LTS 3			
3k - 6k	Bike lane	No Parking	LTS 2	LTS 2	LTS 2	Add 1 up to LTS 4	LTS 1	n/a
		Parking	LTS 2	LTS 2	LTS 3			
	No bike lane		LTS 3	LTS 3	LTS 4			
> 6k	Bike lane	No Parking	LTS 3	LTS 3	LTS 4	Add 1 up to LTS 4	LTS 1	n/a
		Parking	LTS 3	LTS 4	LTS 4			
	No bike lane		LTS 3	LTS 4	LTS 4			

Source: *City of Boston's Bicycle Level of Traffic Stress Technical Documentation (December, 2020)*

The methodology primarily uses roadway segment attributes including vehicle volumes, speed limit, bicycle facilities, on-street parking presence, and conflict factors to determine the level of stress a bicycle rider is expected to experience on that street segment. Conflict factors include industrial, commercial, or hotel land uses; key bus routes; pick-up/drop-off zones (including cab stands or valet zones); and school zones. Conflict factors are included in the methodology because they may make bicycle riding more stressful due to increased vehicular traffic during certain times of the day. If one or more of the conflict factor criteria are met, the LTS score is increased by 1. The presence of multiple criteria does not increase the score by more than one initial point.

The LTS analysis for the Town of Wellesley was based on the availability and reliability of the Town and state data sources necessary for the LTS methodology outlined above. It is important to note that Interstate 95 is a limited-access highway and does not permit bicycle access, and therefore is not included in this analysis. Table 6 presents the data sources and assumptions used for the various criteria required to determine the LTS score based on the criteria in Figure 18.

Table 6. Bicycle LTS Data Sources and Analysis Assumptions

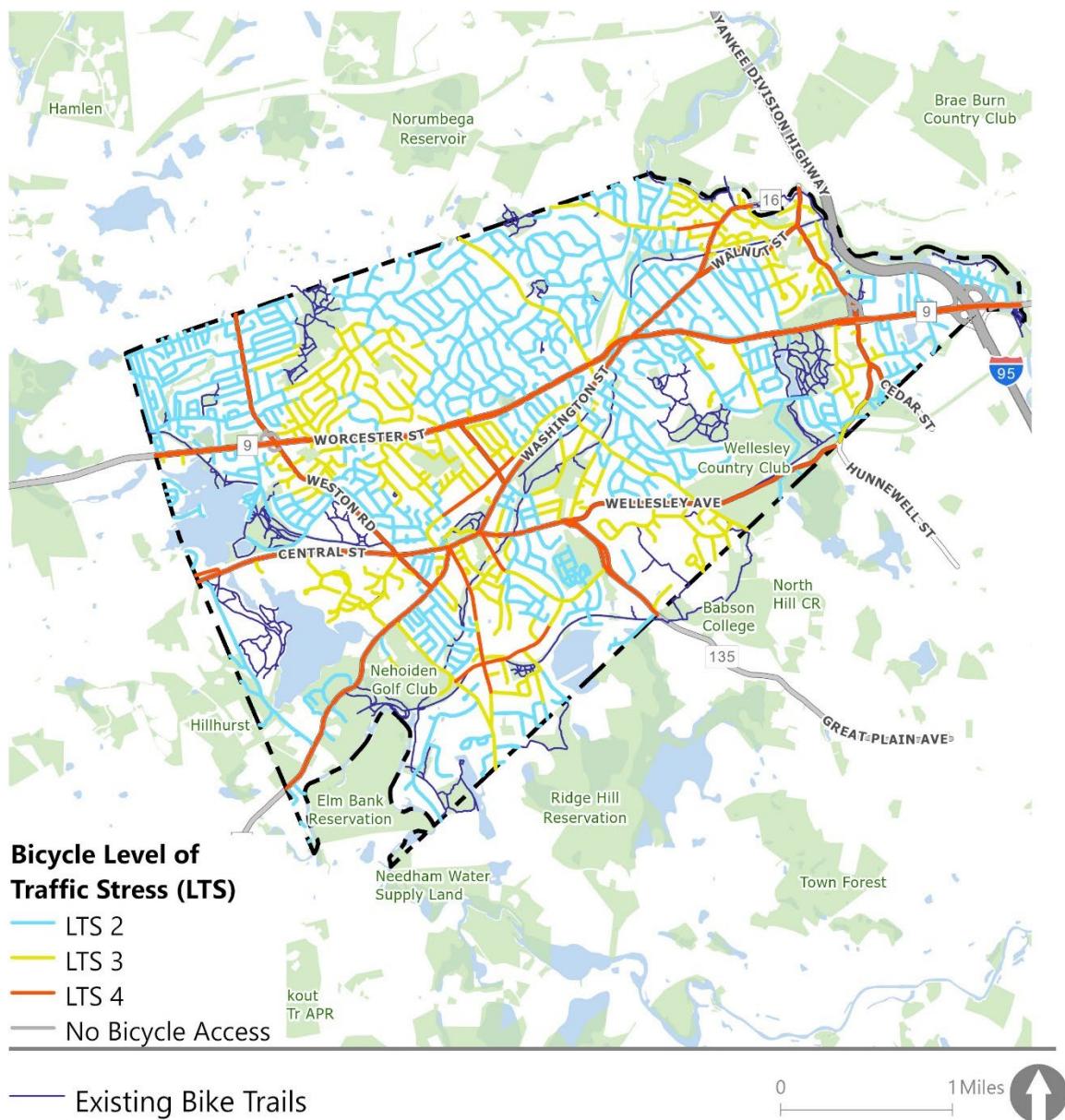
Data	Source and Analysis Assumptions
Vehicular Volumes	<ul style="list-style-type: none">Annual Average Daily Traffic (AADT) data is obtained from MassDOT's Traffic Inventory (2023).In instances where AADT information is not available for local roadway segments, the AADT is assumed to be between 1,500 to 3,000.
Bicycle Facilities	Information on bike lanes is obtained from MassDOT's Bike Inventory (2023) supplemented by the data on bike trails and shared-use paths from the Town of Wellesley.
Vehicular Parking	The presence of parking on roadways with bike lanes was obtained using Google Maps.
Posted Speed Limit	<ul style="list-style-type: none">Speed limit information is sourced from MassDOT's Roadway Inventory (2023).For local roadways where speed limit data is not available, a default speed limit of 25 mph is assumed.
Conflict Factors	<ul style="list-style-type: none">The Town of Wellesley's zoning map provides information on industrial and commercial land uses in the area.School zone information is obtained from the multimodal trip generators (Figure 2). Roadway segments within 0.25 mile of a school are considered to have a conflict factor.Key bus routes are identified using MetroWest Regional Transit Authority (MWRTA)'s route map, which includes Route 1 serving the Town of Wellesley.

RESULTS

Figure 19 illustrates the bicycle level of traffic stress (LTS) on Town of Wellesley's roadway network. As shown below, the Town's existing bike facilities are restricted to bike trails located in parks and conservation areas. Most local roads and collector streets in the Town have a Level of Traffic Stress (LTS) rating of 2 or 3, while arterial roads are rated LTS 4.

LTS 3 and LTS 4 are observed on roadways with AADT greater than 3,000 vehicles per day and are in the areas with conflict factors including commercial/school zones and key bus routes in the Town. Roadways with LTS 3 and LTS 4 in the Wellesley Square, Wellesley College, Babson College, Lower Falls neighborhood, and near the Weston Road / Worcester Street intersection. There are no LTS 1 roadways in the Town of Wellesley.

Figure 19. Bicycle Level of Traffic Stress (LTS)



Bicycle Level of Traffic Stress (LTS) Wellesley Townwide Safe Routes Plan



Key Existing Conditions Findings

Key findings from the existing conditions analyses include:

- **Multimodal Trip Generators:** Multimodal trip generators in the Town are concentrated in and around Wellesley Square, Wellesley Hills, and the Overbrook neighborhood.
- **Population Density:** Areas such as Wellesley Square, Babson Park, and Wellesley Lower Falls exhibit medium to high population densities. Additionally, population density is notably concentrated around major transportation corridors, including the MBTA Commuter Rail line, State Route 9, and State Route 27.
- **Employment Distribution:** Employment in the Town is predominantly concentrated in the central and northeast regions, with job densities ranging from 4,066 to 6,350 jobs per square mile.
- **Age:** Children under 14 years of age and older adults 65 years or older comprise greater than 30% of the Town's population. Safe and accessible infrastructure is crucial to promote walking and biking as transportation modes among vulnerable population groups, including children and older adults, ensuring that all age groups can use these modes safely and comfortably.
- **Vehicle Ownership:** Approximately 4% of the Town's occupied housing units do not own a vehicle.
- **Commuting Patterns:** Nearly half of the Town's workforce (49%) commute by driving alone in a car, 11% walk to work, and fewer than 1% bike to work.
- **Environmental Justice Populations:** Two census block groups with minority populations greater than 45% are designated as Massachusetts Environmental Justice (EJ) Populations. One of these block groups is located west of Wellesley Square, south of Central Street, while the other is south of Wellesley Avenue and west of the Wellesley Country Club. These EJ Populations are areas of priority in the Safe Routes Plan to ensure equitable access to active transportation in the Town.
- **Roadway Network:** More than 70% of the Town's roadway network comprises of local roads. Central Street, Great Plain Avenue, Worcester Street and Washington Street are arterials with posted speeds exceeding 35 mph. Several roadways in the Town have vehicular volumes greater than 6,000 vehicles per day, and several more experience between 3,000 and 6,000 vehicles per day. In the absence of appropriate facilities, higher vehicular volumes and speeds could pose barriers to walking and biking for individuals of all ages and abilities.
- **Sidewalk Gaps:** Most of the sidewalk gaps are located north of Worcester Street, particularly in the northeast and northwest parts of the Town. These gaps align with areas of high population and job density, such as Overbrook and Wellesley Farms. Additionally, sidewalk gaps are present on arterials with posted speeds exceeding 35 mph and vehicular volumes greater than 6,000 vehicles per day, including Central Street and Washington Street.
- **Bicycle Facilities:** The Town's existing bicycle infrastructure is limited to bike trails located within parks and conservation areas.
- **Level of Traffic Stress (LTS):** Most local roads and collector streets in the Town have a LTS rating of 2 or 3, while arterial roads are rated LTS 4. LTS 3 and LTS 4 are observed on roadways with AADT greater 3,000 vehicles per day and are in the areas with conflict factors including commercial/school zones and key bus routes in the Town. While LTS 4 roadways are generally arterials in the Town, LTS 3 roadways are in the Wellesley Square, Wellesley College, Babson College, Lower Falls and near Weston Road/Worcester Street intersection.