



# CENTRAL MASSACHUSETTS METROPOLITAN PLANNING ORGANIZATION (CMMPO)

# 2018 REGIONAL PEDESTRIAN PLAN

### **CHAPTER 1: INTRODUCTION**



In order to balance the needs of all system users, multimodal transportation options will become essential in the future. Municipalities across the Commonwealth are working hard to keep up with demands on the existing transportation network. Through this struggle, it has become apparent that cities and towns that seek a positive health outcome in the future will need to balance various modes of transport through an integrated, multimodal network. A balanced multimodal network will create a system that works to move people and goods in an effective, efficient, and safe manner. Indeed, the recognition that a balanced transportation system will lead to healthier outcomes for the residents and visitors to the region has moved to the forefront of transportation decision making. Land use patterns greatly influence regional quality of life and the efficiency of transportation systems, looking beyond transportation infrastructure alone.

The Central Massachusetts Metropolitan Planning Organization (CMMPO) region includes the City of Worcester and the thirty-nine (39) surrounding municipalities in southern Worcester County, Massachusetts. The transportation staff of the Central Massachusetts Regional Planning Commission, who serve as the staff to the CMMPO, have been charged with creating a comprehensive, multi-modal

strategy that includes pedestrian mobility as an integral part of the region's transportation system. The vison of the most recent CMMPO Long Range Transportation Plan, Mobility2040 is as follows:

The CMMPO envisions Central Massachusetts in 2040 as a growing region of 40 well connected, livable communities with congestion reduction, and improved multi-modal mobility and air quality. Healthy, creative transportation methods that integrate active travel modes through the use of technology will safely and efficiently move people between homes, jobs, and services and move products between places of manufacturing and sale.

The CMMPO vision strives to take advantage of walking's benefits to the region: improved health outcomes, air quality and environmental impact, transportation efficiency, safety, economic development and activity, attraction and retention of employers and employees, social engagement, and overall improved quality of life at a neighborhood and regional level. In cities and towns across the nation, walking has become a key factor for measuring a community's quality of life. Improved availability of efficient and safe pedestrian networks has played a strong role in making a city or region more competitive economically, attractive to a talented workforce, and sparked interest in public and private investment. The intent of this plan is to take an essential step toward a future where pedestrian travel is seen as a key component of a well-balanced multimodal transportation network.

Walking is a fundamental human activity that has been most often considered a recreational activity. While it is a recreational activity, more people are including walking trips in their daily work commute as opposed to driving alone. Providing adequate and connected pedestrian facilities is essential for the regional transportation planning process because of the positive health and community benefits from this active mode choice.

Planning for pedestrians has become more of a planning trend as almost every single trip, whether it be by car, bike, bus, train does involve some walking. Everyone is a pedestrian and to be consistent with *MassDOT's Municipal Resource Guide for Walkability,* the terms "walking" and "pedestrian" are used inclusively of people of all abilities including those using assistive devices. Staff at Central Massachusetts Metropolitan Organization's (CMMPO) responsibility is to ensure that pedestrians are afforded meaningful opportunities to walk safely and well. This report considers the context from which the 2018 CMMPO Regional Pedestrian Plan ("the Plan") carries forward past pedestrian planning work with ongoing Complete Streets planning and other related planning efforts underway in CMMPO communities.

#### **Purpose**

The CMMPO Regional Pedestrian Plan is intended to facilitate the expansion and upgrade of the pedestrian network in the region in order to encourage more walking trips and safely link important destinations to where people live. Additionally, this Plan is intended to document the extensive pedestrian-related planning and project development work being conducted in CMMPO's communities. The recommendations contained herein should be used as a guide for local jurisdictions in taking advantage of these opportunities. The intent of this plan is not to secure funding for every project, but to identify potential opportunities. Specifically, this Plan will:

- Identify opportunities to enhance pedestrian travel within the region;
- Assist local jurisdictions in pedestrian planning and project opportunities;
- Ensure that regional pedestrian goals are consistent with and support CMRPC's mobility 2040 update;
- Support the work of the CMRPHA's community health improvement program (chip) as it relates to walking, and;
- Guide CMMPO pedestrian policy and project performance monitoring/evaluation

The CMMPO Regional Pedestrian Plan will serve as the pedestrian component of the upcoming CMMPO Long Range Transportation Plan (LRTP). The goals of the Regional Pedestrian Plan must be consistent with the goals of Mobility2040, the current LRTP, but also the LRTP that will begin development over the next year. Implementation of the recommendations of this plan will provide for a comprehensive pedestrian transportation network that is focused on accessibility, mobility, and safety.

The tables on the following pages show how the goals and recommendations of the CMMPO Regional Pedestrian Plan work to integrate with the goals and initiaves of Mobility 2040, the CMMPO Long Range Transportation Plan.

# Table 1: Mobility 2040 Goals



Goal 1: To provide a network of safe, comfortable, direct, and convenient pedestrian facilities for all users of various skill levels and abilities

Goal 2: To reduce the reliance on automobiles while increasing the pedestrian mode split

Goal 3: To increase the safety of pedestrians for all users of various skill levels and abilities, while reducing injuries and deaths involving motorists and people.

Goal 4: To maximize the multimodal capacity of existing roadways

Goal 5: To provide improved pedestrian connections to existing and future public transit facilities

Goal 6: To facilitate and encourage government and public involvement in the planning and design of pedestrian facilities

Goal 7: To facilitate the connection between neighborhoods and recreational opportunities via pedestrian infrastructure

Goal 8: To provide pedestrian facilities that connect attractors and generators, such as schools, employment centers, town centers, parks, etc.

Goal 9: To ensure that the needs of pedestrians are considered during the planning and design of future projects in the public and private sector

Goal 10: To provide a more balanced and affordable transportation network

Table 3: Goal & Initiative Integration – Regional Pedestrian Plan and Mobility 2040

# Encourage Walking & Increase Pedestrian Mode Share

- •Maximize multimodal use of the region's pedestrian facilities
- Maintain, improve and add pedestrian/transit connections
- •Provide connections and also improve connections among the region's activity generators such as neighborhoods, employment, civic and recreational facilities

# Increase pedestrian Safety & Security

Reduce the number of bicycle and pedestrian collisions, injuries and fatalities
 Implement context-sensitive design standards and policies that emphasize safety and comfort

# Integrate Pedestrians' Needs Into Public & Private Projects

- •Support pedestrian issue and design advocacy
- •Facilitate and encourage public involvement in the region's pedestrian planning and design activities
- •Be the region's resource for walking by leveraging federal, state and municipal tools, funding and plans

# Expand on the Region's Pedestrian Infrastructure

•Keep database of pedestrian infrastructure for maintenance needs

#### **Benefits of Walking and Walkable Communities**

Cities and towns that invest in programs and infrastructure projects that encourage walking are able to reap the benefits at the community level and their residents personally enjoy lifestyle and health benefits. The term "walkable" refers to communities that provide safe, accessible, comfortable, convenient and connected pedestrian infrastructure for their constituents. People and communities are able to experience stronger social, economic, environmental and health benefits when improving walkability in their neighborhoods.

#### Mobility & Connectivity Benefits

- Accessible communities increase mobility options for everyone and are essential for the mobility of people with physical disabilities, limited mobility, or without access to a vehicle.
- Walking infrastructure increases opportunities for recreation by connecting residents and employees to parks, trails, and open spaces.



Image 1: Walkable communities have safe crossing facilities that include crosswalks,

# Safety Benefits

Complete Streets improve safety indirectly as well, by encouraging non-motorized travel and increasing the number of people bicycling. According to an international study, as the number and portion of people bicycling and walking increases, deaths and injuries decline. This is known as the safety in number hypothesis: more people walking and biking can reduce the risk per trip. Roadway design and engineering approaches commonly found in Complete Streets applications create long-lasting safety improvements through speed reduction. This type of engineering approach can encourage safer bicycling as well. Sidewalk bicycle riding, especially against the flow of adjacent traffic, is more dangerous than riding in the road due to unexpected conflicts at driveways and intersections. A recent review of bicyclist safety studies found that the addition of well-designed bicycle-specific infrastructure tends to reduce injury and crash risk. On-road bicycle lanes reduced these rates by about 50%. Greater intersection density and fewer lanes on major roadways are associated with fewer total, severe and fatal crashes because they slow vehicle speeds and encourage more predictable behaviors.



Figure 1: Motorists traveling at lower speeds are less likely to contribute to pedestrian fatalities and serious injuries. Credit: FHWA's Achieving Multimodal Networks.

#### Health & Wellness Benefits

The health benefits of regular physical activity such as walking are far-reaching: reduced risk of coronary heart disease, stroke, diabetes, and other chronic diseases; lower health care costs; and improved quality of life for people of all ages. Regular exercise provides the opportunity for health benefits for older adults such as a stronger heart, a more positive mental outlook, and an increased chance of remaining indefinitely independent—a benefit that will become increasingly important as our population ages in the coming years.

50% OF TRIPS IN METRO AREAS ARE LESS THAN 3 MILES 28% OF TRIPS ARE LESS THAN 1 MILE ALMOST 70% OF CMMPO SURVEY RESPONDENTS INDICATED THEY WOULD BE WILLING TO TRAVEL OVER 2 MILES VIA WALKING.

Figure 2 Trip Data (Source: Smart Growth America and CMMPO Survey Results

The automobile has become the dominate form of transportation for almost all trips in the United States, greatly exacerbating the sedentary lifestyle of the majority of Americans. Health advocates suggest that children and adults participate in a moderate level of activity for at least 30 minutes per day. Walking could be the answer for many people, be it to school or to work. The American Diabetes Association says walking lowers your blood sugar levels and your overall risk for diabetes. Researchers at the University of Boulder Colorado and the University of Tennessee found that regular walking lowered blood pressure by as much as 11 points and may reduce the risk of stroke by 20% to 40%. Once of the most cited studies on walking and health, published in the New England Journal of Medicine in 2002, found that those who walked enough to meet physical activity guidelines (30 or more minutes of moderate activity on 5 or more days per week) had a 30% lower risk of cardiovascular disease, compared with those who did not walk regularly.

(https://www.prevention.com/fitness/a20485587/benefits-from-walking-every-day/)

#### **Transportation Benefits**

Congestion is a growing concern in the CMMPO region, leading to wasted time, resources, and increased pollution. The shift of some daily trips from automobile to walking could help to ease congestion and lessen pollution. Approximately 50% of all trips in metropolitan areas are less than three miles in length, and 28% are one mile or less. In rural areas, 30% of all trips are two miles or less, and yet a vast majority of these trips are by automobile. Congestion is not solely an urban issue. Regions or all sizes have experienced increased congestion, costing the economy \$87.2 billion in hours lost to traffic jams and wasted fuel in 2007 alone.

An increase in walking and related improvements to infrastructure can also improve public transit ridership. Improved access to WRTA fixed transit routes will allow for trip chaining to cover greater distances without the need for an automobile. It is essential that the network developed in this plan provide connections between attractors/generators and transit facilities.

Walking is a no-cost option for children, young adults, senior citizens, or others who cannot afford to or choose not to own an automobile. About 44% of all vehicle trips in both congested areas and other areas made during the morning peak are not to work or related to a work trip. Instead, they are for shopping, going to school or the gym, or running errands. Many such trips are short and could be made by walking if a proper regional network is in place. Even if a small percentage of trips within the CMMPO region could be moved from an automobile to walking, there would be a marked effect on congestion. The development of a well-connected pedestrian network in the region is a much more cost-effective measure than trying to expand roadway lane miles in an already constrained fiscal climate.

#### **Economic Development Benefits**

Walking is a no-cost form of transportation for all system users. It is significantly more affordable than vehicle ownership, resulting in a greater share of income that is free to circulate into the economy via other means. It should be noted that this is not a practical option for a variety of situations, however, it can still lead to savings if certain trips are taken via walking or a reduction in the necessary number of cars per household. Additionally, it is possible that a reduction in healthcare costs could be realized due

to the increased physical activity and health benefits of traveling via pedestrian means as opposed to sitting in a motor vehicle.

The benefits of travelling on foot can be seen in the local economy as well. Residents who choose to travel on foot will more than likely shop in their local community as opposed to travelling a greater distance via automobile. This allows for more money and tax dollars to stay in the local community, supporting local merchants and residents. According to the National Complete Streets Coalition, this "green dividend" means that residents can spend money in other ways, such as housing, restaurants, and entertainment, that keep money circulating in the local economy.

A study by the Political Economy Research Institute at the University of Massachusetts, Amherst found that pedestrian and bicycle infrastructure projects create 11-14 jobs per \$1 million of spending while road infrastructure projects create approximately 7 jobs per \$1 million of expenditures. Because of the higher engineering intensity and labor requirements related to bicycle and pedestrian facilities, the employment impacts of said projects are higher than routine maintenance and resurfacing.

*Image 2 – Pedestrian infrastructure can help provide an economic boost to a neighborhood or corridor.* 

- Studies show that higher walkability in communities improves economic activities and attract new businesses.
- Homes in walkable neighborhoods have higher values than homes in less walkable neighborhoods.

#### Environmental Benefits

Replacing driving trips with walking trips can reduce carbon dioxide emissions, one of the main greenhouse gases that contribute to climate change. The more people that chose to walk over driving not only reduces carbon dioxide but other automobile emissions that cause adverse health effects.



Image 3: NACTO via Seattle Public Utilities

Additionally, many roadway designs that accommodate walking often include space for trees, landscaping and pervious surfaces, which reduces stormwater runoff and reduces flooding.

The American Lung Association gives Worcester County a grade of "C" related to Ozone air quality in its *State of the Air 2017* report, which represents an improvement over 1995-1996 levels. However, there is always room for air quality improvement and a reduction in ground level ozone. Motor vehicle emissions are responsible for a large percentage of gasses that contribute to lung cancer, heart and lung

disease, asthma, etc. Ozone can lead to premature death, breathing problems, central nervous system issues, and reproductive and developmental harm. Replacing driving with walking for shorter trips will help to improve regional air quality and energy efficiency.

(Source: http://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/ozone.html)

#### Equity Considerations

Providing safe, accessible and convenient walking infrastructure is something that everyone can use regardless of economic wealth or physical mobility. The ability to reduce the use of a household's motor vehicle can also greatly reduce the average household's annual transportation costs. According to one study, the cost of operating a sedan for one year in 2013 ins approximately \$10,374 (AAA, Your Driving Costs) Improving the pedestrian network in the CMMPO region is essential in providing residents and visitors who do not have an option to drive or ride a bicycle with a safe and reliable alternative that is virtually free. Finally, households with an annual income of less than \$25,000 are nine times more likely to have no car than households with incomes greater than \$25,000 (NHTS 2001).

#### **Employer Benefits**

Having employees who walk to work can provide employers with a host of benefits such as increased productivity, improved health, a lower number of missed days, and lower healthcare costs. It has been mentioned previously how people who choose to travel via pedestrian means are more connected to their communities and generally have a higher level of well-being. Employees who walk to work do not require the large amount of space that automobile parking takes up, leading to potential development and land acquisition savings. Furthermore, the time savings of not being stuck in automobile traffic can lead to increased productivity that benefits employees and employers alike. A well-connected pedestrian network can foster travel options for people who might otherwise be limited economically. This alternative travel network can open up employment opportunities for residents as well as expand the potential pool of employees.

#### Livability Benefits

Complete Streets, including bicycle facilities, are designed to be an important aspect of the livability of a community and region. The addition of bicycle facilities to the transportation network is a key part of creating networks that are for all users, increasing safety and system efficiency. The regional reliance on automobile travel leaves residents with a lack of modal choice. More urban areas such as Worcester or Southbridge feature destinations that are close in distance, but may be lacking in accessibility due to streets that are designed solely to



Image 5 – Walking provides residents and visitors with level of neighborhood interaction not possible in a vehicle.

move as many automobiles as possible throughout the day. The focus on the automobile as the main

mode of travel also has a greater impact on neighborhoods inhabited by people of color and people with limited economic means. An integrated transportation network that includes bicycle facilities can help residents who may not be able to afford a personal vehicle and rely instead on alternative transportation modes.

Safety also plays a large role in the livability of a region. High speed, auto focused roads are unsafe for bicyclists and pedestrians alike. According to the National Highway Traffic Safety Association, the 5-year moving average for cyclist fatalities in the Commonwealth from 2012-2016 was 10 deaths per year. The average for the CMMPO region from 2011-2015 is much lower, totaling to 0.2 deaths per year. While it could be seen as a positive trend that bicycle fatalities are lower in the CMMPO region, it could be argued that ridership is much lower due to a lack of a bicycle facility network that makes it safe and convenient for riders. A bicycle facility network that is well defined, safe, and reflects the community in which it is located will enhance the livability of a community for all residents and visitors.

A greater sense of community can develop when people in a neighborhood have the option to get out of their automobiles and stroll down the sidewalk or ride along in a bike lane or multiuse pathway. Social interaction is possible at a level that is unimaginable when residents are encased in automobiles. A well-designed bicycle network allows residents and visitors to interact with one another and their environment that enriches community character and builds a sense of place while increasing the perception of safety.

#### **Plan Development**

The 2018 CMMPO Regional Pedestrian Plan serves as an update to the 2011 Regional Bicycle & Pedestrian Plan. In order to allow for a more thorough analysis, the two components of the former plan have been split for the current update. This decision was made to reflect MassDOT's current efforts with the Statewide Bicycle Plan and the Statewide Pedestrian Plan. The 2018 Regional Pedestrian Plan has seven major associated tasks: Existing Conditions/Data Collection (where available), Analysis of Existing Conditions, Strategies/Facility Recommendations, Implementation/Benchmarking, Documentation, CMMPO Bicycle & Pedestrian Advisory Committee, Public Participation/Outreach.

#### Existing Conditions/Data Collection

The data collection phase involved the accumulation of Geographic Information System (GIS) data from CMRPC, MassDOT, and municipalities throughout the region. The data was collected to create draft regional maps of the existing conditions. Data collected included the following: schools, streets, rivers, railroads, Interstate Highways, existing sidewalk facilities on federal aid eligible roadways through the CMRPC Pavement Analysis Program and local roads in communities that have participated in the MassDOT Complete Streets Program with CMRPC, land uses, attractors and generators.

#### Analysis of Existing Conditions

After pulling together all of the available regional data, CMMPO staff began to analyze what was collected. Through careful analysis of the GIS data gathered, meetings with planning and engineering staff, local leaders and stakeholders, and a public involvement effort detailed in a later section, staff highlighted opportunities and constraints within the region.

#### Strategies/Facility Recommendations

A proposed strategy for addressing the regional pedestrian network needs was then prepared. Included were policies and programs that will assist CMMPO member jurisdictions in prioritization, end of trip amenities, infrastructure, maintenance, and education.

#### Implementation/Benchmarking

Staff created an implementation plan in order to provide guidance to completing the regional pedestrian network. The implementation plan includes policies and programs to address the Five E's: engineering, education, encouragement, enforcement, and evaluation. Benchmarks for gauging the success of the plan have also been included.

#### **Documentation**

All of the above tasks are detailed in this document. The documentation and recommendations within this plan are intended to provide a clear guide for the CMMPO and municipalities in the region to achieve the goal of a well-designed pedestrian network.

# CMMPO Bicycle & Pedestrian Advisory Committee (BPAC)

The CMMPO BPAC was established with the development of the 2011 Regional Bicycle & Pedestrian Plan. This committee has been restructured and revived for the 2018 Regional Bicycle Plan and the 2018 Regional Pedestrian Plan to provide direction and input on the development of both networks in the CMMPO region. Representatives from various municipalities, regional departments, and community groups have been invited to join the group. The committee is a valuable resource in the shaping of the plan and the final recommendations for the region.

# Public Participation and Community Outreach

A survey was developed in an effort to provide additional input and feedback about the regional needs regarding cycling and walking. The intention behind the survey was to collect a voluntary response from across the region, with the knowledge that the typical responder would already have an interest in bicycling and/or walking. The survey was administered mainly online, but hard paper copies were also made available.

Walk Bike Worcester, a local multimodal transportation advocacy group, was an integral partner in the dissemination of the survey and key stakeholder in the public outreach process. CMMPO staff utilized Facebook and Twitter to promote the development of the plan and provide links to surveys, information, and public meeting notices.

Sub-regional meetings with planning, public works, or engineering staff of the various CMMPO subregions were held to gain further input on local efforts and to provide a regional consistency to the plan. Each subregional meeting was presented with data and maps from stakeholder input sessions and asked to clarify or revise as necessary related to local needs and priorities. This approach was taken in order to try and receive the most amount of feedback from the 40 municipalities in the CMMPO region, allowing for citizen comment and a feedback loop with government officials.

Workshop participant comments and recommendations included:

- new connections between emerging residential development and traditional village centers i.e. Grafton and Northbridge;
- improved crosstown connections, connecting segments of pathways and trails already developed; first mile/last mile connections between transit via walking Worcester

Predictably, most participants focused upon bicycling, and almost all participants' concerns were truly Complete Streets issues, not solely pedestrian issues.

• Regional walking (hiking)

Concurrent to the sub-region meetings, CMRPC released an online bicycling and walking survey in July 2018. Respondents were asked to indicate:

- walking activities by trip type;
- knowledge of rules and regulations pertaining to walking

- considerations & impediments when choosing to walk
- perception of safety when walking;
- walking facility improvements

A key goal for this survey was to judge the state of walking in the region today and to generate ideas for future policy and project development. Respondents commented on the following pedestrian issues:

- limited sidewalk infrastructure or infrastructure in poor condition
- connections from newer low-density residential neighborhoods to older established village centers
- traffic enforcement, interactions with vehicles and bicyclists

Staff observed that regional trail systems tended to be a higher priority for cyclists, where 'local' infrastructure was more important to pedestrians.

The region's cities and towns are the front-line organizations most often responsible for pedestrian infrastructure construction and maintenance, and some are actively planning and funding construction/repair of such infrastructure. In public rights-of-way, this work is almost always a component of a larger roadway project, and is the responsibility of most communities' engineering and/or public works' departments. As many have noted, the transportation industry has forever devoted most performance monitoring and data generation to motor vehicle operations. Consequently, little systematic pedestrian activity recording occurs.

#### **Pedestrian Facility Types**

This chapter is intended to provide definitions, descriptions and other useful technical information regarding pedestrian facilities. Consistent design and descriptions of pedestrian facilities will provide a network that is predictable for all transportation system users, increasing safety and efficiency in the region. The guidelines and descriptions provided in this chapter are based primarily on the national guidelines established by the American Association of State Highway and Transportation Officials' (AASHTO) 2010 Guide for the Planning, Design, and Operation of Pedestrian Facilities, and the U.S. Department of Transportation Federal Highway Administration's 2009 edition of the Manual on Uniform Traffic Control Devices (MUTCD). Additional Information is provided by the Draft MassDOT Municipal Resource Guide for Walkability. Regardless of how one travels during their daily journey, they are a pedestrian at some point in the day. It is imperative to provide facilities that are thoughtfully designed to be safe and easy to navigate in areas of the region that are conducive to pedestrian activity. The table below highlights the basic categories of pedestrian on-street facilities.

Facility	Land Use	Location/	Setting	Cost	Preferred
Туре		Placement			Width
Sidewalks	Varies	Parallel to Road	Urban/Rural	Medium	5ft. +
Crosswalks	Varies	Crossing	Urban/Rural	Low	8ft. +
Curb Ramps	Varies	Crossing	Urban/Rural	Low	5ft. +
Overpass	Varies	Over Roadway	Urban	High	10ft. +
Transit Stop	Varies	Parallel to Road	Urban	Low-Medium	N/A
Shared Use Path	Varies	Parallel to Road	Urban/Rual	Medium-High	10ft. +

#### **Types of Pedestrian Facilities**

#### Sidewalks / Walkways

Pedestrian travel facilities are often referred to as sidewalks or walkways and primarily provide transportation system users a safe space within the right of way that is separated from motorized traffic. The sidewalk area is typically located in the area between edge of the right-hand travel lane / fog line and the edge of the roadway right of way. The preferred width for sidewalks is five-feet in order to be compliant with the Americans with Disabilities Act (ADA), with a minimum acceptable width of four feet in order to maintain compliance. Sidewalks are encouraged to be much wider in width in areas where there is a high level of pedestrian activity. Sidewalks serve a dual purpose of a transportation system for commuters and recreational users who are enjoying exercise.

Sidewalks also serve as a buffer zone between vehicles and pedestrian traffic, preferably with a planting strip that could include grass or street trees whenever possible. This buffer area can be employed to accommodate signage, utilities, street furniture or other amenities. Urban areas with narrow right of way may have difficulty accommodating street trees without creative placement, as they typically require at least four feet for root systems. Sidewalks form the pedestrian area of the larger buffer zone that may include on-street parking, bicycle facilities, and curbing/gutter.

Sidewalks / Pedestrian Corridors also typically have an area known as the frontage zone that helps to ensure that adjacent structures (fences, signs, buildings, etc.) do not impede pedestrian travel. Active frontage zones in urban areas may include seating for dining, while passive frontage zones in suburban or rural areas may include additional plantings that do not impede travel. ADA accessibility should always be a priority when designing pedestrian walkways and frontage zones, and should be incorporated where appropriate when bridge replacement and rehabilitation projects take place, ADA accommodations are often severely lacking on older bridges in the CMMPO region.

#### **Crossing Facilities**

Pedestrians are often hindered in their attempts to safely cross roadways and intersections across the region, as such, crossings are an integral part of a safe pedestrian network. Crossing facilities include the following: marked crosswalks, pedestrian overpasses or underpasses (tunnels), curb ramps, transit stops, and all the related signage or signalization. Safety is the highest-ranking priority when it comes to crossing siting and design, as it places pedestrians in direct conflict with motorized traffic. Clear markings and signage are necessary to provide information not only to motorists, but pedestrians as well. Areas of the CMMPO region that have higher levels of pedestrian as well as vehicular traffic should be a priority for safety improvements related to crossings.

Crossing zones, whatever form they make take on, should be an area where people feel safe to cross the street. In situations where people do not feel safe crossing the street at a particular intersection or midblock area, they make avoid using facilities and choose to cross in unmarked locations instead, greatly increasing their chances of being struck by a motorized vehicle or rail line. Furthermore, poorly designed pedestrian crossings can actually decrease pedestrian travel in an area due to their discouraging effects.

Complete Streets improvements such as pedestrian refuge islands, curb extensions, and rapid-flashing beacons can help to slow down and alert motorists to the presence of people who need to cross the street. Many municipalities in the CMMPO region have begun to participate in the MassDOT Complete Streets Program and have developed plans to improve crossings within their jurisdictions.

# **Curb Ramps**

Curb ramps provide access between the sidewalk and roadway for people using wheelchairs, strollers, walkers, crutches, handcarts, bicycles, or who have mobility restrictions that make it difficult to step up and down high curbs. Curb ramps must be installed at all intersections and midblock locations where there are pedestrian crossings, as mandated by federal legislation (1973 Rehabilitation Act and ADA 1990).

When possible, it is preferred that a separate curb ramp be installed for each crosswalk at an intersection, rather than one ramp for all directions as it will not provide proper orientation for visually impaired pedestrians. Additionally, warning pads should be provided to alert pedestrians that they are approaching the edge of the sidewalk and entering the street. CMMPO member municipalities are required to meet ADA compliance with newly constructed projects, and are encouraged to upgrade

existing facilities. The MassDOT Complete Streets Program has provided municipalities with an opportunity to work with CMRPC staff to audit and catalog sidewalk and ramp conditions through the Tier II Prioritization process.

High pedestrian activity areas, such as town centers, commercial districts, school zones, parks, hospital/medical areas, senior/assisted living areas, and transit stops should all be prioritized for ADA compliance and curb ramp installation/retrofit. Curb ramps should be constructed to current ADA design standards whenever and wherever possible.

#### Marked Crosswalks

Crosswalks are typically installed to delineate optimal or preferred locations for pedestrians to cross a roadway or intersection. Marked crosswalks help to provide visual information and clarity for pedestrians and motorists. Crosswalks are often installed at larger, busier intersections that are signalized, interstate or highway on and off ramps, school zones, or other hazardous locations. High pedestrian volume locations should have marked crosswalks in order to guide pedestrians through a preferred pathway in the intersection to maximize safety. Crosswalks can be raised to calm traffic and reduce vehicle speeds. There are various ways to delineate crosswalks. Many times, municipalities will supplement marked crosswalks with MUTCD approved signage to provide additional warning for motorists. Municipalities should be aware that pedestrians will often choose the easiest path of travel through intersections or across roadways, and should take care to install crosswalks in locations that are both convenient and safe.

#### Pedestrian Overpasses / Underpasses

Walkways that are located above or below roadways or rail lines allow for the uninterrupted flow of pedestrians and motorized traffic. It should be noted that overpasses and underpasses are high-cost infrastructure solutions that are typically visually intrusive and should only be installed in cases where all other options have been explored. Safety issues are typically the main driver behind overpasses/underpasses, and no other options are feasible.

In order to provide ADA compliance, it is often necessary to have an extensive ramping system or elevators that can accommodate wheelchairs, other assisted mobility devices, or even bicyclists in some cases. In many cases, the additional length and potential steep slopes that is required discourages use. Overpasses are preferable when the facility they cross is below grade, allowing for a relatively flat crossing, such as over a depressed freeway. Underpasses work well when they are designed in a manner that is welcoming to users, and makes them feel safe in terms of personal security.

#### **Transit Stops**

Pedestrian access to a robust public transportation system is essential to a well-connected regional network that has a high quality of life. The Worcester Regional Transit Authority has a number of fixed route transit routes that cover approximately 40% of the CMMPO region. Signage, lighting, shelters, trash barrels, and bicycle parking are desirable amenities that may be present at larger bus stops in

heavy pedestrian areas. An accessible pedestrian network is desirable in areas that are served by fixed route transit service, with a complete sidewalk network that has safe crossings located at convenient intervals.

Transit stops should be located in proper areas in order to enhance pedestrian safety. Care should be taken to not obstruct pedestrian line of sight or motorists' line of sight regarding crossing pedestrians. Far-side bus stops are encouraged to provide a higher level of pedestrian safety through visibility. Bus stops located at the far side of intersections may also improve traffic operations.

ADA accessibility is essential to a well-connected public transit system, all bus stops should be accessible to pedestrians in wheelchairs, and should connect to the sidewalk network free from obstructions. Whenever possible, an allowance for adequate room for wheelchair lifts or curb ramps to allow street boarding.

#### **Off-Road Pedestrian Connections**

Off-street pedestrian connectors are similar to shared-use paths, except that they usually only extend a short distance and they usually connect a residential development to another destination, such as a park, school, or commercial development. They are typically provided in areas that have a high potential for pedestrian trips but where the roadway network would otherwise require significant out-of-direction travel. Like shared-use paths, off-street pedestrian connectors can also accommodate other modes of non-motorized travel, such as bicycling.

#### **Pedestrian Amenities**

As mentioned in the Regional Bicycle Plan, end of trip facilities can encourage people to commute or to simply increase their daily pedestrian activity level. The focus of these facilities is to make it as easy as possible for commuters to choose walking as opposed to another form of transportation. Comfortable seating and pedestrian lighting should be provided in high pedestrian activity areas and major transit transfer points. Street trees and other facilities that provide shade from the summer sun are also recommended. Water fountains are also a welcomed amenity along heavily traveled routes.

#### **Shared Use Facilities**

Some facilities are designed to be separated from traffic for use by both cyclists and pedestrians, they are typically referred to as shared use paths. Shared use paths are seen as an excellent way to promote cycling and walking due to their perceived increased level of safety. Shared use paths are often constructed along rivers or other waterways, utility corridors, limited access roadways, abandoned or active rail lines, or in parks or other open space areas. Shared use paths often attract a wide variety of users with an equally wide variety of skill levels. It is important that the paths are wide enough for two-way travel, with typical widths from 10 to 14 feet.

Some consideration should be taken regarding the following in relation to shared use paths: <a href="http://www.pedbikeinfo.org/planning/facilities\_ped\_paths.cfm">http://www.pedbikeinfo.org/planning/facilities\_ped\_paths.cfm</a>

- Shared-use paths are a complement to the roadway network; they are not a substitute for providing access on streets.
- Connections to the regular street network are important, but a high number of crossing at intersections create potential conflicts with turning traffic.
- At intersections with roadways, paths should be signed, marked, and/or designed to discourage or prevent unauthorized motorized access.
- All users should be encouraged to stay right. An exception may be paths along waterways or other features that capture the attention of pedestrians. In these instances, markings and/or signage may be used to encourage pedestrians to stay on the side of the path closest to the attraction to reduce conflicts associated with pedestrians crossing the pathway.
- Since nearly all shared use paths are used by pedestrians, they need to meet the accessibility requirements of the Americans with Disabilities Act (ADA).
- In areas with extremely heavy pathway volume, it may be necessary to segregate pedestrians from wheeled cyclists.

#### **Existing Conditions**

A thorough analysis of existing conditions in the Central Massachusetts Metropolitan Planning Organization region is necessary before providing recommendations for new facilities, programs, and policies. The cataloging of existing conditions allowed MPO staff, along with regional stakeholders and citizens, to develop a baseline for developing and prioritizing new projects. The analysis of existing conditions included looking at all available data on federal aid eligible roadway sidewalks, as well as available data from local sidewalk inventories, projects that are programmed for construction in the near future, origins and destinations that are or could be popular for pedestrians, and existing opportunities and constraints that could play a role in how pedestrian infrastructure is developed in the future.

It should be noted that within the CMMPO region, there is a general lack of data regarding the presence, location, or condition of sidewalks. CMRPC Transportation Staff have tried to remedy this lack of data by collecting sidewalk conditions along Federal Aid eligible roadways when performing yearly Regional Pavement Analysis for each of the six subregions. Typically, the installation of sidewalks has been required of land developers in more urbanized areas of the region, while many rural and some suburban areas do not or did not in the past require their provision. Responsibility for the maintenance of sidewalks varies throughout the region between adjacent property owners, municipalities, and the Commonwealth/MassDOT. Design standards and materials used for sidewalk construction throughout the region varies widely, the vast majority of which predates the Americans with Disabilities Act (ADA), requiring extensive upgrades to accommodate pedestrians who have mobility impairments.

The CMMPO region's forty communities vary widely - from rural and suburban to urban – all with various levels of accessible pedestrian infrastructure. For example, the long distances between housing, employment opportunities and essential services in many rural and small towns do not necessitate multi-modal transportation facilities. Instead, these areas have road systems that are designed for vehicular traffic as opposed to pedestrians and bicyclists. In the region's more urban areas, one would find more sidewalks and protected walkways.

Assessing pedestrian needs and conditions in the region was the first task for the development of this plan. It should be noted that the needs and conditions analysis is ongoing, and will be expanded upon in the years to come, this effort is merely a beginning. This task highlighted a lot of the existing walking conditions experienced by pedestrians. Staff approached the assessment by analyzing existing walking infrastructure inventories and feedback elicited through public outreach to determine an area's "walkability," or how friendly and/or safe an area is to walking.

The regional sidewalk network has many gaps in connectivity, which can lead to barriers to pedestrian travel at the neighborhood, municipal, and regional level. This lack of adequate available data in terms of location, condition, and age of pedestrian facilities has made it difficult to truly assess the regional

pedestrian network. Some municipalities do have information regarding pedestrian or multi-use facilities within their borders. All submitted information will be incorporated into the plan, but many of the pedestrian-related recommendations will focus on increased data collection before additional programmatic and policy-oriented recommendations can be made. Additionally, CMRPC is currently in the early stages of a multi-year Regional Trails planning effort that will provide a great deal of data clarity regarding off-road pedestrian and bicycle facilities.

Pedestrian *activity* data (like bicycling volumes) data remains difficult to obtain. Planners have long relied on snapshots (i.e. Census Journey to Work data), volunteer field surveys of specific locations or path/trail facilities, and the occasional Statewide Household Travel Survey (2012). Mobility innovations (i.e. FitBit, SmartPhone apps) are enabling better collection/sharing of pedestrian activity data. An exception to this is the transportation community's focus upon safety and the reporting of injuries and fatalities. The collection and reporting of pedestrian-related injuries and fatalities has been led by MassDOT through the development of its Highway Safety Plan, with active participation of every MPO region including the CMMPO.

#### **CMMPO Walking Trips vs. Statewide Walking Trips**

One source of walking data available is through the American Community Survey (ACS). Data is collected and aggregated into five-year totals for commuting trip types to work for anyone aged 16 and older. The chart below shows the percentage of carpool, public transit and walking trips for CMMPO and Massachusetts commuters. The amount of walking commutes in the CMMPO region has dipped slightly from the 2009-2013 ACS data to the most recent data in 2012-2016. As for the state of Massachusetts, walking trips have increased slightly from the 2009-2013 ACS data to 2012-2016 ACS data to 2012-2016.



**Constraints and Opportunities** 

The existing conditions in the CMMPO region were evaluated by the Transportation staff in order to understand where potential opportunities and constraints exist in the region regarding travelling as a pedestrian. Opportunities and constraints do not always have to be physical in nature, they can be created by a culture of travel that is dominated by the automobile, cyclist/motorist/pedestrian behavior, municipal policies, or general attitudes toward pedestrians.

The recommendations of this plan are intended to serve as a starting point for a more robust pedestrian network for the region, however, the CMMPO and the 40 municipalities in the region should always be on the lookout for new opportunities to provide the best network possible for residents and visitors who travel via pedestrian means. New opportunities could present themselves in the future that may reduce or eliminate constraints identified in this plan, leading to a more connected network for pedestrians. One of the goals of this plan is to provide a network of safe, comfortable, continuous, direct, and convenient pedestrian facilities for all users of various skill levels and abilities, the reduction of constraints is essential in the achievement of said goal.

#### **Constraints**

Most of the factors that present constraints to developing a connected pedestrian network are common to many metropolitan areas across the United States, the Worcester Metropolitan area is no exception to this challenge. Listed below are some of the constraints that present the greatest challenge to connectivity:

- Interstates/Limited Access Highways
- Active Railways
- Rivers, Streams, other bodies of water
- High-speed/High-volume roads
- Right of way issues (funding/acquisition)
- Perception of safety
- Land use/Development patterns
- Climate
- Terrain
- Roadway/Facility Maintenance

#### Interstates/Limited Access Highways

The Interstate and limited access highway system in the CMMPO Region consists of I-90, I-190, I-290, I-395, I-495, and MA-146; all of which present barriers to mobility in the communities that they pass through. Additionally, in some instances, the crossings provided are large, multi-lane, higher speed roadways or bridges that add to the difficult and often dangerous nature of walking around highways. High-speed, high-volume roadways often have minimal accommodations for pedestrians and are some of the most difficult segments of roadway to retrofit for pedestrian facilities.



Image 5 – Interstate 290

# Active Railways

In addition to the safety hazard that train tracks pose to people crossing them, active railways can also serve as barriers to pedestrian travel. Lack of crossings or grade separation over long distances, or a high level of rail traffic, can create a barrier similar to that of an Interstate Highway. Much like highway interchanges, extra planning is required in many cases.



Image 6 – Active rail can be an impediment to the regional network. Source: railpictures.net

# Rivers, Streams, other bodies of water

There are a large number of rivers, streams, lakes, reservoirs, and other bodies of water in the CMMPO region that provide a high level of natural resources, recreation opportunities, and scenic beauty to each of the 40 cities and towns of southern Worcester County. While providing a needed natural resource, waterways and other bodies of water can present barriers to pedestrian travel. Narrow pre-existing bridges or long intervals without a crossing are two of the ways that people who walk can be affected by waterways.

# High-Speed / High-Volume Roads

Many of the major roads in the region carry large volumes of traffic that travels at higher speeds. These roadways are unsafe for people who walk without the proper infrastructure in place. Many of these roadways are the most direct route between town centers or other attractors or generators. They present a large barrier to pedestrian connectivity.

# Right of way issues

In many instances, it may be necessary to acquire additional right of way in order to accommodate pedestrian facilities along roadways. The cost for adding or developing additional right of way can be

prohibitive when it comes to locating sidewalk facilities, especially in urbanized areas. Gaps in the pedestrian network can occur when right of way becomes a problem, this can diminish the functionality of the network.

ALMOST 60% OF SURVEY RESPONDENTS STATED THAT THEY FELT A LACK OF SAFETY WHEN WALKING.

# Perception of Safety

Perhaps more than any other reason, perception of safety

colors people's attitudes toward walking. People will not embrace walking as a valid form of transportation if they do not feel safe while doing so, they will choose another form of transport almost every time. Feedback received through public outreach, as well as stakeholder interviews, indicates that a good deal of the region's residents and workforce do not walk more often because of their perceived level of safety. Motorist behavior, lack of facilities, lighting, enforcement, roadway debris, and lack of visibility at night were some of the issues listed regarding perception of safety.

#### Land Use Patterns

Segregated land use patterns in many of the forty CMMPO communities can discourage travel via pedestrian means. Long distances or difficult connections between residential and other forms of land use can create barriers between origins and destinations. These barriers lead many who are able to choose automobile travel to do so. In order to increase the viability of walking, an effort should be made to incorporated mix-use into new development in the region. The blending of uses will help to bolster the multimodal network in the region.

#### Climate

The CMMPO region typically has long winters with significant snowfall totals. This can be a deterrent to walking due to snow removal, cold, and lack of end-of-trip facilities. People who walk may feel an increased perceived lack of safety in winter months due to narrowed useable right of way, varied levels of snow clearance, and the general unpleasant nature of commuting in winter.



# Roadway and Facility Maintenance

Image 7 – Climate plays a major role in the ability of residents and visitors to travel via pedestrian means.

Many communities in the CMMPO region struggle to maintain their transportation networks. This can create a barrier for people who walk in the region. A lack of or deteriorated sidewalk network leads to reduced visibility and perceived safety for pedestrians. Patched pavement and sidewalks from utility construction as well as deterioration from winter storms and plowing can make travel difficult for people and may even create hazardous conditions related to crashes.

#### **Opportunities**

The CMMPO region also has a great deal of opportunities when it comes to establishing or improving pedestrian facilities in each of its forty communities. Some areas with high opportunity potential are:

- Future Roadway Improvements
- Active Railway Right of Way
- Abandoned and Inactive Railway Right of Way
- Utility Easements
- Topography in Town Centers
- Existing Roads with excess width
- End of Trip Facilities

#### Future Roadway Improvements

Roadway Improvement projects, whether they occur through the Transportation Improvement Program, Town Initiatives, Chapter 90, Complete Streets Program, or other avenues, are excellent opportunities to expand or improve the pedestrian transportation network. When pedestrian facilities are included in the planning and design, right of way, and construction of roadway improvements, the cost can be lower than retrofitting existing roads with the same facilities. Projects identified in various local and regional plans, such as the CMMPO Long Range



Image 8 – Roadway Improvement Projects are opportunities for the expansion of the pedestrian network. Source: MassDOT

Transportation Plan, CMMPO Transportation Improvement Plan, local Complete Streets Tier II Prioritization Plans, as well as municipal master plans can provide opportunities for the CMMPO and local municipalities to expand the regional pedestrian network, as well as fill in gaps.

#### Active Railway Right of Way

Rail corridors are often wide and contained cleared areas alongside tracks in order to provide access for maintenance or visibility. In some areas, it is feasible to locate a multi-use path within the railroad right of way, as is the case with a portion of the Blackstone River Bikeway in northern Rhode Island. This use of rail corridor to form connections between origins and destinations, is referred to as "Rails-with-Trails." While these corridors are often located in ideal locations for town to town connections and are usually graded in a manner that is conducive to cycling and pedestrian activity, it is often difficult to create agreements between freight rail operators and municipalities.

#### Abandoned and Inactive Railway Right of Way

Much like the corridors mentioned in the previous paragraph, abandoned or inactive railway corridors can provide excellent opportunities for regional connectivity if the proper agreements can be developed. "Rails-to-Trails" projects typically provide regional connections that are useful for recreational and commuting needs due to the historic layout of railroads. Typically, an abandoned rail corridor may be owned by a municipal, state, or other governmental entity, although in some cases a private interest may control the property.

#### Utility Easements

Powerline corridors, pipeline corridors, and other utility easements can also serve as regional additions to the pedestrian / multi-use pathway network. Utility easements typically cover long distances and provide direct connections between potential origins and destinations. In most cases, the land located in the easement is used as an access road to maintain the infrastructure. This lends to the potential for using the easement for alternative travel modes. As with the rail corridors mentioned previously, extensive agreements need to be reached in order to add easements to the transportation network. A

good deal of coordination is necessary with utility operations as well as adjacent land owners in order to reach a shared use agreement.

# Topography in Town Centers

While the CMMPO region is known for its hilly terrain, it does have a number of town centers that are relatively flat, which lend themselves to pedestrian networks that are easy to navigate. Town centers that are not physically challenging to traverse via pedestrian means will allow for a shift in local trips from the automobile to walking with the appropriate investment in facilities and coordinated land use activity.

# Existing Roads with excess width

Many roads in the CMMPO region have wide lanes that are not painted with shoulder or "fog" lines or have multiple travel lanes that are larger than required. This extra width could be used to accommodate pedestrian travel. Extra wide lanes can be narrowed to modern acceptable standards to allow for pedestrian facilities to be installed, and shoulders can be striped and properly signed to allow for bicycle travel. Additionally, some of the multi-lane roadways in the region could be narrowed through a "road diet" to accommodate cycling and pedestrian infrastructure. Traffic analysis can be performed in order to determine a road's eligibility for a reduction in lanes and associated levels of service.



Image 9 – Roads with excess width are prime candidates for pedestrian network expansion or improvements.

# End of trip facilities

As mentioned in the Regional Bicycle Plan, end of trip facilities can encourage people to commute or to simply increase their daily pedestrian activity level. The focus of these facilities is to make it as easy as possible for commuters to choose walking as opposed to another form of transportation. This is especially true in areas that are highly conducive to walking, or contain a lot of attractors and generators. End of trip facilities are an important factor taken into account when people who walk are making a decision whether or not to commute to work via pedestrian means.



Image 10 – End of Trip Facilities

#### **Commuter Needs**

According to US News and World Report, the average commute in the Worcester Metro area is 28.3 minutes, which is approximately 2.2 minutes longer than the national average. Additionally, approximately 90% of commuters travel via automobile, leading to congestion and air pollution. One of the main goals of this regional pedestrian plan is to reduce reliance on the automobile for daily travel. In order to do this, it is necessary to make it easy and practical for CMMPO region residents and workers to make some daily commute trips via walking instead of by automobile. In order to make the shift from automobile to walking more practical, the CMMPO and municipal governments should focus on providing a connected pedestrian network that not only has on and off-road facilities, but the following characteristics should be present as well:

- <u>A Convenient Network of Facilities</u> Sidewalks and paths should be installed to provide logical and safe connections between major attractors and generators, such as residential areas and commercial districts. People who walk usually prefer sidewalks for their commute, however, greenways or other multi-use paths would also be beneficial to creating a robust network in the CMMPO region.
- <u>End of trip facilities</u> Amenities such as benches, trash receptacles, pedestrian lighting, and water fountains should be located at larger employment centers or other popular destinations.
- <u>Facility maintenance</u>- Road debris and broken pavement and sidewalks can create very dangerous situations for pedestrians. An online system with a map component for reporting and addressing maintenance issues would go a long way to ensure a safe pedestrian network.
- <u>Integration with WRTA and MBTA transit</u> In order to establish a truly interconnected transportation network, pedestrian improvements should be coordinated with regional transit planning whenever possible to provide a robust system that allows for efficient movement across modes.
- <u>Safety & Enforcement</u> Up-to-date design standards are necessary when constructing the
  pedestrian network for the CMMPO region in order to provide an acceptable level of safety and
  connectivity. Furthermore, a proactive enforcement approach from local police departments
  would go a long way to reduce rates of crashes and aggressive transportation system user
  behavior.
- <u>Information Availability</u> Municipalities and CMMPO staff should work together to provide the most up-to-date information regarding pedestrian network travel, available routes, maps, end of trip facilities, ways to report maintenance related issues, and more. All town websites as well as the CMRPC website should include relevant links regarding the pedestrian network.
- <u>Encouragement</u> Activities such as those that take place during Bay State Bike Week, with bike
  to work day, International Walk to School Day, safety campaigns, and commuter incentive
  programs such as MassRIDES all help to encourage more CMMPO region residents to choose to
  bike or walk to work or school. Educational campaigns should focus on the rules of the road for
  all transportation system users so that everyone on the road or other facilities knows their rights
  and responsibilities.

#### **Recreational Needs**

The needs of recreational pedestrians are quite different from that of people who commute via walking. People who commute via walking typically prefer to travel along major roadways that provide the most direct connection between home and work. On the other hand, recreational pedestrians often prefer to travel in loops through neighborhoods or along greenways that provide exercise, shade from the summer sun, visual variety, and other features.

The CMMPO region has an abundance of areas that lend themselves to recreational walking and tourism. There are a good deal of public parks and other passive recreation resources in the forty municipalities that make up the region. A number of the goals of this plan lend themselves to developing a pedestrian network that provides

AN OVERWHELMING NUMBER OF RESPONDENTS LISTED EXERCISE (90%) OR RECREATION (83%) AS THEIR TOP REASONS FOR WALKING.

links between neighborhoods, commercial centers, and recreational spaces such as parks or other features. Recreational walking is an essential component to the region's quality of life and to developing a pedestrian component to travel and tourism efforts in Central Massachusetts. A well-connected pedestrian network can serve as a place where people can interact, connect with nature, exercise, and simply enjoy all that the region has to offer.

A well-connected pedestrian network can also provide health benefits to the CMMPO region. Positive health outcomes have been attributed to walking and daily moderate physical activity. The pedestrian network should be developed to provide convenient access to recreational areas, allowing the region's residents to easily add walking to their day to day living. The CMMPO region offers a vast array of parks, both municipally operated as well as state and private land trust open space. There is already a good deal of recreational walking that takes place in the region, the development of an interconnected pedestrian network of sidewalks, multi-use paths, and signage will provide an opportunity to fill in and connect the gaps between parkland and residents. Experienced pedestrians may be comfortable exercising adjacent to or in mixed traffic, but the larger group of potential walkers desires a greater feeling of safety that is provided by greenways, multi-use paths, parks, or low-traffic neighborhood streets. With this in mind, the regional pedestrian network should be developed with less experienced recreational users in mind. The linking of local and regional recreation spaces with residential areas and commercial centers will improve the accessibility and connectivity of the CMMPO region. The recommendations in this plan deal with the following recreation related needs:

- <u>Connections</u> Safe and convenient connections between residential areas and recreational space will help the region's residents reach destinations via walking, reducing reliance on the automobile and generating positive health outcomes.
- <u>Design</u> Connected facilities that are usable for all groups and ages will lead to a greater range of appeal. Separated, multi-use pathways such as rail trails, greenways, or the Blackstone River

Bikeway are helpful to users who don't wish to travel on busier roadways as commuters or recreational users, as well as those that use alternative mobility devices.

- <u>Aesthetics</u> Consideration should be given to the design of pedestrian facilities in terms of proper lighting, shade from the summer sun, drinking water availability, and restroom facilities. This is especially important for longer facilities such as the Boston/Worcester Airline Trail and the Blackstone River Bikeway.
- <u>Encouragement / Education</u> Public Safety Campaigns, Service Announcements, rules of the road, and training classes can provide encouragement for people who may be interested in walking, but unsure of how to go about using the network. The CMMPO and local municipalities should coordinate efforts to encourage local residents and visitors to increase the level of pedestrian activity in the region. Highlights should include local ordinances, the promotion of the environmental and health benefits of walking, and safety tips.

#### **Attractors and Generators**

The connectivity of the regional pedestrian network is one of the most important goals of this plan. Convenient and direct routes between popular origins and destinations, or generators and attractors, are essential in providing the option of an alternative form of travel such as bicycling or walking. Appropriate end of trip facilities such as racks, lockers, benches, or shower/restroom facilities can make destinations even more attractive to potential cyclists or pedestrians.



Image 11 – Downtown Worcester holds a great deal of the CMMPO region's attractors and generators, such as Union Station.

In order to establish as baseline determination of where bicycle facilities and sidewalks should be located in the CMMPO Region, the major origins and destinations were identified using Geographic Information System data that CMRPC holds in its database, as well as input received during stakeholder meetings and public outreach held for the plan update. Stakeholders and survey respondents indicated typical locations for origins and destinations in the region for recreational or commuting needs. CMMPO staff then using some of the following datasets to aid in the mapping analyses:

- Schools / Colleges
- Libraries
- Hospitals

- Open Space/Parks
- Town Halls
- Shopping Centers

Due to the variety that exists in terms of development the CMMPO region, as well as its geographic size, it is not practical to provide direct connections to each and every attractor and generator in the region. However, attempts have been made to connect town centers and areas of significant density or mix of uses. The network that has been developed through this planning process will focus on providing connections between the aforementioned locations. Through the mapping exercise, CMMPO staff were able to develop a hybrid "hot spot" map of likely trip origin and destination locations. This map will prove useful in the prioritization of bicycle and pedestrian projects in the Long-Range Transportation Plan, Transportation Improvement Plan, or municipal Complete Streets Prioritization Plans.

# **Regional Pedestrian Statistics, Policies, Programs**

Pedestrian *activity* data (like bicycling volumes) data remains difficult to obtain. Planners have long relied on snapshots (i.e. Census Journey to Work data), volunteer field surveys of specific locations or path/trail facilities, and the occasional Household Travel Survey (CTPS, 2012) Mobility innovations (i.e. FitBit, SmartPhone apps) are enabling better collection/sharing of pedestrian activity data. An exception to this is the transportation community's focus upon safety and the reporting of injuries and fatalities. The collection and reporting of pedestrian-related injuries and fatalities has been led by MassDOT through the development of its Highway Safety Plan, with active participation of every MPO region including the CMMPO.

#### Massachusetts Summary Statistics

- MassDOT-owned roadway miles: 3,017 (<20%); sidewalk miles, 928 (8%). 92% of sidewalks in MA under municipal jurisdiction
- MassDOT has no pedestrian facility condition data
- 24% of all MA trips are one mile or less
- Mode Share: CMRPC reported in 2011 that approximately 10.4% of all Massachusetts trips were walking trips, a 44% higher proportion than the national average and the fourth highest walking trip share of any state. (2011 Bike-Ped Plan).
- MassDOT Ped Plan Update (2018): statewide, 19% of all trips are walking trips, a sizeable increase.
- Boston, MA-NH-RI Urbanized Area (2012-2016 ACS): walking as a share of all commuting trips: 5.5% (2012); 5.6% (2013), 5.5% (2014); 5.6% (2015), and 5.6% (2016) = approximately 5.6% overall.
- Safety: Massachusetts also had the twelfth lowest pedestrian fatality rate, 1.38 deaths per 100,000 population or 40% below the national average (2011 Bike-Ped Plan).
- MassDOT Ped Plan Update (2018): 14,944 people statewide involved in a crash while walking, 2010-2014; trend upward.
- Age cohorts: % persons aged 75 and older, 2010-2014 grew the most in metropolitan Boston, next highest in the PVMPO region, and in the middle of the range for CMMPO, MVMPO, NMMPO, 495 corridor in Boston MPO, OCMPO and SMMPO regions. Notably, next least was the Cape and Islands, with the lowest rates observed in BRMPO, FRCOG regions. MassDOT Ped Plan Update (2018): In CMMPO region # of persons 65 and older expected to grow faster than other age cohorts.

#### Who walks? Cohorts (age, gender, income) and Characteristics

The characteristics of pedestrians are quite different and more universal to most people. However, pedestrians can range in many of these characteristics including age (e.g., children, adults, and the elderly), walking speed, ability (e.g., ambulatory or visual impairments), and purpose (e.g., recreational walking, running, commuting). These characteristics often dictate the type of facility a pedestrian is comfortable using. Wider, detached sidewalks with a landscaped or amenity zone buffer are generally preferred and typically serve the greatest number of pedestrians by providing a buffer between the pedestrian and vehicular traffic. Similarly, wider sidewalks also provide adequate space to accommodate passing and use by persons in wheelchairs or other mobility devices. Like sidewalks, multi-use trails primarily serve as recreational facilities for pedestrians. However, these facilities can provide important everyday connections to key destinations.

Pedestrian activity concentrations by activity type:

- Live/work/shop
- Human services
- Civic, social
- Recreation

The transportation profession long regarded walking as an activity most frequently associated with recreation. However, since the 1970's transportation officials, walking advocates and the general public have progressively raised the visibility and practice of walking as a primary transportation mode for everyday activities. Walking has been promoted in related policies to address climate change, increase energy efficiency and cost effectiveness, and to improve health. Walkability has also been integrated into nondiscrimination and transportation equity policies.

As noted in MassDOT's *Municipal Resource Guide for Walkability* (2017), 70% of pedestrian fatalities occur at mid-block locations. Therefore, it is important to provide safe street crossings at non-intersection, or "mid-block," locations. Signs, pavement markings, crossing islands, and lighting can improve safety at such locations. In addition, each approach to an intersection (signalized or unsignalized) legally requires a pedestrian crossing, whether or not it is marked. In developed areas, crossing demand can be anticipated where there are pedestrian generating land uses on either side of a street. People walking are sensitive to out-of-direction travel and may choose the most direct path even if there is no marked crosswalk.

#### Pedestrian Data Collection Innovations

An FHWA-funded effort to collect more and better bike/ped data, the Minnesota Bicycle and Pedestrian Counting Initiative, has been active since 2010. The University of Minnesota and the Minnesota Department of Transportation (MnDOT) has undertaken a statewide effort to support bike and pedestrian traffic monitoring by local, regional, and state organizations. Recently, the project team completed an implementation study—the second of three MnDOT-funded projects related to the initiative—specifically designed to engage local agencies. The goal was to demonstrate the feasibility of using both permanent and portable sensors to collect bicycle and pedestrian traffic data in several Minnesota cities, suburbs, and small towns. The team worked with agencies in five MN locations to install commercially available sensors—including inductive loops, passive infrared, pneumatic tubes, and radio beams—to collect traffic counts. Overall findings indicate that all of the sensors produced reasonably accurate measurements—and that participating agencies found value in the collected data. Findings and Bike Infographic case studies from the study have already been incorporated into the draft Bicycle and Pedestrian Data Collection Manual, a new MnDOT guidance document being used in statewide training workshops. Also, as a result of the study, MnDOT plans to include commitments to bike and pedestrian traffic monitoring in its forthcoming statewide bicycle and pedestrian plans. In addition, MnDOT is investing in a network of permanent traffic monitoring sites around the state as well as in portable equipment that will be available to local agencies.

http://www.cts.umn.edu/publications/catalyst/2015/september/counting and https://www.fhwa.dot.gov/livability/case\_studies/minneapolis/index.cfm

**Placemeter**, <u>http://www.placemeter.com/</u> is a software company that analyzes camera footage for pedestrian counts. Its clients so far include business improvement districts, transportation departments and stores. Its principal reports that human counts on busy corners tend toward accuracy rates of just 70-80%. It is reported that Placemeter's video analysis, by contrast, has 95% accuracy in the daytime and still performs relative well at nighttime, particularly where environments are well-lit. The technology is reportedly versatile enough to work beyond specialized cameras and sensors. The company can use conventional security cameras to count passersby — without recording the video. That data can be used, in concert with <u>weather forecasts</u>, to predict seasonal shifts.

**PedTrax** is a unique pedestrian tracking feature that provides both volume and speed data of pedestrian activity in crosswalks. This data is collected automatically, and concurrently, with the primary detection function of Iteris video detection systems, as well as vehicle and bicycle counts. PedTrax is provided on all new Vantage camera systems and as a free firmware upgrade to existing Edge2 and VantageNext systems that employ the latest hardware revisions

Although not marketed to pedestrians per se, **Strava** is a website and mobile app used to track cycling and running activity via GPS. Users upload workouts and are provided with statistics such as pace, heart rate, and elevation, and are compared with the activity other users generate to produce cyclist and runner heat maps online. The service uses the GPS functionality of mobile phones or other devices such as Garmin or <u>Fitbit</u> devices to record multiple types of data during athletic activities. (<u>https://en.wikipedia.org/wiki/Strava</u>). While Strava is innovative, others have opined that mobile phone data is not the best option to capture pedestrians. It can be used to capture longer trips (i.e. motor vehicles), but it cannot capture the number of people arriving (in a central city) with details about

routes or mode of transportation used. The data is also restricted depending upon the wireless service provider (Pablo Alvarez, Universidad Publica de Navarra, 2015)

https://www.researchgate.net/post/Where can I source\_pedestrian\_movement\_data\_from\_smart\_p hones\_eg\_Google\_iPhone

#### Future CMRPC Pedestrian Data Collection Efforts

A multi-year pedestrian count program has been discussed, considering the following factors:

- Trail organizations typically have the largest pools of volunteers who are regularly engaged and enthusiastic and may already be collecting data.
- Municipalities: some of the region's communities may be conducting pedestrian activity counts
- Any future MassDOT initiated data collection efforts.
- Complete Streets is currently the most active and able to plan for data collection in our region.
- Outcomes of similar efforts conducted in MPO regions in Massachusetts (i.e. Boston, Cape Cod), and in other states.

As of the writing of this Plan, the CMRPC Transportation staff is exploring the idea a combined staff/volunteer-based bicyclist and pedestrian count field program in the CMMPO region in spring 2019. Orientation and training materials are in development, and the overall program may include:

- An interactive web map with count locations sorted among CMRPC staff and volunteers;
- Communications materials tailored to training volunteers;
- An updated CMRPC website that guides viewers effectively to pedestrian-related content, and
- Targeted audiences for future outreach/education, including
  - Colleges, advocacy Organizations, Local Business/Employee Volunteers

# Local/regional 'walkability' assessments

Some advocacy groups and media have prepared their own assessments of walkability in our region. An example is from an April 17, 2017 Worcester Business Journal (WBJ) <u>article</u> focused upon developments and destinations in downtown Worcester, focused on Washington Square, Shrewsbury Street, and the central business district as shown in Figure 3 below:



# Walkability: From Washington Square to Worcester's destinations

Even though the paths aren't friendly to pedestrians, Worcester's popular attractions are within a 15-minute walk of Union Station.

Figure 3: Walkability is key for Pedestrians (Source: Worcester Business Journal)

While the article noted that several improvements including the conversion of Washington Square had been completed, it was suggested that other improvements being championed by the Canal District Alliance and the City could aid walkability, such as:

- improvements underneath the I-290 viaduct;
- lighting and artwork installations underneath the CSX/MBTA railroad viaducts, Grafton, Green and Harding Streets, and
- expansion of one or more development sites surrounding Washington Square, and concurrent closure/elimination of obsolete rights-of-way.

A walkability assessment conducted by State of Place, a firm that uses several hundred factors and algorithms to score a city's "place quality," or how well it works as walkable, livable space, was cited in the article.

# Related Active Policies, Plans, and Projects *Federal*

#### Americans with Disabilities Act

The Americans with Disabilities Act of 1990 (ADA) is a wide-ranging civil rights law that prohibits discrimination based upon disability. Disability is defined in the ADA as "a physical or mental impairment that substantially limits a major life activity." In particular, Title II of the ADA prohibits discrimination on the basis of a disability by any public entity's policies, programs or services. Access includes physical access as detailed in the ADA Standards for Accessible Design and programmatic access.

#### **Complete Streets**

The National Complete Streets Coalition established this Program in 2004 to promote design and operation of roadways for safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. The Coalition's work is targeted to communities: those that adopt a Complete Streets policy direct their transportation planners and engineers to **routinely design and operate an entire right of way or rights of way to enable safe access for all users**, regardless of age, ability, or mode of transportation. Complete Streets is a policy that long coexisted independent of federal surface transportation legislation; it is now said that Complete Streets is formally referenced (in whole or part) within the Fixing America's Surface Transportation, or FAST Act (December 2015) as follows:

- Requires the Secretary of Transportation to encourage states and metropolitan planning organizations to adopt road design standards;
- Directs the (USDOT) Secretary to report on state progress toward implementation and to identify best practices in the states
- Requires State transportation departments to take into account access for all users and modes of transportation when designing and building National Highway System roadways.
- Requires the use of the National Association of City Transportation Officials (NACTO)'s Urban Street Design Guide as one of the standards that U.S. Department of Transportation (USDOT) must consider when developing design standards, and it permits local governments to use their own adopted design guides if they are the lead project sponsor and the direct recipient of the federal funds for the project—even if it differs from state standards.

Municipalities must:

- Develop a Complete Streets Policy<sup>1</sup> that incorporates ten principles
- Review and modify agency procedures and processes
- Identify training needs and implement with agency staffs
- Review, revise and implement Complete Streets supportive design guidelines and standards
- Establish and implement relevant performance measures

<sup>&</sup>lt;sup>1</sup> <u>https://smartgrowthamerica.org/resources/elements-complete-streets-policy/</u>
The Coalition reported as of July 2018 that over **1,325 local, regional and state agencies** have adopted Complete Streets policies, totaling **more than 1,400 policies nationwide**.<sup>2</sup>

#### Commonwealth of Massachusetts

#### MassHighway Project Development and Design Guidebook (2006)

The *Guidebook* was developed as a flexible, multimodal approach to Massachusetts roadway design/construction. Its purpose was to support a transportation system providing seamless, functional, and safe access for all users. In addition, the Guidebook provided direction for Complete Streets design, and integrated non-motorized planning into the transportation project development process. Pedestrian accommodations were specifically included in intersection and geometric design, interchanges, bridges and work zones. Chapter 3, *Basic Design Controls*, and Chapter 5, *Cross-Section and Roadside Elements*, have sections which specifically address pedestrian design. Chapter 11, *Shared Use Path and Greenways*, and Chapter 16, *Traffic Calming and Traffic Management*, address trails and traffic calming respectively. The Guidebook remains effective as of this Plan's development.

#### MassDOT Pedestrian Plan (in development, 2016-2018)

This plan defines a vision for Massachusetts in which all people have a safe and comfortable walking option for short trips. When pedestrian facilities, including sidewalks, ramps, and crosswalks, are absent, poorly maintained, or unsafe, it puts people in danger, encouraging trips in cars that could reasonably be made on foot. MassDOT's focus on walkability will help reduce the demand for new vehicle trips, reduce greenhouse gas emissions, promote public health, and support economic development.

The *Statewide Pedestrian Plan* is being constructed upon the following core goals:

- Improve Accessibility Improve mobility and connectivity to major community services, housing and employment centers with an emphasis on changing demands, underserved communities, healthy transportation options, and connections to transit;
- Improve Safety Provide guidance on state of the practice in policy, design, implementation, enforcement, and evaluation of safer pedestrian environments;
- Improve Maintenance Identify policies and model practices to improve maintenance, yearround usability and state of good repair of existing and planned pedestrian infrastructure, and
- Prudent Investment Develop a prioritized investment strategy that supports our goals and complements robust regional pedestrian planning efforts; and, provide a business case based on economic and public health data that inspires municipalities to invest in walking environments.

<sup>&</sup>lt;sup>2</sup> <u>https://smartgrowthamerica.org/program/national-complete-streets-coalition/</u>

A Municipal Guide for Walkability was released in 2017 as a component of the Statewide Pedestrian Plan. It contains the following preliminary walking investment priorities:

- Americans with Disabilities Act (ADA) Accessibility
- Pedestrian Access to Transit
- Statewide Safety Trends
- Snow Clearance

- Ongoing Facility Maintenance
- Support for Small Projects
- Meaningful Performance Measures (e.g., SRTS)
- Project Evaluation and Selection

Of particular importance to CMRPC is the Plan's Pedestrian Facility Critical Gap Analysis. MassDOT produced composite scores for all 351 Commonwealth communities in a range of 0-200 points according to criteria for:

- infrastructure inventory (schools, retail & restaurants, parks, transit)
- sidewalk gaps
- safety
- equity (% non-white, zero-car households, low-income, and LEP)
- accessibility in accordance with the Americans with Disabilities Act

The following data sources were used:

- ACS 2010-2014
- MAPC local access score tool
- MassDOT sidewalk inventory
- MassDOT crash data
- MassDOT Office of Civil Rights information

MassDOT ranked CMRPC communities in the Medium to Low range – meaning that each community already had a well-developed and/or maintained pedestrian facility network. MassDOT's Plan contains six initiatives, of which the following CMRPC believes are the most action-oriented:

- Establish a set of pedestrian priority projects on MassDOT-owned roadways and bridges to address critical safety, accessibility, and connectivity gaps;
- Launch a year-round maintenance and operations plan for MassDOT-owned pedestrian facilities and support municipalities in similar efforts, and
- Invest in data collection to support all Plan initiatives and to track progress.

MassDOT's draft Pedestrian Plan is being finalized during fall 2018. CMRPC will update this document at such time as MassDOT's plan is finalized.

## MassDOT Complete Streets Funding Program

The Massachusetts Department of Transportation (MassDOT) Complete Streets Funding Program was created by legislative authorization as part of the 2014 Transportation Bond Bill with the intent of rewarding municipalities that demonstrate a commitment to embedding Complete Streets in policy and practice. MassDOT was provided with seven criteria to develop the program, and a requirement that

one-third of the funding be expended in Massachusetts municipalities with incomes below the median household income. MassDOT undertook additional efforts to develop its Program criteria while advancing the goals embedded in the legislation. Massachusetts' regional planning agencies provide Complete Streets oversight and technical assistance to their respective communities https://www.mass.gov/complete-streets-funding-program.

Accordingly, CMRPC serves as the Complete Streets coordinator to the forty communities within its region. The Commonwealth intends that municipalities choosing to participate can: 1) obtain technical assistance to analyze their community's needs and develop a Complete Streets Prioritization Plan, and 2) apply for funding for construction of Complete Streets infrastructure projects. Massachusetts operates its Program through an online portal<sup>3</sup> which contains complete information on Program requirements, prior awards, and application information.

#### Healthy Communities Compact

Established in the 2009 Transportation Reform Bill, the Healthy Transportation Compact added public and environmental health as explicit goals and decision-making criteria. Compact member agencies were required to establish individual agency policies and programs leading to compatible transportation decisions. This support included the promotion of interagency cooperation on State and Federal policies that promote healthy transportation. The Compact was charged with:

- reducing greenhouse gas emissions;
- increasing bicycle and pedestrian travel;
- working with the Massachusetts Bicycle and Pedestrian Advisory Board to implement Complete Streets;
- implementing health impact assessments;
- expanding Safe Routes to School (SRTS) programs;
- initiating public-private partnerships that support efficient transportation;
- establishing an advisory council, and
- developing Compact goals and performance measures.

In addition, MassDOT's Healthy Transportation Policy Directive required all state transportation projects to increase bicycling, transit and walking options.

https://www.fhwa.dot.gov/Environment/ehei/awards/2010/massachusetts.cfm

Although the Compact's formal interagency working groups are no longer active as of the writing of this Plan, it is included here as its wide-ranging policies led to interagency planning processes that remain current.<sup>4</sup>

<sup>&</sup>lt;sup>3</sup> <u>https://masscompletestreets.com/</u>

<sup>&</sup>lt;sup>4</sup> <u>https://www.livablestreets.info/the\_healthy\_transportation\_compact\_4\_14\_16</u>

#### Design Criteria for MassDOT Highway Division Projects

MassDOT enacted this Engineering Directive in 2014 to implement new Commonwealth criteria for pedestrian and bicycle accommodations in conjunction with federal FHWA-applied criteria. The Design Criteria have been applied to all projects for which the Division is:

- the project proponent;
- responsible for project funding (state or federal aid), or
- controls the affected infrastructure (State Highway).

Projects receiving 25% (design) Project Approval after 2/4/14 were required to comply with this Directive unless specifically exempted by MassDOT. Criteria specific to pedestrian accommodations are:

- Pedestrian accommodations shall be in accordance with Chapter 5 of the Guide and the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities.
- Wherever adjacent land uses include commercial or residential development greater than 5 units per acre, a sidewalk shall be provided along the roadway adjacent to the use. (See P13-0001, Section 2C.)
- For projects in urbanized areas on roadways where pedestrians are legally allowed, sidewalks shall be provided on both sides of the roadway. (See P-13-0001, Section 2E. Refer to MassDOT's Road Inventory Maps for urbanized area boundaries.)
- For bridge projects, sidewalks shall be provided on both sides of the roadway if pedestrians are legally allowed. (See P-13-0001, Section 2E.)
- For projects on roadways that pass under bridges and where pedestrians are legally allowed, sidewalks shall be provided on both sides of the roadway beneath each bridge. (See P-13- 0001, Section 2E.)
- The minimum sidewalk width below which a design exception is required is 5', exclusive of curb.

The complete Engineering Directive, including specific design standards, exemptions and related information is available on the <u>MassDOT website</u>; a link to the Directive can also be found in the Appendix of this Plan.

#### Community Compact Initiative

Pedestrian planning and program/capital investments can also be funded through the Massachusetts Community Compact Initiative, which was established by the Baker-Polito Administration in 2015. The <u>Initiative</u> "gives Massachusetts cities and towns the chance to make needed improvements through collaboration with and support from the Commonwealth. Each Compact is a voluntary, mutual agreement between the Baker-Polito Administration and the local government. Municipalities interested in <u>applying for a Community Compact</u> can submit an application online at any time. **Choose Best Practices** — the community must choose one or more <u>best practice areas</u> it wants to implement. For example, the **Transportation/Public Works Best Practice Area** supports adopting Safe Routes to School programs, adapting streets to accommodate people using all modes of transportation, and promoting safety and mobility for older drivers.

#### MassDOT ADA Transition Plan (2012)

MassDOT finalized an ADA Transition Plan in 2012 to identify and address accessibility tasks that applied to its policies, internal and external processes, and discrete capital projects. MassDOT Tasks included:

- Establishment of a MassDOT public contact point for questions, comments and complaints. <u>http://www.massdot.state.ma.us/ContactUs.aspx</u> includes a feature that allows the public to select 'roads and bridges' and to submit questions, comments and complaints that may include accessibility;
- Establishment of an internal ADA Working Group to review MassDOT's performance in prioritizing and constructing ramp/crosswalk ADA improvements at a wide range of locations in each MassDOT Highways Division region, and
- Revision of MassDOT agreements re: securing commitments to carry out maintenance activities on federal-aid projects.

MassDOT created two sets of project priorities:

- Priority #1 projects involve removing barriers to programs and facilities under MassDOT's jurisdiction, and
- Priority #2 projects involve architectural barriers to be removed as planned alterations are made to a specific building or facility with a forecast date. Priority #2 items are being addressed in MPO TIPs and/or with state bond funds.

Of the above, the task that is most visible and relevant to the pedestrian planning process is MassDOT's ramp/crosswalk projects across all Highway Division regions. MassDOT selected District 3 to test an ADA project pilot; its consultant generated a deficient curb ramp list and schedule for improvements. Phase II of the project is currently underway and is focused on designing and advancing projects to construct ramps prescribed for remediation in the schedule from Phase I. Note that some of these projects are being coordinated with roadway and sidewalk construction projects in specific corridors. In 2017, MassDOT programmed a total of 38 curb cut projects in the CMMPO communities of Auburn, Oxford, Upton, and Worcester. 2018 projects have yet to be funded or programmed (as of 8/13/18).

#### Future Policy, Project Priorities and Advocacy

#### Policy

Consistent with MassDOT's Pedestrian Plan Vision Statement, CMRPC's regional vision for pedestrian transportation is for the development of safe, convenient and comfortable walking options. In recent years, most preexisting federal and state pedestrian transportation programs have supported elements of what is now Complete Streets.

CMRPC's role now and in the foreseeable future is to:

- Ensure that the region's pedestrian planning activities support federal and state directives
  - participating in the Massachusetts Bicyclist and Pedestrian Advisory Board (MABPAB) coordination
  - monitoring performance
  - promote increased safety
- Coordinate and advocate for pedestrians among a diverse set of federal, regional and local stakeholders
  - o CMMPO 3c Process
  - o Participation in trainings, conferences and other events
- Administer its Complete Streets technical assistance program as its principal pedestrian planning effort;
- Continue policy, regulation and design guideline development to create and enhance walking, by:
  - reactivating the region's Bicyclist and Pedestrian Advisory Board (BPAB);
  - initiating new data collection activities, i.e. working with walking and path/trail advocacy organizations to update facility data and to generate usage information
- Serve as a regional resource on pedestrian issues and a partner in resolving them.
  - Improving facility and use data collection;
  - Pedestrian safety analyses/project development
  - Managing shared-use of public rights-of-way

The most challenging of the above tasks is to anticipate and plan for multimodal transportation technology and practice changes as they affect walking. Sharing use of public rights-of-way with new and different vehicle types is the 'hot issue' as of this Plan's writing, and includes:

- Adequacy of existing pedestrian infrastructure to support multiple activities;
- Shared-mobility devices, and
- Automated and connected vehicles.

The following was edited from a Planetizen article written by David Levinson, July 11, 2018 <u>https://www.foreground.com.au/transport/future-footpath/?platform=hootsuite</u> – also at www.transportist.org

"Many (sidewalks/footpaths/pedestrian spaces) today are already functionally obsolescent.....not wide enough for current or future mobility. Further, existing signs, street trees, garbage and recycling bins, racks, hydrants and street furniture compete for this space – and make it particularly tough for persons with disabilities to use. "Counting pedestrians is an under-appreciated change. Systems cannot manage what they do not monitor, and the uncounted are ignored. By counting people walking on sidewalks, their value can be recognized in the programming of <u>traffic lights</u>, which are currently timed in favor of motor vehicles (which are counted), not pedestrians (uncounted)....."

Driverless or autonomous vehicles could become a dominant mode in coming years....and, increased goods deliveries w/truck loading-unloading already compete with on-street parking, bus stops, taxi-stands, and other protected zones.



Image 12: Starship Robotic Delivery Service operating in the US, 2018 (Levinson)

As municipal spaces are regulated in a wide variety of types, marking and enforcement....Coord\* is working on software

for digitally mapping and standardizing the description of regulations for all spaces in a city, while <u>Grid</u> is developing systems for booking virtual loading bays in real-time. Proponents believe tools like these will permit users and governments to not only map where regulations apply, but measure their effectiveness and, if appropriate, make a case when it is determined that they should be changed. Like with off-street parking, planners predict that curb space may transition away from parking as AVs and rideshare, and loading/unloading become more dominant."

CMRPC will use resources such as those developed by the National Association of City and Town Officials (NACTO) to assist its communities in developing municipal guidelines for regulating shared mobility devices. Likewise, as such devices are used in CMRPC communities, the staff has begun working with local officials, civic organizations and mobility partners (e.g. downtown alliances, community-based development organizations). At present, shared mobility in the region is taking the form of Worcester-based bikeshare programs. For this Plan, CMRPC's focus is upon assisting its communities now and in the future with the use of shared mobility devices in public spaces, particularly roadways, sidewalks and trails, so that these devices do not create ADA accessibility or public safety hazards for pedestrians. For example, in Complete Streets planning, NACTO has suggested that 'small vehicles' (shared mobility devices) be parked within a demarcated space on the street, such as in a car-parking spot. Some cities have repurposed no-parking zones near intersections for bike and bike share parking, as they have a lower profile and do not interfere with the line of sight for pedestrians or drivers.

#### Safety

A Governors' Highway Safety Association (GHSA) Spotlight on Highway Safety report (2017 data) advised that in recent years, U.S. pedestrian fatalities grew while all other traffic deaths decreased by 14%. In addition, pedestrians accounted for a larger proportion of traffic fatalities than in the past 33 years. However, in Massachusetts the rate of 1.17 pedestrian fatalities per 100,000 population by state (2016) ranked 39th nationwide. The GHSA commented that safety is traffic safety officials contribute to annual changes in the number of pedestrian fatalities, including economic conditions, demographics, weather, fuel prices, vehicle miles traveled, and the amount of time people spend walking. On the other hand,

concerted traffic safety efforts led by SHSOs and state/local partners can reduce pedestrian fatalities, and appear to have contributed to a reversal of the recent trend of large increases in the numbers of nationwide pedestrian fatalities. Without making a direct correlation or claiming a definitive link, more recent factors contributing to the increase in pedestrian fatalities might include the growing number of state and local governments that have decriminalized the recreational use of marijuana, which can impair judgment and reaction time for all road users, and the increasing use of smartphones, which can be a significant source of distraction regardless of travel mode.

GHSA is advocating for a "3E" approach to pedestrian safety that includes targeted enforcement, engineering improvements, and public education:

- Increase Separation of Pedestrians from Motor Vehicles
- Make Pedestrians More Visible to Drivers
- Implement Engineering and Enforcement Measures to Reduce Speeds

This report contains information for Massachusetts, but as would be expected no regional information.

#### **Public Health**

#### **Region-wide**

Healthy Heart Trails: the MA Department of Conservation and Recreation (DCR) promotes its network of such trails, offering 75 individual designated trails across Massachusetts. The <u>DCR website</u> offers this information by sub-region, including the Central region covered in part by this Plan. DCR also provides on the website a *Healthy Heart Trail Walking Log* for pedestrians and trail visitors to monitor their walking activity daily and weekly.

#### Senior Mobility

The Massachusetts Councils on Aging sponsor a <u>Keep</u> <u>Moving Program</u>, which encourages communities to establish walking clubs and sponsor walking activities designed with seniors in mind. In the CMMPO region, walking clubs affiliated with Councils on Aging/Senior Centers have been established in Clinton, Douglas, Millbury, Sturbridge, Upton and Worcester. A complete statewide directory, and updated walking



Image 13: Millbury Council on Aging Walking Club "Go The Distance" walking challenge. *Millbury Sutton-Chronicle* 

event information by community, is available on the MCOA website.

#### Projects Promoting Walkability

CMRPC offers its communities technical assistance for revising local ordinances and design standards to promote Complete Streets principles. For example, staff are working with the Town of West Boylston to

develop a Village Center District including transportation and streetscape design components. Figure 5 below is an example of a GIS-based visualization tool staff is using which is featured here for its pedestrian-oriented elements:



Figure 5: Village Center Rendering

The staff will be preparing similar resources for other CMRPC communities going forward. Also, CMRPC will continue interacting with peer agencies to identify and possibly implement walkability projects. A good example is a September 2018 FRCOG walk audit training designed for members of a Deerfield-based senior center walking club. The purpose was to raise participants' awareness of walkability and the built environment as staff implemented Complete Streets projects. Session participants:

- viewed a presentation;
- split into pairs to investigate the condition of local sidewalks, signage, street crossings, and other factors that can make walking safe and enjoyable or unsafe and unpleasant, and
- reconvened at their Senior Center to compare/share observations over lunch.

This training was designed by FRCOG's Regional Health Nurse, and its Senior Transportation Planner. Afterward, staff prepared a report on the participants' observations for the Town of Deerfield to consider as it developed its Complete Streets Prioritization Plan. FRCOG led similar successful workshops in Northfield and Shelburne Falls – after which FRCOG staff incorporated seniors' observations into the Town of Buckland Complete Streets Prioritization Plan, and an updated Town of Shelburne Falls walking map.

#### **Plan Recommendations**

The intent of this plan is to provide a planning tool for the CMMPO, the Massachusetts Department of Transportation (MassDOT), and the forty (40) local Municipalities within the CMRPC region to develop a connected network of pedestrian facilities that is safe, convenient, and continuous for residents and visitors within the CMMPO region. The Regional Pedestrian Plan is intended to facilitate the expansion and upgrade of the pedestrian network in the region in order to encourage more walking trips and safely link important destinations to where people live.

Collaboration between the CMMPO and neighboring MPO's (MAPC, MRPC, PVPC, Rhode Island State Planning Council, and the Northeastern Connecticut Council of Governments) is essential to improving regional connectivity. The Pedestrian Plan also aims to support the work of the Central Massachusetts Regional Public Health Alliance's (CMRPHA) Community Health Improvement Program (CHIP) as it relates to physical activity and wellness. The recommendations contained in this plan are broad in scope, and include policy and legislative changes as well as physical improvements to the transportation network.

The pedestrian-related recommendations should be used as a guide for local jurisdictions in taking advantage of these opportunities as well as a guide for CMMPO pedestrian policy and project performance monitoring/evaluation. In recent years, most preexisting federal and state pedestrian transportation programs have supported elements of what is now Complete Streets. Implementation of the recommendations of this Plan will provide for a comprehensive pedestrian transportation network that is focused on accessibility, mobility, and safety. The intended result is a region that is well connected and friendly to pedestrians of all abilities.

The strategies listed below are potential actions that will help CMMPO member municipalities to facilitate the expansion and upgrade of the pedestrian facilities in the region:

- Adoption of the CMMPO Regional Pedestrian Plan. Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with the Plan
- Coordinate and advocate for pedestrians among a diverse set of federal, regional and local stakeholders
  - Collaboration with the CMMPO through a continuing, comprehensive, and cooperative multimodal transportation planning process ("3C Process")
  - Better integrate the CMMPO Bicycle and Pedestrian Advisory Committee into the planning efforts of the CMMPO
  - Participation in the Massachusetts Bicyclist and Pedestrian Advisory Board (BPAB);
  - Participation in trainings, conferences and other events
- Engage with MassDOT technical assistance programs as a principal pedestrian planning effort, including Complete Streets Funding Program and Safe Routes To School (SRTS) Program

- Utilize the MassDOT Complete Streets Funding Program process to adopt and implement local Complete Streets policies and prioritization plans to continue to close the gaps in the pedestrian network i.e. sidewalks, crosswalks, ramps, etc.
- Partner eligible K-8 grade schools with MassDOT SRTS Program and utilize SRTS technical assistance to pursue Infrastructure Application Grant
- Work with CMRPC and MassDOT to identify potential for shared use or multi-use paths along right-of-ways, including rail trail planning as appropriate
- Promote increased safety by prioritizing efforts on MassDOT-owned roadways where there are a frequent number of pedestrian-involved crashes.
- Monitoring performance
- Continue policy, regulation, and design guidelines development to create and enhance pedestrian activity
  - Initiating new data collection activities, i.e. Working with walking and path/trail advocacy organizations to update facility data and to generate usage information
  - Encourage pedestrian accommodations and/or healthy corridor planning into community design guidelines such as the West Boylston Village Center District proposal
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public and education campaigns that promote the rules of the road to educate all transportation users of their responsibilities.
  - Improving facility and use data collection
  - Pedestrian safety analyses/project development
  - Managing shared-use of public rights-of-way
- Increased pedestrian planning and application for capital investments through state programs and grant opportunities such as the Community Compact Cabinet, Housing Choice Initiative, EEA Planning Assistance Grant Program, and MassWorks Infrastructure Program.
- Explore and manage shared mobility devices.

# Subregional Maps

# Municipal Recommendations

## **North Subregion - Barre**

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and prepare Tier III construction application to implement projects.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
- Partner eligible K-8 grade schools with the MassDOT Safe Routes to School (SRTS) Program to increase safe biking and walking among students.
  - o Pursue SRTS Infrastructure Funding Grant
  - Work to incorporate Safe Routes to School materials and practices into local education systems in order to increase active transportation participation and safety.
- Work with MassDOT and DCR to ensure that Regional Multi-Use Trails and Pathways are advanced to meet the needs of subregional and regional travel via alternative modes.
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# BARRE BICYCLE FACILITIES

<u>On-Road:</u> Existing 0 Miles <u>Programmed</u> 0 Miles Potential 19.87 Miles Multi-Use: Existing 7 Miles **Programmed** 0 Miles Potential 3 Miles

## North Subregion – Holden

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Conduct needs assessment and develop a Tier II
    Prioritization Plan, or listing of proposed projects.
  - Select shovel-ready projects identified in the Tier II Plan and prepare Tier III construction application to implement projects.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
- Partner eligible K-8 grade schools with the MassDOT Safe Routes to School (SRTS) Program to increase safe biking and walking among students.
  - Pursue SRTS Infrastructure Funding Grant
  - Work to incorporate SRTS materials and practices into local education systems in order to increase active transportation participation and safety.
- Work with MassDOT and DCR to ensure that Regional Multi-Use Trails and Pathways are advanced to meet the needs of subregional and regional travel via alternative modes.
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# HOLDEN BICYCLE FACILITIES

Existing 2.02 Miles <u>Programmed</u> 0 Miles Potential 27.01 Miles Multi-Use Existing 5.2 Miles **Considered** 4 Miles

#### **North Subregion - Oakham**

#### **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
  - (1) Identify a local representative to attend a Complete Streets 101 or 201 training course. (2) Develop a Tier I Complete Streets Policy for MassDOT scoring and approval. Adopting a Tier I Complete Streets Policy officially demonstrates the local commitment to improve the quality of life for all citizens and it advances the community into Tier II activities. (3) Conduct needs assessment and develop Tier II Complete Streets Prioritization Plan, or listing of proposed projects. (4) Select shovel-ready projects identified in the Plan and pursue Tier III Complete Streets Construction Application.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
- Partner eligible K-8 grade schools with the MassDOT Safe Routes to School (SRTS) Program to increase safe biking and walking among students.
  - Pursue SRTS Infrastructure Funding Grant
  - Work to incorporate SRTS materials and practices into local education systems in order to increase active transportation participation and safety.
- Work with MassDOT and DCR to ensure that Regional Multi-Use Trails and Pathways are advanced to meet the needs of subregional and regional travel via alternative modes.
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

## OAKHAM FACILITIES

Existing 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 6.84 Miles <u>Multi-Use</u> <u>Existing</u> 3 Miles

## North Subregion – Paxton

#### **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
  - (1) Identify a local representative to attend a Complete Streets 101 or 201 training course. (2) Develop a Tier I Complete Streets Policy for MassDOT scoring and approval. Adopting a Tier I Complete Streets Policy officially demonstrates the local commitment to improve the quality of life for all citizens and it advances the community into Tier II activities. (3) Conduct needs assessment and develop Tier II Complete Streets Prioritization Plan, or listing of proposed projects. (4) Select shovel-ready projects identified in the Plan and pursue Tier III Complete Streets Construction Application.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
- Partner eligible K-8 grade schools with the MassDOT Safe Routes to School (SRTS) Program to increase safe biking and walking among students.
  - Pursue SRTS Infrastructure Funding Grant
  - Work to incorporate SRTS materials and practices into local education systems in order to increase active transportation participation and safety.
- Work with MassDOT and DCR to ensure that Regional Multi-Use Trails and Pathways are advanced to meet the needs of subregional and regional travel via alternative modes.
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# PAXTON FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 13.05 Miles

## North Subregion – Princeton

#### **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
  - (1) Identify a local representative to attend a Complete Streets 101 or 201 training course. (2) Develop a Tier I Complete Streets Policy for MassDOT scoring and approval. Adopting a Tier I Complete Streets Policy officially demonstrates the local commitment to improve the quality of life for all citizens and it advances the community into Tier II activities. (3) Conduct needs assessment and develop Tier II Complete Streets Prioritization Plan, or listing of proposed projects. (4) Select shovel-ready projects identified in the Plan and pursue Tier III Complete Streets Construction Application.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
- Partner eligible K-8 grade schools with the MassDOT Safe Routes to School (SRTS) Program to increase safe biking and walking among students.
  - Pursue SRTS Infrastructure Funding Grant
  - Work to incorporate SRTS materials and practices into local education systems in order to increase active transportation participation and safety.
- Work with MassDOT and DCR to ensure that Regional Multi-Use Trails and Pathways are advanced to meet the needs of subregional and regional travel via alternative modes.
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# PRINCETON FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 23.27 Miles

## North Subregion – Rutland

#### **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and prepare Tier III construction application to implement projects.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
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- Work with MassDOT and DCR to ensure that Regional Multi-Use Trails and Pathways are advanced to meet the needs of subregional and regional travel via alternative modes.
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# RUTLAND FACILITIES

Existing 3.31 Miles Programmed 0.98 Miles Potential 21.15 Miles <u>Multi-Use</u> Existing 7.85

## North Subregion - West Boylston

#### **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and prepare Tier III construction application to implement projects.
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# WEST BOYLSTON FACILITIES

Existing 2.77 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 15.90 Miles Multi-Use Existing 1 Mile Potential 2 Miles

## Northeast Subregion – Berlin

#### **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and pursue Tier III Complete Streets Construction Application.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
- Work with Safe Routes to School (SRTS) Program Partners (K-8 schools) to pursue Infrastructure Funding Grant to improve safe biking and walking among students.
  - Prioritize projects that connect to existing/proposed Complete Streets projects or other roadway and sidewalk improvement projects.
  - Work to incorporate SRTS materials and practices into local education systems in order to increase active transportation participation and safety.
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## **BERLIN FACILITIES**

Existing 0 Miles **Programmed** 0 Miles Potential 13.01 Miles Multi-Use: Existing 0 Miles Programmed 0 Miles Potential 4.21 Miles **Considered** 2 Miles

#### Northeast Subregion – Boylston

#### **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
  - (1) Identify a local representative to attend a Complete Streets 101 or 201 training course. (2) Develop a Tier I Complete Streets Policy for MassDOT scoring and approval. Adopting a Tier I Complete Streets Policy officially demonstrates the local commitment to improve the quality of life for all citizens and it advances the community into Tier II activities. (3) Conduct needs assessment and develop Tier II Complete Streets Prioritization Plan, or listing of proposed projects. (4) Select shovel-ready projects identified in the Plan and pursue Tier III Complete Streets Construction Application.
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# BOYLSTON FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 18.00 Miles

## Northeast Subregion – Northborough

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
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# NORTHBOROUGH FACILITIES

Existing 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 12.75 Miles <u>Multi-Use</u> <u>Potential</u> 6.76 Miles

64

## Northeast Subregion – Shrewsbury

#### **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and pursue Tier III Complete Streets Construction Application.
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# SHREWSBURY FACILITIES

Existing 0 Miles <u>Programmed</u> 3.67 Miles <u>Potential</u> 21.07 Miles <u>Multi-Use</u> <u>Potential</u> 5.88

#### Northeast Subregion – Westborough

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
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# WESTBOROUGH FACILITIES

Existing 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 20.76 Miles <u>Multi-Use</u> <u>Potential</u> 9.16 Miles

## Southeast Subregion – Blackstone

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
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# BLACKSTONE FACILITIES

Existing 1.48 Miles Programmed 0 Miles <u>Potential</u> 5.39 Miles <u>Multi-Use</u> <u>Existing</u> 4 Miles

#### Southeast Subregion – Douglas

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
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# DOUGLAS FACILITIES

Existing 0 Miles Programmed 0 Miles <u>Potential</u> 13.87 Miles <u>Multi-Use</u> <u>Existing</u> 7 Miles

## Southeast Subregion – Grafton

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Conduct needs assessment and develop a Tier II
    Prioritization Plan, or listing of proposed projects.
  - Select shovel-ready projects identified in the Tier II Plan and prepare Tier III construction application to implement projects.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
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# GRAFTON FACILITIES

Existing O Miles <u>Programmed</u> 2.07 Miles <u>Potential</u> 25.55 Miles <u>Multi-Use</u> <u>Considered</u> 3 Miles

#### Southeast Subregion – Hopedale

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
  - (1) Identify a local representative to attend a Complete Streets 101 or 201 training course. (2) Develop a Tier I Complete Streets Policy for MassDOT scoring and approval. Adopting a Tier I Complete Streets Policy officially demonstrates the local commitment to improve the quality of life for all citizens and it advances the community into Tier II activities. (3) Conduct needs assessment and develop Tier II Complete Streets Prioritization Plan, or listing of proposed projects. (4) Select shovel-ready projects identified in the Plan and pursue Tier III Complete Streets Construction Application.
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# HOPEDALE FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 2.96 Miles

#### Southeast Subregion – Mendon

#### **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and prepare Tier III construction application to implement projects.
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## MENDON FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 18.48 Miles
# Southeast Subregion – Millbury

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
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# MILLBURY FACILITIES

Existing 1.58 Miles **Programmed** 1.19 Miles Potential 17.20 Miles Multi-Use Existing 1 Mile Potential 3 Miles **Considered** 3 Miles

# Southeast Subregion – Millville

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
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# MILLVILLE FACILITIES

Existing 1.57 Miles Programmed 0 Miles Potential 5.82 Miles <u>Multi-Use</u> Existing 2 Miles

# Southeast Subregion – Northbridge

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Conduct needs assessment and develop a Tier II
     Prioritization Plan, or listing of proposed projects.
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# NORTHBRIDGE FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 14.07 Miles <u>Multi-Use</u> Considered

6 Miles

## Southeast Subregion – Sutton

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
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# SUTTON FACILITIES

Existing 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 22.20 Miles <u>Multi-Use</u> <u>Considered</u> 0.9 Mile

75

# Southeast Subregion – Upton

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
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# **UPTON FACILITIES**

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 16.47 Miles

# Southeast Subregion – Uxbridge

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
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# UXBRIDGE FACILITIES

Existing 0.77 Miles **Programmed** 2.85 Miles Potential 22.70 Miles Multi-Use Existing 5 Miles **Considered** 6 Miles

#### Southwest Subregion – Auburn

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Conduct needs assessment and develop a Tier II
     Prioritization Plan, or listing of proposed projects.
  - Select shovel-ready projects identified in the Tier II Plan and prepare Tier III construction application to implement projects.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
- Partner eligible K-8 grade schools with the MassDOT Safe Routes to School (SRTS) Program to increase safe biking and walking among students.
  - Pursue SRTS Infrastructure Funding Grant
  - Work to incorporate SRTS materials and practices into local education systems in order to increase active transportation participation and safety.
- Work with MassDOT and DCR to ensure that Regional Multi-Use Trails and Pathways are advanced to meet the needs of subregional and regional travel via alternative modes.
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# AUBURN FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0.60 Miles <u>Potential</u> 9.93 Miles

# Southwest Subregion – Charlton

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and prepare Tier III construction application to implement projects.
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- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# CHARLTON FACILITIES

<u>Existing</u> 3.23 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 24.62 Miles

# Southwest Subregion – Dudley

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
  - (1) Identify a local representative to attend a Complete Streets 101 or 201 training course. (2) Develop a Tier I Complete Streets Policy for MassDOT scoring and approval. Adopting a Tier I Complete Streets Policy officially demonstrates the local commitment to improve the quality of life for all citizens and it advances the community into Tier II activities. (3) Conduct needs assessment and develop Tier II Complete Streets Prioritization Plan, or listing of proposed projects. (4) Select shovel-ready projects identified in the Plan and pursue Tier III Complete Streets Construction Application.
    - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
- Partner eligible K-8 grade schools with the MassDOT Safe Routes to School (SRTS) Program to increase safe biking and walking among students.
  - Pursue SRTS Infrastructure Funding Grant
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- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# DUDLEY FACILITIES

Existing 0 Miles Programmed 0 Miles <u>Potential</u> 11.66 Miles <u>Multi-Use</u> <u>Considered</u> 4 Miles

# Southwest Subregion – Oxford

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Conduct needs assessment and develop a Tier II
     Prioritization Plan, or listing of proposed projects.
  - Select shovel-ready projects identified in the Tier II Plan and prepare Tier III construction application to implement projects.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
- Work with Safe Routes to School (SRTS) Program Partners (K-8 schools) to pursue Infrastructure Funding Grant to improve safe biking and walking among students.
  - Prioritize projects that connect to existing/proposed
     Complete Streets projects or other roadway and
     sidewalk improvement projects.
  - Work to incorporate SRTS materials and practices into local education systems in order to increase active transportation participation and safety.
- Work with MassDOT and DCR to ensure that Regional Multi-Use Trails and Pathways are advanced to meet the needs of subregional and regional travel via alternative modes.
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# **OXFORD FACILITIES**

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 16.11 Miles

## Southwest Subregion – Southbridge

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
  - (1) Identify a local representative to attend a Complete Streets 101 or 201 training course. (2) Develop a Tier I Complete Streets Policy for MassDOT scoring and approval. Adopting a Tier I Complete Streets Policy officially demonstrates the local commitment to improve the quality of life for all citizens and it advances the community into Tier II activities. (3) Conduct needs assessment and develop Tier II Complete Streets Prioritization Plan, or listing of proposed projects. (4) Select shovel-ready projects identified in the Plan and pursue Tier III Complete Streets Construction Application.
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- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# SOUTHBRIDGE FACILITIES

Existing 1.05 Miles **Programmed** 0 Miles Potential 12.68 Miles Multi-Use Existing 0.25 Mile **Considered** 3 Miles

# Southwest Subregion – Sturbridge

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and prepare Tier III construction application to implement projects.
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  - Pursue SRTS Infrastructure Funding Grant
  - Work to incorporate SRTS materials and practices into local education systems in order to increase active transportation participation and safety.
- Work with MassDOT and DCR to ensure that Regional Multi-Use Trails and Pathways are advanced to meet the needs of subregional and regional travel via alternative modes.
- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# STURBRIDGE FACILITIES

Existing 3.67 Miles Programmed 0 Miles <u>Potential</u> 17.44 Miles <u>Multi-Use</u> <u>Existing</u> 3 Miles

## **Southwest Subregion - Webster**

## **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
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# WEBSTER FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 8.61 Miles

# West Subregion - Brookfield

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
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# BROOKFIELD FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 7.70 Miles

# West Subregion – East Brookfield

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
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# EAST BROOKFIELD FACILITIES

<u>Existing</u> 2.85 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 3.74 Miles

# West Subregion - Hardwick

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
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# HARDWICK FACILITIES

Existing 0 Miles <u>Programmed</u> 0.75 Miles <u>Potential</u> 14.04 Miles <u>Multi-Use</u> <u>Considered</u> 4 Miles

# West Subregion – Leicester

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and prepare Tier III construction application to implement projects.
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# LEICESTER FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0.59 Miles <u>Potential</u> 15.18 Miles

# West Subregion – New Braintree

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
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# NEW BRAINTREE FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 4.74 Miles

# West Subregion – North Brookfield

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
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# NORTH BROOKFIELD FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 12.99 Miles

# West Subregion – Spencer

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
  - Select shovel-ready projects identified in the Town's Tier II Complete Streets Prioritization Plan and pursue Tier III Complete Streets Construction Application.
  - Work with MassDOT to ensure that arterial and collector streets with excess shoulder width are closely examined to determine how quickly they can be converted into Complete Streets with pedestrian accommodations including compliance with ADA standards.
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# SPENCER FACILITIES

<u>Existing</u> 2.91 Miles <u>Programmed</u> 0.28 Miles <u>Potential</u> 19.61 Miles

## West Subregion – Warren

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
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- Work with local, regional, and statewide advocacy groups and other stakeholders to expand public education campaigns that promote the rules of the road so that all transportation system users are aware of their responsibilities.

# WARREN FACILITIES

<u>Existing</u> 0 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 8.86 Miles

# West Subregion – West Brookfield

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Continue Complete Streets development in town
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# WEST BROOKFIELD FACILITIES

<u>Existing</u> 0.72 Miles <u>Programmed</u> 0 Miles <u>Potential</u> 8.87 Miles

## **Central Subregion – Worcester**

# **Priority Recommendations**

- Adopt the CMMPO Regional Pedestrian Plan and the CMMPO Regional Bicycle Plan.
  - Pedestrian network planning should be incorporated into a municipality's planning process, with land use development and future transportation plans reflecting compliance with both plans.
- Participate in MassDOT Complete Streets Funding Program
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# WORCESTER FACILITIES

Existing 11.08 Miles Programmed 4.49 Miles Potential 100.24 Miles <u>Multi-Use</u> Existing 3 Miles

# **Appendix A: Acronyms**

AASHTO - American Association of State Highway and Transportation Officials

- ACS American Community Survey
- ADA Americans with Disabilities Act
- APBP Association of Pedestrian and Bicycle Professionals
- **BLOS Bicycle Level of Service**

CMMPO BPAC – Central Massachusetts Metropolitan Planning Organization Bicycle & Pedestrian Advisory Committee

- CMAQ Congestion, Mitigation, and Air Quality Program
- FHWA Federal Highway Administration
- FTA Federal Transit Authority
- GIS Geographic Information System
- HSIP Highway Safety Improvement Program
- LOS Level of Service
- LRTP Long Range Transportation Plan
- MPO Metropolitan Planning Organization
- MUTCD Manual on Uniform Traffic Control Devices
- NACTO National Association of City Transportation Officials
- NHS National Highway System
- PLOS Pedestrian Level of Service
- RTP Recreational Trails Program
- SOV Single Occupancy Vehicle
- SRTS Safe Routes to School
- STP Surface Transportation Program
- TIP Transportation Improvement Program

## **Appendix B: Definitions**

American Association of State Highway and Transportation Officials (AASHTO): a nonprofit, nonpartisan association representing highway and transportation departments. <u>www.aashto.org</u>

**American Community Survey (ACS):** the <u>ACS</u>, administered by the U.S. Census Bureau, regularly gathers information previously contained only in the long form of the decennial census, such as ancestry, educational attainment, income, language proficiency, migration, disability, employment, and housing characteristics.

**Americans with Disabilities Act (ADA):** Americans with Disabilities Act (ADA) is federal legislation enacted in 1990 prohibiting discrimination against persons with disabilities. <u>https://www.investopedia.com/terms/a/americans-with-disabilities-act-ada.asp</u>

Association of Pedestrian and Bicycle Professionals (APBP): a non-profit organization established in 1993 to promote walking, bicycling policies, practices, and supportive infrastructure/environments. APBP is focused upon peer knowledge sharing, advancing technical expertise, and supporting members' professional development. <u>https://www.apbp.org/</u>

**Bicycle Boulevard** - A roadway that is shared by motorists and bicyclists and that has been modified to function as a through street for bicyclists while discouraging through automobile traffic. Local access for automobiles is maintained. (AASHTO-*Guide for the Development of Bicycle Facilities*)

**Bicycle Level of Service (BLOS)** – A methodology developed by the Federal Highway Administration that can be used to evaluate a roadway segment's compatibility for allowing efficient operation for both bicycles and motor vehicles.

**Bicycle Facility** - A general term denoting improvements and provisions to accommodate or encourage bicycling, including parking facilities, maps, all bikeways, and shared roadways. (NCDOTNorth Carolina Bicycle Facilities Planning and Design Guidelines)

**Bicycle Lane (Bicycle Lane)** - A portion of a roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. (AASHTO *Guide for the Development of Bicycle Facilities*)

**Bicycle Route (Bicycle Route)** - A segment of a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational markers, with or without a specific bicycle route number. (NCDOT-*North Carolina Bicycle Facilities Planning and Design Guidelines*)

**Central Massachusetts Regional Public Health Alliance (CMRPHA):** a coalition comprised of the Towns of Grafton, Holden, Leicester, Millbury, Shrewsbury, West Boylston, and the City of Worcester. <u>CMRPHA</u>, managed by Worcester's Division of Public Health, functions as a regional public health district, providing services to partner municipalities.

**Community Health Improvement Plan (CHIP):** a long-term, systematic effort to address public health problems based on the results of community health assessment activities and the community health improvement process. A plan is typically updated every three to five years (source: <u>Centers for Disease Control</u>)

**Code of Federal Regulations (CFR):** codification of the general and permanent rules and **regulations** (sometimes called administrative law) published in the **Federal** Register by the executive departments and agencies of the **federal** government of the United States.

**Collector** - A roadway classification that is designated to roadways that connect local streets to arterial streets. In urbanized areas, collector streets provide land access and traffic circulation within residential and commercial developments.

**Congestion Mitigation and Air Quality Program (CMAQ):** a flexible federal transportation funding source for state and local governments; funds transportation programs and projects to help meet the requirements of the Clean Air Act. <u>https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm</u>

**Complete Streets:** a set of principles stating that all people, regardless of age, ability, income, race, or ethnicity, should have safe, comfortable, and convenient access to community destinations and public places—whether walking, driving, bicycling, or taking public transportation.

**Connected Networks:** A connected pedestrian/bicycle network is a cohesive system of transportation facilities that provide multiple direct routes allowing people of all ages and abilities to safely, comfortably, and conveniently travel to a particular destination.

**Countermeasure:** a term used in highway safety planning to describe a safety program or program approach focused on a particular type of crash problem.

**Crash Modification Factor (CMF):** used to calculate the expected number of crashes after implementing a given countermeasure at a specific location. As mentioned above, the Crash 94 Modification Factors Clearinghouse includes a web-based database of CMFs and supporting documentation.

**Crash type:** classifications of pedestrian crashes based on research into the pre-crash actions taken and errors made by a driver, walker, or bicyclist and the circumstances in which the crash occurs. Countermeasures have been developed and tested for many of the identified crash types, which include turning vehicle, overtaking, dart-out, bus-related, failure to yield, and many other crash types. The Pedestrian and Bicycle Crash Analysis Tool (PBCAT) provides additional information on crash types and how to classify crash data using the PBCAT approach.

**Crosswalk** - (a) That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable roadway, and in the absence of a sidewalk on one side of the roadway, the part of a roadway included within the extension of the lateral lines of the sidewalk at right angles to the centerline; (b) Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines of other markings on the surface. (MUTCD)

**Cycle Track** - A bikeway that is physically separated from motor vehicle traffic and distinct from the sidewalk. (NACTO Urban Bikeway Design Guide)

**Exposure:** period during or point at which a pedestrian could potentially be involved in a crash with a motor vehicle. Road user exposure is often used as the denominator for calculating pedestrian or bicycle crash rates.

**Fatality Analysis Reporting System (FARS):** a nationwide census providing NHTSA, Congress and the American public yearly data regarding fatal injuries suffered in motor vehicle traffic crashes.

**Federal Highway Administration (FHWA):** provides stewardship over the construction, maintenance and preservation of the Nation's highways, bridges and tunnels. FHWA also conducts research and provides technical assistance to state and local agencies in an effort to improve safety, mobility, and livability.

**Federal Transit Administration (FTA):** provides financial and technical assistance to local public transit systems, including buses, subways, light rail, commuter rail, trolleys and ferries.

**Geographic Information System (GIS):** a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

**Greenways** - Greenways are linear corridors that are either natural, such as rivers and streams, or man-made, such as abandoned railroad beds and utility corridors. Some greenways contain trails, which enhance existing recreational opportunities, provide routes for alternative transportation, and improve the overall quality of life in an area. Greenway trails can be paved or unpaved, and can be designed to accommodate a variety of trail users, including bicyclists, walkers, hikers, joggers, skaters, horseback riders, and those confined to wheelchairs. (Greenways, Inc.)

**Highway Safety Improvement Program (HSIP):** an FHWA program that funds state safety projects administered by State DOTs. States may use HSIP funds for infrastructure improvements (e.g., intersection design, pedestrian crossings, etc.) and non-infrastructure improvements (e.g., safety planning, data collection, enforcement and emergency programs).

**Highway Safety Manual (HSM):** the HSM presents a variety of methods for quantitatively estimating crash frequency or severity at a variety of locations. The HSM is managed by AASHTO, FHWA Office of Safety, and the Transportation Research Board Highway Safety Performance Committee.

**Long Range Transportation Plan (LRTP):** Mobility2040 is the current Central Massachusetts Metropolitan Planning Organization (see CMMPO, above).

**Marked Shared Roadways** - A roadway that is shared by motorists and bicyclists and that has been designed by signing and pavement markings as a preferred route for bicycle use. (AASHTO*Guide for the Development of Bicycle Facilities*)

**Major Arterial** – A roadway classification that is designated to roadways that are designed to carry moderate to high traffic volumes and to serve through traffic. Major commercial land uses are typically located along these roadways.

**Massachusetts Bicyclist and Pedestrian Advisory Board (MABPAB):** Established in 2004 to oversee and advise state bicycle and pedestrian program activities. MABPAB also monitors implementation of MA's statewide bicycle and pedestrian transportation plans, and assists the bicycle and pedestrian program office in preparing future plan updates.

**Metropolitan Planning Organization (MPO):** an organization charged with developing and implementing a transportation planning process in covering all urbanized areas (UZAs) with populations over 50,000, as determined by the U.S. Census.

**Manual on Uniform Traffic Control Devices (MUTCD):** an FHWA publication that defines standards used by road managers nationwide to design, install, and maintain traffic control devices (i.e., traffic signs, road surface markings, and signals) on all streets and highways. Some State agencies have developed their own sets of standards, but these must conform to the Federal MUTCD.

National Association of City Transportation Officials (NACTO): NACTO represents large cities on transportation issues of local, regional, and national significance. Its Urban Street Design Guide highlights design improvements that can improve pedestrian, bicycle, transit, and motor vehicle safety and mobility, along with case studies from communities around the United States. https://www.nacto.org/

**Pedestrian and Bicycle Crash Analysis Tool (PBCAT):** a software product developed to assist state and local pedestrian/bicyclist coordinators, planners, and engineers in classifying crash types in conjunction with improving pedestrian and bicycling safety.

**Pedestrian Level of Service (PLOS):** a TRB Highway Capacity Manual (HCM) qualitative measure used to describe operational conditions of vehicular and pedestrian traffic, "based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience." Pedestrian LOS measures are focused upon pedestrian flow rates and sidewalk space, incorporating pedestrian speed, density, and volume.

**Road Safety Audit (RSA):** a formal safety performance review of an existing or future road or intersection. The RSA team identifies and analyzes potential road safety issues, and recommends improvements for all road users.

**Safety in Numbers:** the inverse relationship between biking and walking levels and fatality rates. Facility designs that may encourage walking and biking (bike lanes, sidewalks, signed routes, etc.) also likely contribute to increased safety.

**Self-enforcing/self-explaining roadways:** facilities that efficiently address safety for all users by implementing designs and operations that explain road function and enforce speeds close to limits

**Separated Bike Lane:** A separated bike lane is an exclusive facility for bicyclists that is located within or directly adjacent to the roadway and that is physically separated from motor vehicle traffic with a vertical element. Separated bike lanes are differentiated from standard and buffered bike lanes by the vertical element. They are differentiated from shared use paths (and side paths) by their more proximate relationship to the adjacent roadway and the fact that they are bike-only facilities. Separated bike lanes are also sometimes called "cycle tracks" or "protected bike lanes." (FHWA)

**Shared Roadway** - A roadway which is open to both bicycle and motor vehicle travel. This may be an existing roadway, a street with wide outside lanes (WOLs), or a road with paved shoulders. (AASHTO-*Guide for the Development of Bicycle Facilities*)

**Shared Use Path** - Pathways that are physically separated from motorized vehicle traffic by an open space or barrier and can accommodate multiple user types including bicyclists and pedestrians. (AASHTO-*Guide for the Development of Bicycle Facilities*)

**Shoulder** - The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of sub-base, base and surface courses. (AASHTO-*Guide for the Development of Bicycle Facilities*)

**Sidewalk** - The portion of a street or highway right-of-way designed for preferential or exclusive use by pedestrians. (AASHTO-*Guide for the Development of Bicycle Facilities*)

**Shared Roadways** - A roadway that is shared by motorists and bicyclists and that has been designed by signing as a preferred route for bicycle use. Shared roadways are typically reserved for arterial or collector streets that have high bicycle traffic/demand, but cannot accommodate bicycle lanes or WOLs due to severe physical constraints. (AASHTO-*Guide for the Development of Bicycle Facilities*)

**Sharrow** - A pavement marking used to denote a marked shared roadway. (AASHTO-*Guide for the Development of Bicycle Facilities*)

**Surface Transportation Block Grant Program (STBGP):** federal flexible funding that states and localities can use for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals. Formerly known of as the Surface Transportation Program (STP).

**Strategic Highway Safety Plan (SHSP):** a statewide-coordinated safety plan that functions as a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. An SHSP identifies a State's safety needs and guides investment decisions towards strategies and countermeasure with the most potential to save lives and prevent injuries.

**Shared-use facility:** typically, a paved path adjacent to a roadway or separate from a roadway that is designated for nonmotorized use. Most such facilities include pedestrians and bicyclists, but some are also designated for rollerblades, skateboarders, and equestrians.

**Safe Routes to Schools (SRTS):** a program that examines conditions around schools and conduct projects and activities that work to improve safety and accessibility, and reduce traffic and air pollution in the vicinity of schools. As a result, these programs help make biking and walking to school safer and more appealing transportation choices thus encouraging a healthy and active lifestyle from an early age. These programs are sustained efforts by parents, schools, community leaders and local, State, and Federal governments to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school.

**Toward Zero Deaths (TZD):** a vision succinctly describes how an organization can approach safety—in which even one death on our transportation system is unacceptable. Within FHWA, the Office of Safety, Office of Safety Research and Development, and the Resource Center Safety and Design Technical Services Team jointly established a Safety Strategic Plan to focus on a common safety vision. TZD uses a data-driven, interdisciplinary approach, integrating application of education, enforcement, engineering, and emergency medical and trauma services.

**Transportation Infrastructure Finance and Innovation Act (TIFIA):** federal credit assistance funded through the FAST Act to states, localities, other public authorities, and private entities undertaking projects sponsored by public authorities, three distinct types of financial assistance:

- Secured loans are direct Federal loans to project sponsors offering flexible repayment terms and
  providing combined construction and permanent financing of capital costs.
- Loan guarantees provide full-faith-and-credit guarantees by the Federal Government to institutional investors, such as pension funds, that make loans for projects.
- Lines of credit are contingent sources of funding in the form of Federal loans that may be drawn upon to supplement project revenues, if needed, during the first 10 years of project operations.
   [23 U.S.C. 603 and 604]

This assistance is provided for eligible surface transportation projects.

**Transportation Improvement Program (TIP):** a list of upcoming transportation projects covering four or more years. A TIP's project list should include bicycle and pedestrian facilities and other transportation enhancements. The TIP is developed by a Metropolitan Planning Organization (MPO) covering the region in which a facility is or will be planned/constructed.

**Vision Zero (1994):** a policy goal by which one should die or suffer serious injury in traffic. The initiative places the main responsibility for safety on system design. A core principle of the vision is that human life and health cannot be exchanged for other benefits within the society (in contrast to the more conventional comparison between costs and benefits, where a monetary value is placed on life and health).

Walking School Bus: a group of children walking to school with one or more adults. It can be as informal as two families taking turns walking their children to school or as structured as a planned route with meeting points, a timetable and a schedule of trained volunteers. More information is available in the National Center for Safe Routes to School Guide.

**Wide Outside Lane (WOL)** - A right-hand lane of a shared roadway that is typically 14 feet wide to better accommodate both bicyclists and motor vehicles in the same lane. (American Planning Association— *Bicycle Facility Planning*)

**U.S. Access Board (USAB):** an independent Federal agency that promotes equality for people with disabilities through leadership in accessible design and the development of accessibility guidelines and standards.

# Appendix C: Regional Bicycle & Pedestrian Survey

# Question 1

# How far is your daily trip to work or school?

Answer Choices	Response	es
0-2 miles	21.77%	27
3-5 miles	20.16%	25
6-10 miles	10.48%	13
11-20 miles	12.90%	16
Over 20 miles	23.39%	29
Unknown	0.00%	0
I do not travel to work or school	11.29%	14
	Answered	124
	Skipped	0

#### Question 2

# How long is your daily trip to work or school?

Answer Choices	Response	S
0-5 minutes	16.39%	20
6-10 minutes	16.39%	20
11-20 minutes	26.23%	32
21-30 minutes	12.30%	15
21-30 minutes	0.00%	0
Over 30 minutes	28.69%	35
I do not travel to work or school by bicycle	0.00%	0
	Answered	122
	Skipped	2

# Question 3

# What form of transportation do you mostly use for your daily travel?

Answer Choices	Responses	5
Car	66.67%	82
Motorcycle	0.81%	1
Bus	4.07%	5
Train	2.44%	3
Carpool/Vanpool	0.00%	0
Bicycle	16.26%	20
Walk/Wheelchair	6.50%	8
I do not travel to work or school	3.25%	4
Other (please specify)		2
	Answered	123
	Skipped	1

# Question 4

# Do you have access to a bicycle?

Answer Choices	Responses	
Yes	93.50%	115
No	6.50%	8
	Answered	123
	Skipped	1

#### Question 5

# Select the option that best describes your bicycle access.

	Skipped	3
	Answered	121
A Bike Share Program is located in my area	3.31%	4
friends, co-workers, or relatives have a bicycle I can use	2.48%	3
A bicycle is available at my school or workplace	0.00%	0
A bicycle is available in my home	7.44%	9
I own a bicycle	86.78%	105
Answer Choices	Response	S

#### Question 6

# If you do not have access to a bicycle, indicate why:

Answer Choices	Responses	S
Cycling is not a convenient method of transportation	12.16%	9
Cost	2.70%	2
No place to store a bicycle	5.41%	4
No time to ride a bicycle	4.05%	3
Don't like riding a bicycle	1.35%	1
Don't know the rules for riding a bicycle	0.00%	0
Don't know how to ride a bicycle	0.00%	0
Physical Limitations	2.70%	2
Other (please specify)	81.08%	60
	Answered	74
	Skipped	50

#### Question 7

# How would you describe your abilities as a person who bikes?

Answer Choices	Responses	6
Beginner	8.06%	10
Intermediate	43.55%	54
Expert	45.97%	57
I do not ride bicycles	2.42%	3
	Answered	124
	Skipped	0

#### **Question 8**

# How would you classify your knowledge of local cycling ordinances?

Answer Choices	Responses	5
No Knowledge	20.33%	25
Some Knowledge	55.28%	68
Complete Knowledge	24.39%	30
I have no knowledge of local cycling ordinances	0.00%	0
	Answered	123
	Skipped	1

8

0

0

# Question 9

#### What is your perceived level of safety when walking or cycling? Answer Choices Responses Very safe 6.45% Generally safe 33.87% 42 Somewhat safe 25.81% 32 Unsafe 21.77% 27 Dangerous 12.10% 15 I do not ride a bicycle or walk to my destinations 0.00% Answered 124 Skipped

## Question 10

# How often do you walk or ride your bicycle to your destination?

Answer Choices	Response	S
Daily	6.50%	8
5-6 times per week	15.45%	19
3-4 times per week	13.82%	17
1-2 times per week	13.82%	17
Less than 4 times per month	34.15%	42
I do not travel to work or school	16.26%	20
	Answered	123
	Skipped	1

#### **Question 11**

# Why do you walk or ride your bicycle? Indicate all that apply.

Answer Choices	Respons	ses
Exercise	90.32%	112
Recreation	82.26%	102
Cycling is friendly to the envrionment	54.03%	67
Destinations, i.e. Running Errands or Shopping	25.81%	32
More cost effective than using an automobile	39.52%	49
Commute to work	28.23%	35
Faster mode of transportation than an automobile	14.52%	18
There is a shower/locker room at work	7.26%	9
Commute to school	4.03%	5
Direct bicycle routes between home, work, and/or school	5.65%	7
I do not own a car	5.65%	7
I do not ride bicycles	4.03%	5
Other (please specify)	8.06%	10
	Answered	124
	Skipped	0

#### **Question 12**

#### Please select your top three (3) reasons why you don't walk or bike more often Answer Choices Responses Physical (Health) 7 5.65% No Access to a Bicycle 4.03% 5 Do Not Know How to Ride a Bicycle 0.81% 1 No Nearby Destinations 38.71% 48 Concerned About Bicycle Theft 38 30.65% Concerned About Safety 72.58% 90 Vehicle Required for my Job 30 24.19% Weather Conditions 58.06% 72 Hilly Terrain 30.65% 38 Other (please specify) 39.52% 49 Answered 124 Skipped 0

#### Question 13

# Please select the top five (5) factors that limit you from cycling or walking more often:

Answer Choices	Response	es
Crossing Barriers (Highways, Bridges, Rivers, Intersections, Etc)	57.26%	71
Route/Lane/Sidewalk Ends Abruptly (Not Continuous)	48.39%	60
Not Enough Off-Road Multi-Use Pathways	65.32%	81
Not Enough On-Road Bicycle Lanes/Facilities	72.58%	90
Lack of Secure Bicycle Parking/Storage/End of Trip Facilities (Showe	35.48%	44
Bicycle Rack on WRTA Bus is Full	0.00%	0
Poor Transit Connections in my Area	11.29%	14
Volume & Speed of Traffic	60.48%	75
Distance/Time to Walk or Bike to Destinations	33.06%	41
Poor Maintenance of Sidewalks/Streets	47.58%	59
Narrow Roadway Lanes/Shoulders	59.68%	74
No Employer Support	6.45%	8
No Guaranteed Ride Home (Weather, Emergency, Etc)	16.13%	20
MBTA Commuter Rail is difficult to travel to on foot or bicycle.	4.03%	5
MBTA Commuter Rail does not allow bicycles on rush hour trains.	9.68%	12
	Answered	124
	Skipped	0

#### Question 14

# Please list the top five (5) factors that would encourage you to walk or bike more often:

Answer Choices	Response	s
More Off-Road Multi-Use Paths	71.77%	89
On Road Bicycle Lanes/Facilities/Colored Lanes/Wider Shoulders	81.45%	101
Separated/Buffered Bicycle Lanes	76.61%	95
New/Repaired Sidewalks and Curb Ramps that are ADA Compliant	30.65%	38
Improved Crossings @ Intersections/Highways/Bridges/Rail/Etc.	64.52%	80
Better Access to WRTA Bus Stops/Stations	8.87%	11
Better Access to MBTA Commuter Rail / Bikes allowed on all trains.	16.94%	21
Improved Roadway/Sidewalk Maintenance (Paving/Sweeping/Snow Clearance)	62.90%	78
Better Maps/Wayfinding	12.90%	16
Traffic Calming (Speed Reduction) + Increased Enforcement of Traffic Violations	62.90%	78
Secure Bicycle Parking/Storage/End of Trip Facilities (Shower, Locker, Etc.)	34.68%	43
	Answered	124
	Skipped	0
## **Question 15**

# What is the farthest distance you would be willing to cycle to a destination?

	Skipped	0
	Answered	124
Over 5 miles (+30 minute ride)	65.32%	81
3.1-5 miles (16-30 minute ride)	20.16%	25
1-3 miles (5-15 minute ride)	14.52%	18
Answer Choices	Responses	

# **Question 16**

# What is the farthest distance you would be willing to walk to a destination?

Answer Choices	Responses	5
0.25 mile - 0.50 mile (5-10 minute walk)	6.45%	8
0.51 mile - 1.0 mile (11-20 minute walk)	25.00%	31
1.1 miles - 2.0 miles (21-40 minute walk)	39.52%	49
2.1 miles - 3.0 miles (41-60 minute walk)	19.35%	24
Greater than 3.0 miles (+60 minute walk)	9.68%	12
	Answered	124
	Skipped	0

## **Question 17**

What is the most important bicycle or pedestrian project need in your area?

Answer Choices	Responses	
#1	100.00%	122
#2	0.00%	0
#3	0.00%	0
	Answered	122
	Skipped	2

#### RAW RESPONSES:

Bike lanes Sidewalk installation and winter clearing Bike paths and more sidewalks Trail on public land Route 122 needs resurfacing with actual bike lanes beyond the white line. It is a very dangerous stretch of road for cyclists that frequently are on it. There is absolutely no shoulder. Improvement of road infrastructure More Bike lanes Safer dedicated bike lanes or sharrows Earn a Bike Bike lane Crosswalk safety (lack of) painted crosswalks & no parking so close to the curbs Creating safer bike lanes. Rehabilitation of roads and sidewalks and creation of bike lanes More protected bicycle lanes Traffic reduction, Traffic calming road infrastructure able to accommodate bike riding/commuting Safer streets! Bike lanes, protected bike lanes, off road bike paths etc. every city has them besides Worcester! Change in driving culture / traffic enforcement bike lanes and driver education Bike lane/good shoulders Bike lanes/signage - nearly non-existent better scheduling/prioritizing of construction projects improving on-road conditions with bike lanes in town centers and on numbered routes Connection to Mass Central Rail Trail in Clinton protected bike lanes separated from autos bike lanes Bike lanes on Pleasant St The intersection between 290, 190, Goldstar and West Boylston Street Driver education about rights of cyclists Separated/Buffered Bicycle Lanes On road bicycle lanes Traffic/bike interactions at Boston intersections Rail trail completion for the section going from Hudson to Berlin under 495. roads here are a death trap More bike lanes More bike paths **Bike lanes** Proper bicycling lanes on roads **Bike lanes** Improved shoulders or bike paths Wider shoulders Mountain biking trails near my house More sidewalks for walking safely off the road. better trail network Dedicated bike paths More trails NEMBA Leominster State Forest with DCR Bike lanes and sidewalks More off-road trails Vehicle speed better off road trail maps Add bike lanes to major routes. Today some state roads have no shoulders at all. **Bike lanes** Share the Road signage, road repair, markings. On Road Bicycle Lanes/Facilities/Colored Lanes/Wider Shoulders

Wider well-maintained paved shoulders on the roads. Bicycle lanes or bicycle paths Need more bike lanes Bike lanes Safe crosswalk Traffic/speed calming measures (Ararat Street / Greendale / Burncoat/ Park Ave) Protected bicycle infrastructure traffic calming measures Crosswalk across from temple on Pleasant Street. Very unsafe. High speed. Nobody stops, even when pedestrian(s) are in the crosswalk. Traffic calming measures: Reduced speed limits, more crosswalks, BMUFL signage, etc. Safe maintained streets Need more trails and sidewalks and better connectivity of those that exist Traffic Enforcement. Too many people choosing to zip around town all the time with no regard for safety Safer bike Lanes, with enforcement so drivers don't violate them More thoughtfully placed bike lanes in Worcester Walking in Sutton is very dangerous as the town lacks sidewalks in almost entirely. Additional Sidewalks widen Route 140 in West Boylston More secure bike lock areas Safe street crossings FLASHING YIELD SIGN ON CORNER OF ADAMS AND KAY The path literally goes from one high volume street to another with no sidewalks to connect to the path. I cannot send my children to use it and they hate it because it is just a straight line goes nowhere. There is nothing interesting or useful about it and creates major safety concerns about vandalism and robbery in my neighborhood. Bike trails! Bike lanes and sidewalks improved pedestrian crossing at busy intersections Bike paths Off street paths Bicycle path Either a more sidewalks or a bike path. There are few places in town for families to ride safely. Sidewalk clearing and continuity Designated biking Lane paths and trails for healthy recreational activities for families **BWALT** Fix Street Lighting and Roads. West Boylston Street/Gold Star Blvd needs to be made safe for ped/bike Build the BWALT trail More trains (both commuter MBTA and Amtrak) allowing bicycles to be carried on board. Bike lanes **Bike lanes** Better infrastructure (a continuous network of bike lanes/multi-use paths and redesigned intersections) Improved sidewalk and pedestrian accommodations i.e. crosswalks, lights, signage Paths Traffic enforcement North Grafton Bike Path

Established him away through town

Separated bike lanes in Worcester

Long distance bike path

education of motorists AND cyclists

Off road bike path

Sidewalk improvement, maintenance, and continuity

BWALT

Grafton Bike paths

North Grafton Bikeway

City of Worcester Bikeways and lanes

Multi use trail development

Better road conditions, removal of sand, fix pot holes.

Safety awareness

completion of Assabet River and Bruce Freeman Rail trails

Assabet river rail trail through Stow

Safe roads w clearly defined bike lanes. Driver awareness/education.

continuous/uninterrupted rail trails

sidewalks

Consistent and safe routes along roads or designated bike paths following common commuting routes. NOT NEEDED: more recreational bike paths that cut through wetlands and forests but lead to nowhere a daily commuter would go for work

Creating safer crossings at busy intersections.

Better on-road signage (my town has NONE). I mean sharrows and painted bike lanes, signage including Bicycles May Use Full Lane. My town has done NOTHING for me as a road cyclist.

## Question 18

What is the main reason that bicycle and pedestrian facilities should be improved or expanded in your area?

	Skipped	7
Answered		117
Reason #3	0.00%	0
Reason #2	0.00%	0
Reason #1	100.00%	117
Answer Choices	Responses	

## RAW RESPONSES:

## Traffic jams

Westborough has many walkable areas (e.g., downtown, Charm Bracelet trails) that would see far more use if sidewalks were more consistently available (and cleared in winter) for pedestrians. Safer for kids and adults to. Bike and walk

NA

Economic impacts.

Encourage more recreation opportunities. Where I live is very rural so commuting by bicycle would be difficult.

Reduction of traffic

More bicycles=fewer cars and less traffic congestion

Safer streets

We have no bike services or even sidewalks. Better services would stimulate more riding. Better for the environment

Bus service is being reduced. too dangerous to cross the street More people might get out and bike Because there are a lot of people that bike in the city and the numbers would grow if there were better facilities for us. So cyclists can safely ride in the city So that more oriole would use them Reduce # of auto and greater public health so People can stop taking their cars everywhere! Reduced fear of dying under an SUV cyclists are being hit by cars Safety Cars are expensive, polluting, and slow in the city Many Worcester residents less-experienced at cycling need them for safety/confidence. encourage more potential and hesitant cyclists to ride on the roads, facilities and signs that signal that they BELONG on our roads, to reduce carbon footprint, to increase health, reduce congestion and change car culture. More people riding & walking - lower collective carbon footprint promote environment & health & reduce car traffic so motorists recognize bikes belong on the streets Get more people to bike commute! Better connection between North Worcester and the rest of the city To encourage more people to use alternate transportation reduce traffic congestion Small community with centrally located shopping centers which could be biked to if the infrastructure was built. To encourage people to bike to work safety Tourism, health Livability Safety Safety Health Reduce traffic congestion Will improve the overall health of the population Safety, overall health, socializing and better for the environment. better for health for both people and the environment Safety Reduce car travel Quality of living in a great wilderness area Enabling safe cycling Too much auto traffic Health safety Prevent needless injuries and deaths from distracted drivers who aren't punished for consequences. Increased general health of population Community connections, real estate values Low Income people depend on walking, biking

People won€<sup>™</sup>to walk unless they see lots of other people doing it and having fun and there€<sup>™</sup>s nothing appealing about picking your way along the roads shoulder

Roads too dangerous to ride on for non-expert riders.

Better access to downtown for bicyclists to diversify commuting options

So more people bike

So more people are able to bike and not scared of vehicle traffic

Encourage health and local shops.

Having more people on the street bicycling or walking will improve local economy and make for better property values.

To enable more people to ride and walk. Streets are too dangerous to bike; a large number of protected bike lanes solves this problem.

healthier

It makes for a friendlier environment. People SEE each other. Interact with each other and with the environment around them.

Provide greater freedom of movement for people unable or unwilling to take on the burden of motor vehicle ownership.

Safety

Give people realistic, fun ways to get out of the car

Congestion and beautification

Climate change

Increased safety and better access for those without cars.

Sidewalks are a safer connection to town for health benefits.

safety!!

Worcester is a relatively dense urban area that could facilitate easy bike access.

Safety

Cars cannot see around tree branches on corner okay and Adams and usually ZIP down Adams Street. Repainted lines in crosswalk have not deterred speeding drivers!

I think they should be removed as they are useless for where they are located. Having a bike/ walking path across the street from senior living facility with no safety guards or crosswalks is just plain dumb.

To promote wellness

Reduce traffic

good for environment and health

Safety & health

Exercise/environmentally friendly

Large population needs

So that families can bike to and from school, to run errands, or to enjoy recreational biking.

Some more people can safely walk and ride

Safety and health

Westboro deans€™t offer any child friendly trails and town roads are too busy

Alternative Modes should be part of the network.

Improve connectivity of North Worcester with rest of the city

Attract millennials and new business to town

Reduce traffic jams and pollution from gas/diesel engines.

Safety

Public transportation sucks

Transportation choice (also recreation)

Nearby school and local medical facility

Safety

Ease congestion Reduce traffic Safety for cars and riders Latent demand. People drive to Elm Park to bike with their kids, then pack it in the car to drive back home. For a healthier community. get some cars off the road They currently done€<sup>™</sup>t exist Walking is simple exercise Recreation They are non-existent Reduce congestion, create a cohesive community, provide connection to mass transit and schools too much traffic Better health for those who ride or walk Ease congestion Safety for bicyclists reduce reliance on autos SAFETY safety To encourage more walking/biking Better for the environment Reduce vehicle use. Tells motorists we belong on the road, and might encourage some more people to bicycle. Motorists might give more respect to us.

## **Question 19**

## What is your gender?

	•	
Answer Choices	Responses	
Female	47.50%	57
Male	52.50%	63
	Answered	120
	Skipped	4

# Question 20

What is your age?			
Answer Choices	Responses		
18 or younger	0.00%	0	
19-25	3.28%	4	
26-35	30.33%	37	
36-45	21.31%	26	
46-60	31.15%	38	
61-75	13.93%	17	
Over 75	0.00%	0	
	Answered	122	
	Skipped	2	

# Question 21

In what ZIP code is your home located? (enter 5-digit ZIP code; for example, 01604 or 01501) Answered 124 Skinned 0

Skipped	0			
01602	01602	01005	01581	01609
01581	01692	01602	01581	01545
01532	01606	01581	01581	01519
01612	01602	01581	01581	01536
01366	01452	01606	01581	01609
01331	01540	01604	01581	01581
01068	01772	01609	01581	01564
01605	01749	01607	01581	01602
01610	01473	01606	01581	01752
01452	01543	01609	01581	01752
01607	01602	01602	01608	01581
01608	01005	01602	01606	01520
01501	01453	01610	01606	01505
01603	01543	01610	01581	01532
01602	01740	01609	01562	01581
01505	01453	01602	01752	01581
01571	01068	01602	01602	
01609	01520	01602	01609	
01609	01536	01590	01607	
01610	01566	01606	01566	
01605	01520	01581	01432	
01453	01507	01609	01519	
01602	01504	01602	01519	
01606	01543	01610	01609	
01581	01462	01582	01536	
01609	01543	01581	01602	
01609	01543	01581	01519	

# **Appendix D: Resources & Guidance**

FHWA Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts:

https://www.fhwa.dot.gov/environment/bicycle\_pedestrian/publications/multimodal\_networks/

FHWA Interim Approvals:

https://mutcd.fhwa.dot.gov/res-interim approvals.htm

FHWA Manual on Uniform Traffic Control Devices:

https://mutcd.fhwa.dot.gov/

FHWA Small Town and Rural Multimodal Networks:

https://www.fhwa.dot.gov/environment/bicycle\_pedestrian/publications/small\_towns/

MassDOT Project Development & Design Guide:

https://www.mass.gov/lists/design-guides-and-manuals

# Websites

https://www.alltrails.com/us/massachusetts/worcester

https://www.discovercentralma.org/articles/hiking-central-massachusetts/

http://www.golocalworcester.com/lifestyle/six-great-hiking-trails-in-central-mass

https://www.gpsmycity.com/gps-tour-guides/worcester-1329.html

http://hikeworcester.com/

https://www.mapmywalk.com/us/worcester-ma/

http://masswalkingtour.org/

https://www.mass.gov/service-details/find-a-healthy-heart-trail - Heart Healthy Trails are marked by a green heart sign at trailheads. Trails measure from 1 to 2 miles in length and are easy to moderate difficulty. (see the Central Region; seven of these are located in the CMMPO region)

http://www.newenglandwaterfalls.com/top25hikesmassachusetts.php

http://www.worcesterma.gov/building-a-healthy-community/woo-moves

https://www.visit-massachusetts.com/central/walking-and-hiking/

## **References:**

American Automobile Association

Pedestrian (and Bicyclist) Fatalities – May 2018: an AAA Foundation analysis of data from the National Highway Traffic Safety Administration <u>General Estimates</u>, and <u>Fatality Analysis Reporting</u> <u>Systems https://www.ssti.us/2018/05/hit-and-run-crashes-are-on-the-rise/</u>

Massachusetts Department of Transportation. *The Massachusetts Amendments to the Manual on Uniform Traffic Control Devices and the Standard Municipal Traffic Code*. <u>http://www.massdot.state.ma.us/Portals/8/docs/traffic/MassMUTCD20120409.pdf</u>

Federal Highway Administration. Crash Modification Factors Clearinghouse. <u>http://www.cmfclearinghouse.org/index.cfm</u>

Federal Highway Administration. Pedestrian and Bicycle Information Center. <u>http://www.pedbikeinfo.org/index.cfm</u>

Federal Highway Administration Small Town and Rural Multimodal Networks. December 2016. <u>https://www.fhwa.dot.gov/environment/bicycle\_pedestrian/publications/small\_towns/fhwahep17024\_lg.pdf</u>

MassDOT

ADA/Section 504 Transition Plan for The Public Rights of Way Update, October 2017 https://www.mass.gov/files/documents/2018/04/02/ADA TransitionPlan 101017.pdf

MassDOT Municipal Resource Guide for Walkability (September 2017) https://www.mass.gov/files/documents/2017/10/19/PedPlan\_MunicipalResourceGuide.pdf

MassDOT Project Development and Design Guide (2006) <u>http://www.massdot.state.ma.us/highway/DoingBusinessWithUs/ManualsPublicationsForms/ProjectDe</u> <u>velopmentDesignGuide.aspx</u>

National Association of City and Town Officials. Guidelines for the Regulation and Management of Shared Active Transportation. Washington, DC: July 2018.

WalkBoston. Rural Walking in Massachusetts: A Tool Kit for Municipalities. 2013. https://walkboston.org/resources/reports/rural-walking-report/

## Footnotes

https://patch.com/massachusetts/westborough/walks-talks-worcester-framingham-rail-trail