City of Pittsfield

THE HEART OF THE BERKSHIRES

BICYCLE FACILITIES MASTER PLAN

July 2021

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Cover Image Source: Wikipedia/Protophobic

Acknowledgments

The City of Pittsfield Bicycle Facilities Master Plan was developed by the Department of Community Development, in cooperation with the Departments of Parks & Recreation, Public Services, and Utilities. Guidance and support for this plan's development were provided by a Project Advisory Committee (PAC).

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Source: City of Pittsfield, MA

Executive Summary

The Need for a Bicycle Master Plan

The City of Pittsfield (City) has successfully designed and implemented several bicycle facilities projects. The planning and implementation of these projects revealed the challenges and trade-offs of implementing bicycle facilities corridor-by-corridor. Based on these challenges, it became evident that the City needs to transform bicycle facility planning from a 'one-street-at-a-time' approach to a holistic 'city-wide network.' A network that is not entirely reliant on expensive and extensive dedicated bicycle infrastructure on all streets but would instead benefit from utilizing the well-connected street grid to develop a range of context-appropriate bicycle facilities to create a city-wide low-stress bicycle network.

The Bicycle Facilities Master Plan (Master Plan) is a significant step forward for the City in its steadfast commitment to plan and implement a safe and accessible city-wide network for people who bike. Bicycling plays a significant role in creating healthy, safe, and livable communities. It provides opportunities for affordable commuting, physical activity, and recreation. Bicycling can also serve as a 'first mile, last mile' solution to connect people to other transportation modes, such as car-pool or transit.

Project Vision

The Bicycle Facilities Master Plan lays out a framework for implementing a well-connected network of comfortable low-stress bicycle facilities that are accessible to people of all ages and abilities, and where bicycling can become a viable transportation option that improves the overall quality of life in Pittsfield.

Plan's Goals

The four goals illustrated in Figure ES.1 build upon the project's vision and expand on lessons learned from national research. The goals also helped craft a Pittsfield-specific planning process.

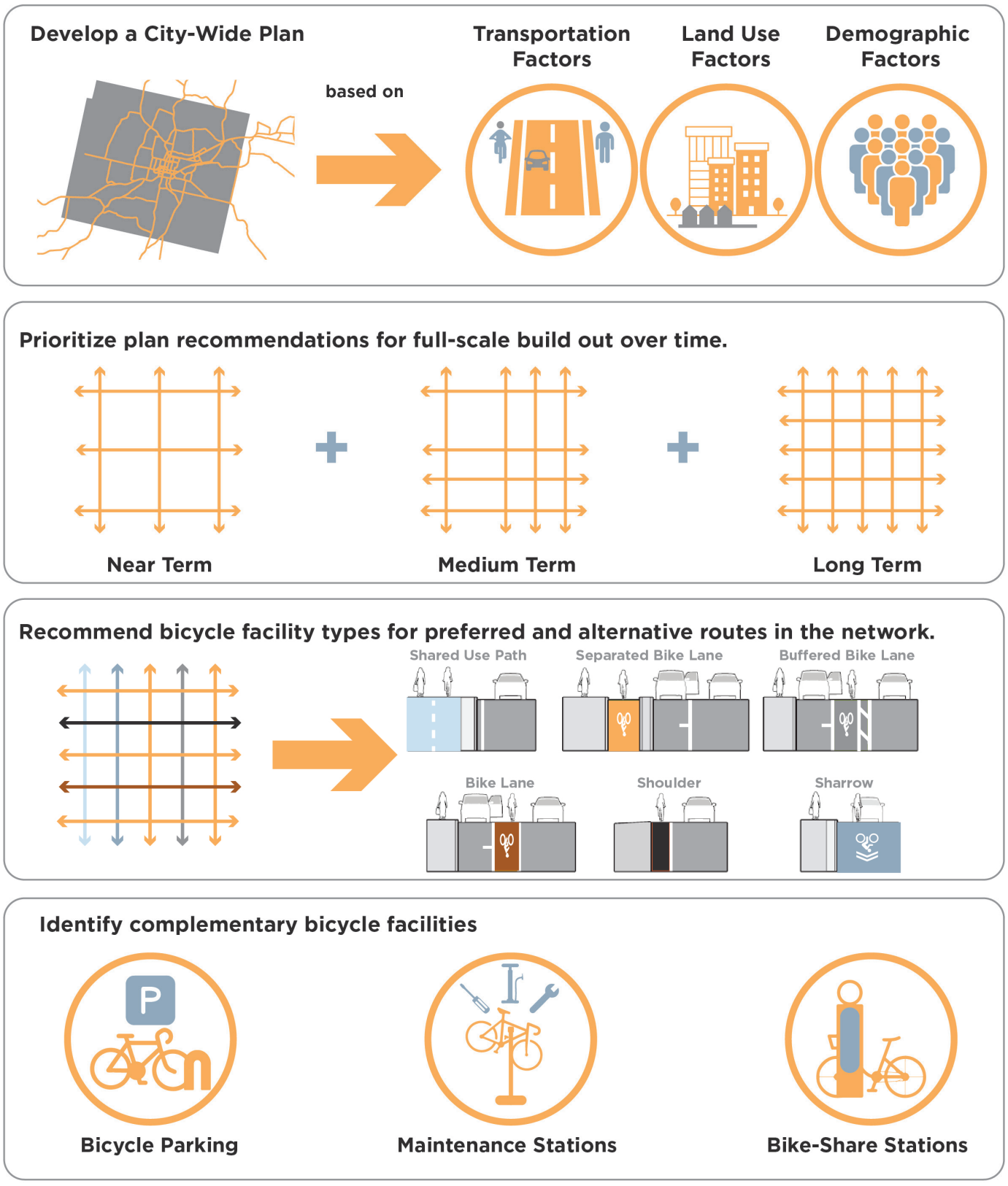


Figure ES.1: Project Goals

Planning Process

This Master Plan involves a robust planning process that documents and analyzes existing conditions, while engaging stakeholders and the general public through an extensive outreach process. The Master Plan utilized a prioritization process to identify strategic corridors and includes a list and a map of projects categorized by recommended bicycle facility types. The Master Plan also includes a toolbox for bicycle facility design treatments, as well as programmatic and policy recommendations related to bicycling in Pittsfield.

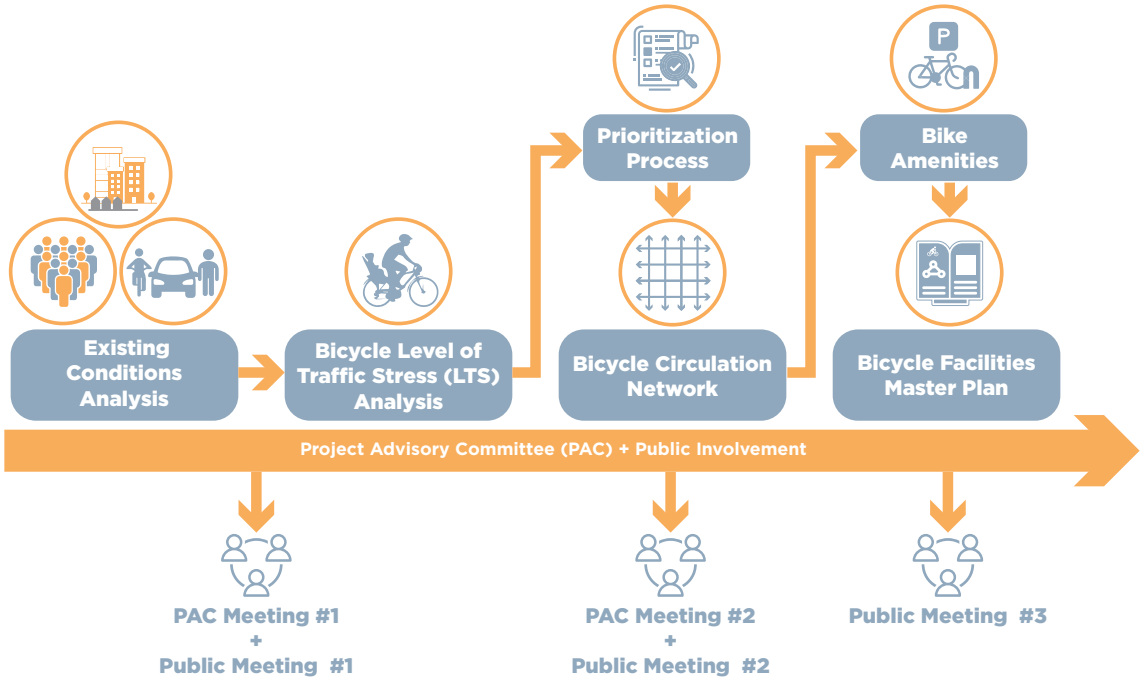


Figure ES.2: Planning Process

Master Plan Contents

This document is organized in several chapters that provide specific information related to project phases and subject areas. The Master Plan includes the following chapters:

- ***Introduction:*** Provides an overview of the project background, vision, planning process, timeline, and goals.
- ***Public & Stakeholder Engagement:*** Summarizes the approach and findings from public outreach and stakeholder engagement activities, including public meetings, Project Advisory Committee meetings, surveys, and online map comments.
- ***Existing Conditions Analysis:*** Maps and analyzes physical and socio-economic conditions applicable to improving the bicycling infrastructure in Pittsfield.
- ***Bicycle Level of Traffic Stress (LTS):*** Provides background information about the Bicycle LTS methodology and presents results of the LTS analysis on Pittsfield's streets.
- ***Recommended Bicycle Network:*** Summarizes the prioritization methodology and presents the recommended city-wide bicycle facilities network.
- ***Supporting Bicycle Amenities:*** Provides information on supporting amenities such as bicycle parking and maintenance stations.
- ***Design Guidelines:*** Illustrates bicycle facility design guidelines for various bicycle facility types, intersection treatments, and transitions between different types of bicycle facilities.
- ***Programs & Policies:*** Lists various recommended bicycle programs and policies to complement the physical bicycle infrastructure.

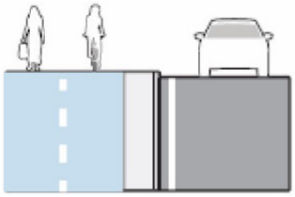
Recommended Bicycle Network

The recommended bicycle network was developed using the findings from the existing conditions analysis, understanding public and stakeholder input, and applying the prioritization process.

The result of the prioritization process is a connected network of low-stress bicycle facilities, including Shared Use Paths, Separated and Buffered Bike Lanes, Conventional Bike Lanes, and Neighborhood Bike Routes. In addition to physical infrastructure, the plan includes program and policy recommendations.

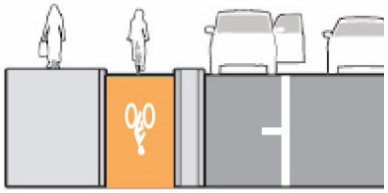
- Shared Use Path

Source: Tahoe Regional Planning Agency



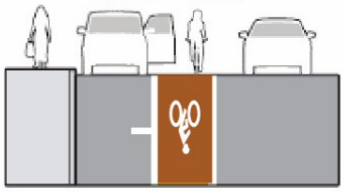
- Separated/Buffered Bike Lanes

Source: Kittelson



- Conventional Bike Lanes

Source: The Urbanist / Ryan Packer



- Neighborhood Bike Routes (Shared Lanes)

Source: NACTO

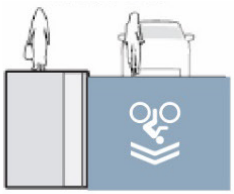


Figure ES.3: Recommended Bicycle Facility Types

Table ES.1 lists the number of street segments and total miles by bicycle facility type. Table ES.2 lists the number of segments and total miles by priority level.

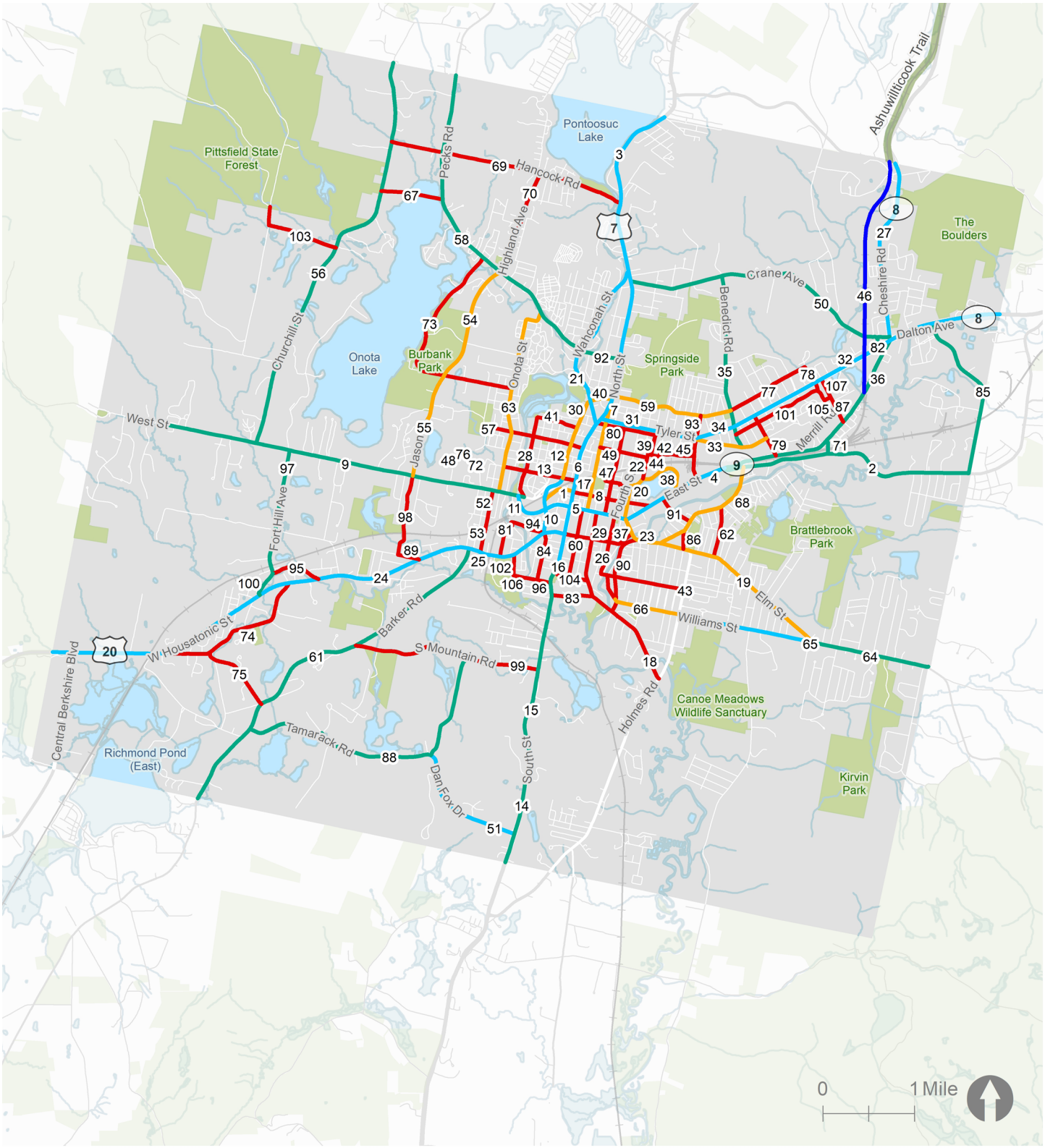
Figure ES.4 maps recommended bicycle network by facility type. Additional details about the recommended street segments and projects are listed in Table 5.4.

Table ES.1: Summary of Recommended Network by Bicycle Facility Types

Bicycle Facility Type	Number of Segments	Miles
Bike Lanes	15	11
Neighborhood Bike Routes	57	28
Separated/Buffered Bike Lanes	16	20
Shared Use Paths	18	29
Trails	1	2
Total	**107**	**90**

Table ES.2: Summary of Recommended Network by Priority Level

Priority	Number of Segments	Miles
High	*46*	*42*
Medium	*32*	*32*
Low	*29*	*16*
Total	**107**	**90**



Bike Lanes

Neighborhood Bike Route

Separated/Buffered Bike Lanes

Shared Use Path

Trail

Note: The numbers on the map indicate specific street segments that form the recommended network. Street segment details are listed in Table 5.4.

Recommended Network by Facility Type

Figure ES.4: Recommended Network by Facility Type

Source: Kittelson

Chapter 1

Introduction

The Bicycle Facilities Master Plan is a significant step forward for the City of Pittsfield in its steadfast commitment to plan and implement a safe and accessible city-wide network for people who bike. Bicycling plays an important role in creating healthy, safe, and livable communities. It provides opportunities for affordable commuting, physical activity, and recreation. Bicycling can also serve as a 'first mile, last mile' solution to connect people to other transportation modes, such as car-pool or transit.

Bike lanes and Sharrows were added on Elm Street in 2015.
Source: The Berkshire Eagle

Previous Projects & Planning Efforts

The City began its efforts to implement bicycle facilities in the early 2000s with North Street's redesign to include bicycle shared lane markings (sharrows) and dedicated bike lanes. This effort was followed by Elm Street's reconstruction with dedicated bike lanes and sharrows. The City is currently working on redesigning Tyler Street to include bike lanes and extending Ashuwillticook Rail Trail into Pittsfield. The City also successfully leveraged MassDOT's Complete Streets program to prioritize projects and secure funding through the adoption of the Complete Streets policy.

2-way separated bike lanes, artistic crosswalks, and parklets on Tyler Street as part of a temporary installation in 2017 by Team Better Block and Mass Development.
Source: Team Better Block

In June 2020, MassDOT established a grant program called 'Shared Streets & Spaces' to implement temporary changes to support walking and biking in response to the COVID-19 global pandemic. The City successfully applied for grant funding to implement multiple projects, including separated bicycle facilities along North Street, Columbus Avenue, and Bradford Street in downtown.

Bike lanes on North Street in downtown installed as part of the Shared Streets & Spaces program funded by MassDOT.
Source: Ben Garver — The Berkshire Eagle

Need for a City-Wide Network Plan

Although Pittsfield has successfully designed and implemented several bicycle facilities projects, their planning and implementation process revealed the challenges and trade-offs required to adopt the City's street corridors. Many streets within the city's downtown and surrounding neighborhoods have limited public right-of-way (ROW) and old utility infrastructure that present challenges to accommodate bicycle facilities while maintaining access and on-street parking for businesses and residences.

Based on these challenges, it became evident that the City needs to transform bicycle facility planning from a 'one-street-at-a-time' approach to a holistic 'city-wide network.' A network that is not entirely reliant on expensive and extensive dedicated bicycle infrastructure on all streets, but would instead benefit from utilizing the well-connected street grid to develop a range of context-appropriate bicycle facilities to create a city-wide low-stress bicycle network. Such an approach will allow for a more significant expansion of bicycle facilities through a network without sacrificing other amenities in the public ROW.

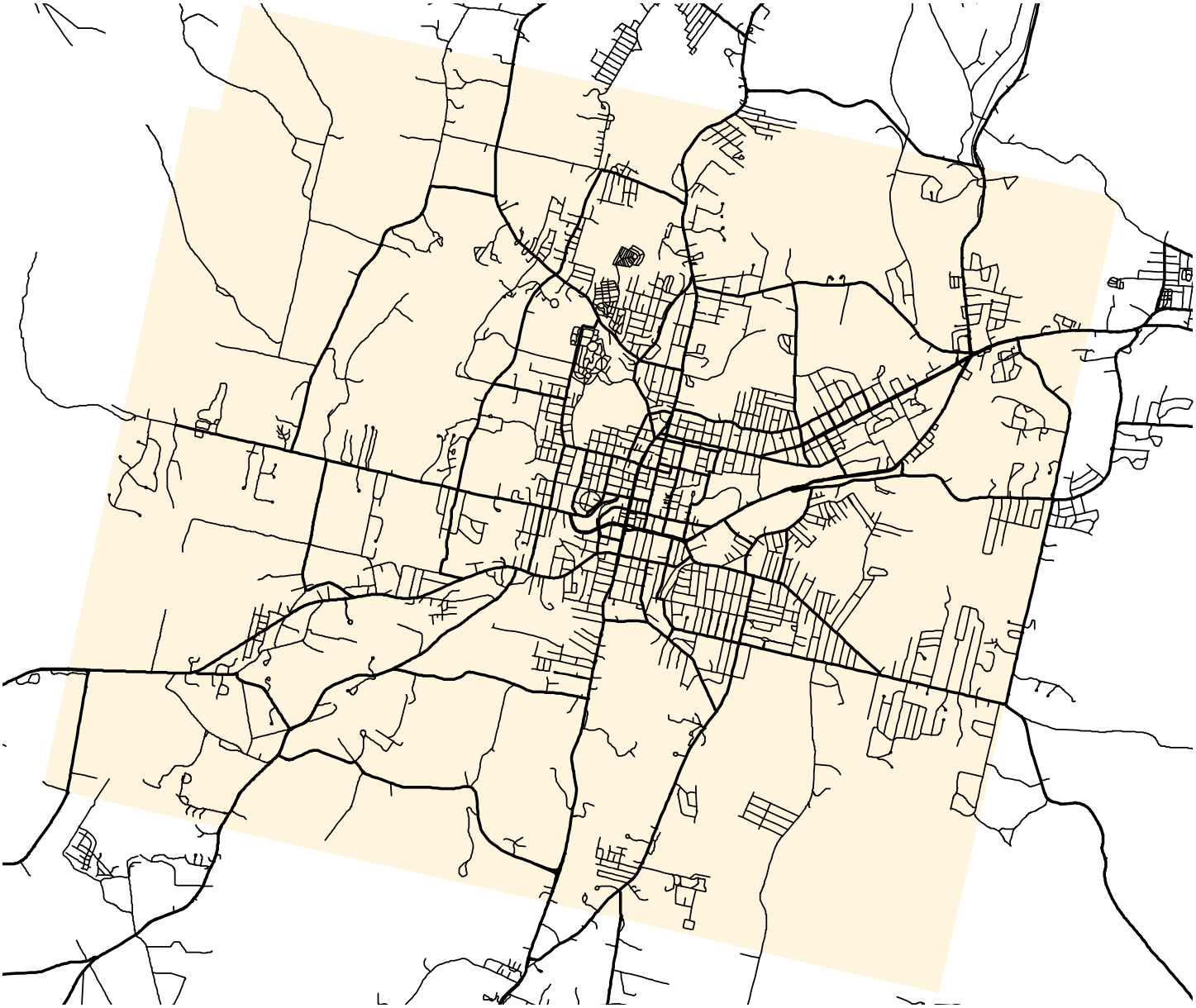


Figure 1.1: Pittsfield's Street Network

Planning Process

This Master Plan was developed using a robust planning process that documented and analyzed existing conditions, while engaging stakeholders and the general public through an extensive outreach process. The Master Plan utilized a prioritization process to identify strategic corridors and includes a list and a map of projects categorized by recommended bicycle facility types. A toolbox for bicycle facility design treatments, as well as programmatic and policy recommendations related to bicycling in Pittsfield are also included in this Master Plan.

The City developed this Master Plan in collaboration with the community members and various stakeholders to focus on creating an equitable bicycle circulation network. The Master Plan's recommendations are based on the goal of connecting neighborhoods with centers of employment, retail, medical services, recreation, and other important destinations, while facilitating regional bicycle trips for those traveling to Pittsfield for work, shopping, or recreation.

A Pittsfield-specific planning process was developed that combined data-driven technical analysis and feedback received from the community members and various stakeholders. The implementation feasibility also informed the recommendations developed through this planning process by factoring in the City's Department of Public Services & Utilities' schedules for future street repaving and reconstruction projects. The planning process aimed at creating an equitable city-wide Bicycle Facilities Master Plan that is visionary yet implementable.

Figure 1.2 illustrates the overall planning process used to develop the Bicycle Facilities Master Plan.

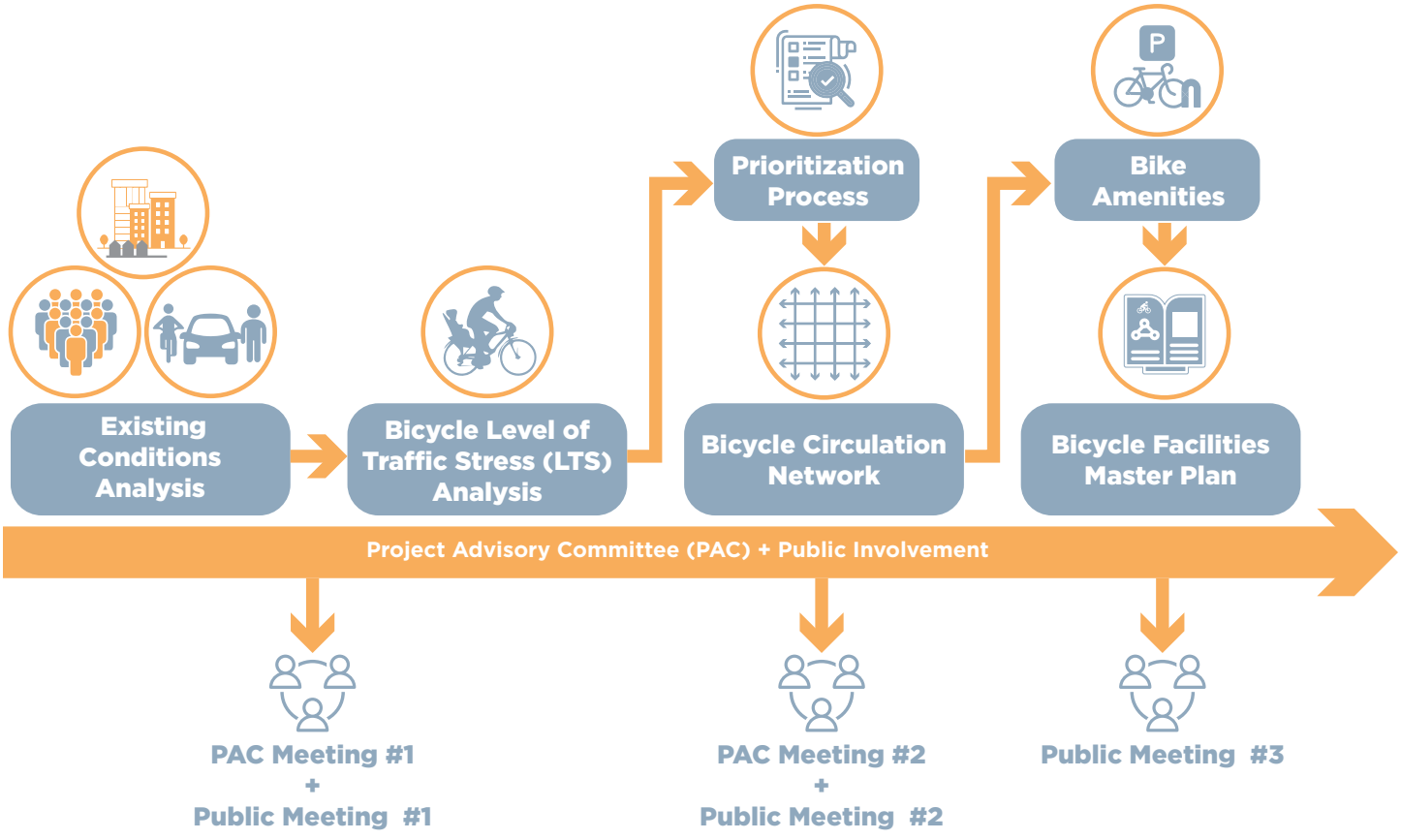


Figure 1.2: Planning Process

Project Timeline

The project scope for the development of this Master Plan was roughly divided into four phases. The project began in August 2020 with the start of 'Existing Conditions Analysis.' The 'Recommended Bicycle Facility Network' was developed in the fall and winter of 2020. The Final Report documenting the entire planning process and recommendations as part of the 'Bicycle Facilities Master Plan' was developed during the spring and summer of 2021. The 'Master Plan' document was finalized based on feedback received in the summer of 2021.

At the culmination of each project phase, the project team presented the respective phases' analysis and findings to the Project Advisory Committee (PAC) and the community to get feedback and guidance for future work. More information about the public and stakeholder outreach process is presented in Chapter 2 of this report.

Figure 1.3 illustrates the project timeline broken down into four project phases. Figure 1.4 shows the overall project goals.

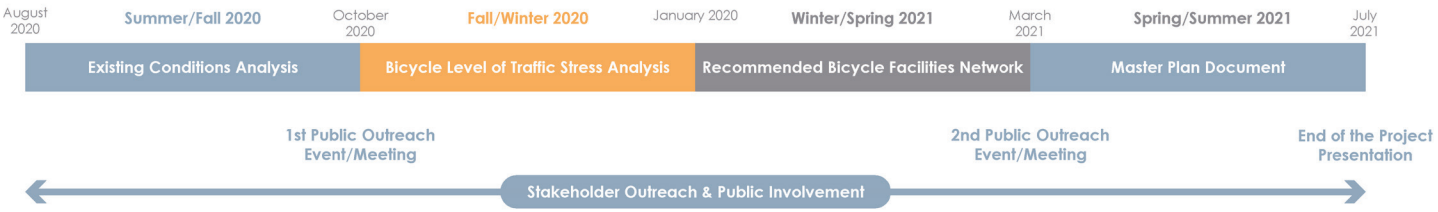


Figure 1.3: Project Timeline

Project Vision

The Bicycle Facilities Master Plan lays out a framework for implementing a well-connected network of comfortable low-stress bicycle facilities that are accessible to people of all ages and abilities, and where bicycling can become a viable transportation option that improves the overall quality of life in Pittsfield.

Project Goals

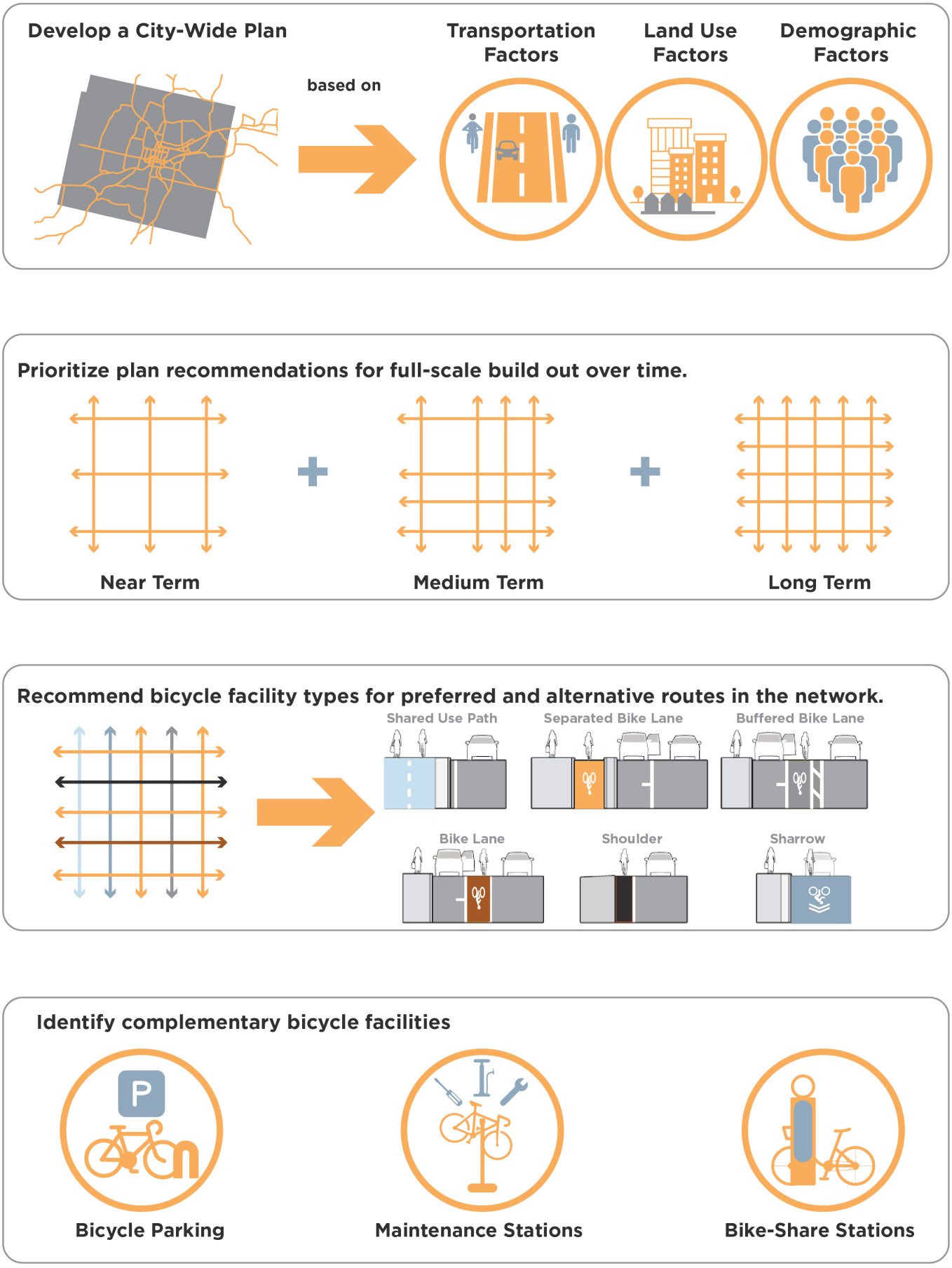


Figure 1.4: Project Goals

Source: Kittelson

Chapter 2

Public & Stakeholder Engagement

Strong public involvement and stakeholder engagement is necessary to create an equitable and implementable plan. At the outset, the project team developed a Public Involvement Plan (PIP) that outlines the activities, methods, and tools that the project team will use to engage the public and major stakeholders.

Due to the outbreak of Coronavirus disease (COVID-19) and the state and local stay-at-home-orders, the project team designed public engagement activities and tools that can be used virtually.

The activities, methods, and tools outlined in the PIP were designed to bring together the community members and local stakeholders who know Pittsfield best. The goal of the public outreach process was to facilitate a proactive and creative engagement process designed to elicit meaningful feedback and input.

The public outreach process for the development of this Master Plan includes the following four methods:

Project Advisory Committee (PAC)

The City established a PAC as part of the stakeholder engagement process to guide this Master Plan's development. The PAC included staff representatives from different City agencies such the Department of Public Services & Utilities, Parks & Recreation, and Community Development. The PAC functioned as a sounding board for the project team by providing input through regular meetings throughout the planning process. The PAC also acted as a liaison between the project team and residents, businesses, City agencies, boards, and commissions.

The public outreach process for this Plan included the following:

- ***Project Advisory Committee (PAC)***
- ***Project Website***
- ***Online Interactive Mapping***
- ***Surveys***
- ***Stakeholder Meetings***
- ***Public Outreach Events***

PAC Meeting #1

The project team hosted the first PAC meeting virtually on July 20, 2020. The project team facilitated a kick-off meeting to discuss the following topics:

- Vision and goals of the master plan
- Key issues and opportunities
- Scope and schedule of work
- Draft 'Existing Conditions Analysis'
- Project methodology and next steps

PAC Meeting #2

The project team hosted the second PAC meeting virtually on January 28, 2021. At this PAC meeting, the project team discussed the following topics:

- Project update
- Bicycle LTS analysis results
- Prioritization process
- Draft recommended bicycle network
- Next steps

The project team presented the results from the existing conditions analysis, public survey, and the bicycle LTS analysis. Additionally, the project team discussed the prioritization methodology for developing the recommended bicycle network and presented the draft city-wide bicycle facilities network.

Project Website

The project team developed a comprehensive website using the ESRI ArcGIS Story Maps platform.

The project website can be accessed here: ***https://www.cityofpittsfield.org/departments/community_development/planning_and_development/bicycle_facilities_master_plan.php.***

The website acted as a one-stop-shop for all project information and was continually updated throughout the planning process. The website includes basic project background, information, and documents related to different project phases, public input surveys, and an interactive mapping tool. The website was designed to include tools and information to effectively act as a virtual public engagement activity. The website integrated online tools such as interactive mapping and public input surveys into the website to gather public feedback as part of existing conditions analysis.

Since the project team was not able to host any in-person events in 2021, the project team updated the website's information to act as virtual public engagement activity to seek input on the draft recommended bicycle network plan and the draft Master Plan.

Figure 2.1: Project website landing page sceenshot

Online Interactive Mapping

As part of the existing conditions analysis, an online interactive mapping tool was created using the ArcGIS Online platform and was integrated within the overall project website. This tool allowed the community members to provide feedback related to specific geographic locations. The project team requested the community members to map specific destinations or routes where they currently bike, where they would like to see bicycle facility improvements. Respondents were able to select a predetermined comment type and add additional detailed comments. The map included six preset comment types. Table 2.1 summarized the number of comments received for each comment type. The interactive online map received a total of 188 comments. The comments and suggestions added to the map helped the project team identify and prioritize improvements to develop Pittsfield's bicycle network. The interactive map tool was also used to share the draft and final recommended network.

Table 2.1: Number of Online Interactive Map Comments (By Type)

Comment Type	Number of Comments
Bike Safety Concern	25
Desired Bike Route	45
Existing Bike Route	3
Bike Barrier	1
Bike Crossing	0
Bike Destination	44
TOTAL	**118**

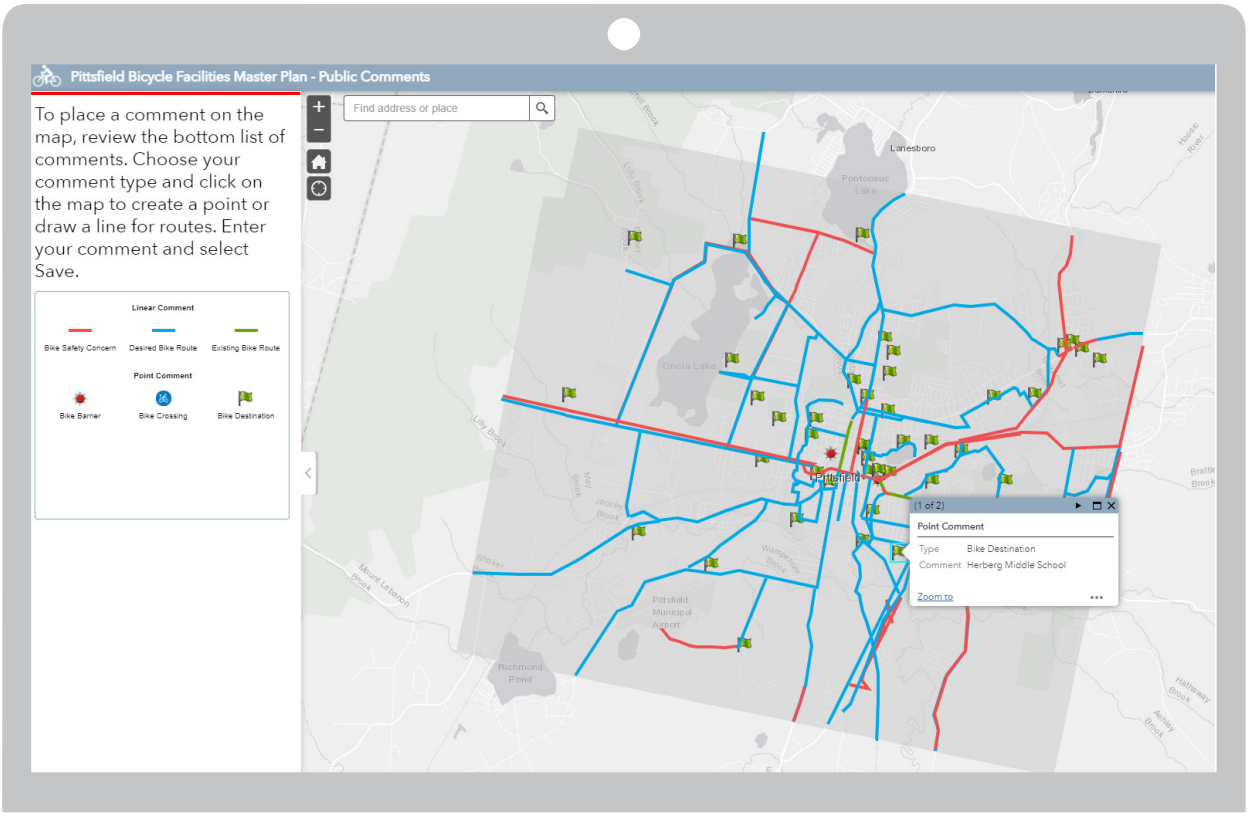


Figure 2.2: Online interactive mapping tool sceenshot

Survey

The project team administered an online survey to solicit public feedback. Survey was a critical tool to get feedback since there was no traditional in-personal public engagement possible because of the COVID -19 pandemic.

Public Input Survey

In October 2020, the project team created and distributed an online public input survey. The project team administered the survey through an online platform - Survey Monkey. The survey contained 25 questions related to the community's perception of bicycling within Pittsfield, and the questions covered a variety of topics.

The questions within the survey were related to the following topics:

- User characteristics: Bicycling purpose, frequency, motivation, and obstacles
- Bicycling behavior during Covid-19
- User bicycling level of comfort on a variety of bicycle facility types
- Recommendations for encouraging bicycling
- General comments/feedback
- User demographics

The survey received 157 total responses. The key takeaways from the survey results are summarized below:

- The vast majority of the respondents bike for exercise and recreation.
- 40% of the respondents are interested in biking more for regular everyday commute and errand trips.
- The majority of the respondents do not feel comfortable riding a bicycle in Pittsfield because of unsafe riding conditions and lack of bicycle facilities.
- The majority of the respondents feel comfortable or somewhat comfortable riding bicycles in Pittsfield but prefer dedicated and separated bicycle facilities.
- The preferred bicycle facility types included paved shoulders on rural roads, shared lanes on quiet residential streets with less traffic, and dedicated and separated bicycle facilities along with major high speed and high traffic volume streets.

Stakeholder Meetings

It is vital to collect early input from important stakeholders in the planning process. The project team conducted a series of one-on-one meetings with specific stakeholders in October 2020. These meetings discussed issues, challenges, and opportunities related to bicycling in Pittsfield. The stakeholder groups were also asked to highlight specific corridors and areas within the City that the project team should focus on while preparing recommendations. A stakeholder-specific list of questions was prepared and shared prior to these meetings. These questions helped guide the discussion and cover important topics during the meeting.

The project team met with the following stakeholder groups:

- Bike advocacy groups
- Major developers and property owners
- Pittsfield Public Schools Superintendent
- Director of Public Health Department at the City of Pittsfield

Because of the COVID-19 pandemic, all the stakeholder meetings were conducted virtually through Microsoft Teams.

Public Outreach Events

The project team gathered meaningful community feedback through public outreach events. These public meetings were scheduled and tailored to specific tasks and milestones. All outreach events included a brief presentation by the project team, followed by an open discussion.

Public Meeting #1

The 1st Public Meeting was held on October 21, 2020. The meeting was held virtually via Zoom due to the COVID-19 pandemic. This meeting introduced the project and shared initial existing conditions analysis.

The meeting had the following objectives:

- Introduce the project and inform the community members of the overall planning process, schedule, and scope.
- Present existing conditions data collection, mapping, and analysis.
- Seek input on the vision and goals of the Master Plan.
- Facilitate the sharing of personal experiences and perspectives from participants on issues and opportunities related to bicycling, major destinations, and desired routes.
- Understand community bicycling needs, barriers to use, and gaps they experience in the system.
- Assess existing bicycling trends, primary usage, trip purpose, travel time, and preferred routes.

Since this meeting was held virtually, the project team relied on the project website, survey, and interactive mapping to gather additional feedback.

Public Meeting #2

The 2nd Public Meeting was held on March 3, 2021. The meeting was held virtually via Zoom due to the COVID-19 pandemic. This meeting provided a project update and shared the draft recommended bicycle network.

Public Meeting #2 built on Public Meeting #1 and had the following objectives:

- Recap the project vision and goals.
- Provide a project update on existing conditions analysis.
- Summarize public input survey results.
- Share the bicycle level of traffic stress analysis results
- Present the prioritization methodology.
- Present the draft recommended city-wide bicycle facilities network.

Since this meeting was held virtually, the project team relied on the project website and interactive mapping to gather additional feedback related to the prioritization process and the draft bicycle network.

Public Meeting #3

The 3rd and the final Public Meeting was held in July 2021. The meeting was held virtually via Zoom due to the COVID-19 pandemic. This was intended to be an informational meeting. The project team presented the final recommended city-wide bicycle facilities network and the other related content in the Master Plan document.

The project website has been updated to include a copy of the Final Master Plan report. The website also contains updated maps for the recommended bicycle facilities network.

Source: Kittelson

Chapter 3

Existing Conditions Analysis

A full inventory of existing city-wide conditions sets the stage for identifying strategic corridors for bicycle facilities in the city's street network. This assessment included mapping and analyzing both physical and socio-economic conditions applicable to improving the bicycling infrastructure in Pittsfield. The project's overall vision and goals helped select relevant datasets to be collected, mapped and analyzed. This analysis was utilized in the prioritization process to help identify streets within the overall city-wide network that should form the city-wide bicycle facilities network.

It is critical to examine the existing land use, demographics, and multi-modal transportation conditions to identify and prioritize corridors that will form the city-wide bicycle network. The existing conditions analysis informed the recommendations for the city-wide bicycle facilities network. The following datasets were collected, mapped, and analyzed as part of existing conditions analysis in the context of developing a bicycle network plan:

Land Use Data

- Existing Land Use
- Generalized Zoning

Pedestrian & Bicycle Facilities

- Existing & Proposed Pedestrian Facilities
- Existing & Proposed Bicycle Facilities

Major Destinations

- Schools & Colleges
- Parks
- Libraries
- Government Offices
- Hospitals
- Parking Facilities

Demographic & Employment Data

- Employment Density
- Population Density
- Commute Patterns
- Households in Poverty or Households without Car
- Households with limited English Skills
- Environmental Justice Areas
- Senior & Youth Population Density

Transit Facilities

- Transit Network - BRTA Routes

Roadway Characteristics

- Roadway Functional Classification
- Traffic Volumes
- Number of Lanes
- Posted Speed

Crashes

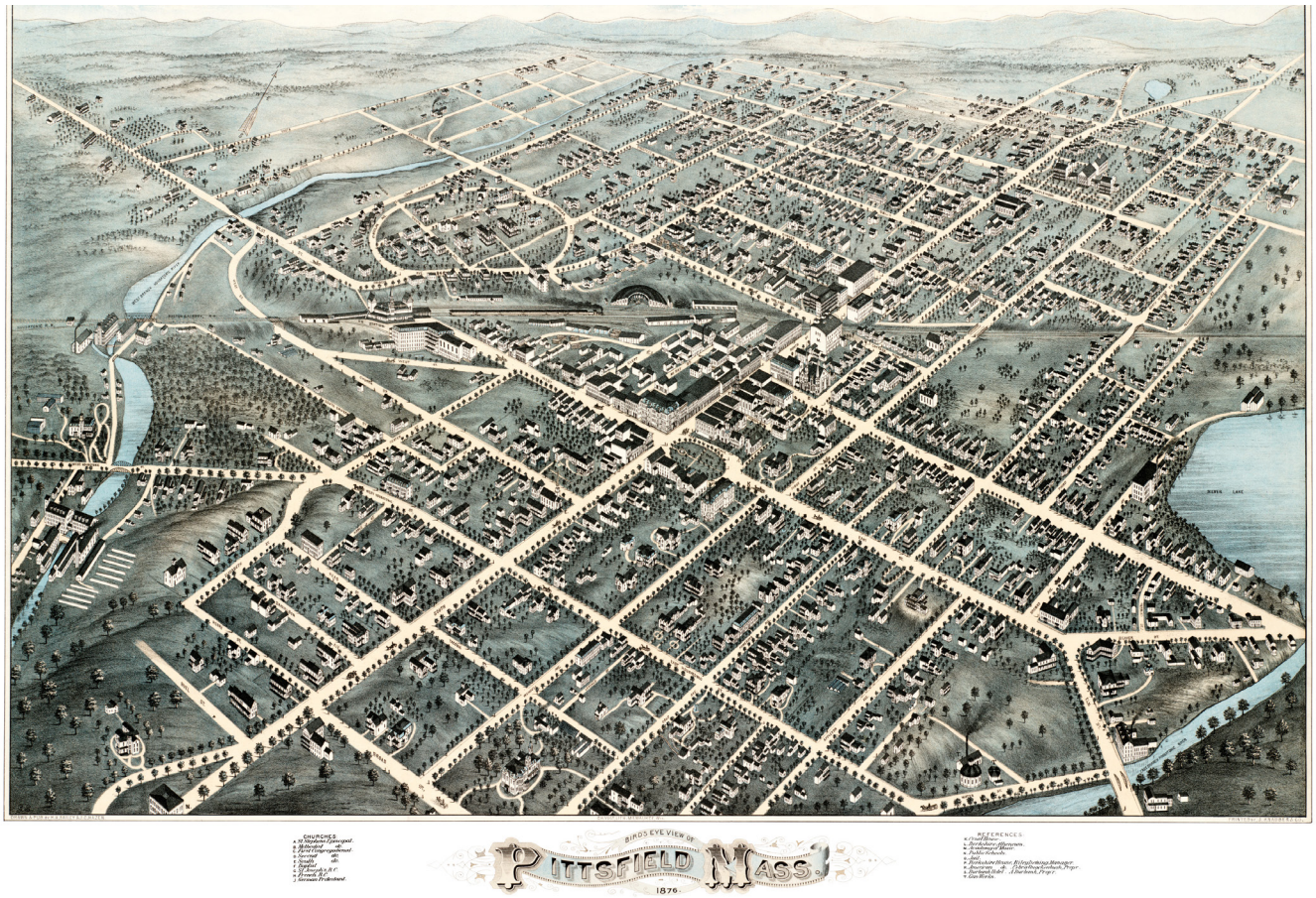
- Pedestrian Crashes
- Bicycle Crashes

City Profile

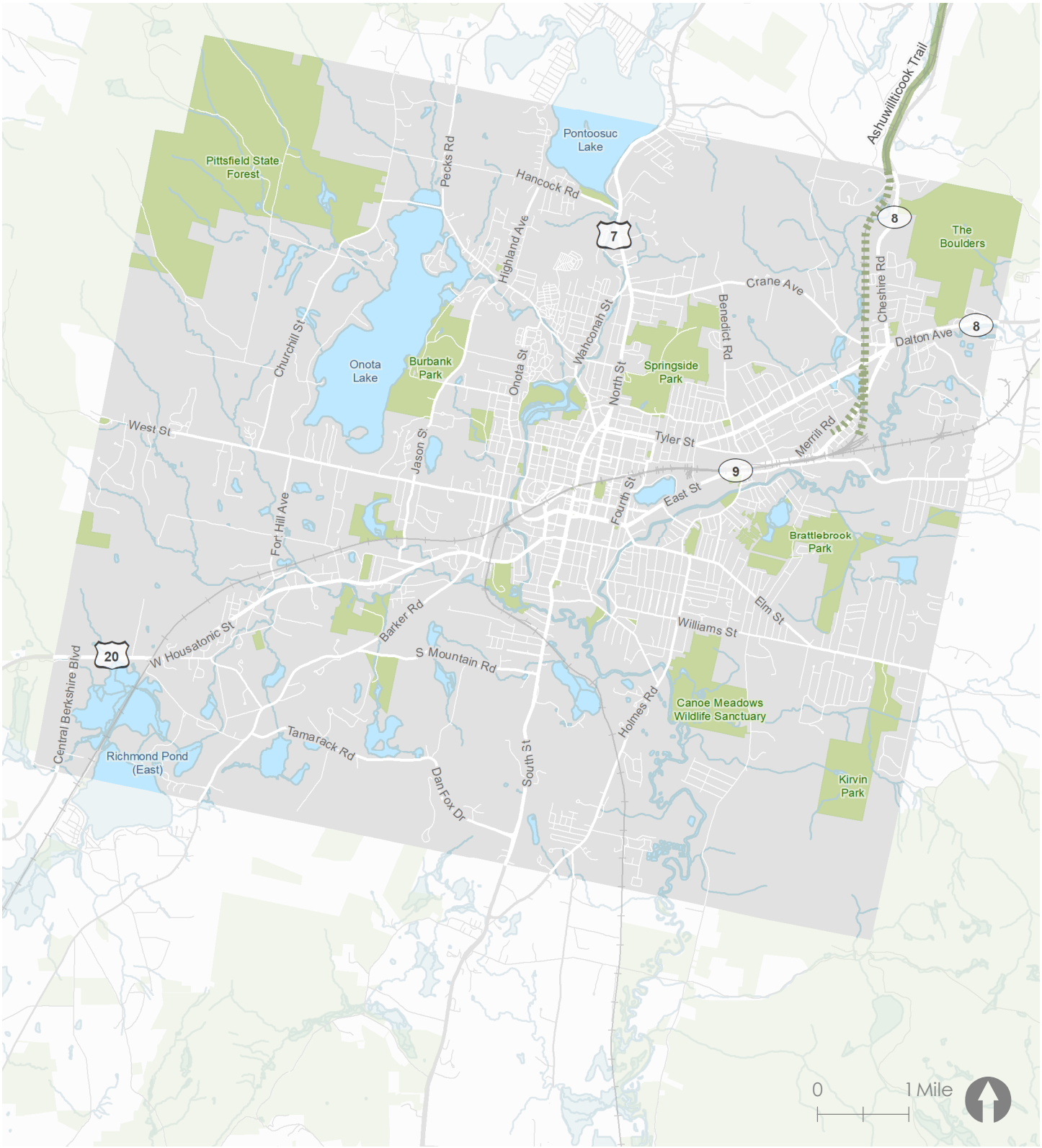
The City of Pittsfield is the largest city and the county seat of Berkshire County. According to the U.S. Census Bureau, the city has an area of 42.5 square miles, of which 40.5 square miles is land and 2.0 square miles is water. The city's population is just over 42,700 people as per the latest U.S. Census 2019 ACS.

Pittsfield lies at the confluence of the east and west branches of the Housatonic River, which flows south from the city towards its mouth at Long Island Sound. The eastern branch leads down from the hills, while the western branch is fed from Onota Lake and Pontoosuc Lake. The city lies between the Berkshire Hills to the east and the Taconic Range to the west. The western portion of the city contains Pittsfield State Forest, a 17 square mile facility with hiking and cross-country skiing trails, camping, and picnic areas. Pittsfield's population and urban development is clustered in the central and eastern parts of the city, covering just one-quarter of the city's area. Southern and western parts of the city are mostly natural or rural, with limited development and population.

Pittsfield is at the crossroads of U.S. Route 7 and U.S. Route 20, which join together in the city. The nearest interstate highway, I-90 (the Massachusetts Turnpike), is about 10 miles south in Lee. The Joseph Scelsi Intermodal Transportation Center serves as the station for Amtrak trains and inter-city buses. The Berkshire Regional Transit Authority (BRTA) is also based at the Intermodal Center and uses it as a hub for most of its lines. Freight Rail lines for CSX Transportation and the Housatonic Railroad also pass through the city. Figure 3.1 displays the overall city limits.



Bird's eye view illustration of Pittsfield from 1875 shows how the natural systems and the original street grid continue to shape the city. Source: Knowol



Parks
Water Bodies
City of Pittsfield
Rail
Existing Ashuwillticook Trail
Proposed Ashuwillticook Trail

Pittsfield City Limits

Figure 3.1: Pittsfield City Limits

Existing Land Use

Land use data was mapped to understand areas with mixed land uses across Pittsfield. Generally, areas with a high mix of land uses generate many bicycle trips since various destinations are located within close proximity.

The majority of Pittsfield's developed properties are residential. West Housatonic Street, Merrill Road, North Street, and Pecks Road serve as commercial and industrial corridors. Downtown Pittsfield has small, dense parcels consisting of commercial, office, public service, and multi-use (mixed-use) properties, surrounded by residential land uses. Agricultural and natural land uses are scattered around the periphery of the City. Figure 3.2 displays the percent breakdown of different land uses.

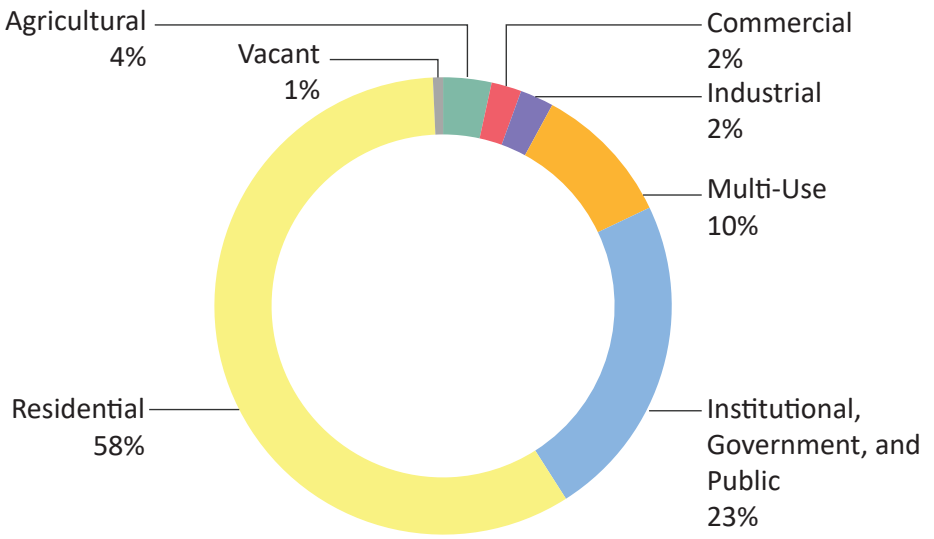
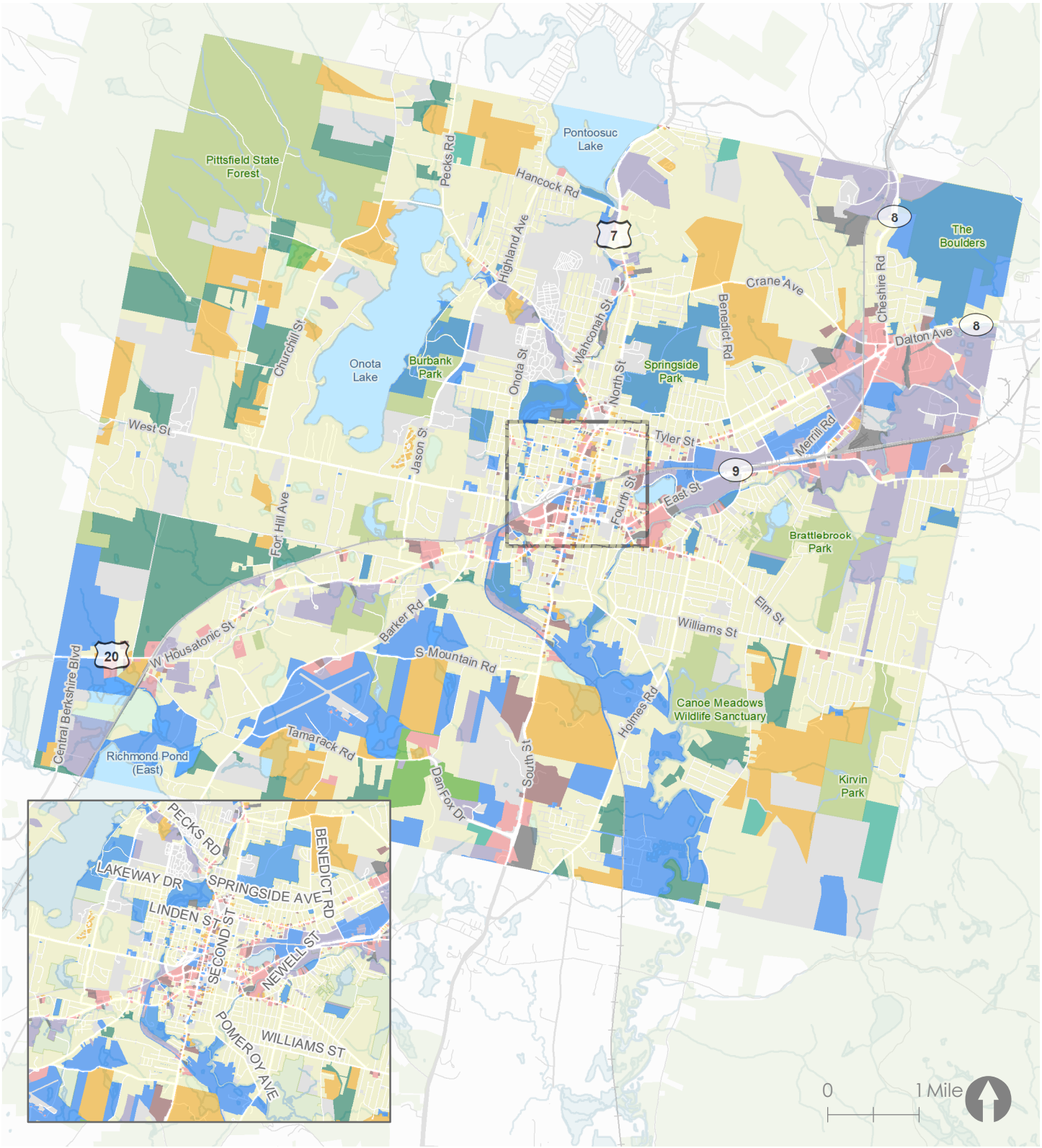


Figure 3.2: Percentage Distribution of Various Land Use Categories in Pittsfield

North Street and Columbus Avenue in Downtown Pittsfield.
Source: iberkshire.com



Existing Land Use

Figure 3.3: Existing Land Use

Generalized Zoning

The City is primarily zoned as low-density single-family. Zoning density increases in central parts of the city with high-density multi-family in the downtown core. Tyler Street, North Street, and First Street serve as the City's main commercial business corridors.

Grouped Businesses provide for a grouping of commercial retail and service outlets, including centers designated and constructed as a single planned unit. General Businesses provide for certain business uses generally located along major routes of travel.

Downtown Businesses provide for a concentrated high-density area, including:

- Principal office buildings
- Retail stores
- Service establishments serving the city and the region
- High-density housing

Neighborhood Businesses provide for small business centers primarily serving the surrounding neighborhoods, including:

- Professional offices
- Convenience retail
- Personal service establishments

Figure 3.4 displays the percent breakdown of different generalized zoning categories.

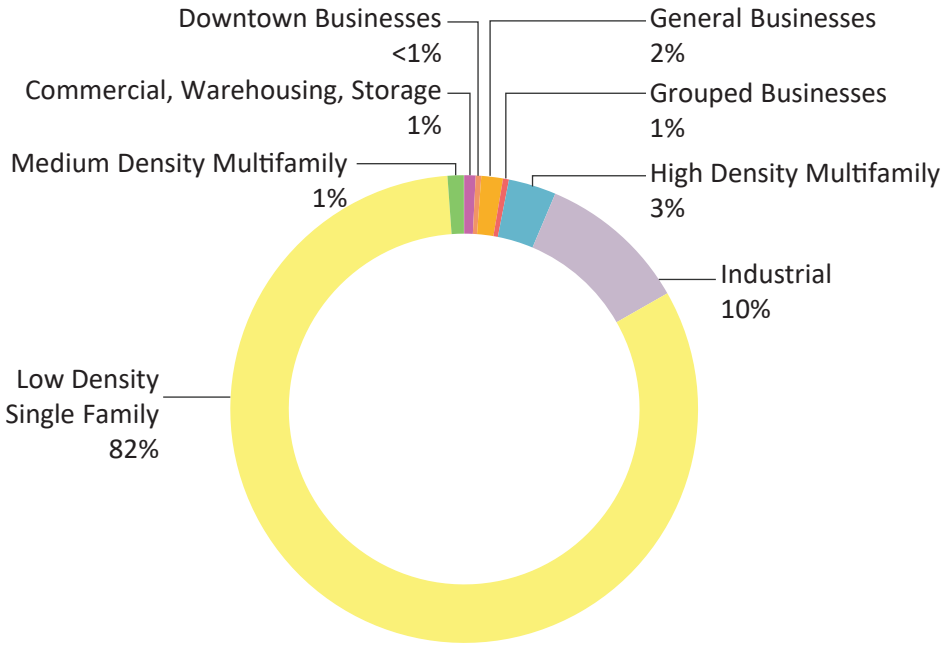
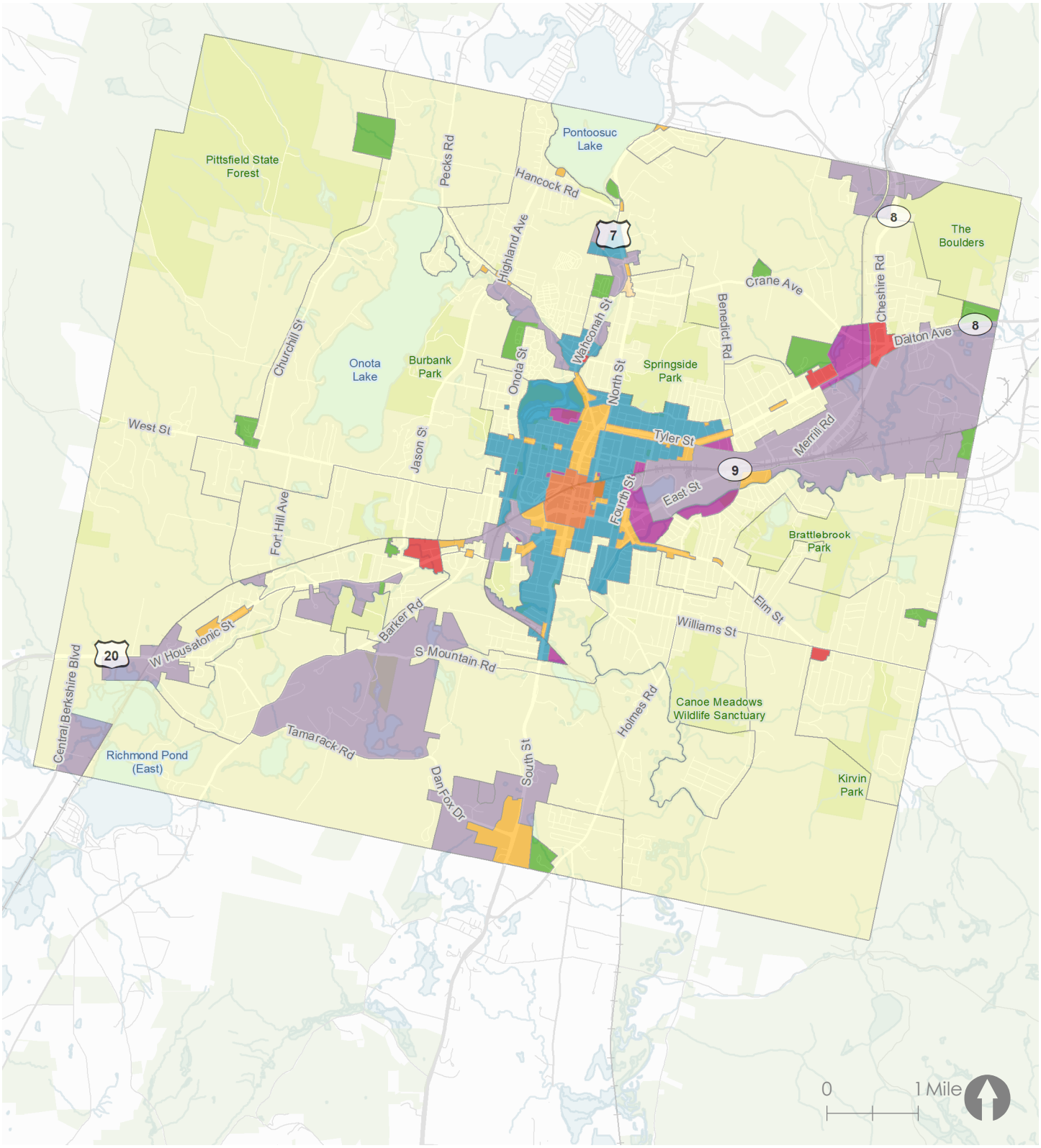


Figure 3.4: Percentage Distribution of Land in Various Zoning Categories in Pittsfield



Source: City of Pittsfield

- Grouped Businesses
- Downtown Businesses
- General Businesses
- Neighborhood Businesses
- Commercial, Warehousing, Storage
- Industrial
- Low Density Single Family
- Medium Density Multifamily
- High Density Multifamily

Generalized Zoning

Figure 3.5: Generalized Zoning

Major Destinations

Land use analysis included developing a list of activity centers and major destinations. Activity centers are areas with a mix of uses, along with high densities of residential population or employment locations. These centers also experience high levels of transit ridership and are likely to generate a large number of pedestrian and bicycling trips. Major destinations such as schools, parks, government offices, libraries, and other attractions were mapped as potential origins or destinations of bicycle trips.

Clusters of major destinations are summarized below:

- Downtown Pittsfield has a mix of commercial and office uses, with parking lots, federal buildings, and employment centers.
- Southwest Pittsfield has several travel-related and recreational facilities, with less dense land uses and destinations along W Housatonic Road. Large destinations include the Pittsfield Airport and Berkshire Community College.
- Northwest Pittsfield primarily consists of natural land uses, with lakes and forest land.
- Northeast Pittsfield is defined as the commercial corridor, with clustered retail destinations along Merrill Road, including shopping malls and plazas.
- Southeast Pittsfield is primarily natural lands, with less dense land uses. There are several schools in this quadrant, along Elm Street and Williams Street.

Figure 3.6 shows the total number of major destinations by type.

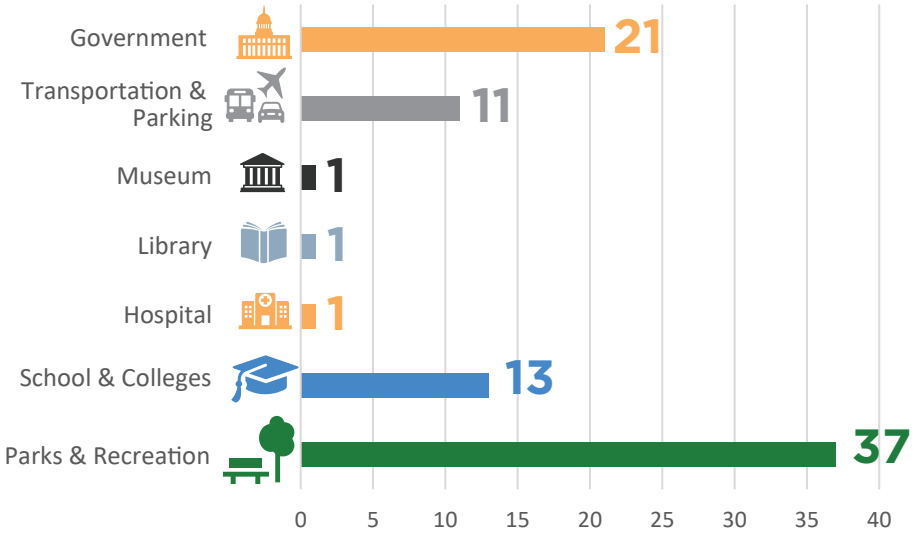
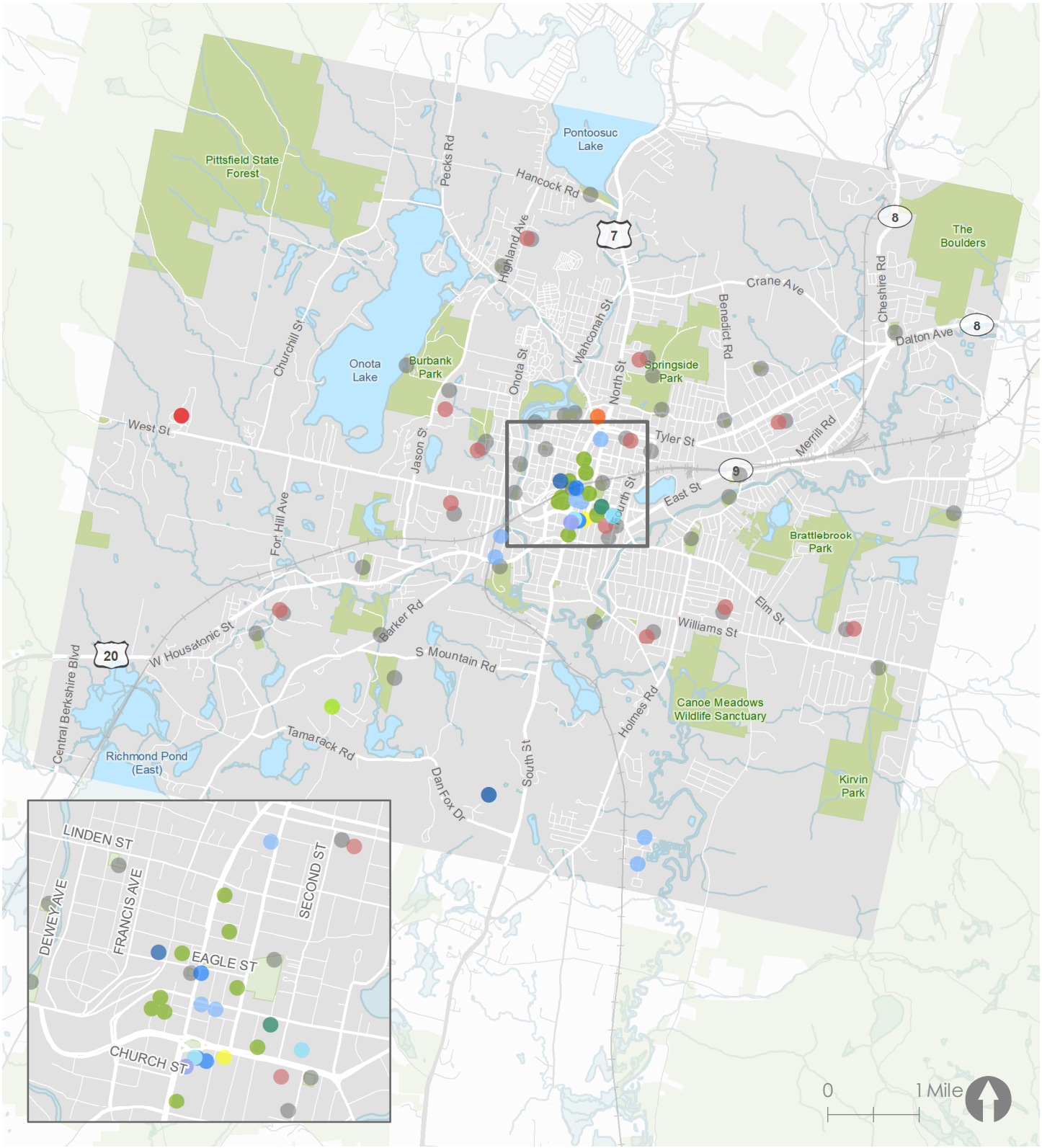


Figure 3.6: Number of Major Destinations by Each Category in Pittsfield



Source: Mass.gov

Airport
City
College
Court
Federal
Hospital
Library
Museum
Parking
Post Office
School
State
Recreation
Rail

Major Destinations

Figure 3.7: Major Destinations

Employment Centers

Connecting major employment centers to surrounding areas by comfortable bicycle facilities will provide a healthier commute mode option for people employed in Pittsfield. As per the US Census Bureau – Center for Economic Studies, the County was home to an estimated 24,446 jobs in 2018.

Some of the major industry sectors in Pittsfield include:

- Health Care and Social Assistance - 6,570 Jobs (27%)
- Retail Trade - 2,710 Jobs (11%)
- Professional, Scientific, and Technical Services - 1,980 Jobs (8%)
- Manufacturing - 1,810 Jobs (7%)

Pittsfield's major employment centers are clustered in downtown Pittsfield, along Dalton Avenue, and W Housatonic Street. Out of 24,446 employees, 61 percent, or 14,978 employees commuted less than 10 miles. A well-connected network of safe and comfortable bicycle facilities can help these shorter trips be made on a bike.

Figure 3.8 shows the inflow and outflow of employees working in Pittsfield based on the US Census Bureau – Center for Economic Studies. As of 2018, 45 percent, or 11,106 employees lived and worked within the city. In addition, 13,340 employees commuted into Pittsfield from outside and 10,665 traveled outside the city for work.

Major employers are listed below:

- Berkshire Medical Center
- General Dynamics
- Elder Services of Berkshire County
- Berkshire Crossing
- Orkin
- Bousquet Ski Area
- Massachusetts Department of Conservation & Recreation
- Berkshire West Athletic Club
- Pittsfield Municipal Airport
- Gable Electric
- Comalli Electric

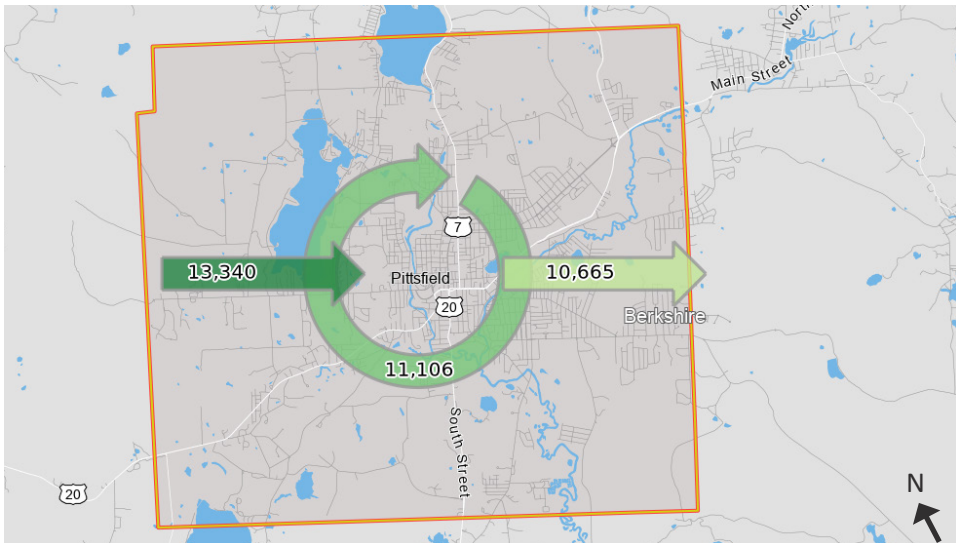
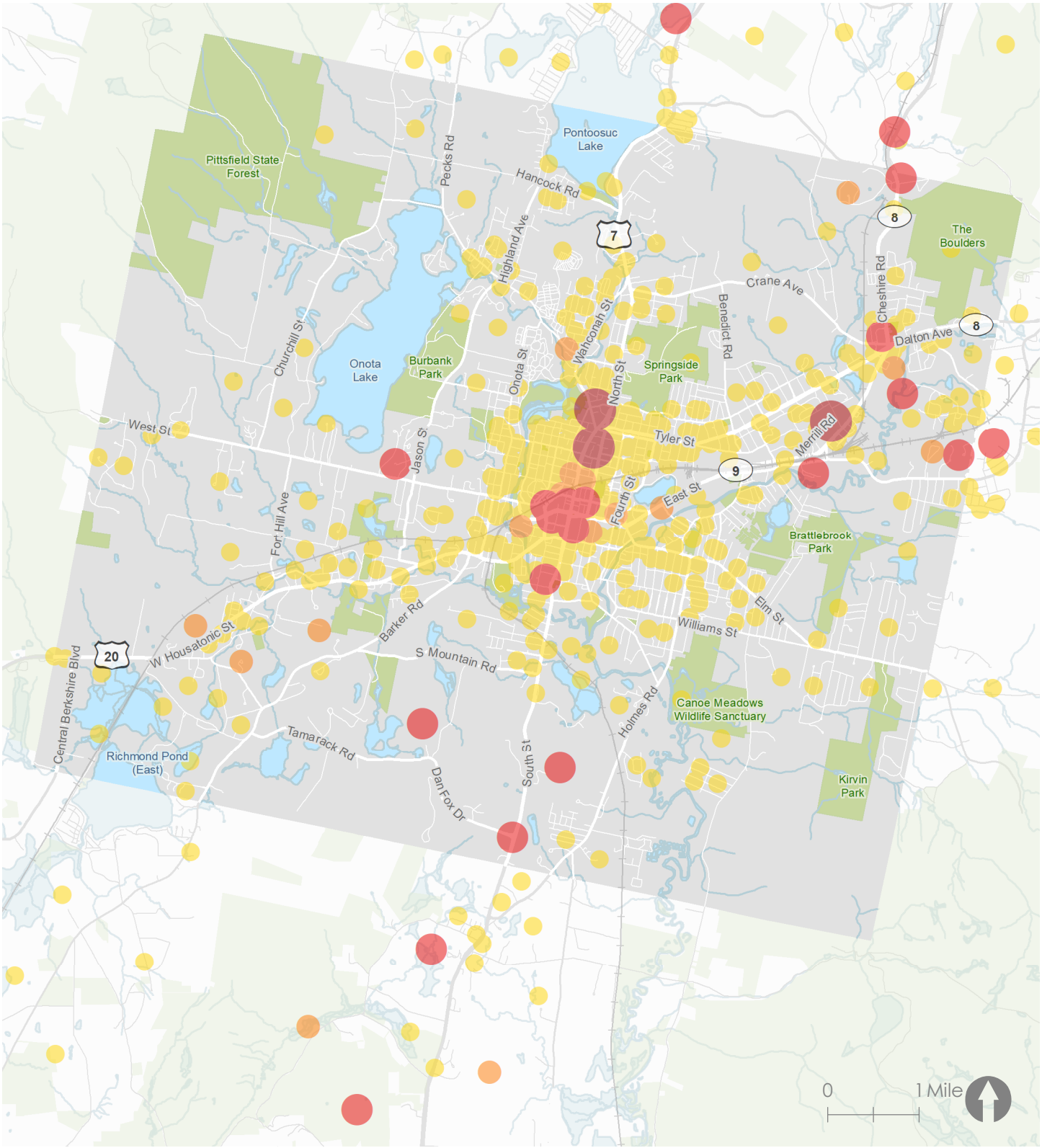


Figure 3.8: Inflow/Outflow of Employees in Pittsfield
Source: US Census Bureau – Center for Economic Studies



Source: Longitudinal Employer--Household Dynamics 2017

Less than 150 Jobs

150 to 250 Jobs

251 to 1,000 Jobs

Greater than 1,000 Jobs

Employment Density

Figure 3.9: Employment Density

Demographic Patterns

The city's demographic data was studied using the latest U.S. Census ACS data as part of the existing conditions analysis to understand the patterns in population and employment density along with identifying areas within the city that have a high concentration of people who may depend on non-automobile modes of transportation. One goal of this project is to create a bicycle facilities network that connects these population and employment centers.

Beyond creating a low-stress city-wide bicycle network, one of the City's major goals is to provide an equitable bicycle network. The bicycle network needs to serve those who depend on bicycling as their primary mode of transportation and attract new riders by making bicycling an attractive travel option.

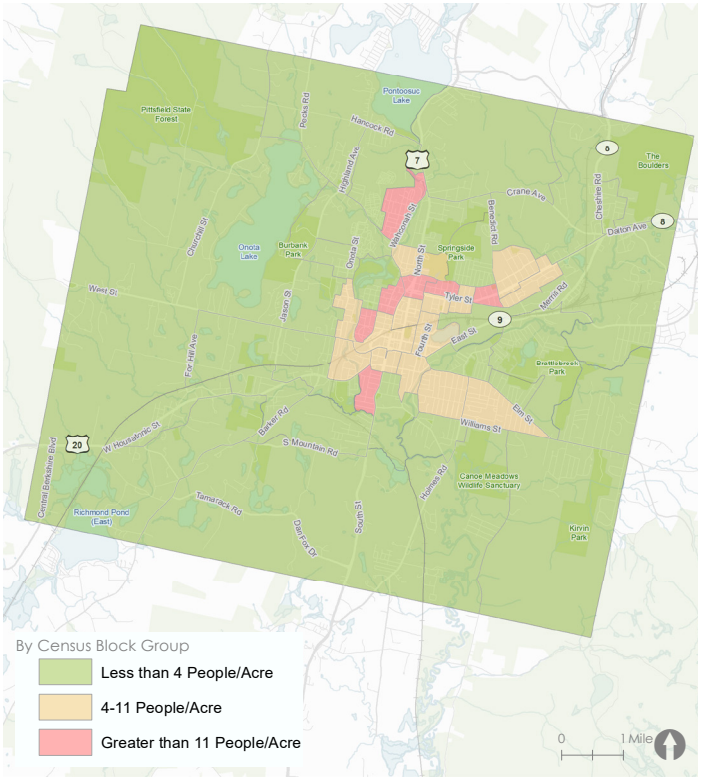
It is essential to acknowledge that bicycle facilities are not just an amenity for those that choose to travel via bicycle, but also a need for those that suffer from transportation disadvantages. Demographic groups that often suffer from transportation disadvantages include :

- Households in poverty
- Households with no vehicles/cars
- People who commute by transit, walking, or biking
- Children and seniors
- People who do not speak English as their first language
- Population residing in designated Environmental Justice Areas

Population Density

Areas with higher population density generate a higher number of bicycle trips. Hence it is important to prioritize bicycle facilities along corridors that connect densely populated areas.

The population density in Pittsfield aligns with the city's employment density. The majority of Pittsfield's population is clustered in the downtown core. The combination of high-density residential, employment centers, and mixed-use developments make downtown Pittsfield an attractive place to live. The City's population becomes less dense as you move outward from the downtown.



Source: ACS 2014-2018

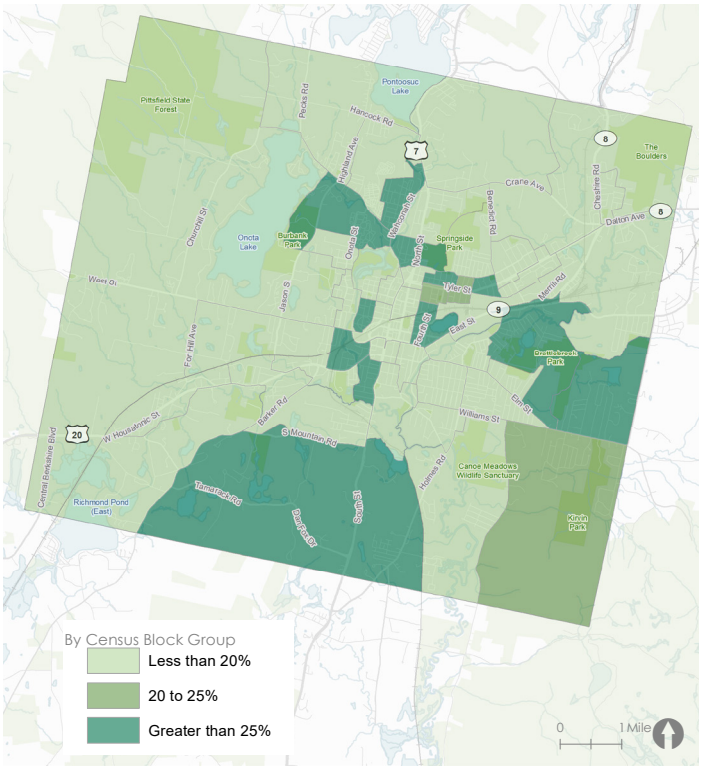
Figure 3.10: Population Density

Youth and Senior Population

Seniors aged 65 and over and children aged 18 and under are two age groups with a high propensity to walk, bike, or take transit and are less likely to drive automobiles.

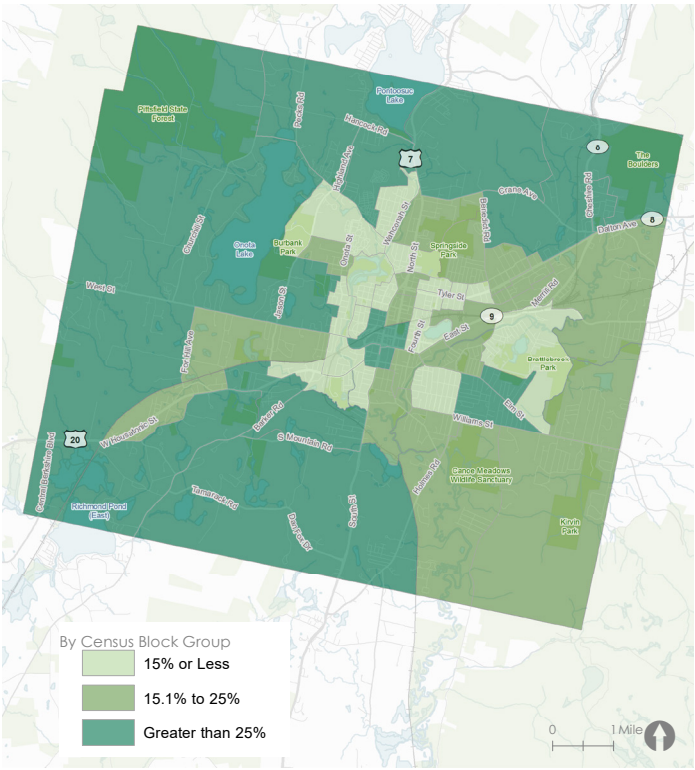
Seniors and youth populations differ geographically throughout Pittsfield. Seniors are clustered outside downtown, along the City's periphery, and the youth population is concentrated in central Pittsfield, closer to downtown. Both, seniors and youth populations are clustered in South Pittsfield (S Mountain Road).

Many block groups in Pittsfield have over 25% elderly population.



Source: ACS 2014-2018

Figure 3.11: Percent of Population Under 18



Source: ACS 2014-2018

Figure 3.12: Percent of Population Over 65

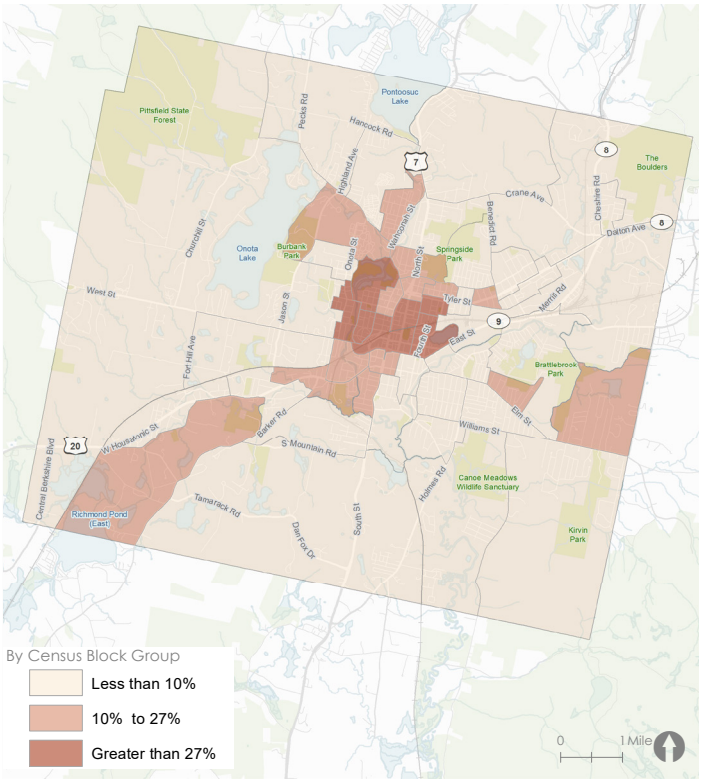
Economically Disadvantaged Populations

A review of Pittsfield's demographic data helped to better understand and serve the needs of all users within the city, especially those who may be disadvantaged.

Households without Cars

Many households do not have access to cars. These household residents depend on walking, biking, or transit to travel. The majority of households without cars are clustered in central Pittsfield, extending north along Wahconah Street and southwest along W Housatonic Street.

Block groups that have high percentages of households without cars display some correlation with households in poverty.



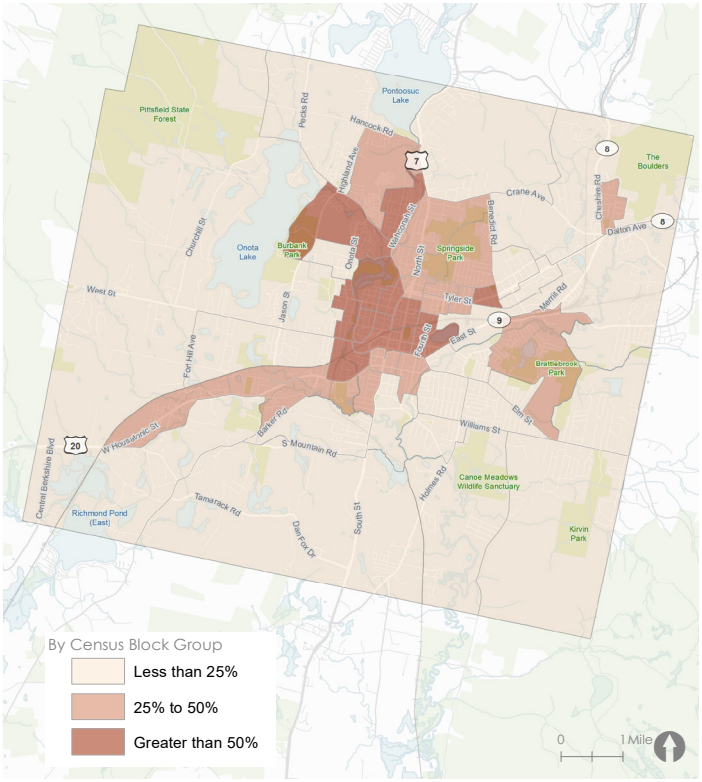
Source: ACS 2014-2018

Figure 3.13: Percent of Households without Cars

Households in Poverty

The Department of Health and Human Services (HHs) defines the 2020 federal poverty level (FPL) and determines the need based on household income and the number of individuals in a household. Poverty levels are defined here.

The Census Block Group demographics show clusters of households in poverty in central Pittsfield and extending southwest, along West Housatonic Street and northwest along Pecks Road.

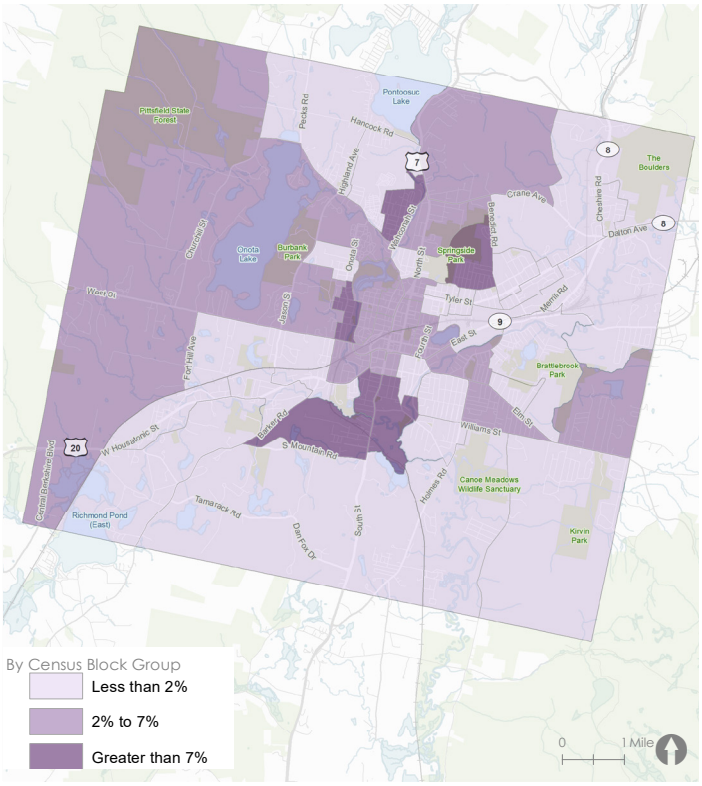


Source: ACS 2014-2018

Figure 3.14: Percent of Households in Poverty

Households with Limited English Skills

Households with limited English language skills are concentrated in the central and western parts of the city. Often areas with a high concentration of households with limited English skills overlap with transportation disadvantaged communities.



Source: ACS 2014-2018

Figure 3.15: Percent of Households Speaking Limited English

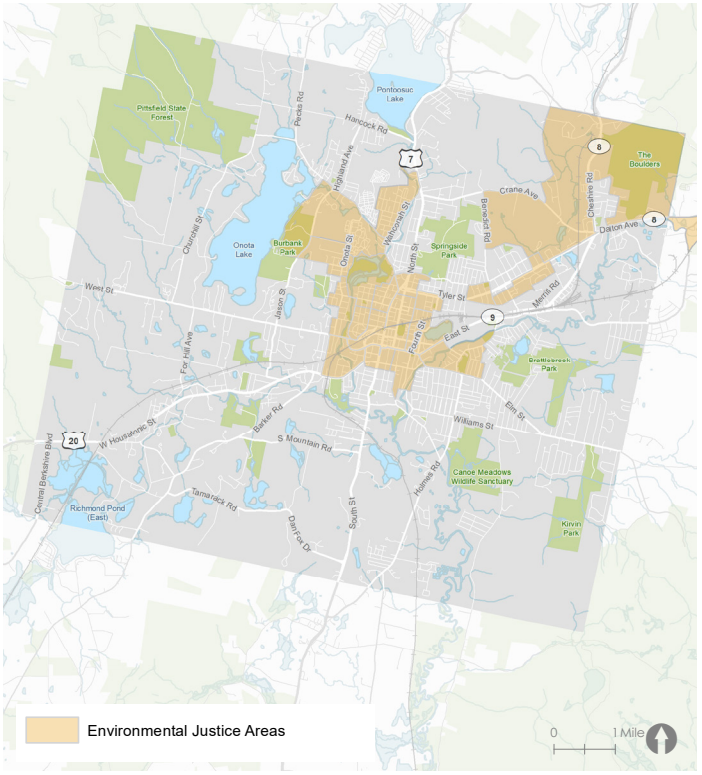
Environmental Justice Areas

Environmental Justice Areas are defined by areas where:

- Medium household incomes are equal to or less than 65% of the statewide median ($62,072)
- 25% or more of residents identify as a race other than white
- 25% or more of households with residents over 14 years old speak limited English

Environmental Justice Areas in Pittsfield include:

- Downtown
- Northeast along Dalton Avenue
- Northwest along Pecks Road



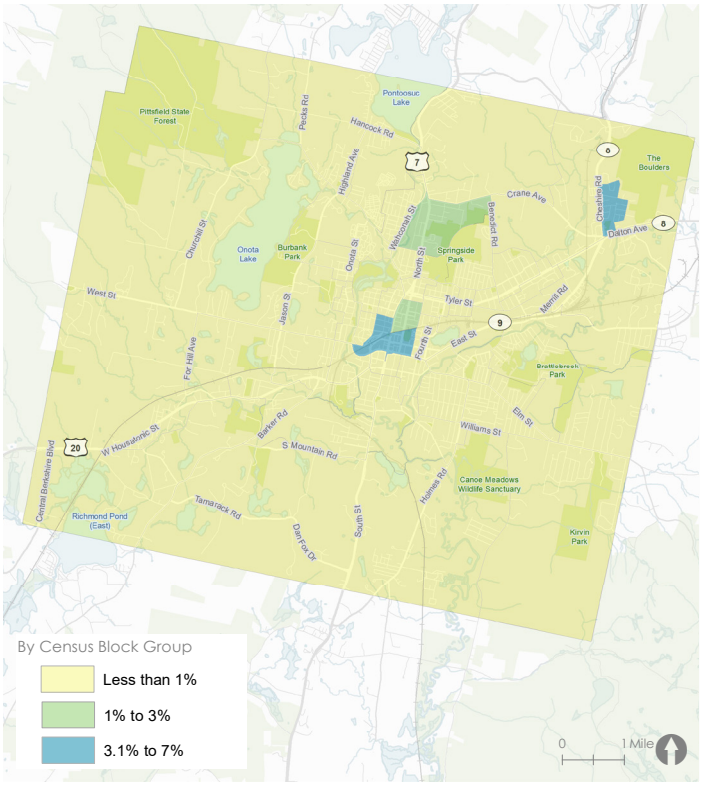
Source: ACS 2014-2018

Figure 3.16: Percent of Population Commuting by Transit

Commute Patterns

Most residents in Pittsfield commute by single-occupancy automobiles. The city's existing density and land use patterns make bicycling, walking, and transit a less desirable and convenient option for many residents. Although residents choose to commute primarily using a personal car, the city has a historic downtown area, with short block lengths, mixed land uses, and a developed network of sidewalks and trails that can support walking and bicycling. The City is committed to enhancing bicycle and pedestrian infrastructure by connecting activity centers to neighborhoods with bicycle facilities and sidewalks.

These maps display commute behavior collected by Census Block Groups from the American Community Survey for the years 2014 to 2018. These maps reflect commute behavior and do not incorporate recreational bicycling and walking.



Source: ACS 2014-2018

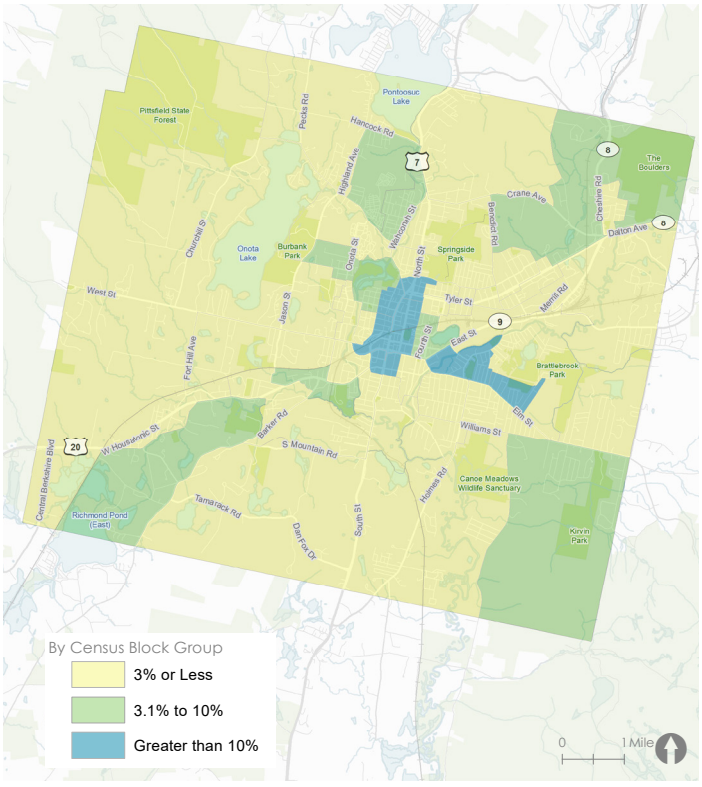
Figure 3.17: Percent of Population Commuting by Bicycle

Commute by Bicycling

Bicycle commuting is low in most of the city. Clusters of bicycle commuters are located in downtown and the northeast, near the Ashuwillticook Rail Trail.

Commute by Walking

Walking commuters are concentrated in the downtown core. Other clusters of high walking commute percentages are shown in the northwest (near the Ashuwillticook Rail Trail), southeast (south of Williams Street and east of East New Lenox Road, and southwest along W Housatonic Street).

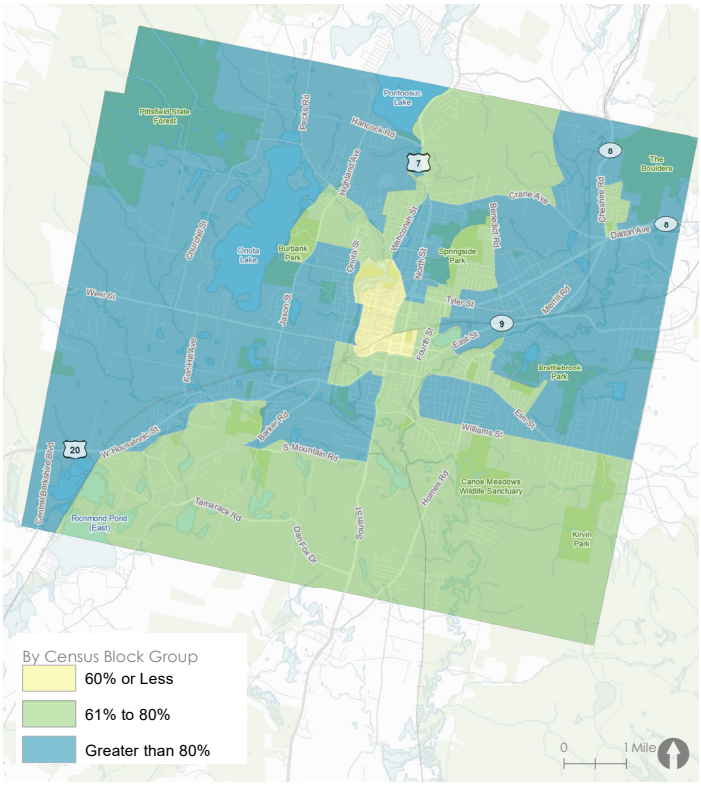


Source: ACS 2014-2018

Figure 3.18: Percent of Population Commuting by Walking

Commuting by Single Occupancy Vehicle

The majority of Pittsfield residents commute by single-occupancy vehicle. This map does not include shared vehicle commuting, such as carpool or vanpool. The southern part of Pittsfield relies less on single occupancy vehicle commuting than the northern portion.

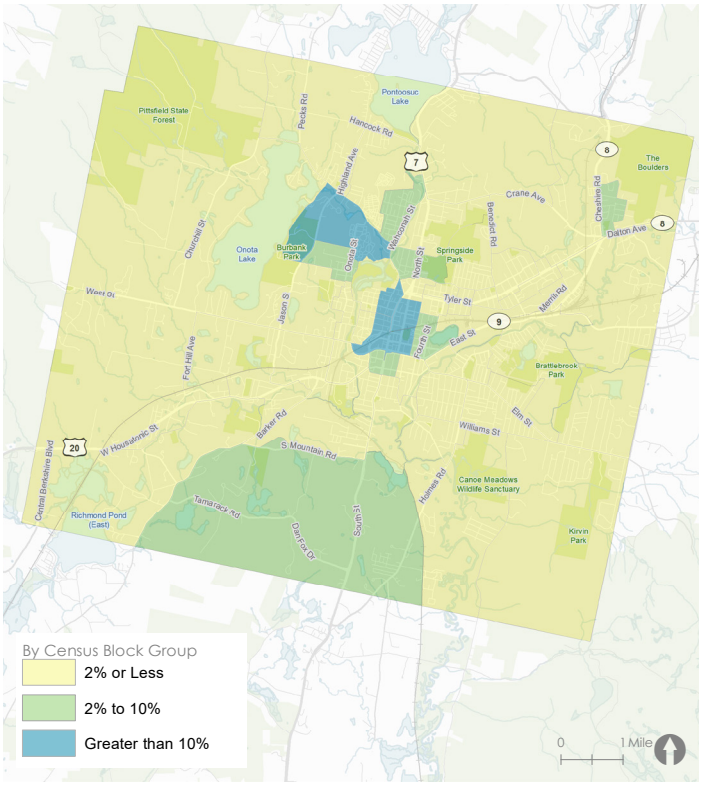


Source: ACS 2014-2018

Figure 3.19: Percent of Population Commuting by Single Occupancy Vehicle

Commute by Transit

Residents who commute by transit are mostly clustered in central Pittsfield, with another cluster in south-central Pittsfield. In general, transit commuting is relatively low in the City.



Source: ACS 2014-2018

Figure 3.20: Percent of Population Commuting by Transit

Existing Pedestrian Facilities

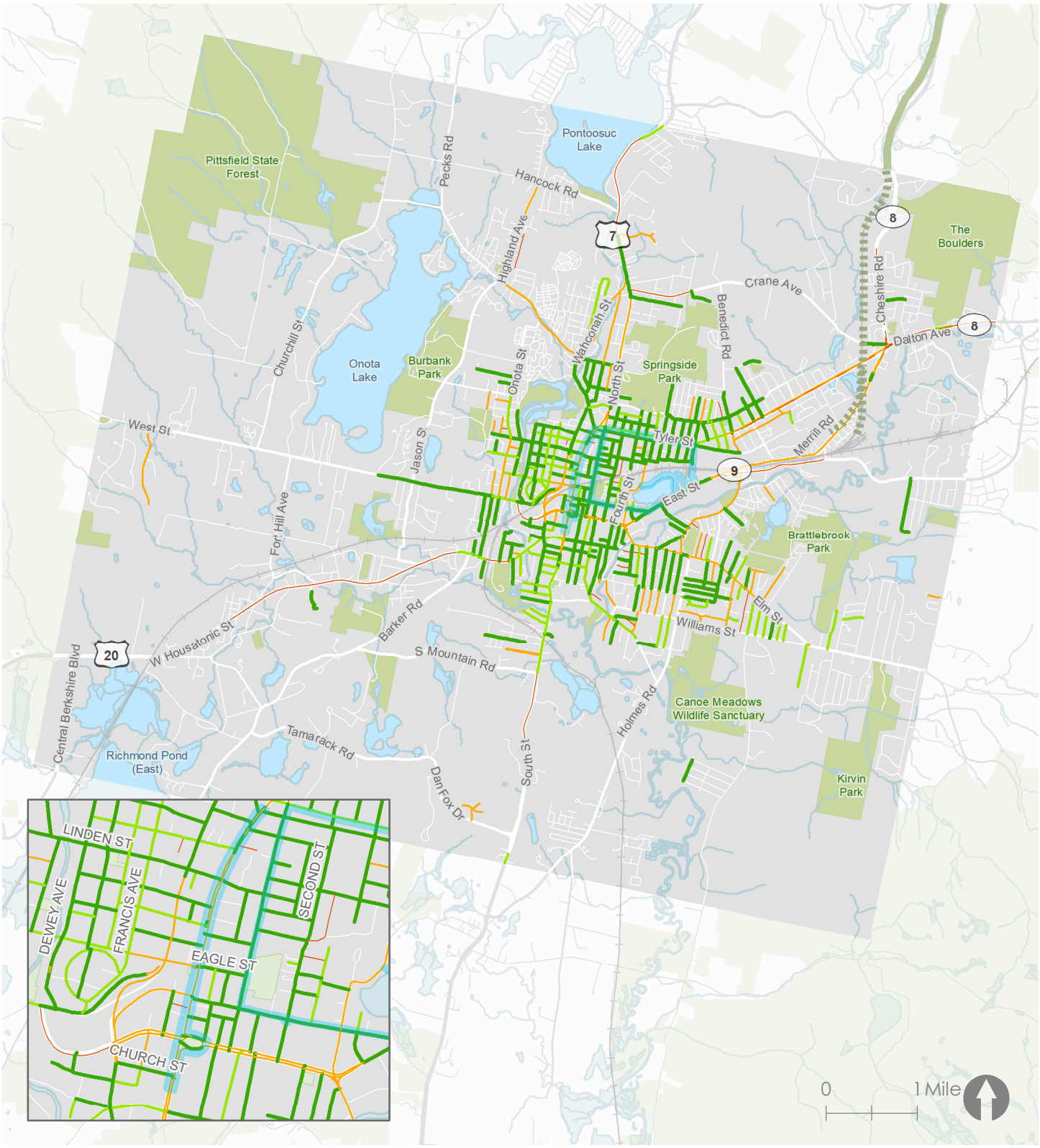
Existing and planned pedestrian facilities were mapped to understand the system's current and proposed infrastructure and gaps. In many areas where there are no dedicated bicycle facilities, pedestrian facilities like sidewalks function as bicycle facilities. Depending on the width and the land use context, a pedestrian facility can effectively function as a shared use path used by pedestrians and bicyclists. The proposed network of bicycle infrastructure will build upon these existing and planned facilities.

Pittsfield has a connected network of sidewalks in the downtown core. Sidewalks are mostly provided on both sides of roads and are greater than 4 feet wide. Very limited sidewalks exist beyond the central part of the city.

The Ashuwillticook Trail currently ends at the northern border of Pittsfield but is planned to extend south into the city, to Merrill Road. This trail would provide a major bicycle and pedestrian connection to and from Pittsfield. The City has planned additional pedestrian facilities as part of the Complete Streets Prioritization Plan.

The City developed multiple branded walking routes as part of the Downtown Loops network. The Downtown Loops network utilizes existing sidewalks and has branding and way-finding signs to encourage people to walk more regularly.

The City has a network of walking routes called Downtown Loops.
Source: berkshireeagle.com



Existing Pedestrian Facilities

Figure 3.21: Existing Pedestrian Facilities

Existing Bicycle Facilities

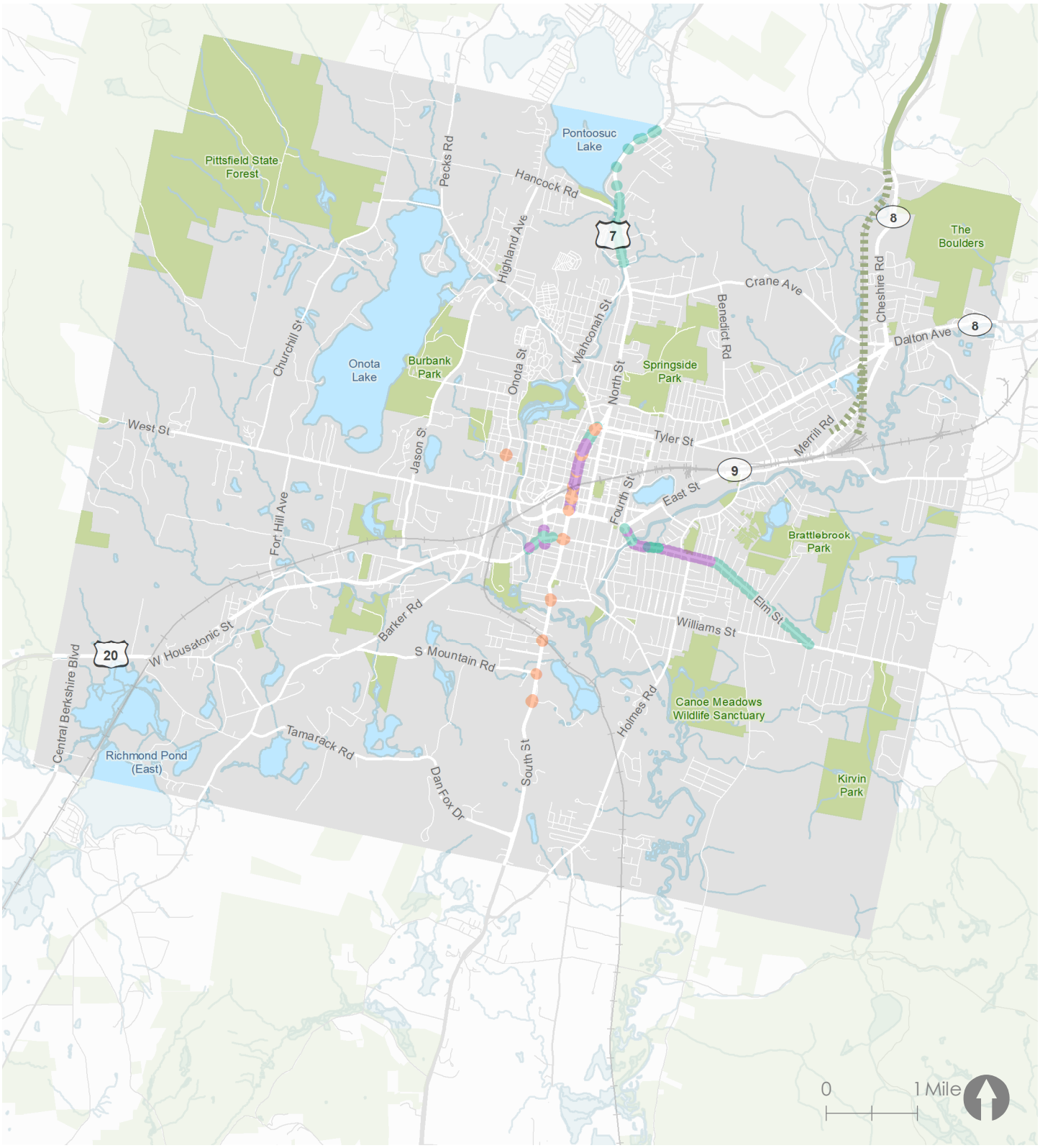
Existing and planned bicycle facilities were mapped to understand the system's current and proposed infrastructure and gaps. There are limited existing dedicated bicycle facilities in Pittsfield. In the early 2000s, the City added sharrows (shared lane markings) along North Street and South Street along with providing bicycle detector loops, which help alert traffic signals when a bicycle is present. The City added bike lanes to Elm Street in 2015. More recently, in the summer of 2020, the City implemented multiple pilot bicycle facilities projects as part of the MassDOT Shared Street and Open Spaces grant program. This program was established to provide additional walking and bicycling facilities in response to the COVID-19 pandemic.

The Shared Streets and Open Spaces program includes the following projects:

- North Street - Parking protected separated bike lanes in downtown
- Center Street - Repurpose curb lane to create a shared-use lane for pedestrians and bicyclists
- Columbus Avenue - Two-way protected bike lanes
- Linden Street & North Street – Protected intersection
- Bradford Street - Two-way protected bike lanes

The Ashuwillticook Trail currently ends at the northern border of Pittsfield but is planned to extend south into the city to Merrill Road. This trail would provide a major bicycle and pedestrian connection to and from Pittsfield. The City has planned additional bicycle facilities along Tyler Street and other corridors as part of the Complete Streets Prioritization Plan.

Elm Street is one of the streets with existing bike lanes.
Source: Google Earth Streetview



Source: City of Pittsfield

- Painted Bicycle Lane
- Bicycle Detector Loop
- Sharrow
- Proposed Ashuwillticook Trail
- Existing Ashuwillticook Trail

Existing Bicycle Facilities

Figure 3.22: Existing Bicycle Facilities

Planned Complete Streets Projects

A Complete Street is one that provides safe and accessible options for all travel modes – walking, biking, transit, and motorized vehicles – for people of all ages and abilities. Designing streets with these principles contributes toward the safety, health, economic viability, and quality of life in a community. MassDOT has set up a three-tier Complete Streets Funding Program to encourage the development of Complete Streets on local roads across Massachusetts.

The City of Pittsfield has successfully leveraged all three tiers of the MassDOT's Complete Streets Funding Program. The City adopted a Complete Streets policy in 2017 as part of the Tier-1 requirements. Further, the City developed a Complete Streets Prioritization Plan in March of 2019, identifying 38 Complete Streets projects as part of Tier-2 requirements. The map on the facing page displays all the projects in the Prioritization Plan. These projects include both pedestrian infrastructure and bicycle infrastructure projects. MassDOT approved and funded ten projects from the Prioritization Plan as part of the Tier-3 of the funding program.

The following bicycle infrastructure projects were funded by MassDOT as part of the Tier-3 funding program:

- Designated bicycle lanes along Wahconah Street from North Street/Burbank Street to the south to North Street/Murphy Place.
- New bike lanes along Elm Street from East Street to Pollock Avenue.

Additional information about the Complete Streets Program can be found on the MassDOT's Complete Streets Portal website (https://masscompletestreets.com/Map/).

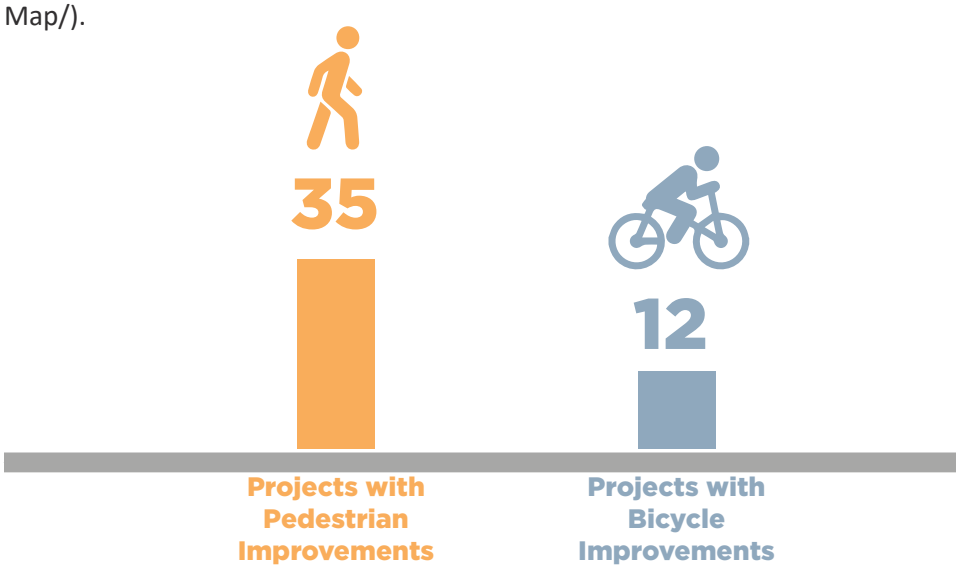
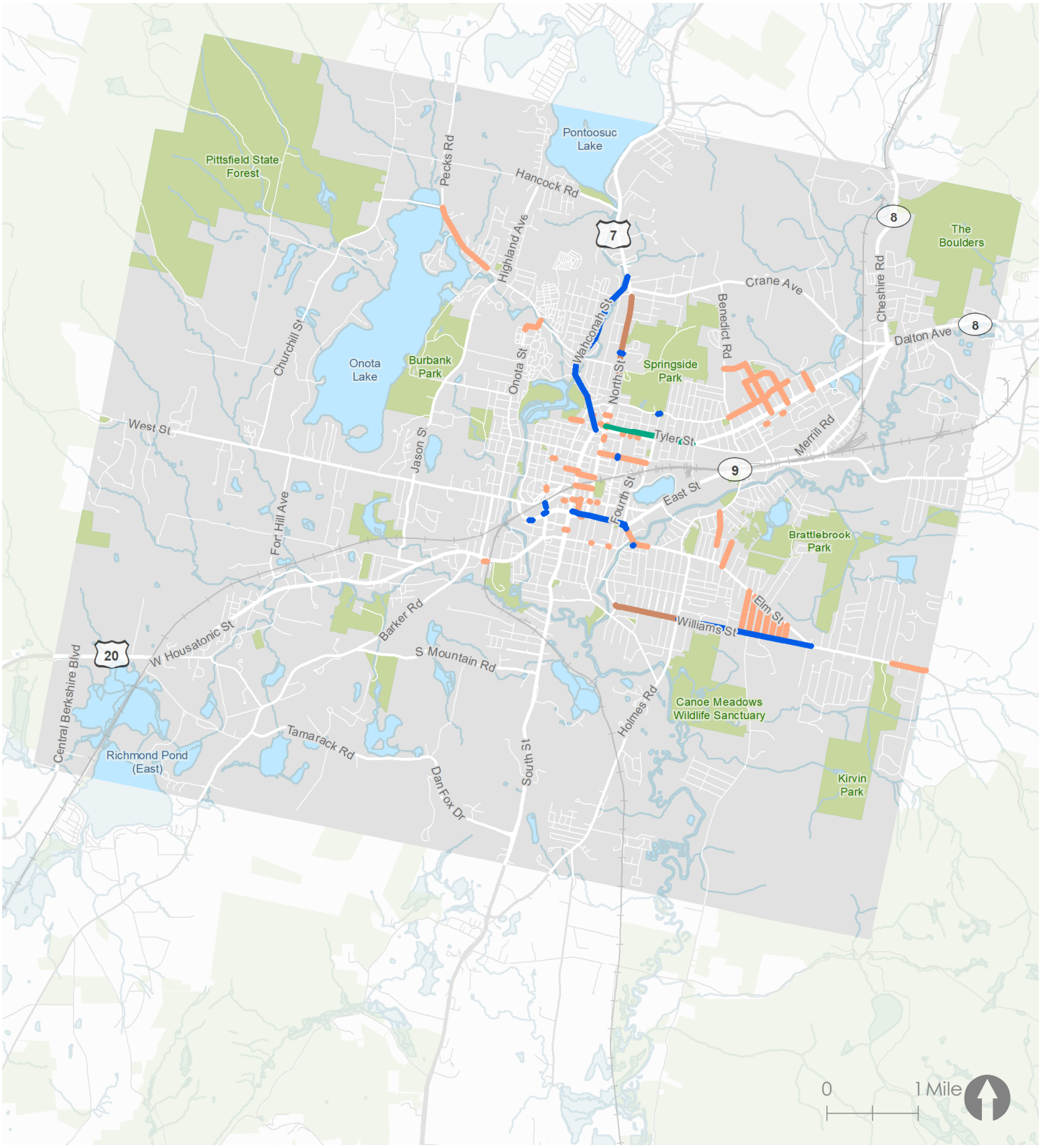


Figure 3.23: Number of Complete Streets Projects by Type



Source: City of Pittsfield

Bicycle Mobility
Pedestrian Mobility
Bicycle and Pedestrian Mobility
Other

Planned Complete Streets Projects

Figure 3.24: Planned Complete Streets Projects

Crash History

The city-wide bicycle and pedestrian crash analysis reflects an unbiased approach to prioritizing corridors with high bicycle and pedestrian crash frequency. The crash history map displays bicycle and pedestrian crashes from 2016 to 2020 by type and severity. Crashes occurred in the most densely populated areas in Pittsfield, such as downtown and in the northeast, along Dalton Avenue.

Recent crash history shows 77 total bicycle and pedestrian crashes between 2016 and 2020. Out of 77 total crashes, 34 were bicycle crashes and 43 were pedestrian crashes. One pedestrian and one bicycle fatality occurred in the last five years. The majority of crashes have been non-fatal injury crashes.

Some of the high crash corridors in the city include:

- Dalton Avenue
- North Street
- South Street
- 1st Street
- Elm Street

Figure 3.25 summarizes the number and severity of pedestrian and bicycle crashes in Pittsfield that occurred between 2016 to 2020.

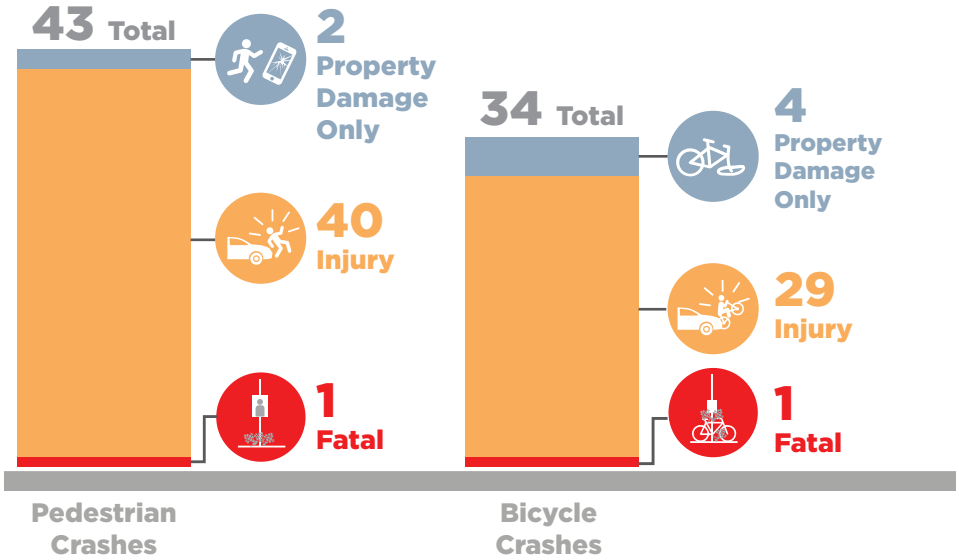
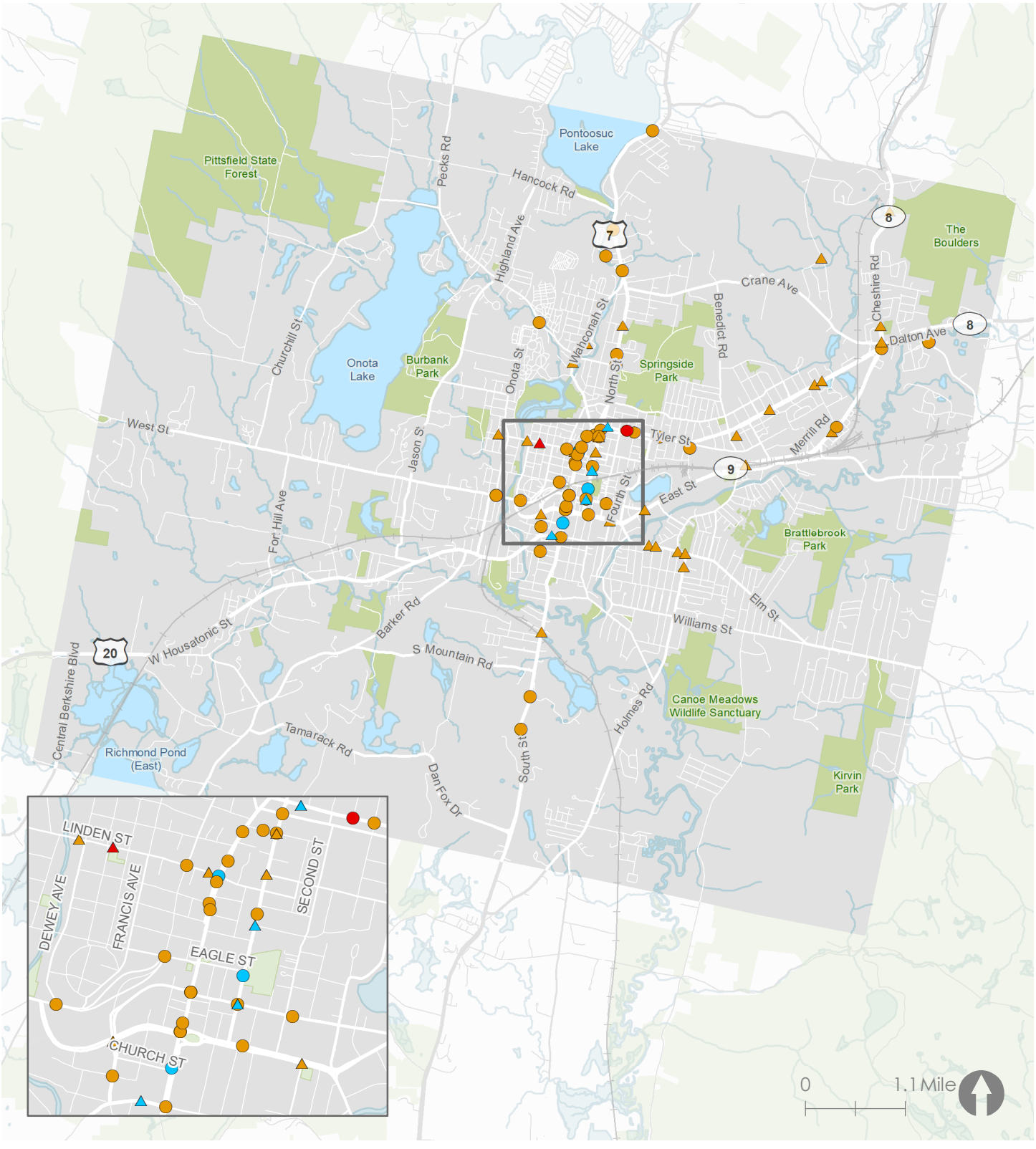


Figure 3.25: Number of Pedestrian and Bicycle Crashes in Pittsfield (2016 to 2020)



Source: Mass.gov

Cyclist Fatality
Pedestrian Fatality
Cyclist Injury
Pedestrian Injury
Cyclist PDO
Pedestrian PDO
Downtown
Rail

Pedestrian & Bicycle Crashes (2016 - 2020)

Figure 3.26: Pedestrian & Bicycle Crashes (2016 - 2020)

Transit Network

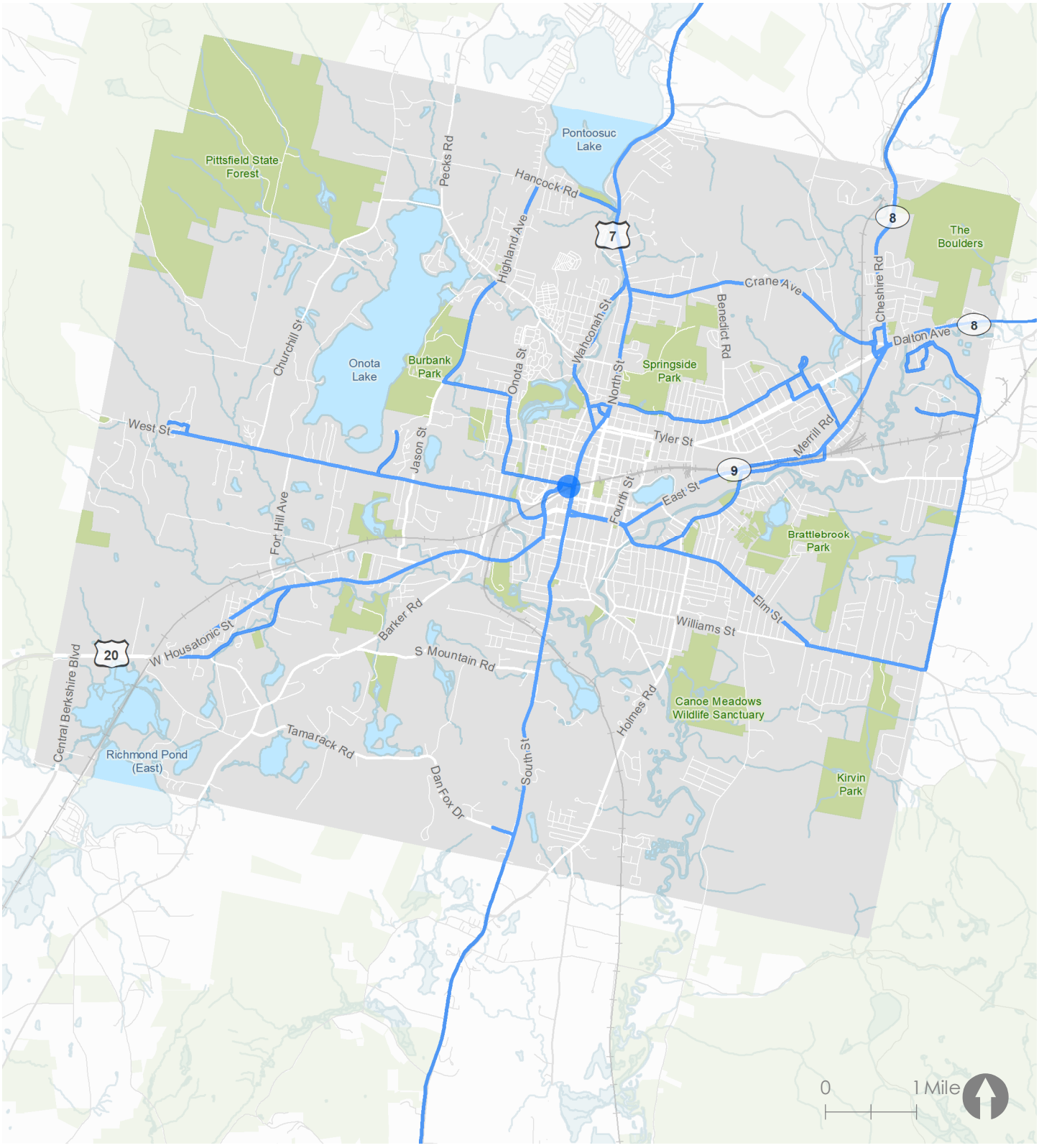
Almost all transit trips start and end as a pedestrian and/or bicycle trip. This phenomenon is often referred to as the concept of first and last-mile connectivity. Transit stops that are well connected to the surrounding areas by comfortable and safe bicycle and pedestrian facilities address the needs of existing transit users and induce more residents to ride transit. Hence, connecting high ridership transit stops with bicycle facilities is one of the objectives of this plan.

Furthermore, buses accessing curbside stops often add complexity to designing bicycle facilities along the same roadway. Therefore, it is vital to understand which roads in Pittsfield have fixed bus routes.

The Berkshire Regional Transit Authority (BRTA) provides bus-based transit in Pittsfield. Transit routes run along major roads in the city and provide service throughout Pittsfield and the surrounding area.

Many routes originate and culminate at the Joseph Scelsi Intermodal Transportation Center. This center is the hub of transit, providing Amtrak, Greyhound bus services, and local BRTA services.

The Joseph Scelsi Intermodal Transportation Center in downtown Pittsfield.
Source: Google Earth Streetview



Source: City of Pittsfield

Berkshire Regional Transit Authority Routes

Transit Center

Rail

Existing Transit Routes

Figure 3.27: Existing Transit Routes

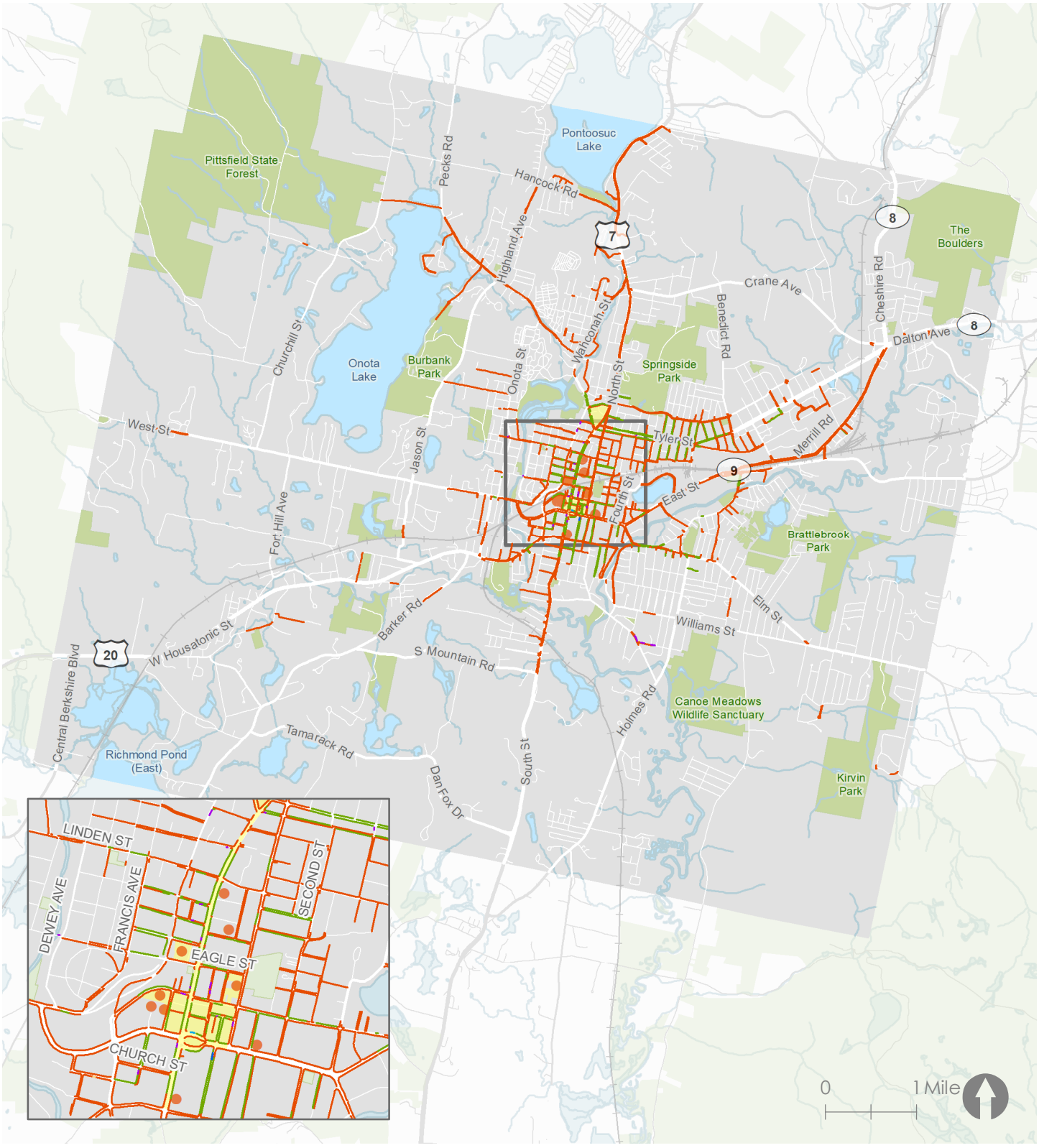
Parking Facilities

It is important to understand parking and other curbside uses such as loading zones and pick-up/drop-off zones when planning a bicycle network since bicycle facilities often compete for limited curbside space with parking, loading, and pick-up/drop-off zone.

The existing location of on-street and off-street parking locations were mapped as part of the existing conditions analysis. Downtown Pittsfield has a mix of parking types, including off-street parking lots and on-street parking. Many streets in the downtown area do not permit on-street parking. Most of the narrow residential neighborhood streets also have on-street parking even though there are no specified parking regulations on these neighborhood streets.

Tyler Street is an example of commercial street with on-street parking on both sides of the street.
Source: Google Earth Streetview

Edward Avenue is a typical example of a narrow two-way yield residential neighborhood street with on-street parking on both sides of the street.
Source: Google Earth Streetview



Source: City of Pittsfield

On-Street Parking
No Parking
Parking Lots
Downtown
Bus Stop
Police Parking
Parking Meter Zones
Loading Zone
Taxi Stand
Rail

Existing Parking Facilities

Figure 3.28: Existing Parking Facilities

Roadway Characteristics

Roadway characteristics such as functional classification, traffic volumes, traffic speeds, and the number of lanes were mapped and analyzed. Pittsfield has approximately 250 miles of roadways within the City's limits. The characteristics of roads throughout the City will help to determine comfortable routes for people on bikes. High speed and high traffic volume streets are often uncomfortable for bicyclists to use if there are no dedicated bicycle facilities present. These roadway characteristics were used as inputs for the Bicycle Level of Traffic Stress (LTS) analysis. Bicycle LTS analysis is discussed in detail in Chapter 4.

Roadway Functional Classification

Roadway classifications provide information about the purpose of a roadway and help to determine appropriate bicycle facilities.

Arterial (principal and minor) roads are primarily designed to prioritize vehicular mobility by facilitating high speeds and high traffic volumes. Arterial roads are often uncomfortable for the average bicycle rider without separated bicycle facilities. Pittsfield's principal arterial roadways include W Housatonic Street, Merrill Road, Dalton Avenue, North Street, and South Street. Some minor arterial roads include West Street, Elm Street, East Street, and Mountain Road. Collector roads are used as a connection between local roads and arterial roads. They provide a balance between access and mobility. Local roads are designed to provide access to properties and are typically not used for through traffic. These streets generally have low speeds and traffic volumes and may be appropriate for the average bicycle rider without dedicated or separated bicycle facilities.

Figure 3.29 summarizes roadway miles by functional classification. Local roads account for 67% of the total roadway mile, while only 22% are arterial roadways.

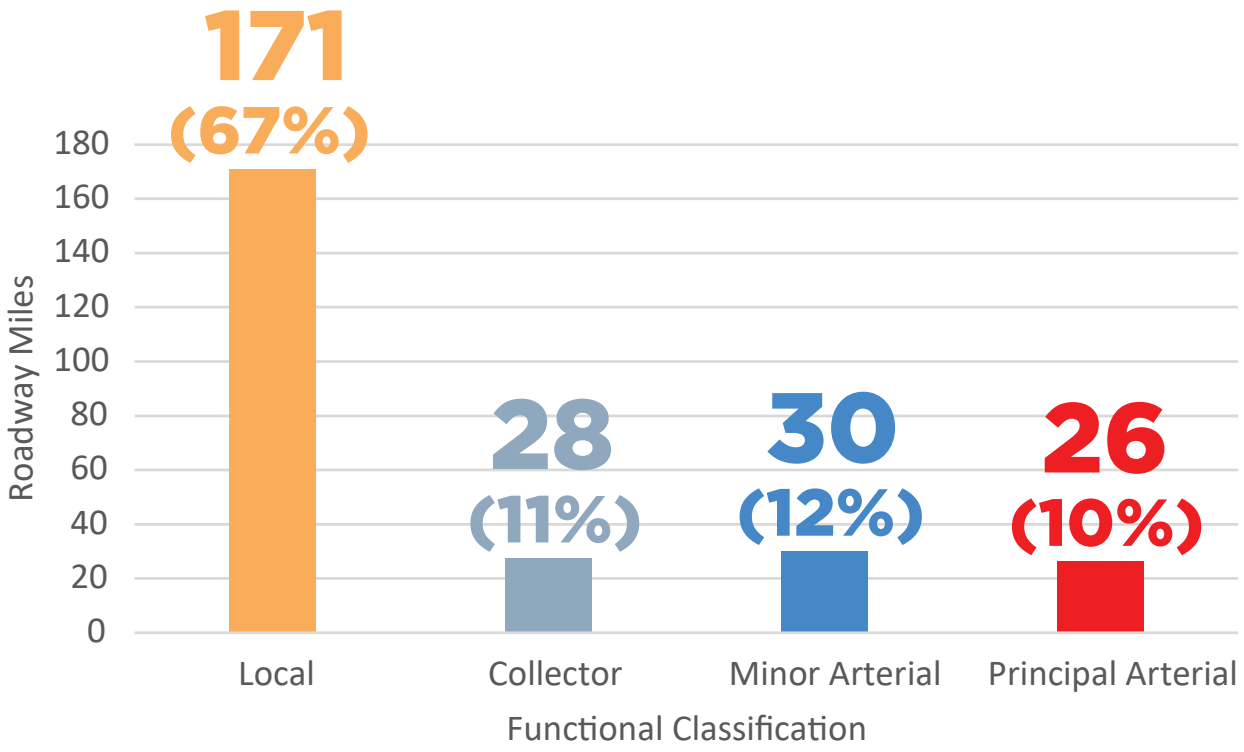
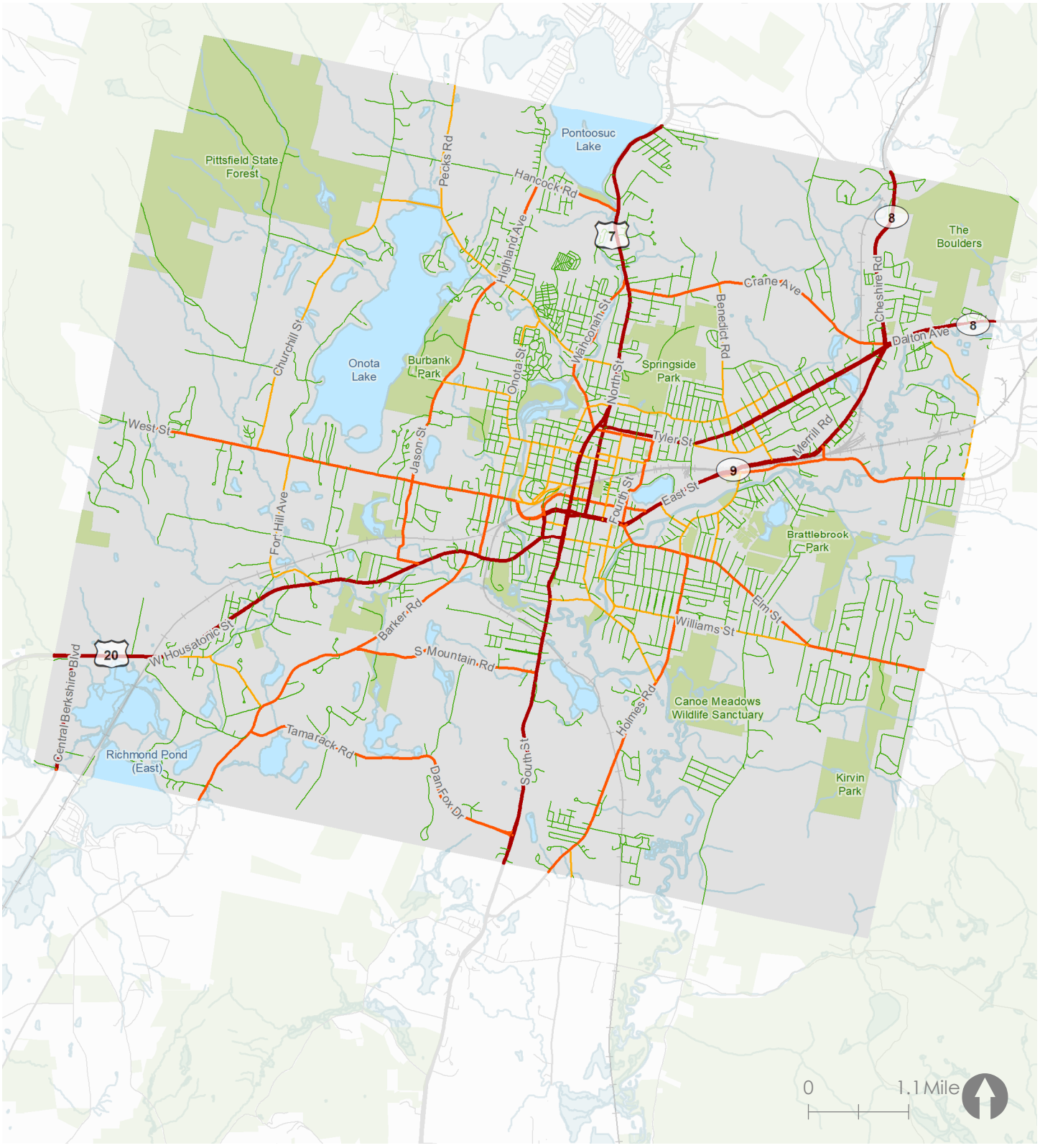


Figure 3.29: Number of Roadway Miles by Functional Classification



Source: MassGIS Data MassDOT Roads

Principal Arterial
Minor Arterial
Collector
Local
Rail

Roadway Functional Classification

Figure 3.30: Roadway Functional Classification

Traffic Volume

Traffic volumes often correlate with roadway classification. Most arterials and collector roads have higher traffic volumes, while local roads have lower traffic volumes. High traffic volumes result in uncomfortable conditions for average bicycle riders riding along these roads without dedicated or separated bicycle facilities.

Local roads are often more narrow and have fewer travel lanes, thus resulting in lower traffic volumes. Roads with lower traffic volumes are more comfortable for bicyclists. Generally, roads with fewer than 3,000 vehicles per day are considered low volume streets that can be shared comfortably with people on bikes without dedicated bicycle facilities. However, many local, low volume roads do not provide direct connections like collector and arterial roads.

Figure 3.31 summarized roadway miles by traffic volume thresholds. On average, 72% of the roadway miles in the city carry under 3,000 vehicles per day and only 16% of roadway miles carry greater than 6,500 vehicles per day.

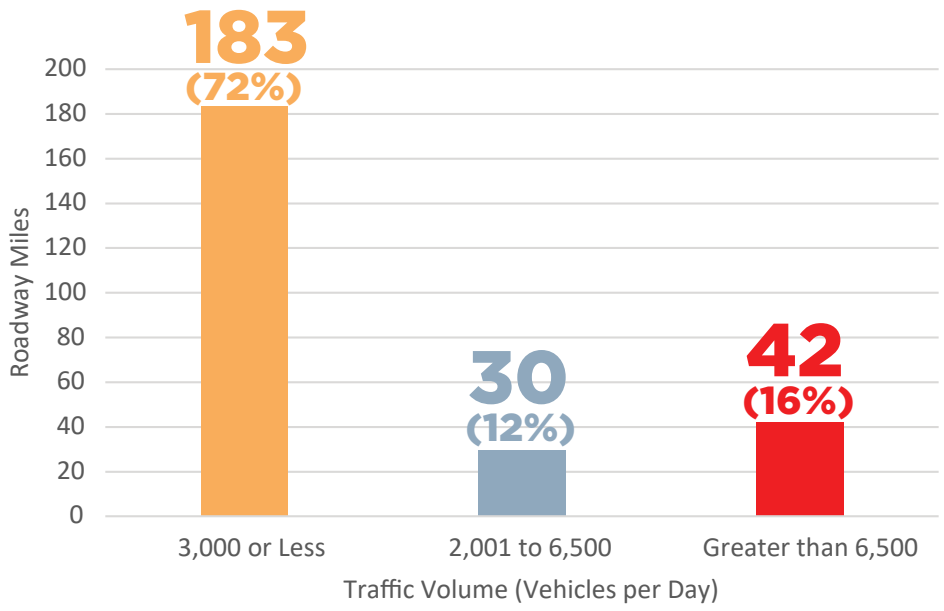
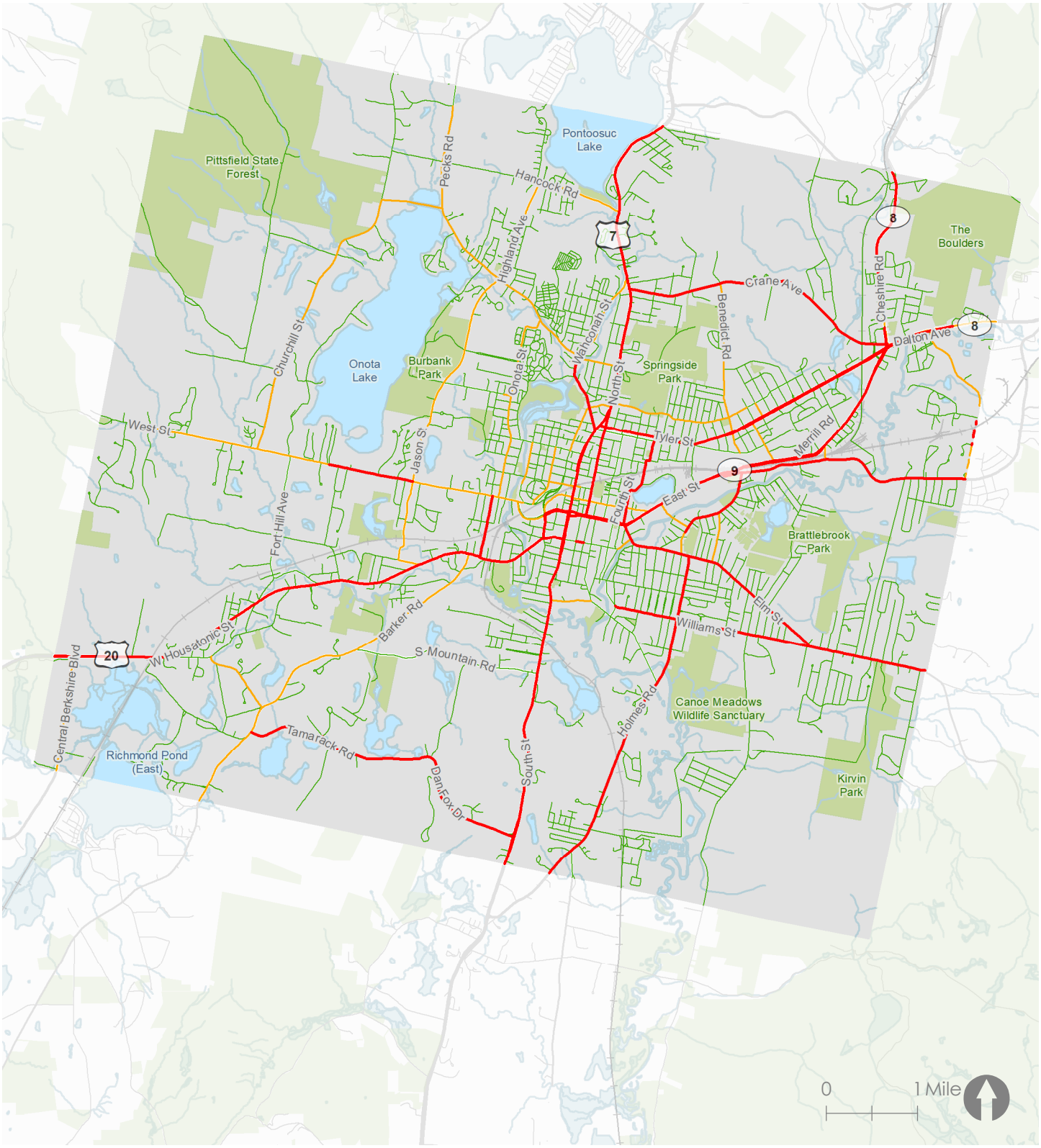


Figure 3.31: Number of Roadway Miles by Traffic Volume



Source: MassDOT Roads

- 3,000 Or Less Vehicles per Day
- 3,001 to 6,500 Vehicles per Day
- Greater than 6,500 Vehicles per Day

Annual Average Daily Traffic (AADT) (2018)

Figure 3.32: Annual Average Daily Traffic (2018)

Number of Roadway Lanes

Very few streets in the city have more than two travel lanes in each direction. Of the total roadway miles in the city, 94% have two or fewer vehicular lanes, while little over 5% of roadways have four or more vehicular lanes. Most of the collector and local roads are two-lane roads with one lane in each direction. Roads with multiple lanes result in uncomfortable conditions for average bicycle riders to ride along these roads without dedicated or separated bicycle facilities.

Most streets in Pittsfield have two lanes of traffic, either two-lane one-way streets or two-lane bidirectional streets. These streets are candidates for implementing bicycle infrastructure such as bicycle lanes, shared lane markings (sharrows), and other bicycle facilities. Roads with four or five lanes of traffic may be too high-stress and high-volume to comfortably accommodate people who bike. Separated bicycle facilities such as shared use paths and separated bicycle facilities (separated bicycle lanes, cycle tracks, etc.) may be necessary on wider roads to create a low-stress bicycle facility.

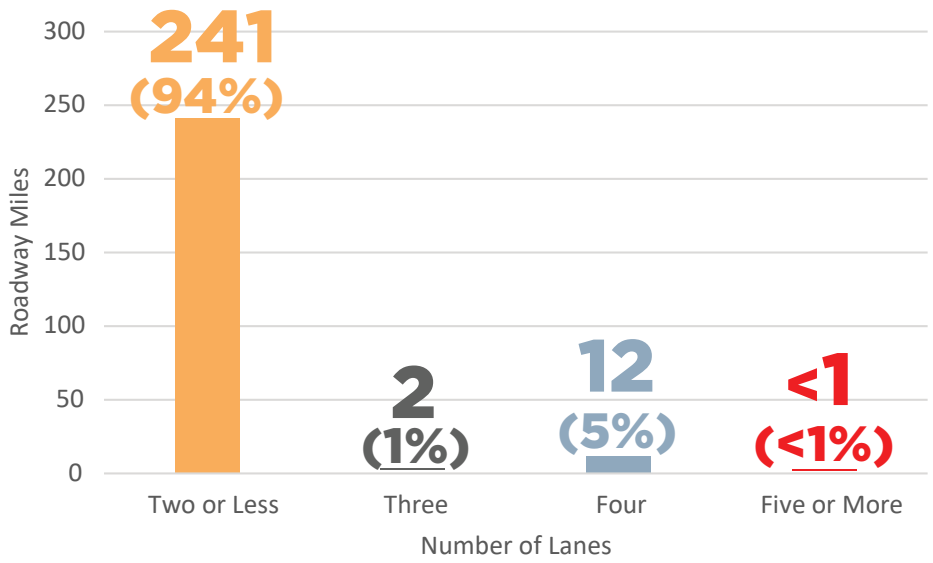
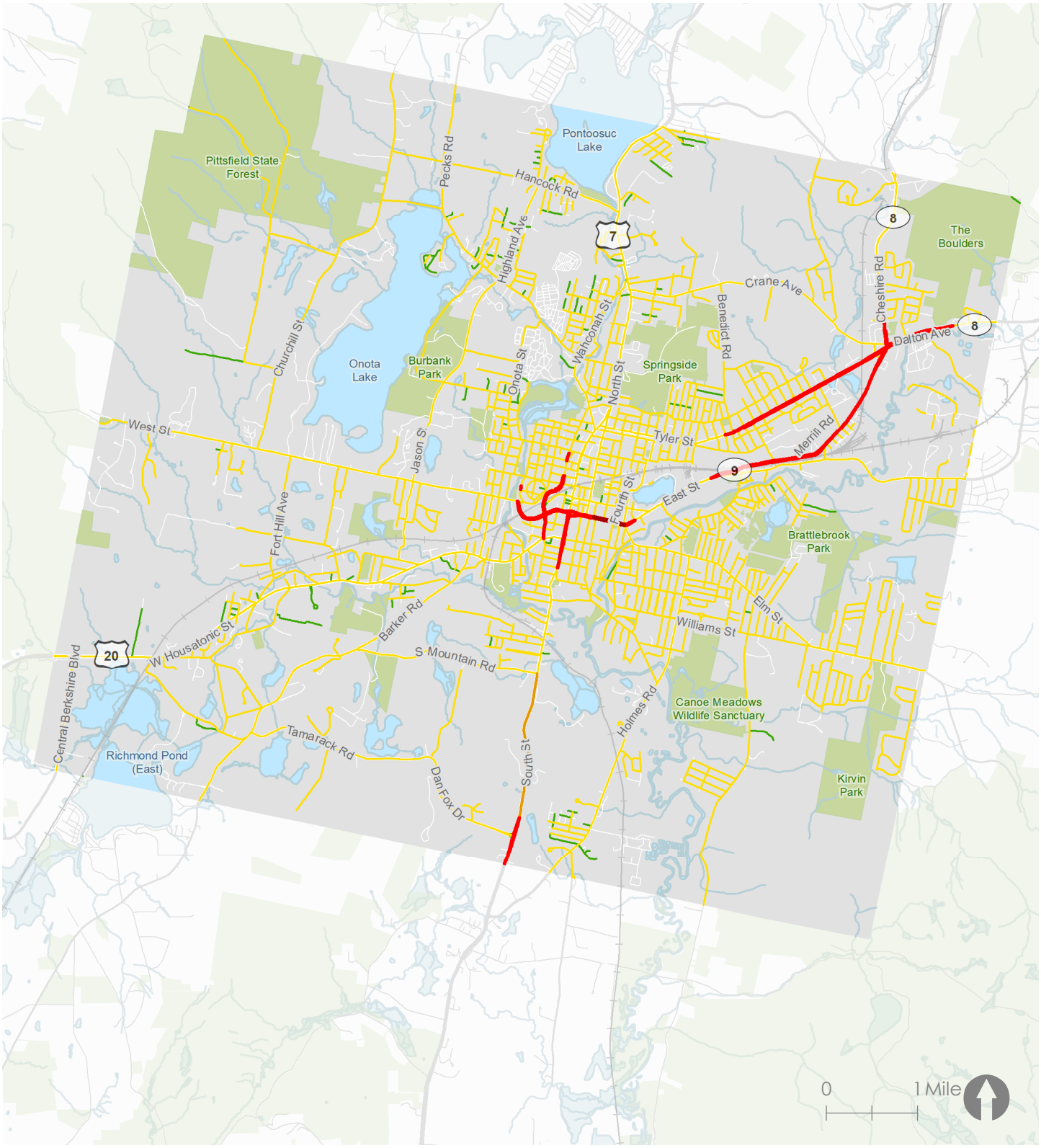


Figure 3.33: Number of Roadway Miles by Number of Lanes

Very few streets such as Dalton Avenue in Pittsfield have more than two lanes. Source: Google Earth Streetview



Source: MassDOT Roads

1
2
3
4
5

Number of Roadway Lanes

Figure 3.34: Number of Roadway Lanes

Speed Limit

Streets with higher vehicular traffic speeds result in uncomfortable conditions for average bicycle riders to ride along these roads without dedicated or separated bicycle facilities.

Speed limits on most of the streets in Pittsfield range from 25 MPH to 35 MPH. Arterial roadways, such as W Housatonic Street, South Street, Dalton Avenue, and Merrill Road, have higher speeds (40 to 45 MPH). An assessment of City speed limits will help identify safe and comfortable corridors to propose bicycle facilities.

Local roads often have lower traffic speeds, thus resulting in more comfortable riding conditions for bicyclists to share the road. Generally, roads with speed limits under 20 MPH or 25 MPH are considered low-speed streets that can be shared comfortably with people on bikes without dedicated bicycle facilities. However, many local, low volume roads do not provide direct connections like collector and arterial roads.

Figure 3.35 summarizes the number of roadway miles by posted speed limits. A little less than 70% of roadway miles in the city have speed limits of 25 MPH or less. A little over 18% of roadway miles have posted speed limits 40 MPH or greater.

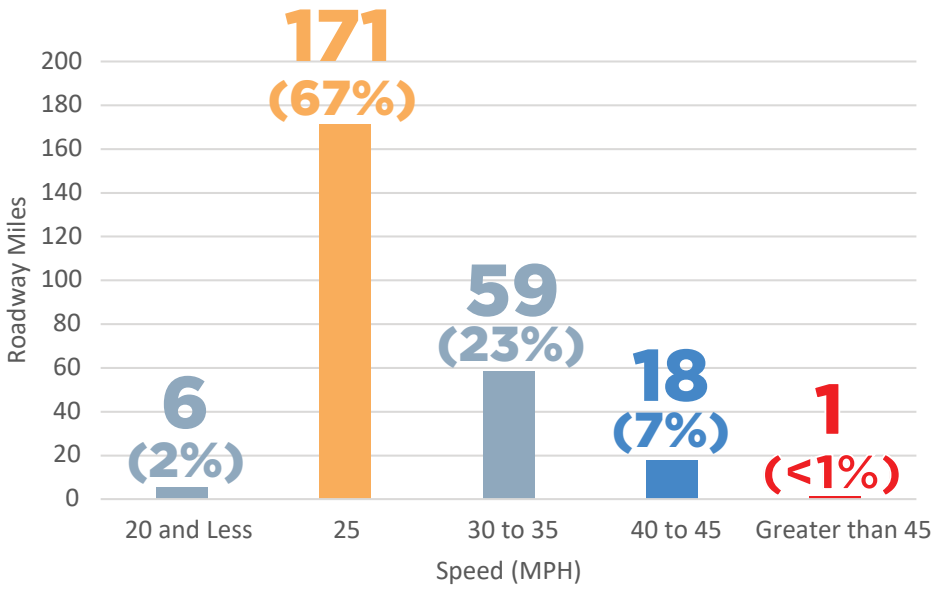
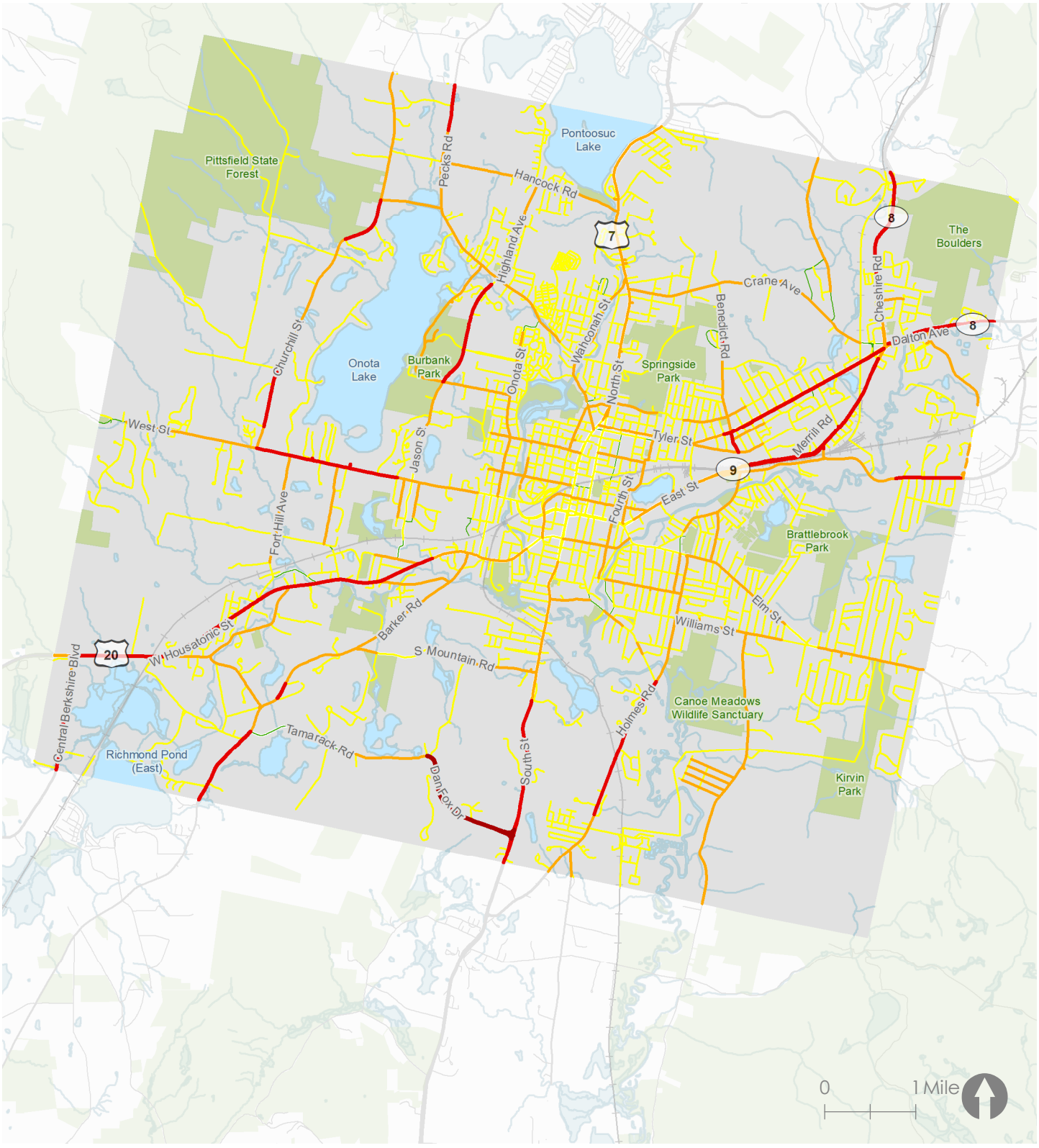


Figure 3.35: Number of Roadway Miles by Speed



Source: MassDOT Roads and City of Pittsfield

20 MPH or Less
25 MPH
30 to 35 MPH
40 to 45 MPH
Greater than 45 MPH

Speed Limit

Figure 3.36: Speed Limit

Source: Kittelson

Chapter 4

Bicycle Level of Traffic Stress

The goal of planning and designing a low-stress bicycle facility network is to enable people of all ages and abilities to feel safe and comfortable riding bicycles throughout the city. A Bicycle Level of Traffic Stress (LTS) analysis was conducted on Pittsfield's street network to identify existing high and low traffic stress streets for people who bike. The analysis was conducted using available existing conditions data and with custom designed GIS-based tool.

This LTS analysis was performed prior to the implementation of bicycle facilities as part of the Shared Streets and Spaces Grant Program. This chapter defines LTS, explains how the GIS tool works, and summarizes the tool's parameters to assign LTS scores to streets. Additionally, a series of maps illustrating the LTS analysis results is included towards the end of this chapter.

Range of Bicycle Riders

Figure 4.1 displays the results of several national surveys that asked respondents to self-identify their level of comfort or confidence riding bicycles in four broad categories. As per these surveys, most people fall into the 'interested but concerned' group, representing people who want to ride bikes regularly but feel unsafe due to a lack of comfortable bicycle infrastructure and lack of safe riding conditions. This group of individuals has a lower tolerance for stressful riding situations than the 'highly confident' group of people biking.

In order to target the goal of increasing overall bicycle ridership, a bicycle network needs to be planned and designed with facilities that are comfortable for the 'interested but concerned' group of riders.

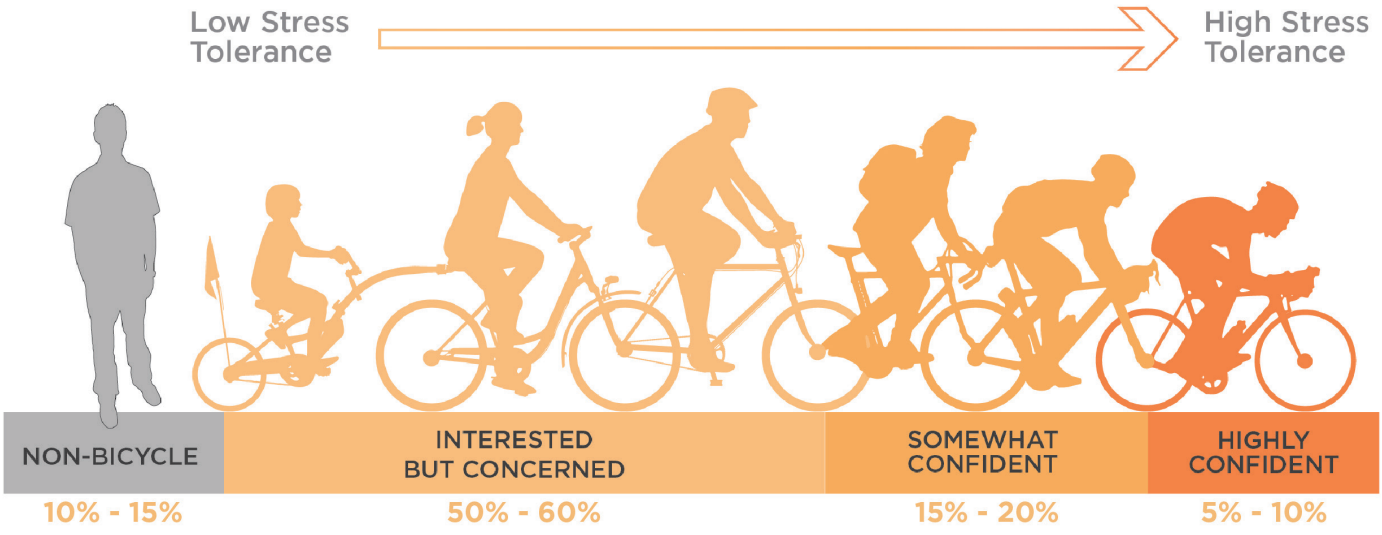


Figure 4.1: Range of Bicycle Riders

The four categories representing a range of bicycle riders are summarized below:

- ***Non-bicycle:***
  People who have no interest in riding a bicycle, no matter the bicycle infrastructure or traffic conditions.
- **Interested but Concerned:**
  People who prefer off-street or separated bicycle facilities or quiet residential streets. People who may not bike at all if bicycle facilities do not meet needs for perceived safety and comfort.
- ***Somewhat Confident:***
  People who generally prefer more separated facilities but are comfortable riding in bicycle lanes or paved shoulders if need be.
- ***Highly Confident:***
  People who are comfortable riding alongside traffic and will bike on roads without bike lanes.

Bicycle LTS Analysis

People on bikes are vulnerable street users and the presence of any one of several factors can make people feel unsafe and uncomfortable to ride a bike along a street. The factors that make people on bikes feel unsafe or uncomfortable to use a street or bike facility include:

- Interactions with fast moving traffic (greater than 25 mph, approximately)
- Frequent interactions with traffic of any speed (greater than 8,000 vehicles per day, approximately)
- Obstructions in a bike facility that force a bicyclist into traffic (debris, parked cars obstructing bike lanes, etc.)
- Dangerous pavement conditions (inadequate snow removal, frequently broken asphalt, slippery gravel or maintenance plates, wheel-catching storm grates, etc.)

The most widely used methodology for determining existing high-stress and low-stress streets in a network is the Level of Traffic Stress (LTS) Methodology. Figure 4.2 shows a variety of roadway characteristics used to calculate bicycle LTS.

Bicycle LTS is a four-point scoring system that indicates how comfortable a street is for different types of cyclists. Streets are categorized into four levels or scores, from LTS 1 being most comfortable/least stressful to LTS 4 being least comfortable/most stressful. Four levels of LTS scores are summarized in Figure 4.3.

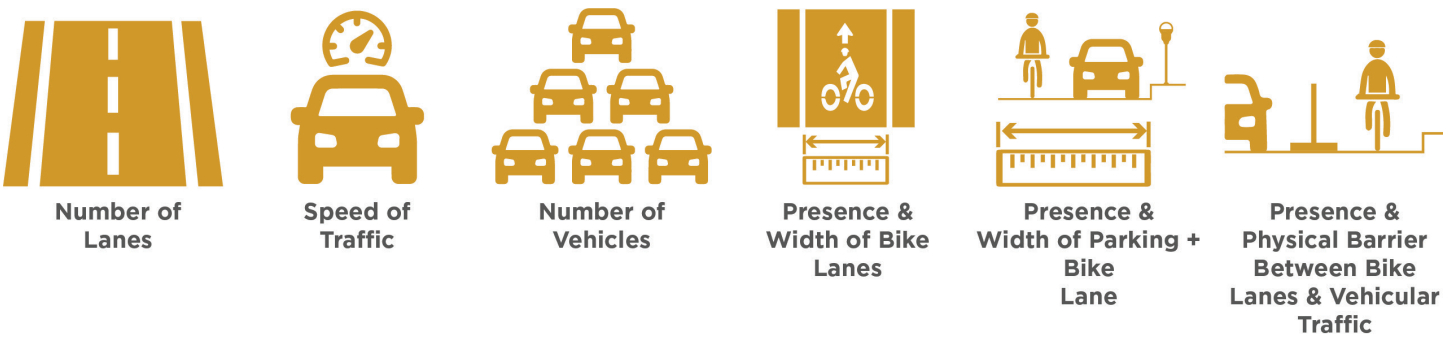


Figure 4.2: Roadway Characteristics used to Calculate Bicycle LTS

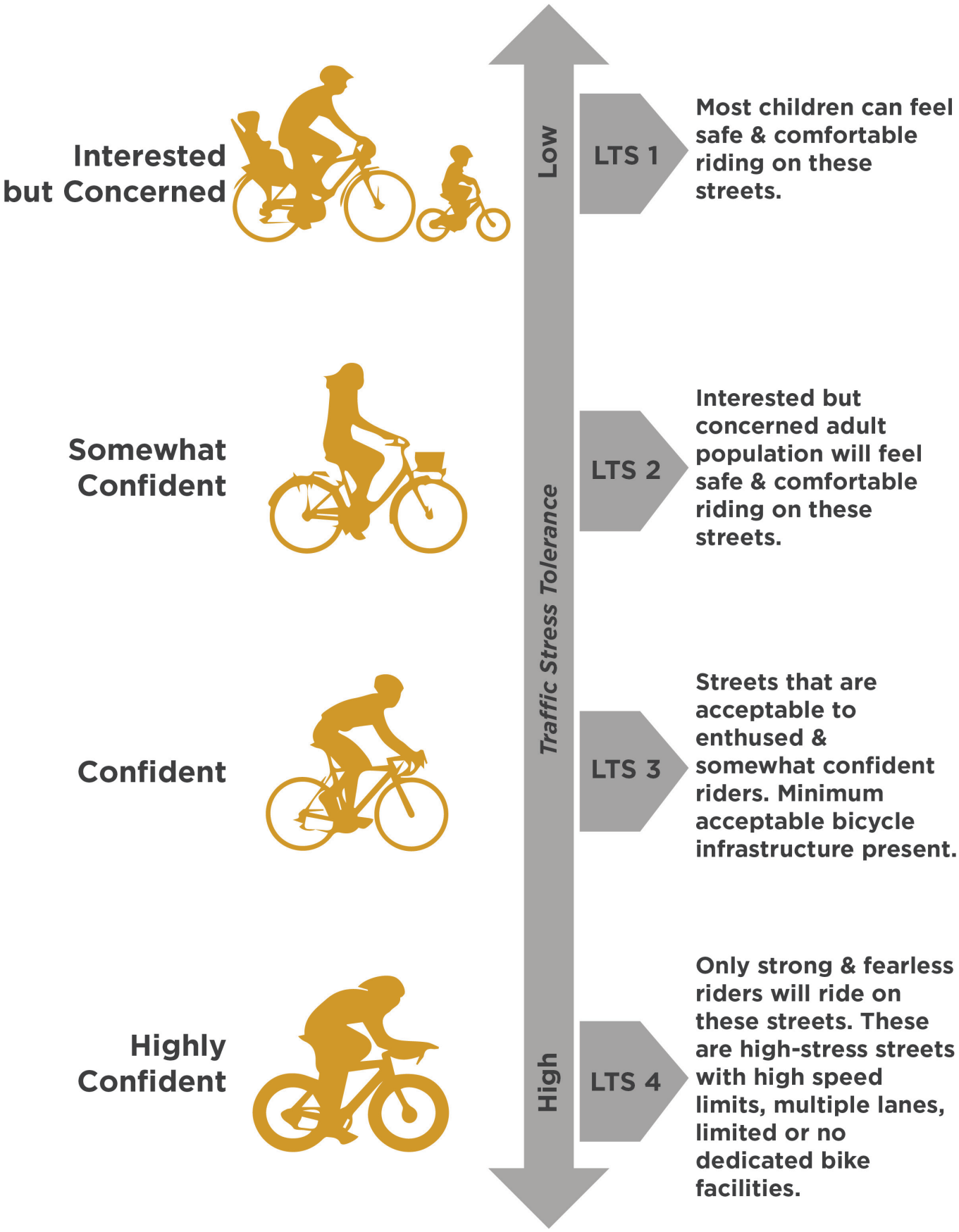
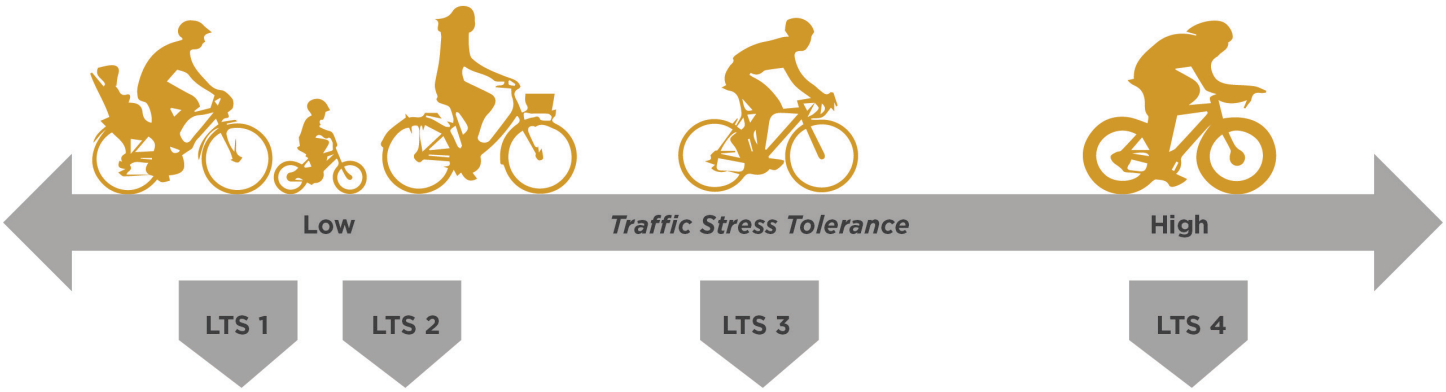


Figure 4.3: Bicycle LTS Scores



Shared Lanes/ Sharrows

< 25 MPH Speed +
Low Traffic Volume

< 35 MPH Speed +
High Traffic Volume

> 40 MPH Speed +
High Traffic Volume

Bike Lanes/ Buffered Bike Lanes

< 30 MPH Speed +
Medium Traffic Volume

> 35 MPH Speed +
Medium to High
Traffic Volume

Works for LTS 4

Separated Bike Lanes

> 35 MPH Speed +
High Traffic Volume

Works for LTS 3 Works for LTS 4

Shared Use Paths/ Trails

Off-Road

Works for LTS 3 Works for LTS 4

Figure 4.4: Bicycle LTS Scores and Corresponding Bicycle Facility Types

Specific bicycle facility types that qualify as low-stress facilities that may be comfortable for 'interested but concerned' or 'somewhat confident' groups vary according to roadway conditions. Figure 4.4 displays Bicycle LTS Scores and corresponding bicycle facility types for different roadway conditions.

GIS Tool

The LTS methodology was applied to Pittsfield's entire street network by utilizing a custom designed GIS tool. Various street characteristics such as number of lanes, posted speed, and traffic volume were used to determine Bicycle LTS on street segments and intersections throughout Pittsfield. Most of the datasets were pulled from MassGIS Data: Massachusetts Department of Transportation (MassDOT) Roads and provided by the City of Pittsfield.

A GIS tool was developed to synthesize various street characteristics to determine the LTS score ranging between 1 to 4. The GIS tool was used to determine the LTS score for both, street segments and intersections.

Bicycle LTS Analysis Results

The bicycle LTS analysis allows the selection of strategic corridors that may be currently high-stress for bicyclists, but with the implementation of low-stress bicycle facilities, these corridors can efficiently connect existing areas of low-stress streets to one another. Street view images next to Figure 4.5 show example streets within Pittsfield for each LTS score.

The bicycle LTS analysis results are displayed in Figure 4.5 and in a series of map figures on the following pages. Figure 4.5 shows total roadway miles by Bike LTS scores. 68% of existing streets are already low-stress. Only around 32% of the streets are high-stress streets. Figure 4.6 shows the overall city-wide street segment level LTS analysis. The results show that the large majority of the City's streets already qualify as low-stress streets as LTS 1 or 2, as seen in Figure 4.7. However, most of these are narrow two-lane residential streets form disconnected islands of small low-stress networks. Figure 4.8 visualizes all of the "islands" of connected low-stress neighborhoods within the city. This visualization allows the strategic selection of corridors for low-stress bicycle facilities based on how efficiently they connect these islands to one another. These islands are separated by wider and busier roads acting as barriers, such as West Street, East Street, W Housatonic Street, Merrill Road, and Dalton Avenue, among others. These wide roads qualify as high-stress corridors and are categorized as LTS 3 and 4, as seen in Figure 4.9 and Figure 4.10. Figure 4.9 also shows locations of signalized intersections. Figure 4.10 shows high-stress intersections categorized as LTS 3 and 4.

Implementing safe, comfortable, and low-stress bicycle facilities along, or parallel to these high-stress street segments and intersections can unlock the existing islands of low-stress streets to create a connected city-wide network of low-stress bicycle facilities. These high-stress street segments and intersections serve as the starting point to prioritizing bicycle projects and developing recommendations for the bicycle facilities network.

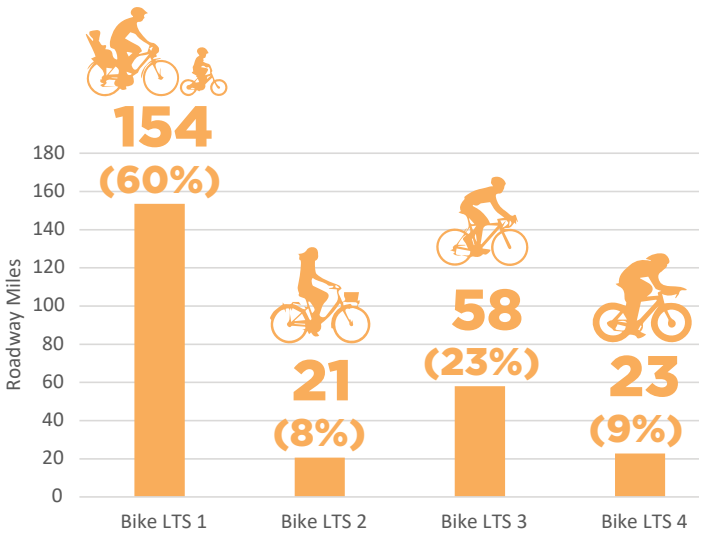
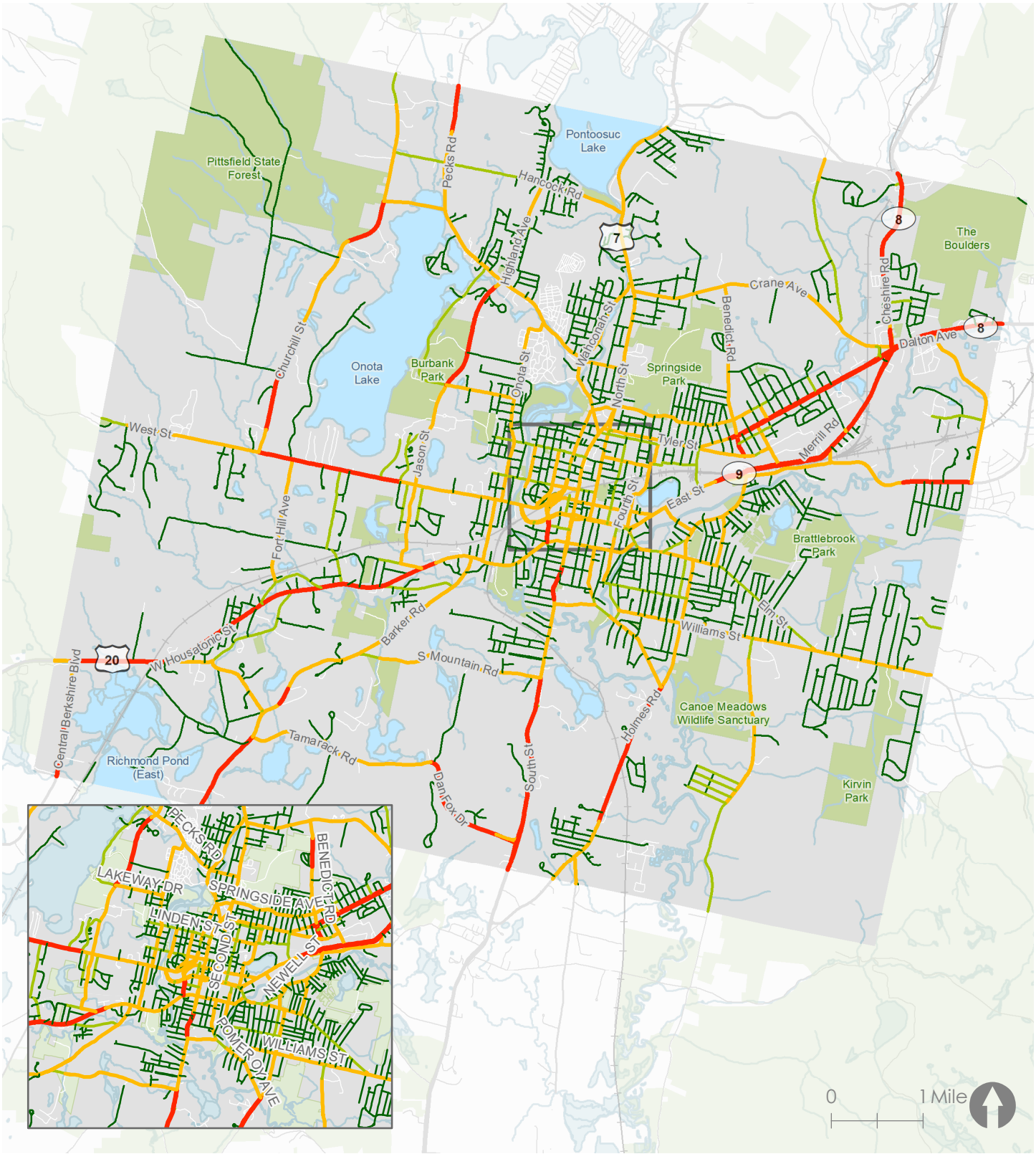


Figure 4.5: Number of Roadway Miles by Existing Bike LTS Scores



Bicycle Level of Traffic Stress (LTS): Segments

Figure 4.6: Bicycle Level of Traffic Stress (LTS): Segments

Robbins Street: Example of LTS 1
Source: Google Earth Streetview

Stoddard Avenue: Example of LTS 1
Source: Google Earth Streetview

Elm Street: Example of LTS 2
Source: Google Earth Streetview

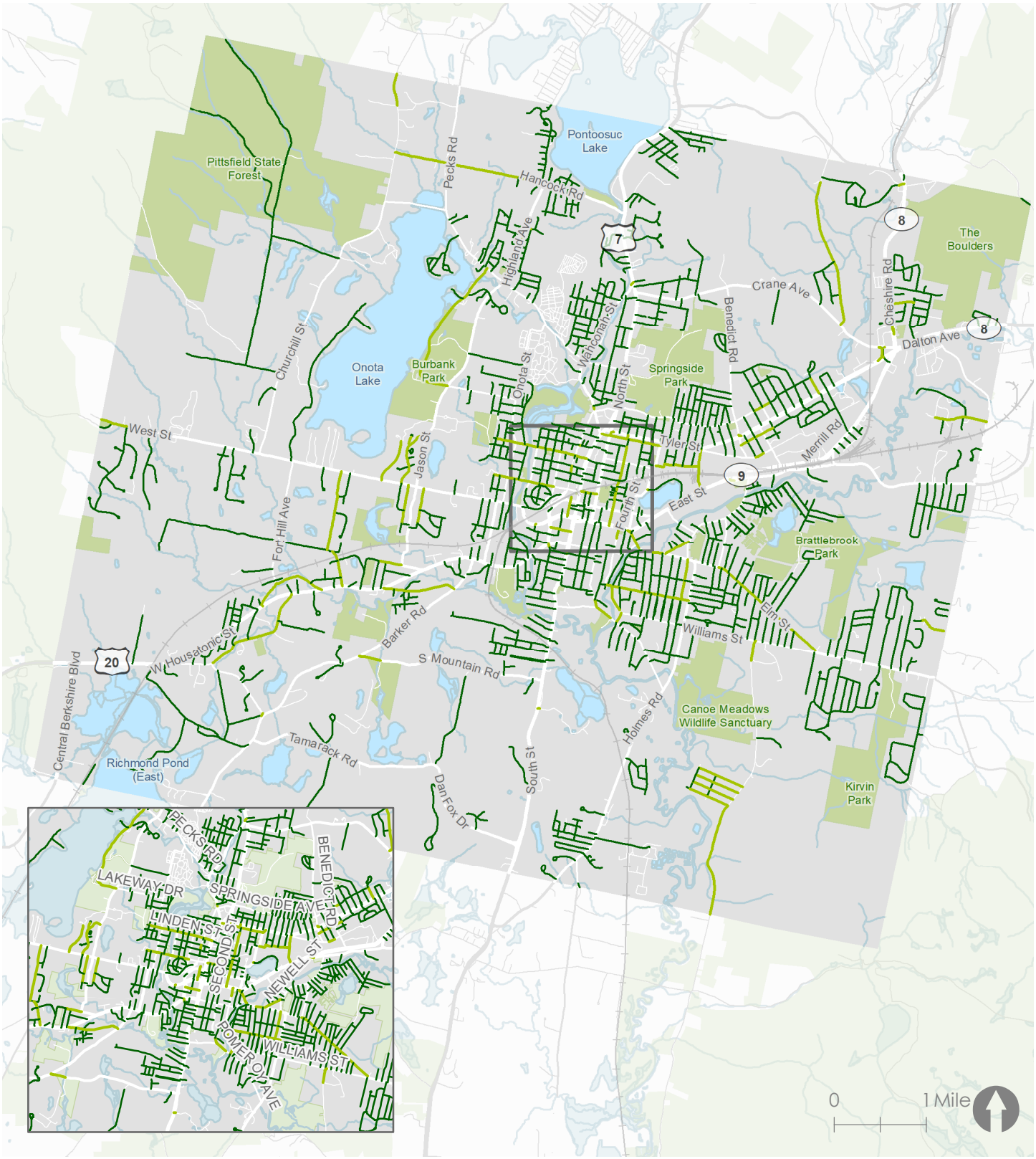
1st Street: Example of LTS 2
Source: Google Earth Streetview

Williams Street: Example of LTS 3
Source: Google Earth Streetview

Tyler Street: Example of LTS 3
Source: Google Earth Streetview

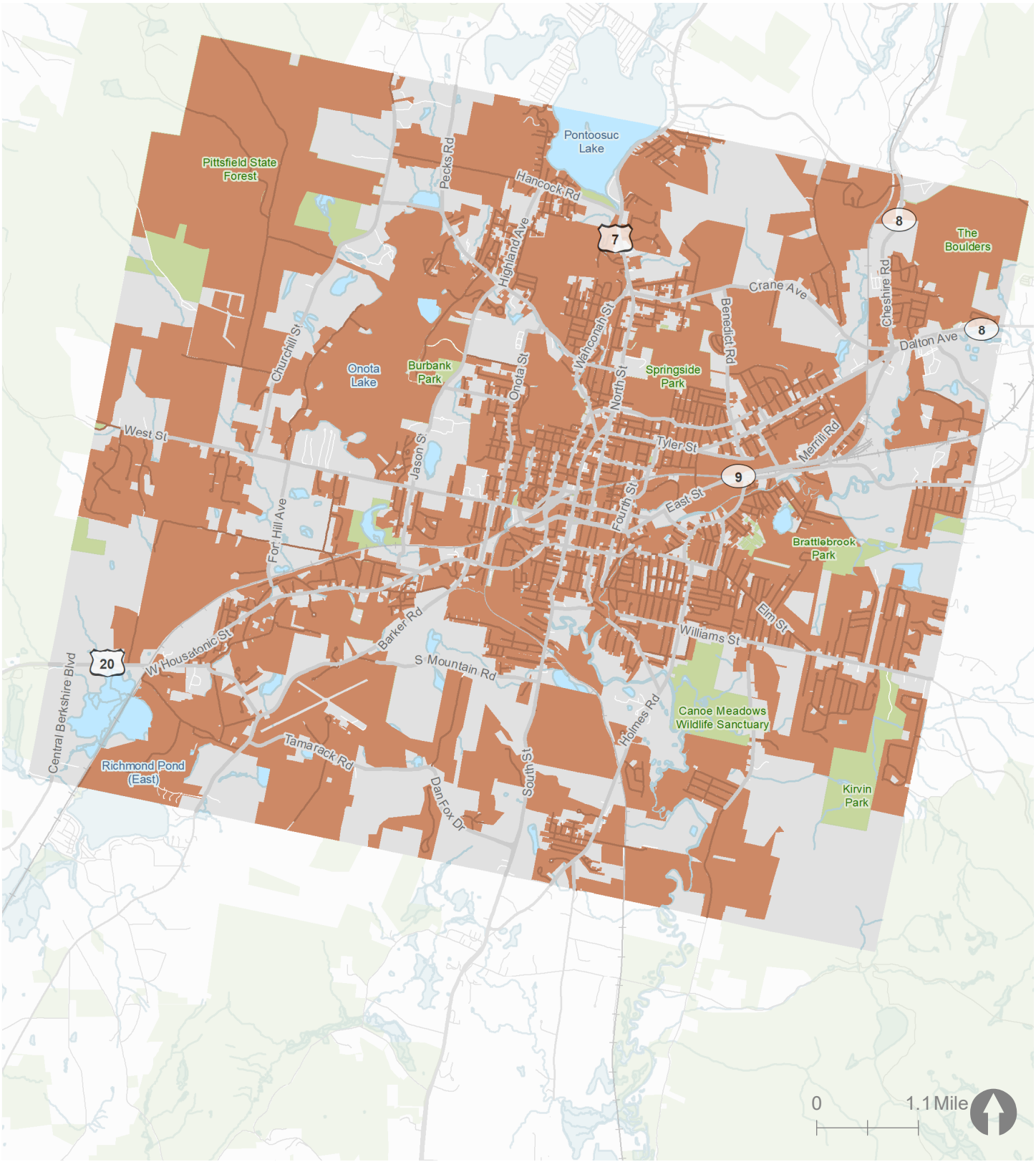
Dalton Avenue: Example of LTS 4
Source: Google Earth Streetview

South Street: Example of LTS 4
Source: Google Earth Streetview



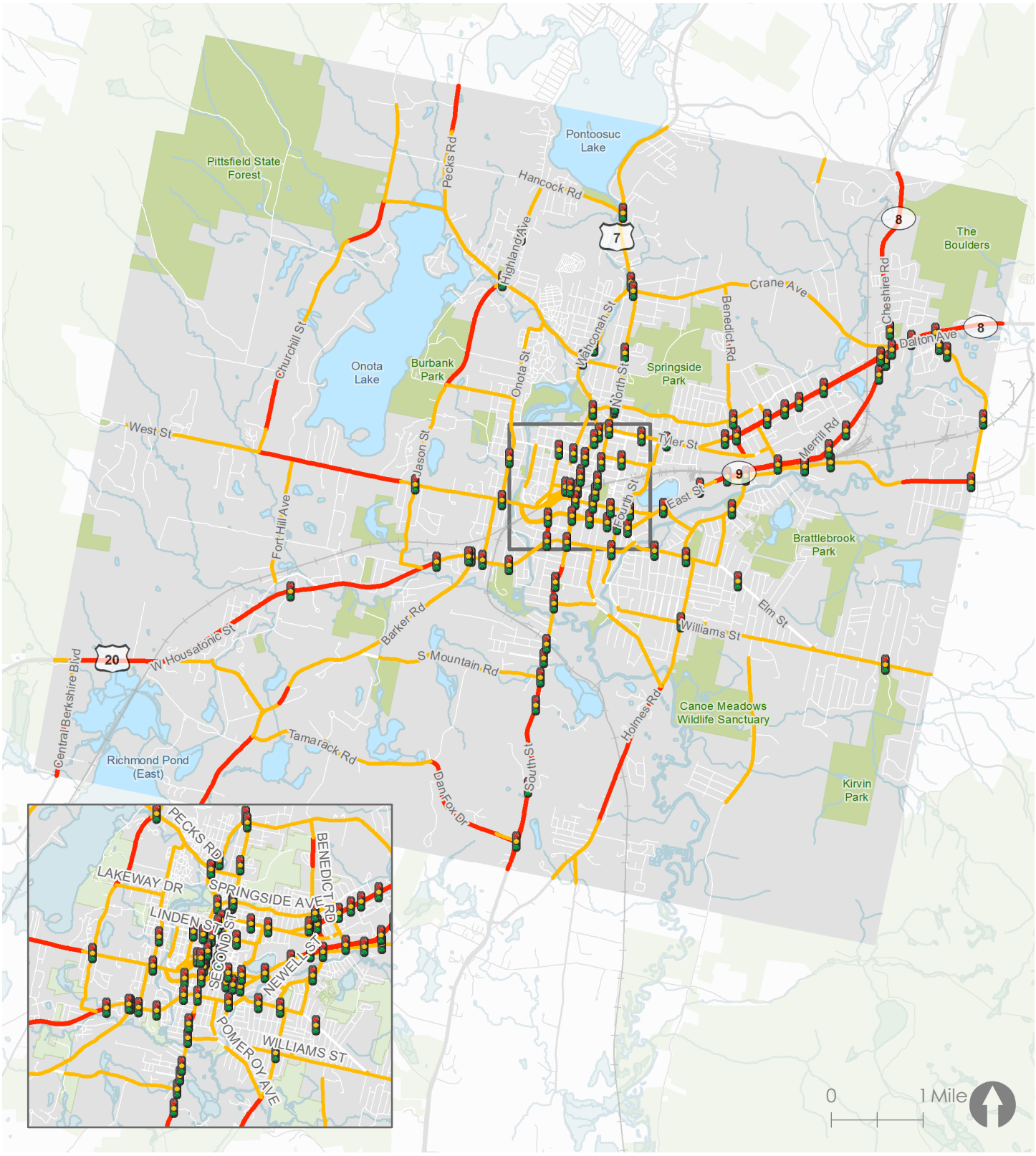
Low Bicycle LTS Segments

Figure 4.7: Low Bicycle LTS Segments



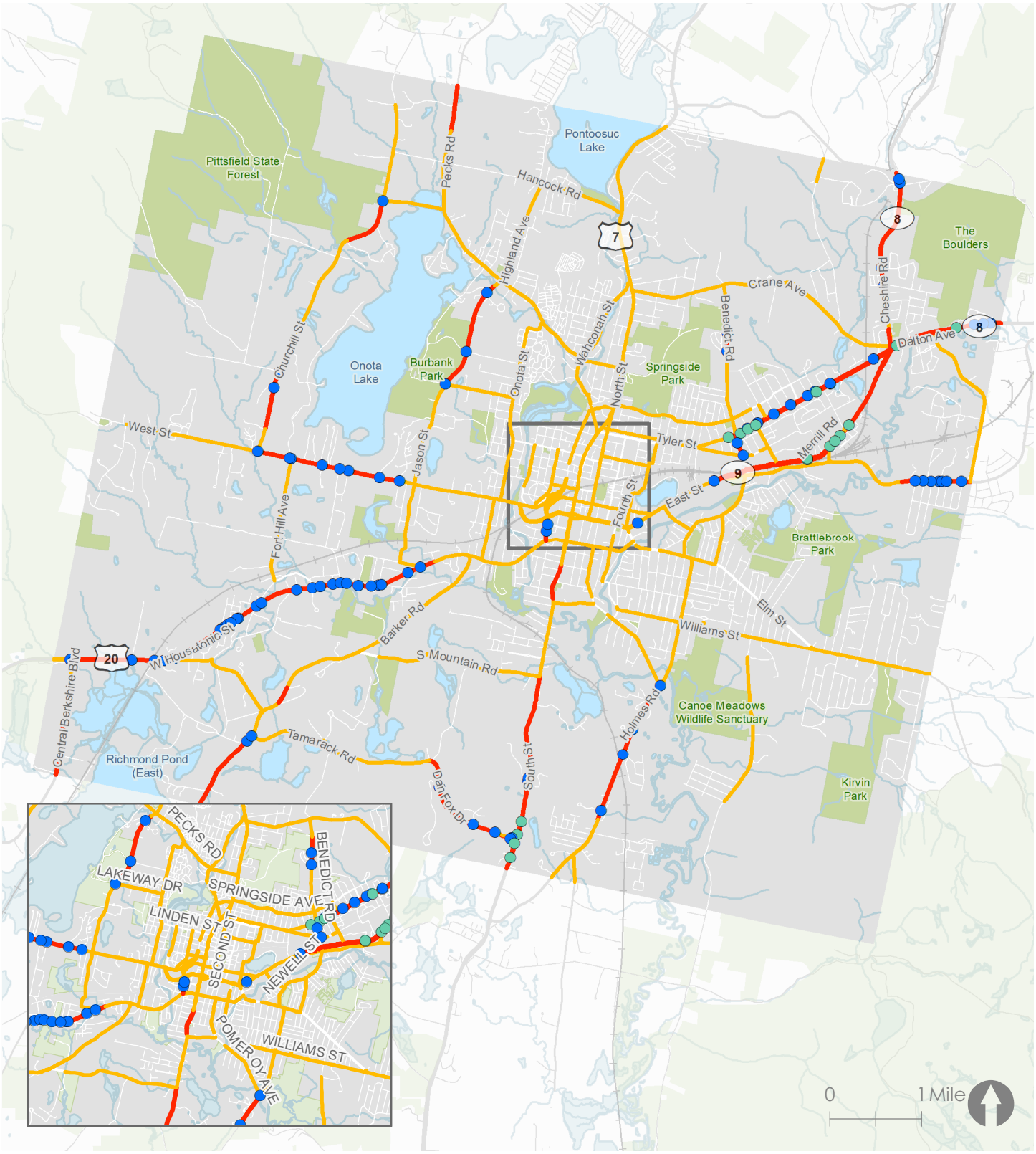
Existing Low-Stress Islands

Figure 4.8: Existing Low-Stress Islands



High Bicycle LTS Segments + Signalized Intersections

Figure 4.9: High Bicycle LTS Segments + Signalized Intersections



High Bicycle LTS Segments + High LTS Unsignalized Intersections

Figure 4.10: High Bicycle LTS Segments + High LTS Unsignalized Intersections

Source: The Berkshire Eagle/Ben Garver —

Chapter 5

Recommended Bicycle Network

Findings from the existing conditions assessment, bicycle level of traffic stress evaluation, and public feedback contributed to developing the recommended city-wide bicycle facilities network. This chapter outlines the four-step process used to develop the recommended bicycle facilities network. Figure 5.1 illustrates the four-step prioritization process.

Prioritization Process

Step 1: Data-Driven Corridor Scoring

Building on the existing conditions analysis, a point system was developed to rank roadway corridors. The point system calculated a 'Total Score' for each corridor in the city. The 'Total Score' was a summation of the Land Use Score, Demographic Score, and Transportation Score.

These scores were calculated using the data collected as part of the existing conditions analysis. Table 5.1 displays the detailed points breakdown used to calculate the scores as part of Step 1: Data-Driven Corridor Scoring. The 'Total Score' value was later used in the process to identify high, medium, and low priority projects. The highest 1/3rd corridors by 'Total Score' were categorized as a high priority, middle 1/3rd as medium priority, and lowest 1/3rd as low priority.

Figures 5.2, 5.3, and 5.4 display the land use, demographic, and transportation prioritization results, respectively. Each map displays low, medium, and high classifications based on the metrics outlined in Table 5.1.

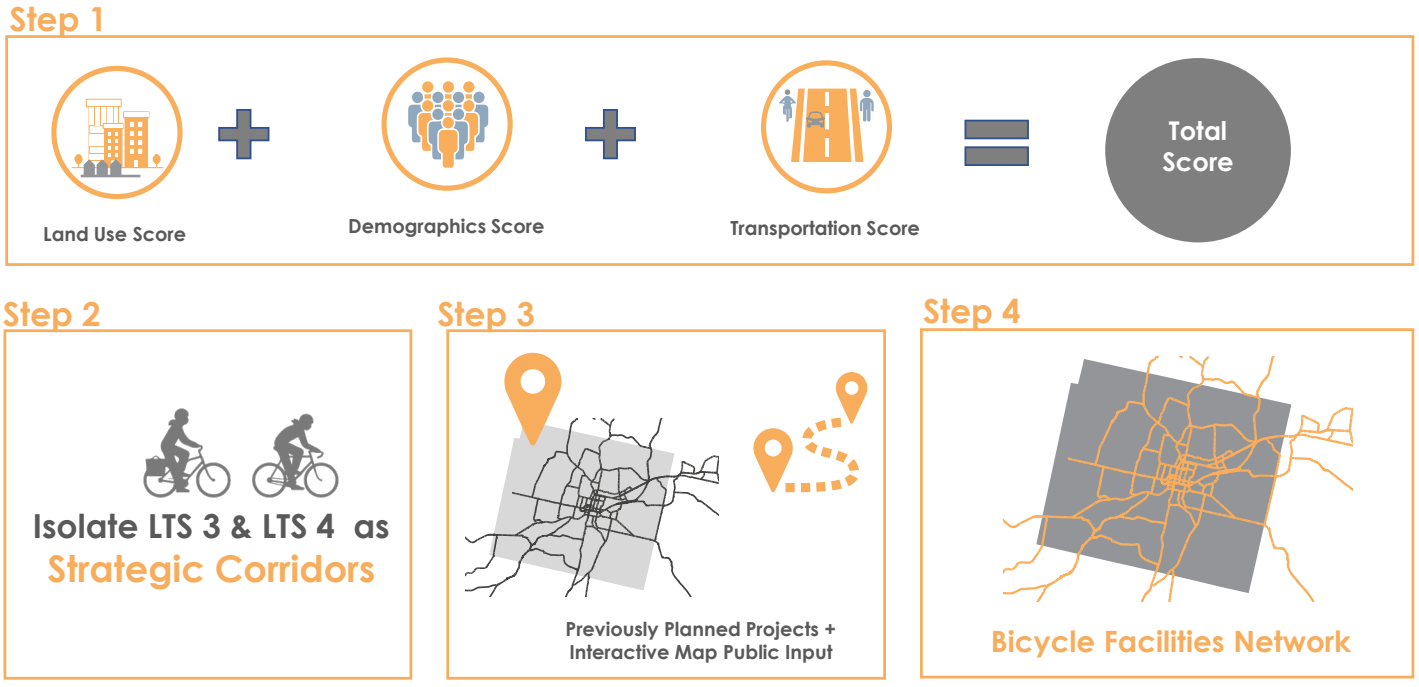


Figure 5.1: Prioritization Process

Table 5.1 Data Driven Analysis to Identify Priority Corridors

Metric	Factor	Criteria/Measure	Points
Land Use and Major Destinations	*Activity, Retail, and Office Centers*	*Within 50 feet (0-1)*	*1 (Within 50 feet)* *0 (Outside 50 feet)*
	Park/Recreation Space/Trailhead		
	Library or Museum	*Within 0.25 Miles (0-1)*	*1 (Within 0.25 miles)* *0 (Outside 0.25 miles)*
	Schools, Colleges, Universities		
	Post Office		
	Government Buildings		
	Total Land Use Score	**0-6 Points**	
Demographics	*Population Density*	*Relative Scoring (1-3)*	*3 (High)* *2 (Medium)* *1 (Low)*
	Employment Density		
	Percent of Population Commuting by Bicycle		
	Percent of Population Commuting by Walking		
	Percent of Households in Poverty		
	Percent of Households without Vehicles		
	Percent of the Population 18 and Under		
	Percent of the Population 65 and Above		
	Within or Intersects Environmental Justice Area	*Yes / No (0-1)*	*1 (Yes) / 0 (No)*
	Total Demographic Score	**0-25 Points**	
Transportation	*Presence of Existing Bicycle Facilities*	*Yes / No (0-1)*	*1 (No) / 0 (Yes)*
	Presence of Planned Bicycle or Pedestrian Facilities		*1 (Yes) / 0 (No)*
	Presence of Existing Pedestrian Facilities		*1 (No) / 0 (Yes)*
	Along or Intersects Transit Route		*2 (Yes; Intersects)* *1 (Yes; Along)* *0 (No)*
	Posted Speed	*Speed Limit (1-4)*	*4 (Greater than or equal to 40 MPH)* *3 (35 MPH)* *2 (30 MPH)* *1 (25 MPH or less)*
	Traffic Volume (ADT)	*Volumes (1-3)*	*3 (Greater than 6,500)* *2 (3,001 to 6,500)* *1 (3,000 or less)*
	Bicycle & Pedestrian Crash Frequency	*Property Damage and Injury Crashes per Mile (1-3)*	*3 (High)* *2 (Medium)* *1 (Low)*
		Fatal Crashes per Mile (0-1)	*1 (Yes)* *0 (No)*
	Bicycle Level of Traffic Stress (LTS)	*Level of Traffic Stress (1-4)*	*4 (LTS 4)* *3 (LTS 3)* *2 (LTS 2)* *1 (LTS 1)*
	Total Transportation Score	**0-21 Points**	

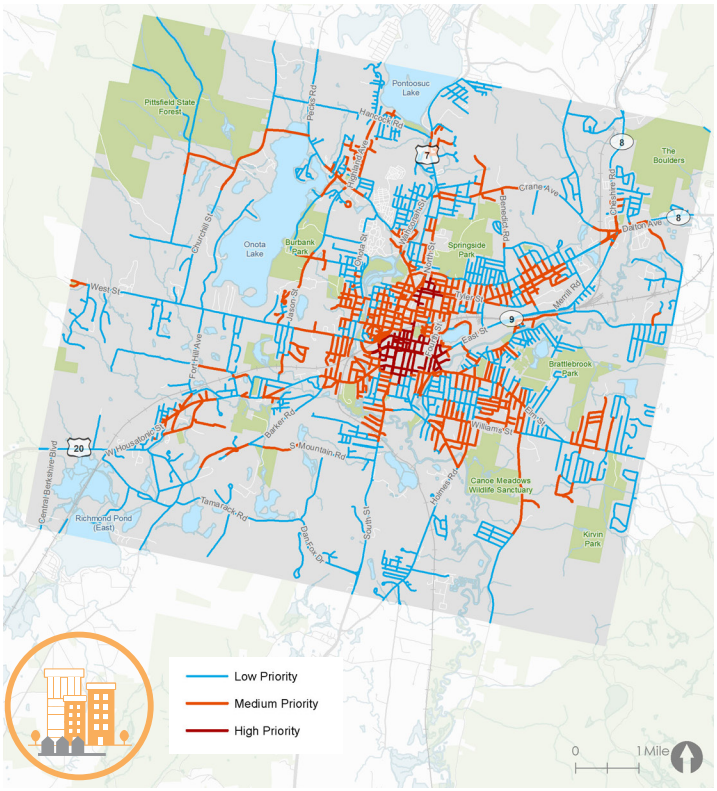


Figure 5.2: Land Use and Destinations Prioritization

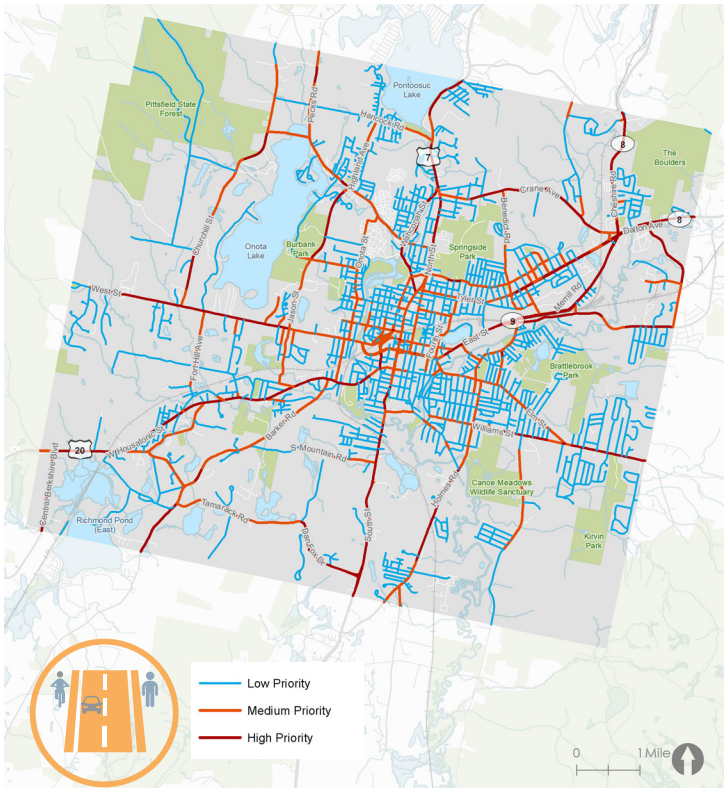


Figure 5.4: Transportation Facilities Prioritization

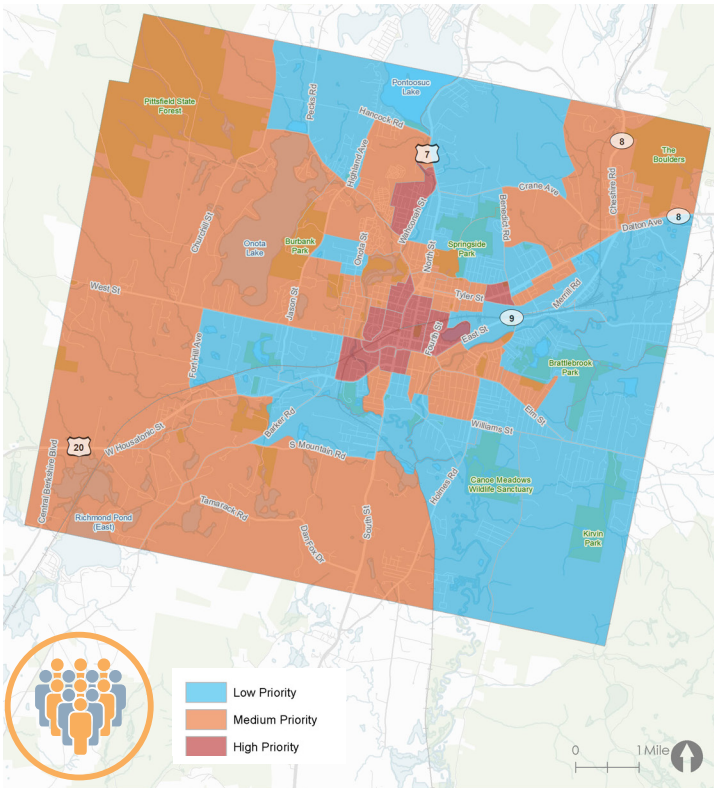


Figure 5.3: Demographics Prioritization

Step 2: Isolate High Stress Corridors

Using the bicycle LTS analysis results, high traffic stress corridors (LTS 3 and LTS 4) were isolated as strategic corridors. Implementing high-quality, low-stress bicycle facilities on these high-stress corridors will enable the City to create a city-wide low-stress bicycle network by connecting the existing disconnected islands of existing low-stress streets.

Step 3: Previously Planned Projects & Public Feedback

As part of this step, corridors were added to the list of strategic corridors from Step 2. The added corridors were previously planned bicycle facilities projects and corridors suggested by the public and stakeholders. An interactive web map was developed as part of the public and stakeholder engagement process that allowed the members of the public and stakeholders to suggest corridors that may form a part of the city-wide bicycle facilities network.

Step 4: Bicycle Facilities Network

As part of this final step, the list of corridors developed as part of Step 3 was reviewed and few corridors were added to connect smaller gaps that resulted in a more complete network. Some of these corridors may already be low-stress streets for people on bicycles. However, branding these corridors as bike routes with markings and signs can create a well-connected city-wide network of bicycle facilities.

The interactive web map was updated to share the draft network with community members and stakeholders. The recommended bicycle network was revised and finalized after incorporating any suggestions and comments received through the web map.

Recommended Network

The prioritization process resulted in a city-wide recommended network of bicycle facilities. A total of 107 street segments or projects totaling about 90 miles are recommended to form the bicycle facilities network.

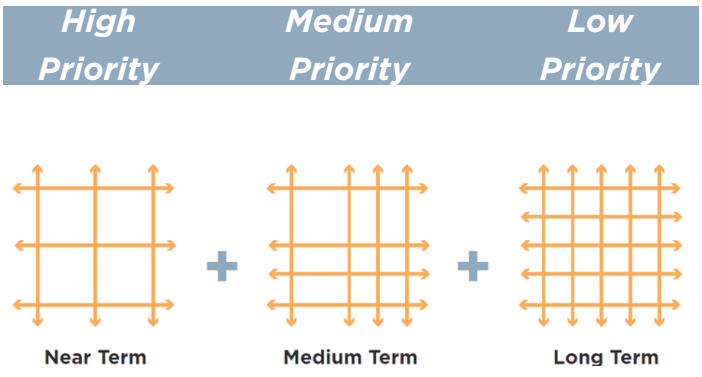
Using the 'Total Score' developed as part of Step 1 of the prioritization process, the street segments were categorized as high (highest 1/3), medium (Middle 1/3), and low (lowest 1/3) priority.

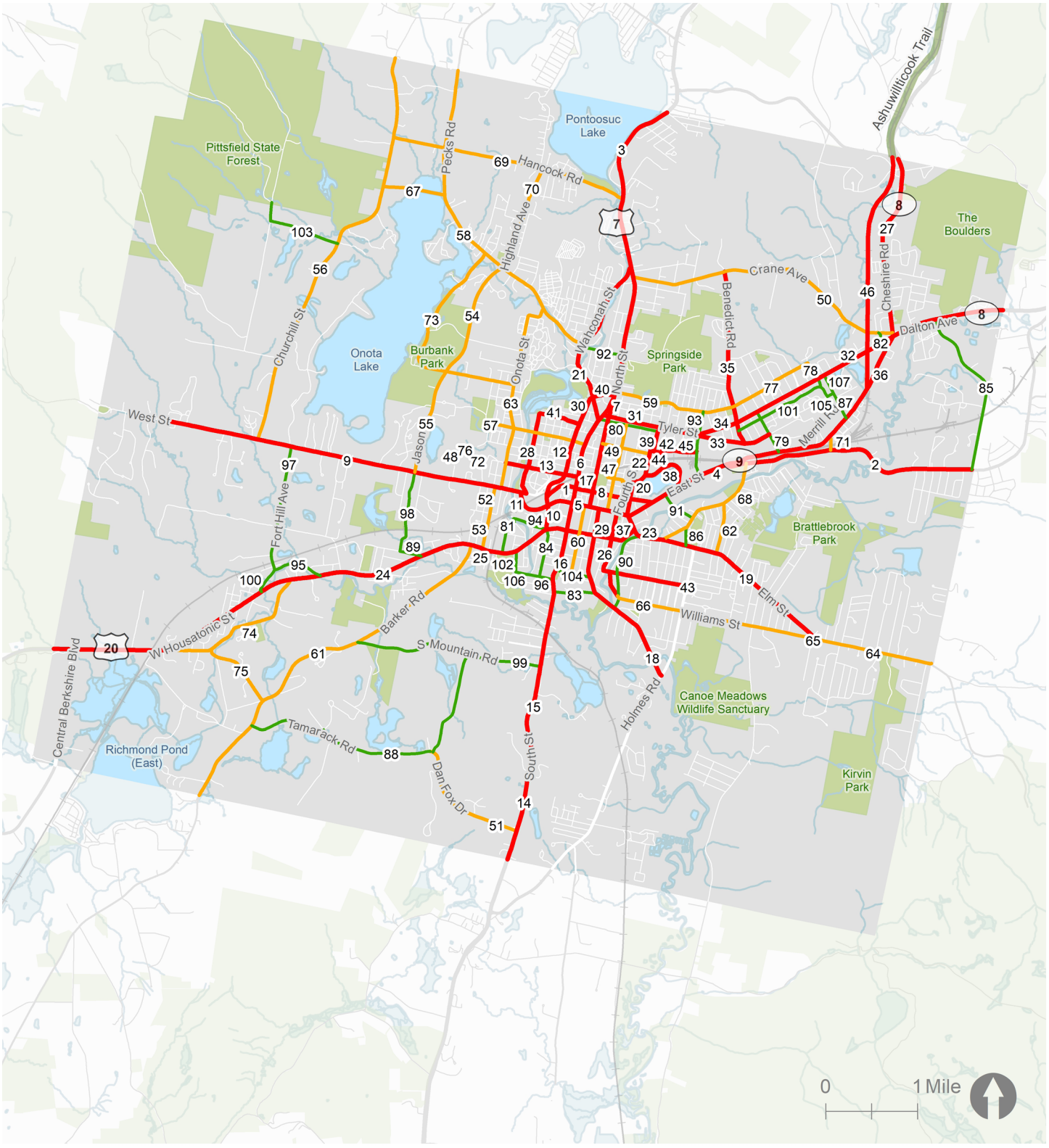
Table 5.2 details the number of segments and miles for each prioritization level as part of the recommended network. Figure 5.5 displays the street segments classified by high, medium, and low priority. Table 5.4 lists all the recommended street segments that form the city-wide bicycle facilities network by segment numbers shown in Figure 5.5.

Table 5.2 Summary of Prioritized Street Segments

Priority	Number of Segments	Miles
High	*46*	*42*
Medium	*32*	*32*
Low	*29*	*16*
Total	**107**	**90**

The high-medium-low priority system can also be used as guidance for phasing. The Master Plan is intended to be implemented in a phased manner to build a city-wide bicycle facilities network over time. The graphic below illustrates the phased approach.





Low

Medium

High

Note: The numbers on the map indicate specific street segments that form the recommended network. Street segment details are listed in Table 5.4.

Recommended Network by Prioritization

Figure 5.5: Recommended Network by Prioritization

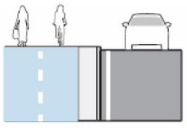
Bicycle Facility Types for the Recommended Network

The proposed recommended network is intended to target bicycle users that are 'interested but concerned.' This group of people is interested in bicycling but feels unsafe using the existing facilities. After completing the prioritization process, specific bicycle facility types were recommended that would best fit each street segment.

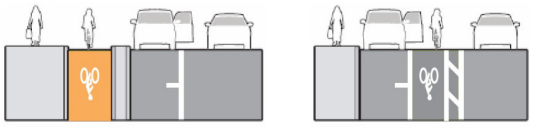
Roadway characteristics such as posted speed and traffic volume were used to determine bicycle facility type. Speed and traffic volume thresholds used to determine bicycle facility type are illustrated in Figure 5.6. These thresholds are generally accepted as industry standard to determine what qualifies as a low-stress bicycle facility type. MassDOT and FHWA have recommended similar thresholds.

The following four major types of on-street facility types are recommended as part of the network:

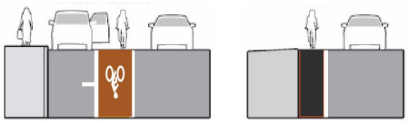
- Shared Use Path



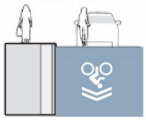
- Separated/Buffered Bike Lanes



- Conventional Bike Lanes



- Neighborhood Bike Routes (Shared Lanes)



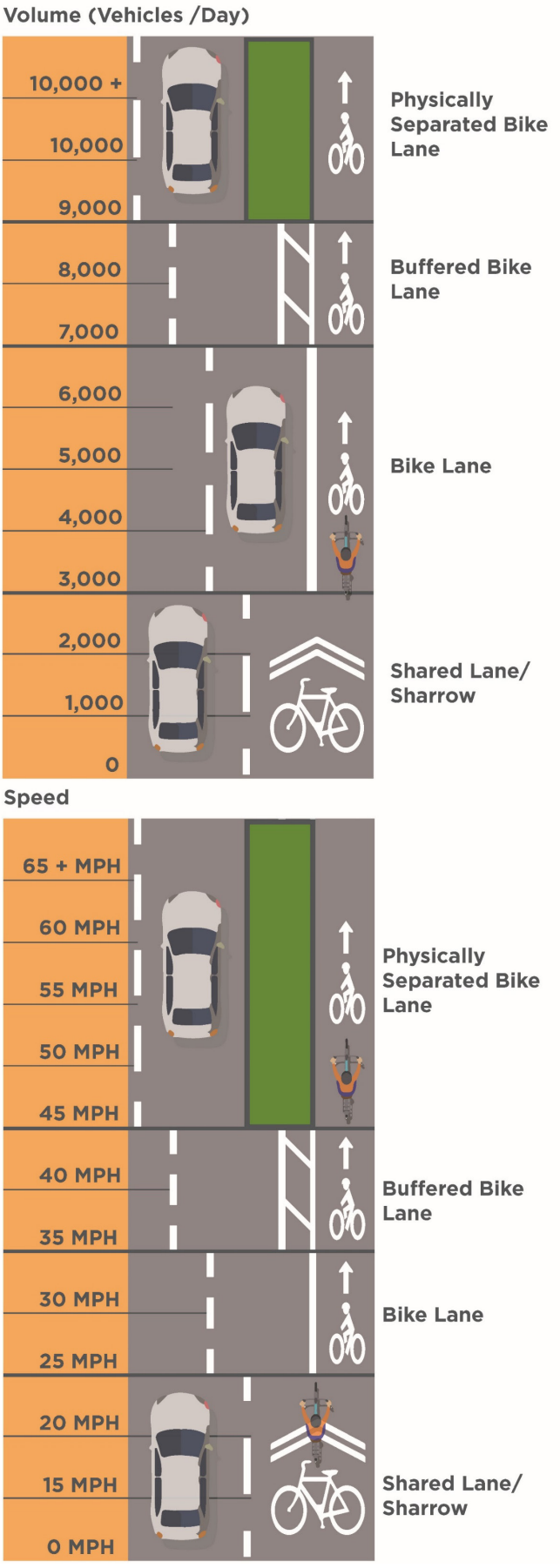


Figure 5.6: Traffic volume and speed thresholds to determine low-stress bicycle facility type

Facility Types in the Recommended Network

Shared Use Path

Source: Tahoe Regional Planning Agency

Source: Christopher B. Burke Engineering, Ltd.

Shared use paths provide a dedicated space for non-motorized users. Shared use paths typically accommodate bi-directional travel and may have striping down the center. Shared use paths may be located adjacent to streets and serve as an extra-wide multimodal sidewalk. Landscape buffers, trees, shrubs, and other elements may be used to enhance the separation between the path and the street. Shared use paths users interact with vehicles at driveways, intersections, and other crossings. Safety mitigation strategies, such as signage and striping, can be used to enhance safety for all users.

Separated/Buffered Bike Lanes

Source: M-NCPPC Montgomery County Planning Department

Source: Kittelson

Separated or buffered bike lanes may be one-way or two-way facilities that provide physical separation from vehicles. Striped buffers may be provided to add separation between people biking and driving. Alternatively, physical objects, such as curbs, flexposts, or planters, may be used to create vertical separation. These types of facilities are recommended along with high speed and high volume streets. The recommended network combines separated bike lanes and buffered bike lanes as one recommended facility type. Additional detailed reviews of utilities, stormwater drainage, and driveway locations is required to assess the feasibility of separated bike lanes along roadway corridors. In most cases, the width requirements are similar for separated bike lanes and buffered bike lanes. Buffered bike lanes can also be treated as an interim treatment that can be implemented through re-striping and does not require roadway reconstruction. Over time, after assessing feasibility, buffered bike lanes can be transformed into separated bike lanes by adding vertical separation.

Conventional Bike Lanes

Source: NACTO

Source: The Urbanist /Ryan Packer

Conventional bike lanes provide designated space for people biking alongside vehicles. Bike lanes may vary in width but are not recommended to be less than five feet in width. Wider bike lanes create a more comfortable environment for people biking. Conventional bike lanes use striping and signage to dedicate space for people biking. Shoulder space may be reallocated and striped to provide on-street bicycle lanes. Conventional bike lanes may be provided on streets with low to moderate vehicular volumes and speeds. It is recommended that higher speed and higher volume streets have buffered or protected bicycle facilities. Conventional bike lanes are recommended on roads with speeds lower than 35 MPH and traffic volumes less than 7,000 vehicles per day.

Neighborhood Bike Routes

Source: NACTO

Source: Bermstyle.com

Neighborhood bike routes, otherwise known as neighborhood greenways or bicycle boulevards, are shared lane roadways recommended on low-speed, low volume local neighborhood streets. These streets are generally low-stress and are comfortable for most bicycle riders. Neighborhood bike routes utilize pavement markings (sharrows) and signage to increase driver awareness of bicyclists. Neighborhood bike routes often utilize wayfinding signage to help people biking navigate throughout the City.

Trails

Source: Trail Link

Source: Explore Adams

Trails include off-road paved trails that are shared between people walking and biking. Trails often follow along active or inactive rail corridors, bodies of water, or utility corridors. Trails provide the highest level of physical separation between vehicles and non-motorized users and provide the highest level of comfort and the lowest level of traffic stress for users.

Although, off-street trails are a crucial low-stress facility type, the recommended network is mostly limited to on-street facilities. The recommended network map includes the Ashuwillticook Rail Trail, which is the only off-road paved trail that is under construction. Past proposals for other off-street trails, such as the Westside Riverway Trail were also reviewed. However, a more in-depth study is required to test the feasibility of off-street trails along rivers, streams, utility corridors, and railroad ROW. The City should conduct a separate study to develop an off-street city-wide trails network.

Facility Type Network Maps and Table

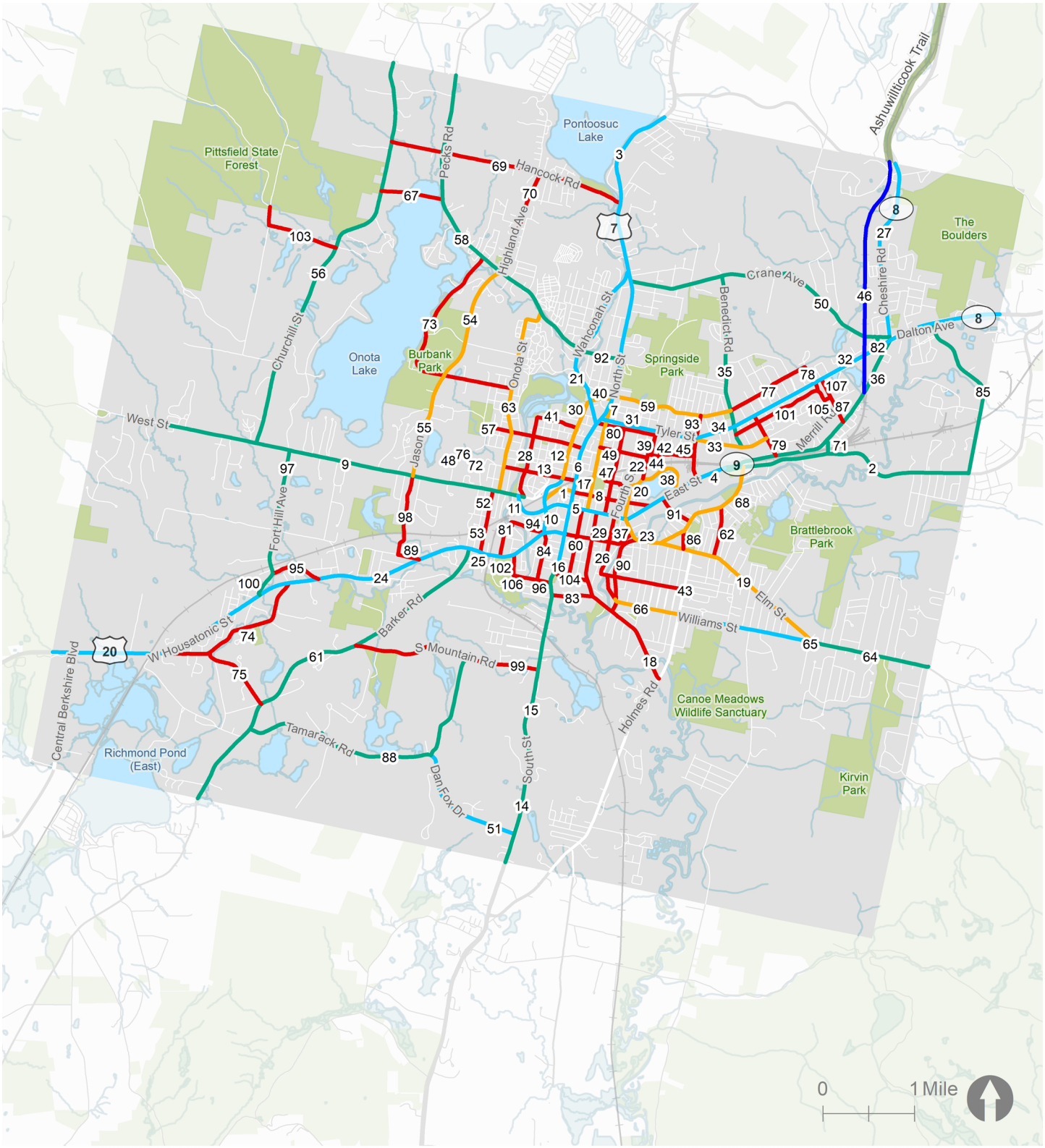
Figure 5.7 maps the recommended network by facility types. Table 5.3 provides additional details about the total number of segments and total miles for each recommended bicycle facility type. Table 5.4 lists all the recommended street segments that form the city-wide bicycle facilities network by segment numbers shown in Figure 5.5.

Table 5.3: Summary of Recommended Bicycle Facilities

Bicycle Facility Type	Number of Segments	Miles
Bike Lanes	15	11
Neighborhood Bike Routes	57	28
Separated/Buffered Bike Lanes	16	20
Shared Use Paths	18	29
Trails	1	2
Total	**107**	**90**

Interim Network

The project team understands that recommendations for shared use paths and separated bike lanes may not be financially and/or technically feasible in the short to medium term. Constructing shared use paths and separated bike lanes require detailed engineering feasibility studies and designs that address utility, stormwater drainage, ROW, and private property access challenges. Since these types of projects may not be feasible to be implemented soon, the project team has identified interim options along these corridors. These interim options include facility types such as shoulders, buffered bike lanes, shared lanes, and sidewalks. Although these interim facilities may not qualify as low-stress facilities, they are intended to be temporary, while the City explores options to implement the recommended low-stress facilities. Figure 5.8 shows the interim network that can be implemented without significant roadway reconstruction.



Bike Lanes

Neighborhood Bike Route

Separated/Buffered Bike Lanes

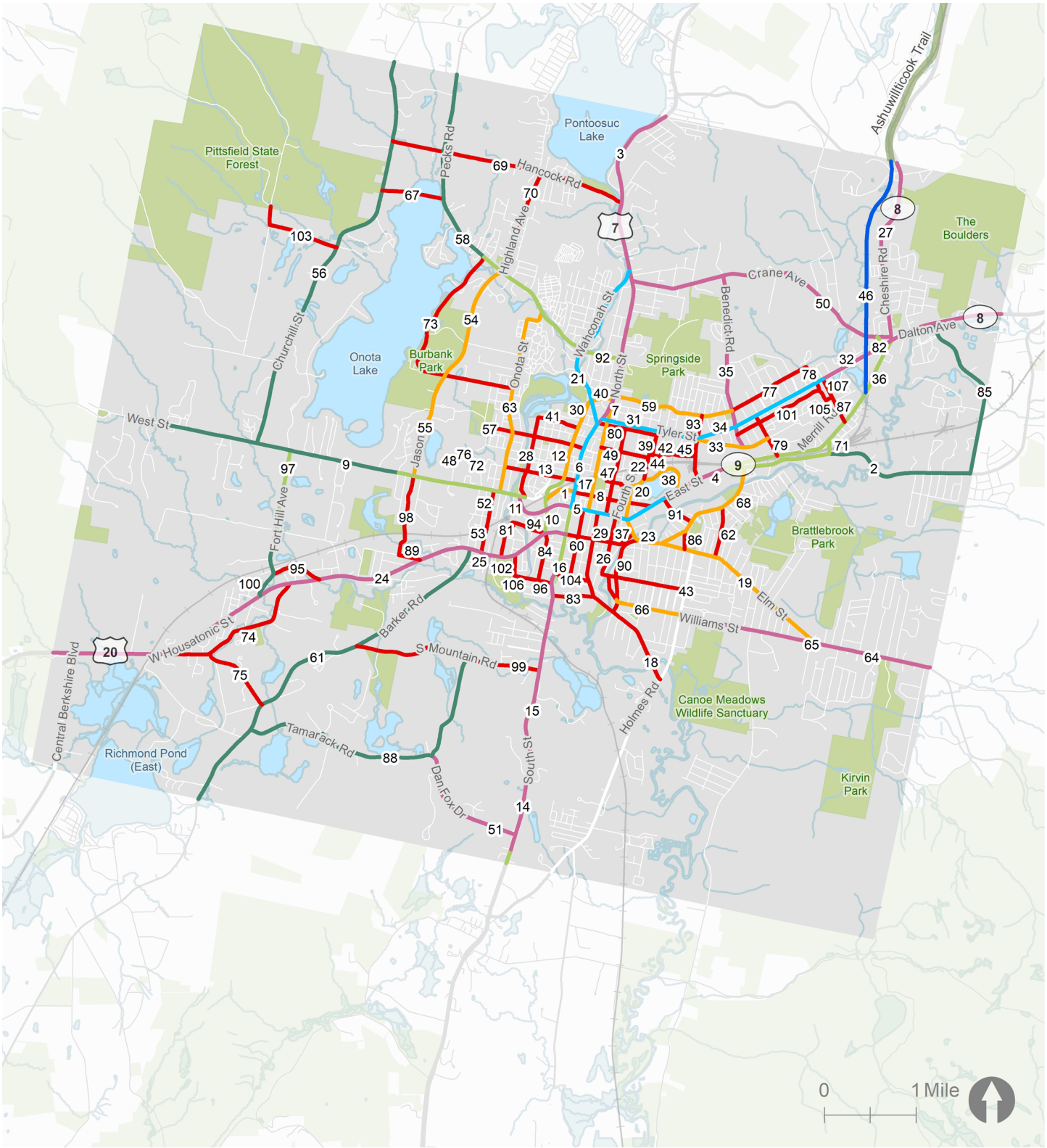
Shared Use Path

Trail

Note: The numbers on the map indicate specific street segments that form the recommended network. Street segment details are listed in Table 5.4.

Recommended Network by Facility Type

Figure 5.7: Recommended Network by Facility Type



Trail
Buffered Bike Lanes
Bike Lanes
Shared Lanes
Sidewalks/Shared Lanes
Bikable Shoulders

Note: The numbers on the map indicate specific street segments that form the recommended network. Street segment details are listed in Table 5.5.

Interim Network (Without Major Road Reconstruction)

Figure 5.8: Interim Network (Without Major Road Reconstruction)

Table 5.4: Recommended City-Wide Bicycle Facilities Network

Recommended City-Wide Bicycle Facilities Network

Segment No.	Street Name	From	To	Bicycle Facility Type	Priority
1	Depot Street	Center Street	North Street	Bike Lanes	High
2	East Street	East Street/Merrill Road	Hubbard Avenue	Shared Use Path	High
3	North Street	Wahconah Street	North City Limit/ Lakeview Street	Separated/Buffered Bike Lanes	High
4	East Street	Fourth Street/Elm Street	Merrill Road/East Street	Separated/Buffered Bike Lanes	High
5	East Street	North Street/South Street	Fourth Street/Elm Street	Separated/Buffered Bike Lanes	High
6	North Street	East Street/West Street	Wahconah Street	Separated/Buffered Bike Lanes	High
7	First Street	North Street/ Stoddard Avenue	East Street	Bike Lanes	High
8	Fenn Street	North Street	East Street	Neighborhood Bike Route	High
9	West Street	Berkshire Community College Entrance	Dewey Avenue	Shared Use Path	High
10	Center Street	Columbus Avenue	West Housatonic Street	Separated/Buffered Bike Lanes	High
11	West Street	College Way	North Street/South Street	Separated/Buffered Bike Lanes	High
12	Center Street	Linden Street	Columbus Avenue	Bike Lanes	High
13	Columbus Avenue	Onota Street	North Street	Neighborhood Bike Route	High
14	South Street	South Mountain Road	South City Limit/Dan Fox Drive	Shared Use Path	High
15	South Street	Colt Road	South Mountain Road	Shared Use Path	High
16	South Street	East Street/West Street	Colt Road	Separated/Buffered Bike Lanes	High

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Existing Posted Speed (MPH)	Recommended Target Speed (MPH)	Existing LTS	Future LTS	Length (Feet)	Existing AADT	Existing Number of Lanes	Status	State Road
30	25	3	1	1,427	3647	2	Recommended	No
40	N/A	4	1	10,952	24999	2	Recommended	No
35	N/A	3	1	14,422	17444	2	Planned (Different Extents)	No
35	N/A	4	1	4,768	24999	2	Recommended	No
25	N/A	4	1	2,428	24999	6	Planned	No
35	N/A	3	1	3,724	17444	2	Planned (Different Extents)	No
25	N/A	3	2	4,735	21840	2	Recommended	No
30	20	3	2	3,342	3394	2	Recommended	No
35	N/A	4	1	15,499	10833	2	Recommended	No
30	N/A	4	1	2,736	11412	4	Recommended	No
25	N/A	4	1	2,763	10833	4	Recommended	No
30	25	4	2	1,464	11412	4	Recommended	No
30	20	3	2	3,125	5258	2	Planned (Different Extents & Facility Type)	No
45	N/A	4	1	8,406	24864	4	Recommended	Yes
35	N/A	4	1	4,551	24864	4	Recommended	No
25	N/A	4	1	2,537	24864	4	Recommended	No

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Segment No.	Street Name	From	To	Bicycle Facility Type	Priority
17	Eagle Street	North Street	First Street	Neighborhood Bike Route	High
18	Pomeroy Avenue	East Street	Holmes Road	Neighborhood Bike Route	High
19	Elm Street	Newell	Williams Street	Bike Lanes	High
20	Fourth Street	Silver Lake Boulevard	East Street	Bike Lanes	High
21	Wahconah Street	North Street	North Street	Separated/Buffered Bike Lanes	High
22	Fourth Street	Curtis Street	Silver lake Boulevard	Neighborhood Bike Route	High
23	Elm Street	East Street	Newell Street	Bike Lanes	High
24	West Housatonic Street	West City Limit/ Central Berkshire Boulevard	Barker Road	Separated/Buffered Bike Lanes	High
25	West Housatonic Street	Barker Road	South Street	Separated/Buffered Bike Lanes	High
26	Appleton Avenue	East Street	High Street	Neighborhood Bike Route	High
27	Cheshire Road	North City Limit	Dalton Avenue	Separated/Buffered Bike Lanes	High
28	Dewey Avenue	Danforth Avenue	West Street	Neighborhood Bike Route	High
29	East Housatonic Street	South Street	Deming Street	Neighborhood Bike Route	High
30	Seymour Street	Wahconah Street	Linden Street	Bike Lanes	High
31	Tyler Street	North Street	Woodlawn Avenue	Separated/Buffered Bike Lanes	High
32	Dalton Avenue	Plastics Avenue	East City Limit	Separated/Buffered Bike Lanes	High
33	Tyler Street	Dalton Avenue/Tyler Street	New York Avenue	Bike Lanes	High
34	Dalton Avenue	Woodlawn Avenue	Plastics Avenue	Separated/Buffered Bike Lanes	High
35	Benedict Road	Crane Avenue	Tyler Street	Shared Use Path	High

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Existing Posted Speed (MPH)	Recommended Target Speed (MPH)	Existing LTS	Future LTS	Length (Feet)	Existing AADT	Existing Number of Lanes	Status	State Road
25	20	3	2	734	3001	2	Recommended	No
35	20	3	1	8,265	2926	2	Recommended	No
35	25	3	2	7,858	10575	2	Existing	No
30	25	3	2	2,104	8017	2	Recommended	No
35	N/A	3	1	7,382	11899	2	Planned (Different Facility Type)	No
30	20	3	2	1,053	8017	2	Recommended	No
35	25	3	2	2,040	10575	2	Planned	No
45	N/A	4	1	18,857	11165	2	Recommended	Yes
45	N/A	4	1	4,460	11165	2	Recommended	No
30	20	3	1	3,627	2734	2	Recommended	No
45	N/A	4	1	7,787	19378	2	Recommended	Yes
30	20	3	2	3,506	3079	2	Recommended	No
30	20	3	2	2,336	7913	2	Recommended	No
30	25	3	2	2,061	3113	2	Recommended	No
30	N/A	3	1	4,154	16516	2	Planned (Different Facility Type)	No
40	N/A	4	1	8,199	16979	4	Recommended	Yes
30	25	3	2	3,266	1528	2	Recommended	No
40	N/A	4	1	5,905	16979	4	Recommended	No
40	N/A	4	1	7,406	3488	2	Recommended	No

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Segment No.	Street Name	From	To	Bicycle Facility Type	Priority
36	Merrill Road	Dalton Avenue/ Cheshire Road	East Street	Shared Use Path	High
37	Deming Street	Guilds Place/East Housatonic Street	Elm Street	Neighborhood Bike Route	High
38	Silver Lake Boulevard	Fourth Street	East Street	Bike Lanes	High
39	Winter Street	Burbank Street	Curtis Street	Neighborhood Bike Route	High
40	Charles Street	Wahconah Street	North Street	Bike Lanes	High
41	Danforth Avenue	Dewey Avenue	Seymour Street	Neighborhood Bike Route	High
42	Brown Street	Curtis Street/Winter Street	Kellogg Street	Neighborhood Bike Route	High
43	Dawes Avenue	Dwight Street/ Appleton Avenue	Holmes Road	Neighborhood Bike Route	High
44	Curtis Street	Fourth Street	Brown Street	Neighborhood Bike Route	High
45	Kellogg Street	Brown Street	Woodlawn Avenue	Neighborhood Bike Route	High
46	Ashuwillticook Rail Trail	North City Limit	Merrill Road	Trail	High
47	Second Street	Burbank Street	East Street	Neighborhood Bike Route	Medium
48	Wallace Place	The Common	Second Street	Neighborhood Bike Route	Medium
49	Lincoln Street	First Street	Fourth Street	Neighborhood Bike Route	Medium
50	Crane Avenue	North Street	Cheshire Road	Shared Use Path	Medium
51	Dan Fox Drive	Tamarack Road	South Street	Separated/Buffered Bike Lanes	Medium
52	Merriam Street	West Street	Buchan Street	Neighborhood Bike Route	Medium
53	South Merriam Street	Catherine Street/ Buchan Street	West Housatonic Street	Neighborhood Bike Route	Medium
54	Valentine Road	Pecks Road	Lakeway Drive	Bike Lanes	Medium
55	Valentine Road	Lakeway Drive	West Street	Bike Lanes	Medium
56	Churchill Street	North City Limit	West Street	Shared Use Path	Medium

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Existing Posted Speed (MPH)	Recommended Target Speed (MPH)	Existing LTS	Future LTS	Length (Feet)	Existing AADT	Existing Number of Lanes	Status	State Road
40	N/A	4	1	9,647	23229	4	Planned	Yes
30	20	3	2	712	4901	2	Recommended	No
35	25	3	2	2,362	1069	2	Recommended	No
30	20	3	2	858	8017	2	Recommended	No
30	25	3	2	941	3235	2	Recommended	No
25	20	1	1	1,764	1069	2	Recommended	No
25	20	2	1	180	1069	2	Recommended	No
30	20	2	1	3,593	2734	2	Recommended	No
30	20	3	2	441	8017	2	Recommended	No
25	20	2	1	1,475	1069	2	Recommended	No
0	N/A	0	1	10,051	0	0	Planned	No
25	20	2	1	3,721	2989	2	Recommended	No
25	20	1	1	254	1069	2	Recommended	No
30	20	3	1	2,050	2863	2	Recommended	No
35	N/A	3	1	12,160	7963	2	Recommended	No
50	N/A	4	1	5,517	10575	2	Recommended	No
25	20	3	2	1,137	7079	2	Recommended	No
25	20	3	2	1,544	7079	2	Recommended	No
45	30	4	2	5,195	5807	2	Recommended	No
35	30	4	2	4,508	5807	2	Recommended	No
40	N/A	4	1	17,948	3088	2	Recommended	No

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Segment No.	Street Name	From	To	Bicycle Facility Type	Priority
57	Linden Street	South Atlantic Avenue/Summit Avenue	North Street	Neighborhood Bike Route	Medium
58	Pecks Road	North City Limit	Wahconah Street	Shared Use Path	Medium
59	Springside Avenue	North Street	Benedict Road	Bike Lanes	Medium
60	Wendell Avenue	East Street	Colt Road	Neighborhood Bike Route	Medium
61	Barker Road	West Housatonic Street	South City Limit	Shared Use Path	Medium
62	Dorchester Avenue	Newell Street	Elm Street	Neighborhood Bike Route	Medium
63	Onota Street	Pecks Road	West Street	Bike Lanes	Medium
64	Williams Street	Elm Street	East City Limit	Shared Use Path	Medium
65	Williams Street	Holmes Road	Elm Street	Separated/Buffered Bike Lanes	Medium
66	Williams Street	High Street	Holmes Road	Bike Lanes	Medium
67	Dan Casey Memorial Drive	Churchill Street	Pecks Road	Neighborhood Bike Route	Medium
68	Newell Street	East Street	Elm Street	Bike Lanes	Medium
69	Hancock Road	Churchill Street	North Street	Neighborhood Bike Route	Medium
70	Highland Avenue	Hancock Road	Pecks Road	Neighborhood Bike Route	Medium
71	Junction Road	Merrill Road	East Street	Shared Use Path	Medium
72	Lake Street	Second Street	Fourth Street	Neighborhood Bike Route	Medium
73	Lakeway Drive	Pecks Road	Onota Street	Neighborhood Bike Route	Medium
74	Lebanon Avenue	West Housatonic Street	West Housatonic Street	Neighborhood Bike Route	Medium
75	Melbourne Road	Lebanon Avenue	Barker Road	Neighborhood Bike Route	Medium
76	Third Street	Lake Street	Lake Street	Neighborhood Bike Route	Medium
77	Elberon Avenue	Benedict Road	Yorkshire Avenue	Neighborhood Bike Route	Medium

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Existing Posted Speed (MPH)	Recommended Target Speed (MPH)	Existing LTS	Future LTS	Length (Feet)	Existing AADT	Existing Number of Lanes	Status	State Road
30	20	2	1	4,060	1069	2	Planned (Intersection)	No
35	N/A	4	1	14,199	4006	2	Recommended	No
35	25	3	2	5,209	4772	2	Recommended	No
25	20	1	1	2,911	1069	2	Recommended	No
45	N/A	4	1	16,412	4666	2	Recommended	No
30	20	3	2	2,158	5034	2	Recommended	No
35	25	3	2	8,296	3030	2	Recommended	No
35	N/A	3	1	5,101	10575	2	Recommended	No
35	N/A	3	1	5,761	10575	2	Recommended	No
35	25	3	2	2,822	10575	2	Planned	No
35	20	3	2	2,642	3088	2	Recommended	No
30	25	3	2	5,185	11823	2	Recommended	No
30	20	3	2	10,124	4811	2	Recommended	No
30	20	3	2	4,590	4339	2	Recommended	No
35	N/A	3	1	582	4854	2	Recommended	No
25	20	1	1	835	1069	2	Recommended	No
30	20	3	2	9,745	3023	2	Recommended	No
30	20	3	1	6,500	2879	2	Recommended	No
35	20	3	2	3,286	3077	2	Recommended	No
25	20	1	1	70	1069	2	Recommended	No
30	20	3	2	3,684	3748	2	Recommended	No

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Segment No.	Street Name	From	To	Bicycle Facility Type	Priority
78	Yorkshire Avenue	Elberon Avenue	Dalton Avenue	Neighborhood Bike Route	Medium
79	New York Avenue	Dalton Avenue	Merrill Road	Neighborhood Bike Route	Low
80	Burbank Street	North Street	Tyler Street	Neighborhood Bike Route	Low
81	Hawthorne Avenue	Worthington Place	West Housatonic Street	Neighborhood Bike Route	Low
82	Crane Avenue Connector	Crane Avenue	Merrill Road	Shared Use Path	Low
83	Crofut Street	South Street	Pomeroy Avenue	Neighborhood Bike Route	Low
84	Elizabeth Street	West Housatonic Street	Boylston Street	Neighborhood Bike Route	Low
85	Hubbard Avenue	Dalton Avenue	East Street	Shared Use Path	Low
86	Meadow Lane	Newell Street	Elm Street	Neighborhood Bike Route	Low
87	Plastics Avenue	Dalton Avenue	Merrill Road	Neighborhood Bike Route	Low
88	Tamarack Road	Barker Road	South Mountain Road	Shared Use Path	Low
89	Gale Avenue	Jason Street	West Housatonic Street	Neighborhood Bike Route	Low
90	High Street	Elm Street	Pomeroy Avenue	Neighborhood Bike Route	Low
91	Lyman Street	East Street	Newell Street	Neighborhood Bike Route	Low
92	Pontoosuc Avenue	Wahconah Street	North Street	Shared Use Path	Low
93	Woodlawn Avenue	Springside Avenue	East Street	Neighborhood Bike Route	Low
94	Worthington Street	Worthington Place	Center Street/West Housatonic Street/ Elizabeth Street	Neighborhood Bike Route	Low
95	Hungerford Street	Fort Hill Avenue	West Housatonic Street	Neighborhood Bike Route	Low
96	Boylston Street	Westside Riverway Trail	South Street	Neighborhood Bike Route	Low

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Existing Posted Speed (MPH)	Recommended Target Speed (MPH)	Existing LTS	Future LTS	Length (Feet)	Existing AADT	Existing Number of Lanes	Status	State Road
25	20	2	1	792	1069	2	Recommended	No
25	20	2	2	1,926	3145	2	Recommended	No
25	20	2	1	2,762	1658	2	Recommended	No
25	20	1	1	2,684	1069	2	Recommended	No
25	N/A	2	1	767	1069	2	Recommended	No
30	20	3	2	1,741	4039	2	Recommended	No
25	20	2	1	2,042	1069	2	Recommended	No
35	N/A	3	1	7,297	3170	2	Recommended	No
25	20	3	2	761	6211	2	Recommended	No
25	20	1	1	2,042	1069	2	Recommended	No
30	N/A	3	1	12,743	10575	2	Recommended	No
30	20	3	2	921	5807	2	Recommended	No
25	20	2	1	3,495	2734	2	Recommended	No
25	20	3	2	1,566	3088	2	Recommended	No
25	25	3	2	1,762	4006	2	Recommended	No
25	20	2	1	2,752	1069	2	Recommended	No
25	20	1	1	553	1069	2	Recommended	No
25	20	2	1	2,169	2978	2	Recommended	No
25	20	1	1	1,155	1069	2	Recommended	No

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Segment No.	Street Name	From	To	Bicycle Facility Type	Priority
97	Fort Hill Avenue	West Street	Hungerford Street	Shared Use Path	Low
98	Jason Street	West Street	Gale Avenue	Neighborhood Bike Route	Low
99	South Mountain Road	Barker Road	South Street	Neighborhood Bike Route	Low
100	Hungerford Street	Fort Hill Avenue	West Housatonic Street	Shared Use Path	Low
101	Connecticut Avenue	Benedict Road	Dalton Avenue	Neighborhood Bike Route	Low
102	Hollister Street	West Housatonic Street	Boylston Street Extension	Neighborhood Bike Route	Low
103	Cascade Street	West City Limit/Berry Pond Circuit Road	Churchill Street	Neighborhood Bike Route	Low
104	Colt Road	South Street	Pomeroy Avenue	Neighborhood Bike Route	Low
105	California Avenue	South Carolina Avenue	Plastics Avenue	Neighborhood Bike Route	Low
106	Boylston Street Extension	Hollister Street	Westside Riverway Trail	Neighborhood Bike Route	Low
107	South Carolina Avenue	Connecticut Avenue	California Avenue	Neighborhood Bike Route	Low

Table 5.4: Recommended City-Wide Bicycle Facilities Network (Cont.)

Existing Posted Speed (MPH)	Recommended Target Speed (MPH)	Existing LTS	Future LTS	Length (Feet)	Existing AADT	Existing Number of Lanes	Status	State Road
35	N/A	3	1	5,316	2978	2	Recommended	No
25	20	3	2	3,500	5807	2	Recommended	No
30	20	3	1	8,019	1644	2	Recommended	No
25	N/A	1	1	1,141	1069	2	Recommended	No
30	20	2	1	4,357	1069	2	Recommended	No
25	20	1	1	886	1069	2	Recommended	No
25	20	1	1	3,799	1069	2	Recommended	No
25	20	1	1	1,736	1069	2	Recommended	No
25	20	1	1	298	1069	2	Recommended	No
25	20	1	1	449	1069	2	Recommended	No
25	20	1	1	494	1069	2	Recommended	No

Table 5.5: Interim Network

Interim Network (Without Major Road Reconstruction)

Segment No.	Street Name	From	To	Interim Bicycle Facility Type
1	Depot Street	Center Street	North Street	Bike Lanes
2	East Street	Junction Road	Hubbard Avenue	Shared Lanes
2	East Street	East Street/Merrill Road	Junction Road	Sidewalks/Shared Lanes
3	North Street	Wahconah Street	North City Limit/ Lakeview Street	Bikable Shoulders
4	East Street	Lyman Street	Merrill Road/East Street	Bikable Shoulders
4	East Street	Fourth Street/Elm Street	Lyman Street	Buffered Bike Lanes
5	East Street	North Street/South Street	Fourth Street/Elm Street	Buffered Bike Lanes
6	North Street	East Street/West Street	Wahconah Street	Buffered Bike Lanes
7	First Street	North Street/ Stoddard Avenue	East Street	Bike Lanes
8	Fenn Street	North Street	East Street	Neighborhood Bike Route
9	West Street	Berkshire Community College Entrance	Notingham Drive/ Salisbury Court	Shared Lanes
9	West Street	Nottingham Drive/ Salisbury Court	Dewey Avenue	Sidewalks/Shared Lanes
10	Center Street	Columbus Avenue	West Housatonic Street	Sidewalks/Shared Lanes
11	West Street	College Way	North Street/South Street	Bikable Shoulders
12	Center Street	Linden Street	Columbus Avenue	Bike Lanes
13	Columbus Avenue	Onota Street	North Street	Neighborhood Bike Route
14	South Street	New South Mountain Road	Country Club of Pittsfield Entrance	Bikable Shoulders
14	South Street	South of Dan Fox Drive	South City Limit/Dan Fox Drive	Sidewalks/Shared Lanes
14	South Street	New South Mountain Road	South of Dan Fox Drive	Bikable Shoulders
14	South Street	South Mountain Road	Country Club of Pittsfield Entrance	Bikable Shoulders

Table 5.5: Interim Network (Cont.)

Recommended Bicycle Facility Type	Priority	Length (Feet)	State Road
Bike Lanes	High	1,427	No
Shared Use Path	High	6,434	No
Shared Use Path	High	4,518	No
Separated/Buffered Bike Lanes	High	14,422	No
Separated/Buffered Bike Lanes	High	2,944	No
Separated/Buffered Bike Lanes	High	1,824	No
Separated/Buffered Bike Lanes	High	2,428	No
Separated/Buffered Bike Lanes	High	3,724	No
Bike Lanes	High	4,735	No
Neighborhood Bike Route	High	3,342	No
Shared Use Path	High	10,023	No
Shared Use Path	High	5,475	No
Separated/Buffered Bike Lanes	High	2,736	No
Separated/Buffered Bike Lanes	High	2,763	No
Bike Lanes	High	1,464	No
Neighborhood Bike Route	High	3,125	No
Shared Use Path	High	3,319	Yes
Shared Use Path	High	614	Yes
Shared Use Path	High	3,266	Yes
Shared Use Path	High	1,207	Yes

Table 5.5: Interim Network (Cont.)

Segment No.	Street Name	From	To	Interim Bicycle Facility Type
15	South Street	Veterans Way	South Mountain Road	Bikable Shoulders
16	South Street	East Street/West Street	Veterans Way	Sidewalks/Shared Lanes
17	Eagle Street	North Street	First Street	Neighborhood Bike Route
18	Pomeroy Avenue	East Street	Holmes Road	Neighborhood Bike Route
19	Elm Street	Newell	Williams Street	Bike Lanes
20	Fourth Street	Silver Lake Boulevard	East Street	Bike Lanes
21	Wahconah Street	North Street	North Street	Buffered Bike Lanes
22	Fourth Street	Curtis Street	Silver lake Boulevard	Neighborhood Bike Route
23	Elm Street	East Street	Newell Street	Bike Lanes
24	West Housatonic Street	West City Limit/ Central Berkshire Boulevard	Barker Road	Bikable Shoulders
25	West Housatonic Street	Barker Road	South Street	Bikable Shoulders
26	Appleton Avenue	East Street	High Street	Neighborhood Bike Route
27	Cheshire Road	North City Limit	Dalton Avenue	Bikable Shoulders
28	Dewey Avenue	Danforth Avenue	West Street	Neighborhood Bike Route
29	East Housatonic Street	South Street	Deming Street	Neighborhood Bike Route
30	Seymour Street	Wahconah Street	Linden Street	Bike Lanes
31	Tyler Street	North Street	Woodlawn Avenue	Buffered Bike Lanes
32	Dalton Avenue	Plastics Avenue	East City Limit	Bikable Shoulders
33	Tyler Street	Dalton Avenue/Tyler Street	New York Avenue	Bike Lanes
34	Dalton Avenue	Woodlawn Avenue	Plastics Avenue	Buffered Bike Lanes
35	Benedict Road	Crane Avenue	Tyler Street	Bikable Shoulders
36	Merrill Road	Dalton Avenue/ Cheshire Road	East Street	Sidewalks/Shared Lanes
37	Deming Street	Guilds Place/East Housatonic Street	Elm Street	Neighborhood Bike Route
38	Silver Lake Boulevard	Fourth Street	East Street	Bike Lanes
39	Winter Street	Burbank Street	Curtis Street	Neighborhood Bike Route
40	Charles Street	Wahconah Street	North Street	Bike Lanes

Table 5.5: Interim Network (Cont.)

Recommended Bicycle Facility Type	Priority	Length (Feet)	State Road
Shared Use Path	High	4,551	No
Separated/Buffered Bike Lanes	High	2,537	No
Neighborhood Bike Route	High	734	No
Neighborhood Bike Route	High	8,265	No
Bike Lanes	High	7,858	No
Bike Lanes	High	2,104	No
Separated/Buffered Bike Lanes	High	7,382	No
Neighborhood Bike Route	High	1,053	No
Bike Lanes	High	2,040	No
Separated/Buffered Bike Lanes	High	18,857	Yes
Separated/Buffered Bike Lanes	High	4,460	No
Neighborhood Bike Route	High	3,627	No
Separated/Buffered Bike Lanes	High	7,787	Yes
Neighborhood Bike Route	High	3,506	No
Neighborhood Bike Route	High	2,336	No
Bike Lanes	High	2,061	No
Separated/Buffered Bike Lanes	High	4,154	No
Separated/Buffered Bike Lanes	High	8,199	Yes
Bike Lanes	High	3,266	No
Separated/Buffered Bike Lanes	High	5,905	No
Shared Use Path	High	7,406	No
Shared Use Path	High	9,647	Yes
Neighborhood Bike Route	High	712	No
Bike Lanes	High	2,362	No
Neighborhood Bike Route	High	858	No
Bike Lanes	High	941	No

Table 5.5: Interim Network (Cont.)

Segment No.	Street Name	From	To	Interim Bicycle Facility Type
41	Danforth Avenue	Dewey Avenue	Seymour Street	Neighborhood Bike Route
42	Brown Street	Curtis Street/Winter Street	Kellogg Street	Neighborhood Bike Route
43	Dawes Avenue	Dwight Street/ Appleton Avenue	Holmes Road	Neighborhood Bike Route
44	Curtis Street	Fourth Street	Brown Street	Neighborhood Bike Route
45	Kellogg Street	Brown Street	Woodlawn Avenue	Neighborhood Bike Route
46	Ashuwillticook Rail Trail	North City Limit	Merrill Road	Trail
47	Second Street	Burbank Street	East Street	Neighborhood Bike Route
48	Wallace Place	The Common	Second Street	Neighborhood Bike Route
49	Lincoln Street	First Street	Fourth Street	Neighborhood Bike Route
50	Crane Avenue	Clark Road	Cheshire Road	Bikable Shoulders
50	Crane Avenue	North Street	Clark Road	Bikable Shoulders
51	Dan Fox Drive	Tamarack Road	South Street	Bikable Shoulders
52	Merriam Street	West Street	Buchan Street	Neighborhood Bike Route
53	South Merriam Street	Catherine Street/ Buchan Street	West Housatonic Street	Neighborhood Bike Route
54	Valentine Road	Pecks Road	Lakeway Drive	Bike Lanes
55	Valentine Road	Lakeway Drive	West Street	Bike Lanes
56	Churchill Street	North City Limit	West Street	Shared Lanes
57	Linden Street	South Atlantic Avenue/Summit Avenue	North Street	Neighborhood Bike Route
58	Pecks Road	North City Limit	Lakeway Drive	Shared Lanes
58	Pecks Road	Lakeway Drive	Wahconah Street	Sidewalks/Shared Lanes
59	Springside Avenue	North Street	Benedict Road	Bike Lanes
60	Wendell Avenue	East Street	Colt Road	Neighborhood Bike Route
61	Barker Road	West Housatonic Street	South City Limit	Shared Lanes
62	Dorchester Avenue	Newell Street	Elm Street	Neighborhood Bike Route
63	Onota Street	Pecks Road	West Street	Bike Lanes
64	Williams Street	Elm Street	East City Limit	Bikable Shoulders
65	Williams Street	Holmes Road	Elm Street	Bikable Shoulders

Table 5.5: Interim Network (Cont.)

Recommended Bicycle Facility Type	Priority	Length (Feet)	State Road
Neighborhood Bike Route	High	1,764	No
Neighborhood Bike Route	High	180	No
Neighborhood Bike Route	High	3,593	No
Neighborhood Bike Route	High	441	No
Neighborhood Bike Route	High	1,475	No
Trail	High	10,051	No
Neighborhood Bike Route	Medium	3,721	No
Neighborhood Bike Route	Medium	254	No
Neighborhood Bike Route	Medium	2,050	No
Shared Use Path	Medium	9,568	No
Shared Use Path	Medium	2,593	No
Separated/Buffered Bike Lanes	Medium	5,517	No
Neighborhood Bike Route	Medium	1,137	No
Neighborhood Bike Route	Medium	1,544	No
Bike Lanes	Medium	5,195	No
Bike Lanes	Medium	4,508	No
Shared Use Path	Medium	17,948	No
Neighborhood Bike Route	Medium	4,060	No
Shared Use Path	Medium	8,388	No
Shared Use Path	Medium	5,811	No
Bike Lanes	Medium	5,209	No
Neighborhood Bike Route	Medium	2,911	No
Shared Use Path	Medium	16,412	No
Neighborhood Bike Route	Medium	2,158	No
Bike Lanes	Medium	8,296	No
Shared Use Path	Medium	5,101	No
Separated/Buffered Bike Lanes	Medium	5,761	No

Table 5.5: Interim Network (Cont.)

Segment No.	Street Name	From	To	Interim Bicycle Facility Type
66	Williams Street	High Street	Holmes Road	Bike Lanes
67	Dan Casey Memorial Drive	Churchill Street	Pecks Road	Neighborhood Bike Route
68	Newell Street	East Street	Elm Street	Bike Lanes
69	Hancock Road	Churchill Street	North Street	Neighborhood Bike Route
70	Highland Avenue	Hancock Road	Pecks Road	Neighborhood Bike Route
71	Junction Road	Merrill Road	East Street	Sidewalks/Shared Lanes
72	Lake Street	Second Street	Fourth Street	Neighborhood Bike Route
73	Lakeway Drive	Pecks Road	Onota Street	Neighborhood Bike Route
74	Lebanon Avenue	West Housatonic Street	West Housatonic Street	Neighborhood Bike Route
75	Melbourne Road	Lebanon Avenue	Barker Road	Neighborhood Bike Route
76	Third Street	Lake Street	Lake Street	Neighborhood Bike Route
77	Elberon Avenue	Benedict Road	Yorkshire Avenue	Neighborhood Bike Route
78	Yorkshire Avenue	Elberon Avenue	Dalton Avenue	Neighborhood Bike Route
79	New York Avenue	Dalton Avenue	Merrill Road	Neighborhood Bike Route
80	Burbank Street	North Street	Tyler Street	Neighborhood Bike Route
81	Hawthorne Avenue	Worthington Place	West Housatonic Street	Neighborhood Bike Route
82	Crane Avenue Connector	Crane Avenue	Merrill Road	Sidewalks/Shared Lanes
83	Crofut Street	South Street	Pomeroy Avenue	Neighborhood Bike Route
84	Elizabeth Street	West Housatonic Street	Boylston Street	Neighborhood Bike Route
85	Hubbard Avenue	Dalton Avenue	East Street	Shared Lanes
86	Meadow Lane	Newell Street	Elm Street	Neighborhood Bike Route
87	Plastics Avenue	Dalton Avenue	Merrill Road	Neighborhood Bike Route
88	Tamarack Road	Barker Road	South Mountain Road	Shared Lanes
89	Gale Avenue	Jason Street	West Housatonic Street	Neighborhood Bike Route
90	High Street	Elm Street	Pomeroy Avenue	Neighborhood Bike Route
91	Lyman Street	East Street	Newell Street	Neighborhood Bike Route
92	Pontoosuc Avenue	Wahconah Street	North Street	Sidewalks/Shared Lanes

Table 5.5: Interim Network (Cont.)

Recommended Bicycle Facility Type	Priority	Length (Feet)	State Road
Bike Lanes	Medium	2,822	No
Neighborhood Bike Route	Medium	2,642	No
Bike Lanes	Medium	5,185	No
Neighborhood Bike Route	Medium	10,124	No
Neighborhood Bike Route	Medium	4,590	No
Shared Use Path	Medium	582	No
Neighborhood Bike Route	Medium	835	No
Neighborhood Bike Route	Medium	9,745	No
Neighborhood Bike Route	Medium	6,500	No
Neighborhood Bike Route	Medium	3,286	No
Neighborhood Bike Route	Medium	70	No
Neighborhood Bike Route	Medium	3,684	No
Neighborhood Bike Route	Medium	792	No
Neighborhood Bike Route	Low	1,926	No
Neighborhood Bike Route	Low	2,762	No
Neighborhood Bike Route	Low	2,684	No
Shared Use Path	Low	767	No
Neighborhood Bike Route	Low	1,741	No
Neighborhood Bike Route	Low	2,042	No
Shared Use Path	Low	7,297	No
Neighborhood Bike Route	Low	761	No
Neighborhood Bike Route	Low	2,042	No
Shared Use Path	Low	12,743	No
Neighborhood Bike Route	Low	921	No
Neighborhood Bike Route	Low	3,495	No
Neighborhood Bike Route	Low	1,566	No
Shared Use Path	Low	1,762	No

Table 5.5: Interim Network (Cont.)

Segment No.	Street Name	From	To	Interim Bicycle Facility Type
93	Woodlawn Avenue	Springside Avenue	East Street	Neighborhood Bike Route
94	Worthington Street	Worthington Place	Center Street/West Housatonic Street/ Elizabeth Street	Neighborhood Bike Route
95	Hungerford Street	Fort Hill Avenue	West Housatonic Street	Neighborhood Bike Route
96	Boylston Street	Westside Riverway Trail	South Street	Neighborhood Bike Route
97	Fort Hill Avenue	West Street	Gale Avenue	Sidewalks/Shared Lanes
97	Fort Hill Avenue	Gale Avenue	Hungerford Street	Shared Lanes
98	Jason Street	West Street	Gale Avenue	Neighborhood Bike Route
99	South Mountain Road	Barker Road	South Street	Neighborhood Bike Route
100	Hungerford Street	Fort Hill Avenue	West Housatonic Street	Shared Lanes
101	Connecticut Avenue	Benedict Road	Dalton Avenue	Neighborhood Bike Route
102	Hollister Street	West Housatonic Street	Boylston Street Extension	Neighborhood Bike Route
103	Cascade Street	West City Limit/Berry Pond Circuit Road	Churchill Street	Neighborhood Bike Route
104	Colt Road	South Street	Pomeroy Avenue	Neighborhood Bike Route
105	California Avenue	South Carolina Avenue	Plastics Avenue	Neighborhood Bike Route
106	Boylston Street Extension	Hollister Street	Westside Riverway Trail	Neighborhood Bike Route
107	South Carolina Avenue	Connecticut Avenue	California Avenue	Neighborhood Bike Route

Table 5.5: Interim Network (Cont.)

Recommended Bicycle Facility Type	Priority	Length (Feet)	State Road
Neighborhood Bike Route	Low	2,752	No
Neighborhood Bike Route	Low	553	No
Neighborhood Bike Route	Low	2,169	No
Neighborhood Bike Route	Low	1,155	No
Shared Use Path	Low	3,434	No
Shared Use Path	Low	1,882	No
Neighborhood Bike Route	Low	3,500	No
Neighborhood Bike Route	Low	8,019	No
Shared Use Path	Low	1,141	No
Neighborhood Bike Route	Low	4,357	No
Neighborhood Bike Route	Low	886	No
Neighborhood Bike Route	Low	3,799	No
Neighborhood Bike Route	Low	1,736	No
Neighborhood Bike Route	Low	298	No
Neighborhood Bike Route	Low	449	No
Neighborhood Bike Route	Low	494	No

Source: Kittelson

Chapter 6

Supporting Bicycle Amenities

Bicycle amenities such as short-term and long-term bicycle parking, maintenance stations, changing rooms with lockers and showers, amongst others, support the bicycle facilities network by providing needed supporting infrastructure to make bicycling a viable transportation mode. Installing these amenities throughout the city will encourage more people to travel by bicycle. This chapter describes basic design features and planning for some of these bicycle amenities. Key locations throughout the city are identified where some of these amenities should be installed.

The City may choose to augment bicycle amenities by implementing additional programs, such as bikeshare and scooter-share programs. Since the City is currently leading a separate bikeshare feasibility study, this report does not include information related to bikeshare programs.

Bicycle Parking

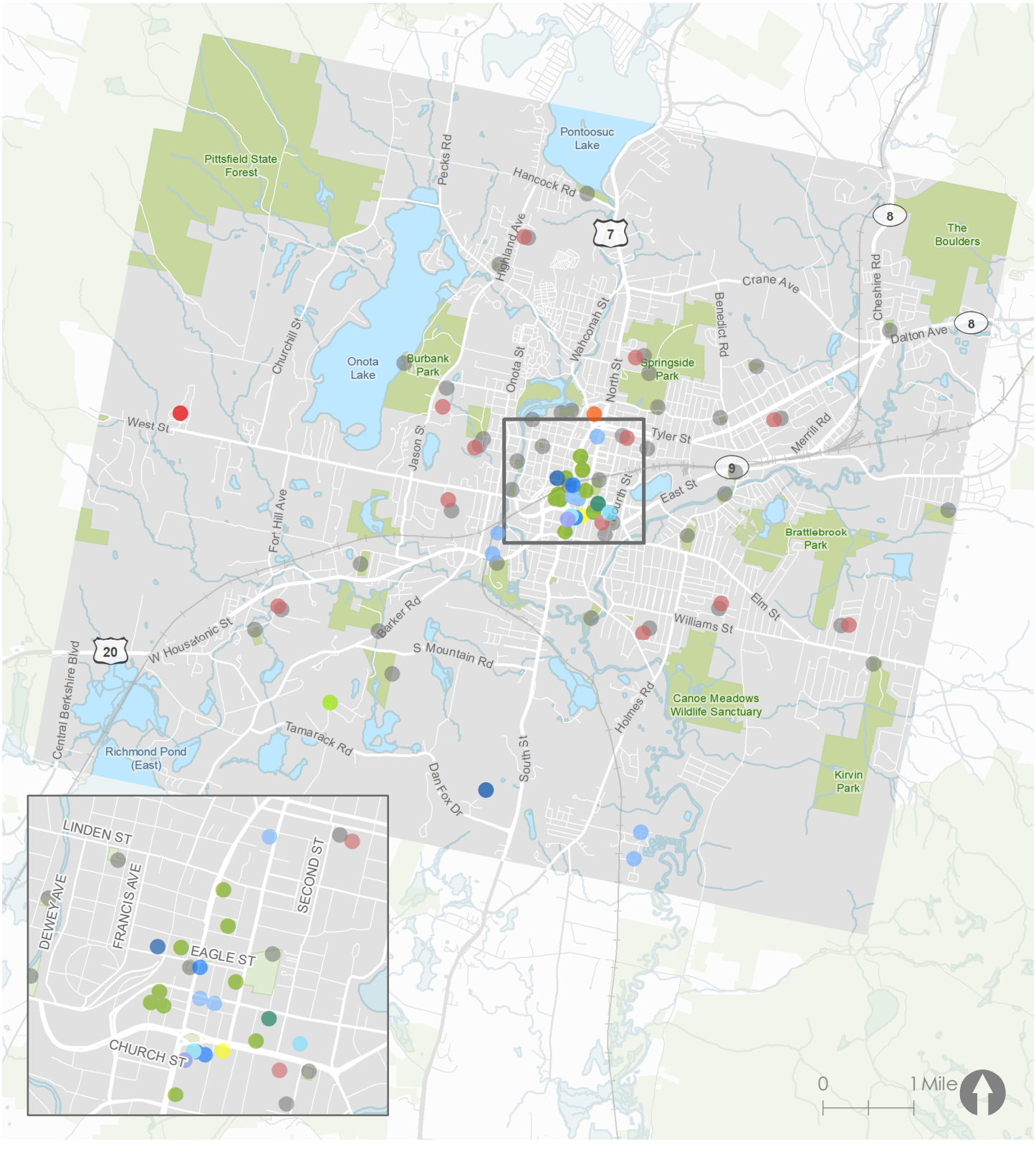
Bicycle parking should be reliable, accessible, and widely available throughout the city. Both, the location and type of bicycle parking depend on the needs of the users. The following sections provide guidance on where to install bicycle parking and what type of parking facilities to provide.

Bicycle Parking Location

Bicycle parking should be located at major destinations throughout the city, including commercial districts, parks, recreation sites, libraries, schools, employment centers, and residential areas. Figure 6.1 displays the major destinations in Pittsfield. The City should prioritize installing bicycle parking racks at these destinations. In addition, the City should review and make necessary changes to the zoning requirements and the development review process to include bicycle parking requirements. Developing a set of bicycle parking requirements for future development that can be on public or private property will help ensure that needs of people traveling by bicycle are considered and prioritized throughout the city.

Bicycle parking may be located within the public ROW on sidewalks, where space permits, or within on-street parking widths along streets with on-street car parking. The location and orientation of bicycle parking may vary, depending on available space.

Bicycle parking can be located along sidewalks if space allows for parallel or perpendicular bicycle racks in addition to a clear walk zone.
Source: Kittelson



Source: Mass.gov

Airport
Court
Library
Post Office
Recreation
City
Federal
Museum
School
Rail
College
Hospital
Parking
State

Major Destinations

Figure 6.1: Major Destinations

Bicycle parking racks located on a street within on-street car parking width. The bicycle racks are protected with flexposts, or bollards, to improve visibility. Given the proximity to moving vehicles, safety precautions should be taken to ensure people parking their bikes are safe and adequately removed from traffic.
Source: Kittelson

Additionally, The City can mandate or incentivize developers and property owners to provide bicycle parking on private property. The City may require a specific number of bicycle parking spaces per 1,000 sq. ft. of retail or commercial uses or per residential unit similar to car parking requirements. The City can also institute Travel Demand Management (TDM) programs to incentivize developers, employers, business owners, and residential property managers to provide bicycle parking for tenants, employees, and visitors. The figure below shows long-term bike storage rooms that can be provided in office buildings and residential apartment buildings. Encouraging residents and employees to commute by bicycle rather than single-occupancy vehicles can also reduce the demand for vehicle parking spaces and the number of vehicular trips a development generates.

Bicycle Storage Room
Source: Dero.com

Some cities have requirements for the minimum number of bicycle parking spaces based on land use. Parking minimums and maximums are often used for vehicular parking. Table 6.1 below shows an example of parking minimums from Washington DC.

Table 6.1 Example Minimum Bicycle Parking Spaces by Land Use
Source: DDOT Bike Parking Guide (2018)

Land Use	Long-Term Spaces	Short-Term Spaces
Eat/Drink Establishment	1 / 10,000 SF	1 / 3,500 SF
Education, College/University	1 / 7,500 SF	1 / 2,000 SF
Education, Public or Private	1 / 7,500 SF	1 / 2,000 SF
Office	1 / 2,500 SF	1 / 40000 SF
Parks and Recreation	None	1 / 10,000
Residential Apartment	1 / 3 DU	1 / 20 DU
Retail	1 / 10,000 SF	1 / 3,500 SF

Bicycle Parking Type

There are a variety of bicycle parking types the City may choose to install. Appropriate bicycle parking types depend on the type of bicyclists using the facilities. Bicycle parking near transit stations, for instance, should consider higher security amenities, as people biking may leave their bicycles parked and unattended for longer durations of time. In situations like these, bicycle lockers may be a viable option, as shown in the image below.

Common types of bicycle parking types include:

- Bike racks (u-rack, wave, grid, spiral, bollard, custom)
- Bike lockers
- Bicycle storage rooms

Bicycle Lockers
Source: King County Metro

U-Rack Bike Parking
Source: Kittelson

Spiral Bike Parking
Source: Belson Outdoors

Grid Bike Parking
Source: Porter Athletic

Wave Bike Parking
Source: Bike Colorado Springs

Bollard Bike Parking
Source: Inhabitat

Creative Bike Parking
Source: DCist

The type of bike racks used may depend on the number of spaces required, available space, funding, and preference. The City may choose to implement one specific bike rack design throughout the City to maintain consistency. The City may use temporary bike racks, as shown in the image below, for special events, including farmers markets, art shows, music events, pop-up events, public meetings, and other events. Temporary bike racks encourage visitors and attendees to travel by bicycle, reducing traffic congestion and decreasing the demand for vehicular parking.

Temporary Bike Parking
Source: Bicycle Network

Bicycle Parking Design Guidance

Designing effective bike parking depends on a variety of factors. When designing bike parking, the following factors should be explored:

- Duration of stay
- Proximity to destination
- Ease of use
- Security
- Added benefits (maintenance stations, lighting, maps)

The first consideration when designing bike parking should consider the bicyclist's length of stay. Short-term parking accommodates people visiting destinations for short durations, roughly two hours or less. Short-term visitors may be less familiar with the area, so it is important that bike racks are clearly visible.

Long-term parking accommodates routine visitors, such as residents, employees, or public transit users. Long-term visitors often leave their bicycles unattended for several hours or longer and require secure parking that may include weather protection. Security is most important for long-term bike parking. Whereas convenience is critical for short-term parking, long-term bike parking users are willing to trade location convenience for security and weather protection. Signage may be helpful for new users. After determining the types of users that will be using the bike parking facilities for short-term and long-term durations, the design should consider location options and alignments.

The following design guidance outlines site planning for short-term and long-term bike parking:

Short Term Parking Location and Features:

- Visible and close to entrance (50 feet or less)
- Consider weather-protected cover
- Lighting
- Location should be visible to the public or seen from within the destination

Long Term Parking Location and Features:

- Signage for first time users
- Locations may vary, secure facilities are most important
- Security may include individual user locks, keys, smart cards, mobile applications, or other technologies

Another design consideration includes the quantity of bike parking spaces. The City may choose to implement bicycle parking minimums, as mentioned previously in Table 6.1. Additionally, there are many other resources, including the Association of Pedestrian and Bicycle Professionals (APBP) Bicycle Parking Guidelines, that may help determine adequate parking spaces. The City may opt to start small with bike parking, as the City builds up its network of bicycle infrastructure.

Preferred Racks for All Applications

INVERTED U
also called
staple, loop

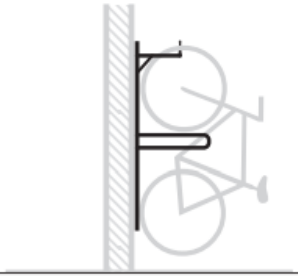
POST & RING

WHEELWELL-SECURE

High-Density Racks

STAGGERED WHEELWELL-SECURE

VERTICAL



TWO-TIER

Secondary Rack Options

WAVE
also called undulating
or serpentine

SCHOOLYARD
also called
comb, grid

COATHANGER

WHEELWELL

BOLLARD

SPIRAL

SWING ARM SECURED

Bike Parking Rack Styles
Source: APBP Essentials of Bike Parking

Bicycle Maintenance Stations

In addition to supplying a variety of bicycle parking, the City should consider installing bicycle maintenance stations, or bike repair stations, throughout the City at key destinations. Bicycle maintenance stations may include attached tools and bike tire pumps. Maintenance stations often include screwdrivers, flat wrenches, and other tools useful for tuning and up-keeping bicycles. Stations may also include pressure gauges, pump pistons, and how-to guides. Bike maintenance stations allow people biking the opportunity to make on-the-go repairs.

Location

Repair and maintenance stations should be located in areas with existing or anticipated high bicycle ridership. Locations may include trailheads, near clusters of employment centers, transit stations, parks, and schools. Figure 6.2 shows potential locations for bicycle repair and maintenance stations in Pittsfield.

Type

Bicycle maintenance and repair stations come in a variety of colors, shapes, sizes, prices, and with varying amenities. The City may choose to use consistent maintenance stations throughout the City to maintain consistency and increase user recognition.

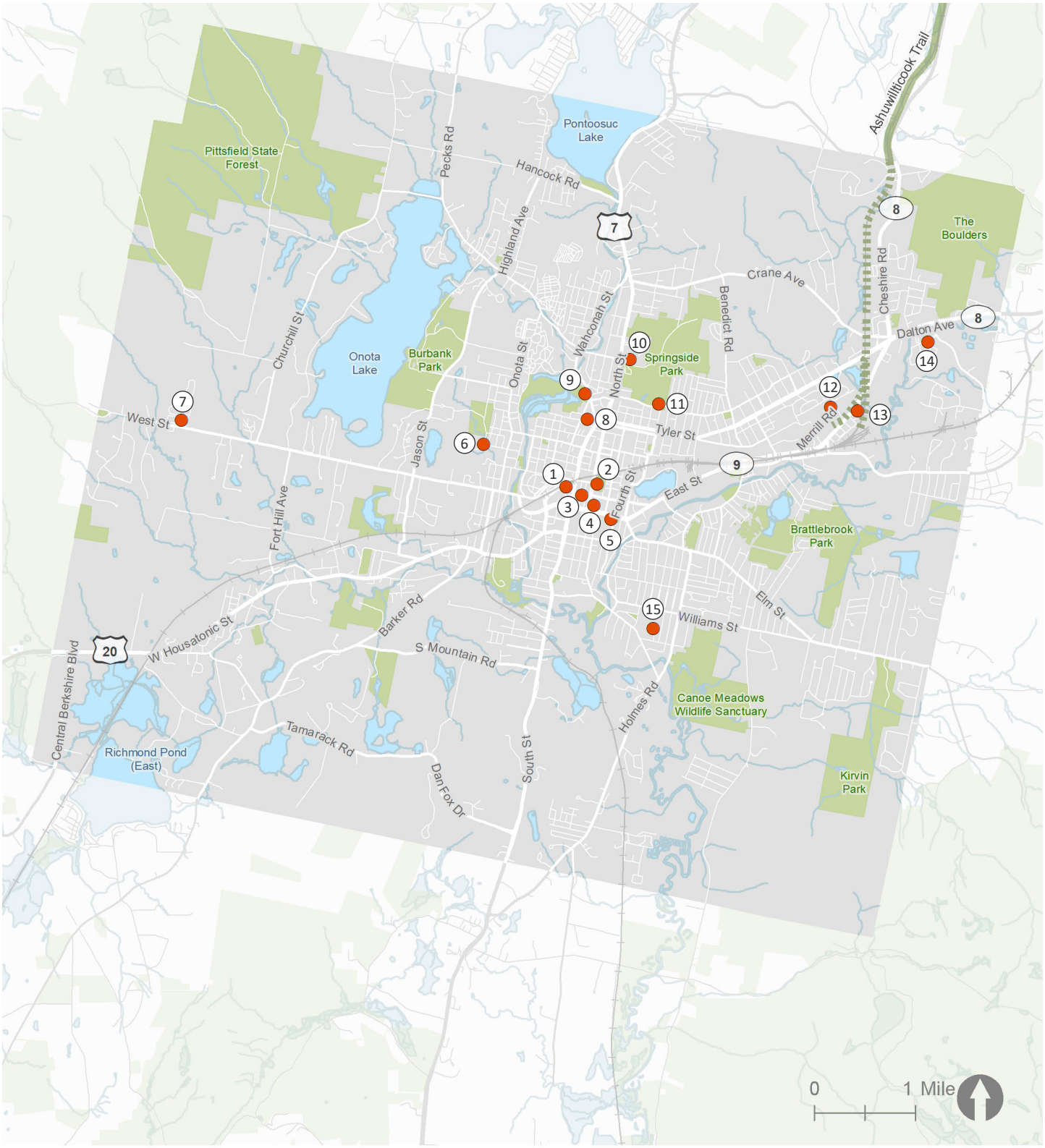
Bike repair stations may include all or some of the following:

- Repair stand to hold bicycle off the ground
- Attached tools
- Tire pump
- Pressure gauge
- Nearby bike parking
- How-to guide

Bicycle maintenance station along a street
Source: Northeastern University

Bicycle maintenance station along a trail
Source: Stolen Ride

Tools provided at bicycle maintenance stations
Source: Dero



Potential Locations for Long-Term Bicycle Parking & Maintenance Stations

Figure 6.2: Potential Locations for Long-Term Bicycle Parking & Maintenance Stations

Potential Locations for Long-Term Bicycle Parking and Maintenance Stations

1. Joseph Scelsi Intermodal Transportation Center (North Street & Columbus Avenue)
2. The Common (1st Street & Eagle Street)
3. City of Pittsfield City Hall (Allen Street & Fenn Street)
4. Gladys Allen Brigham Community Center (East Street & Willis Street)
5. Pittsfield High School (East Street & Appleton Avenue)
6. Coolidge Playground/Conte Elementary School/West Side Community School (Union Street & Atlantic Avenue)
7. Berkshire Community College (West Street & College Entrance)
8. Berkshire Medical Center (North Street & Wahconah Street)
9. Wahconah Park (Wahconah Street & Park Entrance)
10. Springside Park/Hebert Arboretum/John T. Reid Middle School (North Street & Pontoosuc Avenue)
11. Rotary Park/Springdale Park (Springside Avenue & Park Entrance)
12. General Dynamics (Merrill Road & Facility Entrance)
13. Ashuwillticook Rail Trail Trailhead (Merill Road & Trailhead)
14. Berkshire Crossing (Hubbard Avenue & Shopping Center Entrance)
15. Herberg Middle School (Marshall Avenue & School Entrance)

Source: Kittelson

Chapter 7

Design Guidelines

Introduction

The following chapter is a reference for best practices and guidance for designing bicycle facilities. This chapter is divided into two sections: Design Principles and Facility Typology Toolkit.

The overarching principles of safety, context sensitivity, and designing for all roadway users are discussed in the Design Principles section. Unique facility typologies and treatments are presented in the Facility Typology Toolkit section. The strengths, constraints, and design considerations of facility types are explored to provide an overview of potential solutions and their characteristics for use on varying roadway types. Additional resources for future reference are listed for each bicycle facility type.

Information provided in this chapter is not intended to replace or supersede any of the following adopted federal, state, or local design standards:

- MassDOT Separated Bike Lane Planning & Design Guide
- Massachusetts Highway Department Project Development & Design Guide
- MassDOT Plan Preparation Guidelines for Consultants Preparing Right-of-Way Plans
- MassDOT Guidelines for the Planning and Design of Roundabouts
- AASHTO Guide for Development of Bicycle Facilities.
- FHWA Separated Bike Lane Planning and Design Guide
- FHWA Small Town and Rural Multimodal Networks
- NACTO Urban Bikeway Design Guide

Rather, this toolkit provides guidance to the City on best practices and preferred treatments that support bicycling. The recommendations contained in this document are not binding but should be used when possible to enhance the project development process to support the Master Plan.

It is important to recognize that bicycle planning continues to experience fast-paced innovations through the use of new technology, research, and analytical methods, resulting in new guidance and new facility types. Therefore, the guidance and resources listed in this chapter may need to be updated in the future.

Design Principles

Safety

Safety is one of the most important considerations while designing bicycle facilities and drives many of the federal, state, and local requirements. The difference in speeds and mass between motorized vehicles and non-motorized vulnerable roadway users like pedestrians and bicyclists, known as 'speed differential,' is an important factor to mitigate to enhance safety. Separating people on bikes in space and time from fast-moving and heavy vehicular traffic can help reduce the impact of speed and mass differential to improve safety. When separation is not possible, enhancing visibility, minimizing direct pedestrian or bicyclists' exposure to vehicular traffic, lowering traffic

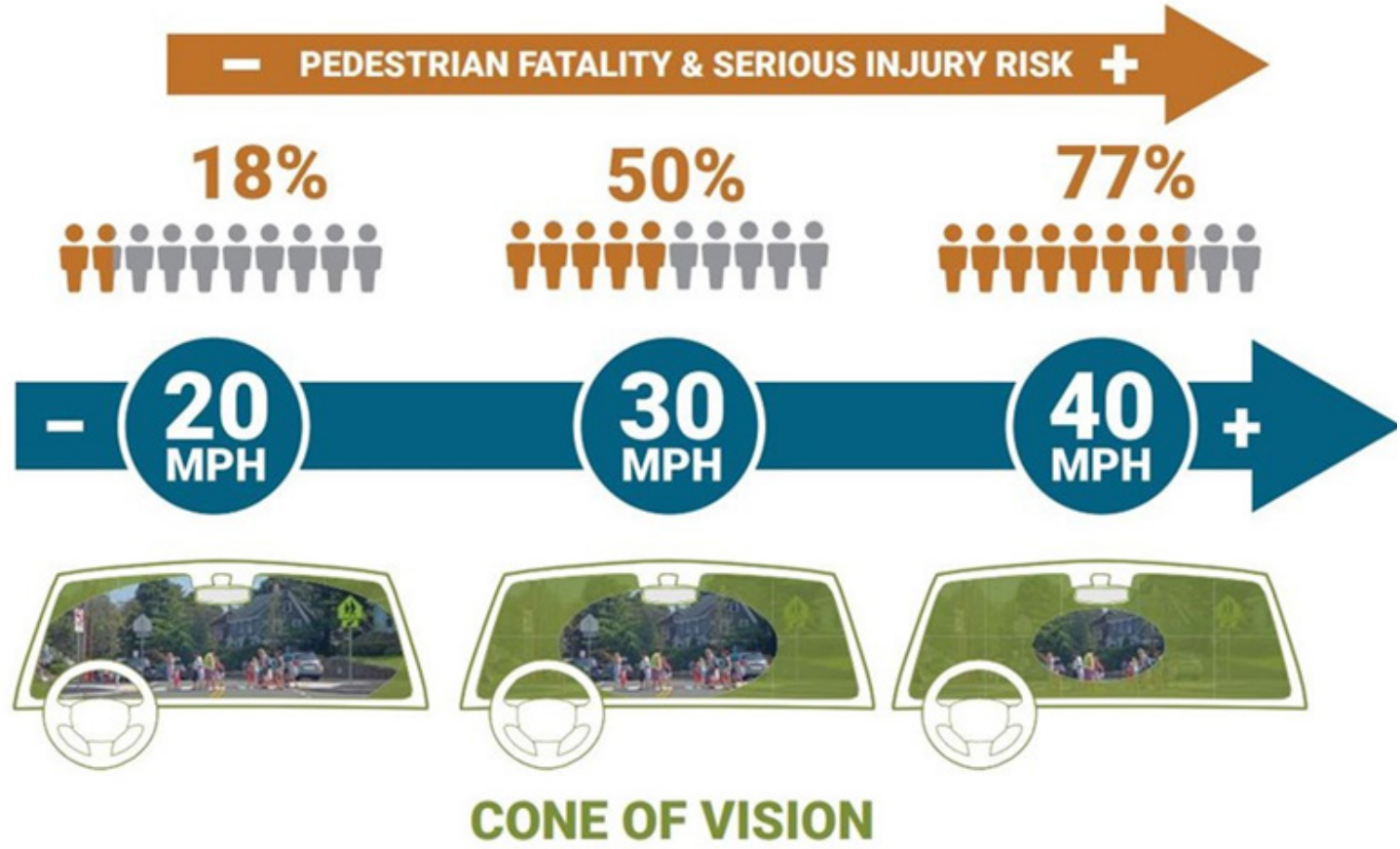


Figure 7.1: Motorist's Visual Field and Peripheral Vision Reduced at Higher Speeds

Source: Federal Highway Administration (FHWA)

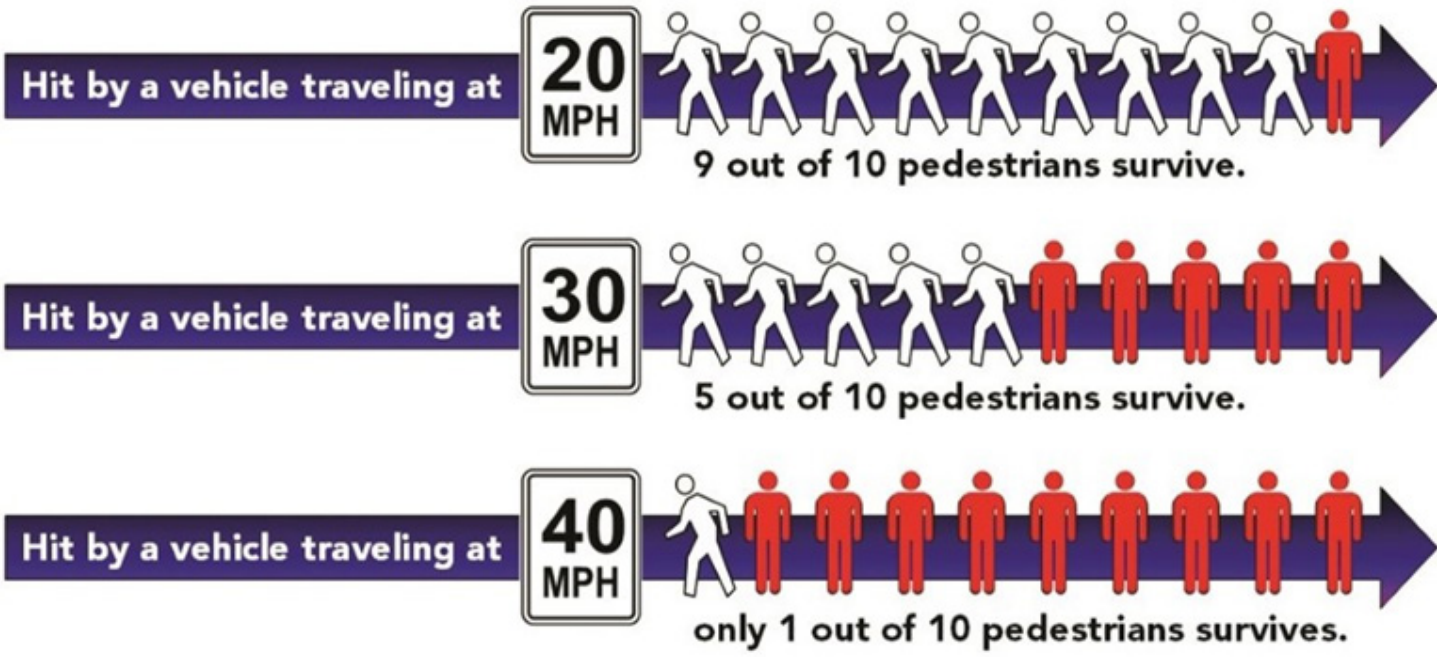


Figure 7.2: Higher Traffic Speeds Lead to More Severe Crashes

Source: Vision Zero Network

speeds, and designing facilities that encourage predictable behavior from all modes is important to improve overall safety. Conflict zones such as intersections, driveways, bus stops, and other types of mixing zones need to be carefully designed following the principles mentioned above. Figure 7.1 and Figure 7.2 shows how the risk of serious injury or fatality increases with increased travel speed. Figure 7.3 shows the mass differential between a bus, a car, and a bicyclist/pedestrian.

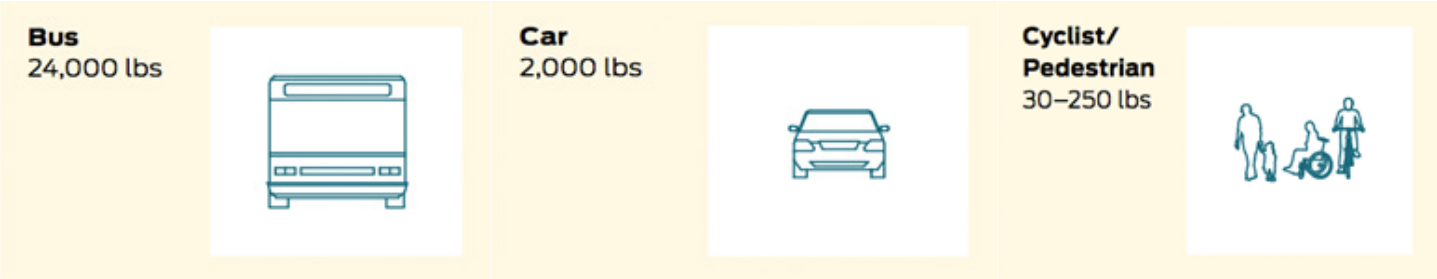


Figure 7.3: Mass Differential between Different Street Users

Source: National Association of City Transportation Officials (NACTO)

Designing for Users of All Ages and Abilities

Too often, streets are designed for the operational efficiency of one mode – automobiles. This approach frequently results in streets that are uncomfortable for people who walk, bike, or ride transit. People of different age groups and abilities respond differently to their surrounding environments. For example, children often have underdeveloped abilities to judge distance and speed. Seniors who depend on pedestrian or transit networks more when compared to other adults may have limited visibility, agility, and strength. Similarly, people with disabilities have special needs that need to be addressed through ADA-compliant street design. It is important to consider all modes and varying skills, abilities, and needs of all Pittsfield residents and visitors while designing streets, especially while designing bicycle and pedestrian facilities.

Context Sensitive Design

Understanding local context regarding surrounding land uses, community characteristics, and environmental conditions is important when designing a roadway facility. The context sensitive design approach looks beyond the typical design standards associated with roadway functional classification types and develops more context-specific solutions that address local needs in terms of user types, safety concerns, and local communities. The natural-to-rural-to-urban transect is an urban planning model that defines a series of context zones that transition from the natural environment, rural areas, suburban areas to the dense urban core. This model can be used to identify a street's land use context and redefine design standards that are sensitive to the land use context and appropriate for its functional classification. Figure 7.4 shows different land use context zones.

Four factors generally indicate an area's context: land use, site design, building design, and multimodal activity. These factors can be further defined as follows:

- Present and future land use affect the width and design of roadways, building typology, and travel demand.
- Site design affects the location and orientation of buildings, parking, and block size. Area plans, zoning codes, and stated goals provide an indication of how the area's site design may change in the future.
- Building design affects the height, density, scale, aesthetic character, and relationship of the pedestrians to adjacent structures.
- Pedestrian, bicyclist and transit activity is typically driven by land use mix and density; as a result, future estimates of activity may also be an indicator of transect zone typology.

To appropriately identify the bicycle and pedestrian facility to be implemented on a roadway, the proper land use context and functional road classification need to be evaluated. Context classification defined through this system will inform the city's planning, design, construction, and maintenance practices to apply design criteria and standards.

The context classification system was created because of the need to define contexts beyond urban and rural classifications, and to include multimodal needs into the functional classification system. The bicycle and pedestrian facility types and intersection treatments defined in this chapter should be applied on roadways in consideration of a context classification system to create a transportation network that meets the needs of all users. The exact number and type of zones should be calibrated by the City to better fit Pittsfield's context and needs.

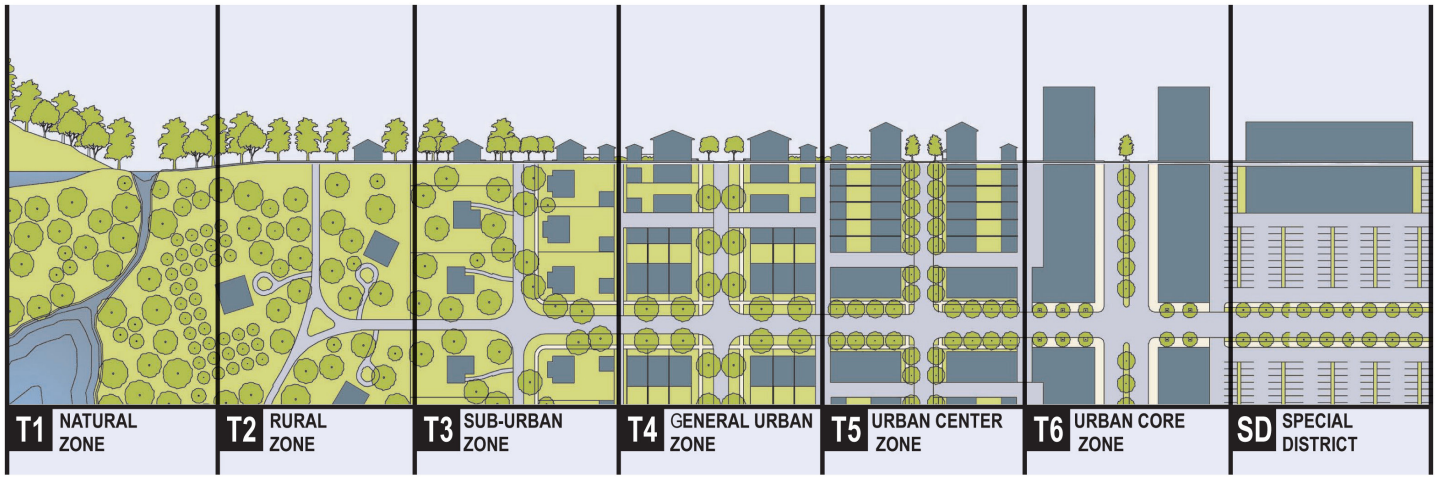


Figure 7.4: Context Zones

Source: The Center for Applied Transect Studies (CATS)

Flexibility to Accommodate Micromobility Options

In the past few years there has been an explosion of new transportation modes, especially in downtown areas of cities across the country. These new modes categorized under the broad umbrella term of 'micromobility' include very light vehicles such as electric scooters (e-scooters), electric skateboards (e-skateboards), shared bicycles and electric pedal assisted bicycles (e-bikes). Many micromobility options are offered through a shared network of vehicles such as bike sharing or scooter sharing, allowing people to join through membership or rent vehicles for one-off trip.

The electric assist or battery operated vehicles such as e-scooters or e-bikes often have maximum travel speeds of 30 MPH and maximum battery power that lasts 40 minutes and can travel between 5 to 10 miles. Most users choose to ride either on the sidewalk or in bike lanes because of the size and speed of these vehicles, as well as the high level of rider exposure.

Micromobility options are still a new phenomenon and are evolving rapidly. Overall given the speed and size of these vehicles, they may fit well with traditional bicycles and could share bicycle facilities. However, there has not been enough industry-wide research or policies and regulations to help develop any specific micromobility recommendations. More research and analysis is required to get a better understanding of these modes. As micromobility options evolve and cities, states, and the Federal Government develops new guidelines and regulations, future updates of this Master Plan can address these issues in more detail.

Facility Typology Toolkit

The following pages outline the bicycle facility typology toolkit. The toolkit presents detailed information related to bicycle facility types, intersection treatments, conflict point treatments, and transitions. Each facility type within the toolbox includes the following sections:

- Design guidance graphic
- Brief description
- Advantages
- Disadvantages
- Example images
- Additional guidance

The toolkit provides information about the following bicycle facility types:

- Neighborhood Bike Routes
- Conventional Bike Lanes
- Buffered Bike Lanes
- One-way Separated Bike Lanes
- Two-way Separated Bike Lanes
- Shared Use Paths

The design guidance graphic for various facility types provides guidance on treatments at conflict points such as bus stops and driveways.

The toolkit provides information on the following intersection treatments:

- Bike Boxes at Signalized Intersection
- Protected Intersection
- Bike Lane and Right Turn Only Lane Configurations
- Roundabouts with Shared Lanes + Shared Use Path
- Roundabouts with Separated Bike Lanes

In addition, the toolkit provides guidance related to bicycle facility transitions. The following bicycle facility treatments are discussed:

- Transition to a Shared Lane and Conventional Bike Lane
- Two-Way Facility to One-Way Facility (Near Side Transition)
- One-Way Facility to Two-Way Facility (Far Side Transition)

Neighborhood Bike Routes

1. Sharrow markings communicate to motor vehicles that bicyclists share the road.
2. Bicycle route and wayfinding signs give directions to bicyclists.
3. Posted speed limit should be lower than 25mph, ideally 20mph.
4. Traffic calming treatments such as spot median islands, speed humps, curb extensions, etc.

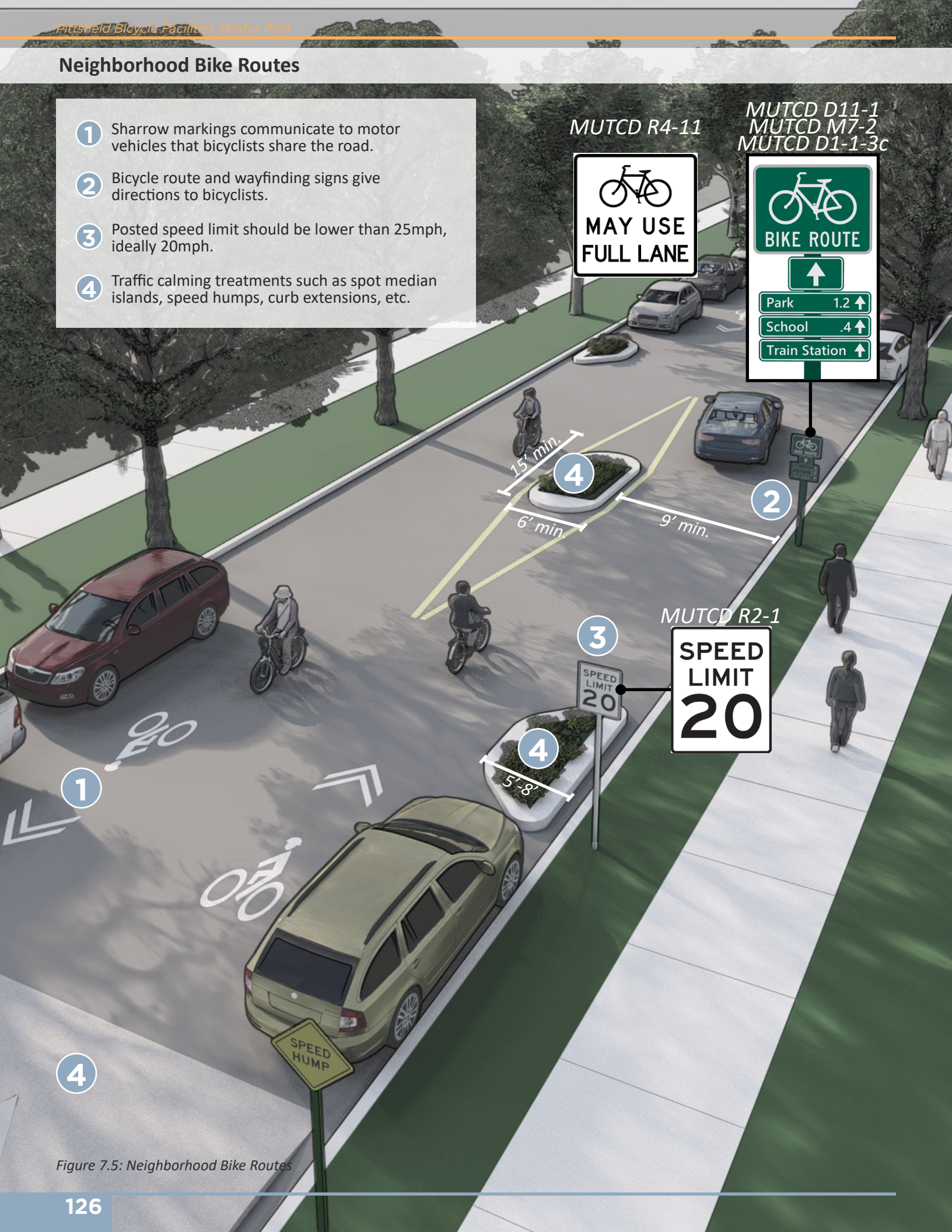


Figure 7.5: Neighborhood Bike Routes

Neighborhood Bike Routes

Neighborhood Bike Routes are typically residential streets with low vehicle volumes and low speeds where motor vehicles and bicycles share the road space. Neighborhood Bike Routes may also be referred to as Bicycle Boulevards or Neighborhood Greenways. Neighborhood Bike Routes use pavement markings, signs, and traffic calming elements to enhance safety and comfort for people on bicycles. Neighborhood Bike Routes are usually narrow, residential local streets with on-street parking and street trees.

Neighborhood Bike Routes aim to optimize through-travel for people biking. These streets should consider limiting the use of stop signs along Neighborhood Bike Routes. Additionally, wayfinding signage is an important navigation component for people biking through a connected network of Neighborhood Bike Routes. To be effective, Neighborhood Bike Routes should connect to other types of bicycle infrastructure to create a safe and connected network of bicycle facilities.

Advantages

- Easy to implement
- Low-cost
- Limited impacts to on-street parking, drainage, and curbs
- Designs may include green infrastructure and other stormwater mitigation strategies
- Treatments may have secondary benefits, such as traffic calming, wayfinding, and speed reduction
- Maintains existing vehicular flow
- May discourage cut-through vehicle traffic

Disadvantages

- Lower bicycle comfort, due to the presence of motor vehicles in the shared road space
- Requires some maintenance coordination
- May require user education and familiarity

Additional Guidance

- NACTO Urban Bikeway Design Guide
- FHWA Small Town and Rural Multimodal Networks
- AASHTO Guide for the Development of Bicycle Facilities
- Massachusetts Highway Department Project Development & Design Guide
- Portland State University - Fundamentals of Bicycle Boulevard Planning & Design

Example of a Neighborhood Bike Route/Neighborhood Greenway in Portland, OR
Source: Bermstyle.com

Example of a Neighborhood Bike Route/Bicycle Boulevard in Madison, WI
Source: NACTO

Conventional Bike Lanes

1. Bicycle symbol marking indicates dedicated lane for bicyclists.
2. Use of green paint to enhance visibility of conflict zones such as driveways and intersections.
3. At bus stops, buses pull out to the curb and share the space with bicycles.
4. Where on-street parking is present, position bike lane between parking and travel lane.
5. Curbside bike lane places bicyclists between curb/gutter pan and travel lane.

Figure 7.6: Conventional Bike Lanes

Conventional Bike Lanes

Conventional bike lanes designate exclusive space for people biking. Bicycle lanes are provided through the use of striping and signage. Conventional bike lanes are located adjacent to vehicular travel lanes and flow in the same direction as vehicle traffic. Conventional bike lanes are typically on the right side of the street, between the vehicle travel lane and curb/edge of pavement or on-street parking.

Conventional bike lanes may vary in width. According to NACTO, the desired bicycle lane width adjacent to a curb is 6 feet. Bike lanes adjacent to street parking should use additional striping and bike lane width to minimize parked vehicles from encroaching into the bike lane. Additionally, bike lanes should not be positioned to the right-side of a right turn only lane or to the left-side of a left turn only lane. See MUTCD for additional guidance.

Additional bike lane safety design measures may include using green paint to indicate conflict areas between people biking and other modes. Dashed white lines may also be used to indicate conflict areas near driveways, turn lanes, and intersections.

Advantages

- Increase comfort and safety for people biking on higher speed, higher volume streets as compared to shared lanes
- Dedicated space limits interactions between people biking and driving
- Allows people biking to travel independently from vehicle traffic
- Increases visibility and predictability of interactions between travel modes
- Increases total person-throughput street capacity

Disadvantages

- Conflict points may create uncomfortable situations for people biking
- Conventional bike lanes located adjacent to curbs may accumulate garbage and debris
- Requires maintenance coordination

Additional Guidance

- NACTO Urban Bikeway Design Guide
- FHWA Manual on Uniform Traffic Control Devices. Chapter 9 Traffic Control for Bicycle Facilities.
- AASHTO Guide for the Development of Bicycle Facilities
- Massachusetts Highway Department Project Development & Design Guide

Example of a conventional bike lane in Cambridge, MA
Source: NACTO

Example of a conventional bike lane in Cambridge, MA
Source: City of Cambridge, MA

Buffered Bike Lanes

Figure 7.7: Buffered Bike Lanes

Buffered Bike Lanes

Buffered bike lanes are conventional bike lanes paired with additional striped buffer space between the bike lane and the vehicle travel lane and/or parking lane. Buffered bike lanes are preferred along streets with high volumes and high speeds, where conventional bike lanes may not adequately enhance comfort and safety for people biking.

When designing a buffered bike lane adjacent to on-street parking, a buffer may be provided between the bike lane and on-street parking, between the travel lane and bike lane, or between both, the bike lane and the travel lane and on-street parking. Buffers between bike lanes and on-street parking help to minimize conflicts between people biking and opening car doors. In contrast, a buffer between the travel lane and bike lane provides additional space between fast-moving vehicular traffic and people on bicycles.

Buffered bicycle lanes should be marked with two solid white lines on both edges of the buffer space to indicate where crossing is discouraged. Buffer space should be 24 inches at a minimum and may include diagonal striping if the width is 3 feet or wider to increase driver visibility. Buffered bike lanes may use green conflict paint or dashed lines to indicate conflict areas. On intersection approaches with right turn only lanes, the bike lane should be transitioned to a through bike lane located to the left of the right turn only lane. Alternatively, a combined bike lane/vehicle turn lane may be used if there is limited space.

Advantages

- Provides greater separation between people biking and driving
- Enhances safety and comfort for people biking
- Allows people biking to pass other bikers
- Appeals to a wider variety of bicyclists

Disadvantages

- Buffer striping may require additional maintenance
- Conflict points may create uncomfortable situations for people biking
- Conventional bike lanes located adjacent to curbs may accumulate garbage and debris
- Requires maintenance coordination

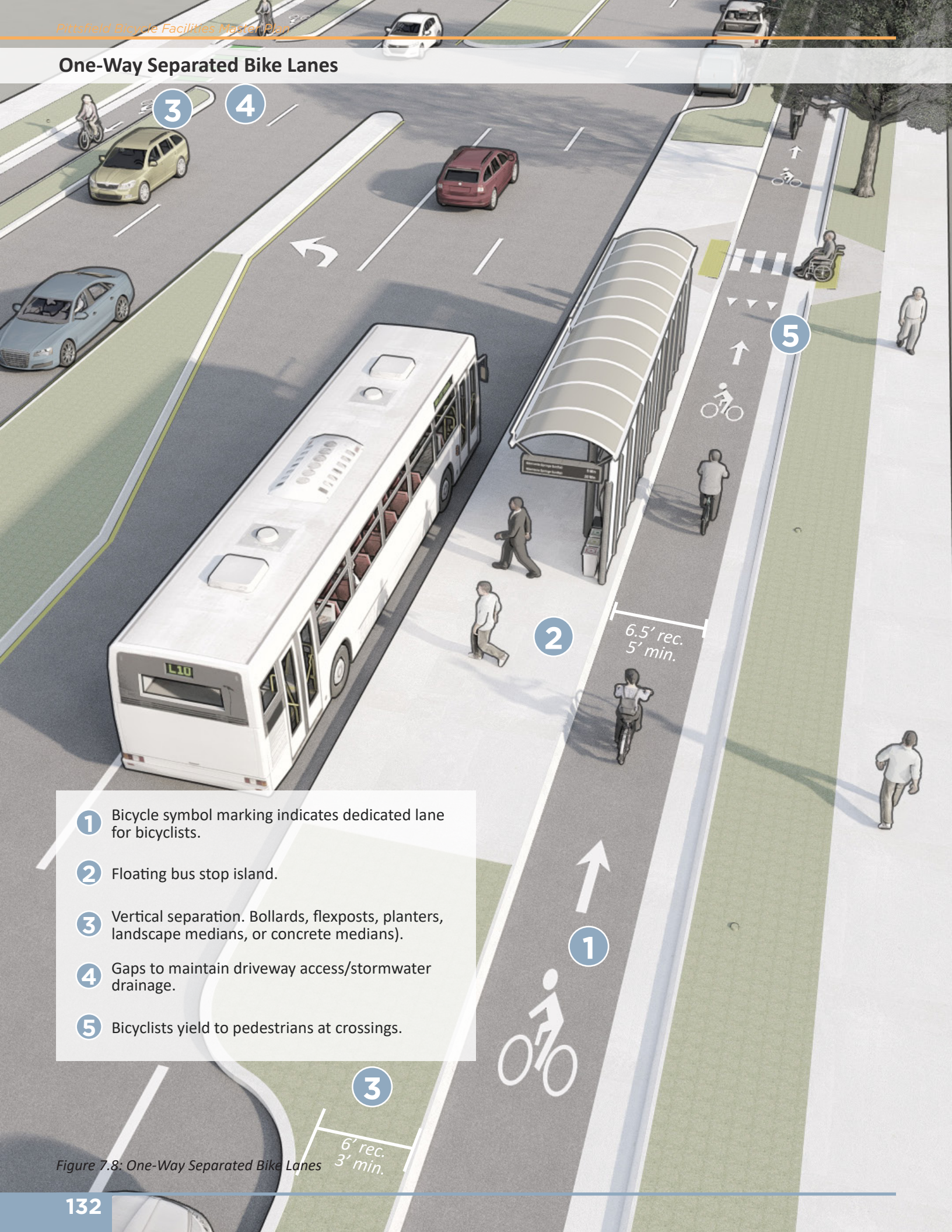
Additional Guidance

- NACTO Urban Bikeway Design Guide
- FHWA Manual on Uniform Traffic Control Devices
- AASHTO Guide for the Development of Bicycle Facilities
- Small Town and Rural Design Guide: Facilities for Walking and Biking

Example of a buffered bike lane in Corvallis, OR.
Source: City of Corvallis, OR

Example of a buffered bike lane adjacent to on-street parking in Boston, MA
Source: City of Boston, MA

One-Way Separated Bike Lanes



1. Bicycle symbol marking indicates dedicated lane for bicyclists.
2. Floating bus stop island.
3. Vertical separation. Bollards, flexposts, planters, landscape medians, or concrete medians).
4. Gaps to maintain driveway access/stormwater drainage.
5. Bicyclists yield to pedestrians at crossings.

Figure 7.8: One-Way Separated Bike Lanes

One-Way Separated Bike Lanes

One-way separated bike lanes, also known as one-way protected bike lanes or one-way cycle tracks, are bike lanes that are physically separated by vertical elements from vehicular traffic. Separated bike lanes are separated from vehicular traffic by physical barriers, such as bollards, raised medians, planters, parking, and other objects. Separated bike lanes may be one-way, two-way, street level, or sidewalk level. One-way separated bike lanes that are elevated above street level are called raised separated bike lanes or raised cycle tracks. Separated bike lanes provide enhanced comfort and safety for bicyclists by creating additional separation between people driving and walking.

Separated bike lanes may require additional maintenance for leaf and snow removal. Bollards or flexible delineators may be removed to help facilitate snow removal.

Raised cycle tracks may be used to provide additional separation between people driving and biking. At intersections, raised cycle tracks may be dropped and merged onto the street or can be maintained at the sidewalk level. When designing raised cycle tracks, it is critical to ensure separation between people walking and biking.

Advantages

- Physical separation prevents vehicles from blocking the bike lane
- Enhanced comfort and safety
- Enhanced bicyclist visibility
- Reduces conflict between people driving and biking

Disadvantages

- Physical barriers may require additional maintenance
- Bike lanes located adjacent to curbs may accumulate garbage and debris
- May require coordination with emergency, transit, and police departments

Additional Guidance

- MassDOT Separated Bike Lane Planning & Design Guide
- NACTO Urban Bikeway Design Guide
- FHWA Small Town and Rural Multimodal Networks
- AASHTO Guide for the Development of Bicycle Facilities
- Massachusetts Highway Department Project Development & Design Guide

Example of a one-way separated bike lane in Cambridge, MA
Source: City of Cambridge, MA

Example of a one-way separated bike lane in Boston, MA
Source: Boston Cyclists Union

Two-Way Separated Bike Lanes

1. Bicycle symbol marking indicates dedicated lane for bicyclists.
2. Use skipped yellow centerline striping to indicate two-way travel.
3. Use of green paint to enhance visibility of conflict zones such as driveways and intersections.
4. Vertical separation. Bollards, flexposts, planters, landscape medians, or concrete medians).
5. Gaps to maintain driveway access/stormwater drainage.
5. Cars yield to bikes.

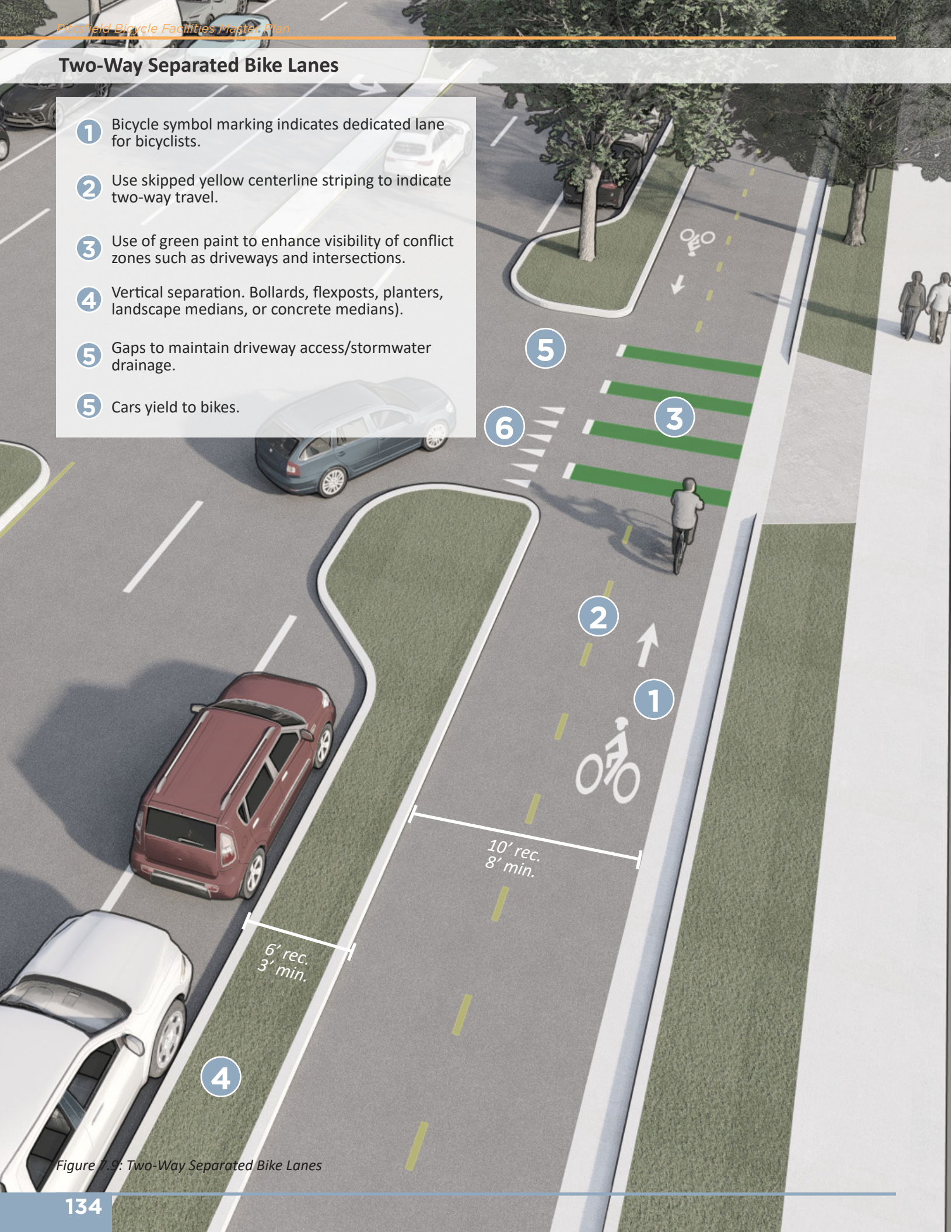


Figure 7.9: Two-Way Separated Bike Lanes

Two-Way Separated Bike Lanes

Two-way separated bike lanes, also known as two-way protected bike lanes, or two-way cycle tracks are bi-directional bike lanes that are physically separated by vertical elements from vehicular traffic. Bike lanes are separated from vehicular traffic by physical barriers, such as bollards, raised medians, planters, parking, and other objects. Similar to one-way separated bike lanes, two-way separated bike lanes may be designed at street level, sidewalk level, or at an elevation in between. Two-way separated bike lanes are physically separated by objects such as planters, medians, bollards, or vertical elevation. Two-way separated bike lanes accommodate bi-directional bicycle movements and may require additional considerations at intersections and conflict areas.

Two-way separated bike lanes are feasible on streets with few conflicts (driveways, intersections, alleys, etc.) on one side of the street. Two-way separated bike lanes may be used where one-way separated bike lanes are not feasible on either side of the street due to right of way constraints. Two-way bicycle facilities may be used to connect to other bicycle facilities, such as trails or shared use paths.

Design considerations should include separation and clear demarcation between people biking and walking. Striping, concrete, signage, and tactile pavement may be used to delineate conflict areas.

Advantages

- Physical separation prevents vehicles from blocking the bike lane
- Enhanced comfort and safety
- Enhanced bicyclist visibility
- Reduces conflict between people driving and biking

Disadvantages

- Physical barriers may require additional maintenance
- Bike lanes located adjacent to curbs may accumulate garbage and debris
- May require coordination with emergency, transit, and police departments
- May require additional considerations at intersections and conflict areas, such as signal re-timing

Additional Guidance

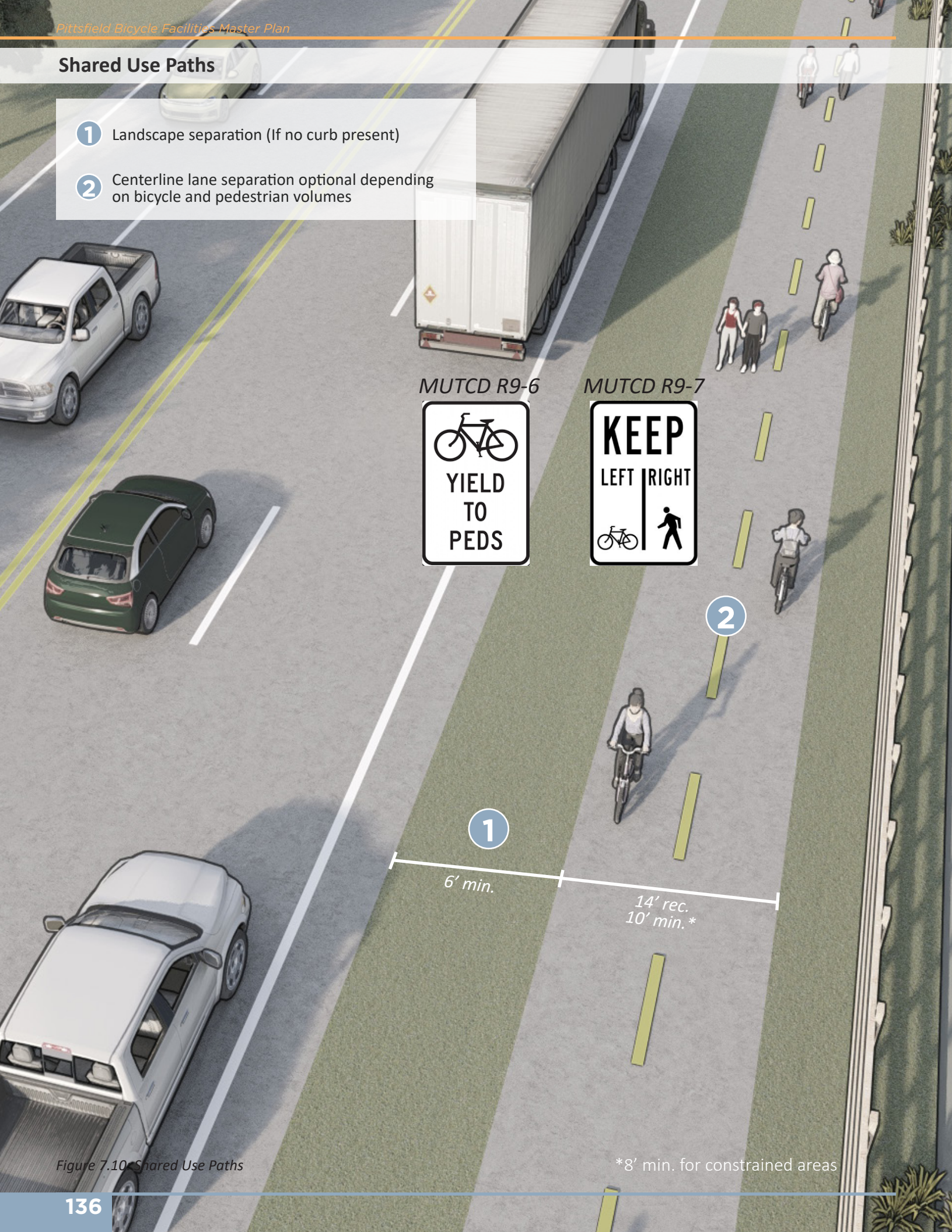
- NACTO Urban Bikeway Design Guide
- FHWA Small Town and Rural Multimodal Networks
- AASHTO Guide for the Development of Bicycle Facilities
- MassDOT Separated Bike Lane Planning & Design Guide
- Massachusetts Highway Department Project Development & Design Guide

Example of a two-way separated bike lane in New York City
Source: The City of Cambridge, MA

Example of a Two-Way Separated Bike Lane in Washington DC
Source: People for Bikes

Shared Use Paths

1. Landscape separation (If no curb present)
2. Centerline lane separation optional depending on bicycle and pedestrian volumes



*8' min. for constrained areas

Figure 7.10: Shared Use Paths

Shared Use Paths

Shared use paths, sometimes called sidepaths are physically separated facilities from vehicular traffic and shared between non-motorized travel modes such as bicycling, walking, or horseback riding. These facilities can be found in a variety of settings, including urban, rural, and suburban. Shared use paths can be used for commuting or recreational purposes. Shared use paths may be designed directly adjacent to streets and provide a facility wider than a sidewalk that can be shared by non-motorized users. These facilities are often segments along roadways of larger trails and greenways that are typically located in off-road settings. These facilities are wide enough to accommodate bi-directional travel.

Shared use paths, greenways, and trails may be designed along active or abandoned rail corridors, alongside utility corridors, or along promenades and waterfront areas. These facilities should connect to other bicycle and pedestrian facilities and major destinations, such as schools, parks, transit stations, employment centers, and commercial districts. Additionally, ADA accessibility is a critical component of safe, accessible, and comfortable facilities that can be used by all users.

Advantages

- Physical separation from vehicles enhances comfort and safety for non-motorized users
- Limited interactions and conflict points with vehicles
- Design may incorporate landscaping and stormwater management strategies

Disadvantages

- Expensive to construct
- Requires right of way along roadway corridor to accommodate wider widths

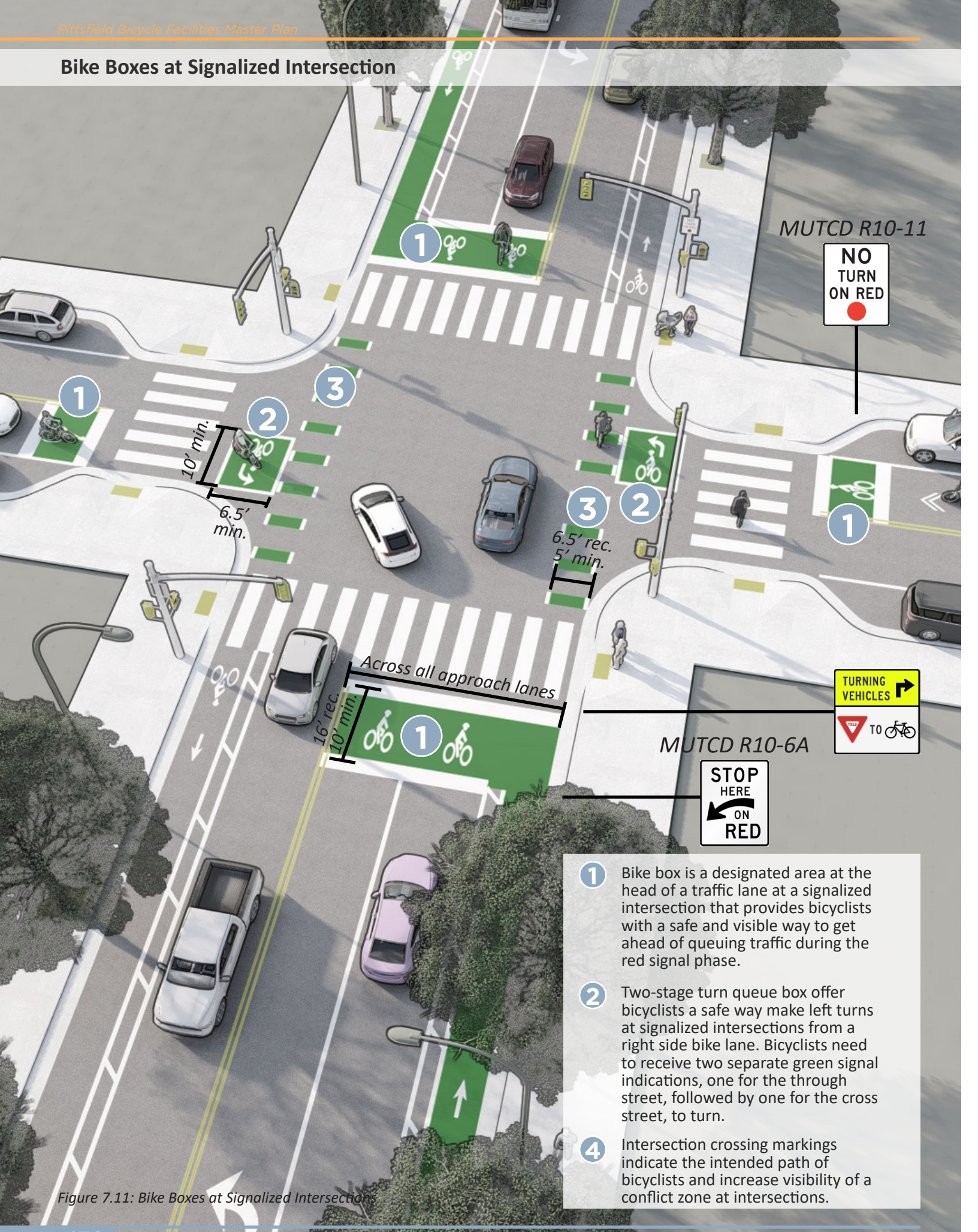
Additional Guidance

- MassDOT Shared use path Planning and Design Guide
- MassDOT Shared use path Impacts Study
- Massachusetts Department of Conservation and Recreation: Trails Guidelines and Best Practices Manual
- FHWA Small Town and Rural Multimodal Networks
- FHWA Shared use path Level of Service Calculator
- FHWA Evaluation of Safety, Design, and Operation of Shared Use Paths

Example of a shared use path in South Lake Tahoe, CA
Source: Tahoe Regional Planning Agency

Example of a shared use path in Skokie , IL
Source: Christopher B. Burke Engineering, Ltd.

Bike Boxes at Signalized Intersection



1. Bike box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.
2. Two-stage turn queue box offer bicyclists a safe way make left turns at signalized intersections from a right side bike lane. Bicyclists need to receive two separate green signal indications, one for the through street, followed by one for the cross street, to turn.
4. Intersection crossing markings indicate the intended path of bicyclists and increase visibility of a conflict zone at intersections.

Figure 7.11: Bike Boxes at Signalized Intersections

Protected Intersection

1. Corner island separates bikes from vehicles, prevents vehicles from encroaching on the bike lane, and creates a protected queuing area for bicyclists waiting to turn.
2. Bike queue area designates space for bicyclists to wait for a green signal. This shortens crossing distances and gives people on bikes a head-start.
3. Motorist Waiting Zone provides space between the vehicle lane and the bike crossing for vehicles to yield/wait before turning.
4. Bicyclists yield to pedestrians at crossings.
5. No Stopping / No Standing Zone
   Motor vehicle parking and stopping are prohibited on the approach to the intersection.
6. Intersection crossing markings indicate the intended path of bicyclists and increase visibility of a conflict zone at intersections.

Figure 7.12: Protected Intersection

Bike Lane and Right Turn Only Lane Configurations

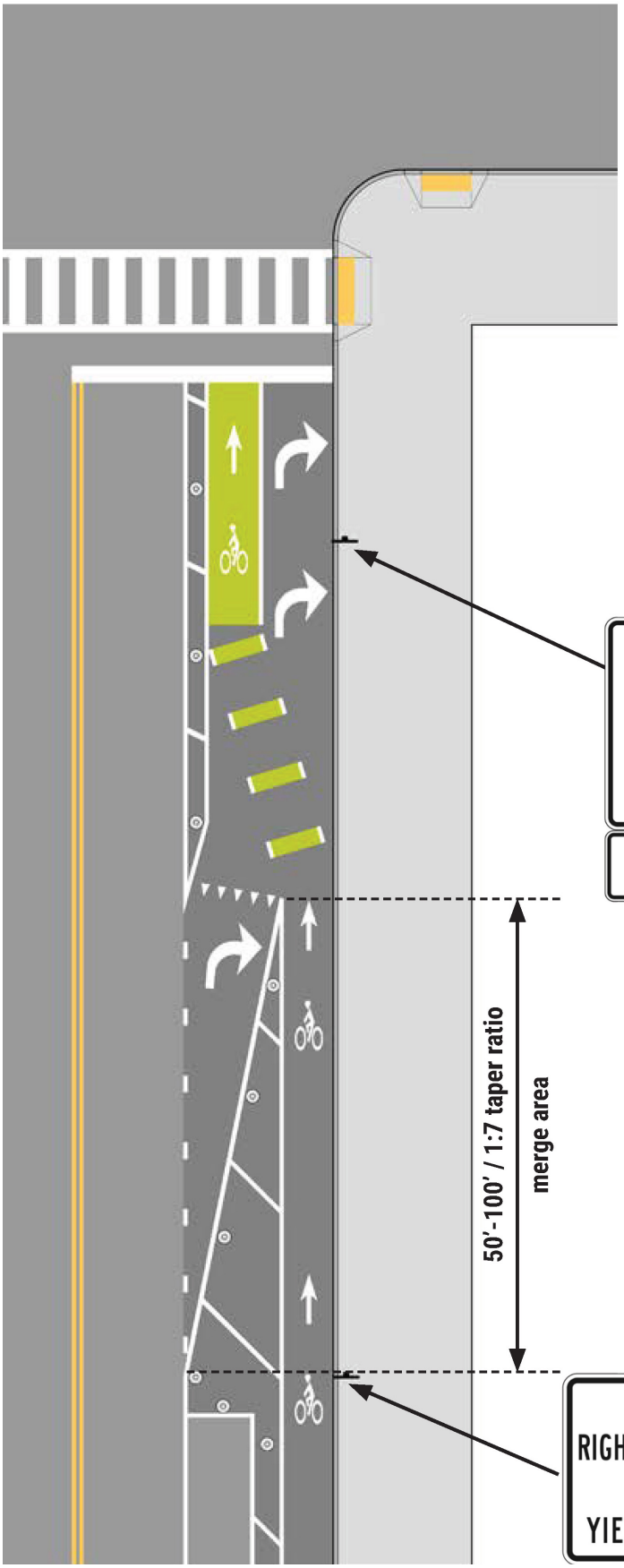


Figure 7.13: Angled Crossing Mixing Zone with Bike Lanes
Source: MassDOT Separated Bike Lane Planning & Design Guide

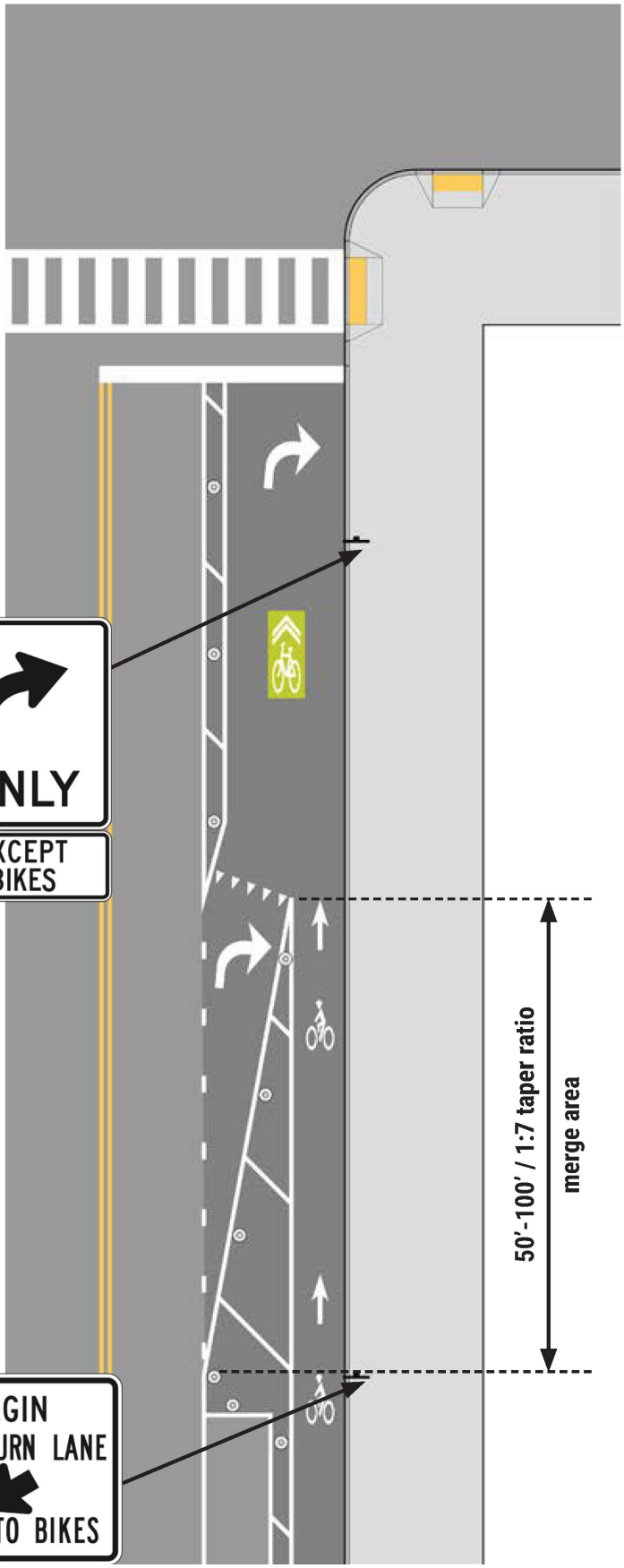
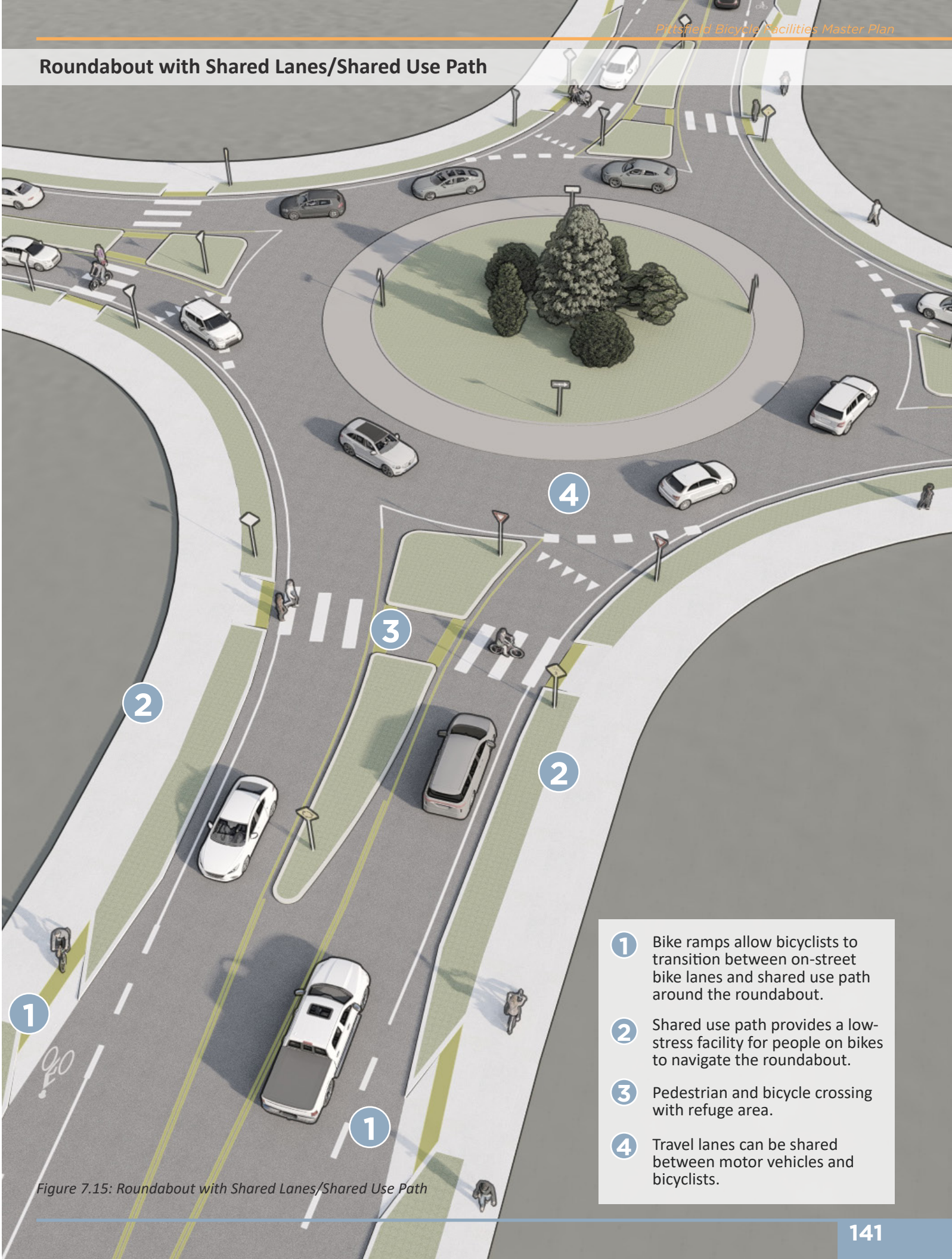


Figure 7.14: Angled Crossing Mixing Zone with Shared Lanes
Source: MassDOT Separated Bike Lane Planning & Design Guide

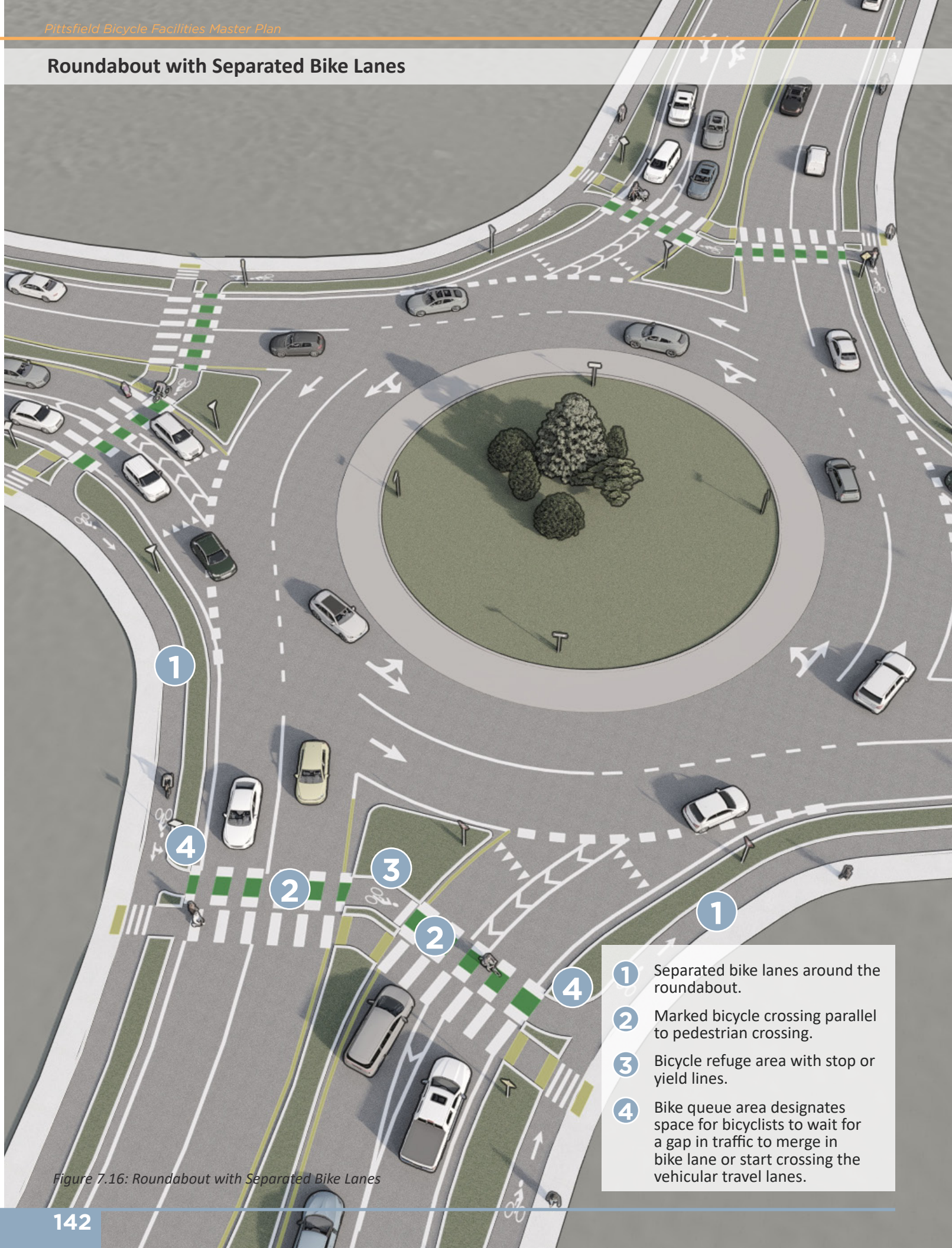
Roundabout with Shared Lanes/Shared Use Path



1. Bike ramps allow bicyclists to transition between on-street bike lanes and shared use path around the roundabout.
2. Shared use path provides a low-stress facility for people on bikes to navigate the roundabout.
3. Pedestrian and bicycle crossing with refuge area.
4. Travel lanes can be shared between motor vehicles and bicyclists.

Figure 7.15: Roundabout with Shared Lanes/Shared Use Path

Roundabout with Separated Bike Lanes



1. Separated bike lanes around the roundabout.
2. Marked bicycle crossing parallel to pedestrian crossing.
3. Bicycle refuge area with stop or yield lines.
4. Bike queue area designates space for bicyclists to wait for a gap in traffic to merge in bike lane or start crossing the vehicular travel lanes.

Figure 7.16: Roundabout with Separated Bike Lanes

Transition to a Shared Lane and Conventional Bike Lane

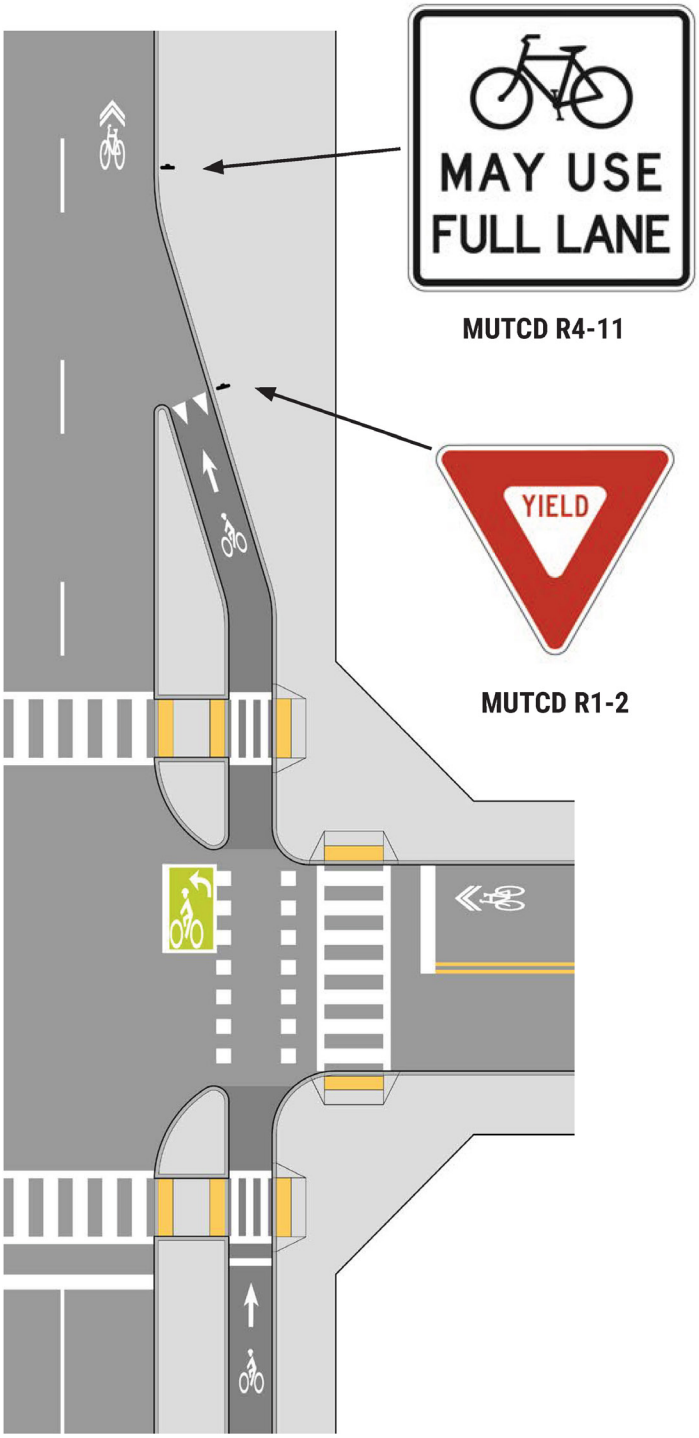


Figure 7.17: Angled Transition to a Shared Lane
Source: MassDOT Separated Bike Lane Planning & Design Guide

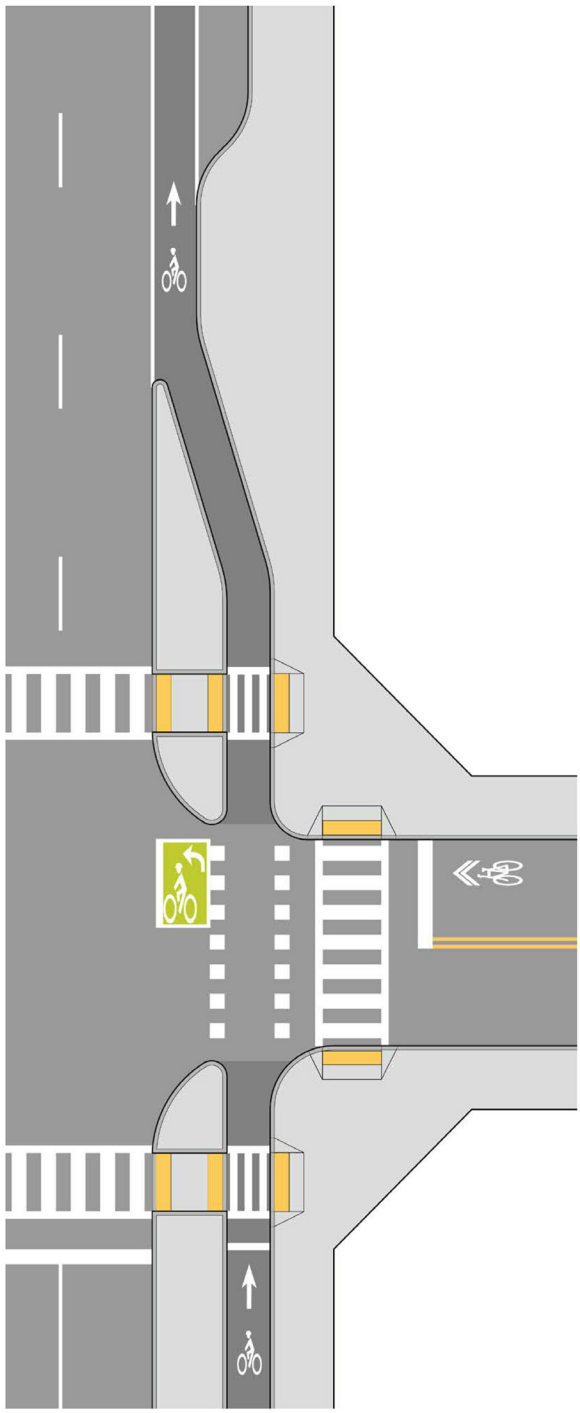


Figure 7.18: Transition to a Conventional Bike Lane
Source: MassDOT Separated Bike Lane Planning & Design Guide

Transition from One-Way Facility to Two-Way Facility (Far Side Transition)

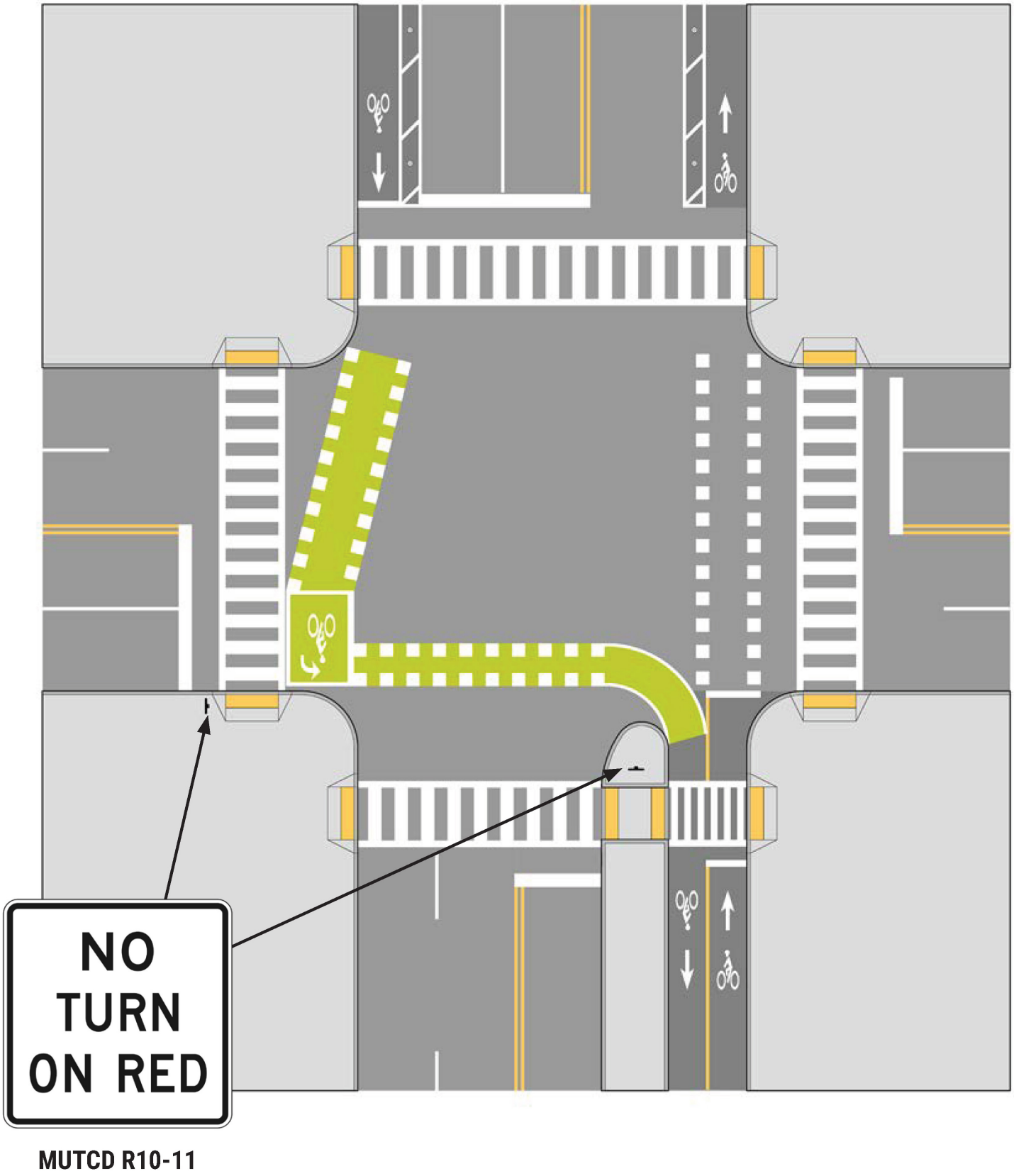


Figure 7.19: Transition from One-Way Facility to Two-Way Facility (Far Side Transition)

Source: MassDOT Separated Bike Lane Planning & Design Guide

Transition from Two-Way Facility to One-Way Facility (Near Side Transition)

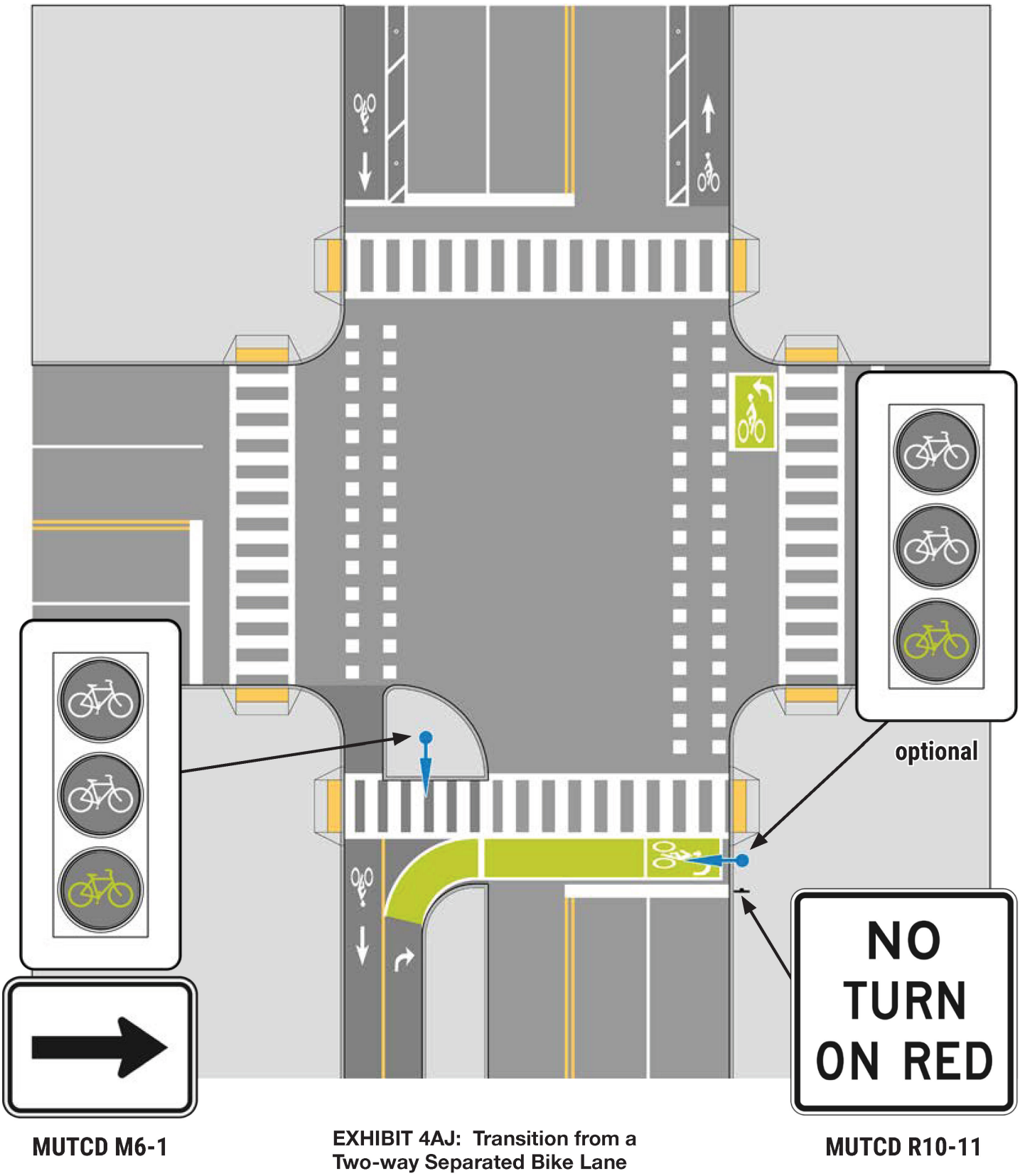


Figure 7.20: Transition from Two-Way Facility to One-Way Facility (Near Side Transition)

Source: MassDOT Separated Bike Lane Planning & Design Guide

Source: City of Pittsfield, MA

Chapter 8

Programs & Policies

A well-connected network of low-stress bicycle facilities is necessary but not sufficient condition to increase bicycling in any community. A comprehensive approach of many different and complementary innervations is necessary to make Pittsfield a true bicycle-friendly community.

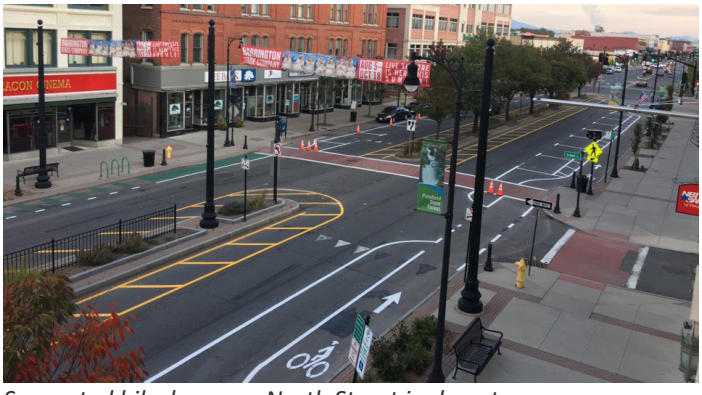
It is important for the City to develop targeted bicycle programs and policies to complement the physical bicycle infrastructure to encourage bicycling. This chapter outlines recommended bicycle programs, policies, and initiatives that the City can implement over time.

The recommended policies and programs are organized by the following topics:

- ***Project Development***
- ***Safety***
- ***Maintenance and Operations***
- ***Education and Encouragement***
- ***Zoning and Development Review***
- ***Funding***
- ***Evaluation***

Project Development

- Build on the City's Complete Streets Policy by revising the project development process to mandate the accommodation of bicycle facilities and amenities in all roadway construction and maintenance projects.
- Adopt a new or revise existing roadway design manual to include the latest bicycle facility design standards.
- Develop new traffic calming guidebook and initiate a neighborhood slow streets program to implement traffic calming treatments along Neighborhood Bike Routes.
- Explore 'quick build' or 'tactical urbanism' strategies to implement recommended bicycle facilities as pilot projects as part of an incremental implementation approach similar to the North Street project implemented as part of the MassDOT Shared Streets and Spaces Grant Program.
- Establish a program to fund corridor studies, concept designs, and final engineering design to advance recommended bicycle facilities.



Separated bike lanes on North Street in downtown are implemented as a pilot project.
Source: City of Pittsfield, MA

Safety

- Establish a program in partnership with the Police Department to track bicycle related crashes and identify hotspots to prioritize safety improvements.
- Explore adopting a Vision Zero plan to set a target of zero fatalities and serious injuries resulting from roadway crashes.
- Establish policies for the use of electric bicycles, electric pedal-assist bicycles, scooters, and other micro-mobility modes. Although, pedestrian and bicycle facilities can be shared by electric and electric pedal-assist bicycles, it is important to designate zones where bicycles may not share sidewalks, such as downtown, where greater conflict between pedestrians and bicyclists is expected. It is also critical to establish speed regulations to ensure that the speed differential is limited between conventional bicycles and electric-powered bicycles and scooters.
- Review City ordinances and codes pertaining to bicycles and update if necessary to focus on bicycle safety.
- Support legislation at the local, state, and federal levels to improve safety for bicyclists.

Maintenance and Operations

- Establish a process to evaluate the implementation of recommended bicycle facilities as part of routine re-striping and re-surfacing projects. Please refer to FHWA 'Incorporating On-Road Bicycle Networks into Resurfacing Projects' report for additional information.
- Establish policies and processes to maintain bicycle facilities for year round access.
- Evaluate and update existing maintenance policies and standards to accommodate all types of bicycle facilities.
- Consider adding narrow maintenance vehicles to the City's fleet to sweep and remove snow from separated bike lanes.
- Enforce no parking and no stopping regulations to keep bicycle facilities clear.
- Develop Temporary Traffic Control Plans (TTCP) to provide detailed guidance to proactively address bicyclists' safety and operational needs.

Refer to MassDOT Separated Bike Lane Planning & Design Guide: Chapter 7-Maintenance for additional details on maintenance and operations of bicycle facilities.

Ghost bike memorial marking the location of a fatal crash involving a person riding a bicycle.

Source: Rory Finneren

Narrow snow removal machines used to haul away snow from separated bike lanes.

Source: Bicycle Dutch Blog

Education and Encouragement

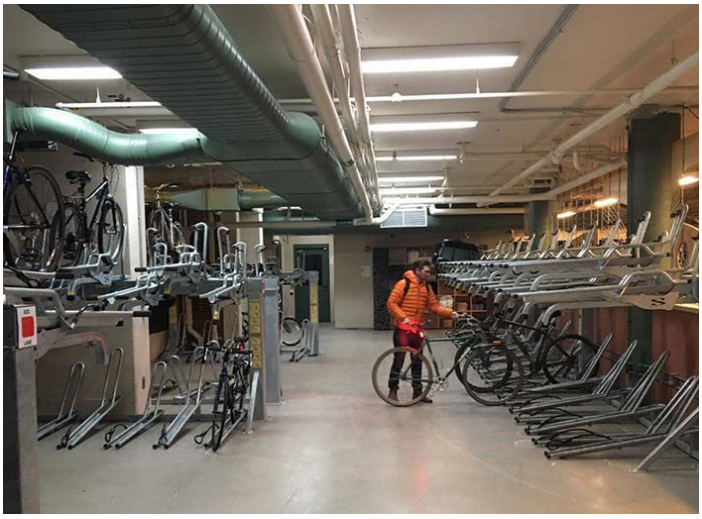
- Collaborate with Pittsfield Public Schools to establish a Safe Routes to School program to encourage students to walk and bike to school. This program can include other activities such as 'learn to ride' classes, 'bike to school' day, and the development of a 'traffic garden to teach about traffic safety.
- Develop and maintain information such as an updated City website about bicycling resources and an updated map of bicycle facilities.
- Partner with local bicycle advocacy groups to organize events to encourage bicycling that align with other local, state, and national events such as 'Bike to Work Day'.
- Consider establishing a program to teach bicycle riding classes to adults.
- Continue to organize and expand the number of community bike rides.
- Implement a bike share program and monitor ridership, safety, and equitable access.
- Develop a Parking and Transportation Demand Management (PTDM) program to encourage developers, property managers, and employers to promote public incentives such as bicycle commuter benefits.

Zoning and Development Review

- Review City's current zoning requirements and modify as necessary to mandate a minimum number of bicycle parking spaces for all development projects.
- Review the City's current development review process and modify as necessary to include multimodal transportation mitigation requirements including implementation of the recommended bicycle facilities.
- Establish a program or policy to partner with developers to incentivize or encourage new developments to include bike storage rooms, changing rooms, and maintenance stations.
- Establishing a subdivision ordinance that requires developers to provide connectivity easements for shared use paths and/or to reserve right of way for proposed bikeways.

Education programs to teach children to ride bicycles.

Source: Cascade Bicycle Club



Bicycle storage rooms provided as part of new apartment and office buildings to encourage bicycling.

Source: Saris Infrastructure. Credit: Mike Basarich

Funding

- Continuously monitor and leverage available local, state, regional, federal and non-profit funding sources to plan, design, and implement recommended bicycle facilities and amenities.
- Continue to leverage state-level funding programs such as MassDOT Complete Streets Funding Program and Shared Streets and Spaces Grant Program to implement recommended bicycle facilities.
- Leverage state-level Chapter 90 Program funding to implement recommended bicycle facilities. Chapter 90 program reimburses cities and towns for expenditures on road-related construction projects and bikeways. Municipalities have the flexibility to use Chapter 90 funds for the construction and maintenance of shared use paths, dedicated bikeways, right-of-way acquisition, landscaping, and design work.
- Leverage the Mass Trails funding program to implement recommended bicycle facilities.
- Revise the project prioritization process and the City's Capital Improvement Plan to include recommended bicycle facilities.
- Partner with private sector entities such as developers, major employers, or institutions to fund bicycle facilities in the city.

Evaluation

- Based on detailed corridor-level studies, confirm or modify bicycle facility types and alignments for recommended facilities.
- Track progress on implementation of recommended bicycle facilities by priority level, facility type, and the number of miles.
- Establish a bicycle counts program to monitor overall bicycle ridership in the city. Bicycle counts can be collected through a mix of manual counts, permanent and temporary bicycle counters at strategic locations.
- Conduct public surveys periodically to receive feedback on implemented bicycle infrastructure in the city.
- Collaborate with the local bicycle advocacy group and/or advisory committee to host listening and learning sessions.
- Monitor bicycle mode share as part of all trips in the city.
- Collect and analyze bicycle related crash data to identify hot spot locations.

Additional Sources:

- Massachusetts Bicycle Transportation Plan (2019)
- MassDOT Municipal Resource Guide for Bikeability (2019)

The $64 million Cultural Trail in Indianapolis, IN, was paid for with a mix of federal, local, and private funds.

Source: Saris Infrastructure. Credit: Kelley Jordan Schuyler

Permanent automated bicycle counters in Cambridge, MA.

Source: City of Cambridge, MA

Source: Kittelson

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