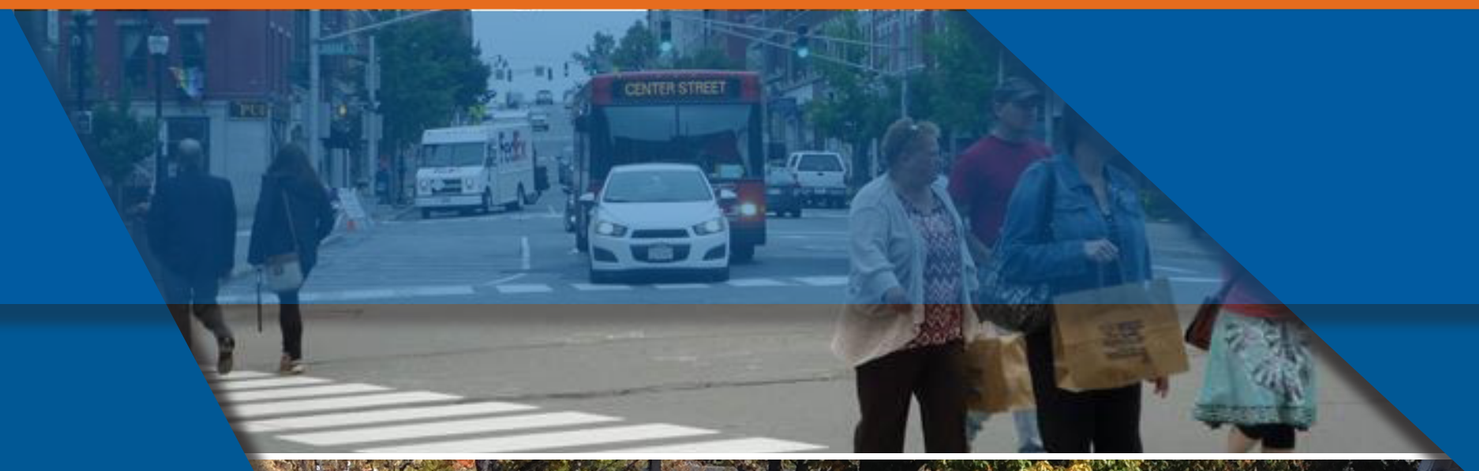
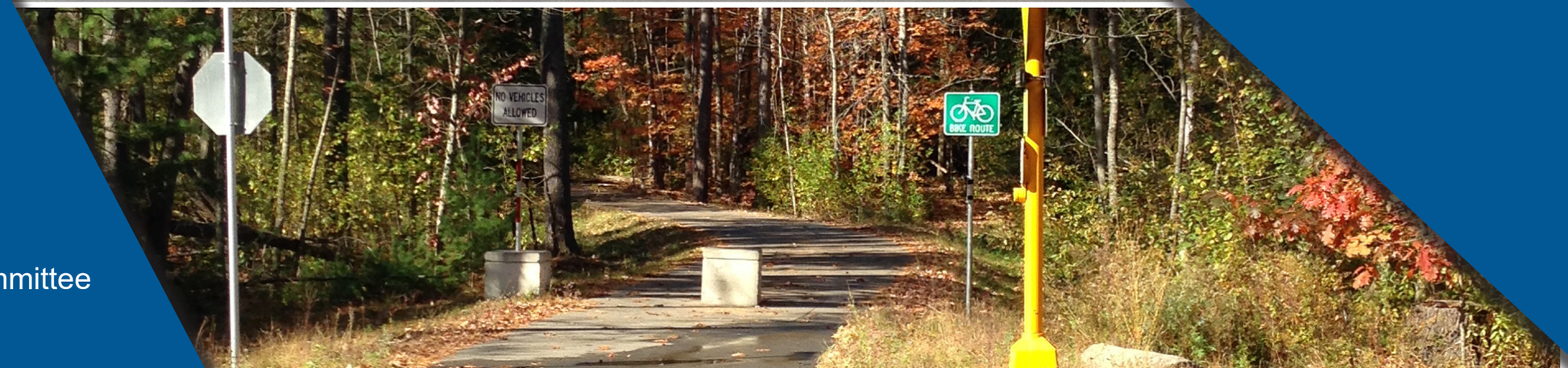
BACTS - Long-Range Pedestrian and Bicycle Transportation Plan





July 26, 2019

prepared for:

BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

prepared by:

T·Y·LIN INTERNATIONAL

Adopted by the BACTS Policy Committee

September 17, 2019

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USDOT Disclaimer

This report was funded in part through a grant from the Federal Highway Administration, U.S. Department of Transportation. The views and opinions of the authors or agency expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

BACTS Title VI Policy Statement

The Bangor Area Comprehensive Transportation System is committed to ensuring that the fundamental principles of equal opportunity are upheld in all decisions involving our employees and contractors/consultants and, to ensuring that the public-at-large is afforded access to our programs and services.

To that end, no person shall be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any BACTS program or activity on the grounds of race, color, national origin, income, sex, age, disability, or limited English proficiency. BACTS assures all its programs and activities will be free from discrimination, whether those programs and activities are federally funded or not.

BACTS conducts its Title VI/Environmental Justice Program in a team approach involving all BACTS personnel. The Director of BACTS is responsible for BACTS' compliance with the Title VI/EJ implementing regulations.

Inquiries concerning BACTS' policies, investigations, complaints, compliance with applicable laws, regulations, and concerns regarding compliance with Title VI/Environmental Justice, may be directed to the Director, Bangor Area Comprehensive Transportation System, 12 Acme Road Suite 104, Brewer, ME 04412, telephone 207-974-3111.

This policy statement must be circulated throughout BACTS and be included by reference in all contracts, agreements, programs and services administered by BACTS.

Preface

The BACTS Long-Range Regional Pedestrian and Bicycle Transportation Plan has been developed to document and provide a shared vision for a safe and functional connected pedestrian and bicycle transportation network within the greater Bangor urbanized area. This Plan complements the BACTS Metropolitan Transportation Plan (MTP), and as is the case with the MTP, serves as a guide for collaboration, coordinated decision-making and long-term planning for programming of transportation projects at the municipal, regional and state levels.

Because BACTS neither owns nor operates the transportation system it has authority and responsibility for transportation policy-making in; it is not involved in the implementation of project priorities established or proposed. As a Metropolitan Planning Organization (MPO), BACTS' primary responsibility is to develop regional plans that coordinate various elements of transportation networks into one cohesive regional transportation system and identify transportation investment priorities within the region. BACTS evaluates and approves proposed transportation improvement projects; facilitates communication between member communities and local, state and federal transportation agencies; and sponsors and conducts studies to assist in the transportation planning process with the goal of executing a continuing, cooperative and comprehensive planning process in the region.

While the University of Maine campus is an integral part of the BACTS region, the campus is outside of the responsibility and authority of BACTS. Therefore, it is outside the scope of this plan to recommend or propose improvements to the University of Maine transportation network. BACTS recognizes the campus is a very high generator of pedestrian and bicycle traffic and encourages the University to evaluate, plan and program improvements to their transportation network which enhance the safety and connectivity of the pedestrian and bicycle facilities offered on campus.

All proposed projects listed within this document are planning level recommendations based solely on observed gaps in transportation network connectivity and/or areas of observed potential for safety improvements. The projects listed are provided for illustrative purposes and may require further evaluation and scoping to determine feasibility.

Identification in this Plan does not constitute a guarantee that any specific project will be implemented in whole, or in part, during the planning horizon.

Definitions

- Metropolitan Planning Organization - A metropolitan planning organization (MPO) is a federally mandated and federally funded transportation policy-making organization in the United States that is made up of representatives from local government and governmental transportation authorities.
- Metropolitan Transportation Plan - The Metropolitan Transportation Plan (MTP) is a long-range planning document that identifies transportation deficiencies, policies, strategies, and projects over the next two decades. It is updated on a four-year cycle.
- BACTS Region - the greater Bangor urbanized area, which includes all of Bangor, Brewer, Veazie, and Penobscot Indian Island; Orono and Old Town east of I-95; and portions of Hampden, Hermon, Milford, Orrington, and Bradley.
- Public Identified Priority Location - Citizen-identified locations of concern in each community, as compiled by BCM at the public forums.
- Place of Interest – Land use destination that generates pedestrian demand.
- Pedestrian/Bicycle Crash – A crash involving a pedestrian or bicyclist that requires either $1,000 or greater in damage, an injury, or a fatality to be reported.
- East Coast Greenway - The East Coast Greenway is a 3,000-mile biking and walking route linking the major cities of the Atlantic coast of the United States, from Calais, Maine, to Key West, Florida.
- Sidewalk - a usually paved walk for pedestrians at the side of a street.
- Multi-Use Path - A multi-use path is a form of infrastructure that supports multiple recreation and transportation opportunities, such as walking, bicycling, inline skating and people in wheelchairs.
- Municipal Boundary - The terms mean the same as city/town limit/boundary.
- BACTS Boundary – Limit of the BACTS Region.
- Pedestrian Facilities – Generally consist of sidewalks.
- Bicycle Facilities – Generally consists of multi-use paths, bicycle lanes, or roadway shoulders.

Acronyms

- BACTS – Bangor Area Comprehensive Transportation System
- MaineDOT – Maine Department of Transportation
- FHWA – Federal Highway Administration
- FTA – Federal Transit Administration
- USDOT – United States Department of Transportation
- BCM – Bicycle Coalition of Maine
- RRFB – Rectangular Rapid Flash Beacon

EXECUTIVE SUMMARY

The BACTS Long-Range Pedestrian and Bicycle Transportation Plan inventories the existing pedestrian and bicycle facilities, identifies network facility gaps and deficiencies, and offers recommendations to create a connected regional pedestrian and bicycle transportation network in the greater Bangor urbanized area. It is mindful of the financial constraints BACTS municipalities face, as well as the geographical, environmental, land use, and demographic limitations of the region. This Plan will be incorporated, by reference, into the BACTS 2018-2038 Metropolitan Transportation Plan (MTP) and the subsequent update of that Plan.

The BACTS region (the U.S. Census defined Bangor Urbanized Area) covers 43 square miles encompassing the urban areas of Bangor, Bradley, Brewer, Hampden, Hermon, Milford, Old Town, Orono, Orrington, Penobscot Indian Island, and Veazie with a population of 60,248 according to the 2017 ACS 5-Year Estimates.

MEANS OF TRANSPORTATION TO WORK
2013 - 2017 ACS 5-YEAR ESTIMATES

	Bangor	Bradley	Brewer	Hampden	Hermon	Milford	Old Town	Orono	Orrington	Penobscot Indian Island	Veazie	Bangor Urbanized Area
Total:	**15,141**	**777**	**4,819**	**4,021**	**3,225**	**1,621**	**3,855**	**4,815**	**1,773**	**321**	**930**	**28,637**
Car, truck, or van:	13,245	746	4,441	3,818	3,015	1,541	3,453	3,683	1,669	288	889	24,978
Drove alone	11,268	671	3,999	3,545	2,765	1,217	2,789	3,150	1,504	228	828	21,334
Carpooled:	1,977	75	442	273	250	324	664	533	165	60	61	3,644
In 2-person carpool	1,712	75	312	161	196	276	639	415	138	50	46	3,125
In 3-person carpool	136	0	70	0	33	48	25	68	27	10	13	283
In 4-person carpool	52	0	8	108	11	0	0	27	0	0	0	87
In 5- or 6-person carpool	16	0	52	4	10	0	0	23	0	0	2	88
In 7-or-more-person carpool	61	0	0	0	0	0	0	0	0	0	0	61
Public transportation (excluding taxicab):	227	0	19	18	0	0	35	48	0	6	6	359
Bus or trolley bus	227	0	19	18	0	0	35	31	0	6	6	342
Streetcar or trolley car	0	0	0	0	0	0	0	17	0	0	0	17
Taxicab	11	0	19	0	0	0	18	0	0	0	0	48
Motorcycle	17	0	28	0	16	0	0	12	0	0	11	51
Bicycle	25	0	7	0	0	25	79	45	0	0	0	156
Walked	796	0	42	20	27	0	111	758	20	17	0	1,655
Other means	178	0	72	0	13	38	0	22	0	2	0	312
Worked at home	642	31	191	165	154	17	159	247	84	8	24	1,078

Based on BACTS jurisdiction and available resources, developing the Plan using a facility-based pedestrian and bicycle network was determined to be the most appropriate for the BACTS region. We recognize the importance of the many off-road trails and recreational facilities to pedestrians and bicycle enthusiasts. However, the emphasis of BACTS' efforts is the on-road transportation network. BACTS planning area (and jurisdiction) is limited to arterial and collector roads. Local roads fall under the jurisdiction of each municipality. There are a couple of off-road multi-use paths noted in the proposed facilities plan. These off-road facilities are local initiatives specific to the individual municipalities which have been proposed by advisory committee members and have been included in the Plan as a courtesy.

Retrofitting pedestrian and bicycle facilities into an existing roadway as a stand-alone project presents more challenges than incorporating facilities into the design of a new or reconstructed roadway. However, the purpose of the Plan is to identify gaps and deficiencies and provide recommendations on how to create a pedestrian and bicycle transportation network that connects the entire BACTS region. Figure 6.9 Illustrates the existing pedestrian transportation network and the proposed improvements to achieve pedestrian transportation network that connects the entire BACTS region. Figure 7.9 Illustrates the existing bicycle transportation network and the proposed improvements to achieve a bicycle transportation network that connects the entire BACTS region. BACTS urges member municipalities who don't already have a local plan in place to address gaps in pedestrian and bicycle facilities, to utilize this Plan as a framework.

Addressing the needs of non-motorized (and transit) users early in the transportation project planning process is cost-effective, efficient, and critical to the development of a balanced and safe transportation system. The MaineDOT Complete Streets Policy outlines how the State, and its project partners, will consider the needs of all users when planning and developing projects funded partially or in full through MaineDOT. This includes all MPO and Locally Administered Projects, regardless of the reason the project was initiated. The policy must be adhered to for any relevant new construction, rehabilitation and reconstruction projects. Municipalities are strongly encouraged to adopt similar local policies to ensure projects funded locally are also consistently planned and designed in a manner that considers pedestrian, bicycle and transit needs in planning and developing road projects, as well as when reviewing and approving land use, housing and commercial developments.

Both the U.S. Bicycle Route 1 and the East Coast Greenway cross through the BACTS region. **U.S. Bike Route 1** is a cross-country bicycle route that runs the length of the United States eastern seaboard. It is 1,525.6 miles with the southern segment beginning at Key West, Florida and the northern segment terminating at Calais, Maine at the Canadian border. **The East Coast Greenway** (ECG) is a 3,000-mile bicycling and walking path which begins in Calais, Maine at the Canadian border and extends to Key West, Florida. In the BACTS region, the ECG route runs through Bangor and Brewer.

In addition, Northern Maine Development Commission (NMDC), in conjunction with the Maine Department of Transportation (MaineDOT), is working towards establishing a permanent federally designated bicycle route in northern Penobscot and Aroostook Counties. The bike route designation would complement and connect to the existing U.S. Bike Route 1. As currently envisioned the Proposed Northern US Bike Route will connect to the existing U.S. Bike Route 1 in Bangor and terminate at the International Bridge in Fort Kent. The proposed route is approximately 320 miles. The proposed route crosses through the BACTS region in Bangor, Veazie, Orono, and Old Town. More information about the proposed route, including maps can be found on the NMDC website http://www.nmdc.org/. The proposed routes have been included on the Plan maps for reference.

The recommended projects listed in this Plan are planning-level recommendations and may require further evaluation to determine feasibility and/or appropriate treatment. A "preferred" facility type may not be practicable for a variety of reasons and alternative facilities or treatments may have been considered instead. The BACTS region is primarily rural in nature and has characteristics that are vastly different than those in more densely developed and populated metropolitan areas. Other constraints (utilities, drainage, available right-of-way, etc.) may prohibit the viability of what may be considered "preferred" or "modern" bicycle facilities even in the more densely developed and populated areas.

Guidance documents included as appendices to this Plan provide illustrative information on the types of recommended facilities and treatments. The Federal Highway Administration (FHWA) has adopted American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets (Green Book)* and the supplemental guides for pedestrian and bicycle facility design as the standard for projects on the National Highway System (NHS). The *Manual on Uniform Traffic Control Devices (MUTCD)* is the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel. With the exception of some ADA minimum requirements for pedestrian facilities which exceed federal minimums, MaineDOT generally follows the AASHTO standards for bicycle and pedestrian facility design.

1.1 Introduction

The Bangor Area Comprehensive Transportation System (BACTS) is the organization designated by Federal and Maine state government to carry out much of the transportation planning in the greater Bangor urbanized area, which includes all of Bangor, Brewer, Veazie, and Penobscot Indian Island; Orono and Old Town east of I-95; and portions of Hampden, Hermon, Milford, Orrington, and Bradley (see **Figure 1.1**). BACTS is responsible for advising and prioritizing certain transportation needs for the region for the Maine Department of Transportation (MaineDOT), Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

With the assistance of T.Y. Lin International (TYLI), BACTS is developing a regional long-range pedestrian and bicycle transportation plan which will be incorporated by reference into the BACTS Metropolitan Transportation Plan (MTP). The MTP serves as a guide for development of future Transportation Improvement Programs (TIP), transportation studies, work programs, and projects in the BACTS region covering a 20-year horizon.

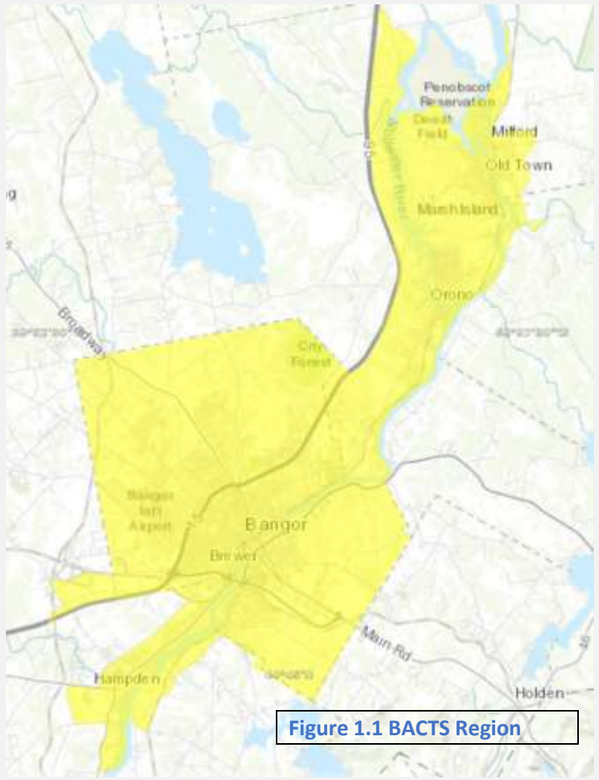


Figure 1.1 BACTS Region

1.2 Purpose and Objective

Purpose

The Plan shall promote safe, convenient and attractive pedestrian and bicycle transportation options in the BACTS area which provides ADA accessible connectivity with other modes of transportation to support independent mobility for all people regardless of age, physical constraint, or income. This Plan envisions transportation options that supports the goals for livability and sustainability, promotes walking and bicycling as an integral part of an active lifestyle, and fosters a sense of community. The system will include a comprehensive, safe, and logical region-wide transportation network that supports walking and bicycling as a viable, convenient and popular travel choice for residents and visitors.

Objective

- Reduce the number of bicycle and pedestrian related injuries and fatalities.
- Enhance connectivity and multi-modal transportation choices.
- To continue to identify and map existing and proposed facilities.
- To provide for accessibility and safety of people of all ages and abilities, recognizing the responsibility to plan for the needs of disadvantaged or vulnerable groups or individuals, specifically those with vision or hearing impairments and/or using mobility devices.

1.3 Advisory Committee

The BACTS Policy Committee established an advisory committee to work with the consultant and assist in the development of goals, objectives, and recommendations and offer input, suggestions, and feedback to the consultant. The committee included municipal and MaineDOT officials, representatives from active transportation groups, and BACTS staff.

Patrick	Adams	Active Transportation Planner	MaineDOT
Andrew	Allen	Eastern Region Traffic Department	MaineDOT
Erik	DaSilva	Education Program Coordinator	Bicycle Coalition of Maine
John	Devin	Region Engineer	MaineDOT
Linda	Johns	Planning Director	City of Brewer
Bruce	Mattson	Traffic Engineer	MaineDOT
Kierie	Piccininni	Advocate	Walk N Roll
Belle	Ryder	Asst. Town Manager	Town of Orono
John	Theriault	City Engineer	City of Bangor
Kyle	Drexler	Town Planner	Town of Orono
Jim	Chandler	Town Manager	Town of Hampden
Connie	Reed	Transportation Planner	BACTS
Rob	Kenerson	Executive Director	BACTS
Tom	Errico	Consultant	TYLIN
Todd	Serbent	Consultant	TYLIN

1.4 Other Studies and Plans

The bicycle and pedestrian plans for the municipalities included in the BACTS region were compiled. Bangor, Brewer, Orono, Old Town, Hermon, Veazie and Hampden have bicycle and pedestrian plans in the latest update of their Comprehensive Plans. Orrington prepared a Village Plan that addresses pedestrian issues. Milford, Bradley, and Indian Island do not have Comprehensive Plans, or the Plans do not contain bicycle and pedestrian considerations. The following summarizes the bicycle and pedestrian plans:

Bangor

Bangor has strong pedestrian linkages in the urban core of the City and scattered parks, but no formal coordinated interconnected system. The City has a goal to “Utilize a ‘Complete Streets’ approach in reconstruction and new roadway design for safe movement of pedestrians and other non-automobile traffic in the community”. The City has the following recommended policies to reach this goal:

- Formally identify a pedestrian sidewalk system on major streets and in residential areas. Whenever possible sidewalks should be separated from vehicular travel lanes.
- Develop a program to widen pavement and designate pedestrian/bike lanes on existing major arterial streets which lack sidewalks.
- Upgrade existing sidewalks in developed areas. In order to reduce long-term maintenance costs, the City should consider opportunities for eliminating sidewalks on one side of a street and replacing these sidewalks with a landscaped esplanade.
- Provide clearly marked and properly designed interconnections between various automobile, pedestrian and other pathways in the City which are handicapped accessible.

- The City of Bangor Broadway Corridor Study recommendations to improve bicycle and pedestrian conditions on Broadway from I-95 to Burleigh Road include the following:
  - Add a pedestrian connection between Husson Avenue and the Bangor Gardens Neighborhood
  - Create a multi-use path from I-95 to Grandview Avenue

Brewer

The City of Brewer updated its Comprehensive Plan in 2015. The following are goals contained in said Plan:

> "Create and sustain more opportunities for people to use alternatives to the automobile by interconnecting neighborhoods and centers of activity with pedestrian and bicycle paths and public transportation links. Make sure these alternatives are easily accessible and readily available to older citizens and those with disabilities."
>
> "Provide a variety of settings and outdoor recreational opportunities for parks, pathways, and facilities – including riding a bike or walking along a road, playing tennis or organized sports, or cross-country skiing, biking, walking, or snowmobiling along a woodland path."
>
> "Provide ready and safe access to parks, pathways, and other recreation areas from every neighborhood in the City and along the Penobscot River waterfront."

The City continues to amend their ordinances to help reach these goals. Items currently in their Land Use Code include the requirement that all new roads have at least one sidewalk and are designed to safeguard against hazards to both vehicular and pedestrian traffic on proposed streets.

With the assistance of a hired consultant, the City performed a Walkability and Placemaking Study in the summer of 2017. This study concentrated on the downtown and waterfront locations. The City is currently implementing recommendations for bicycle and pedestrian improvements.

The City of Brewer has completed a multi-use trail along the Penobscot River called the "Brewer Riverwalk". This 0.78-mile lighted trail has an 8-12 foot paved width with benches, camera-fed security, free Wi-Fi, and a tunnel underneath the Joshua Chamberlain Bridge. The trail connects the downtown area to other businesses and uses and has also been designated as part of the East Coast Greenway.

The construction of a trail/sidewalk along Dirigo Drive is highly used by active people for walking and running. This 3-mile trail includes benches and is marked with pedestrian mileage signage. The easterly end connects with the Eastern Maine Healthcare Systems complex who has walking incentives for their employees.

The City added RRFB crosswalks at 3 locations and upgraded signage and markings at most other locations. All major intersections have been upgraded to be ADA compliant.

The City now has a sidewalk along Parkway South from Wilson Street to Greenwood Drive (which is where the residential development ends). This sidewalk connects with two crosswalks across Parkway South to the Brewer Community School (in which one is a RRFB). It also connects the dense residential neighborhoods and the City-owned properties.

The City continues to upgrade deficient sidewalks and improve bicycle accommodations whenever possible. The East Coast Greenway comes through Brewer. While cycling has not been widely integrated into the Brewer community, improvements such as the Brewer Riverwalk will continue to be investigated. An unused railroad spur owned by Pan Am has potential to become part of a regional bicycle and pedestrian trail network.

BACTS completed a Safe Route to School Study in 2010 and recommended the following, much of which has been completed:

- Extend the sidewalk on the north side of Parkway South to Elm Street; [The City now has sidewalks along Parkway South from Wilson Street to Greenwood Drive as noted above.]
- Add a sidewalk on Grove Street
- Build a walkway on the City owned property across from the schools which will align with the current crosswalk on Parkway South in front of the school and connect Sherwood Forest neighborhoods to the crosswalk. [The City has constructed as noted previously.]
- Add painted shoulder pedestrian areas in the Sherwood Forest neighborhood

Orono

The following topics each have detailed sections in Volume 1 of the Comprehensive Plan:

- Sidewalks and Crosswalks (Volume 1, p. 8-11).
- Bicycling (Volume 1, p. 8-12).
- University of Maine Envisioned Circulation System (Volume 1, p. 8-16).
- Complete Streets (Volume 1, p. 8-19).
- Proposed Downtown Loop Trail (Volume 2, p. 10-3).
- Trails and Recreational Open Space Network (Volume 1, p. 10-7).
- Trail Connections, Locally and Regionally (Volume 1, p. 10-11).

The following topics each have detailed sections in Volume 2 of the Comprehensive Plan:

- Downtown long-term transition (Volume 2, p. 10)
  - Transition from a neighborhood commercial district to a specialty district.
  - Encourage mixed-use and residential development within walking distance.
- Expanding resource-based economic sectors (Volume 2, p. 12)
  - Discusses regional trail system.
- Beautification (Volume 2, p. 21)
  - Discusses plan to enhance the built environment through vegetation and landscaping in public places.
- Adjusting standards in the C-2 district (Volume 2, p. 29-30)
  - Amend standards of district to meet purpose of mixed-use, walkable district.
- Adjusting boundaries and standards of the Village Commercial District (Volume 2, p. 31)
  - Downtown will grow in a compact, walkable manner.
- Designing Accessible Street Network (Volume 2, p. 34)
  - Adopt a complete streets policy.
- Street and sidewalk improvements (Volume 2, p. 36)
  - Plan for improvements in 5-year Capital Improvement Plan.
  - Pavement preservation.

The following can be found in the Code of Ordinances:

- Chapter 18 – Land Use, Article V, Sec. 18-128: Design Guidelines
  - Discusses standards for C-2 and Village Commercial districts.
  - "Pedestrian circulation and face-to-face retail sales shall be encouraged."
- Chapter 18 – Land Use, Article V, Sec. 18-134: Mobile Home Parks
  - "Where possible, provision shall be made for pedestrian and bicycle paths to connect mobile home lots with recreational facilities within the park and with such paths or rights-of-way outside but adjacent to the park."
- Chapter 18 – Land Use, Article V, Sec. 18-135: Off-street Parking and Loading

  - "Provisions must be made to restrict the "overhang" of parked vehicles when it might restrict traffic flow on adjacent through roads, restrict pedestrian and bicycle movement on adjacent walkways, or damage landscape materials."

- Chapter 18 – Land Use, Article VI, Sec. 18-177: Site Plan Review Criteria
  - Discusses placing bicycle racks at building entrance areas if appropriate.
- Chapter 32 – Streets and Sidewalks, Article II: Right-of-Way
  - This article deals largely with the conditions and maintenance of streets and sidewalks. While not much is mentioned specifically about pedestrians or bicyclists, it is relevant information in regard to the infrastructure that these people use.
- Chapter 34 – Traffic and Vehicles, Article II, Sec. 34-36: Designation of Crosswalks
  - " The town manager and chief of police are hereby authorized to establish and to designate and shall thereafter maintain, or cause to be maintained, by appropriate devices, marks or lines upon the surface of the roadway, crosswalks, at intersections where in their opinion there is particular danger to pedestrians crossing the roadway…"
- Chapter 34 – Traffic and Vehicles, Article II, Sec. 34-37: Designation of Safety Zones, Traffic Lanes
  - "For the protection on pedestrians, the town manager and chief of police…are authorized to locate safety zones, by suitable designations, within the roadways of squares or highways."
- Chapter 34 – Traffic and Vehicles, Article III: Stopping, Standing, and Parking
  - This article provides details about vehicles obstructing pedestrian access.

The following maps can be found in Volume 1 of the Comprehensive Plan:

- Sidewalks and Crosswalks in Orono Village (Comp Plan, Vol. 1, p. 8-11).
- Overview of Trail System in Orono (Comp Plan, Vol. 1, p. 10-9).
- University of Maine Recreational Trail System (Comp Plan, Vol. 1, p. 10-10).

The following information is from Chapter 8 of Orono's 2014 Comprehensive Plan.

> "Orono maintains 13 miles of public sidewalks. Significant gaps exist in the sidewalk system. No sidewalks exist on Kelley Road, Main Street south of Dirigo Pines, or on most of Stillwater Avenue west of I-95. Crossing Route 2 is a safety concern. Many pedestrian attractions exist on both sides of Route 2. Crossing guards are staffed before and after the school. The Pine and Mill Street intersection includes pedestrian cycles. Sidewalks are maintained through the Town's capital improvement plan."

The Plan notes that BACTS divides Orono's roads into three cyclist skill levels. The beginning level roads include Bennoch Road to Godfrey Drive, Colburn Drive, Penobscot Street, and Union Street. Intermediate cyclist roads include Main Street, Park Street, Margin Street, Kelley Road, Stillwater Avenue, Rangeley Road, Water Street, and North Main Street. Advanced cyclist roads include College Avenue, Forest Avenue, Goodridge Drive, and Mill Street. Orono has a marked bicycle route along Main Street/Park Street and adequate shoulders along Route 2. The University of Maine maintains off-road bicycle trails/paths.

Orono has a goal to "Design a street network that is equally accessible, safe and efficient for travel by motor vehicle, bicycle and on foot, and that promotes efficient extension of public utilities in public right-of-way". To achieve this goal, Orono will adopt a complete streets policy that includes:

- Consulting MaineDOT to assist in preparing the policy.
- Affirmation that all users of the system, including pedestrians and cyclists of all skill levels, should be able to use the towns streets safely.
- Maintenance of sidewalks and bicycle paths for safe year-round use.
- Applying the policy to the entire width of rights-of-way of both new streets and retrofit projects.
- Use of best design criteria to accommodate multiple modes of travel, scaled to each type of street.
- Integration of the off-street trail system into the complete street program.

The Town recently conducted a study of Park Street that developed the following specific bicycle and pedestrian recommendations:

- Reconstruct the sidewalks on both sides of Park Street from College Avenue to the Reserve Apartments.
- Add a sidewalk on Grove Street.

Old Town

The following information is from Chapter 9 of Old Town's 2016 Comprehensive Plan.

> "Old Town has a 22-mile sidewalk network serving mostly the urbanized portions of the Town. The University of Maine maintains an extensive bicycle trail system connecting the University to University Housing Park, Stillwater Avenue, and Perkins Avenue. Old Town suggests utilizing Brewer's Safe Route to School Study for their purposes. "

Old Town has the following goals for their Bicycle/Pedestrian Network (Figure 9.19 9.4.c-9.4.g):

- Based on an inventory of streets and roads, identify and prioritize those roadways that should be redesigned and ultimately improved as Complete Streets; amend ordinances to require new development activity on streets designated as Complete Streets to share in the cost implementing needed public improvements.
- Continue to improve sidewalks especially in downtown and in neighborhoods adjacent to downtown.
- Continue to improve off-road walking and cycling paths for health and recreation as well as to provide an alternative to vehicular traffic.
- Review street opening regulations and revise such that public or private entities who cause a street opening are required to pay the cost of restoring the street to or sidewalk to good repair, or as an alternative, require a surety bond that would allow the city to recoup costs incurred by inadequate repair work.
- Explore feasibility of future adoption of Woodland Avenue.

Hampden

The following goals were established in the 2010 Hampden Comprehensive Plan:

- Meet the diverse needs of residents and minimize vehicle miles traveled by promoting alternatives to single passenger commuter trips, including: bikeways, the BAT, park and ride lots, carpooling, and pedestrian walkways.
  - Explore a sidewalk network throughout Route 1A and the 4-mile square perimeter.
  - Promote a bike path/pedestrian way along Coldbrook Road, Route 1A from Bangor to Dorothea Dix Park, and County Road.

Hermon

The following was taken from the Hermon Comprehensive Plan:

- The Town of Hermon will continue to explore and expand trail systems that promote the health, well-being and transportation of its residents.

The following recommendations were also taken from the Comprehensive Plan:

- Complete the connection of schools and village center via a bike/pedestrian trail system.
    - Explore the appropriateness of acquiring permanent easements for trails to support multi-seasonal use by pedestrians, equestrians, bicyclists, jogger, snowmobilers and all-terrain vehicle (ATV) users.
    - Pursue constructing more trails that connect schools and residential areas to allow more utilization of nature and open space.
    - Develop a master plan that identifies all recreational trails that are available for public use in Hermon.

Veazie

The Town prepared a Comprehensive Plan in 2017 with the following pedestrian and bicycle elements:

Veazie has a concentration of sidewalks in the central village area. Veazie's sidewalks include:

- School Street from State Street to the Veazie Community School.
- State Street to Main Street and providing access to the ballfield recreation areas.
- Intersection of State Street and School Street then south to the town line.

Sidewalks appear to be adequately provided within residential areas. Bicycle/pedestrian routes are found along Chase Road, Route 2, and School Street. Safety for cyclists and pedestrians on other roads in town varies. There is a bicycle trail from Veazie into the neighboring Town of Orono.

Orrington

The Town of Orrington prepared a Village Improvement Plan (that envisions the North Orrington Village as a Village Center) that identified several recommendations including:

High Importance:

- Pedestrian safety & infrastructure: Sidewalks and crosswalks in the Village.
- Traffic calming for the Village area.
- Design guidance for new development in the Village, to ensure development makes a positive contribution to the Village.

Medium Importance:

- Bicycle amenities.
- Signage style for the Village(s), including historic markers/signs.
- Improvements to the Snows Corner intersection.
- Gateway sign improvements.
- A community bulletin board or informational kiosk in the village center.
- A small park in front of Snows Corner Plaza.
- Working with private owners on improvements for the Village.
- Decorative banners, flags, or hanging baskets.

Other Plan Components, Low Priority:

- Pedestrian-scale lighting.
- Added landscaping and street trees to enhance the Village.
- Small roadside parks or seating areas.

MaineDOT Heads Up Campaign

Senior leadership at MaineDOT, in response to urging from citizens, legislature and the media, has developed a program aimed at mitigating non-motorized crash fatalities. The "Heads Up" program targets geographic areas in the State which have experienced a greater than average number of pedestrian and bicycle crashes. The 21 communities identified make up almost 28% of the population in the state and account for more than two-thirds (68%) of all the crashes. Four of the 21 identified municipalities are in the BACTS area - Bangor, Brewer, Old Town and Orono.

To assist with education and outreach efforts, MaineDOT contracted with the Bicycle Coalition of Maine (BCM) to conduct public workshops and forums in each of the targeted communities. The first round of public forums (held in 2017) focused on gathering feedback about locations perceived as dangerous and/or lacking safe pedestrian accommodations. During these meetings a prioritized list of the top ten locations with safety concerns were developed. Using this list of priorities, MaineDOT, BCM, and municipal leaders, performed on-site reviews and have been working together to develop a list of implementation strategies and target specific potential safety improvement projects. Note: Public forums have not yet been held in the City of Old Town.

The following is the list of citizen-identified locations of concern in each community, as compiled by BCM at the public forums. These locations are also identified as "public identified priority location" on the Existing Pedestrian Facilities and Demand maps. The Ranking is a measure of the top ten identified areas of concern within each community, with a ranking of 1 being the area of highest priority. Note: There were two forums held in Bangor, one on the East side of the City and one on the West Side of the City; therefore, the ranking and prioritization has been combined and does not follow 1-10. In addition, an 11th location was identified and prioritized by raise of hand vote and is notated by ***.

Bangor

Priority Locations - All	Rank	Notes about problems
Broadway (95/Center St. to Griffin)	1	Roads seem too wide, Speeding Traffic, No crosswalks, No sidewalks, Crosswalks are not visible enough, Signals not present or not working well, Problems with maintenance and condition, Lack of ADA features and access, no shoulder or bike lanes, too many cars, sidewalk ends abruptly, sidewalks too narrow
Int. of Hammond / 14th / Royal	1	Roads seem too wide, Speeding Traffic, Crosswalks are too long, Crosswalks are not visible enough.
Stillwater (95 overpass to Gilman Rd. (Home Depot area))	2	Roads seem too wide, Speeding traffic, No crosswalks, No sidewalks, Crosswalks are too long, Signals not present or not working well, Other?, running red lights
Maine Ave. / Odlin Rd. (395 to Vermont Ave. Rotary)	2	Roads seem too wide, Speeding traffic, No sidewalks, Lack of ADA features and access.
14th St / Valley Ave. to Ohio St. (Kenduskeag Stream up to Ohio St.)	3	Roads seem too wide, Speeding traffic, No crosswalks, No sidewalks, Lack of ADA features and access.
Intersection Oak/State & Washington	4	Speeding traffic, Signals not present or not working well, Lack of ADA features and access, dangerous for blind people
Int. of Union St. / 13th St. (near park entrance)	4	Speeding traffic, No crosswalks, Crosswalks are not visible enough, Signals not present or not working
Harlow (State/Exchange Intersection to Cumberland)	5	Roads seem too wide, Speeding traffic, Roads/crosswalks are poorly lit, Lack of ADA features and access, confusing intersection / many directions of turning traffic, ped signal too short, drivers do not stop event when lights are on, library entrance is between crosswalks, poor visibility to left when turning onto Harlow from Spring, cars fail to stop at RRFB in front of library, no bike lanes, ped signal too infrequent

Hogan Rd. / 95 overpass (upcoming project)	6	Roads seem too wide, Speeding traffic, No crosswalks, No sidewalks, Signals not present or not working well, Lack of ADA features and access, failure of drivers to obey TCD
Finson (Ohio to Davis)	7	Speeding traffic, No crosswalks, No sidewalks, Roads/crosswalks poorly lit, many young families walking on edge of travel lane
Int. of Union / Hammond / 4th	***	Roads seem too wide, crosswalks are too long.

Brewer

Priority Locations - Brewer	% high priority	Rank	Notes about problems
Int: Wilson / Main	76.9%	1	Speeding traffic, crosswalks are too long, roads/crosswalks are poorly lit, signals not present or working well, motorists' turn signals conflict with ped crossing, too much traffic
Int: Wilson / State	72.0%	2	No crosswalks, no sidewalks, crosswalks are too long, signals not present or not working well, motorists don't yield to peds
Parkway South @ I-395 interchange	66.7%	3	Speeding traffic, crosswalks are too long,
N. Main (Union to Church)	58.3%	4	Speeding traffic, crosswalks are not visible enough, roads/crosswalks are poorly lit, signals not present or not working well, problems with maintenance and condition, needs RRFB
Hannaford (parking lot & rear passage)	54.6%	5	Speeding traffic, motorists cutting intersection to get to Parkway S.
Int: State / Penobscot	52.0%	6	Speeding traffic, crosswalks are too long, motorists run red light
Int: Parkway / Elm / S Brewer Dr.	41.7%	7	No crosswalks, no sidewalks, roads/crosswalks poorly lit, signals not present or not working well
Chamberlain (entire)	37.5%	8	Speeding traffic, roads/crosswalks poorly lit, problems with maintenance and condition (plant growth obscures signs), sidewalks should be on east side, motorists disobey STOP signs, int. with Washington needs 4-way STOP.
Starlight Dr & Sunset Strip (loop)	22.7%	9	No sidewalks, crosswalks are not visible enough, roads/crosswalks are poorly lit, problems with maintenance and condition, Existing street lights don't work
Int: Holyoke / Main	22.7%	10	Speeding traffic, crosswalks are not visible enough, roads/crosswalks are poorly lit, signals not present or not working well.

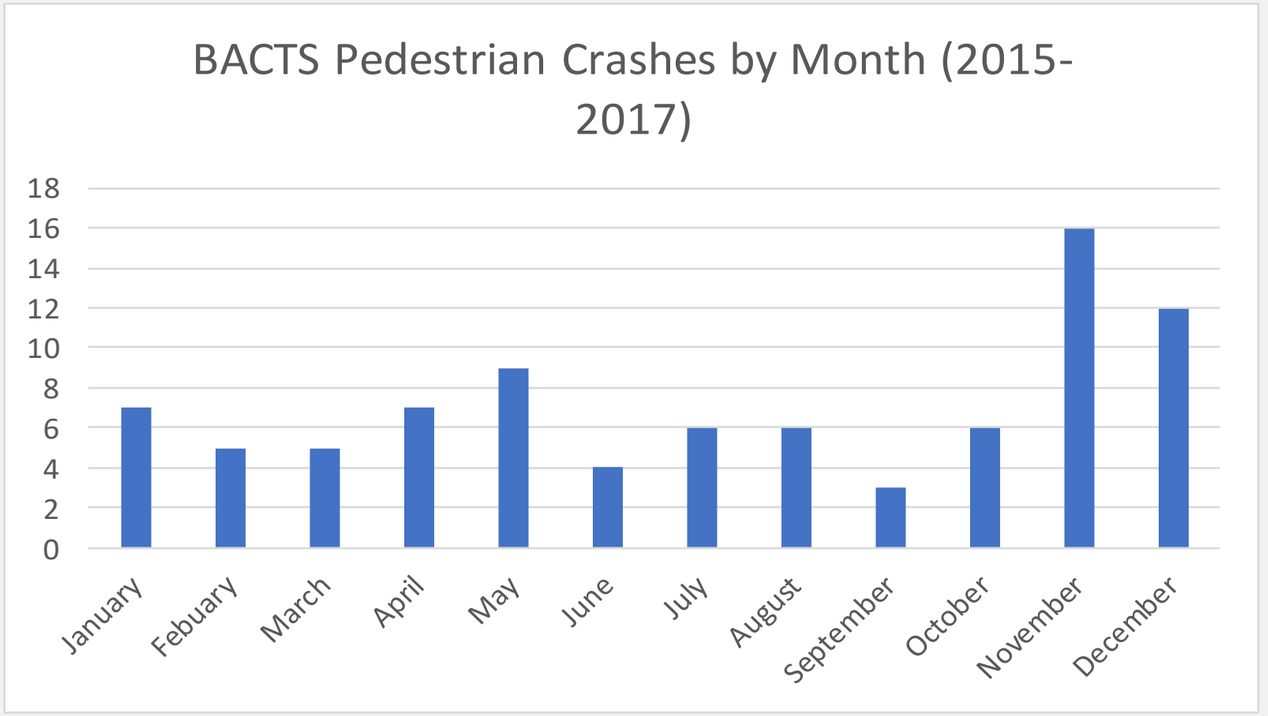
Orono

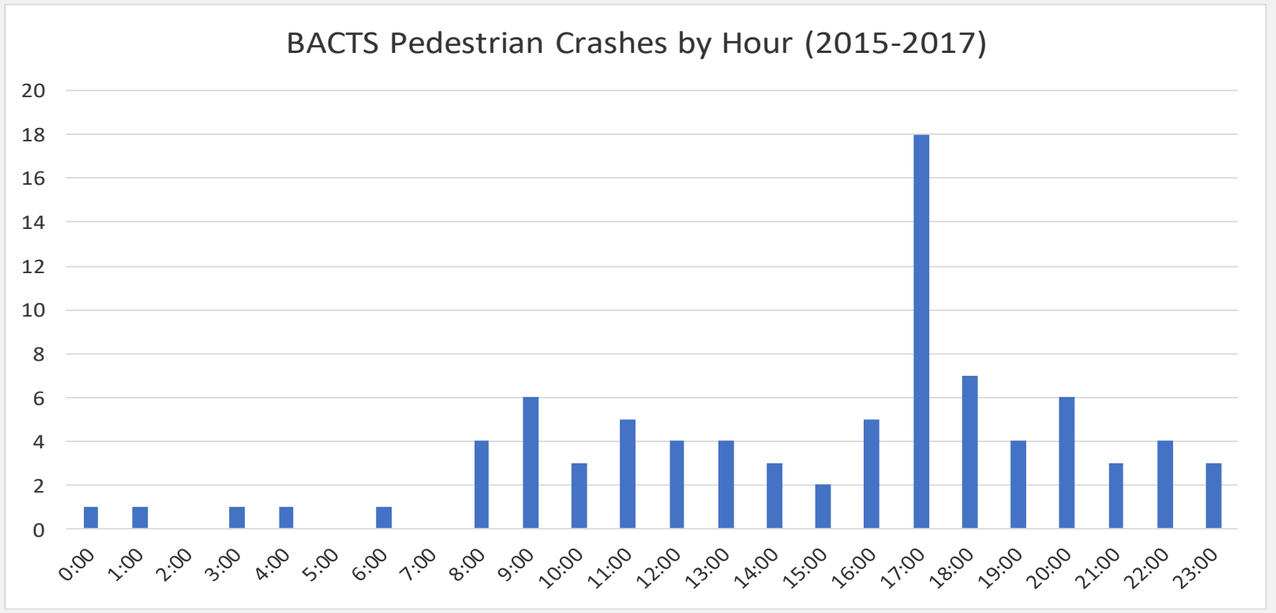
Priority Locations - Orono	% high priority	Rank	Notes about problems
Int: Forest / Bennoch / Mill / Pine	85.7%	1	Roads seem too wide, Speeding Traffic, Crosswalks are too long, Crosswalks are not visible enough, Roads/crosswalks are poorly lit, Signals are not present/working well, gas station traffic, motorists turning right/left and don't yield to peds when crossing signal on, ped crossing signal too short, too many crosswalks, more calming features needed, confusing yield signals, need all-stop for ped crossing, Irving curb-cuts too wide, motorists stop on top of crosswalks
Int: College Ave. / Main St. / Park St.	73.0%	2	Signals are not present/working well, traffic light config is confusing (1 left arrow and 2 straight lights), Motorists turning N onto Park from College don't yield to ped crossing
Main St. (Pine St. to Westwood St.)	52.8%	3	Crosswalks are not visible enough, Roads/crosswalks are poorly lit, traffic does not stop for peds, motorists cut corner if turning right off Main onto Westwood, too many crosswalks
Stillwater Ave. (all of it)	52.6%	4	Speeding Traffic, No crosswalks, No sidewalks, Problems with maintenance and condition, no shoulder, motorists run red lights at Godfrey and I95 ramps
Pine St. (Main St. to Library)	48.7%	5	No sidewalks, Crosswalks are not visible enough, Roads/crosswalks are poorly lit, sidewalk needed on both sides, vehicles going into/out of parking lot do not see/yield to peds, sidewalk would be safer on other side
Int: N. Main Ave. / Main St.	40.5%	6	Roads seem too wide, Speeding traffic, Crosswalks are too long, Crosswalks are not visible enough, Roads/crosswalks poorly lit, Signals not present or not working well
Forest Ave. (end of sidewalk to Essex)	38.2%	7	Speeding traffic, No Crosswalks, No sidewalks, Roads/crosswalks are poorly lit, Problems with maintenance and conditions, no shoulder
N. Main Ave. (Main St. to Penobscot)	35.3%	8	Speeding traffic, No crosswalks, No sidewalks, Sidewalks not present or not working well, Problems with Maintenance and condition, Would prefer sidewalk too not switch sides
Main St. (Westwood to Kelley)	33.3%	9	No crosswalks, Sidewalks needed on both sides, need crosswalks near Leadbetter's and at bus stations
Middle St. (all of it)	21.6%	10	Speeding traffic, Roads/crosswalks poorly lit, Problems with Maintenance and condition, Need 4-way STOP at Beech, Sidewalks in poor condition

2.0 Pedestrian Conditions

2.1 Pedestrian Crashes

Pedestrian crashes were obtained using the Maine Crash Public Query Tool provided by the MaineDOT. Only reported crashes are listed. A crash requires either $1,000 or greater in damage, an injury, or a fatality to be reported. The location of pedestrian crashes are shown on **Figures 2.1 through 2.8.** There were 86 pedestrian crashes between 2015 and 2017 within the BACTS region. Three (3) of these crashes resulted in a fatality and 83 crashes resulted in an injury. The fatalities occurred on Outer Hammond Street in Bangor, Hammond Street east of Main Street in Bangor, and Eastern Avenue west of Rinfret Drive in Brewer. November is the most dangerous month for pedestrians. Sixteen (16) pedestrian crashes occurred in November (18.6%). December is the next most dangerous month. One third of pedestrian crashes occurred in either November or December. Pedestrian crashes by month are shown to the right. The hour between 5:00 pm to 6:00 pm is the most dangerous time of day for pedestrians. Eighteen (18) of the 86 pedestrian crashes occurred during this hour. Pedestrian crashes by hour are shown to the right. Forty-six (46) of the pedestrian crashes occurred at night. Forty (40) pedestrian crashes occurred during the day.





2.2 Existing Pedestrian Facilities and Demand

Pedestrian facilities include both multi-use paths and sidewalks. TYLI conducted a preliminary inventory of facilities. BACTS is currently conducting a separate sidewalk inventory to specifically capture ADA issues. **Figures 2.1 through 2.8** provides information on crash location and pedestrian facility information. To gain an understanding of likely higher pedestrian demand areas, locations or places of interest have been mapped.

Bangor

The density of sidewalks is highest in the downtown area. Most streets east of I-95 feature at least a sidewalk on one side. The major routes (Main Street, Hammond Street, Union Street, Broadway, Stillwater Avenue, and State Street) feature sidewalks on both sides east of I-95. In outer Bangor, sidewalks are less common. Ohio Street has inconsistent sidewalks. Stillwater Avenue features a multi-use path instead of a sidewalk from the Bangor Mall to Hogan Road. **Figures 2.1, 2.2 and 2.3** summarize the Pedestrian Inventory.

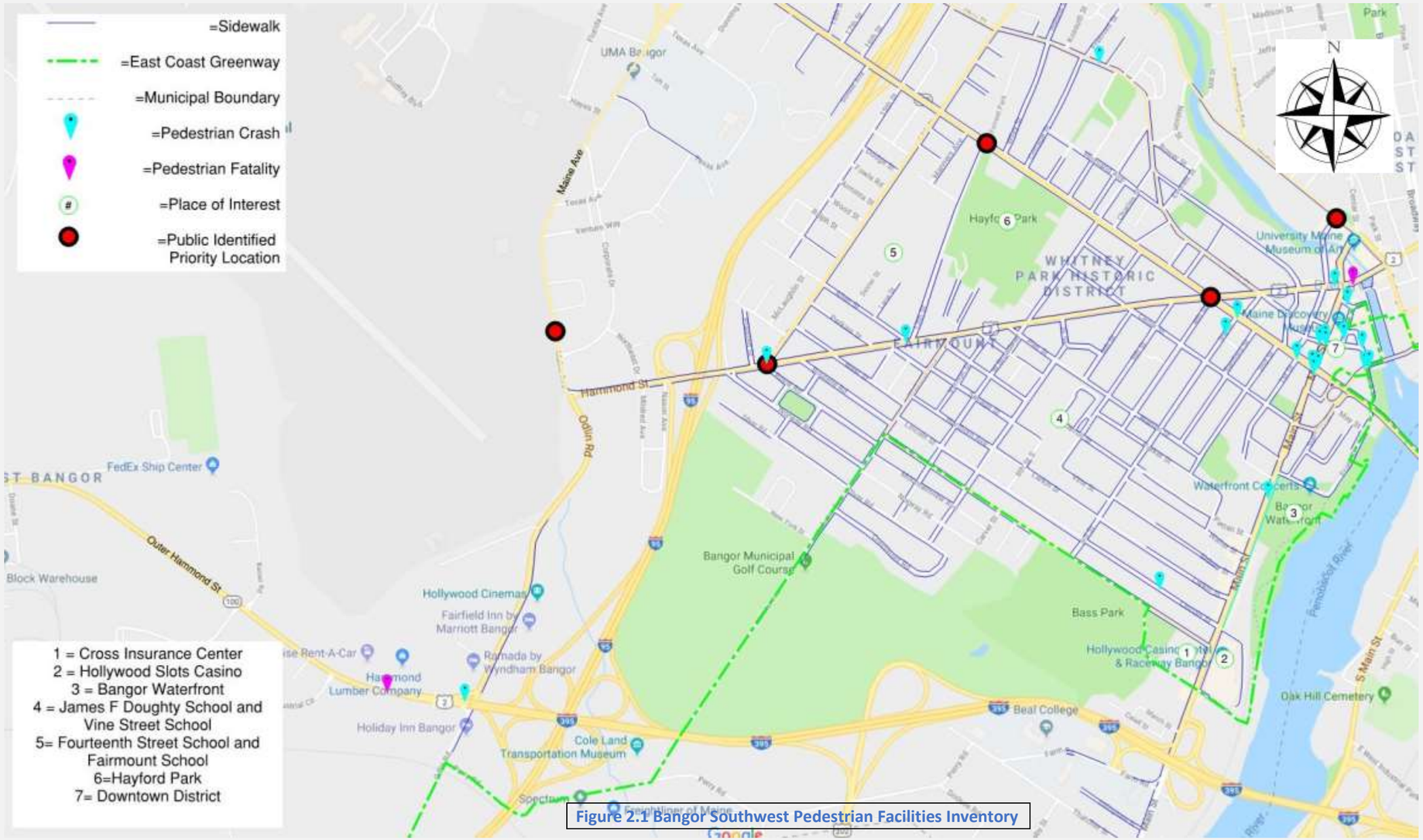


Figure 2.1 Bangor Southwest Pedestrian Facilities Inventory

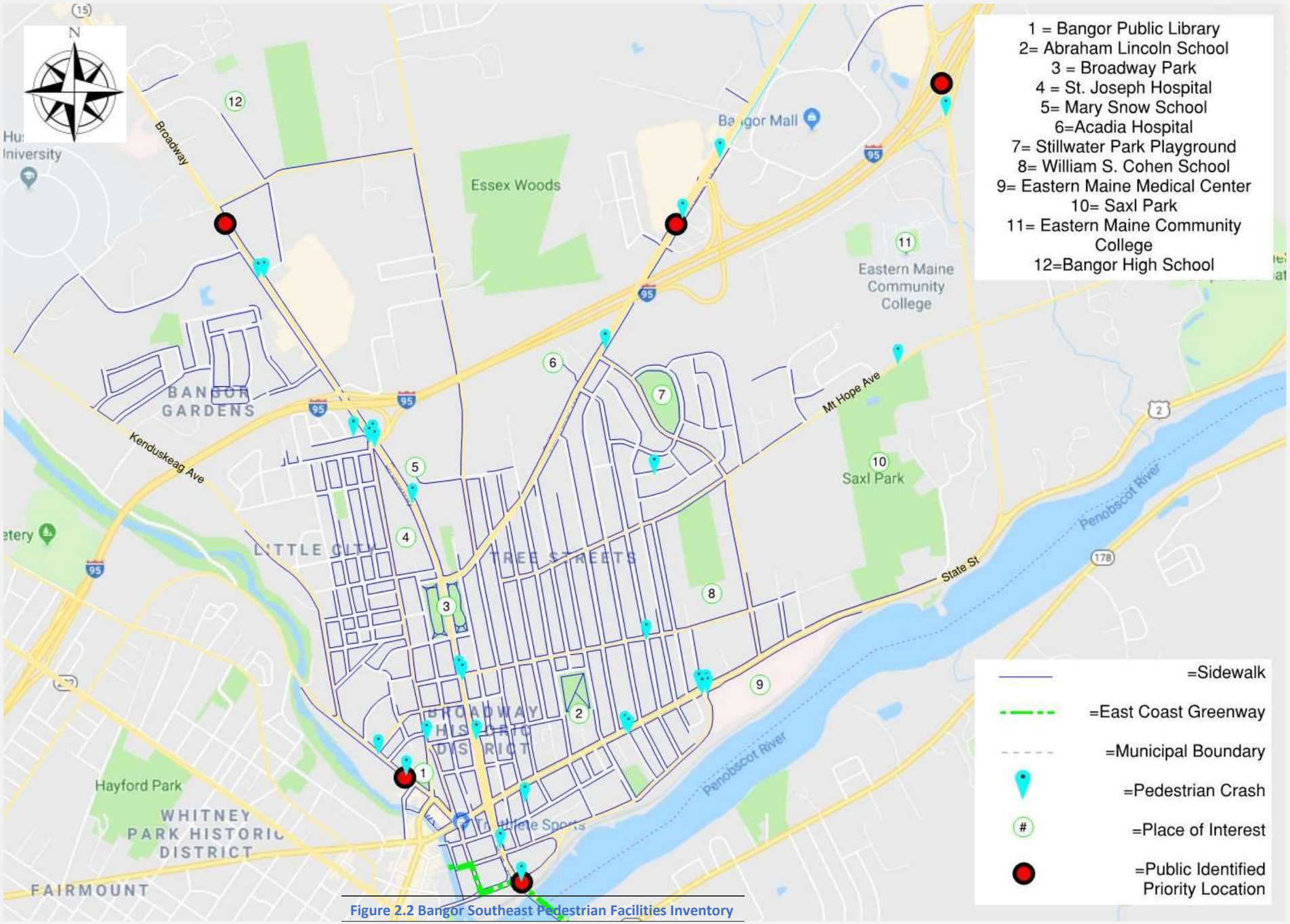


Figure 2.2 Bangor Southeast Pedestrian Facilities Inventory

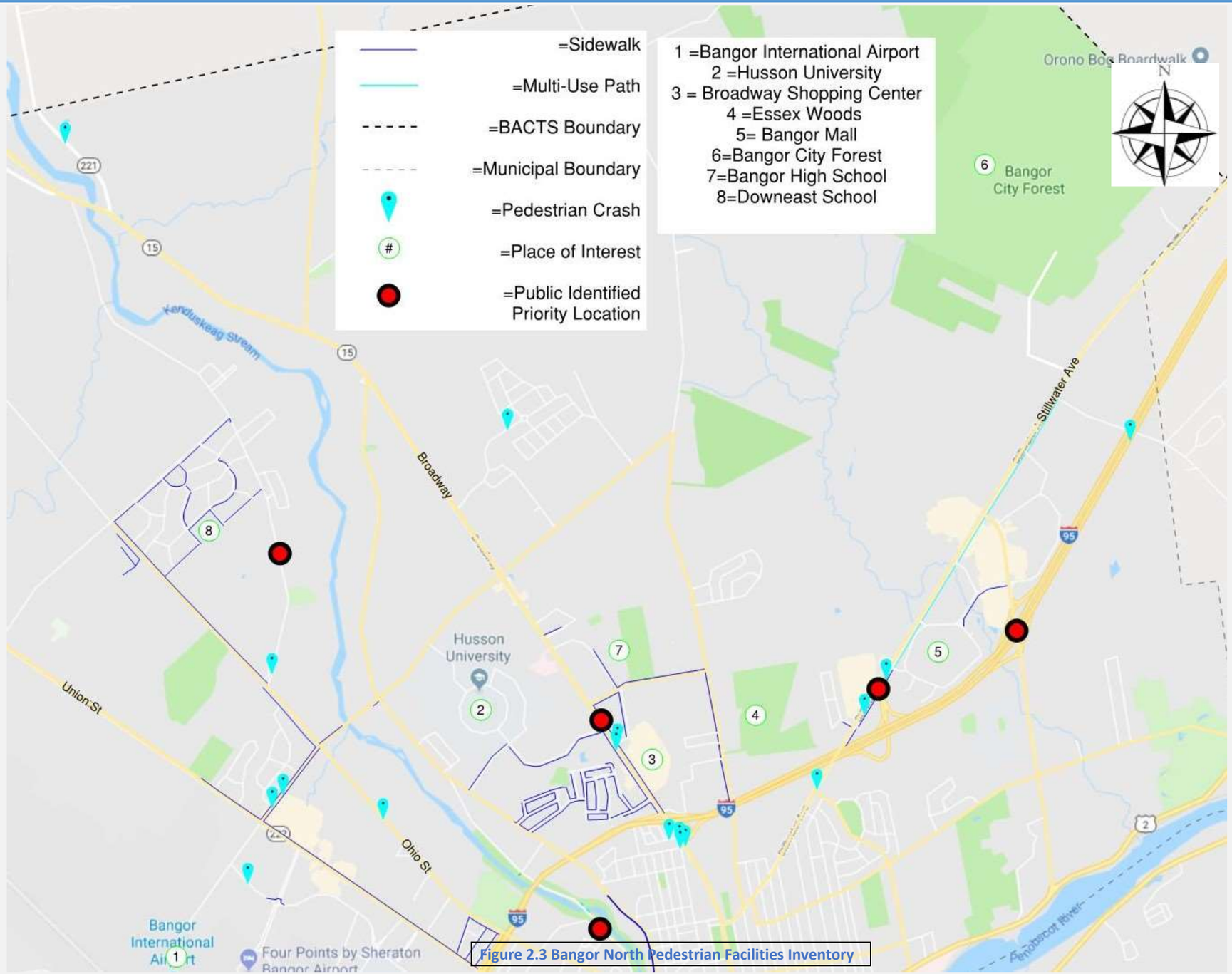


Figure 2.3 Bangor North Pedestrian Facilities Inventory

Brewer

Most of Brewer's sidewalks are located adjacent to Wilson Street, State Street, and North Main Street and South Main Street. The southern half of the City is accessible using sidewalks on South Main Street and Parkway South. Dense neighborhoods in the urban center have sidewalks on both sides of the street. A multi-use path is located on Dirigo Drive and provides a three-mile exercise route for area employees as well as being a destination for others. **Figure 2.4** summarizes the Pedestrian Inventory.

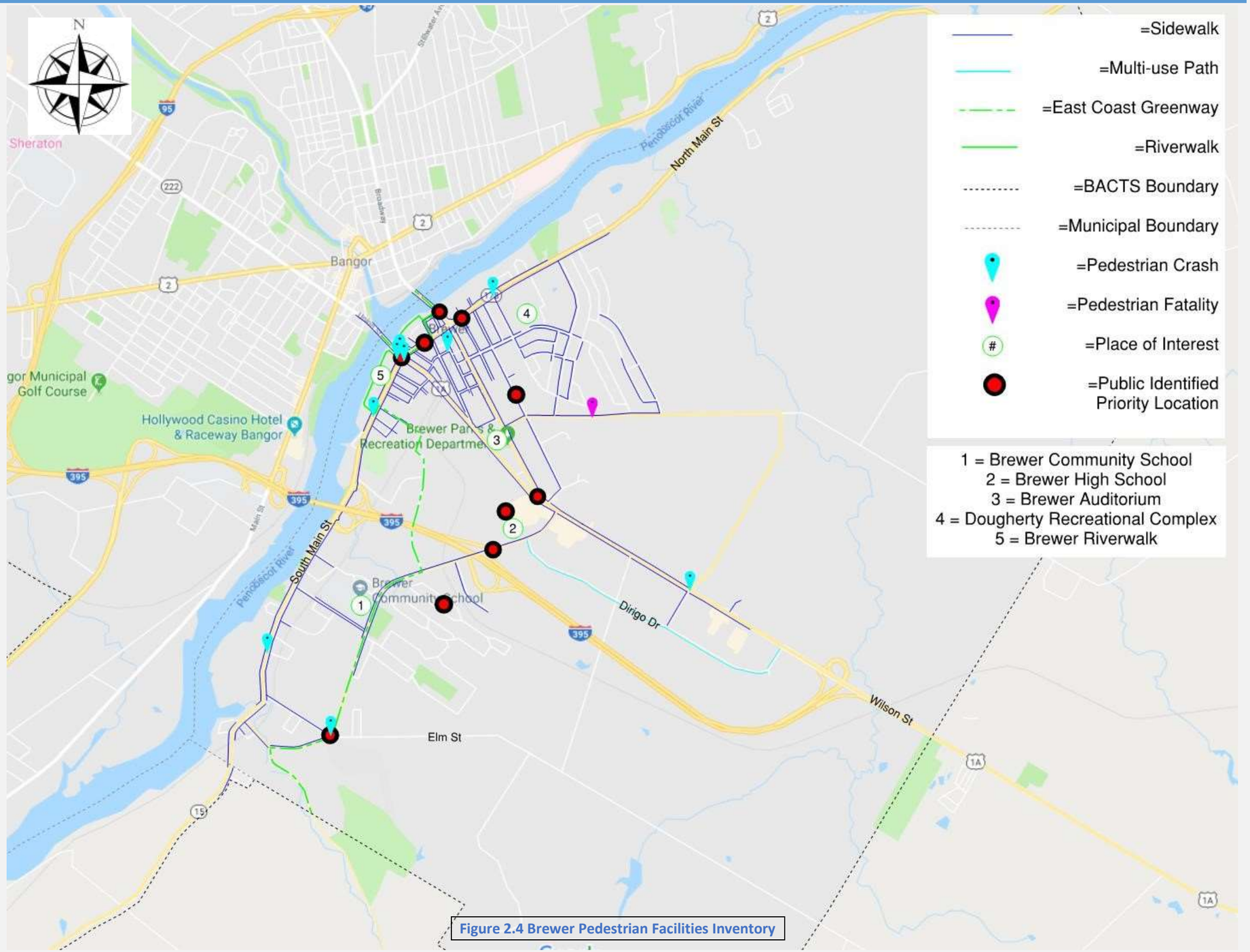


Figure 2.4 Brewer Pedestrian Facilities Inventory

Hampden

The sidewalks in Hampden are limited to Route 1A near Hampden Academy and near the Bangor municipal boundary. **Figure 2.5** summarizes the Pedestrian Inventory.

Orrington

There are no sidewalks in Orrington within the BACTS region.

Hermon

There are no sidewalks in Hermon within the BACTS region.

Additional Places of Interest in Hampden

Figure 2.5 Hampden/Orrington/Hermon Pedestrian Facilities Inventory

See map inset for additional places of interest in Hampden

Veazie

Sidewalks in Veazie are located along State Street from Bangor to Main Street. School Street and Thompson Road also have sidewalks. **Figure 2.6** summarizes the Pedestrian Inventory.

Figure 2.6 Veazie Pedestrian Facilities Inventory

Orono

Several roadways have at least one sidewalk in Orono. Route 2 in Orono has two sidewalks from Gilbert Street to The Reserve Apartments. College Avenue features two sidewalks from Park Street to the University of Maine entrance. **Figure 2.7** summarizes the Pedestrian Inventory.

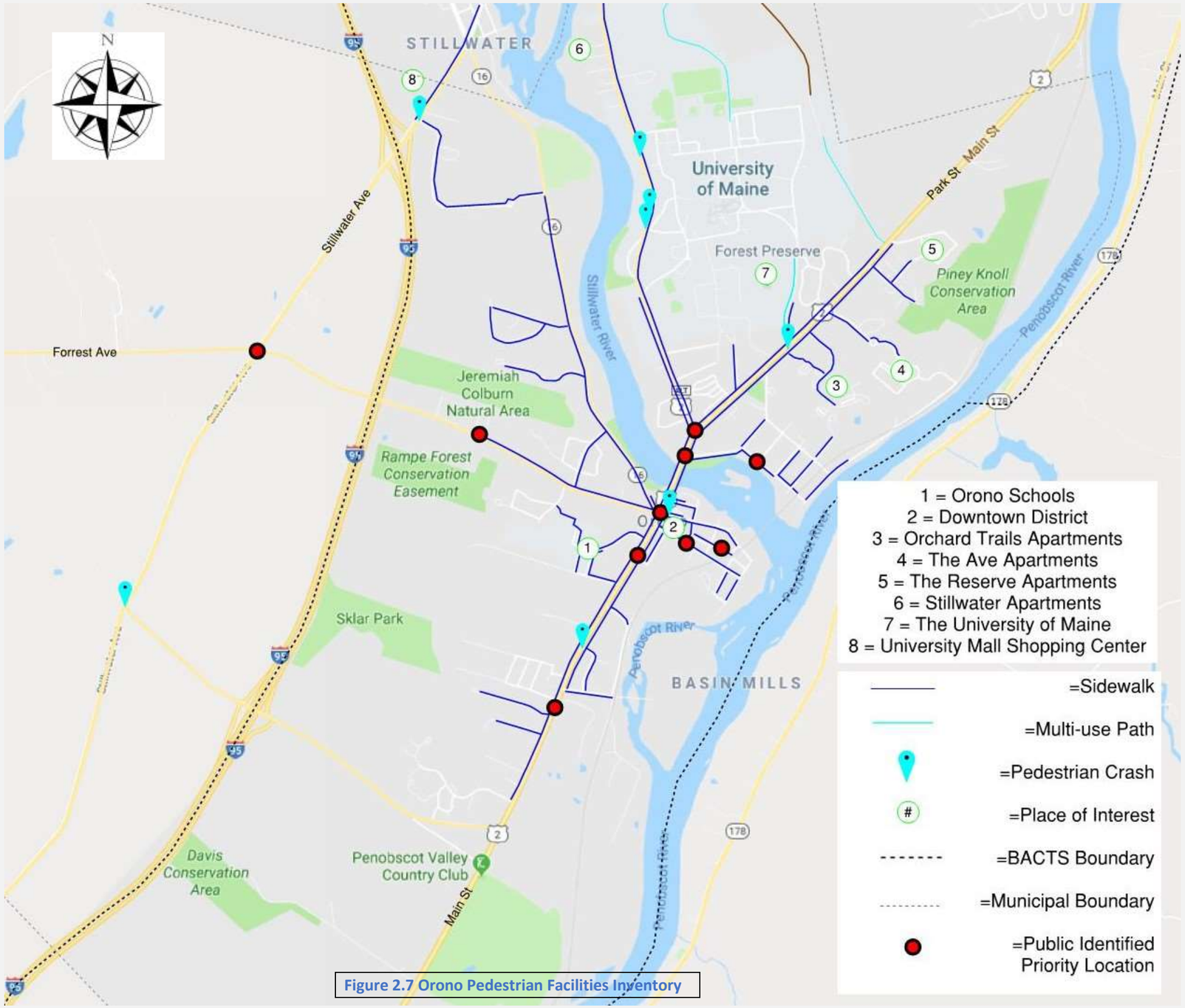


Figure 2.7 Orono Pedestrian Facilities Inventory

Old Town

Many downtown streets have sidewalks. Old Town has sidewalks along the length of Stillwater Avenue and Main Street. The larger neighborhoods have sidewalks. **Figure 2.8** summarizes the Pedestrian Inventory.

Milford

Route 2 and Route 178 in Milford has sidewalks. Call Road has a minor segment of sidewalk. The neighborhood near the dam has sidewalks on at least one side.

Penobscot Indian Nation

There is a sidewalk on Down Street from the bridge to Church Street. There is a sidewalk on the east side of Wabanaki Way from Oak Hill Road to Rolling Thunder Drive. There is a sidewalk on the north side of Bear Ridge Drive from Wabanaki to Burnurwubskek. There is a sidewalk on the south side of Rolling Thunder Drive. There is a sidewalk on Nohkomess. There is a sidewalk on Olamon Lane. There is a sidewalk on the north side of Burnurwubskek.

Bradley

There is a sidewalk on the east side of Route 178 from Hillside Avenue to Bullen Street and on Bullen Street from Main Street to Highland Street.

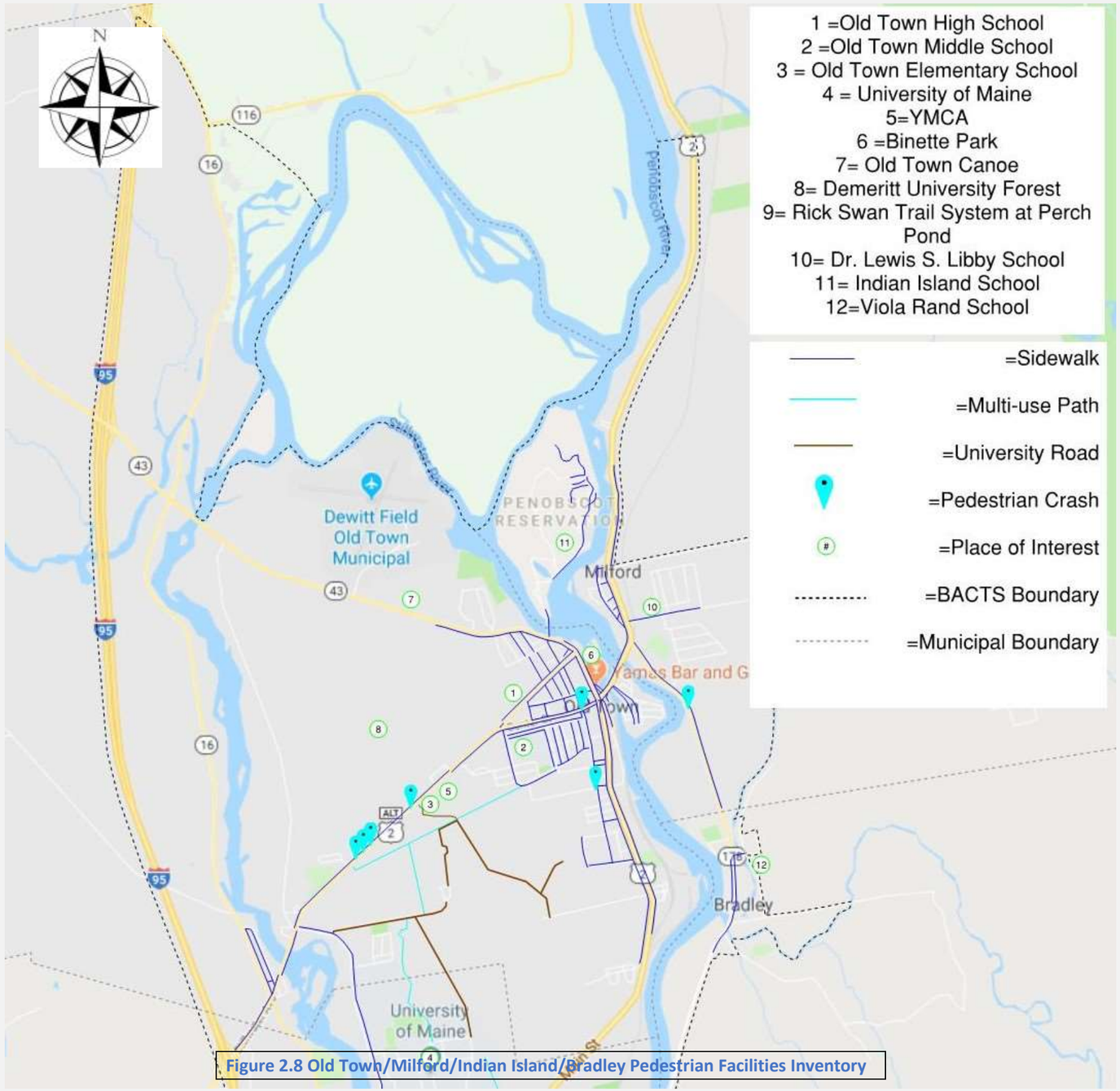


Figure 2.8 Old Town/Milford/Indian Island/Bradley Pedestrian Facilities Inventory

2.3 Accessibility – ADA Requirements

Accessible pedestrian facilities improve the quality of life for those with mobility, visual, hearing, or other disabilities by reducing barriers to services, opportunities, and social activities. Pedestrian access routes, which provides continuous and clear pedestrian pathways, enhance mobility and encourage independence by increasing transportation choice.

There are two regulations addressing accessibility of individuals with disabilities which apply to transportation projects. Section 504 of the Rehabilitation Act of 1973 (Section 504) and Title II of the Americans with Disabilities Act (ADA) (Title II). If a public entity receives any Federal financial assistance from the Department of Transportation (DOT) whether directly or through another DOT recipient, then the entity must also comply with DOT's Rehabilitation Act of 1973 (Section 504) requirements even if the road alteration project at issue does not use Federal funds.

Title II of the Americans with Disabilities Act (ADA) requires that state and local governments ensure that persons with disabilities have access to the pedestrian routes in the public right of way. An important part of this requirement is the obligation whenever streets, roadways, or highways are altered to provide curb ramps where street level pedestrian walkways cross curbs. This requirement is intended to ensure the accessibility and usability of the pedestrian walkway for persons with disabilities.

The U.S. Access Board published its Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) in 2011 and a supplemental notice with guidance on shared use paths in 2013 https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way. The PROWAG recommends accessibility guidelines for sidewalks, street crossings, and intersections. It will become an enforceable standard only after the Board publishes a final rule and only after the U.S. Department of Justice (USDOJ) and/or the USDOT adopt the final guidelines into their respective ADA and Section 504 of the Rehabilitation Act regulations. However, many jurisdictions have chosen to apply the draft PROWAG as an equivalent facilitation for the ADA Standards because they provide more specific coverage of accessibility issues in the public-right-of-way. Jurisdictions that have adopted the draft PROWAG as their standard should consistently apply all provisions of the draft PROWAG.

MaineDOT has initiated a statewide inventory of all sidewalks to determine compliance with ADA requirements, specifically the presence and compliance of curb ramps. BACTS has not yet completed this inventory for the planning area. Once this data has been collected it will be provided to MaineDOT and the findings will be incorporated into BACTS planning documents.

The FHWA Accessibility Resource Library: https://www.fhwa.dot.gov/accessibility/ provides all information that relates to the Americans with Disabilities Act (ADA) or other accessibility resources that may affect research, planning, design, construction, or operations of any Federal Highway Administration project.

Accessibility/ADA Specific Guidance

2010 ADA Standards for Accessible Designs State and Local Government Facilities: Title II and Public Accommodations and Commercial Facilities: Title III
https://www.ada.gov/regs2010/2010ADAStandards/2010ADAStandards.pdf

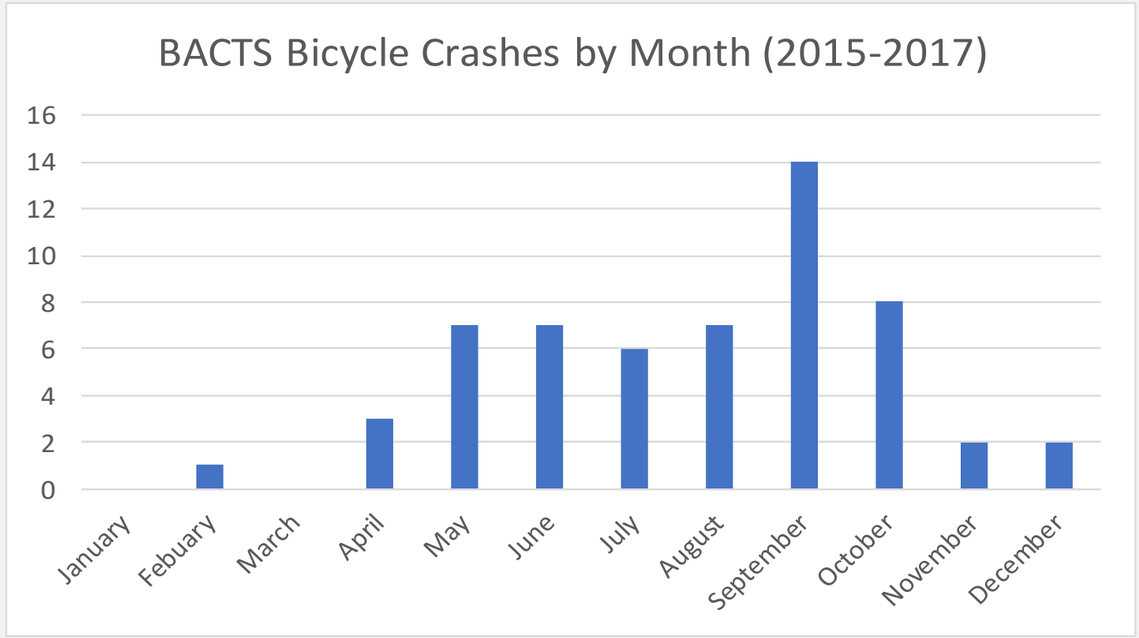
Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) 2011: https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way

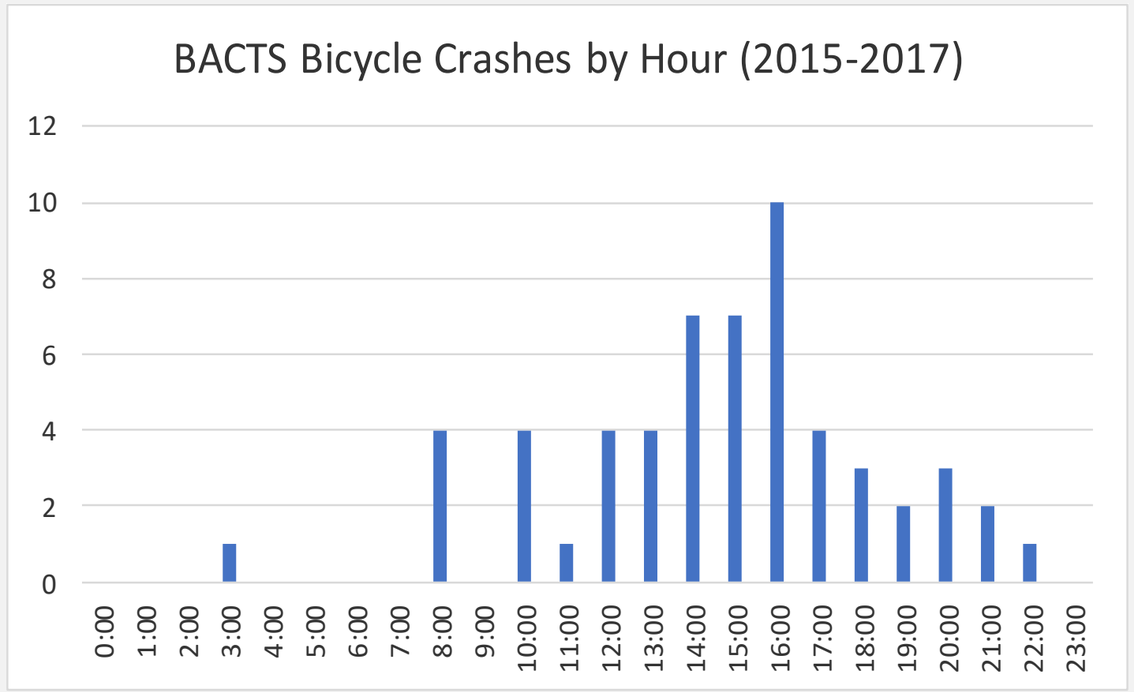
FHWA Accessible Shared Streets Notable Practices and Considerations for Accommodating Pedestrians with Vision Disabilities - October 2017
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_networks/fhwahep16055.pdf

3.0 Bicycle Conditions

3.1 Bicycle Crashes

Bicycle crashes were obtained using the Maine Crash Public Query Tool provided by the MaineDOT. Only reported crashes are listed. A crash requires either $1,000 or greater in damage, an injury, or a fatality to be reported. Fifty-seven (57) bicycle crashes occurred within the BACTS region. No crashes resulted in a fatality. Fifty (50) crashes resulted in an injury. Seven (7) crashes resulted in property damage. September is the most dangerous month for bicyclists. Fourteen (14) crashes occurred in September. The complete breakdown of bicycle crashes by month is shown to the right. The hour between 4:00 pm and 5:00 pm is the most dangerous hour for bicyclists. Ten (10) crashes occurred within this hour. The period between 2:00 pm to 5:00 pm contains almost half of the bicycle crashes. A full breakdown of bicycle crashes by hour is shown to the right. Only 10 bicycle crashes occurred at night while 47 crashes occurred during the day. **Figures 3.1 through 3.8** depict crash locations.





3.2 Existing Bicycle Facilities

Bicycle facilities can include bicycle lanes, shoulders 5 feet and wider, and multi-use paths where bicycles are allowed. Existing bicycle facilities were inventoried using Google Maps, GIS data from BACTS communities, and field inventory.

Bangor

The following bicycle facilities exist in Bangor and are shown on **Figures 3.1, 3.2 and 3.3.**

- Wide shoulders on Outer Hammond west of the Ramada Inn.
- Odin Road features wide shoulders from Outer Hammond Street to Texas Avenue, except where truncated by turn lanes at Outer Hammond Street, Hammond Street, Venture Way, and Texas Avenue.
- Hammond Street features wide shoulders from Odin Road to Union Street.
- Vermont Avenue, Texas Avenue, and Maine Avenue feature wide shoulders.
- Union Street features wide shoulders from Manners Avenue to the Main Street, but shoulders are interrupted by turn lanes at Hammond Street and Main Street.
- Ohio Street features wide shoulders from Davis Road to 14th Street but the eastbound shoulders are interrupted intermittently.
- Broadway features wide shoulders from the municipal boundary to Grandview Avenue and from the I-95 northbound On-Ramp to Stillwater Avenue.
- Stillwater Avenue features wide shoulders from Grove Street to Fern Street and a multi-use path on the northbound side from the Bangor Mall entrance to Hogan Road.
- Kenduskeag Avenue features a northbound bicycle lane from Husson Avenue to Griffin Road.

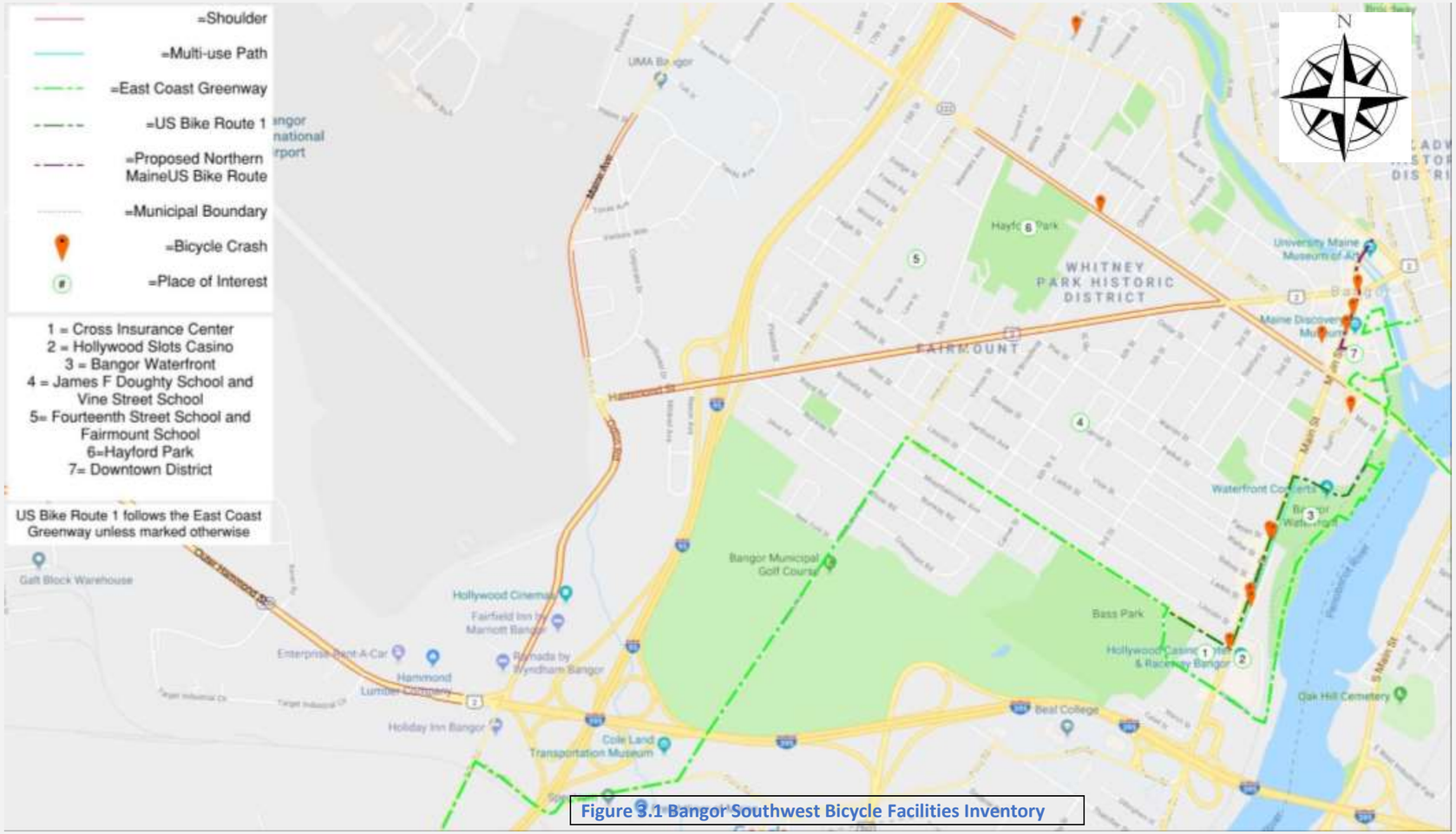


Figure 3.1 Bangor Southwest Bicycle Facilities Inventory

- Washington Street/Hancock Street features wide shoulders to Pearl Street.
- State Street from Summit Avenue to the municipal boundary features a wide shoulder.
- Hogan Road from State Street to Longview Drive features wide shoulders but the shoulders are frequently interrupted due to turn lanes.

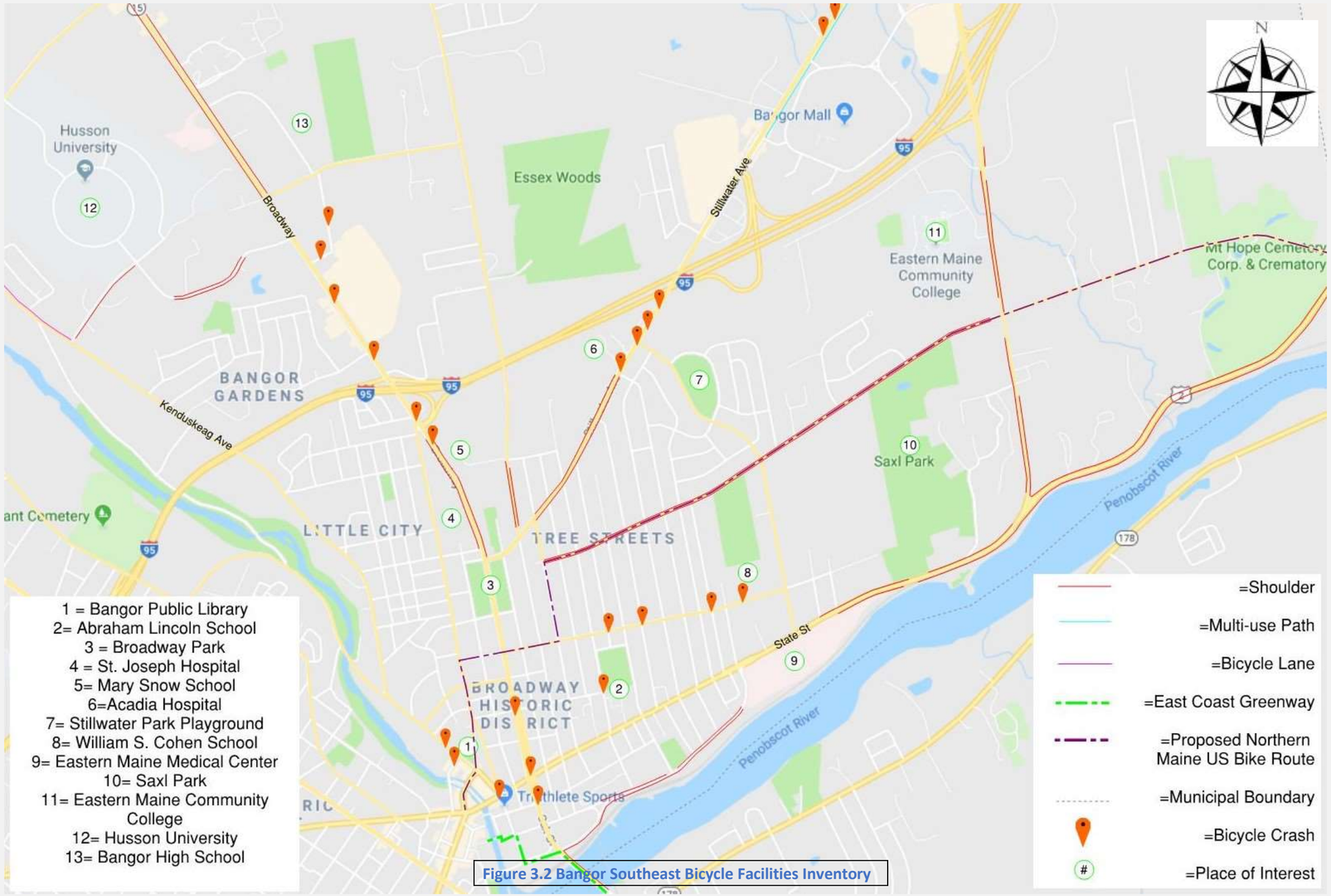


Figure 3.2 Bangor Southeast Bicycle Facilities Inventory

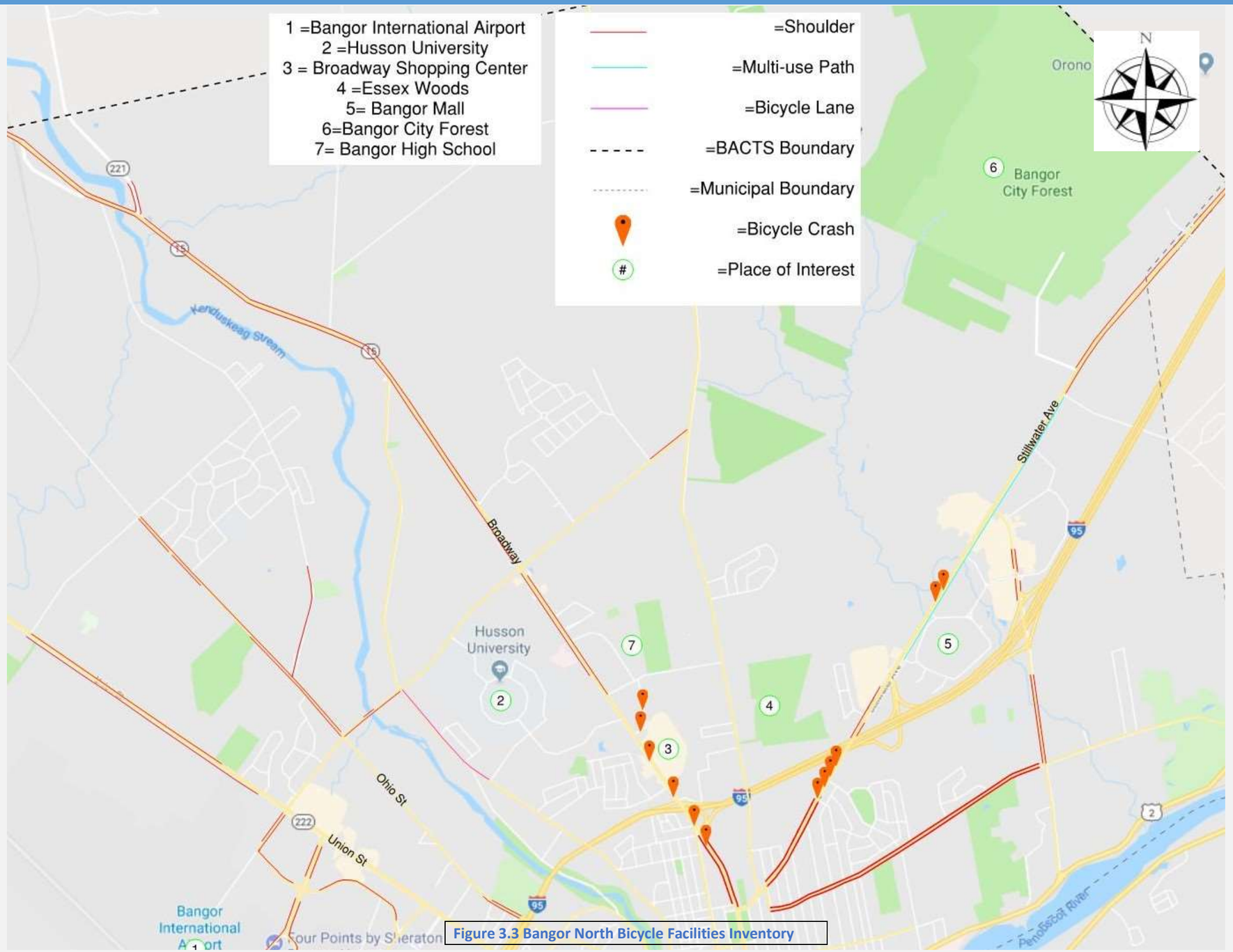


Figure 3.3 Bangor North Bicycle Facilities Inventory

Brewer

The following bicycle facilities are available in Brewer and shown on **Figure 3.4**.

- North and South Main Street feature wide shoulders except where infringed at South Brewer Drive, from Pendleton Street to Grove Street, between the I-395 ramps, and from Wilson Street to Chamberlain Street.
- Elm Street features wide shoulders between Mill Street and Parkway South.
- Parkway South features wide shoulders between Elm Street and Robertson Boulevard.
- Wilson Street features wide shoulders from North Main Street to State Street.
- State Street features wide shoulders from North Main Street to Wilson Street.
- Washington Street features wide shoulders between State Street and Floyd Street.
- Parkway North features wide shoulders between North Main Street and Washington Street.
- Eastern Avenue features wide shoulders from Hanover Place to Oak Grove Drive.
- Wilson Street features wide shoulders at the intersection of Dirigo Drive and Wilson Street and continues east. This intersection also features bicycle lanes. The I-395 ramps cut into the wide shoulder.
- Dirigo Drive features a marked multi-use path on the south side. However, this path does not meet the current minimum width standard.

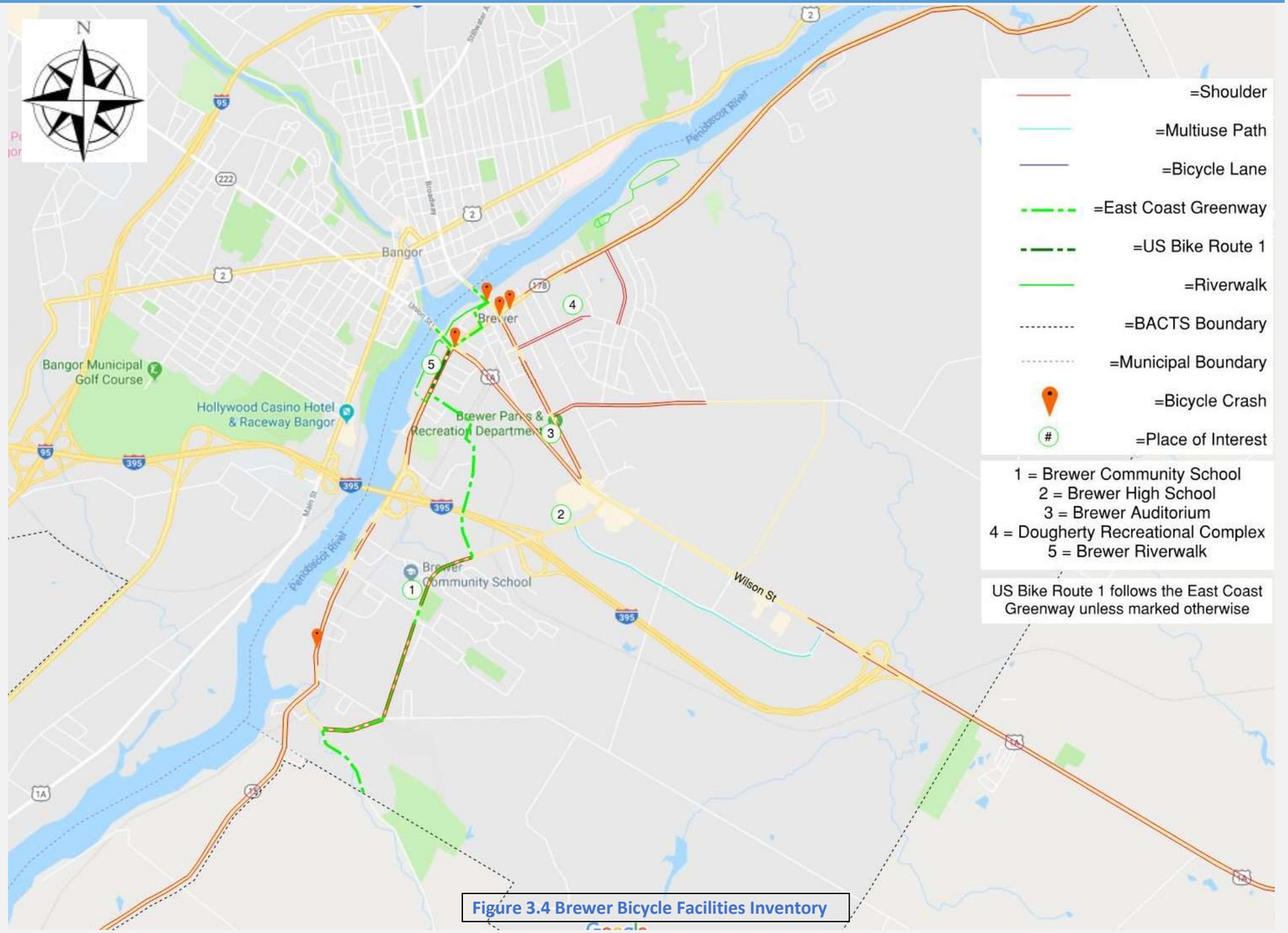


Figure 3.4 Brewer Bicycle Facilities Inventory

Hampden

The following bicycle facilities are available in Hampden and shown on **Figure 3.5**.

- Main Road North features wide shoulders from the Bangor municipal boundary to Wheelden Heights and again on Main Road South from the middle school to the Winterport municipal boundary.

Orrington

- Route 15 in Orrington has wide shoulders.

Hermon

- There are no bicycle facilities in Hermon in the BACTS region.

Additional Places of Interest in Hampden

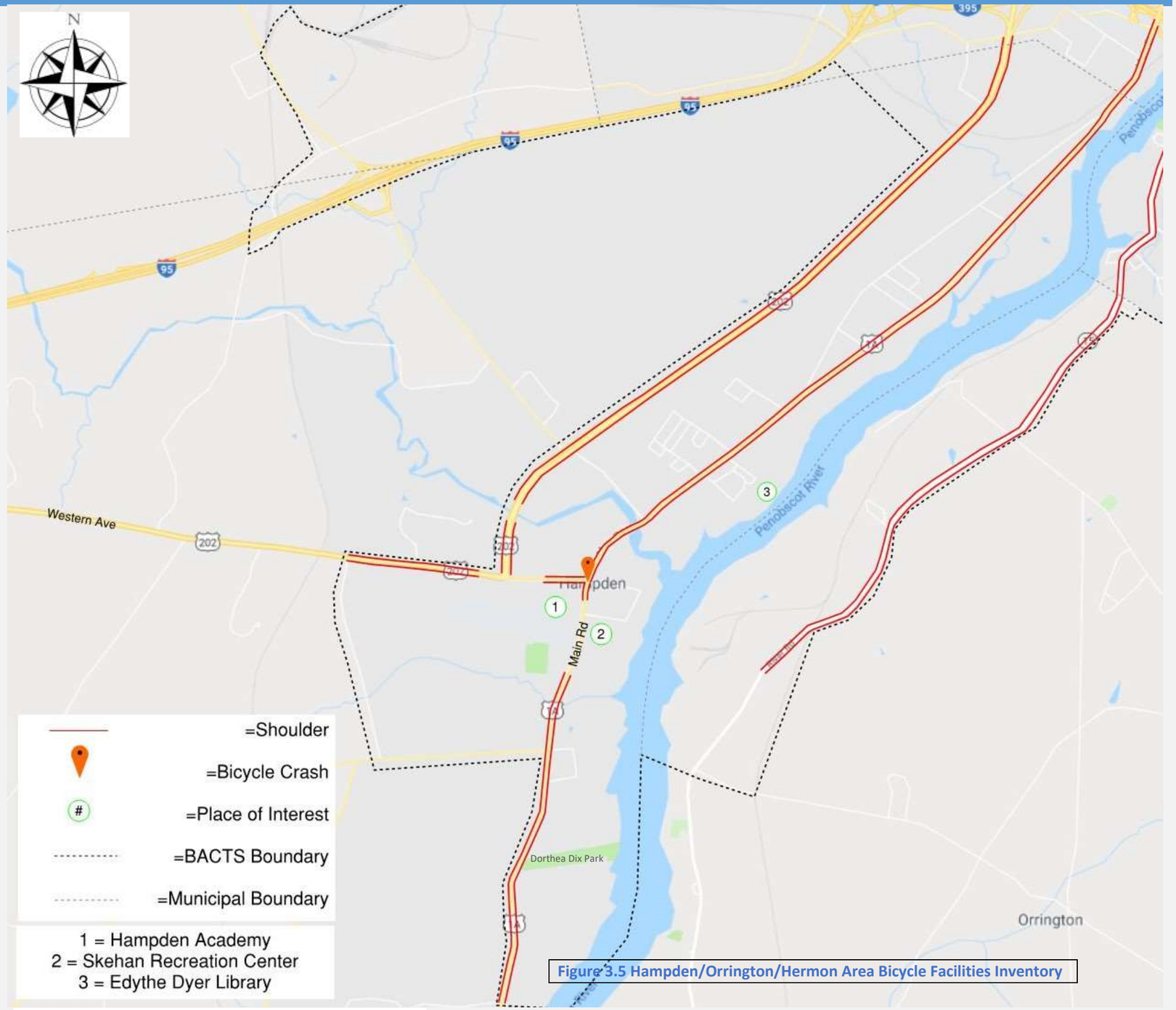


Figure 3.5 Hampden/Orrington/Hermon Area Bicycle Facilities Inventory

See map inset for additional places of interest in Hampden

Veazie

The following bicycle facilities are available in Veazie and shown on **Figure 3.6**.

- State Street features wide shoulders from the Bangor municipal boundary to Main Street and from Greystone Trailer Park to the Orono municipal boundary.
- Chase Road features wide shoulders from State Street to Jackson Drive.
- Eagleview Drive features wide shoulders from School Street to Shore Road.

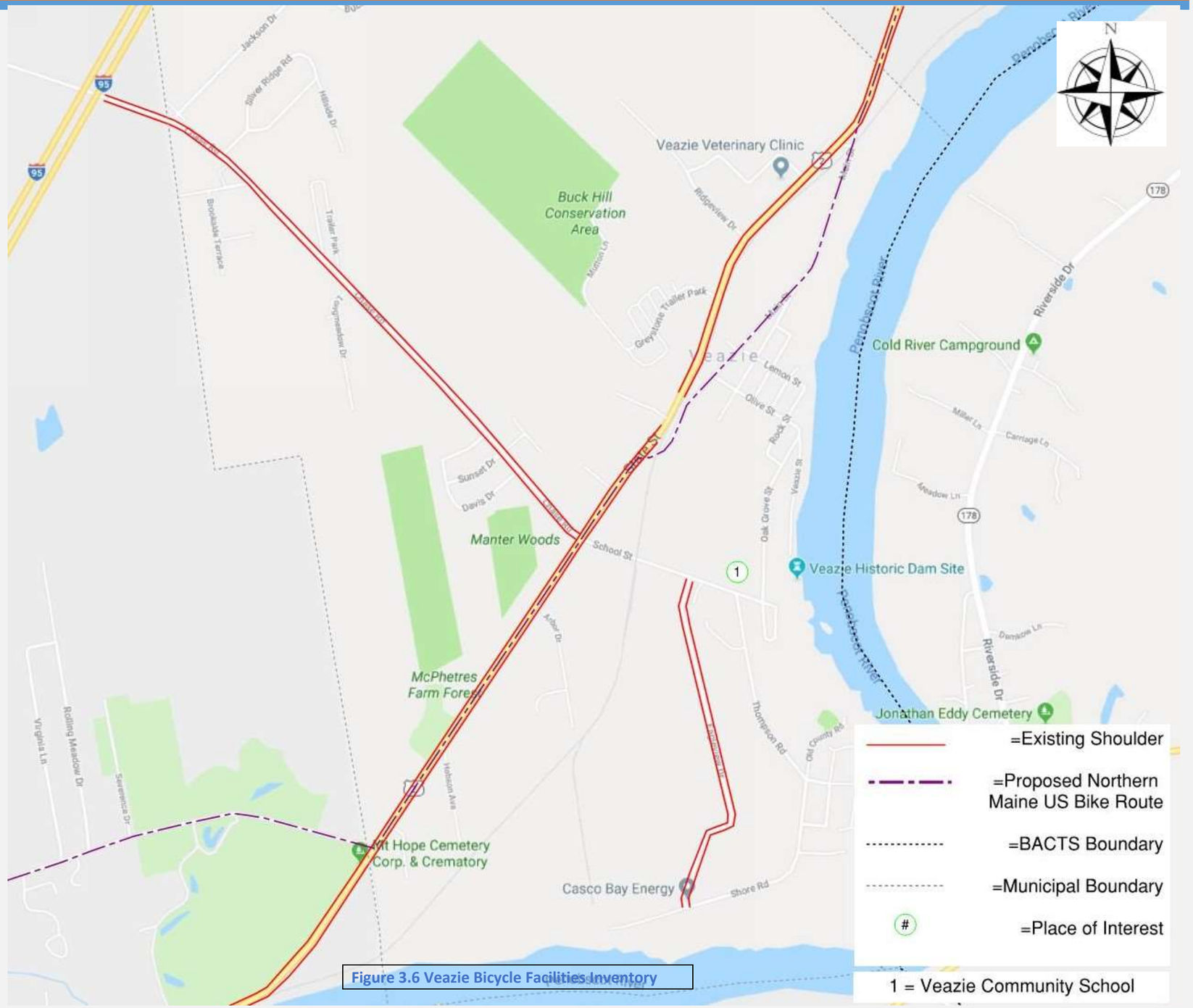


Figure 3.6 Veazie Bicycle Facilities Inventory

Orono

The following bicycle facilities are available in Orono and shown on **Figure 3.7.**

- Main Street has bicycle lanes from Pine Street to Canal Street.
- College Avenue features wide shoulders.
- Park Street features wide shoulders marked as bicycle lanes.
- Bennoch Road features wide shoulders north of Noyes Drive.
- Forest Avenue features wide shoulders from Noyes Drive to I-95.
- Kelley Road features wide shoulders from Main Street to I-95.

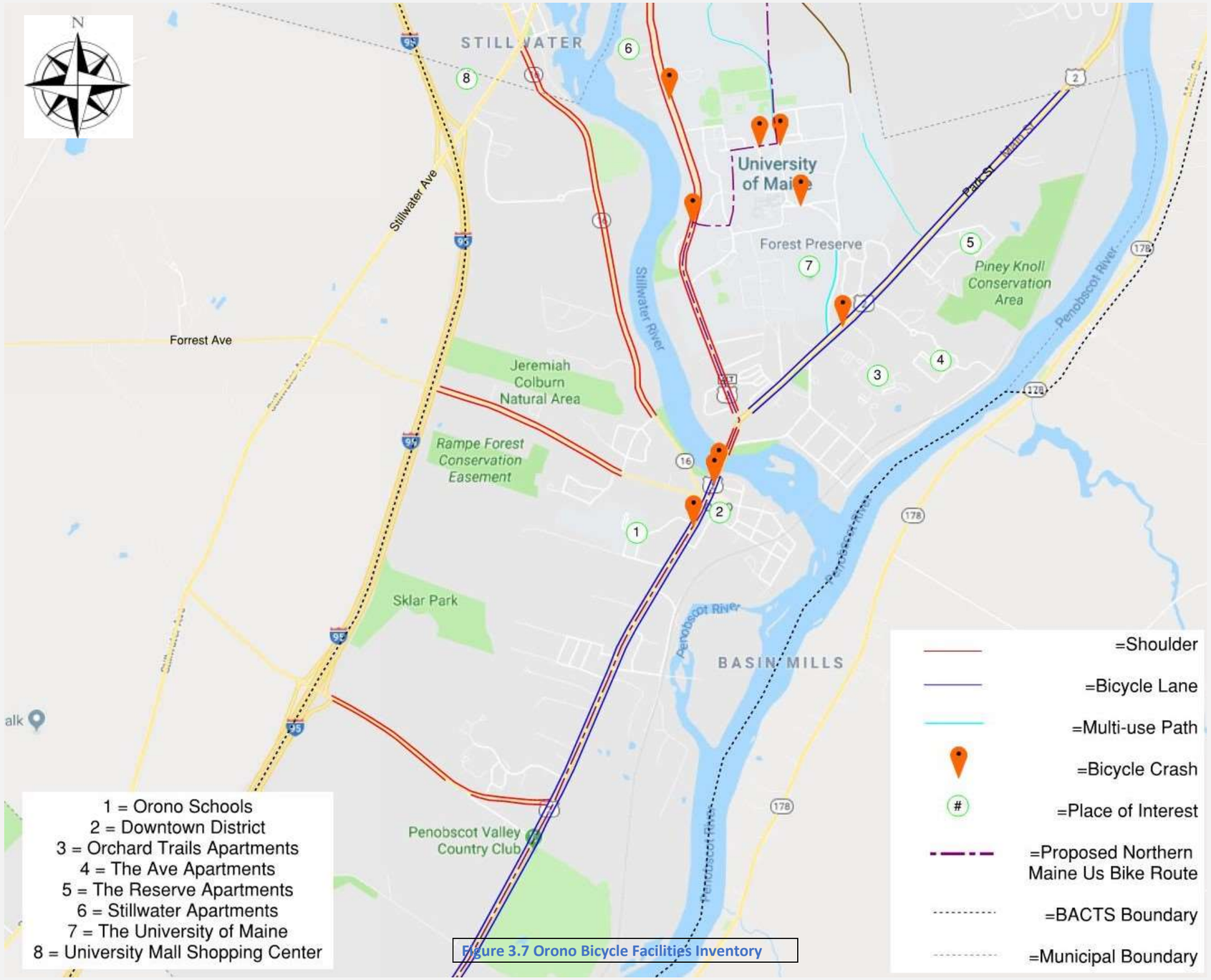


Figure 3.7 Orono Bicycle Facilities Inventory

Old Town

The following bicycle facilities are available in Old Town. The bicycle facilities in Old Town as well as the Penobscot Indian Nation and Milford are shown on **Figure 3.8.**

- Main Street features wide shoulders from the Orono municipal boundary to Brunswick Street except at the intersections of Center Street and Stillwater Avenue and from Fourth Street to I-95.
- Stillwater Avenue features wide shoulders from Main Street to the YMCA except for the intersection of Center Street.
- College Avenue has wide shoulders from Stillwater Avenue to the Orono municipal boundary.
- Bennoch Road has wide shoulders from Stillwater Avenue to just south of the Old Town Water District.

Milford

Route 178 features wide shoulders except through downtown Milford.

Penobscot Indian Nation

There are no shoulders in the Penobscot Indian Nation.

Bradley

Route 178 in Bradley has wide shoulders.

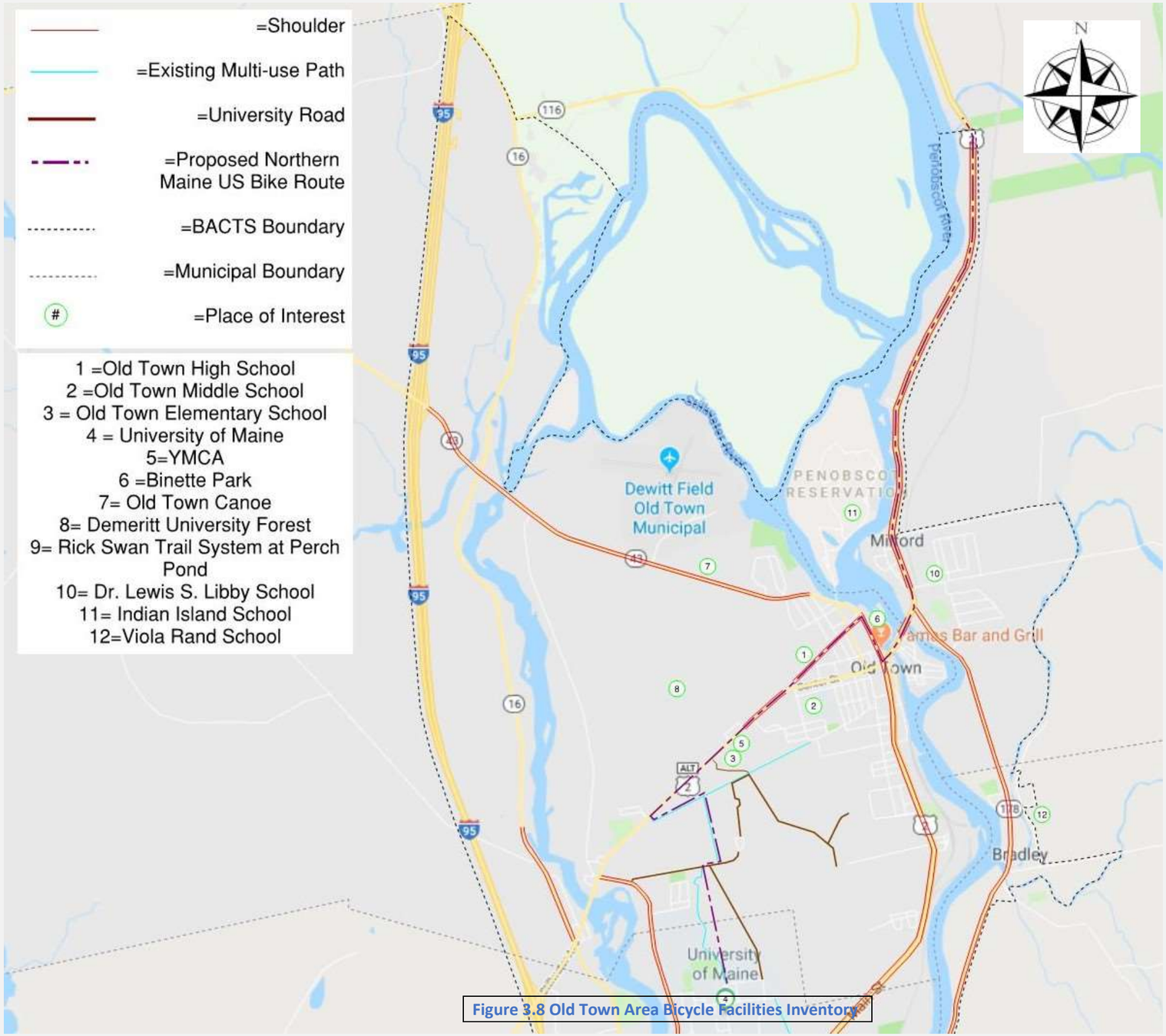


Figure 3.8 Old Town Area Bicycle Facilities Inventory

3.3 Bridges

Both the Joshua Chamberlain Bridge and the Penobscot Bridge connecting Bangor and Brewer are vitally important to the regional active transportation network. U.S. Bicycle Route 1 crosses the Joshua Chamberlain Bridge and the East Coast Greenway route crosses both the Joshua Chamberlain Bridge and the Penobscot Bridge (*this is an "envisioned" route to the ECG route)*.

The importance of, and concerns with, the adequacy/safety of the pedestrian and bicycle facilities on both bridges have been identified and discussed during the development of this Plan. However, further analysis is required to determine the feasibility of proposed improvements to the current infrastructure. Ultimately, MaineDOT must approve any facility and/or improvement to the Bridges. Under agreement with MaineDOT, the City of Bangor has responsibility for the Joshua Chamberlain Bridge and the City of Brewer has responsibility for the Penobscot Bridge road striping.

See FHWA Small Town and Rural Multimodal Networks for guidance on pedestrian and bicycle facilities on bridges.

Joshua Chamberlain Bridge

The Joshua Chamberlain Bridge was built in 1955 and reconstructed in 2013. The posted speed limit is 25 mph and the AADT according to the October 2018 MaineDOT Bridge Inventory is 14,431. Proposed bicycle facility improvements include adding shared lane pavement markings and signage to increase awareness and enhance safety.

There are no shoulders, but there are sidewalks on both sides of the roadway with concrete barriers separating them from the two-lane roadway. The sidewalk accessed from the Bangor side is elevated with steps. This needs to be corrected in order to make the sidewalk ADA accessible.

Penobscot Bridge

The Penobscot Bridge was built in 1997. The posted speed limit is 35 mph and the AADT according to the October 2018 MaineDOT Bridge Inventory is 24,636. There are three-foot shoulders and a sidewalk on the right side, with no barrier protection from the four-lane roadway.

Planners and Engineers from MaineDOT and the Cities of Bangor and Brewer, BACTS staff, Bicycle Coalition of Maine staff, and East Coast Greenway Coalition representatives are currently engaged in a dialog about potential short-term pedestrian and bicycle facility improvements to the Penobscot Bridge. Careful review and planning taking into consideration the roadway's geometry, traffic conditions, connectivity, and the safety of all users may prohibit the viability of what may be considered "preferred" bicycle facilities on the Bridge. Ultimately, MaineDOT must approve any facility and/or treatment on the Bridges.

A MaineDOT bridge inspector identified structural issues with the poles/bases of the lighting which was on the Bridge and they were subsequently removed. Currently, there is no lighting on the bridge which is a safety concern for both pedestrians and motorists. MaineDOT has indicated that there will be a future capital project in the workplan to replace the lighting; however, there is no timeframe for the replacement.

3.4 Existing Bicycle Demand

STRAVA compiles the routes of athletes running and cycling in communities using applications and devices designed for athletes. This information does not provide information on the total bicycle or pedestrian demands but does provide a good enough sample to show patterns. This information is visualized as a heat map showing the routes most commonly taken. The heat map shows the routes taken over the last few years and is updated yearly. Exact volumes are not available, but general conclusions can be determined in each municipality. These heat maps are illustrated on **Figures 3.9 and 3.10.** In the figures, redder and thicker lines correspond to higher volumes of cyclists.

Bangor

- Bicyclists avoid Union Street from Main Street to Griffin Road.
- Bicyclists avoid Broadway from State Street to Kenduskeag Avenue.
- Bicyclists avoid Hogan Road.
- Main Street and State Street are major bicycling routes.
- Kenduskeag Avenue, Essex Street, and Mt. Hope Avenue see frequent bicyclist traffic.

Brewer

- North and South Main Street is the primary bicyclist route.
- Eastern Avenue, Parkway South, and Elm Street see frequent bicyclist traffic.
- Wilson Street sees frequent bicyclist traffic from Bangor to Vista Way before that traffic diverts and heads down Dirigo Drive.
- Wilson Street sees very small amounts of bicyclist traffic from Parkway South to Dirigo Drive.

Hampden

- Main Road sees the heaviest bicyclist traffic.
- Western Avenue sees frequent bicyclist traffic.
- Route 202 has some bicyclist traffic.

Veazie

- State Street sees the heaviest amount of bicyclist traffic.
- Chase Road also sees bicyclist traffic.

Orono

- Route 2 sees the heaviest bicyclist traffic.
- College Avenue, Bennoch Road, and Forest Avenue see frequent bicyclist traffic.
- The University of Maine campus has high bicyclist activity.
- The trail network north of the University sees frequent bicyclist activity.

Old Town/Milford

- Bicyclists avoid Stillwater Avenue from the western terminus of the multi-use path to Main Street.
- Bicyclists avoid Center Street.
- The trails south of Stillwater Avenue has frequent bicyclist activity.
- Main Street and Bennoch Road see frequent bicyclist traffic.
- Route 178 sees frequent bicyclist traffic.

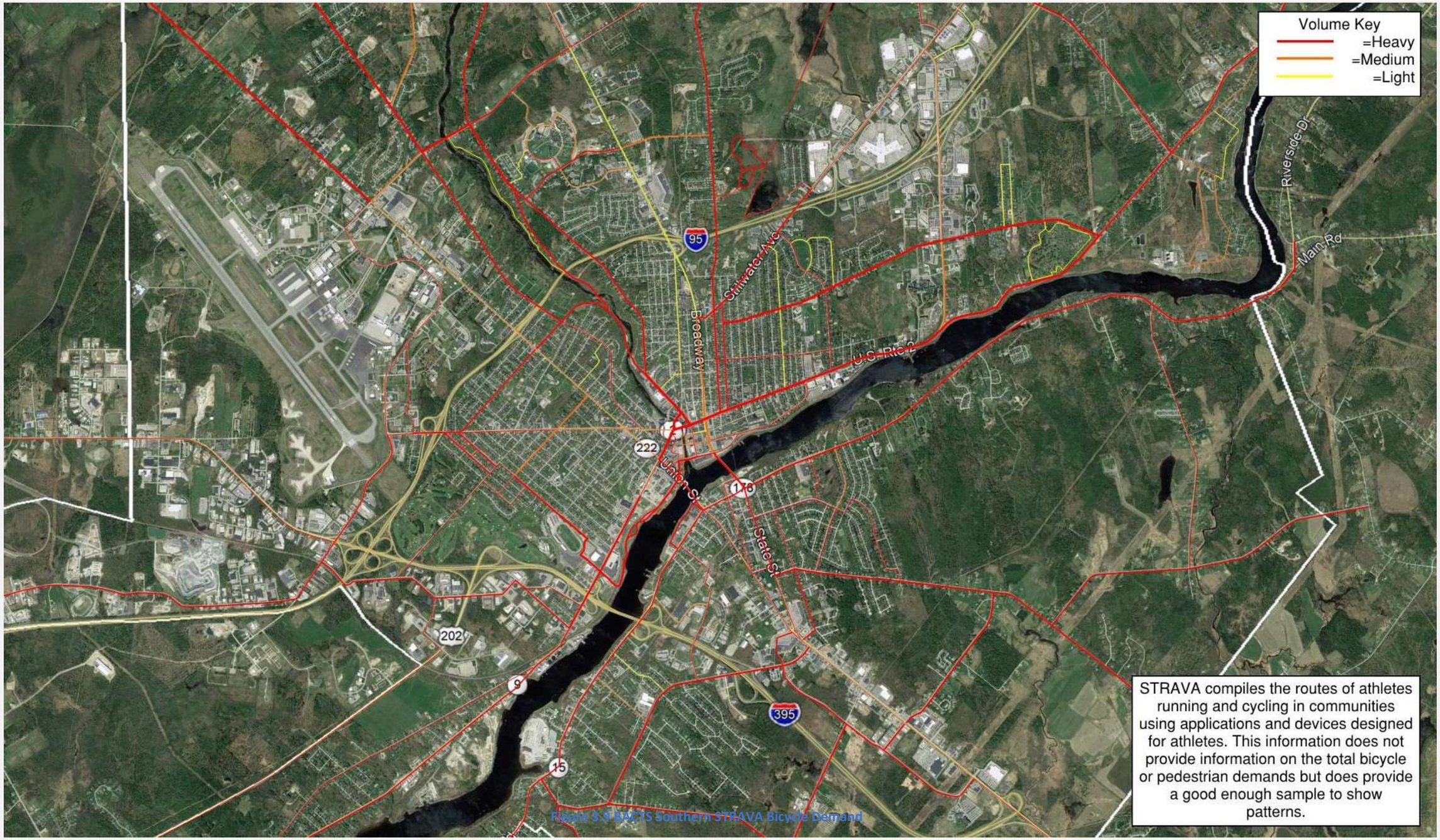


Figure 3-9 BACTS Southern STRAVA Bicycle Demand

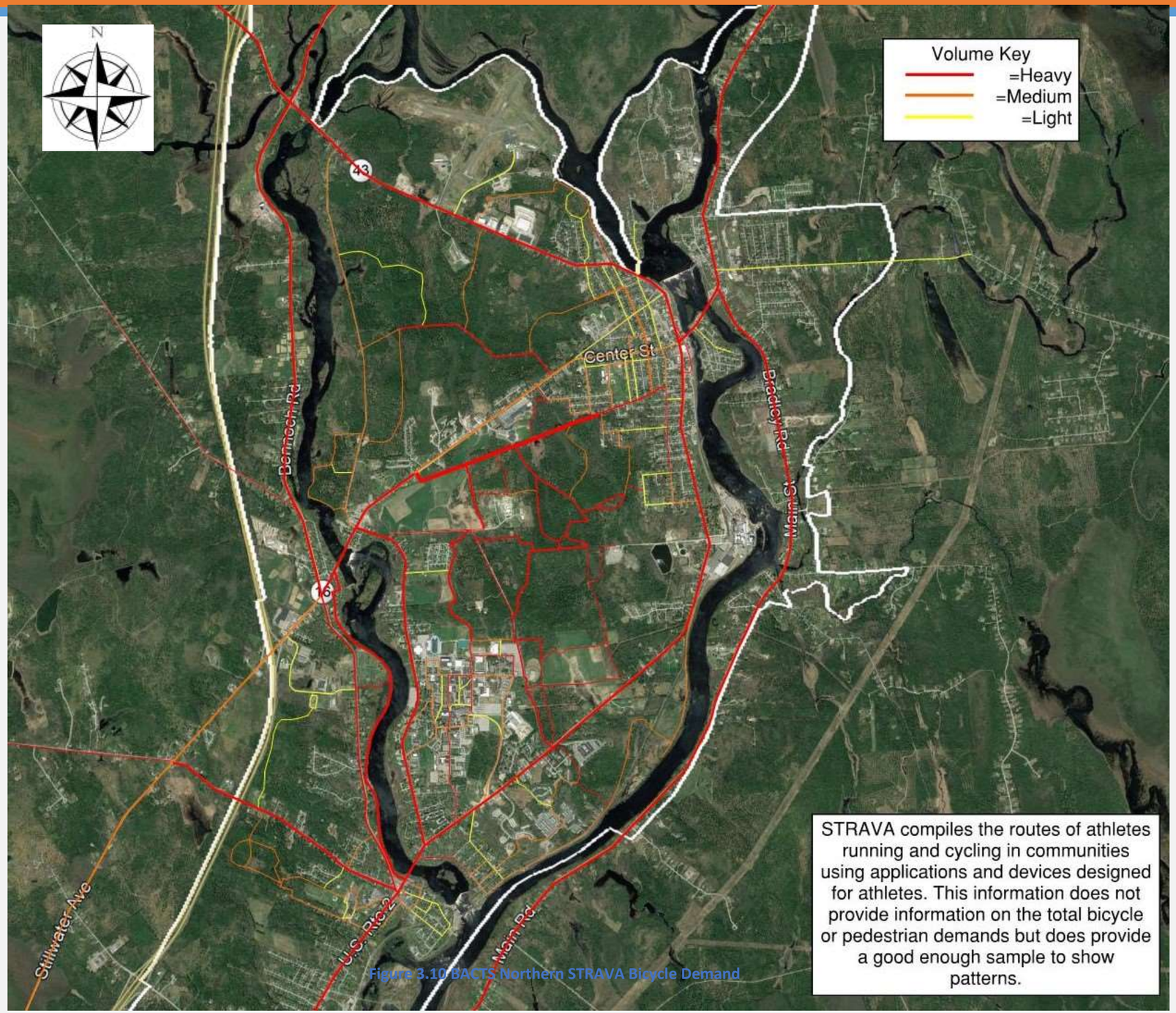


Figure 3.10 BACTS Northern STRAVA Bicycle Demand

4.0 Transit Services

The fixed route bus service in the BACTS area, referred to as Community Connector, is owned and operated by the City of Bangor. Community Connector provides service in the urbanized areas of Bangor, Brewer, Hampden, Old Town, Orono, Veazie, and the University of Maine, as follows:

Bangor Routes	Day(s)	Frequency	First Stop	Last Stop
Capehart	M-F	30 minutes	6:06 a.m.	6:27 p.m.
	S	30 minutes	7:06 a.m.	6:11 p.m.
Center Street	M-F	30 minutes	6:15 a.m.	6:08 p.m.
	S	60 minutes	6:45 a.m.	6:08 p.m.
Hammond Street Neighborhood	M-F	30 minutes	5:53 a.m.	6:10 p.m.
	S	60 minutes	9:15 a.m.	5:40 p.m.
Mall Hopper	M-S	60 minutes	6:55 a.m.	6:45 p.m.
Mount Hope	M-S	60 minutes	6:15 a.m.	6:05 p.m.
Stillwater Avenue	M-S	60 minutes	6:45 a.m.	6:35 p.m.
Brewer Routes	Day(s)	Frequency	First Stop	Last Stop
Brewer North	M-S	60 minutes	7:15 a.m.	5:48 p.m.
Brewer South	M-S	60 minutes	6:45 a.m.	6:22 p.m.
Hampden Route	Day(s)	Frequency	First Stop	Last Stop
Hampden	M-F	60 minutes	6:15 a.m.	6:10 p.m.
Veazie, Orono, Old Town Route	Day(s)	Frequency	First Stop	Last Stop
VOOT	M-F	60 minutes	5:45 a.m.	7:00 p.m.
	S	120 minutes	6:15 a.m.	7:05 p.m.
Black Bear Orono Express Route	Day(s)	Frequency	First Stop	Last Stop
BBOE*	M-F	30 minutes	6:55 a.m.	9:55 p.m.

*Operates only during the University of Maine academic calendar year.

These bus routes are illustrated in **Figure 4.1** and **Figure 4.2**.

There is an important interrelated relationship between transit and active transportation. Because every transit rider begins and ends a transit trip by walking, the pedestrian and bicycle facilities play a critical role in attracting new riders and maintaining existing levels of ridership. The presence of high-quality infrastructure and amenities for active transportation near transit greatly enhances a person's ability to access transit services. Frequent and reliable transit service also makes walking and bicycling more appealing ways to access transit.

The Community Connector bus system currently operates on a flag stop basis, whereby passengers can request boarding and alighting anywhere along a route. There are very few designated stops along each route with limited signage provided. As a pulse system, buses from all routes (with the exception of the Black Bear Orono Express and Mall Hopper shuttle service) arrive and department from the Pickering Square bus depot at approximately the same time in order to minimize layover time for passengers transferring from one route to another.

A study of the bus system is currently underway and is expected to be completed in June 2019. It is anticipated that the study will produce recommendations for bus route modifications, schedule alterations, suggested bus stop and station locations, among other facility suggestions. When an implementation plan is developed for the Community Connector system, BACTS will work with the City of Bangor to provide data on the current, planned, and recommended pedestrian and bicycle facility locations to ensure that transit facilities and pedestrian and bicycle facilities are in alignment.

Recommendations that are expected to come out of the study include designation of bus stops and bus station(s). It is extremely important that these facilities and related amenities be planned and designed in harmony with available pedestrian facilities and/or include strategies to implement appropriate pedestrian and bicycle facilities making safe and convenient connections for passengers. Some of these considerations include presence of sidewalks, crosswalks and curb ramps.

See p 50-52 and 71 – 82 FHWA Achieving Multimodal Networks for guidance on bus stop design and access to transit.

See p 157 – 163 and 198 -203 ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach.

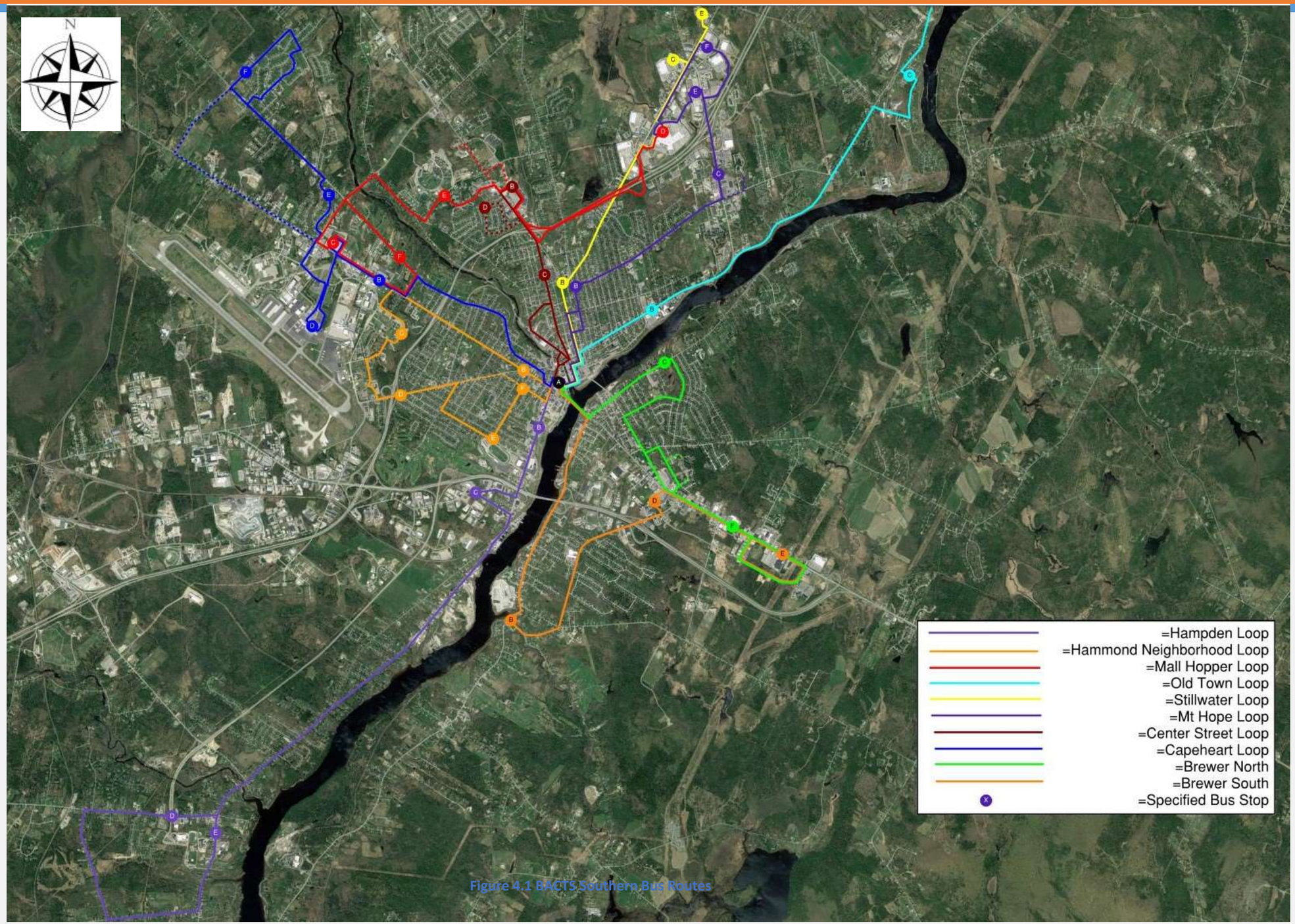


Figure 4.1 BACTS Southern Bus Routes

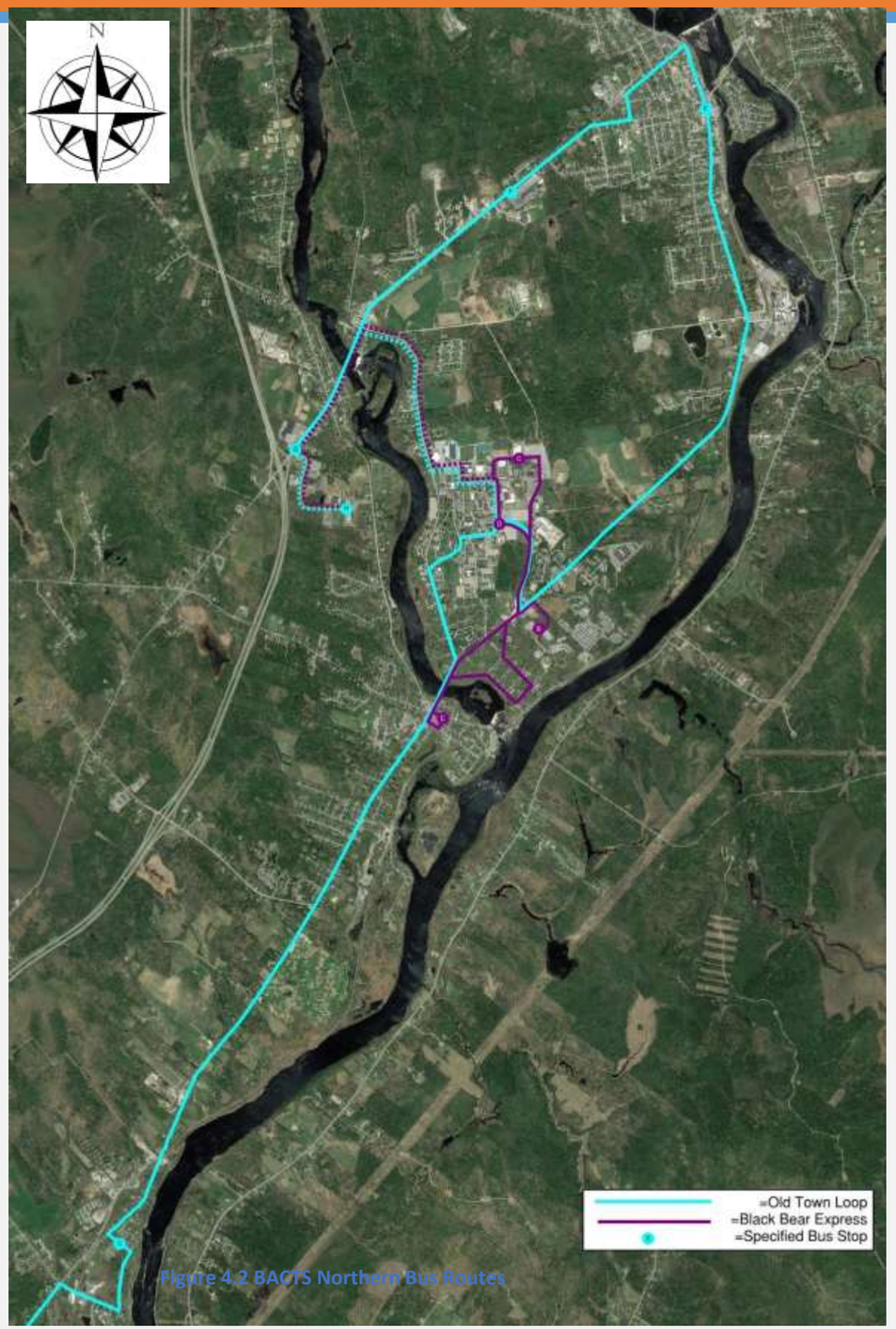


Figure 4.2 BACTS Northern Bus Routes

5.0 Planned or Programmed Transportation Improvements

Planned or programmed transportation improvements are projects that have already been included in an approved Transportation Improvement Program (TIP) and/or Workplan. Actual project implementation may be affected by the recent surge in construction costs and the limited number of available contractors.

Bangor

- Improve the intersections at of 14th Street and Ohio Street as well 14th Street and Union Street to install traffic signals with pedestrian equipment and improve sidewalks in 2019.
- Signal Improvements to Union Street and Main Street in 2019.
- Trail 5 will be built connecting Sylvan Road to Stillwater Avenue in 2019.
- A new sidewalk will be constructed on the west side of Union Street from Vermont Avenue to Griffin Road in 2019.
- Intersection signal improvements at State Street and Forest Avenue in 2020.
- Main Street from Dutton Street to the municipal boundary will be repaved in 2020.
- Union Street from Hammond Street to I-95 will be repaved in 2019.
- Signal improvements and through lane addition at Stillwater Avenue/Bangor Parcade in 2019.
- Hammond Street from Maine Avenue to I-95 ramps widening and possible new signals with a new sidewalk on the south side in 2019.
- Buck Street sidewalk from Main Street to Bass Park Boulevard in 2019.
- Sidewalk upgrades, including radiant heat, on Exchange and State Streets in 2019.
- Pedestrian safety improvements to install lighting and high visibility pedestrian signs on Outer Hammond Street between the end of I-395 and the Target Industrial Complex in 2018.
- Intersection Improvement Broadway/Center Street/ I-195 Off-Ramp

Brewer

- Outer Wilson Street is being repaved with some minor sidewalk alterations in 2019.
- Minor sidewalk alterations during repaving on South Main Street from Elm Street to Abbott Street in 2019.
- Reconstruct sidewalks along Eastern Avenue from State Street to Oak Grove Drive during repaving in 2019.
- Intersection improvements at Wilson Street and Dirigo Drive in 2019/2020.
- Add Bump outs and RRFB on North Main Street at City Hall in 2019.

Hampden

- Add 800 feet of sidewalk on Western Avenue to complete the “4-mile square” around Mayo Road, Western Avenue, Kennebec Road, and Route 1A in 2020.
- Road reconstruction with the addition of 1.73 miles of sidewalk along Main Road North (1A) from Western Avenue to Mountainview Drive in 2019/2020.

Veazie

- No future projects planned.

Orono

- Main Street sidewalks in 2019/2020.
- College Avenue sidewalk project 2017-2022.
- Intersection Improvements at Main Street and Pine Street
- Intersection Improvements at Main Street, Bennoch Road, and Mill Street
- Intersection Improvements at Main Street and North Main Avenue
- Intersection Improvements at Main Street, College Avenue, and Park Street

Old Town/Milford

- Intersection improvements at College Avenue and Stillwater Avenue 2021/2022.
- Reconstruction of Stillwater Avenue from College Avenue to the Elementary School.
- Intersection Improvements at Stillwater Avenue and Bennoch Road

Hermon

- Intersection improvements at Coldbrook Road/Odlin Road/Emerson Mill Road in 2019.

6.0 Pedestrian Facility Plan Recommendations

Design Needs of Pedestrians

Pedestrians have a variety of characteristics and the transportation network should accommodate a variety of needs, abilities, and possible impairments. Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. Children have low eye height and walk at slower speeds than adults. They also perceive the environment differently at various stages of their cognitive development. Older adults walk more slowly and may require assistive devices for walking stability, sight, and hearing.

Age	Characteristics
0-4	Learning to walk
	Requires constant adult supervision
	Developing peripheral vision and depth perception
5-8	Increasing independence, but still requires supervision
	Poor depth perception
9-13	Susceptible to "dart out" intersection dash
	Poor judgment
	Sense of invulnerability
14-18	Improved awareness of traffic environment
	Poor judgment
19-40	Active, fully aware of traffic environment
41-65	Slowing of reflexes
65+	Difficulty crossing street
	Vision loss
	Difficulty hearing vehicles approaching from behind

The MUTCD recommends a normal walking speed of three and a half feet per second when calculating the pedestrian clearance interval at traffic signals. The walking speed can drop to three feet per second for areas with older populations and persons with mobility impairments. While the type and degree of mobility impairment varies greatly across the population, the transportation system should accommodate these users to the greatest reasonable extent.

Impairment	Effect on Mobility	Design Solution
Wheelchair and Scooter Users	Difficulty propelling over uneven or soft surfaces.	Firm, stable surfaces and structures, including ramps or beveled edges.
	Cross-slopes cause wheelchairs to veer downhill.	Cross-slopes of less than two percent.
	Require wider path of travel.	Sufficient width and maneuvering space.
Walking Aid Users	Difficulty negotiating steep grades and cross slopes; decreased stability.	Smooth, non-slipperly travel surface.
	Slower walking speed and reduced endurance; reduced ability to react.	Longer pedestrian signal cycles, shorter crossing distances, median refuges, and street furniture.
Hearing Impairment	Less able to detect oncoming hazards at locations with limited sight lines (e.g. driveways, angled intersections, channelized right turn lanes) and complex intersections.	Longer pedestrian signal cycles, clear sight distances, highly visible pedestrian signals and markings.
Vision Impairment	Limited perception of path ahead and obstacles; reliance on memory; reliance on non-visual indicators (e.g. sound and texture).	Accessible text (larger print and raised text), accessible pedestrian signals (APS), guide strips and detectable warning surfaces, safety barriers, and lighting.
Cognitive Impairment	Varies greatly. Can affect ability to perceive, recognize, understand, interpret, and respond to information.	Signs with pictures, universal symbols, and colors, rather than text.

See p 87-90 FHWA Achieving Multimodal Networks for guidance on designing accessible pedestrian facilities.

See MaineDOT Minimum ADA Requirements for Pedestrian Facilities, which requires that new pedestrian facilities, or existing facilities that must be reconstructed, be designed and built to meet minimum requirements that in some cases exceed the minimum ADA standards.

Facility Improvement Recommendations

A brief description of types of proposed pedestrian improvements are listed below. Refer to guidance documents noted for a more detailed description, illustrations, and design information's for each type of facility. Links to these documents are included in the Section 12.0 of the Plan.

Sidewalk - facility separated from the roadway by a curb (and sometimes a setback) for the exclusive use by pedestrians. *See p 4-19 FHWA Small Town and Rural Multi Modal Networks; See MaineDOT Minimum ADA Requirements for Pedestrian Facilities 01.24.18*

Multi-Use Path (Shared-Use Path) - facilities separated from roadways for use by bicyclists and pedestrians. *See p 4-3 FHWA Small Town and Rural Multi Modal Networks*

Painted Shoulder Pedestrian Area (Pedestrian Lane) - designated space on the roadway for the exclusive use of pedestrians. *See p 5-7 FHWA Small Town and Rural Multi Modal Networks*

Curb Extension – roadway edge treatment where a curb line is bulbed out toward the middle of the roadway to narrow the width of the street and shorten the pedestrian crossing distance. *See p 195- 197 ITE's Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*

Marked Crosswalk - location designated as right-of-way for pedestrians to cross the street and vehicles to yield to pedestrians delineated by white crosswalk pavement markings. *See p 34 FHWA Achieving Multimodal Networks; See MaineDOT Guidelines on Crosswalks 01.17.19*

Mid-Block Crossing- direct pedestrians to cross at the safest locations and makes them visible to vehicles. *See p 103 FHWA Achieving Multimodal Networks; See MaineDOT Guidelines on Crosswalks 01.17.19*

Curb Ramps - must be installed with truncated domes as detectable warnings at all intersections and mid-block locations where there are pedestrian crossings in order to provide crucial access to sidewalks for people using wheelchairs and other mobility devices. *See MaineDOT Minimum ADA Requirements for Pedestrian Facilities 01.24.18*

Median/Refuge Island - allow pedestrians a safer place to stop at the midpoint of the roadway before crossing the remaining distance (particularly helpful for those pedestrians with limited mobility). *See MaineDOT Guidance on Medians and Islands 01.17.19*

Intersection Improvement - Designing multi-modal intersections with the appropriate accommodations for all users must be performed on a base-by-case basis. The design extends beyond the immediate intersection. A thorough understanding of the community's objective and priorities must be clear because there will undoubtedly be trade-offs required. *See Chapter 10 Intersection Design Guidelines of ITE's Designing Walkable Urban Thoroughfares: A Context Sensitive Approach; See MaineDOT Intersection and Interchanges Practices and Procedures; See p 18-20 FHWA Achieving Multimodal Networks.*

Pedestrian Hybrid Beacon - facilitate pedestrian crossings at unsignalized locations with marked crosswalks by warning and controlling traffic activated by pedestrian detectors, such as pushbuttons at uncontrolled crossings of multi-lane, higher speed and/or volume roadways where there is a need for pedestrian crossings without inordinate delay to vehicular traffic. *See p 34 FHWA Achieving Multimodal Networks.*

Rectangular Rapid Flashing Beacon (RRFB) - LED flashing beacons alert motorists of pedestrian crossings activated by pedestrian detectors such as pushbuttons, placed on both sides of the crosswalks used in conjunction with pedestrian crossing sign and supplemented with advance yield or stop pavement markings, most effective on two-lane streets. *See p 34 FHWA Achieving Multimodal Networks*

Pedestrian Signals- indicate to pedestrians when it is permissible and safe to cross a street. *See p38 FHWA Achieving Multimodal Networks; See Part 4 Highway Traffic Signals Manual on Uniform Traffic Control Devices (MUTCD)*

Pedestrian Signage - used to increase awareness and provide information to improve roadway safety and/or assist in wayfinding. *Guidance on design and application of traffic control devices, including pedestrian signage, can be found in the Manual on Uniform Traffic Control Devices (MUTCD)*

Pavement Markings – used to increase awareness, often used with additional measures to enhance safety and increase awareness. Pavement markings can signify locations where pedestrians can safely cross the street, designate right of way for motorists to yield, and/or draw attention to the presence of pedestrians. *Guidance on design and application of traffic control devices, including pavement markings, can be found in the Manual on Uniform Traffic Control Devices (MUTCD); See MaineDOT Traffic Engineering Striping and Stenciling Handbook*

The Highway Program within the Bureau of Project Development of MaineDOT is responsible for design and construction of projects to improve the safety and mobility of Maine's highways and streets. The Complete Street Design Practices and Procedures guidance is based on *A Policy on Geometric Design of Highways and Streets (Greenbook)* and other related documents or publications.

In addition, ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach provides guidance on planning and developing roadway improvement projects on arterial or collector roads to support walkable communities.

Planning level recommendations in this Plan may require further evaluation to determine feasibility and/or appropriate treatment.

Bangor

Southwest (See Figure 6.1)

- Outer Hammond Street Multi-Use Path (South side from Odlin Road to Hermon municipal boundary).
- Odlin Road Sidewalk (East side from Day's Inn to Hammond Street). There may be restrictions on constructing sidewalks near the runway of the airport.
- Odlin Road Sidewalk (West side and add a crossing). Intended to provide a safe crossing between the land uses on both sides of the street. Crossing location to be determined and will likely need an RRFB.
- Maine Avenue Sidewalk (East side from Hammond Street to Godfrey Boulevard).
- Ohio Street Sidewalk (South side from James Street to Thomas Hill Road). Topography will make implementation difficult and will likely require retaining walls. Historic permitting may be required given proximity to the School.
- Ohio Street Crossings (Add crosswalks at James Street and Thomas Hill Road). This is suggested as a short-term strategy to provide connections to and from the east side sidewalk in lieu of the construction a sidewalk on the south side.
- Hammond Street/Odlin Road (Intersection Improvements).
- Middle Street/Water Street/Maine Road (Intersection Improvements). There were three pedestrian crashes at this intersection from 2015-2017.
- Outer Hammond Street Crossing (Pedestrian Hybrid Beacon). The location of the crossing is to be determined and when installed it shall be coordinated with the I-395 traffic signal.
- Extend the Penobscot River Multi-Use Path (southerly from Dutton Street to Route1A).
- Joshua Chamberlain Bridge Sidewalks (remove steps).
- Odlin Road/Route 2 (Intersection Improvements).

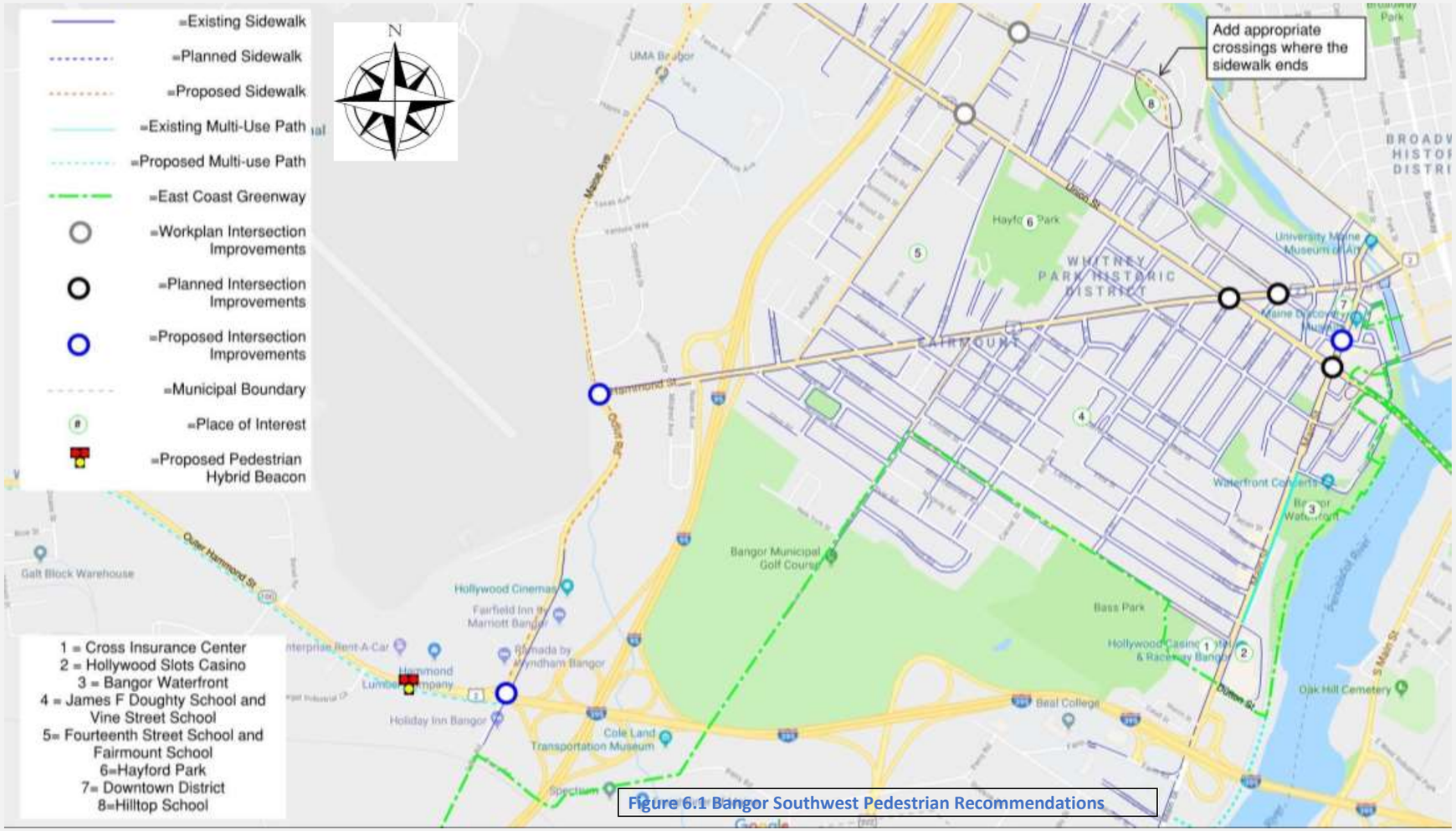


Figure 6.1 Bangor Southwest Pedestrian Recommendations

Bangor

Southeast (See Figure 6.2)

- Broadway Sidewalk (Northeast side from Grandview Avenue to Griffin Road).
- Mt. Hope Avenue Sidewalk (North side extension to State Street).
- Hogan Road Sidewalk (East side from Bangor Mall Boulevard to Mt. Hope Avenue).
- Hogan Road Sidewalk (West side from Mt. Hope Avenue to Dorothea Dix Psychiatric Center).
- State Street Sidewalk (North side extension to Veazie municipal boundary). There are grade issues and likely some ledge from Saxl Park to Hogan Road. There is a bridge to the east of Meadowbrook Road that may need widening.
- State Street/Hogan Road (Intersection Improvements).
- State Street/Hancock Street/Otis Street (Intersection Improvements). There were 4 pedestrian crashes at this location from 2015-2017.
- Essex Street Sidewalk (North West side from Grandview Avenue to Burleigh Road).

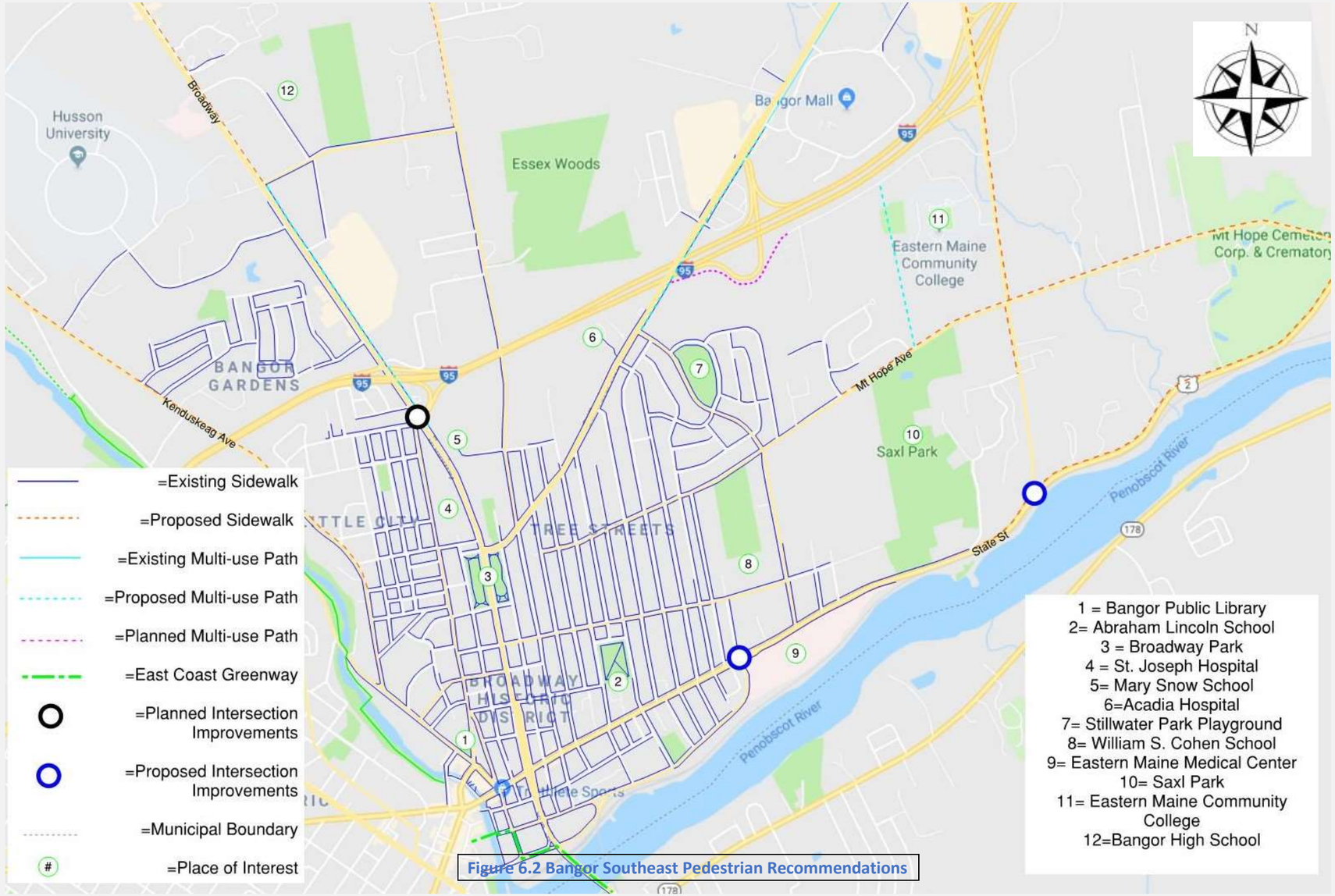


Figure 6.2 Bangor Southeast Pedestrian Recommendations

Bangor

North (See Figure 6.3)

- Griffin Road Sidewalk (North side extension to Broadway).
- School Street Sidewalk (Broadway to Hillside Avenue).
- Broadway Sidewalk (Husson Avenue to Grandview Avenue). There is an existing sidewalk that terminates in areas that needs to be connected to the intersection.
- Kenduskeag Avenue Sidewalk (North side extension to Griffin Road). There are significant width constraints to constructing this sidewalk and thus this is a long-term recommendation. It should be noted that, when replaced, the I-95 bridge should include a sidewalk.

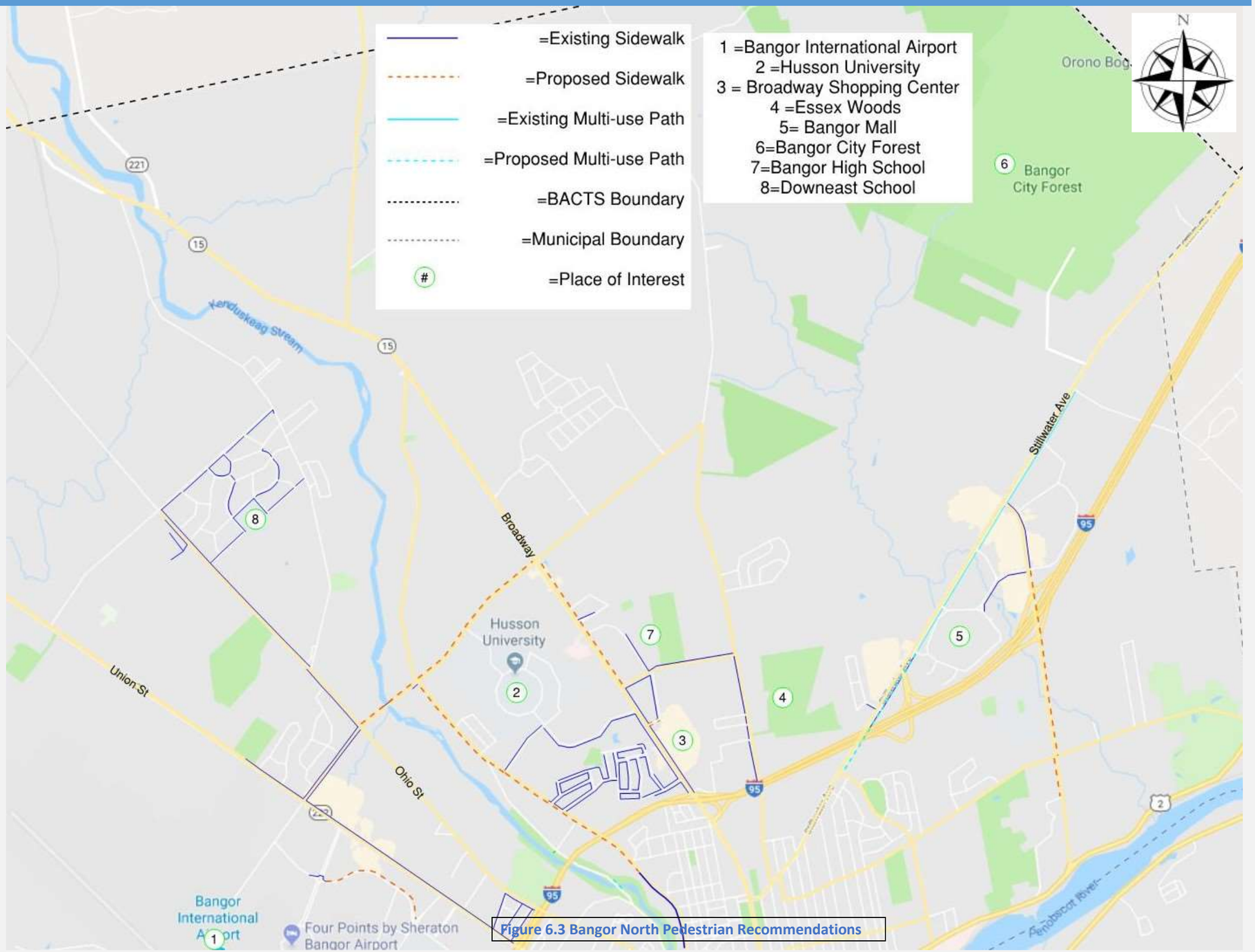


Figure 6.3 Bangor North Pedestrian Recommendations

Brewer (See Figure 6.4)

- Hillcrest Drive Sidewalk (West side from North Main Street to Oak Grove Drive).
- South Main Street Sidewalk (North side from Cove Street to Harriman Way). There is little room on this side approaching the Sedgeunkedunk Stream.
- South Main Street Sidewalk (South side over Sedgeunkedunk Stream). A sidewalk would need to be added over the bridge.
- Grove Street Sidewalk (West side from South Main Street to Parkway South). There is a rail crossing on the street.
- Edgewood Drive Painted Shoulder Pedestrian Area.
- Sunset Strip Painted Shoulder Pedestrian Area.
- Robinhood Drive Painted Shoulder Pedestrian Area.
- Nottingham Way Painted Shoulder Pedestrian Area.
- Canterbury Road Painted Shoulder Pedestrian Area.
- North Main Street Crossing (New Pedestrian Crossing Signs at Indian Trail Park).
- Wilson Street Study (Conduct a study to investigate an appropriate location for a pedestrian crossing between State Street and Green Point Road). Pedestrians currently dart into traffic because signalized crossings are too far apart. Adding a new crossing could cause traffic back-ups and delays at traffic signals.

Proposed Brewer Land Trust Brewer Rail Trail Project

The Brewer Land Trust proposed Brewer Rail Trail uses an inactive, overgrown portion of railroad (part of the Calais Branch Rail Line) from Wilson Street to approximately 1,000 feet easterly of Green Point Road and is 2.12 miles. The potential rail trail would serve as both recreational and a multi-modal, non-motorized transportation connection.

With an average right-of-way of 66 feet, this parcel calculates to 17.3 acres. The owner of this segment of rail is Pan Am Systems, Inc. Brewer Land Trust has been working with Pan Am on an offer for ownership.

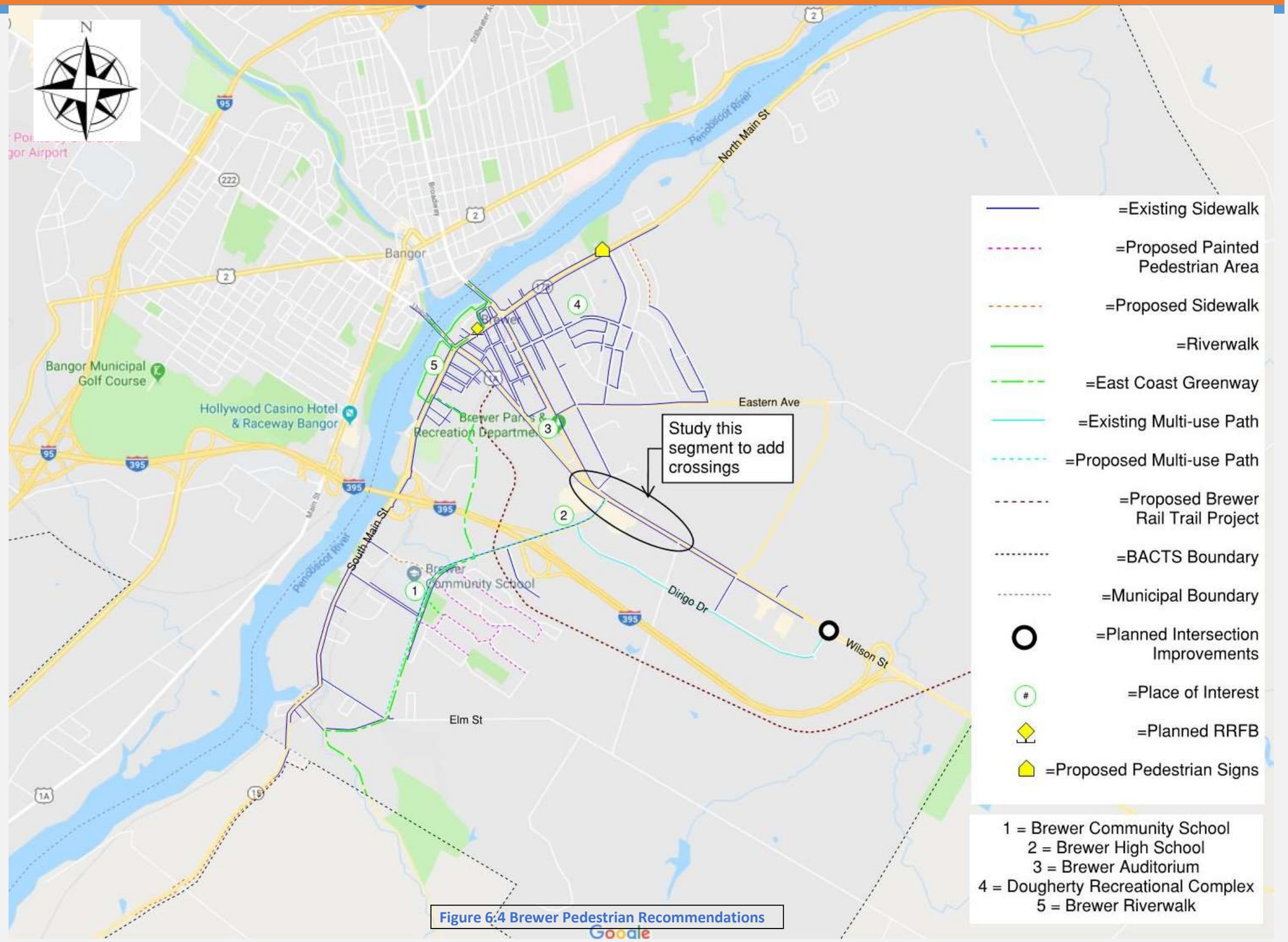


Figure 6.4 Brewer Pedestrian Recommendations

Hampden (See Figure 6.5)

- Western Avenue Sidewalk (Mayo Road to Route 202). The current sidewalk project on the north side had significant permitting issues. This sidewalk will likely face similar issues, particularly over the culvert.
- Main Road North Crossing at the Edythe Dyer Library Street (Install RRFB).
- Western Avenue and Route 1A (Intersection Improvements).

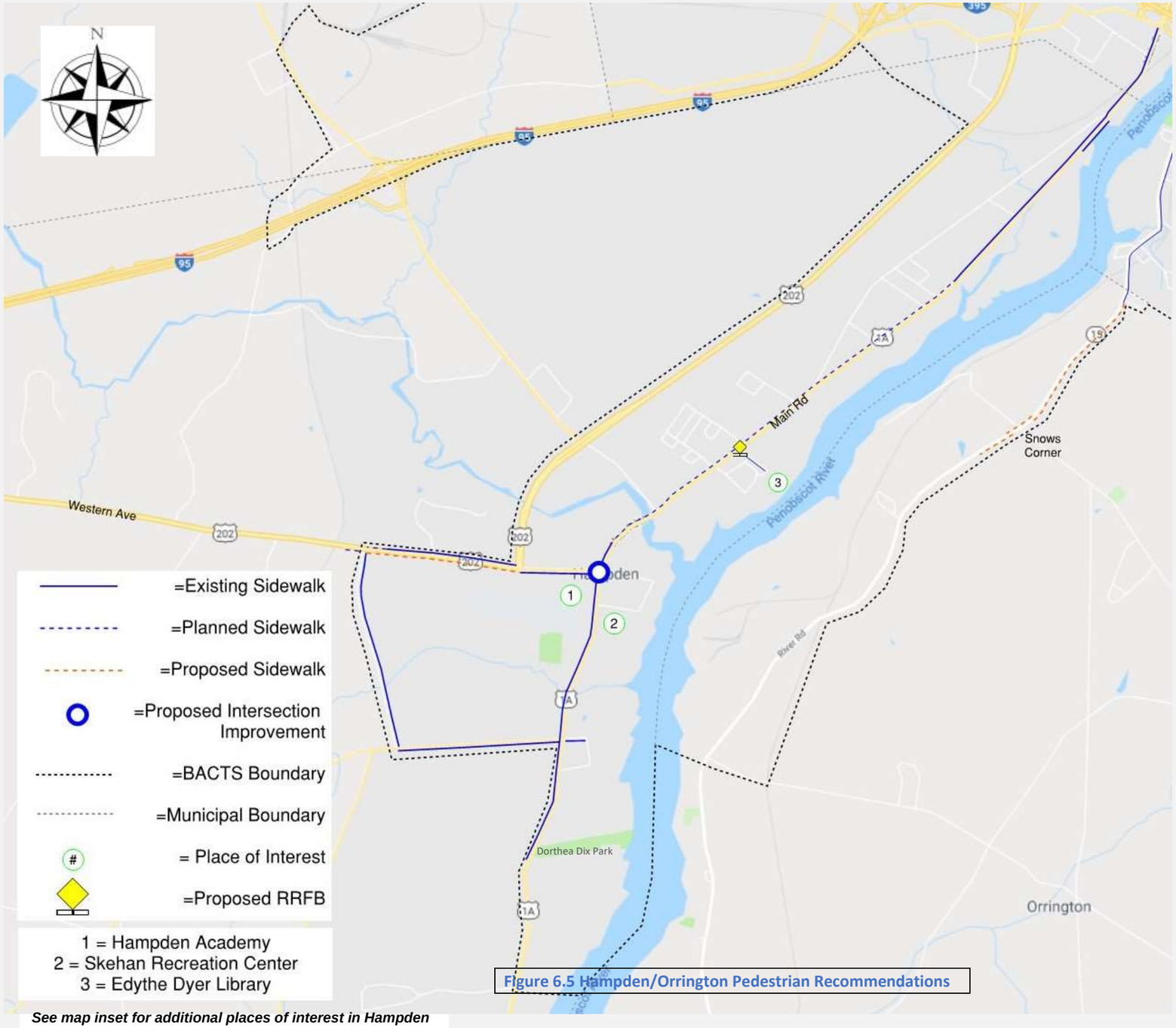
Orrington

- Route 15 Sidewalks. Primarily along the southeast side of the road from the Brewer Municipal Boundary to Snows Corner Road. With sidewalks on the northeast side in the village center area. There are right of way limitations that will require sidewalks to be next to the roadway. Wright-Pierce provided a detailed design and plan for the sidewalk in the Orrington Village Improvement Plan.

Hermon

- None.

Additional Places of Interest in Hampden



See map inset for additional places of interest in Hampden

Figure 6.5 Hampden/Orrington Pedestrian Recommendations

Veazie (See Figure 6.6)

- State Street Sidewalk (West side to Orono municipal boundary). There are short sections of retaining walls north of Main Street.

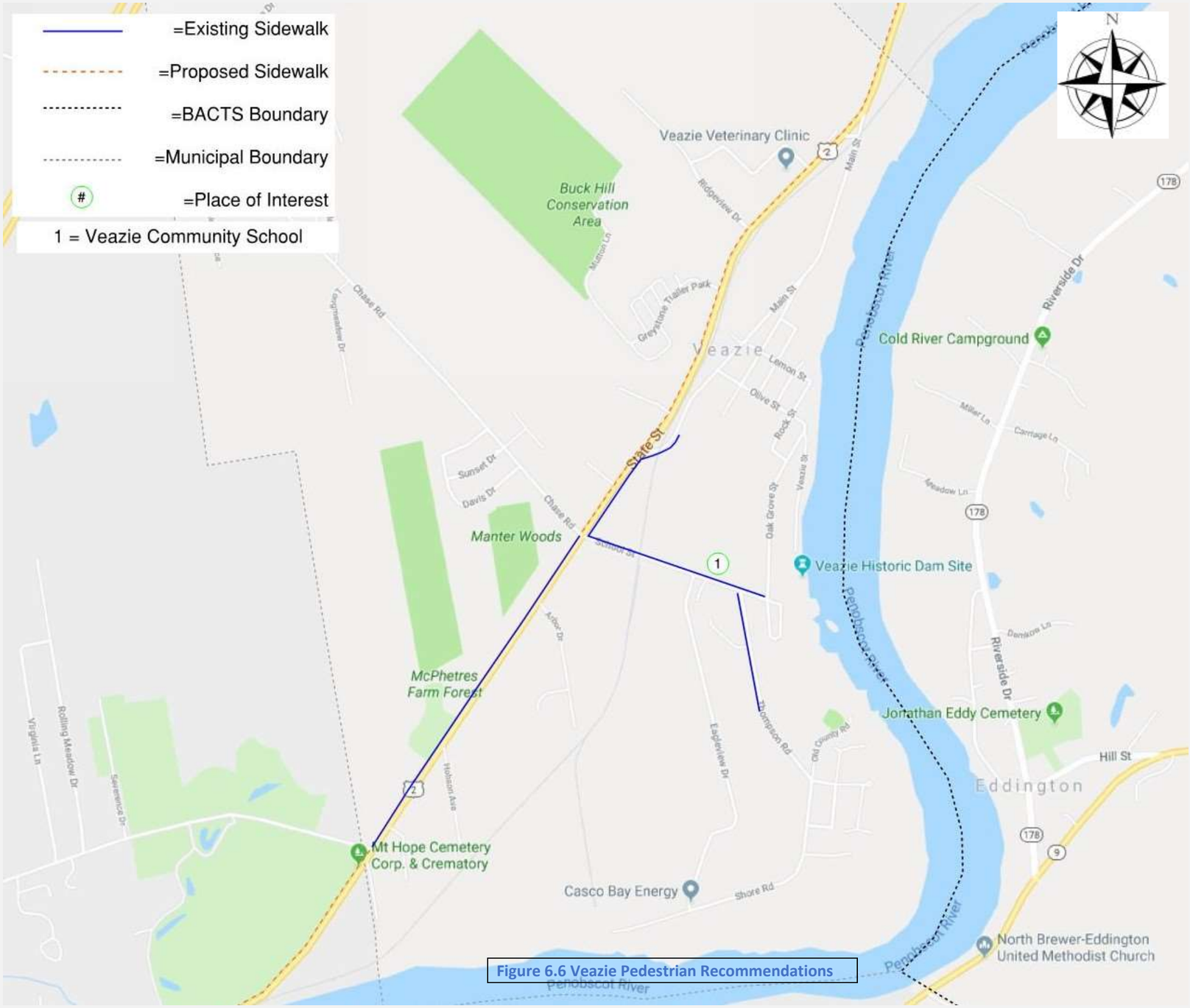


Figure 6.6 Veazie Pedestrian Recommendations

Orono (See Figure 6.7)

- Main Street Sidewalk (West Side from Veazie municipal boundary to Kelley Road).
- Park Street Sidewalk (East Side from The Reserve Apartments to the Old Town municipal boundary).
- Crosby Street Sidewalk (East Side Entire Length of Street). The right-of-way from Pierce Street to Penobscot Street is limited.
- Bennoch Road Sidewalk (West Side from Godfrey Drive to Old Town municipal boundary). Right-of-way is limited in this segment.
- Park Street Sidewalk Improvements (As recommended in the Park Street Study). Add an esplanade on the east side. Remove obstructions on the west side.
- Main Street Mid- Block Crossing north of Westwood Street (Install RRFB).
- Install curb extensions on Main Street at Westwood Street.
- New Crossing on Main Street at Gilbert Street (Install RRFB).
- Gilbert Street Sidewalk (Leadbetters to Gilbert Street). This will be a small landing that will allow residents to get to Leadbetters from the neighborhoods to the west via ADA compliant facilities connecting into the existing sidewalk network.
- North Main Avenue Sidewalk (Connect to Penobscot Street). There is a rail crossing where the current sidewalk ends.
- OFF-ROAD LOCAL INITAITIVE: Marden Park Multi-Use Path (Connecting Park Street to Crosby Street through Marden Park).
- OFF-ROAD LOCAL INITIATIVE: Off-Road Multi-Use Path (Parallel to Route 2 from Kelley Road to Westwood Road).

Figure 6.7 Orono Pedestrian Recommendations

Old Town (See Figure 6.8)

- Stillwater Avenue Sidewalk (East side from YMCA entrance to Elementary School). This segment will allow residents of Old Town's largest neighborhood to walk their children to school.
- Stillwater Avenue Sidewalk (West side from YMCA to Center Street). This segment creates a continuous sidewalk on Stillwater Avenue.
- Main Street Sidewalk (East side from Orono to existing sidewalk).
- Bennoch Road Sidewalk (West side from Orono municipal boundary to Stillwater Avenue).

Milford

- None.

Penobscot Indian Nation

- Wabanaki Way Sidewalk (Connect existing sidewalk to Down Street).
- Down Street Sidewalk (East side from current sidewalk to Wabanaki Way).
- There are homes close to the roadway, making a sidewalk difficult at both above locations.

Bradley

- Route 178 Sidewalk (East side from current sidewalk to Milford municipal boundary). This segment connects Bradley to the rest of the region.

Figure 6.8 Old Town/Penobscot Indian Nation/Bradley Pedestrian Recommendations

BACTS Regionwide Pedestrian Connectivity

Figure 6.9 presents the existing pedestrian transportation network throughout the BACTS region and illustrates how proposed improvements will achieve a connected regional pedestrian transportation network.

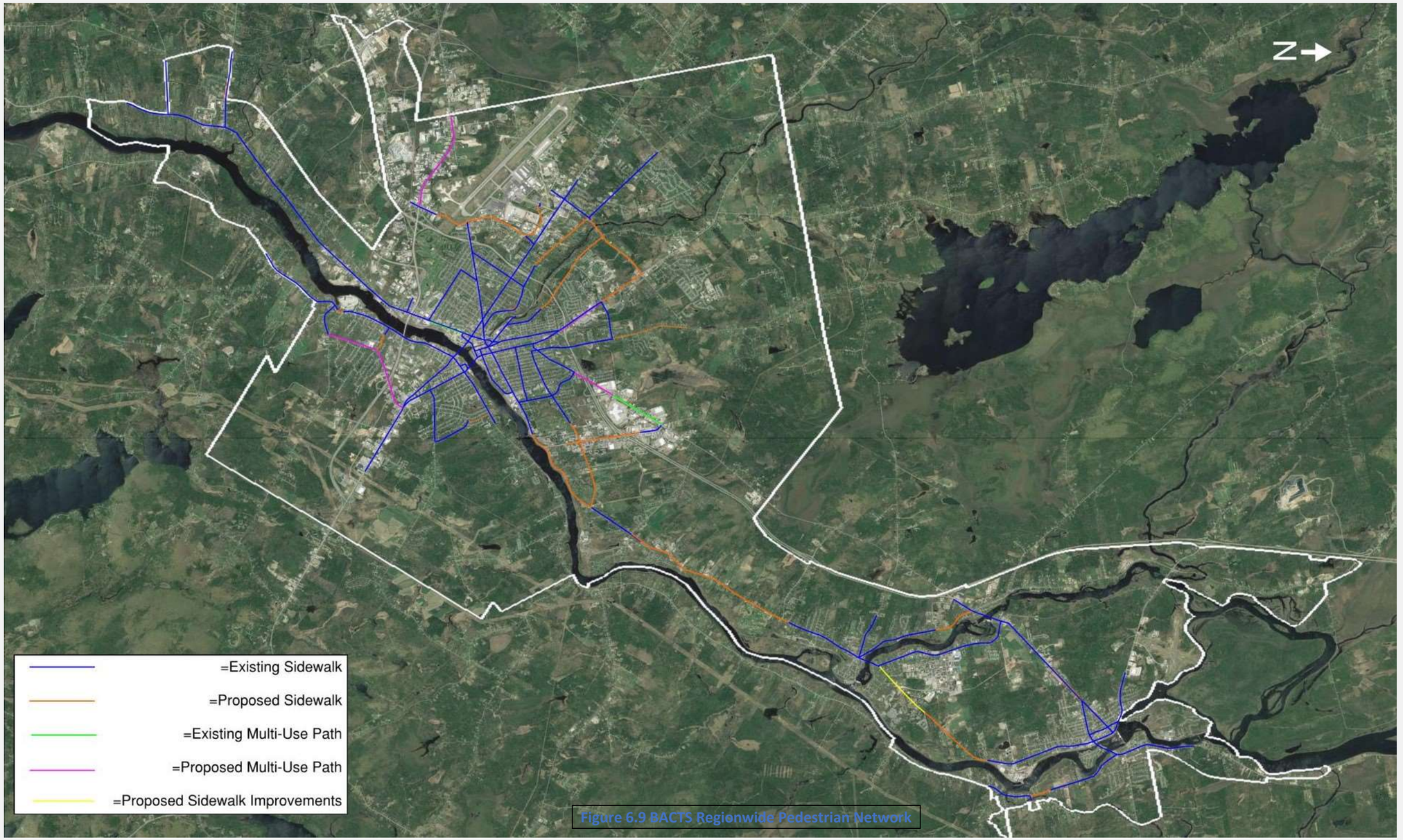


Figure 6.9 BACTS Regionwide Pedestrian Network

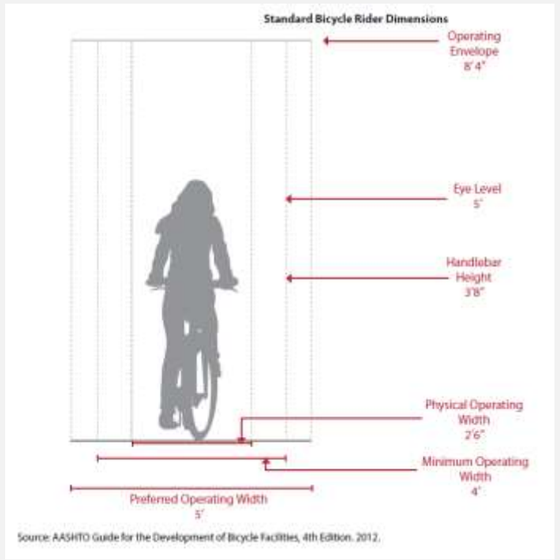
7.0 Bicycle Facility Plan Recommendations

Design Needs of Bicyclists

Bicyclists, by nature, are much more affected by poor facility design, construction, and maintenance practices than motor vehicle drivers. Bicyclists lack the protection from the elements and roadway hazards provided by an automobile's structure and safety features. By understanding the unique characteristics and needs of bicyclists, a facility designer can provide quality facilities and minimize user risk.

Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

The figure below illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.



Source: AASHTO Guide for the Development of Bicycle Facilities, 4th Edition. 2012.

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories. The figure and table below summarize the typical dimensions for bicycle types.

Bicycle as Design Vehicle - Typical Dimensions

Source: AASHTO *Guide for the Development of Bicycle Facilities*, 4th Edition *AASHTO does not provide typical dimensions for tricycles.

Bicycle as Design Vehicle - Typical Dimensions

Bicycle Type	Feature	Typical Dimensions
Upright Adult Bicyclist	Physical width	2 ft 6 in
	Operating width (Minimum)	4 ft
	Operating width (Preferred)	5 ft
	Physical length	5 ft 10 in
	Physical height of handlebars	3 ft 8 in
	Operating height	8 ft 4 in
	Eye height	5 ft
	Vertical clearance to obstructions (tunnel height, lighting, etc)	10 ft
	Approximate center of gravity	2 ft 9 in - 3 ft 4 in
Recumbent Bicyclist	Physical length	8 ft
	Eye height	3 ft 10 in
Tandem Bicyclist	Physical length	8 ft
Bicyclist with child trailer	Physical length	10 ft
	Physical width	2 ft 6 in

The expected speed that different types of bicyclists can maintain under various conditions also influences the design of facilities such as shared use paths. The table to the right provides typical bicyclist speeds for a variety of conditions.

Bicycle as Design Vehicle - Design Speed Expectations

Bicycle Type	Feature	Typical Speed
Upright Adult Bicyclist	Paved level surfacing	15 mph
	Crossing Intersections	10 mph
	Downhill	30 mph
	Uphill	5 -12 mph
Recumbent Bicyclist	Paved level surfacing	18 mph

*Tandem bicycles and bicyclists with trailers have typical speeds equal to or less than upright adult bicyclists.

The Highway Program within the Bureau of Project Development of MaineDOT is responsible for design and construction of projects to improve the safety and mobility of Maine's highways and streets. The Complete Street Design Practices and Procedures guidance is based on AASHTO's *A Policy on Geometric Design of Highways and Streets (Greenbook)* and other related documents or publications.

Facility Plan Recommendations

A brief description of the types of bicycle facility improvements proposed are listed below. Refer to the guidance documents noted for a more detailed description, illustrations, and design information for each type of facility. These documents are included in Section 12.0 of the Plan.

Bicycle Lane – roadway or portion of roadway that has been designated for use by bicyclists by pavement markings and/or signs. *See p 3-11 FHWA Small Town and Rural Multi Modal Networks*

Shared Lane – facility where both bicycles and vehicles operate within the same travel lane, either side by side or in single file depending on roadway width. Marked shared lanes may be designated by pavement markings, signage and/or other traffic calming devices. *Guidance on design and application of traffic control devices, including those specific to bicycle facilities, can be found in the Manual on Uniform Traffic Control Devices (MUTCD)*

Neighborhood Byway (Bicycle Boulevard) **–** local street or series of contiguous low-volume local street segments designed to accommodate through bicycle traffic where vehicles and bicyclists share the same travel lane. Signs and pavement markings are the minimum treatments necessary to designate a neighborhood byway. *See p 2-9 FHWA Small Town and Rural Multi Modal Networks*

Paved Shoulder **–** portion of the roadway contiguous with the traveled way that accommodates stopped vehicles and emergency use. *See p 3-3 FHWA Small Town and Rural Multi Modal Networks; See p 42 FHWA Achieving Multimodal Networks*

Multi-Use Path - facility separated from roadways for use by bicyclists and pedestrians. *See p 99 FHWA Achieving Multimodal Networks; See p 4-3 FHWA Small Town and Rural Multi Modal Networks*

Interchange Improvements/Intersection Improvements - Designing multi-modal intersections with the appropriate accommodations for all users must be performed on a base-by-case basis. The design extends beyond the immediate intersection. A thorough understanding of the community's objective and priorities must be clear because there will undoubtedly be trade-offs required. *See Chapter 10 Intersection Design Guidelines of ITE's Designing Walkable Urban Thoroughfares: A Context Sensitive Approach; See MaineDOT Highway Design Chapter 5 Intersections and Interchanges Practices and Procedures; See p 18-20 FHWA Achieving Multimodal Networks*

Road Diet – can reduce vehicle speeds and the number of lanes pedestrians cross, as well as reallocate travel lanes of a roadway (typically reduce a 4-lane roadway to 3 lane) to create space to expand or add pedestrian and/or bicycle facilities. *See p 30 FHWA Achieving Multimodal Networks*

Bicycle Ramp – At grade separated roadways, it may be convenient to allow bicyclists to exit the roadway even if vehicles may not. Ramps can be constructed to allow easy entrance and exit from the roadway.

Pavement Markings - used to increase awareness, often used with additional measures to enhance safety and increase awareness. Pavement markings can be used to indicate exclusive use, shared use, or other guidance for bicyclists and motorists on the roadway alone or in combination with signage. *Guidance on design and application of traffic control devices, including those specific to bicycle facilities, can be found in the Manual on Uniform Traffic Control Devices (MUTCD)*; MaineDOT Traffic Engineering Striping and Stenciling Handbook

Shared Use Signage **–** used to increase awareness that vehicles and bicyclists operate within the same travel lane. *Guidance on design and application of traffic control devices, including those specific to bicycle facilities, can be found in the Manual on Uniform Traffic Control Devices (MUTCD); MaineDOT Bicycle Sign Templates based on MUTCD standards*

Traffic Calming – helps reduce vehicular volumes and speed - includes a variety of physical roadway measures that are designed to help improve safety and reduce conflicts between motorists, bicyclists, and pedestrians. *See p 22-24 FHWA Achieving Multimodal Networks*

Planning level recommendations in this Plan may require further evaluation to determine feasibility and/or appropriate treatment.

Bangor

Southwest (See Figure 7.1)

- Ohio Street (From Hammond Street to 14th Street) Shared Lane markings and signage.
- Joshua Chamberlain Bridge pavement markings, signage and lighting.

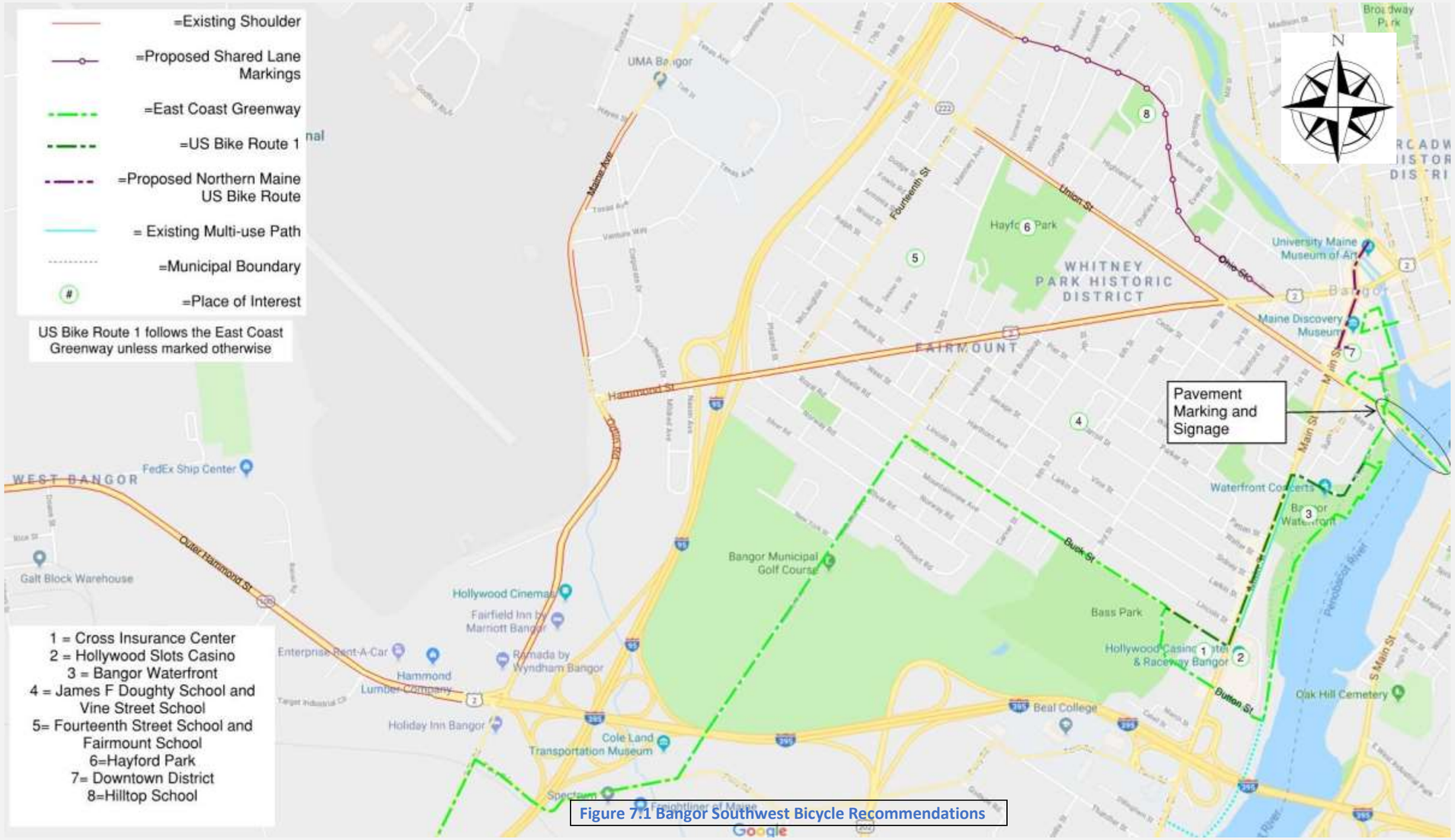


Figure 7.1 Bangor Southwest Bicycle Recommendations

Bangor

Southeast (See Figure 7.2)

- Essex Street Neighborhood Byway (Traffic Calming, Pavement Markings and Signage).
- Garland Street Neighborhood Byway (Traffic Calming, Pavement Markings and Signage).
- Mt. Hope Avenue Neighborhood Byway (Traffic Calming, Pavement Markings and Signage).
- Howard Street Neighborhood Byway (Traffic Calming, Pavement Markings and Signage).
- Broadway Bicycle Lanes (Stillwater Avenue to State Street): Add shared-lane markings where lanes are not feasible.
- Husson Avenue Shoulders (Pavement Markings for Length of Road).
- Stillwater Avenue Multi-Use Path (Extend from Bangor Mall Boulevard to Howard Street) – This will require modification to the I-95 Bridge Structure.
- Stillwater Avenue Shoulders (Broadway to Grove Street). There is no room for shoulders where turn lanes are present.
- OFF-ROAD LOCAL INITIATIVE: Eastern Maine Community College Multi-Use Path (Sylvain Road to Mt. Hope Avenue).
- 14th Street and Valley Avenue. (Intersection Improvements).

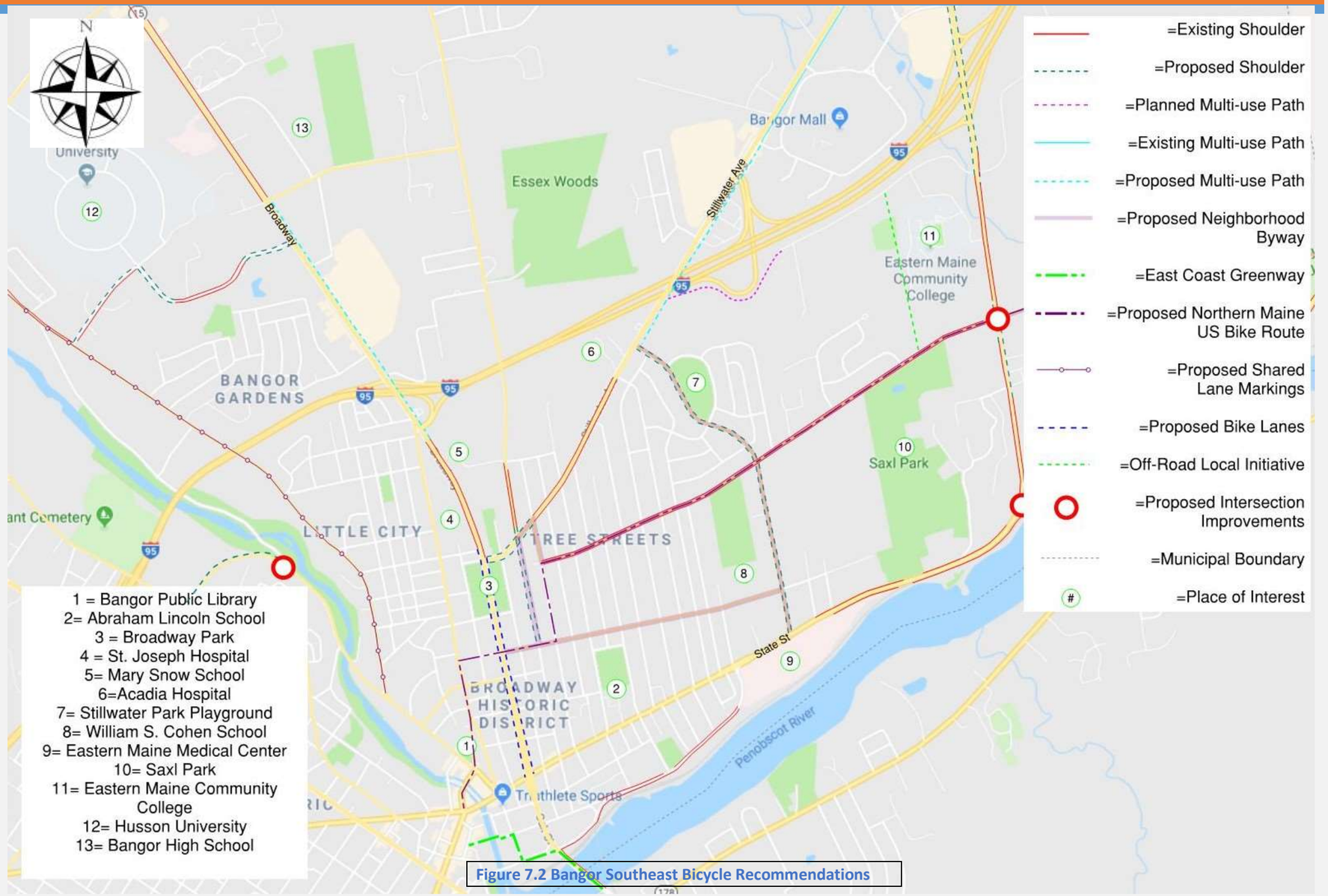


Figure 7.2 Bangor Southeast Bicycle Recommendations

Bangor

North (See Figure 7.3)

- Ohio Street Shoulders (Eighteenth Street to Griffin Road). There is a narrow bridge near Griffin Road.
- Griffin Road Bike Lanes (Union Street to Broadway). The shoulder is gravel from Kenduskeag Avenue to Broadway. Turn lanes will present a challenge.
- Broadway Multi-Use Path (Grandview Avenue to I-95 NB Ramps. There is limited right-of-way on Broadway.
- Kenduskeag Avenue shared lane markings (Harlow Street to Griffin Road).
- Conduct a Study to evaluate feasibility of bicycle facilities on Union Street. Union Street has significant space constraints and heavy traffic volumes that limit right-of-way cross-section opportunities.
- Broadway/Griffin Road/Burleigh Road (Intersection Improvements).

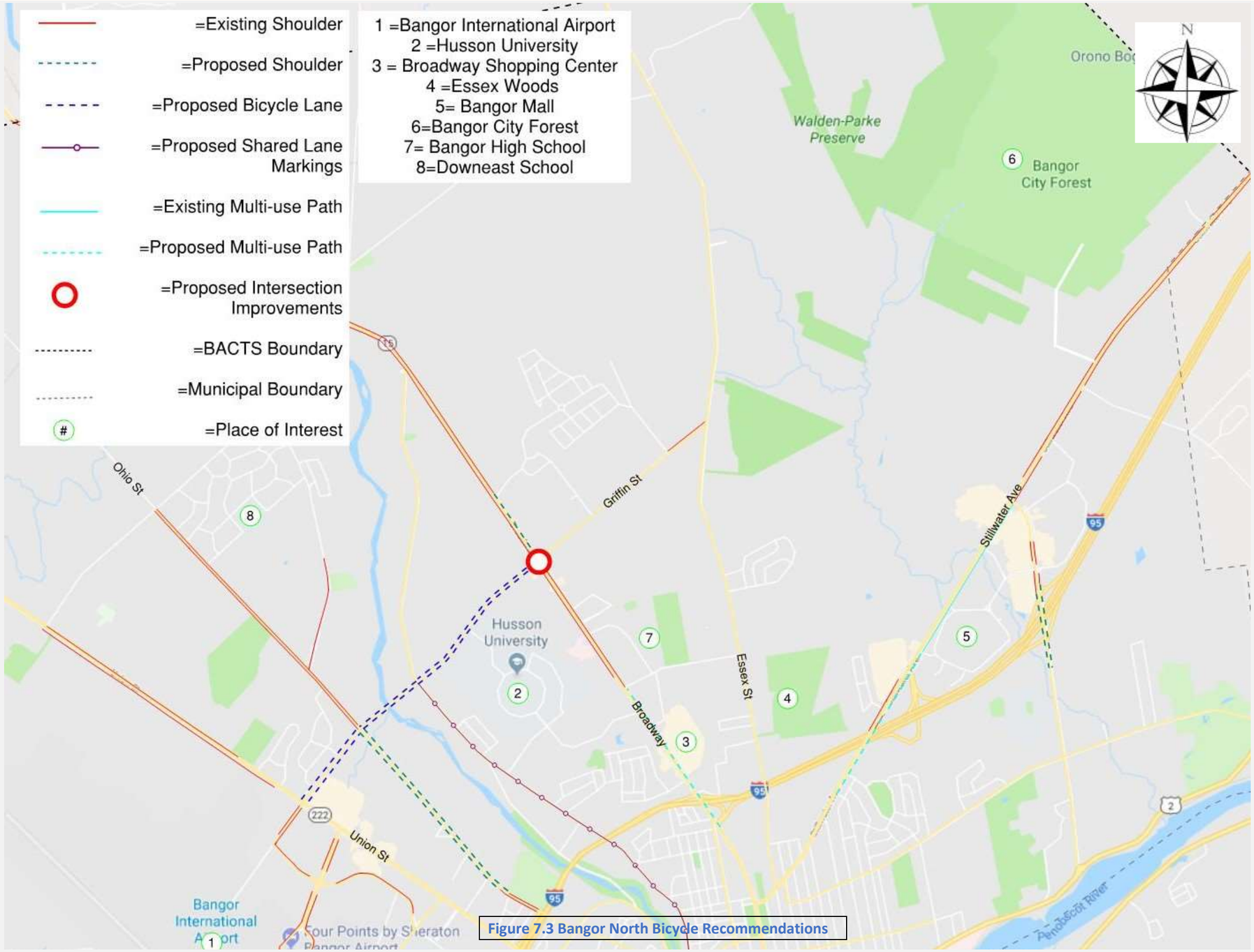


Figure 7.3 Bangor North Bicycle Recommendations

Brewer (See Figure 7.4)

- Parkway South Multi-Use Path (North side from Elm Street to Wilson Street). The right-of-way may be limiting on the northeast side, particularly on the I-395 overpass.
- South Main Street Shoulders (Under I-395 add shoulders, investigate road diet). There is little room to widen the road with the Penobscot River to the west, and a retaining wall and the I-395 bridge substructure to the east.
- Washington Street Neighborhood Byway (Connect Washington Street to the Riverwalk using Eastern Avenue, Center Street, East Summer Street, and Parker Street by utilizing traffic calming, pavement marking, and signage).
- North Main Street Shoulders (Wilson Street to Chapman Street). There is an extreme grade on the northbound approach at the State Street/North Main Street intersection that is problematic for bicyclists. Turn lanes also present challenges.
- Wilson Street Shoulders (State Street to Parkway South to connect to Dirigo Drive). This segment is geometrically confusing. Consider this as part of the study proposed to determine pedestrian crossing location in this same area.
- Elm Street Shoulders (South Main Street to Mill Street). The Sedgeunkedunk Stream limits widening to the north. Right-of-way limits widening to the south.
- Penobscot Bridge pavement markings, signage and lighting.
- I-395 Interchange with Wilson Street (Interchange Improvements).
- OFF-ROAD LOCAL INITIATIVE: Proposed Brewer Land Trust Rail Trail starting at Wilson Street, intersecting Parkway South and Green Point Road, to the Holden municipal boundary. The trail runs along a defunct Pan-Am rail line for 20,869 feet. The required overpass over I-395 is already built. The biggest challenge is acquiring the rail line.
- Eastern Avenue Shoulders. (Route 9 Connector to the existing shoulders that truncate at Oak Grove Drive).
- Route 9 Connector Bicycle Ramps to allow bicyclists on and off of the grade separated connector.
- Wilson Street/Main Street Intersection (Intersection Improvements).

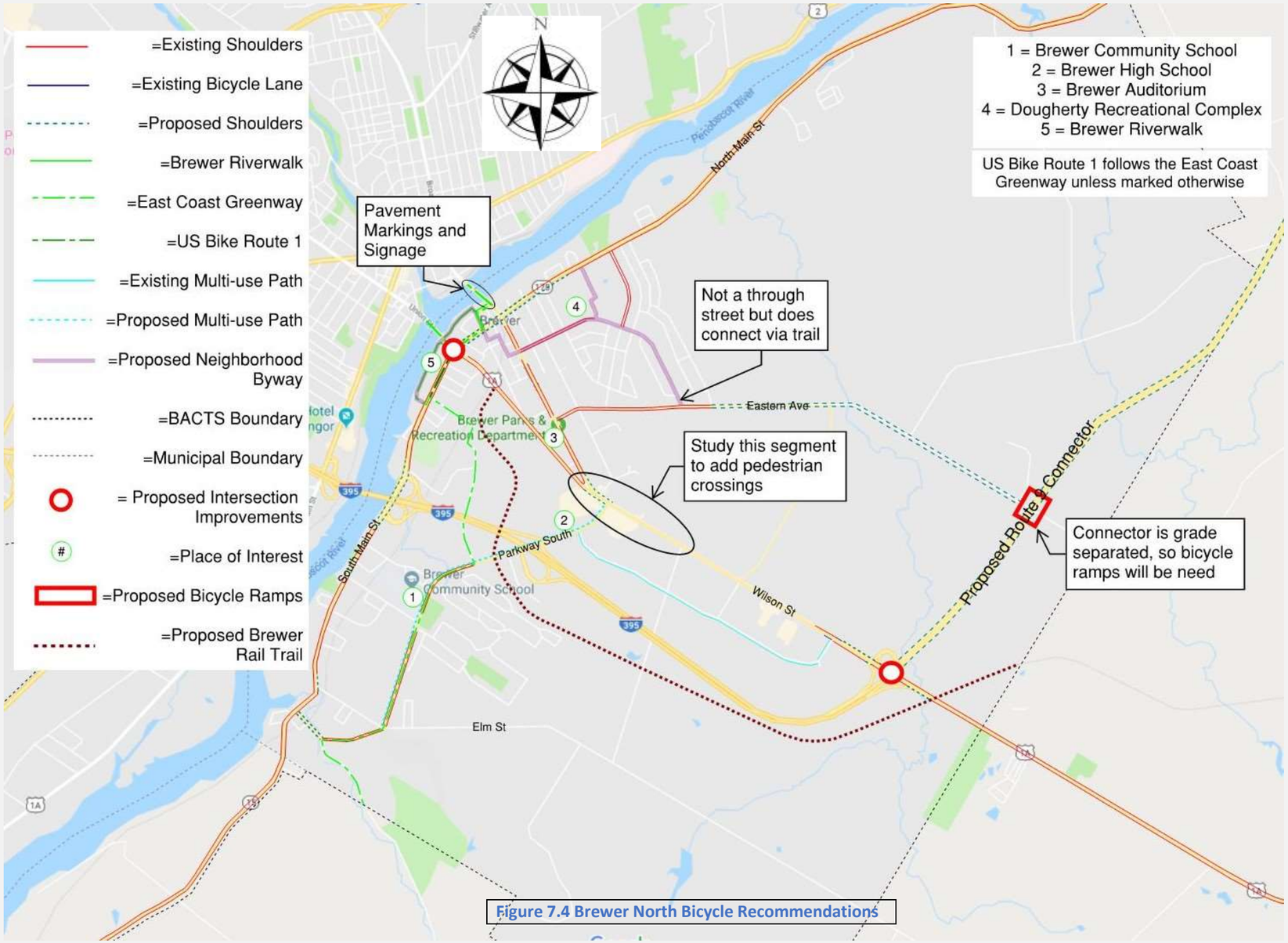


Figure 7.4 Brewer North Bicycle Recommendations

Hampden (See Figure 7.5)

- Western Avenue and Route 202 (Intersection Improvements).
- Western Avenue and Route 1A (Intersection Improvements).
- Route 1A Shoulders (South of Cottage Street to south of the Reeds Brook School). A center left turn lane constrains pavement width and shoulders. There is little right-of-way for roadway widening.

Orrington

- None.

Hermon

- None.

Additional Places of Interest in Hampden

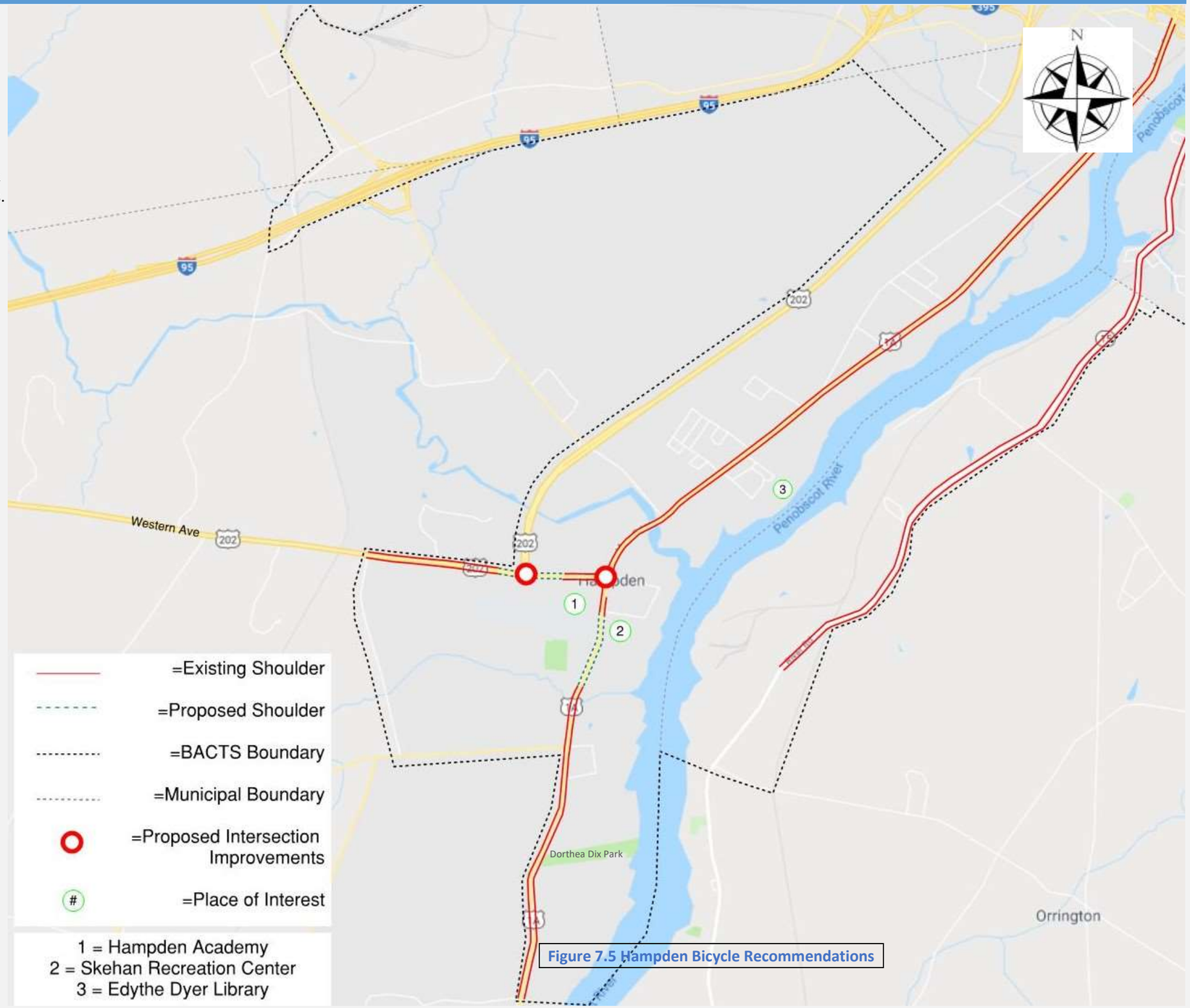


Figure 7.5 Hampden Bicycle Recommendations

See map inset for additional places of interest in Hampden

Veazie (See Figure 7.6)

- Route 2 Shoulders (Extend through the sharp curve). Retaining walls on the west side limit the ability to widen.
- School Street Signage (Shared Lane use signage near the school).

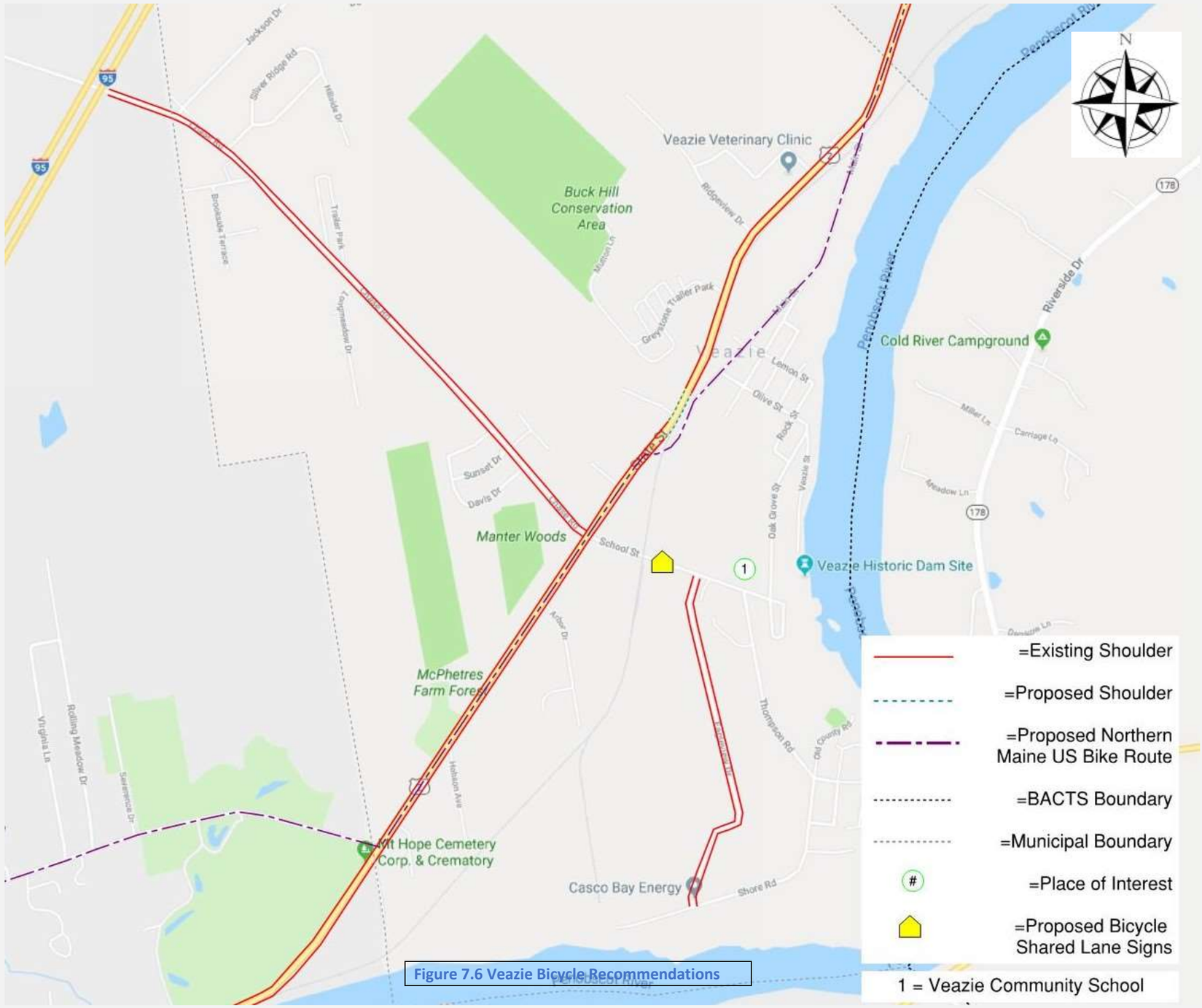


Figure 7.6 Veazie Bicycle Recommendations

Orono (See Figure 7.7)

- Stillwater Avenue Bicycle Lanes (I-95 Interchange to the Old Town municipal boundary). Right-of-way is limited.
- Park Street Bicycle Lanes (Formalize shoulders into Bicycle Lanes from College Avenue to the Reserve).
- Bennoch Road Shoulders (Extend to Main Street). On street parking presents a challenge. Bridge structures narrow the road.
- Forest Avenue Shoulders (Extend from Noyes Drive to the intersection of Bennoch Road). Right-of- way is likely limited.
- OFF-ROAD LOCAL INITIATIVE: Off-Road Multi-Use Path (Parallel to Route 2 from Kelley Road to Westwood Road).
- Main Street Bicycle Lane (A climbing lane up-hill from the bridge north of Canal Street to Bennoch Road). There is no room for widening.
- Bennoch Road/Forest Avenue Intersection (Intersection Improvements).

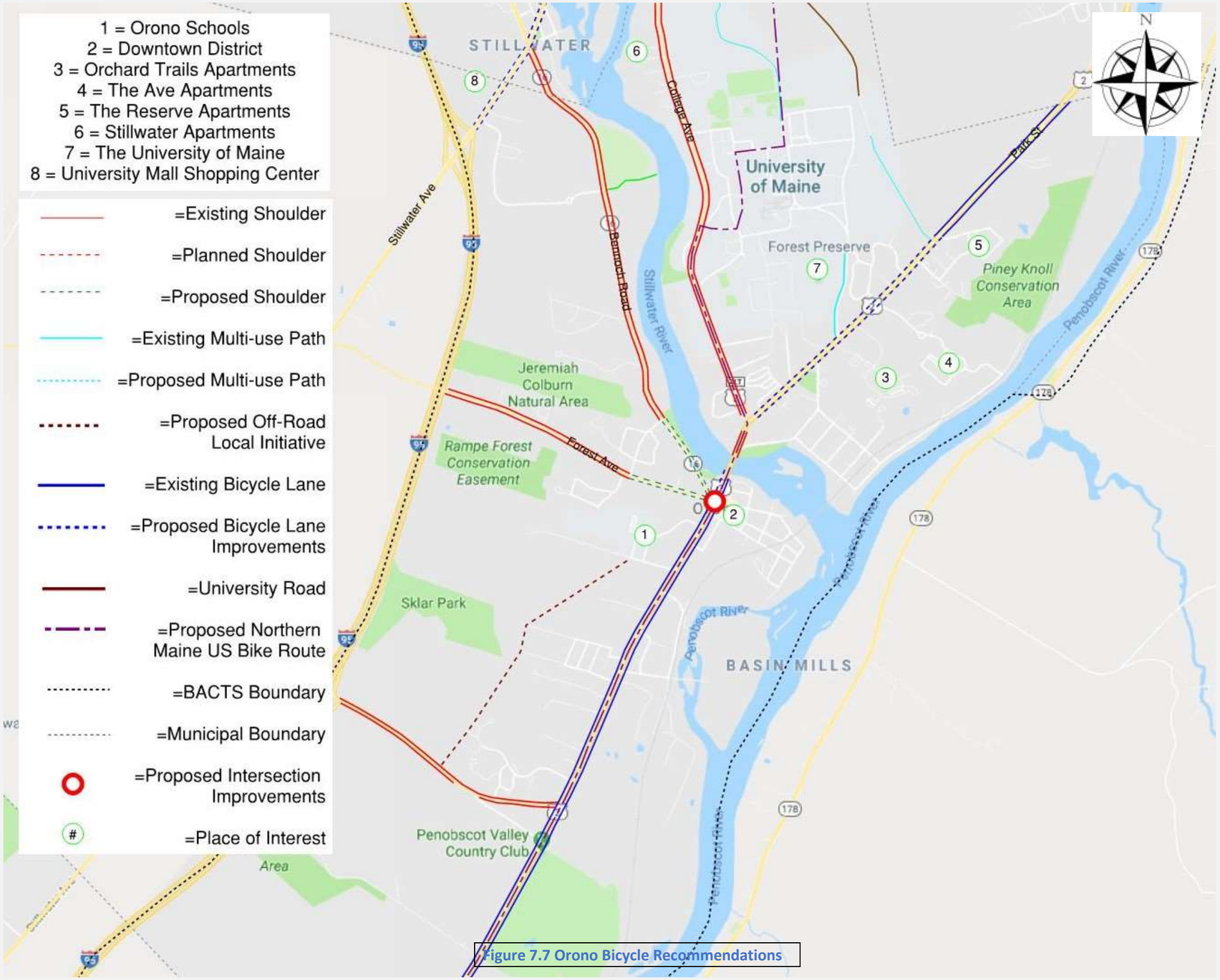


Figure 7.7 Orono Bicycle Recommendations

Old Town (See Figure 7.8)

- Stillwater Avenue Shoulders (From the I-95 southbound off ramp to the YMCA). There are likely constraints with right-of-way.
- Perkins Street Neighborhood Byway (Traffic Calming, Pavement Markings and Signage).
- Brunswick Street Neighborhood Byway (Traffic Calming, Pavement Markings and Signage from Perkins Street to Stillwater Avenue).
- Center Street Shoulders (Over the bridges to Milford). Two of Old Town's three bicycle crashes occurred in this segment. The bridges over the Penobscot River limit widening.
- Main Street Shoulders (Stillwater Avenue to Fourth Street) Proximity to the river may present challenges.

Milford

- Route 2/Route 178 (Intersection improvements). A railroad track crosses the Route 178 approach.

Penobscot Indian Nation

- None

Bradley

- None

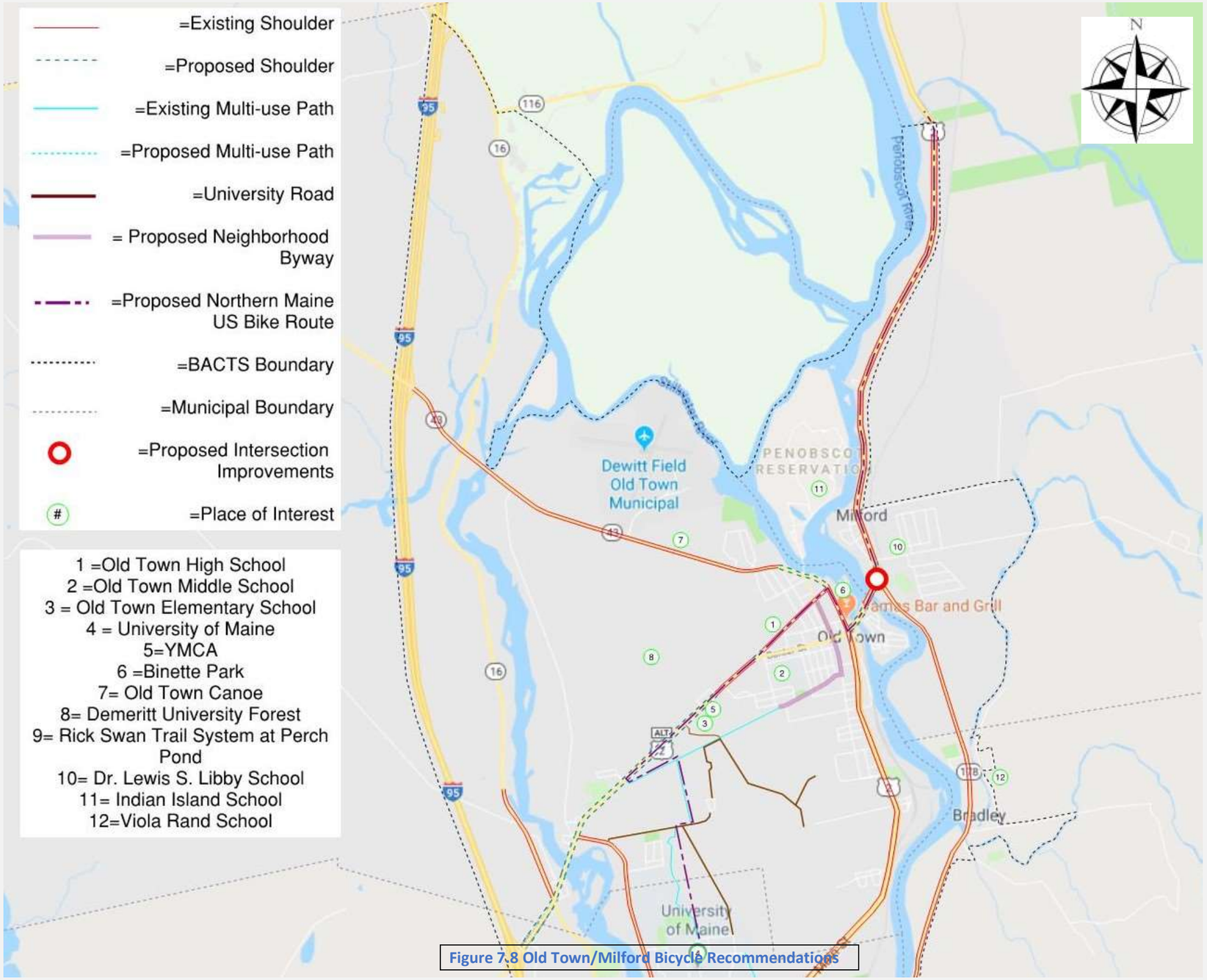


Figure 7.8 Old Town/Milford Bicycle Recommendations

BACTS Regionwide Bicycle Transportation Network

Figure 7.9 presents the existing bicycle transportation network throughout the BACTS region and illustrates how proposed improvements will achieve a connected regional bicycle transportation network.

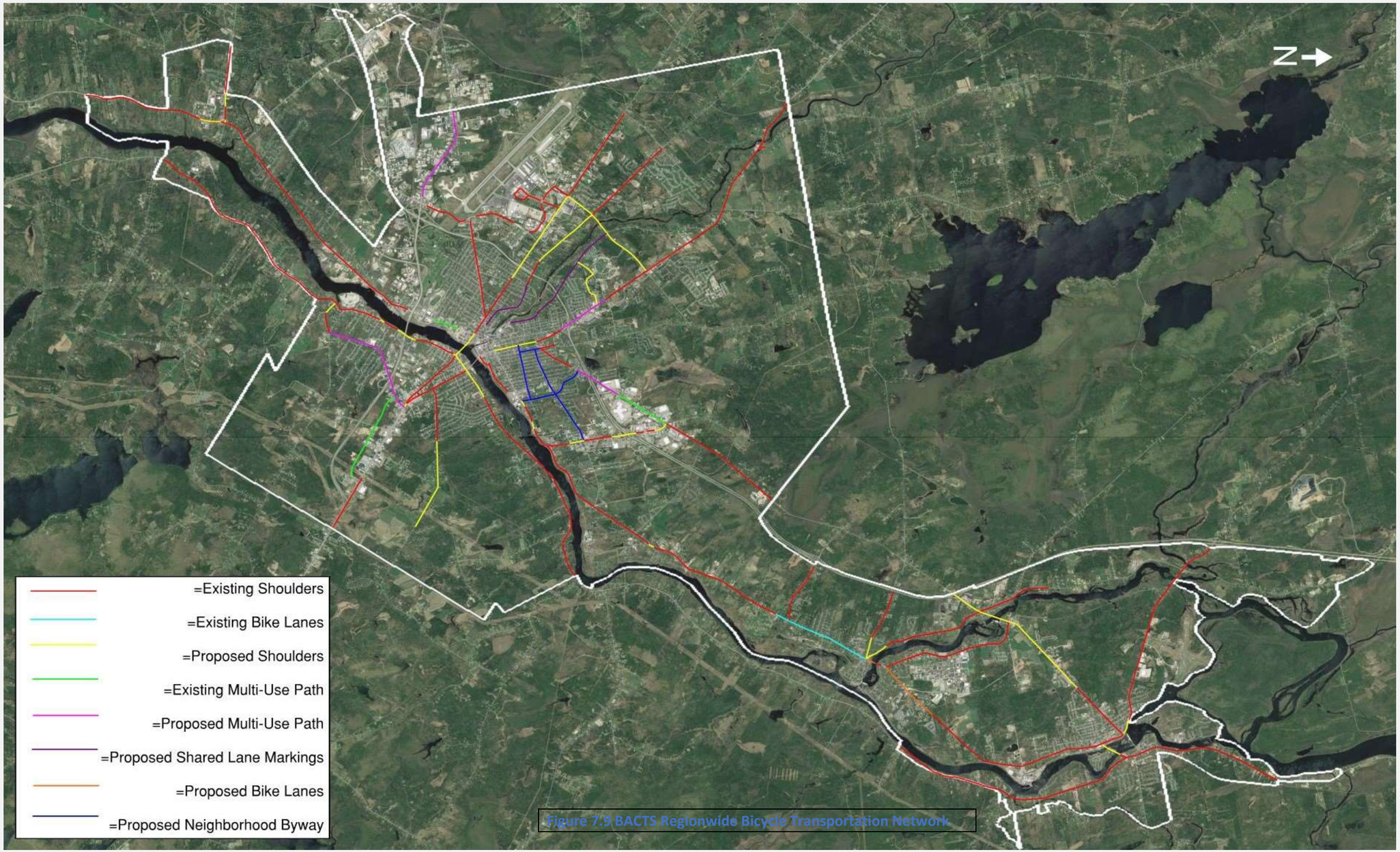


Figure 7.9 BACTS Regionwide Bicycle Transportation Network

8.0 Project Prioritization / Cost

The following tables present a prioritized list of the suggested pedestrian and bicycle facility improvement projects with planning-level cost estimates sorted by community.

Recommendations do not constitute a promise for or obligate any specific funding for projects. Projects (located on arterial and collector roads) must be submitted for consideration and rating under BACTS project selection procedures as described in the Transportation Improvement Program (TIP) document to be considered for federal funding. Projects on local roads are not eligible to be submitted as BACTS projects as they fall under the jurisdiction of each municipality.

Other funding opportunities may exist for pedestrian and bicycle facility projects. For example, MaineDOT's Bicycle and Pedestrian Program Funding (https://www.maine.gov/mdot/pga/funding/) assists municipalities with funding sidewalks, pedestrian crossing improvements, off-road transportation- related trails, downtown transportation improvements, or projects that address safety and/or ADA compliance concerns.

The priority ranking system was established based on a number of criteria using general qualitative guidelines. The factors that contributed to each of the criteria and the general scoring is described below. Estimated project cost was not included in the project prioritization scoring; however, project cost may be a determinant in local project implementation prioritization. A higher score means higher priority.

Stakeholder Input: Feedback at Public Meetings, MaineDOT/BCM "Heads Up" Campaign Forum Comments, Previous Study or Report Findings, Local Municipal Reports

Rating: 1 – No Previous Input
10 –Repeated Concerns and/or Feedback Reported

Ease of Construction/Constraints: Available Right of Way, Utility Relocation, Roadway Geometry Issues, Environmental Barriers, Drainage, Staff Time Required

Rating: 1 – Constraints Make Project Difficult
10 –Little to No Constraints Exist

Safety: Total Pedestrian and Bicycle Crashes, Fatal and Severe Injury Pedestrian and Bicycle Crashes, Observed and/or Reported Areas with Potential Safety Concerns

Rating: 1 – No Pedestrian/Bicycle Crashes and/or Safety Concerns
10 – Location with Multiple Pedestrian/Bicycle Crashes

Demand: Population Density, Strava Heat Map Intensity

Rating: 1 – Low Demand
10 –High Demand

Connectivity: Benefit to Regional Connectivity, Connectivity to Existing Facilities, Pedestrian/Bicycle Barriers

Rating: 1 – Low Transportation Network Connectivity Benefit
10 –High Transportation Network Connectivity Benefit

Proximity to Transit: Provides Access to Bus Routes

Rating: 1 – Not on a Bus Route
10 –On a Bus Route

Proximity to Trip Generators: Distance to Identified Places of Interest (Schools, Libraries, Retail Centers, Parks, etc.)

Rating: 1 – Farther than: 1 Mile for pedestrians, 3 Miles for bicyclists
10 –Within 0.1 Mile for pedestrians, 0.3 miles for bicyclists

Planning Level Cost Estimate: Planning level cost estimates are provided to give a general idea of the anticipated cost of the recommended projects in 2019 terms. Project costs may vary depending on final project scope, design, materials, and other factors affecting the economy and industry at time of implementation.

Low: Less than $50,000
Medium: $50,000 - $200,000
High: Greater than $200,000

Town	Project	Scope	Pedestrian Plan Improvements- Prioritization (1 to 10)								
			Stakeholder Input	Ease of Construction	Safety	Demand	Connectivity	Proximity to Transit	Proximity to Trip Generators	Total	Planning Level Cost Estimate
Bangor	State Street/Hancock Street/Otis Street Intersection	Intersection Improvements	8	4	10	8	10	10	10	60	TBD
Bangor	Middle Street/Water Street/Main Street Intersection	Intersection Improvements	5	9	9	8	9	10	9	59	TBD
Bangor	Mt. Hope Avenue Sidewalk	North side extension to State Street	7	6	8	10	7	10	10	58	High
Bangor	Joshua Chamberlain Bridge Sidewalk	Remove Steps from the Sidewalk	8	3	6	10	10	10	8	55	High
Bangor	Hammond St/Odlin Rd Intersection	Intersection Improvements	7	9	5	2	5	10	1	39	TBD
Bangor	Odlin Rd/Route 2 Intersection	Intersection Improvements	9	7	9	2	5	2	1	35	TBD
Bangor	Essex Street Sidewalk	Northwest side from Grandview Avenue to Burleigh Rd	2	9	5	2	4	5	6	33	Medium
Bangor	School Street Sidewalk	From Broadway to Hillside Avenue	10	5	10	3	3	9	10	50	Low
Bangor	Ohio Street Crossings	Add crosswalks at James Street and Thomas Hill Road	6	8	6	7	2	10	10	49	Low

Town	Project	Scope	Pedestrian Plan Improvements- Prioritization (1 to 10)								
			Stakeholder Input	Ease of Construction	Safety	Demand	Connectivity	Proximity to Transit	Proximity to Trip Generators	Total	Planning Level Cost Estimate
Bangor	Broadway Sidewalk	Northeast side from Grandview Avenue to Griffin Road	5	7	5	3	8	10	8	46	Medium
Bangor	Hogan Road Sidewalk	East side from Bangor Mall Boulevard to Mt. Hope Avenue	6	4	8	2	7	10	8	45	High
Bangor	State Street Sidewalk	North side extension to Veazie municipal boundary	4	4	5	7	10	10	5	45	High
Bangor	Hogan Road Sidewalk	West side from Mt. Hope to the Psychiatric Center	6	4	8	3	7	8	8	44	High
Bangor	Broadway Sidewalk	From Husson Ave to Grandview Ave	10	1	5	3	7	10	8	44	Low
Bangor	Penobscot River Multi-Use Path	Extend the Path from Dutton Road to Route 1A	3	8	2	7	6	9	8	43	Medium
Bangor	Outer Hammond Street Crossing Location TBD	Pedestrian Hybrid Beacon. Coordinate with the 395 signals	8	7	10	4	10	1	1	41	Medium
Bangor	Griffin Road Sidewalk	North side extension to Broadway	5	3	4	5	7	10	7	41	Medium
Bangor	Odlin Road Sidewalk	East side from Day's Inn to Hammond Street	8	3	7	5	10	1	6	40	Medium
Bangor	Maine Avenue Sidewalk	East side from Hammond Street to Godfrey Boulevard	10	2	5	5	5	5	8	40	High
Bangor	State Street/Hogan Road Intersection	Intersection Improvements	2	5	2	7	10	10	4	40	TBD
Bangor	Kenduskeag Avenue Sidewalk	North side extension to Griffin Road	3	1	5	9	10	5	7	40	Medium
Bangor	Outer Hammond Street Multi-Use Path	South side from Odlin Road to Hermon municipal boundary	8	5	10	4	10	1	1	39	High
Bangor	Ohio Street Sidewalk	South side from James Street to Thomas Hill Road	2	1	6	7	2	10	10	38	Low
Bangor	Odlin Road Sidewalk	Connect businesses on the west side and add a crossing with an RRFB	8	5	5	5	3	1	6	33	Medium
Brewer	North Main Street Crossing	New Pedestrian Crossing Signs at Indian Trail Park	9	8	7	5	6	10	8	53	Low
Brewer	Wilson Street Study	Conduct a study between State Street and Green Point Road to determine the best location for a pedestrian crossing	9	1	9	8	7	10	7	51	Low
Brewer	Grove Street Sidewalk	West side from South Main to Parkway South	10	9	2	6	5	8	10	50	Medium
Brewer	Edgewood Drive Painted Pedestrian Area	Painted Shoulder Pedestrian Area	10	9	1	8	1	6	10	45	Low
Brewer	Nottingham Way Painted Pedestrian Area	Painted Shoulder Pedestrian Area	10	9	1	8	1	6	9	44	Low
Brewer	Sunset Strip Painted Pedestrian Area	Painted Shoulder Pedestrian Area	10	9	1	8	1	6	8	43	Low
Brewer	Robinhood Drive Painted Pedestrian Area	Painted Shoulder Pedestrian Area	10	9	1	8	1	6	8	43	Low
Brewer	Canterbury Street Painted Pedestrian Area	Painted Shoulder Pedestrian Area	10	9	1	8	1	6	7	42	Low
Brewer	Hillcrest Drive Sidewalk	West side from North Main to Oak Grove Drive	4	8	2	7	6	5	7	39	Medium
Brewer	South Main Street Sidewalk	North side from Cove Street to Harriman Way	2	4	2	8	5	10	3	34	Low
Brewer	South Main Street Sidewalk	South side over Sedgenunkedunk Stream	2	4	2	8	5	10	3	34	Low
Hampden	Route 1A/Western Avenue Intersection	Intersection Improvements	8	5	6	7	8	10	10	54	TBD
Hampden	Western Avenue Sidewalk	Mayo Road to Route 202	7	3	2	10	8	10	10	50	Medium

Town	Project	Scope	Pedestrian Plan Improvements- Prioritization (1 to 10)								
			Stakeholder Input	Ease of Construction	Safety	Demand	Connectivity	Proximity to Transit	Proximity to Trip Generators	Total	Planning Level Cost Estimate
Hampden	Main Road North crossing	RRFB near Library Road	7	10	6	7	6	10	1	47	Low
Veazie	State Street Sidewalk	West side to Orono municipal boundary	3	3	8	7	10	10	6	47	High
Orono	Main Street Mid-Block Crossing	Install a RRFB north of Westwood Street	10	10	7	8	5	10	9	59	Low
Orono	Park Street Sidewalk Improvements	Improve the sidewalks by adding an esplanade on the east side and removing obstructions	10	10	5	10	1	10	9	55	High
Orono	Main Street Curb Extension	Install curb extensions on Main Street at Westwood Street	10	5	7	6	5	10	10	53	Low
Orono	Park Street Sidewalk	East side from The Reserve Apartments to Old Town municipal boundary	3	8	4	7	10	10	10	52	Medium
Orono	Main Street Sidewalk	From Leadbetters to Gilbert Street creating an ADA compliant landing for the Mid-Block crossing	7	10	4	7	3	10	5	46	Low
Orono	Main Street Mid-Block Crossing	Install a RRFB near Gilbert Street	7	10	4	7	3	10	5	46	Low
Orono	Crosby Street Sidewalk	East side entire length of street	4	5	3	9	3	10	8	42	Medium
Orono	Main Street Sidewalk	West side from Veazie municipal boundary to Kelley Road	3	6	4	6	10	10	1	40	High
Orono	Bennoch Road Sidewalk	West side from Godfrey Drive to Old Town municipal boundary	3	2	4	8	7	7	7	38	Medium
Orono	Marden Park Multi-Use Path OFF-ROAD LOCAL INITIATIVE	Connecting Park Street to Crosby Street through Marden Park	5	10	1	2	2	10	7	37	Low
Orono	North Main Avenue Sidewalk	Connect to Penobscot Street	7	2	2	5	2	10	4	32	Low
Old Town	Stillwater Avenue Sidewalk	East side from YMCA entrance to Elementary School	5	5	5	6	2	10	10	43	Medium
Old Town	Stillwater Avenue Sidewalk	West side connecting the gap from the YMCA to Center Street	7	5	3	6	2	10	10	43	Medium
Old Town	Main Street Sidewalk	East side from Orono to existing sidewalk	3	8	4	7	10	10	1	43	Medium
Old Town	Bennoch Road Sidewalk	West side from Orono municipal boundary to Stillwater Avenue	3	2	4	8	7	7	7	38	Medium
Penobscot Indian Island	Down Street Sidewalk	East side from current sidewalk to Wabanaki Way	2	1	2	5	6	6	8	30	Low
Penobscot Indian Island	Wabanaki Way Sidewalk	Connect existing sidewalk to Down Street	2	1	2	4	6	5	9	29	Medium
Bradley	Route 178 Sidewalk	East side from current sidewalk to Milford municipal boundary	5	10	2	1	9	1	8	36	Medium
Orrington	Route 15 Sidewalks	From Brewer municipal boundary to south of Snows Corner	5	1	2	2	7	7	1	25	High

Town	Project	Scope	Bicycle Plan Improvements-Prioritization (1 to 10)								
			Stakeholder Input	Constraints	Safety	Demand	Connectivity	Proximity to Transit	Proximity to Trip Generators	Total	Planning Level Cost Estimate
Bangor	Mt Hope Avenue Neighborhood Byway	Traffic calming, pavement markings, and signage	8	8	5	10	8	10	10	59	Medium
Bangor	Howard Street Neighborhood Byway	Traffic calming, pavement markings, and signage	8	9	5	8	10	9	10	59	Medium
Bangor	Fourteenth Street and Valley Avenue Intersection	Intersection Improvements	10	9	5	10	8	8	6	56	Medium
Bangor	Griffin Road Bicycle Lanes	From Union Street to Broadway	8	9	7	7	7	9	9	56	High
Bangor	Joshua Chamberlain Bridge	Pavement markings, signage and lighting	7	1	7	10	10	10	10	55	TBD
Bangor	Ohio Street Shared Lane Markings	From Hammond Street to Fourteenth Street	7	5	6	6	10	10	10	54	Low
Bangor	Stillwater Avenue Multi-Use Path	Extend from Bangor Mall Boulevard to Howard Street	5	2	10	9	8	10	9	53	High
Bangor	Essex Street Neighborhood Byway	Traffic calming, pavement markings, and signage	8	9	3	7	8	8	9	52	Low
Bangor	Garland Street Neighborhood Byway	Traffic calming, pavement markings, and signage	8	5	10	6	5	7	10	51	Medium
Bangor	Husson Avenue Shoulders	Entire length of road	3	10	3	8	7	10	10	51	High
Bangor	Ohio Street Shoulders	From Eighteenth Street to Griffin Road	7	2	6	10	8	10	6	49	High
Bangor	Broadway Bicycle Lanes	From Stillwater Avenue to State Street. Add Shared-use markings where bicycle lanes are not feasible	3	4	8	3	10	10	10	48	High
Bangor	Broadway Multi-Use Path	Grandview Ave to I-95 NB Ramps	10	2	4	3	7	10	10	46	High
Bangor	Stillwater Avenue Shoulders	Broadway to Grove Street	4	3	4	8	6	10	10	45	Low
Bangor	Kenduskeag Avenue Shared Lane Markings	Harlow Street to Griffin Road	3	1	5	9	10	5	9	42	Low
Bangor	Union Street Study	Conduct a Study to evaluate feasibility of bicycle facilities. There are significant space constraints and heavy traffic volumes that limit right-of-way cross-section opportunities	7	2	5	1	5	10	10	40	Medium
Bangor	OFF-ROAD LOCAL INITIATIVE; EMCC Multi-Use Path	Connecting Sylvan Road to Mt Hope Avenue	9	4	1	2	2	10	10	38	Medium
Bangor	Broadway/Griffin Road/Burleigh Road Intersection	Intersection Improvements	3	6	3	3	4	8	7	34	TBD
Brewer	Parkway South Multi-Use Path	North Side from Elm Street to Wilson Street	9	8	6	9	8	10	10	60	High
Brewer	Washington Street Neighborhood Byway	Connecting Washington Street to the Riverwalk using Eastern Avenue, Center Street, E Summer Street, and Parker Street using traffic calming, signage, and pavement markings	7	7	8	8	8	9	10	57	Medium
Brewer	Penobscot Bridge	Pavement markings, signage and lighting	7	1	7	10	10	10	10	55	High
Brewer	North Main Street Shoulders	Wilson Street to Chapman Street	3	1	10	9	10	10	10	53	Medium
Brewer	Wilson Street Shoulders	State Street to Parkway South to connect to Dirigo Drive including as part of the proposed Wilson Street Study	7	1	5	9	10	10	9	51	Low
Brewer	Wilson Street/Main Street	Intersection Improvements	8	1	9	7	6	10	10	51	TBD

Town	Project	Scope	Bicycle Plan Improvements-Prioritization (1 to 10)								
			Stakeholder Input	Constraints	Safety	Demand	Connectivity	Proximity to Transit	Proximity to Trip Generators	Total	Planning Level Cost Estimate
Brewer	South Main Street Shoulders and Road Diet	Under I-395 overpass- Road Diet	5	2	4	10	8	10	9	48	Medium
Brewer	OFF-ROAD LOCAL INITIATIVE: Brewer Land Trust Proposed Rail Trail	Proposed by Brewer Land Trust to convert 2.12 miles of inactive railroad from Wilson Street to approximately 1000 feet easterly of Green Point Road into a multi-use path	10	2	2	5	9	10	8	46	TBD
Brewer	Eastern Avenue Shoulders	From Route 9 Connector to Oak Grove Drive	10	10	10	9	3	1	1	44	High
Brewer	Elm Street Shoulders	Both sides from South Main Street to Mill Street	3	1	3	9	7	10	7	40	Medium
Brewer	I-395 Interchange with Wilson Street	Interchange Improvements	5	5	4	6	7	4	8	39	Medium
Brewer	Route 9 Connector Bike Ramps	Add ramps to allow bicyclists on and off grade separated connector	10	10	5	9	3	1	1	39	TBD
Hampden	Western Avenue and Route 202 Intersection	Intersection Improvements	8	8	5	9	8	10	10	58	TBD
Hampden	Western Avenue and Route 1A Intersection	Intersection Improvements	8	3	7	9	8	10	9	54	TBD
Hampden	Route 1A Shoulders	South of Cottage Street to south of Reeds Brook School	5	3	4	10	9	10	9	50	Medium
Veazie	Route 2 Shoulders	Extend through the sharp curve	2	1	2	10	10	10	9	44	Medium
Veazie	School Street Signage	Shared use signage near the school	2	10	4	4	3	6	10	39	Low
Orono	Park Street Bicycle Lanes	Formalize shoulders into bicycle lanes from College Avenue to the Reserve Apartments	10	10	5	10	7	10	9	61	Low
Orono	Main Street Bicycle Lane	Add climbing lane up-hill from the bridge to Bennoch Road	8	5	10	10	8	10	10	61	Low
Orono	Forest Avenue and Bennoch Road Intersection	Intersection Improvements	5	2	6	8	7	10	10	48	TBD
Orono	Stillwater Ave Bicycle Lanes	From I-95 Interchange to the Old Town municipal boundary	5	1	5	5	7	10	10	43	Medium
Orono	Bennoch Road Shoulders	Extend from Noyes Drive to Main Street	5	3	3	9	6	7	10	43	Medium
Orono	Forest Avenue Shoulders	Extend from Noyes Drive to the intersection with to Bennoch Road	5	3	3	6	6	7	10	40	Medium
Orono	OFF-ROAD LOCAL INITIATIVE: Multi-Use Path Parallel with Route 2	From Kelley Road to Westwood Road	7	2	2	2	1	4	10	28	High
Old Town	Center Street Shoulders	Both sides over the bridges to Milford	5	2	10	10	9	8	9	53	Medium
Old Town	Perkins Street Neighborhood Byway	Add traffic calming, pavement markings, and signage	7	9	6	10	2	6	10	50	Low
Old Town	Brunswick Street Neighborhood Byway	Add traffic calming, pavement markings, and signage from Perkins Street to Stillwater Avenue	7	9	6	7	5	8	8	50	Low
Old Town	Stillwater Avenue Shoulders	Both sides from the bridges I-95 southbound off-ramp to the YMCA	8	2	5	3	8	10	10	46	High
Old Town	Main Street Shoulders	From Stillwater Avenue to Fourth Street	5	5	5	9	6	8	8	46	Medium
Milford	Route 2/Route 178 Intersection	Intersection Improvements	5	2	5	9	10	5	8	44	TBD

9.0 Safety Performance Management

This Plan identifies a comprehensive, safe, and logical region-wide transportation network that supports walking and bicycling as a viable, convenient and popular travel choice for residents and visitors of the BACTS region. The primary goal is to promote safe, convenient and attractive active transportation options, providing accessible connectivity with other transportation modes, and supporting independent mobility for all people. Promoting active modes of travel supports more than just the transportation network, it also supports the goals of livability and sustainability, walking and bicycling as an integral part of an active lifestyle, and fosters a sense of community.

Providing a safe place to walk and bike is essential for all users, but especially for the most vulnerable users of the transportation system. It is important for the safety of pedestrians and bicyclists that the transportation system incorporate (to the extent possible) sidewalks, shoulders, lighting, and safe crossings where needed and appropriate. It is also essential that pedestrians and bicyclists are educated regarding safe behaviors including the need to dress with brightly colored clothing and to be aware of their surroundings. It is critical that drivers are educated on the importance of reducing speed and giving pedestrians and bicyclists plenty of space. All road users need to be paying full attention to their travel and taking precautions to assure the safety of others.

Safety Performance Management (PM) is a part of the overall Transportation Performance Management (TPM) program, which the Federal Highway Administration (FHWA) defines as a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. FHWA Highway Safety Improvement Program (HSIP) and Safety PM rules establish five performance measures for which State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) must establish annual safety targets. These safety performance measures are applicable to all public roads regardless of ownership or functional classification. The measures are:

1. Number of Fatalities
2. Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
3. Number of Serious Injuries
4. Rate of Serious Injuries per 100 million VMT
5. Number of Non-motorized Fatalities and Non-motorized Serious Injuries

Performance Targets

A target is defined as a quantifiable level of performance or condition, expressed as a value for the measure, to be achieved within a time period required. FHWA strongly discourages using aspirational targets or Toward Zero Deaths (TZD) targets for setting annual safety targets. The FHWA and National Highway Traffic Safety Administration (NHTSA) agree that zero fatalities on our Nation's roads is the only acceptable goal; however, agencies should recognize that reaching zero fatalities will require time and significant effort by many different partner agencies.

Annual targets must be data-driven, realistic and achievable. Setting aspirational or TZD targets that are not data-driven, realistic or achievable does not align with performance management framework or the stated congressional policy to improve project decision-making through performance-based planning and programming. The NHTSA requires States to submit data-driven annual targets in their Highway Safety Plans (HSP). Setting data-driven performance targets enables decision-makers to utilize their safety resources in ways that will result in the greatest reduction in fatalities and serious injuries and in increased accountability and transparency by allowing the public to better understand safety expectations and expenditure results. The HSP must also identify the State's highway safety problems, describe its performance measures, define its performance targets, and develop evidence-based countermeasure strategies to address the problems and achieve the targets.

An MPO may adopt the State's targets and support the State's efforts in achieving those targets, develop its own quantifiable performance targets, or use a combination of both. Whether an MPO agrees to support the State's targets or establish its own targets, the MPO must include a report evaluating the condition and performance of the transportation system with respect to the safety performance targets, in the Metropolitan Transportation Plan (MTP) including progress achieved by the MPO in achieving safety performance targets.

In November 2017, the BACTS Policy Committee voted to adopt the 2018 MaineDOT developed safety performance targets and support the State's efforts in achieving those targets. In January 2019, the BACTS Policy Committee voted to adopt the 2019 MaineDOT developed safety performance targets and support the State's efforts in achieving those targets as shown below.

State of Maine	2018 Targets	2019 Targets
Number of Fatalities	153.4	165.0
Number of Serious Injuries	763.0	737.6
Rate of Fatalities	1.03	1.10
Rate of Serious Injuries	5.12	4.90
Number of Non-Motorized Fatalities and Serious Injuries	90	91
Source: MaineDOT Office of Safety		

Although, BACTS has opted to adopt and support the State safety performance targets, the MaineDOT Office of Safety provides BACTS specific target calculations applying the same assumptions and methodology to developing the State targets using BACTS region statistics, as shown below.

BACTS	2018	2019
Number of Fatalities	7.4	6.0
Number of Serious Injuries	43.6	39.0
Rate of Fatalities	0.87	0.71
Rate of Serious Injuries	5.08	4.64
Number of Non-Motorized Fatalities and Serious Injuries	11.4	9.8
Source: MaineDOT Office of Safety		

The MaineDOT Office of Safety took a conservative and realistic approach to determining the initial safety performance targets. The 2018 targets were developed with the goal of stabilizing the total number of fatalities; reducing the total number of serious injuries, and reducing the number of non-motorized fatalities and serious injuries.

Countermeasures and Mitigation Strategies

With the alarming increase in the percentage of pedestrian and bicycle crashes resulting in fatalities and serious injuries in 2015 and 2016 throughout the State, MaineDOT dedicated resources to studying and analyzing pedestrian and bicycle crashes. The results showed that:

Maine's pedestrian crashes were concentrated in population centers. MaineDOT identified 10 different areas of the State which included 21 communities with the most significant pedestrian crashes (65% of crashes and 35% of fatalities). Of the 21 identified communities, there are **four within the BACTS region: Bangor, Brewer, Orono, and Old Town**.

- Nearly 80% of the pedestrian fatalities were individuals 26 years and older (approximately 28% were 71+).
- In addition to the 21 focus communities, issues were noted in nonurban settings (approximately 57% of pedestrian fatalities occur on rural roads and approximately 48% of crash fatalities occur on roads with posted speed limits of 40/+ mph).
- Impaired conditions are noted in 27.8% of fatal crashes and reported *more often for pedestrians* than drivers.
- 66.2% of the fatal crashes occur between dusk and dawn. Visibility and wearing dark clothing is often cited.

As outlined in the 2017 Strategic Highway Safety Plan, MaineDOT developed several strategies to address the findings as follows:

Pedestrian-focused Strategies:

- Conduct focused statewide outreach.
- Develop pilot projects within target communities for specifically identified "at-risk vulnerable populations."
- Identify opportunities for pedestrian infrastructure improvements, including sidewalks and crossing improvements.
- Incorporate proposed pedestrian infrastructure within MaineDOT's and local community's planning process to insure that identified pedestrian needs are addressed and included within nearby infrastructure projects.
- Educate municipalities, planners, and advocates.
- Continue and expand state agency coordination.
- Improve state and local policies and ordinances.
- Collaborate with law enforcement.
- Continue pedestrian safety signage and visible crossing program.
- Continue safety awareness campaigns.
- Expand the number, type, content, and frequency of safety awareness programming that targets adults.
- Analyze and consider transportation needs of all users.

Bicycle-focused Strategies:

- Coordinate bicycle improvements including paved shoulders, signage and bike lanes.
- Educate municipalities, planners and advocates.
- Continue safety awareness campaigns.
- Continue and expand state agency coordination.
- Maintain a webpage providing safety information.
- Improve state and local policies and ordinances to ensure that bicycle connections are made whenever feasible.
- Identify key locations where engineering improvements could be made.

In an effort to address safety concerns and make progress toward reducing the number of fatalities and serious injuries resulting from pedestrian and bicycle crashes on Maine's roads, MaineDOT developed demographically targeted initiatives for mitigating non-motorized crash fatalities. The "Heads Up" program targets the geographic areas in the State which have experienced a greater than average number of pedestrian and bicycle crashes.

In 2017, MaineDOT and Bicycle Coalition of Maine (BCM) began the education and outreach forums designed to provide contact in each focus community, distribute information, gather feedback, and identify specific locations of concern for the general public where engineering and/or physical countermeasures could be implemented. After the public forums, MaineDOT and BCM compiled feedback received and the top priority locations of concern and met with municipal staff to review and discuss potential safety improvements. The final product is a report with recommendations for each municipality. In addition, MaineDOT and Cushman Transportation Consulting initiated a pilot project focused on providing tailored programs to population segments identified as the most vulnerable (the homeless population; the elderly population and those with disabilities; and those with limited English comprehension). The greater Bangor region was chosen as the pilot area for the elderly and those with disabilities.

These programs continued through 2018 with additional education and outreach public forums designed to provide contact in each community and distribute information and gather feedback, but instead of identifying specific areas of concern in the community, these forums focused on human behaviors and law enforcement. BACTS staff and member municipalities participated in these education and outreach programs to assist in raising awareness in all user groups and enforcement officials of the shared rights and responsibilities of bicyclists, pedestrians, and motorists to obey the rules of the road and trails and engage in safe operating behavior.

BACTS will continue to support local, regional and state-wide efforts aimed at decreasing crashes and serious injuries through better crash investigation and reporting that can reveal existing hazardous areas, stricter enforcement of existing laws and regulations, physical reconfigurations of hazardous conditions, more local regulations that encourage good bicycling and walking environments, and greater awareness of other users of the transportation system.

Performance Outcomes

As stated in the 2017 Strategic Highway Safety Plan, Maine supports the National goal of *Driving Toward Zero Deaths*. Zero deaths uses a data-driven and interdisciplinary approach that targets specific areas for improvement and employs proven countermeasures that apply education, enforcement, engineering, and emergency medical services (the "4Es") to implement safety solutions. The zero deaths concept also incorporates basic principles such as broad institutionalization of the safety culture, a systems approach, and a recognition that the nature of humans to make mistakes means that infrastructure must be designed to mitigate driver error to the greatest extent possible.

Many stakeholders across the State are working together to improve these results and the 2017 MaineDOT Strategic Highway Safety Plan outlines action plans related to Enforcement, Education, Engineering and Emergency/Incident Response that are necessary to affect safety improvements. The Plan defines the crash focus areas and outlines the strategies that the various stakeholders can employ together in a coordinated, comprehensive program. BACTS supports the State's efforts and coordinates and cooperates with MaineDOT to the maximum extent possible in implementation of programs, plans and projects which improve the safety of the transportation network of the region, and the State.

According to the U.S. Department of Transportation (USDOT), National Highway Traffic Safety Administration (NHTSA) Report on Traffic Safety Facts, the total number of traffic fatalities in Maine increased by 7.5% between 2016 (160) and 2017 (172); pedestrian fatalities increased by 17.7% between 2016 (17) and 2017 (20); and bicyclist fatalities decreased by 50% between 2016 (4) and 2017 (2).

Data obtained from the *State of Maine Crash and Highway Facts 2017 and State of Maine Pedestrian and Bicycle Crash History 2013-2017* vary slightly from those reported to NHTSA because of variances in crash classifications, late submittals and differing reporting criteria. Although the data may differ from the officially reported NHTSA fatalities, the data reported in the State of Maine publications illustrate annual performance trends.

The MaineDOT Office of Safety provided preliminary 2018 crash statistics; however, these are not finalized and may change. In addition, 2018 data for vehicle miles traveled (VMT) is not yet available. Therefore, estimated rates of fatalities and serious injuries are not able to be calculated for 2018.

State of Maine Annual Performance	2013	2014	2015	2016	2017	2018 Est.
Numbers of Fatalities	144	131	156	160	172	140
Number of Serious Injuries	724	693	638	630	620	687
Rate of Fatalities	1.00	0.91	1.05	1.07	1.15	TBD
Rate of Serious Injuries	5.03	0.91	4.30	4.20	4.15	TBD
Number of Non-Motorized Fatalities and Serious Injuries	71	98	81	90	93	83

BACTS Region Annual Performance	2013	2014	2015	2016	2017	2018 Est.
Number of Fatalities	3	10	6	7	2	1
Number of Serious Injuries	51	43	42	37	34	32
Rate of Fatalities	0.36	1.21	0.72	0.81	0.24	TBD
Rate of Serious Injuries	6.12	5.19	5.01	4.29	4.03	TBD
Number of Non-Motorized Fatalities and Serious Injuries	8	12	10	9	9	4

2018 Maine Highway Safety Plan:
https://www.maine.gov/dps/bhs/publications/documents/FFY18HSPWebsite.pdf

Maine's 2017 Strategic Highway Safety Plan:
https://www.maine.gov/mdot/safety/docs/Strategic-Highway-Safety-Plan_2017.pdf

10.0 Pedestrian and Bicycle Facility Maintenance

ADA regulations require public agencies to maintain walkways in an accessible condition, with only isolated or temporary interruptions in accessibility. Part of this maintenance obligation includes reasonable snow removal efforts. As part of maintenance operations, public agencies' standards and practices must ensure that the day-to-day operations keep the path of travel on pedestrian facilities open and usable for persons with disabilities, throughout the year. This includes snow removal, as well as debris removal, maintenance of accessible pedestrian walkways in work zones, and correction of other disruptions.

Regular sidewalk and bicycle facility maintenance includes sweeping, maintaining a smooth roadway surface, ensuring that the gutter-to-pavement transition remains relatively flat, and installing bicycle-friendly drainage grates. Landscaping should be designed and maintained to ensure sidewalk and bikeways do not become inaccessible due to overgrown vegetation.

Maintenance Activity	Frequency
Inspections	Seasonal – at beginning and end of Summer
Pavement sweeping/ blowing	As needed, with higher frequency in the early Spring and Fall
Pavement sealing	5 - 15 years
Pothole repair	1 day - 1 week after report
Culvert and drainage grate inspection	Before Winter and after major storms
Pavement markings replacement	As needed
Signage replacement	as needed
Shoulder plant trimming (weeds, trees, brambles)	Twice a year; middle of growing season and early Fall
Tree and shrub plantings, trimming	1 – 3 years
Major damage response (washouts, fallen trees, flooding)	As soon as possible
Snow removal	As soon as possible

During and after a snowstorm, most municipalities prioritize their resources and plow the arterial and collector roadways first, then the local roadways focusing on opening up lanes for vehicles. The long Maine winters can present challenges in maintaining pedestrian and bicycle facilities. Limited municipal staff, equipment, and funds may stretch the limits of what is physically and fiscally able to be completed. It is essential that communities review maintenance policies and include provisions in local budgets to ensure pedestrian and bicycle facilities are kept in a state of good repair and usable throughout the year. It should be expected that pedestrian and bicycle activity will occur year-round, even in inclement weather. Providing safe and comfortable accommodations for pedestrians and bicyclists during the winter months requires a strategic snow removal and de-icing program that includes appropriate snow removal equipment and a snow removal prioritization schedule. There are only a couple municipalities in the BACTS region that currently have written sidewalk maintenance and snow removal prioritization plans.

11.0 Public Participation and Comments

Two public meetings were held during the development of the Pedestrian and Bicycle Transportation Plan. Both meetings were facilitated by T.Y.Lin. Copies of the formal presentations shown at the public meetings are posted on the BACTS website. Public notices of the meetings, sign-in sheets, and recorded comments received from participants at the meetings are included in this section of the Plan, as well as copies of all written public comments and responses. With the assistance of MaineDOT, the September public meeting and listening session was BACTS first attempt at a virtual public meeting using Adobe Connect. Unfortunately, there were no participants who chose to take advantage of the virtual meeting.

The BACTS Policy Committee is responsible for final acceptance of the Long-Range Pedestrian and Bicycle Transportation Plan, as well as to review and respond to comments received during the public comment period(s). Per the BACTS Public Participation Plan, all relevant written or oral comments received, as well as responses to those comments, are included as part of the final Plan.

In cases where the final Plan contains substantive changes from the draft that was made available for public comment or raises new material issues that interested parties could not reasonably have foreseen from the public involvement efforts, then BACTS shall provide an additional duly noticed public comment period on the revised draft Plan of not less than ten (10) days. While comments received on the draft Plan did not raise new material issues; they did point out that clarifying information had been omitted from the Plan. These comments prompted revisions which resulted in substantial changes being made from the draft to the final document. These changes did not materially change the proposed improvement recommendations. A summary of public comments received on the draft Plan at the March 13 public meeting and a general response to the public comments is included beginning on page 77. Copies the formal written public comments received on the draft Plan and individual responses to those comments are also included in this section beginning on page 78.

The final Plan was posted for a 10-day public review and comment period prior to acceptance by the Policy Committee. Public comment was received by one individual and minor edits to the Hampden maps were made in response to that comment. That comment and the individual response to the comment is included on page 86.

The Policy Committee approved the final Plan, with the minor change to the Hampden maps in response to the public comment received, at the September 17, 2019 Policy Committee meeting.

Public Participation Schedule

Tuesday, September 18, 2018	Public Meeting #1 Listening Session Cross Insurance Center, Bangor
Wednesday, March 13, 2019	Public Meeting #2 Draft Plan Black Bear Inn, Orono
Wednesday, February 27, 2019	Posting Draft Plan Public Comment Period Start
Wednesday, April 3, 2019	Draft Plan Public Comment Period End
Wednesday July 31, 2019	Posting of Final Plan Public Comment Period Start
Tuesday, August 13, 2019	Final Plan Public Comment Period End
Tuesday, September 17, 2019	Policy Committee Final Plan Approval

NOTICE OF PUBLIC MEETING

BANGOR AREA COMPREHENSIVE TRANSPORTATION SYSTEM

LONG-RANGE PEDESTRIAN AND BICYCLE TRANSPORTATION PLAN

Bangor Area Comprehensive Transportation System (BACTS) is the organization designated by Federal and Maine state government to carry out much of the transportation planning in the greater Bangor urbanized area, which includes all of Bangor, Brewer, Veazie, and Penobscot Indian Island; Orono and Old Town east of I-95; and portions of Hampden, Hermon, Milford, Orrington, and Bradley. BACTS is responsible for advising and prioritizing certain transportation needs for the region for the Maine Department of Transportation (MaineDOT), Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

With the assistance of consultant T.Y.LIN International, BACTS is developing a regional long-range pedestrian and bicycle transportation plan which will be incorporated into the BACTS Metropolitan Transportation Plan (MTP). The MTP serves as a guide for development of future Transportation Improvement Programs (TIP), transportation studies, work programs, and projects in the BACTS region covering a 20 year horizon.

Residents, business owners, employees, students, and pedestrian and bicycle advocates are encouraged to attend the public meeting to learn about the planning process, share their vison and offer input.

Date: Tuesday, September 18, 2018

Time: 4:00 p.m. – 5:00 p.m. – Open House
5:00 p.m. – 5:30 p.m. – Presentation
5:30 p.m. – 6:30 p.m. – Question and Answer Session

Location: Cross Insurance Center Meeting Rooms 3 and 4
515 Main Street, Bangor - *Use Southeast Entrance on the corner of Dutton and Main Streets*

Accessibility: Reasonable accommodations will be made for persons with disabilities. Individuals requiring special accommodations to participate, such as auxiliary aids and/or sign language interpretation services should contact Cindy Meservey at 974-3111 or cmeservey@bactsmpo.org **no later than Thursday, September 13 in order to accommodate these needs**.

A language identification card and over-the-phone interpretation services for Individuals who speak English less than very well will be available at the meeting.

Virtual Meeting: 5:00 p.m. – 6:30 p.m.

If you are unable to attend the meeting in person, you can participate virtually through Adobe Connect, thanks to our partners at MaineDOT.

URL (if joining by computer): http://stateofmaine.adobeconnect.com/bactsbikepedplan/

Audio Conference Details (if joining by phone):
Conference phone number: 1-877-455-0244 Conference code: 4667620898

IMPORTANT! **If you have never attended an Adobe Connect meeting before:**
Test your connection:
http://stateofmaine.adobeconnect.com/common/help/en/support/meeting_test.htm
Get a quick overview: http://www.adobe.com/products/adobeconnect.html

BACTS TRANSPORTATION SYSTEM

LONG-RANGE PEDESTRIAN AND BICYCLE TRANSPORTATION PLAN
PUBLIC MEETING

SEPTEMBER 18, 2018 - 4:00 – 6:30 p.m.
CROSS INSURANCE CENTER MEETING ROOMS 3 AND 4

ATTENDANCE RECORD

Printed Name	Email Address
Karen Marysdaughter	Karenmd@myfairpoint.net
DOMINICK RIZZO	dominick@hughes.net
Karen Cullen	planner@hampdenmaine.gov
Shanisse Roberts	shanisse.g.robertsse@maine.gov
John Devin	John.Devin@Maine.gov
Linda Johns	ljohns@brewermaine.gov
John Theriault	Bangor City Engineer
Patrick Adams	Maine DOT
Belle Ryder	Orono Assistant Town Manager
Frank Higgins	Brewer City Engineer
Erik DiSilva	BCM
Chase Bronsord chase.bronsord@maine.edu	UMO Student - Journalism
Michael Cole	Maine DOT
Connie Reed	BACTS
Rob Kenerson	BACTS
Tom Errico	TY LIN
Todd Serbent	TYLIN

BACTS PEDESTRIAN AND BICYCLE TRANSPORTATION SURVEY

1. What is your primary means of transportation?

- ○ Single Occupancy Vehicle
- ○ Rideshare/Carpool
- ○ Public Transportation (e.g., Bus)
- ○ Bicycle
- ⊗ Walk
- ○ Private Ride Service (e.g., Taxi, Uber)
- ○ Other _____

2. How far do you regularly commute from your home to work or school?

- ○ 1 mile or less
- ⊗ 1 – 3 miles
- ○ 3 – 5 miles
- ○ 5 – 10 miles
- ○ 10 – 15 miles
- ○ More than 15 miles

3. Do you walk or bike from your home as a secondary means of transportation to and from work, school, shopping, or other destinations? I AM PLANNING ON DOING MORE BIKING BUT HAVEN'T YET.

○ Yes. Please indicate how often you walk or bike to work, school, shopping, or other destinations.

○ Daily ○ At least once a week ○ At least once a month ○ Less than once a month

Please indicate the origin and destination points you walk or bike as a secondary means of transportation.
MY NEIGHBORHOOD IS VERY EASY TO BIKE AROUND BUT LEAVING IT TO GO DOWNTOWN, BROADWAY SHOPPING PLAZA + TO MALL IS DIFFICULT. IT FEELS VERY UNSAFE.

⊗ No. Please indicate why you don't walk or bike in your community as a secondary means of transportation.
IT WAS TOO HOT THIS SUMMER, I DON'T HAVE MUCH BIKING EXPERIENCE - IT'S BEEN A WHILE

I NEED TO WORK ON MY SKILLS.

4. Do you walk or bike in your community for recreational purposes?

⊗ Yes. Please indicate how often you walk or bike for recreation.

⊗ Daily ○ At least once a week ○ At least once a month ○ Less than once a month

Please indicate where in your community you walk or bike for recreation.
DOWNTOWN - LIBRARY - CITY HALL - WATERFRONT - SHOPS. I ALSO WALK TO BROADWAY SHOPPING TO HANNAFORD'S + PLANET FITNESS.

○ No. Please indicate why you don't walk or bike in your community for recreation.
_____

5. How would you rate the level of ease of walking in your community?

- ○ Very Easy
- ○ Somewhat Easy
- ⊗ Neither Easy nor Difficult
- ○ Somewhat Difficult
- ○ Very Difficult

If you answered "Difficult," please indicate what makes walking in your community difficult for you.
WHEN YOU ADD WINTER TO THE MIX IT IS DIFFICULT MY NEIGHBOR HOOD (LITTLE CITY) IS EASY TO WALK AROUND AND GET TO DOWNTOWN.

6. How would you rate the level of ease of biking in your community?

- ○ Very Easy
- ○ Somewhat Easy
- ○ Neither Easy nor Difficult
- ⊗ Somewhat Difficult
- ○ Very Difficult

If you answered "Difficult," please indicate what makes biking in your community difficult for you.
NOT TOO ~~MANY~~ MANY PLACES TO SECURELY LEAVE YOUR BIKE. WE NEED MANY MORE BIKE RACKS.

7. How many vehicles does your household have?

- ○ None
- ⊗ One
- ○ Two
- ○ Three or more

Comments:
I AM FORTUNATE TO HAVE A PARTNER WITH A CAR. WE ARE ABLE TO GET TO PLACES NOT MATTER LOCATION OR WEATHER
I PRIMARILY WALK, THEN USE THE BUS AND HOPEFULLY WILL BIKE MORE. LOOKING FOR EMPLOYMENT IS MORE DIFFICULT W/O A CAR (+ A BUS THAT STOPS RUNNING AROUND 6PISH + DOESN'T ON SUNDAY.)

BACTS PEDESTRIAN AND BICYCLE TRANSPORTATION SURVEY

1. What is your primary means of transportation?

- (●) Single Occupancy Vehicle
- ( ) Rideshare/Carpool
- ( ) Public Transportation (e.g., Bus)
- ( ) Bicycle
- ( ) Walk
- ( ) Private Ride Service (e.g., Taxi, Uber)
- ( ) Other _____

2. How far do you regularly commute from your home to work or school?

- ( ) 1 mile or less
- ( ) 1 – 3 miles
- ( ) 3 – 5 miles
- ( ) 5 – 10 miles
- ( ) 10 – 15 miles
- (●) More than 15 miles

3. Do you walk or bike from your home as a secondary means of transportation to and from work, school, shopping, or other destinations?

( ) Yes. Please indicate how often you walk or bike to work, school, shopping, or other destinations.

( ) Daily ( ) At least once a week ( ) At least once a month (●) Less than once a month

Please indicate the origin and destination points you walk or bike as a secondary means of transportation.

Kennebec to McGraw School – last spring
Anywhere else is too far (in the)

( ) No. Please indicate why you don't walk or bike in your community as a secondary means of transportation.

4. Do you walk or bike in your community for recreational purposes?

( ) Yes. Please indicate how often you walk or bike for recreation.

( ) Daily (●) At least once a week ( ) At least once a month ( ) Less than once a month

Please indicate where in your community you walk or bike for recreation.

Kennebec Rd → Main Rd – Hampden (sidewalks)

( ) No. Please indicate why you don't walk or bike in your community for recreation.

September 2018 *Over -*

5. How would you rate the level of ease of walking in your community?

- ( ) Very Easy
- (●) Somewhat Easy
- ( ) Neither Easy nor Difficult
- ( ) Somewhat Difficult
- ( ) Very Difficult

If you answered "Difficult," please indicate what makes walking in your community difficult for you.

6. How would you rate the level of ease of biking in your community?

- ( ) Very Easy
- ( ) Somewhat Easy
- ( ) Neither Easy nor Difficult
- (●) Somewhat Difficult
- ( ) Very Difficult

If you answered "Difficult," please indicate what makes biking in your community difficult for you.

Not a really good place for kids to ride; too many hills

7. How many vehicles does your household have?

- ( ) None
- ( ) One
- (●) Two
- ( ) Three or more

Comments:

September 2018

BACTS PEDESTRIAN AND BICYCLE TRANSPORTATION SURVEY

1. What is your primary means of transportation?

- ○ Single Occupancy Vehicle
- ○ Rideshare/Carpool
- ⊗ Public Transportation (e.g., Bus)
- ○ Bicycle
- ⊗ Walk
- ○ Private Ride Service (e.g., Taxi, Uber)
- ○ Other _____

2. How far do you regularly commute from your home to work or school?

- ○ 1 mile or less
- ○ 1 – 3 miles
- ⊗ 3 – 5 miles
- ○ 5 – 10 miles
- ○ 10 – 15 miles
- ○ More than 15 miles

3. Do you walk or bike from your home as a secondary means of transportation to and from work, school, shopping, or other destinations?

⊗ Yes. Please indicate how often you walk or bike to work, school, shopping, or other destinations.

○ Daily ○ At least once a week ○ At least once a month ⊗ Less than once a month (average for the year)

Please indicate the origin and destination points you walk or bike as a secondary means of transportation.
Bike 4 miles from home, walk 1-2 miles to Airport Mall, bike 1/4-1/2 mile to community garden + school garden

○ No. Please indicate why you don't walk or bike in your community as a secondary means of transportation.

4. Do you walk or bike in your community for recreational purposes?

⊗ Yes. Please indicate how often you walk or bike for recreation.

⊗ Daily ○ At least once a week ○ At least once a month ○ Less than once a month

Please indicate where in your community you walk or bike for recreation.
I walk about 1.5 miles every day in my neighborhood. I volunteer 1 day per week with Walking School Bus.

○ No. Please indicate why you don't walk or bike in your community for recreation.

Very easy in my immediate neighborhood.

5. How would you rate the level of ease of walking in your community? → Bangor area

○ Very Easy ○ Somewhat Easy ○ Neither Easy nor Difficult
○ Somewhat Difficult ⊗ Very Difficult

If you answered "Difficult," please indicate what makes walking in your community difficult for you.
Lack of sidewalks in many areas, or uneven sidewalks. Noisy, smelly, too fast traffic in most areas. Poor snow/ice removal in winter. No crosswalks or walk lights in many areas.

6. How would you rate the level of ease of biking in your community?

○ Very Easy ○ Somewhat Easy ○ Neither Easy nor Difficult
○ Somewhat Difficult ⊗ Very Difficult

If you answered "Difficult," please indicate what makes biking in your community difficult for you.
Few or narrow bike lanes. Noisy, smelly, too fast traffic. Uneven pavement, many potholes. Few bike racks. Oblivious drivers

7. How many vehicles does your household have?

○ None ⊗ One ○ Two ○ Three or more

Comments:

Overall, Bangor is primarily geared to vehicular transportation, and not very user friendly for bikes + walking. There needs to be more of a focus on connecting walking + biking to the bus system (community connector). A bus can only take 2 bikes at a time - I can't count on having a space on the bus's rack for my bike. I'd love to see the bus connect to the Bangor forest (and other nature spots), so I could take public transit to access recreational walking + biking. Recreational biking (& walking) is very different from transportation biking + walking - bike/ped for transportation often happens at rush hour, so there is way more traffic to deal with.

BACTS PEDESTRIAN AND BICYCLE TRANSPORTATION SURVEY

1. What is your primary means of transportation?

- (●) Single Occupancy Vehicle
- ( ) Rideshare/Carpool
- ( ) Public Transportation (e.g., Bus)
- ( ) Bicycle
- ( ) Walk
- ( ) Private Ride Service (e.g., Taxi, Uber)
- ( ) Other _____

2. How far do you regularly commute from your home to work or school?

- ( ) 1 mile or less
- ( ) 1 – 3 miles
- ( ) 3 – 5 miles
- ( ) 5 – 10 miles
- (●) 10 – 15 miles
- ( ) More than 15 miles

3. Do you walk or bike from your home as a secondary means of transportation to and from work, school, shopping, or other destinations?

( ) Yes. Please indicate how often you walk or bike to work, school, shopping, or other destinations.

( ) Daily ( ) At least once a week ( ) At least once a month ( ) Less than once a month

Please indicate the origin and destination points you walk or bike as a secondary means of transportation.

(●) No. Please indicate why you don't walk or bike in your community as a secondary means of transportation.

From a realistic point of view it is too far from shopping or other resales I might need

4. Do you walk or bike in your community for recreational purposes?

(●) Yes. Please indicate how often you walk or bike for recreation.

(●) Daily ( ) At least once a week ( ) At least once a month ( ) Less than once a month

Please indicate where in your community you walk or bike for recreation.

Along the street I live on.

( ) No. Please indicate why you don't walk or bike in your community for recreation.

5. How would you rate the level of ease of walking in your community?

- ( ) Very Easy
- ( ) Somewhat Easy
- ( ) Neither Easy nor Difficult
- (●) Somewhat Difficult
- ( ) Very Difficult

If you answered "Difficult," please indicate what makes walking in your community difficult for you.

lack of sidewalks

6. How would you rate the level of ease of biking in your community?

- ( ) Very Easy
- ( ) Somewhat Easy
- ( ) Neither Easy nor Difficult
- ( ) Somewhat Difficult
- ( ) Very Difficult

If you answered "Difficult," please indicate what makes biking in your community difficult for you.

7. How many vehicles does your household have?

- ( ) None
- (●) One
- ( ) Two
- ( ) Three or more

Comments:

September 18, 2018 Listening Session

Key Stakeholders need to be identified. Transportation for All should be a key stakeholder.

- Karen Marysdaughter

Electric and motorized bikes should also be considered.

- Dominick Rizzo

Other places, like Fredericton and Moncton Canada have a system of bike trails not on the city streets that are on pathways separate from the roadway. A design like that should be considered in a city like Bangor.

- Karen Marysdaughter

Wayfinding signage is inaccessible for the visually impaired. We must find a way to make pedestrian systems safe, convenient and accessible for all users.

- Sharisse Roberts

Opportunities for using rail trails should be explored.

- Dominick Rizzo

The Broadway Shopping Mall is surrounded by residential areas, but it is difficult for pedestrian and bicyclists to get to because Broadway is hard to get through.

- Karen Marysdaughter

Bangor High School needs better accessibility.

- Erik DiSilva

Walking is not feasible for students in Hampden because facilities are lacking between schools either on Main roads or behind the schools in the residential areas.

- Sharisse Roberts

Engineers design like they don't walk.

- Dominick Rizzo

NOTICE OF PUBLIC COMMENT PERIOD AND PUBLIC MEETING

REGIONAL LONG-RANGE PEDESTRIAN AND BICYCLE TRANSPORTATION PLAN

Bangor Area Comprehensive Transportation System (BACTS) is the organization designated by Federal and Maine state government to carry out much of the transportation planning in the greater Bangor urbanized area, which includes all of Bangor, Brewer, Veazie, and Penobscot Indian Island; Orono and Old Town east of I-95; and portions of Hampden, Hermon, Milford, Orrington, and Bradley. BACTS is responsible for advising and prioritizing certain transportation needs for the region for the Maine Department of Transportation (MaineDOT), Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

BACTS contracted with T.Y.LIN International to develop the regional long-range pedestrian and bicycle transportation plan which will be incorporated into the BACTS Metropolitan Transportation Plan (MTP). The MTP, and in turn this Plan, serves as a guide for development of future Transportation Improvement Programs (TIP), transportation studies, work programs, and projects in the BACTS region covering a 20 year horizon. BACTS is soliciting public comments on the plan, which can be viewed on the BACTS website www.bactsmpo.org or at the BACTS office at 12 Acme Road, Suite 104 in Brewer. The 30-day public comment period begins on Wednesday, February 27, 2019.

Comments must be made in writing and received on or before **4:00 p.m., Wednesday, April 3, 2019**. The BACTS Policy Committee is responsible for final acceptance of the Plan, as well as to review and respond to comments received during the public comment period.

Written comments should be directed to:

Cindy Meservey
12 Acme Road, Suite 104
Brewer, Maine 04412
or by email at cindym@bactsmpo.org

A public meeting to present the plan and take comments will be held **Wednesday, March 13, 2019**

Time: 4:30 p.m. – 5:00 p.m. – Open House
5:00 p.m. – 5:30 p.m. – Presentation
5:30 p.m. – 6:30 p.m. – Public Comment Session

Location: Black Bear Inn, 4 Godfrey Drive, Orono

Accessibility: Reasonable accommodations will be made for persons with disabilities. Individuals requiring special accommodations to participate, such as auxiliary aids and/or sign language interpretation services should contact Cindy Meservey at 974-3111 or cmeservey@bactsmpo.org **no later than Friday, March 8 in order to accommodate these needs**.

A language identification card and over-the-phone interpretation services for Individuals who speak English less than very well will be available at the meeting.

BANGOR AREA COMPREHENSIVE
BACTS
TRANSPORTATION SYSTEM

LONG-RANGE PEDESTRIAN AND BICYCLE TRANSPORTATION PLAN
PUBLIC MEETING

MARCH 13, 2019 - 4:30 – 6:30 p.m.
BLACK BEAR INN ORONO PINK ROOM C

ATTENDANCE RECORD

Printed Name	Email Address
Lev Sherman	lbsherma@yahoo.com
Ann Holland (Sherman)	moomadoc@gmail.com

BANGOR AREA COMPREHENSIVE
BACTS
TRANSPORTATION SYSTEM

LONG-RANGE PEDESTRIAN AND BICYCLE TRANSPORTATION PLAN
PUBLIC MEETING

MARCH 13, 2019 - 4:30 – 6:30 p.m.
BLACK BEAR INN ORONO PINK ROOM C

ATTENDANCE RECORD

Printed Name	Email Address
Katherine Glover	~~kcglover~~ katherine.glover@maine.edu
Christine Lipsky	uriadoslipsky@yahoo.com
KYLE DREXLER	kdrexler@orono.org
PATRICK Adams	PATRICK.Adams@Maine.GOV
Kierie Piccininni (on committee)	kierie@walknrollbangor.org
JOHN THERIAULT	JOHN.THERIAULT@BANGORMAINE.GOV
John Devin	John.Devin@maine.gov
Edie Smith	edie_smith@King.senate.gov
Linda Johns	ljohns@brewermaine.gov

Comments Received at March 13, 2019 Public Meeting
Black Bear Inn Orono

Does the Bangor City Council know what this plan entails and do they support it?
-Lev Sherman

Transit is not addressed in the plan. It's only mentioned once.
-Lev Sherman

How long is the Long-Range Plan?
-Katherine Glover

On Stillwater Avenue from Orono to Bangor, there are no shoulders. When is the road due to be redone? It would be a good opportunity to add shoulders to make the road safer for bikers.
-Christine Lipsky

Use speed limit to mandate shoulder on higher speed roads.
-Christine Lipsky

There are multi-layer issues. It seems like priorities are so overwhelming. I can't see how decisions can be made. Is this done through BACTS?
-Lev Sherman

I have been asked by many bikers why a biking map isn't addressed in this plan. Three specifically mentioned having a map within this document.
-Kierie Piccininni

This plan is looking toward the future. What does the town want to do and how do they see the bike network for their town.
-Kierie Piccininni

Greendrinks is updating their bike map this summer for users.
-Linda Johns

Use heat maps for high use areas.
-Katherine Glover

Response to Comments from March 13, 2019 Public Meeting

This Plan provides an outline of the region's existing pedestrian and bicycle transportation services and conditions, identifies gaps and deficiencies in connectivity, and offers recommendations. Once approved, the BACTS Long-Range Pedestrian and Bicycle Transportation Plan will be incorporated, by reference, into the BACTS 2018-2038 Metropolitan Transportation Plan and the subsequent update of that Plan.

BACTS urges member municipalities to use this Plan as a framework for local pedestrian and bicycle facility plans or projects and address the needs of non-motorized and transit users early in the project planning process. BACTS recognizes the important interrelated relationship between transit and active transportation. Providing safe, comfortable, and convenient access to the transit system for pedestrians and bicyclists, regardless of ability, can expand ridership. Once the transit study currently underway by Stantec Consulting is completed, and an implementation plan is developed and approved, BACTS will work with the City of Bangor to provide data on the current, planned, and recommended pedestrian and bicycle facility locations to ensure that transit facilities and pedestrian and bicycle facilities are in alignment.

BACTS is not the entity which implements the project recommendations listed in this Plan, the individual municipalities do. This Plan does not mandate any specific project to be implemented under any specific timeframe. It offers planning-level recommendations based solely on observed gaps in transportation network connectivity and/or areas of observed potential for safety improvements. The projects listed are provided for illustrative purposes and may require further evaluation and scoping to determine feasibility and/or appropriate treatment. The "preferred" facility or treatment type may not be practicable for a variety of reasons and alternate designs or treatments may need to be considered.

Recommendations listed in the Plan do not constitute a promise for or obligate any specific funding for projects. Projects (located on arterial and collector roads) must be submitted for consideration and rating under BACTS project selection procedures as described in the Transportation Improvement Program (TIP) document to be considered for federal funding. Projects on local roads are excluded from consideration as they fall under the jurisdiction of each municipality. Other funding opportunities may exist for these types of projects outside of the BACTS process. For example, MaineDOT's Bicycle and Pedestrian Program Funding (https://www.maine.gov/mdot/pga/funding/) assists municipalities with funding sidewalks, pedestrian crossing improvements, off-road transportation- related trails, downtown transportation improvements, or projects that address safety and/or ADA compliance concerns. In addition, projects require a level of financial commitment from the municipality for both construction and on-going maintenance of the facility.

We recognize the importance of the many off-road trails and recreational facilities to bicycle enthusiasts and pedestrians. However, the emphasis of BACTS' efforts at this time is limited to the on-road transportation network. BACTS planning area includes arterial and collector roads.

Local roads fall under the jurisdiction of each municipality. The Plan does show a couple of proposed off-road multi-use paths. These off-road facilities are locally proposed initiatives that have been included as a courtesy to our municipal members.

Designating a regional bicycle route or producing a bicycle route map for use by the general public for trip planning purposes is not an intended product of this Plan. There are other entities which do offer such products or undertake those specific initiatives. Some of these are listed below:

- United States Bicycle Route 1 Map Book Maine https://www.maine.gov/mdot/bikeped/docs/USBR%201%20Mapbook%20DRAFT.pdf
- NMDC/MaineDOT Proposed U.S. Bicycle Route from Bangor to Fort Kent http://www.nmdc.org/
  - Old Town to Bangor: http://www.nmdc.org/pdf/FDBR%20-%20Sheet%208%20-%20Old%20Town%20to%20Bangor%20DRAFT.pdf
  - Enfield to Old Town http://www.nmdc.org/pdf/FDBR%20-%20Sheet%207%20-%20Enfield%20-%20Old%20Town%20DRAFT.pdf
- The East Coast Greenway https://www.greenway.org/route-map
- Explore Maine http://exploremaine.org/bike/
- Bangor Greendrinks https://bangorgreendrinks.org/map/

East Coast Greenway ALLIANCE

March 28, 2019

Cindy Meservey
Bangor Area Comprehensive Transportation System
12 Acme Road, Suite 104
Brewer, Maine 04412

RE: BACTS Regional Long-Range Pedestrian and Bicycle Transportation Plan

Dear Ms. Meservey,

The East Coast Greenway Alliance (ECGA) is a non-profit organization leading the development of a 3,000-mile traffic-separated bicycling and walking path connecting communities from Calais, Maine to Key West, Florida. Our vision is a linear park that will host tens of millions of visits per year connecting major cities, small towns, and the nature around them. By providing fun, safe, and accessible infrastructure for everything from a local commute to a long adventure, the Greenway fosters healthy, sustainable, and prosperous communities throughout the Eastern Seaboard.

The East Coast Greenway (ECG) route runs through the BACTS region in the municipalities of Brewer, Bangor, Hermon, and Orrington. I have provided Connie Reed with the most up to date GIS data for our current travel route and our "envisioned" off-road route through the region. I urge you to consider including this updated route information in the plan. I also suggest that a long-term transportation goal of the region should be to identify additional corridor opportunities to move the current ECG on-road segments to off-road facilities. As well as prioritizing the construction of the East Coast Greenway in the form of a shared use path along the already identified corridors (like the Brewer Rail Trail for example).

In terms of the content of the draft plan, I was very surprised at the paucity of the bicycle infrastructure recommendations on the BACTS Regionwide Bicycle Transportation Network map. While I commend the inclusion of "proposed shared use path," I am disheartened to see that the only other facility type proposed are shoulders. There are many other types of bicycle facilities including bikes lanes, buffered bike lanes, separated bike lanes, among others that could provide safer and more accessible bicycle infrastructure for the Bangor region. Given the amount of excess pavement width in many locations currently, new configurations with on-street bike facilities could be easily striped to help calm traffic and provide alternative transportation options. The on-street bicycle facility recommendations in this draft plan are more reminiscent of the 1990s and early 2000s, and we do not believe are sufficient for a long-term transportation vision that serves all area residents. If there is an interest in expanding the bicycle and pedestrian mode share, calming traffic, and

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East Coast Greenway ALLIANCE

making streets safe for all users, we suggest more focus on providing a connected and accessible network that the region can aspire to over the long-term.

Additionally, it is not clear what the proposed "intersection improvements" would be for cyclists and it appears that the locations of "existing shared use path" are not correct on the map mentioned above (including the Brewer Riverwalk Phase I & II and the Bangor Waterfront Trail). Another concern is regarding the lack of specific bicycle recommendations made for both the Penobscot and Chamberlain Bridges, besides shoulders on the Penobscot Bridge. These bridges provide major connections between the cities of Bangor and Brewer, and currently host the ECG route. In terms of the long term, there should be a recommendation to provide separated bicycle and ADA compliant pedestrian accommodations on both bridges that are both safe and inviting for users to increase connectivity between the two population centers.

Taking a more visionary and long-term approach to the transportation network will have enduring and meaningful impacts on the safety, accessibility, health, and mobility for the citizens of the Bangor area and users of the East Coast Greenway. Thank you for your consideration.

Sincerely,

Kristine Keeney

Kristine Keeney
New England Coordinator

5826 Fayetteville Rd. #210, Durham, NC 27713 | 919-797-0619 | info@greenway.org | www.greenway.org

Connie Reed

From:	Connie Reed
Sent:	Tuesday, April 23, 2019 5:15 PM
To:	'Kristine Keeney'
Cc:	Jim Tasse; Kierie P.; Erik daSilva; Thomas.errico@tylin.com; Greg Edwards; Cindy; Rob
Subject:	Response to Public Comment on BACTS Draft Long-Range Pedestrian and Bicycle Transportation Plan

The BACTS Policy Committee is responsible for final acceptance of the Long-Range Pedestrian and Bicycle Transportation Plan, as well as to review and respond to comments received during the public comment period. At today's meeting, the Policy Committee voted to approve responses to comments received. Comments received **did not raise new material issues**. However, in reviewing comments it was pointed out that some clarifying information had been omitted from the Plan. This prompted a review of the draft which will result in several edits. Once revisions are completed, the draft final Plan will be posted for public review. A 10-day public comment period will be provided during which comments can be submitted prior to the Policy Committee's adoption of the final Plan.

The following is in response to your comment:

> *"BACTS did receive a GIS file with East Coast Greenway (ECG) updated route information in February 2019. However, the draft Plan and maps had already been completed by the Consultant with the then most recently available ECG route information. The maps in the final Plan will be updated with the information provided.*
>
> *Although, there is an interdependent relationship, BACTS' role and responsibility in metropolitan transportation planning and programming, and its mandated planning document requirements, does not always directly align with the focus and objectives of other entities with varying interests in planning of the transportation network. We recognize the importance of the many off-road trails and recreational facilities to bicycle enthusiasts and pedestrians. However, the emphasis of BACTS' efforts at this time is limited to the on-road transportation network. BACTS planning area includes arterial and collector roads. Local roads fall under the jurisdiction of each municipality. The Plan does show a couple of proposed off-road multi-use paths. These off-road facilities are locally proposed initiatives that have been included as a courtesy to our municipal members. Identifying additional corridor opportunities to move the East Coast Greenway to off-road facilities or prioritizing construction of the East Coast Greenway, or any other designated bicycle route, is outside the intention of this Plan.*
>
> *There are several different recommendations for bicycle facility improvements noted in Section 7.0. In addition to shared-use paths and shoulders, recommendations include bicycle lanes, neighborhood by-ways, intersection improvements, traffic calming measures, signage and pavement markings. Upon further review of the draft, it appears that the recommendations for bicycle lanes were mapped as proposed shoulders. If you looked only at the maps and not text, it appears the only proposed recommendations are shoulders and shared-used paths. The final Plan will be edited to reflect these. The BACTS region is primarily rural in nature and has characteristics that are vastly different than those in more densely developed and populated metropolitan areas. Other constraints (e.g.,*

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utilities, drainage, available right-of-way, etc.) may prohibit the viability of what may be considered "preferred" or "modern" bicycle facilities even in the more densely developed and populated areas.

Detailed evaluation and design of projects is outside the scope of this Plan. The planning level recommendations may require further evaluation to determine feasibility and/or appropriate treatment. Intersection improvements is one such recommendation which will require a more detailed evaluation and consideration when the project is implemented. The "preferred" facility type may not be practicable for a variety of reasons and alternate designs or treatments may need to be considered. The same is true for the recommendations related to both the Penobscot and Joshua Chamberlain Bridges. MaineDOT must approve any facility and/or treatment on the bridges. The most recent communication from MaineDOT expressed reservation about designating bicycle lanes on the bridge; therefore, the Plan recommendation does not include that level of specificity. However, if MaineDOT does approve such a facility, the implemented pavement marking will be a painted separated bicycle lane.

A revised final Plan with the noted edits, as well as others, will be posted for public review. BACTS believes this Plan meets its mission of providing for the safe, economical, efficient, and convenient movement of people and goods over a balanced multimodal transportation system compatible with the socio-economic and environmental characteristics of the region. It is mindful of the financial constraints which BACTS municipalities face, as well as the geographical, environmental, land use, and demographic limitations of the region."

Connie Reed

From: Cindy Meservey
Sent: Wednesday, April 3, 2019 10:02 AM
To: Connie Reed
Subject: FW: BACTS - Long-Range Pedestrian and Bicycle Transportation Plan

From: Jonathan French <jtrea81@live.com>
Sent: Thursday, March 14, 2019 10:04 PM
To: Cindy Meservey <cindym@bactsmpo.org>
Subject: BACTS - Long-Range Pedestrian and Bicycle Transportation Plan

I noticed that in the Orono portion of the plan, the recently constructed shared use paths with the Rangeley Road and Route 2 (Park Street) roundabout were not included, nor was the new sidewalk on Rangeley Rd. These should be mentioned as part of the plan as they are able to be linked on either end of the Route 2 corridor and are linked to the paths and bike lanes connecting the student housing developments along Route 2 and the University of Maine.

-Jonathan French

Sent from Mail for Windows 10

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Connie Reed

From: Connie Reed
Sent: Tuesday, April 23, 2019 3:41 PM
To: jtrea81@live.com
Cc: Rob; Cindy
Subject: Response to Public Comment on BACTS Draft Long-Range Pedestrian and Bicycle Transportation Plan

The BACTS Policy Committee is responsible for final acceptance of the Long-Range Pedestrian and Bicycle Transportation Plan, as well as to review and respond to comments received during the public comment period. At today's meeting, the Policy Committee voted to approve responses to comments received. Comments received **did not raise new material issues**. However, in reviewing comments it was pointed out that some clarifying information had been omitted from the Plan. This prompted a review of the draft which will result in several edits. Once revisions are completed, the draft final Plan will be posted for public review. A 10-day public comment period will be provided during which comments can be submitted prior to the Policy Committee's adoption of the final Plan.

The following is in response to your comment:

> *"The final Plan maps will be updated to include the new facilities on Rangeley Road and Park Street in Orono."*

From: Jonathan French <jtrea81@live.com>
Sent: Thursday, March 14, 2019 10:04 PM
To: Cindy Meservey <cindym@bactsmpo.org>
Subject: BACTS - Long-Range Pedestrian and Bicycle Transportation Plan

I noticed that in the Orono portion of the plan, the recently constructed shared use paths with the Rangeley Road and Route 2 (Park Street) roundabout were not included, nor was the new sidewalk on Rangeley Rd. These should be mentioned as part of the plan as they are able to be linked on either end of the Route 2 corridor and are linked to the paths and bike lanes connecting the student housing developments along Route 2 and the University of Maine.

-Jonathan French

Sent from Mail for Windows 10

From: Roberts, Sharisse G <Sharisse.G.Roberts@maine.gov>
Sent: Thursday, April 4, 2019 11:28 AM
To: Cindy Meservey <cindym@bactsmpo.org>
Subject: RE: Request for Public Comment

Very excited to see that they are looking at connecting the sidewalks from Mayo to Western on the 4 mile loop in Hampden as well as adding sidewalk from Western ave north along Main Rd N and adding an RRFB at the intersection of the library. Hope that all sidewalks will be ADA compliant included truncated domes at each intersection as they are not currently compliant.

Sharisse Roberts, COMS
Orientation & Mobility Instructor

Division for the Blind & Visually Impaired
45 Oak Street, Suite 1
Bangor, ME 04401
Phone: 207-441-3013
Email: Sharisse.G.Roberts@maine.gov

Connie Reed

From: Connie Reed
Sent: Tuesday, April 23, 2019 3:38 PM
To: 'Sharisse.G.Roberts@maine.gov'
Cc: Rob; Cindy
Subject: Response to Public Comment on BACTS Draft Long-Range Pedestrian and Bicycle Transportation Plan

The BACTS Policy Committee is responsible for final acceptance of the Long-Range Pedestrian and Bicycle Transportation Plan, as well as to review and respond to comments received during the public comment period. At today's meeting, the Policy Committee voted to approve responses to comments received. Comments received **did not raise new material issues**. However, in reviewing comments it was pointed out that some clarifying information had been omitted from the Plan. This prompted a review of the draft which will result in several edits. Once revisions are completed, the draft final Plan will be posted for public review. A 10-day public comment period will be provided during which comments can be submitted prior to the Policy Committee's adoption of the final Plan.

The following is in response to your comment:

> *"In addition to best practice guidance, a listing with links to some federal and state resources providing policy and design guidance and considerations for pedestrian and bicycle transportation facilities will be included in the final Plan. Included is MaineDOT ADA Design Guidance for Pedestrian Facilities https://www.maine.gov/mdot/civilrights/docs/ada/ADA_Design_Guidance_1-24-18.pdf which addresses ADA compliance of pedestrian facilities. It requires that new pedestrian facilities, or existing facilities that must be reconstructed, be designed and built to meet the minimum requirements listed in the guidance (several requirements exceed minimum ADA standards), unless an exception is made due to requirements being "technically infeasible" or "physically impractical." "*

Fred Michaud
MaineDOT
Telephone Comment

> *Efforts are underway by Northern Maine Development Corporation (NMDC) and MaineDOT to establish a permanent federally designated bicycle route in northern Penobscot and Aroostook Counties. The bike route designation would complement and connect to the existing US Route One Bike Route located in southern and Downeast Maine. The proposed route would be located on existing state and local roads and/or existing bike and pedestrian trails in the region. As currently envisioned the US Bike Route will connect to the existing US Bicycle Route in Bangor and terminate at the international bridge in Fort Kent.*

Connie Reed

From: Connie Reed
Sent: Tuesday, April 23, 2019 4:06 PM
To: 'Michaud, Fred'
Cc: Rob; Cindy
Subject: Response to Public Comment on BACTS Draft Long-Range Pedestrian and Bicycle Transportation Plan

The BACTS Policy Committee is responsible for final acceptance of the Long-Range Pedestrian and Bicycle Transportation Plan, as well as to review and respond to comments received during the public comment period. At today's meeting, the Policy Committee voted to approve responses to comments received. Comments received **did not raise new material issues**. However, in reviewing comments it was pointed out that some clarifying information had been omitted from the Plan. This prompted a review of the draft which will result in several edits. Once revisions are completed, the draft final Plan will be posted for public review. A 10-day public comment period will be provided during which comments can be submitted prior to the Policy Committee's adoption of the final Plan.

The following is in response to your (telephone) comment regarding efforts underway by Northern Maine Development Corporation (NMDC) and MaineDOT to establish a permanent federally designated bicycle route in northern Penobscot and Aroostook Counties:

> *"The final Plan maps will show US Bike Route One, the East Coast Greenway route, and the proposed Northern Maine US Bike route."*

Old Town to Bangor: http://www.nmdc.org/pdf/FDBR%20-%20Sheet%208%20-%20Old%20Town%20to%20Bangor%20DRAFT.pdf
Enfield to Old Town: http://www.nmdc.org/pdf/FDBR%20-%20Sheet%207%20-%20Enfield%20-%20Old%20Town%20DRAFT.pdf

Connie Reed

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1

BICYCLE · PEDESTRIAN COALITION OF MAINE

Public Comment Regarding:
BACTS - Long-Range Pedestrian and Bicycle Transportation Plan
March 27, 2019

Reference File: https://bactsmpo.org/wp-content/uploads/2019/03/Revised-Draft-Plan-2-8-2019rev2.pdf

Summary Statement
The Bicycle and Pedestrian Coalition of Maine (BPCM) is a statewide organization that works to make Maine better for bicycling and walking. We support well-designed development and streets that create environments that are safe and welcoming for those traveling on foot or bike.

We are writing to offer comments on the DRAFT BACTS - Long-Range Pedestrian and Bicycle Transportation Plan.

While there is a wealth of information about bike/ped policies and current conditions in the BACTS region **we feel this document does not articulate a clear plan to achieve its stated purpose** of creating "a comprehensive, safe, and logical region-wide transportation network that supports walking and bicycling as a viable, convenient and popular travel choice for residents and visitors" (p.5).

Discussion
The stated purpose of the BACTS Long Range Bike Ped Plan is as follows:

> The Plan shall promote safe, convenient and attractive pedestrian and bicycle transportation options in the BACTS area which provides ADA accessible connectivity with other modes of transportation to support independent mobility for all people regardless of age, physical constraint, or income. This Plan envisions transportation options that supports the goals for livability and sustainability, promotes walking and bicycling as an integral part of an active lifestyle, and fosters a sense of community. The system will include a comprehensive, safe, and logical region-wide transportation network that supports walking and bicycling as a viable, convenient and popular travel choice for residents and visitors. (p.5)

Unfortunately, the draft document hardly seems like a plan to achieve these aims (and the statement itself has several usage errors e.g. "options. . . which provides"; "options that supports"). There is no broader vision that this "plan" is seeking to achieve--it seems little more than an account of what's on the ground, without a critical assessment as to whether the existing routes are the best routes for walking or bicycling. We feel the document falls short on multiple points, including:

- the lack of definitions of key terms, e.g. "wide shoulder"--how many feet wide is a "wide" shoulder, as a generic classification? what are the "pavement markings" that are recommended at multiple points? What are "enhanced pavement markings?" What kinds of "traffic calming" measures are imagined? The lack of specificity in the recommendations is troubling
- an over-reliance on "shoulders" (which are not, strictly speaking, bicycle travel lanes) to provide bicycle accommodation--is there a reason these shoulders cannot be upgraded to formal bicycle lanes in the plan?
- the absence of any kind of Bicycle Level of Service Assessment that would assess current conditions and

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explain how upgrades might improve level of service

- the absence of any kind of Pedestrian Level of Service Assessment that would assess current conditions and explain how upgrades might improve level of service
- the lack of a method to identify and plan to optimize priority routes for regional bicycle travel
- the lack of detail regarding how the bike/ped network interacts with existing or planned transit services
- the reliance on Strava data to assess pedestrian demand, without an explanation of how this data is acquired or is useful, and the lack of a heat map (generated by runners, presumably)?
- the reliance of Strava data alone to assess bicycle demand, even though Strava users constitute only about 2% of bicycle riders. And exact volumes *are* available from Strava. Were bike riders in the region consulted about routes and needs?
- a prioritization system that includes opaque and unmeasurable qualities like "enthusiasm of municipality" and "benefit to regional connectivity" (how are these quantified?)
- the absence of specific benchmarks in the buildout of the purported bike/ped network
- no summary of the public process that provided input into the plan
- occasional problems with syntax and editing, beginning with the purpose statement, where there are repeated subject/verb number agreement issues.

The BCM feels this document does not adequately describe current conditions, nor articulate a clear plan to achieve its stated purpose of creating "a comprehensive, safe, and logical region-wide transportation network that supports walking and bicycling as a viable, convenient and popular travel choice for residents and visitors." We hope this document will be revised before it is considered finished or adopted as guidance.

Thank you for the opportunity to comment, and please contact us if you have any questions.

Sincerely

James C. Tassé, PhD
Assistant Director
Bicycle Coalition of Maine

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207-623-4511 | www.bikemaine.org

Connie Reed

From: Connie Reed
Sent: Tuesday, April 23, 2019 5:15 PM
To: 'Jim Tasse'
Cc: John Williams; Kierie P.; Erik da Silva; Thomas.errico@tylin.com; Kristine Keeney; Cindy; Rob
Subject: Response to Public Comment on BACTS Draft Long-Range Pedestrian and Bicycle Transportation Plan

The BACTS Policy Committee is responsible for final acceptance of the Long-Range Pedestrian and Bicycle Transportation Plan, as well as to review and respond to comments received during the public comment period. At today's meeting, the Policy Committee voted to approve responses to comments received. Comments received **did not raise new material issues**. However, in reviewing comments it was pointed out that some clarifying information had been omitted from the Plan. This prompted a review of the draft which will result in several edits. Once revisions are completed, the draft final Plan will be posted for public review. A 10-day public comment period will be provided during which comments can be submitted prior to the Policy Committee's adoption of the final Plan.

The following is in response to your comment:

> *"The BACTS Long-Range Pedestrian and Bicycle Transportation Plan is not intended to be a facility design guide; however, best practice guidance should have been included in the Plan, which was omitted from the draft and will be included in the final Plan. This guidance provides illustrations of facilities and definitions of terms used in the recommendations.*
>
> *The recommended projects are planning-level recommendations and may require further evaluation to determine feasibility and/or appropriate treatment. The "preferred" facility type may not be practicable for a variety of reasons and alternate designs or treatments were considered. The Consultant and Patrick Adams from MaineDOT met individually with municipal planners, engineers, and/or public works directors from Bangor, Brewer, Hampden, Old Town, and Orono to review the identified gaps and proposed facility plan. The group reviewed each recommendation, taking into consideration the data, known constraints, and collective expertise. The recommendations listed in the draft Plan reflect mutually agreed-upon appropriate solutions.*
>
> *The project priority ranking system used was established based on several criteria. The point system was developed by the Consultant using general qualitative guidelines. Quantifiable data in this area is limited. There are no formal data sets on pedestrian and bicycle demand in the BACTS region. The Advisory Committee was provided documentation with guidance detailing factors considered for each ranking criterion. However, definition of the criteria is omitted in the draft Plan and will be added to Section 8.0 in the final Plan to provide clarification.*
>
> *Based on BACTS jurisdiction and planning process, a facility-based network was developed. Defining networks by facility type is a common approach and was determined to be the most appropriate for the BACTS region. A quality-weighted network, with a defined level of service model is considerably more data-intensive and requires performing level of service assessments that analyze the relationship between a pedestrian or bicyclist's subjective perceptions of safety or comfort and the quality of the*

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physical facilities, the roadway's geometry, and traffic conditions. There are no formal data sets available for the region. The resources needed to collect the required data to develop a quality-weighted network, in addition to the on-going resources required to adequately collect the data needed to regularly assess service levels eliminates the viability of developing such a network for this Plan. That in no way diminishes BACTS', or its member municipalities, commitment to provide for a multi-modal transportation network that is designed in a manner that balances the safety, convenience, and accessibility of all users.

BACTS recognizes the important interrelated relationship between transit and active transportation. Providing safe, comfortable, and convenient access to the transit system for pedestrians and bicyclists, regardless of ability, can expand ridership. Frequent and reliable transit service also makes walking and bicycling more appealing ways to access transit. As noted in Section 4.0, the bus system currently operates on a flag stop basis, which means, with very few exceptions, there are no designated bus stops. The bus operator will pick up or drop off a passenger at any location requested along the route that the operator deems safe. A study of the bus system is currently underway and is expected to be completed early this summer. It is anticipated that the study will produce recommendations for bus route modifications, schedule alterations, suggested bus stop and station locations, among other facility suggestions. When an implementation plan is developed for the bus system, BACTS will work with the City of Bangor to provide data on the current, planned, and recommended pedestrian and bicycle facility locations to ensure that transit facilities and pedestrian and bicycle facilities are in alignment.

Although, there is an interdependent relationship, BACTS' role and responsibility in metropolitan transportation planning and programming, and its mandated planning document requirements, does not always directly align with the focus and objectives of other entities with interests in planning of the transportation network. We recognize the importance of the many off-road trails and recreational facilities to bicycle enthusiasts and pedestrians. However, the emphasis of BACTS' efforts at this time is limited to the on-road transportation network. BACTS planning area includes arterial and collector roads. Local roads fall under the jurisdiction of each municipality. The Plan does show a couple of proposed off-road multi-use paths. These off-road facilities are locally proposed initiatives that have been included as a courtesy to our municipal members. Designating a regional bicycle route or producing a bicycle route map for use by the general public for trip planning purposes is not an intended product of this Plan.

A summary of the public input process will be included in the final Plan. It will include this document, as well as copies of all other comments and responses and documents related to the public process. The Advisory Committee for the development of this Plan included both a staff member (Erik daSilva) and a Board member (Kierie Piccininni) from the Bicycle Coalition of Maine. Neither one of them initiated discussion or asked questions related to issues you have commented on (e.g., facility-based network versus a quality-weighted network, identifying and planning to optimize priority routes for regional bicycle travel, availability of demand data). Questions about the scope of the Plan should have been addressed much sooner in the process.

A revised final Plan with the edits noted, as well as others, will be posted for public review. BACTS recognizes the draft omitted some clarifying information such as best practice guidance and definition of criteria used for the project prioritization. However, BACTS believes a facility-based network with the recommended projects suggested in the draft Plan meets its purpose of creating a comprehensive, safe, and logical region-wide transportation network that supports walking and bicycling as a viable, and

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convenient travel option and supports BACTS' overall mission of providing for the safe, economical, efficient, and convenient movement of people and goods over a balanced multimodal transportation system compatible with the socio-economic and environmental characteristics of the region."

NOTICE OF PUBLIC COMMENT PERIOD

REGIONAL LONG-RANGE PEDESTRIAN AND BICYCLE TRANSPORTATION PLAN

Bangor Area Comprehensive Transportation System (BACTS) is the organization designated by Federal and Maine state government to carry out much of the transportation planning in the greater Bangor urbanized area, which includes all of Bangor, Brewer, Veazie, and Penobscot Indian Island; Orono and Old Town east of I-95; and portions of Hampden, Hermon, Milford, Orrington, and Bradley. BACTS is responsible for advising and prioritizing certain transportation needs for the region for the Maine Department of Transportation (MaineDOT), Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

BACTS contracted with T.Y.LIN International to develop the regional long-range pedestrian and bicycle transportation plan which will be incorporated into the BACTS Metropolitan Transportation Plan (MTP). The MTP, and in turn this Plan, serves as a guide for development of future Transportation Improvement Programs (TIP), transportation studies, work programs, and projects in the BACTS region covering a 20-year horizon. BACTS is soliciting public comments on the plan, which can be viewed on the BACTS website www.bactsmpo.org or at the BACTS office at 12 Acme Road, Suite 104 in Brewer. The 10-day public comment period begins on Wednesday, July 31, 2019.

Comments must be made in writing and received on or before **4:00 p.m., Tuesday, August 13, 2019.** The BACTS Policy Committee is responsible for final acceptance of the Plan, as well as to review and respond to comments received during the public comment period.

Written comments should be directed to:

Cindy Meservey
12 Acme Road, Suite 104
Brewer, Maine 04412
or by email at cindym@bactsmpo.org

From: Roberts, Sharisse G <Sharisse.G.Roberts@maine.gov>
Sent: Wednesday, July 31, 2019 4:23 PM
To: Cindy Meservey <cindym@bactsmpo.org>
Subject: RE: Request for Public Comment

Page 16 – lists only places of interest in Hampden as Hampden Academy, Rec center and library. The elementary schools, middle school and Dorothea Dix Park on Main Rd should listed as places of interest. Also Lura Hoit Pool and Rec fields on Western Ave should be listed as places of interest.

Sharisse Roberts, COMS
Orientation & Mobility Instructor

Division for the Blind & Visually Impaired
45 Oak Street, Suite 1
Bangor, ME 04401
Phone: 207-441-3013
Email: Sharisse.G.Roberts@maine.gov

From: Connie Reed
Sent: Tuesday, September 17, 2019 3:22 PM
To: Sharisse.G.Roberts@maine.gov
Cc: Rob <robk@bactsmpo.org>; Cindy <cindym@bactsmpo.org>
Subject: BACTS Long Range Pedestrian and Bicycle Transportation Plan - Response to Public Comment

Good Afternoon Sharisse:

Thank you for your continued participation in the metropolitan transportation planning process. At today's meeting, the Policy Committee voted to adopt the Long Range Pedestrian and Bicycle Transportation Plan and respond to comments received. Comments received did not raise new material issues.

In response to your comment, the map shown on page 16, and all maps of Hampden which are included in the Plan, will contain an inset map labeled "Additional Places of Interest in Hampden" which identifies those places you have listed.

The final document will be posted to the Planning Documents section of our website within the next couple of days.

Connie Reed

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www.bactsmpo.org

12.0 Best Practice Resources and Guidance

The following documents provide detailed descriptions, illustrations, and design information for each type of facility and/or improvement recommendation included, and referenced, in Sections 6.0 and 7.0 of this Plan.

FHWA Achieving Multimodal Networks (August 2016)
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_networks/fhwahep16055.pdf

FHWA Small Town and Rural Multimodal Networks (December 2016)
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/fhwahep17024_lg.pdf

MaineDOT Highway Program Design Practices and Procedures (Complete Street Design Practices and Procedures updated 05.06.19) https://www.maine.gov/mdot/engineering/highway/

- MaineDOT ADA Compliance Policy for Construction and Maintenance (08.11.16) https://www.maine.gov/mdot/civilrights/docs/ada/ADACompliancePolicy.pdf
- MaineDOT Design Guidance-Minimum ADA Requirements for Pedestrian Facilities (01.24.18) https://www.maine.gov/mdot/civilrights/docs/ada/ADA_Design_Guidance_1-24-18.pdf
- MaineDOT Guidelines on Crosswalks (01.17.19) https://www.maine.gov/mdot/engineering/docs/practices/2019/MaineDOT-Guidelines-on-Crosswalks.pdf
- MaineDOT Design Guidance on Medians and Islands (01.17.19)

MaineDOT Complete Streets Policy (June 2014)
(https://www.maine.gov/mdot/engineering/docs/policies/2018/MaineDOT-Complete-Streets-Policy.pdf

ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach (2010)
https://www.ite.org/pub/?id=e1cff43c-2354-d714-51d9-d82b39d4dbad

FHWA Pedestrian Countermeasure Tech Sheets

- Pedestrian Hybrid Beacon (PHB): https://safety.fhwa.dot.gov/ped_bike/step/resources/docs/fhwasa18064.pdf
- Crosswalk Visibility Enhancements: https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_VizEnhancemt2018.pdf
- Pedestrian Refuge Island: https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_PedRefugeIsland2018.pdf
- Raised Crosswalk: https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_RaisedCW2018.pdf
- Road Diet: https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_RoadDiet2018.pdf
- Rectangular Rapid-Flashing Beacon (RRFB): https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_RRFB_2018.pdf

Other Resources and Facility Design Guidance

The following documents provide additional guidance on the selection and implementation of pedestrian and bicycle transportation infrastructure improvements.

FHWA Bikeway Selection Guide - February 2019
https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

Pedestrian and Bicycle Information Center Facility Design Resource Index
http://www.pedbikeinfo.org/planning/facilities_designresourceindex.cfm

MaineDOT Road Diet Guidelines - May 2016 https://www.maine.gov/mdot/engineering/docs/practices/2018/Road-Diet-Guideline.pdf

Manual on Uniform Traffic Control Devices (MUTCD) https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm

Bicycle Facilities and the Manual on Uniform Traffic Control Devices
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/mutcd/

MaineDOT Traffic Engineering Striping and Stenciling Handbook https://www.maine.gov/mdot/traffic/docs/MaineDOT-Traffic-Engineering-Striping-and-Stenciling-Handbook.pdf

MaineDOT Bicycle and Pedestrian Sign Templates
https://www.maine.gov/mdot/bikeped/docs/SignTemplate2016opt.pdf

American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets (Geenbook), 7th Edition
https://store.transportation.org/Item/CollectionDetail?ID=180&gclid=EAIaIQobChMI1K2px-T_4QIVUsDICh0WxAy-EAAYASAAEgK8W_D_BwE

American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities
https://store.transportation.org/Item/CollectionDetail?ID=116&gclid=EAIaIQobChMIn9jFs5bD4QIVFovICh01BAOBEAAYASAAEgIMDfD_BwE

National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide
https://nacto.org/publication/urban-bikeway-desig