ACTIVE TRANSPORTATION STUDY

MassDOT Contract Number: 112307

OLD COLONY PLANNING COUNCIL

October 2021

Acknowledgements and Title VI Notice of Protection

The preparation of this report has been financed in part through grant[s] from the Federal Highway Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code.

This report was funded in part through grant[s] from the Federal Highway Administration [and Federal Transit Administration], U.S. Department of Transportation. The views and opinions of the Old Colony Planning Council expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.

Notice of Nondiscrimination Rights and Protections to Beneficiaries

Federal "Title VI/Nondiscrimination" Protections

The Old Colony Metropolitan Planning Organization (MPO) operates its programs, services, and activities in compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of race, color, or national origin (including limited English proficiency), be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving federal assistance. Related federal nondiscrimination laws administrated by the Federal Highway Administration, the Federal Transit Administration, or both prohibit discrimination on the basis of age, sex, and disability. These protected categories are contemplated within the Old Colony MPO's Title VI Programs consistent with federal interpretation and administration. Additionally, the Old Colony MPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with US Department of Transportation policy and guidance on federal Executive Order 13166.

State Nondiscrimination Protections

The Old Colony MPO also complies with the Massachusetts Public Accommodation Law, M.G.L. c 272 §§ 92a, 98, 98a, prohibiting making any distinction, discrimination, or restriction in admission to or treatment in a place of public accommodation based on race, color, religious creed, national origin, sex, sexual orientation, disability, or ancestry. Likewise, the Old Colony MPO complies with the Governor's Executive Order 526, section 4 requiring all programs, activities, and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background.

Additional Information
To request additional information regarding Title VI and related federal and state nondiscrimination obligations, please contact:
Old Colony Planning Council
Title VI/ Nondiscrimination Coordinator
Mary Waldron
70 School Street
Brockton, MA 02301
508-583-1833 Extension 202
mwaldron@ocpcrpa.org

Title VI Specialist
MassDOT, Office of Diversity and Civil Rights
10 Park Plaza
Boston, MA 02116
857-368-8580
TTY: 857-368-0603
MASSDOT.CivilRights@state.ma.us

Complaint Filing
To file a complaint alleging a violation of Title VI or related federal nondiscrimination law, contact the Title VI Specialist (above) within 180 days of the alleged discriminatory conduct.

To file a complaint alleging a violation of the state's Public Accommodation Law, contact the Massachusetts Commission against Discrimination within 300 days of the alleged discriminatory conduct at:

Massachusetts Commission Against Discrimination (MCAD)
One Ashburton Place, 6th Floor
Boston, MA 02109
617-994-6000
TTY: 617-994-6196

Translation

English: If this information is needed in another language, please contact Mary Waldron at 508-583-1833 Extension 202.

Portuguese: Se esta informação é necessária em outro idioma, entre em contato com Mary Waldron em 508-583-1833 Ramal 202.

Spanish: Si se necesita esta información en otro idioma, por favor póngase en contacto con Mary Waldron al 508-583-1833 extensión 202.

Chinese Simplified: (mainland & Singapore): 如果这个信息是需要用另一种语言，请联系帕特Waldron在508-583-1833分机202。

Chinese Traditional: (Hong Kong & Taiwan): 如果這個信息是需要用另一種語言，請聯繫帕特Waldron在508-583-1833分機202。

Russian: Если эта информация необходима на другом языке, пожалуйста, свяжитесь с Пэт Сиарамелла на 508-583-1833 Extension 202.

Haitian Creole: Si ou bezwen enfòmasyon sa a nan yon lòt lang, tanpri kontakte breve Waldron nan 508-583-1833 Ekstansyon 202.

Vietnamese: Nếu thông tin này là cần thiết trong một ngôn ngữ khác, xin vui lòng liên hệ với Waldron tại 508-583-1833 mở rộng 202.

French: Si cette information est nécessaire dans une autre langue, s'il vous plaît communiquer avec Mary Waldron au 508-583-1833 extension 202.

Italian: Se questa informazione è necessaria in un'altra lingua, si prega di contattare Mary Waldron al 508-583-1833 Extension 202.

Khmer: ប្រសិនបើព័ត៌មាននេះត្រូវបានត្រូវការនៅក្នុងភាសាមួយផ្សេងទៀតសូមទាក់ទងជំនាត់ Waldron នៅផ្នែកបន្ថែម 508-583-1833 202 ។

Arabic: إذا كانت هناك حاجة هذه المعلومات في لغة أخرى، يرجى الاتصال بات Ciaramella.202 امتداد 1833-583-508 في

The preparation of this report has been financed in part through grant(s) from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code.

The views and opinions of the Old Colony Planning Council expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

This report was prepared by the following members of the Old Colony Planning Council staff under the direction of Mary Waldron, Executive Director, and the supervision of Charles Kilmer, Assistant Director/Transportation Program Manager.

Report Preparation, Public Outreach, and Analysis

Ray Guarino, Principal Transportation Planner

rguarino@ocpcrpa.org

Shawn Bailey, Senior Transportation Planner

sbailey@ocpcrpa.org

Kyle Mowatt, Senior Transportation Planner

kmowatt@ocpcrpa.org

Mapping and Graphics

Andrew Vidal, GIS Manager

avidal@ocpcrpa.org

Table of Contents

Introduction

The intent of the *Active Transportation Network Study* is to identify improvements in the bicycle and pedestrian network for increased utility, mobiltiy, and safety for transportation purposes, including commuting and recreational uses in the OCPC region. This study provides an analysis of the bicycle and pedestrian network within a connective, intermodal, and safety context. As a result of this study, it is intended that OCPC will work on the development of projects that can be advanced by the region's communities to the MassDOT Highway Division project development process for statewide funding resources.

The process for this study includes analysis using bicycle level of service (BLOS), pedestrian level of service (PLOS), MassDOT crash clusters, and map data. The data inventory will be compiled for village centers, downtowns, and in proximity to schools, transit and commuter facilities, and community facilities to assist in the determination of measurements of safety.

Pedestrian Transportation

Sidewalks in the Old Colony Planning Council Region

The availability of sidewalks along a road or street in the OCPC region depends upon different factors. In many of the OCPC communities, sidewalks are available in the downtown areas as these areas were developed during a time when auto use was not dominant, and residents relied mostly on other modes including public transit. These downtowns were essential to commercial establishments that were focused in a specific developed area where foot traffic was relied upon for trips from shop to shop.

Sidewalks are widely available downtown in Brockton and along the Main Street corridor at other developed areas in the City such as Campello and Montello. Sidewalks are available in many of the residential areas of Brockton that came into development before the widespread use of the auto. Sidewalk construction is not as prevalent and is inconsistent in those areas of the OCPC region that came into development when auto use became the dominant mode of travel as malls and commercial plazas came into use strung along arterial corridors.

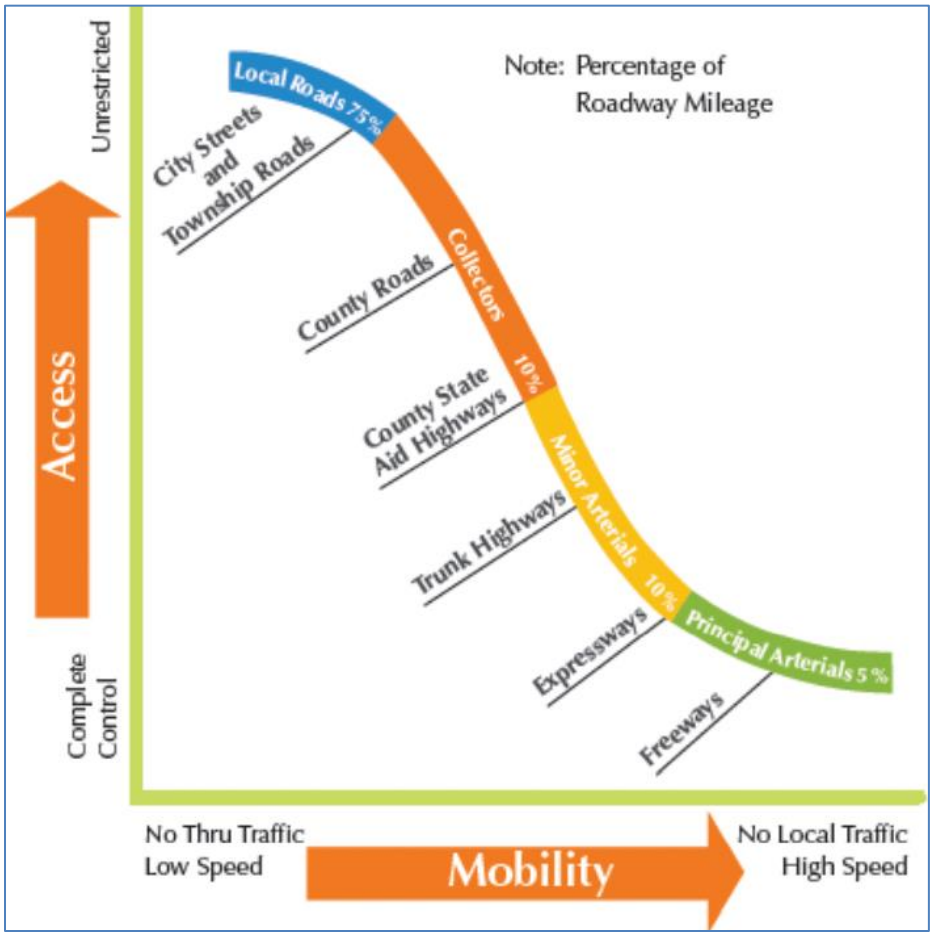
Sidewalks are also prevalent in specific areas such as the downtowns in other OCPC communities such as Bridgewater, Easton, Stoughton, Plymouth, and Whitman. In the OCPC communities with downtowns that are not as demarcated, such as Abington and Halifax, sidewalks are inconsistent and more dispersed.

The likelihood of sidewalks along a street is also dependent upon the classification of the street or road as the function of roads varies depending upon classification. Local roads provide direct access to adjacent land uses, so it is advantageous to construct sidewalks on local roads, although many suburban local roads and cul-de-sacs in single-family developments have inconsistent sidewalks due to dependence on the automobile and because destinations for work, recreation, shopping, or other activities from these neighborhoods are too far to walk. While the main function of a local road is to

provide direct access to adjacent land uses, collector roads provide connection between local roads and arterials. Collectors provide a combination of access and mobility. Minor arterials provide travel across communities and between communities, often with access to adjacent properties, and major arterials (principal arterials) provide corridor connections between different regions. Freeways or limited access highways have ramps and interchanges with no direct access to adjacent properties (except ramps to and from rest stops and truck stops). Although the primary function of the arterial is movement, with higher speeds and higher volumes than collectors or locals, a great deal of commercial development along arterials has occurred over the past few decades making many arterials a destination as much as a thoroughfare. Figure 1 shows the access and mobility associated with roadway functions.

Commercial development along arterials, both major and minor arterials, can attract pedestrians if neighborhoods exist within walking distance or if large residential areas are developed in mixed-use fashion with commercial development within the corridor. The conflict of high speeds, heavy vehicle volumes and a lack of sidewalks and pedestrian accommodation creates dangerous conditions for pedestrians along some of the commercial arterial corridors.

Figure 1



Jane Jacobs, in her classic, *The Death and Life of Great American Cities (1961),* said of streets and sidewalks that, streets in cities serve many purposes besides carrying vehicles and providing circulation, and city sidewalks serve many purposes besides carrying pedestrians. According to Jacobs, a sidewalk is given meaning in conjunction with the buildings and other uses that border it or are very near to it. Jacobs wrote that sidewalks are essential to the activities of the adjacent land uses and play a major role in safety, which she described as a fundamental task of the function of streets and sidewalks. Busy sidewalks rely upon walkers feeling personally safe and secure in their use. In addition, Jacobs contends that the individuals who own and run the various shops and establishments play a major role in creating that atmosphere of safety and security.

In the engineering of transportation infrastructure, the design focus on vehicle mobility and vehicle parking, which allows people to travel farther distances for work, shopping, and other types of trips, has created a street network lagging in pedestrian and bicycle accommodation and safety. The Complete Streets approach, which has grown over the past decade, creates a transportation network that takes into consideration all road users, including bicycle, pedestrians, and transit.

Walking to Improve Health and Revitalize Downtowns

According to Walk Boston[1], walking is good for business. Walk Boston cites a number of reports that state:

- For every dollar spent at an independent business generates about three times as much benefit to the local economy compared to spending a dollar at a chain retailer. (American Independent Business Alliance).
- Patrons of retail businesses who arrive by foot and bicycle in a neighborhood shopping area visit the most often and spend the most money per month. (Toronto Clean Air Partnership).
- Walkable retail areas with unique visual, cultural, social and environmental qualities provide competitive advantages. Their "place-making dividend" attracts people to visit often, stay longer and spend more money (Urban Land Institute).

There are many advantages to investing in sidewalks and pedestrian infrastructure. The percentage of people who have ceased driving increases as the population ages. With more of the population over the age of 65, providing mobility options to a rising number of older non-drivers is a planning challenge as both life expectancy and the number of older Americans grows. Pedestrian improvements along streets, even small-scale projects, result in higher physical activity levels and improves the overall public health and the quality of life. People living in walkable neighborhoods trust neighbors more, participate in community projects and volunteer more than in non-walkable areas. Younger workers are opting to drive less, have less interest in cars, and want to walk and bicycle to work with more social interactions. The benefits of walking are widely recognized as people who walk as part of their daily routine are more

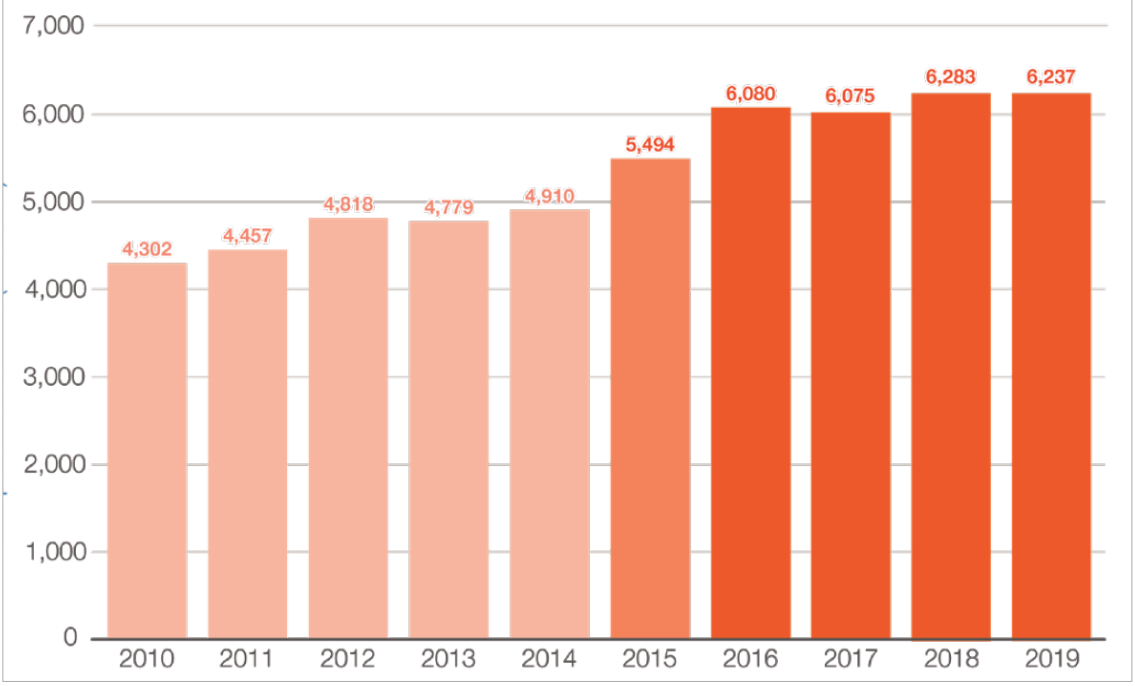
[1] Walk Boston is a non-profit advocacy group in Massachusetts advocating for the walkability and safety of pedestrians.

likely to get the exercise needed to stay healthy and children who walk or bike to and from school improve their overall health and cognitive skills.

Dangerous by Design

Dangerous by Design is a report on national pedestrian safety initiated by the Centers on Disease Control (CDC) and developed in partnership with the Smart Growth Coalition and the National Complete Streets Coalition. An update of this report was released in 2021. This report cites an increase in pedestrian fatalities in the US of 45 percent from 2010 to 2019, based on the National Highway Traffic Safety Administration's (NHTSA) Fatality Analysis Reporting System (FARS).

Figure 2 Fatalities in the US Per Year



According to this study, the factors responsible for the increase in pedestrian fatalities are known to designers and policy makers. The report states that our streets are designed for operations that prioritize the speedy movement of vehicles with the safety of other road users at a lower priority. The design of our streets encourages speed with wide lanes, a lack of high-visibility crosswalks, wide intersections that encourage drivers to make turns without slowing, and long distances between intersections. People will cross these types of streets despite dangerous conditions especially when the nearest safe crosswalk requires a long detour. When there are destinations or transit stops along these types of roads it puts pedestrians in conflict with vehicles. In addition to the design factor that encourages higher speeds, more people are driving bigger vehicles such as pick-up trucks and SUVs (sport utility vehicles), which are two to three times more likely than smaller personal vehicles to kill people walking in the event of a crash.

The report states that all people do not experience the benefits and burdens of transportation policy and funding decisions equally. Low-income households are significantly less likely to have access to a vehicle and less likely to live in communities where they can reach daily needs safely and affordably without a car. Older adults, Black or African American and American Indian or Alaska Native people, and people walking in low-income communities continue to be disproportionately represented in fatal crashes involving people walking.[2]

Figures 3 and 4 show the locations of non-motorized (pedestrian and bicycle) crashes based on data points provided by MassDOT. Figure 3 shows crashes in Brockton and the south portions of Avon and Stoughton. Figure 4 shows Stoughton and Avon and the north portions of Easton and Brockton. These maps show that most of the non-motorized crashes (pedestrian and bicycles) occur on roads that are in the higher road classification categories. As described in the report, *Dangerous by Design*, many of the non-motorized crashes are strung out along arterials that are designed for higher volumes and high speeds. In Brockton, the crashes are focused along the Main Street corridor and in the downtown, which is within the Environmental Justice sectors of the OCPC region, with high minority concentrations, low-income households, and limited English proficiency populations. Although the Brockton Main Street corridor is within a densely populated area with parking along both sides of the street, it does have sections with higher speeds and it attracts a high number of walkers from the connected neighborhoods as well from the available parking along the road. The Main Street corridor experienced three pedestrian fatalities in 2019 (shown in red in Figure 3).

Figure 3 shows non-motorized crashes along Route 123 in Brockton, which is Belmont Street west of Main Street and Centre Street east of Main Street. The conditions along Route 123 are similar to those described in *Dangerous by Design,* especially on Belmont Street, which has a four-lane cross section. Figure 3 also shows non-motorized crashes on Route 27 Pleasant Street as well as Pearl Street, which continues into Stoughton. Figure 4 shows non-motorized crashes in Stoughton within the Route 27 corridor as well as the Route 138 corridor with two with the town center. In addition, Figure 4 shows a fatality within the Route 138 corridor in Easton just south of the Stoughton line.

[2] Dangerous by Design 2021, Page 26

Figure 3

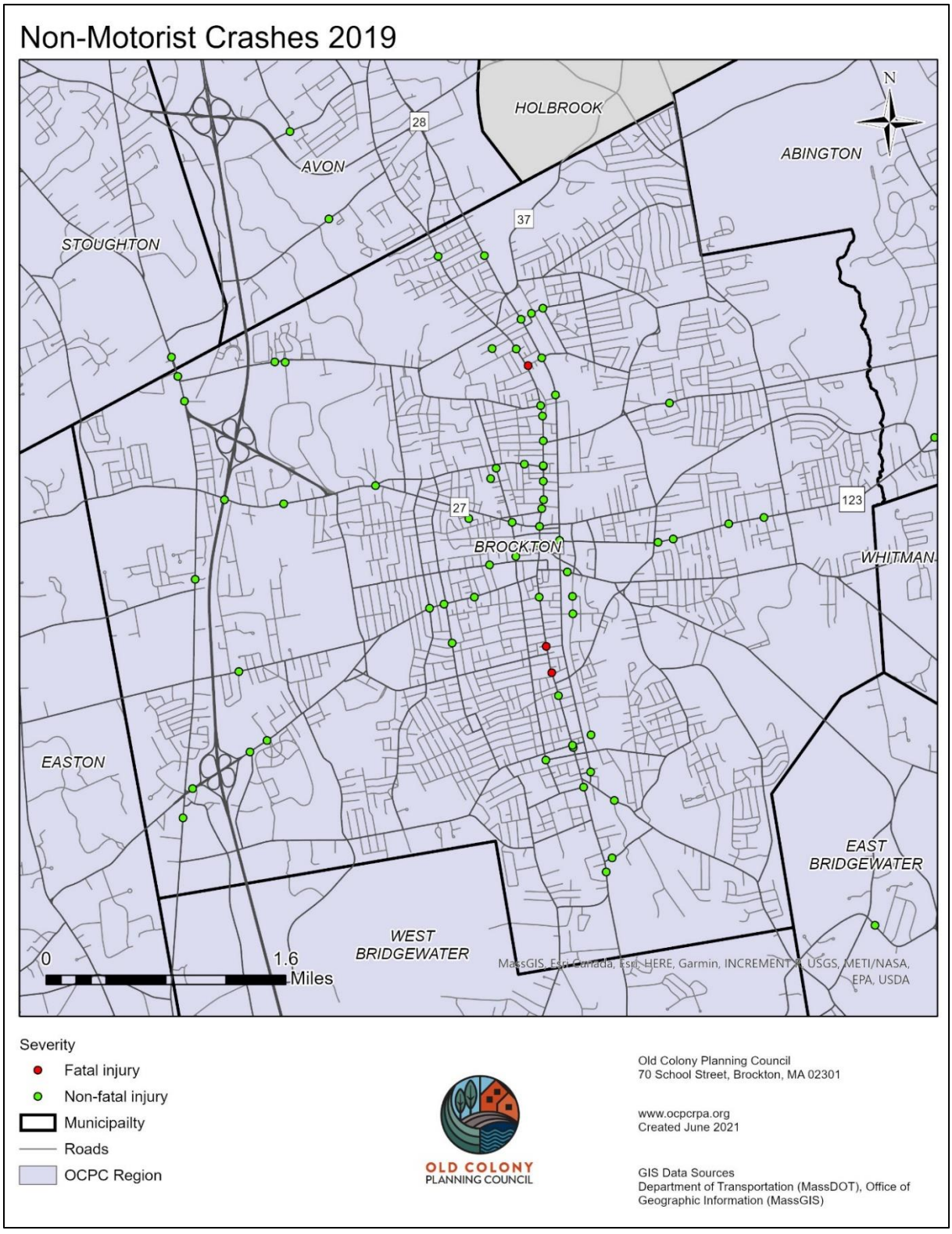

Non-Motorist Crashes 2019
HOLBROOK
ABINGTON
AVON
STOUGHTON
BROCKTON
WHITMAN
EASTON
WEST BRIDGEWATER
EAST BRIDGEWATER
28
37
27
123
N
0
1.6
Miles
MassGIS, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA
Severity
Fatal injury
Non-fatal injury
Municipailty
Roads
OCPC Region
OLD COLONY PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created June 2021
GIS Data Sources
Department of Transportation (MassDOT), Office of Geographic Information (MassGIS)

Figure 4

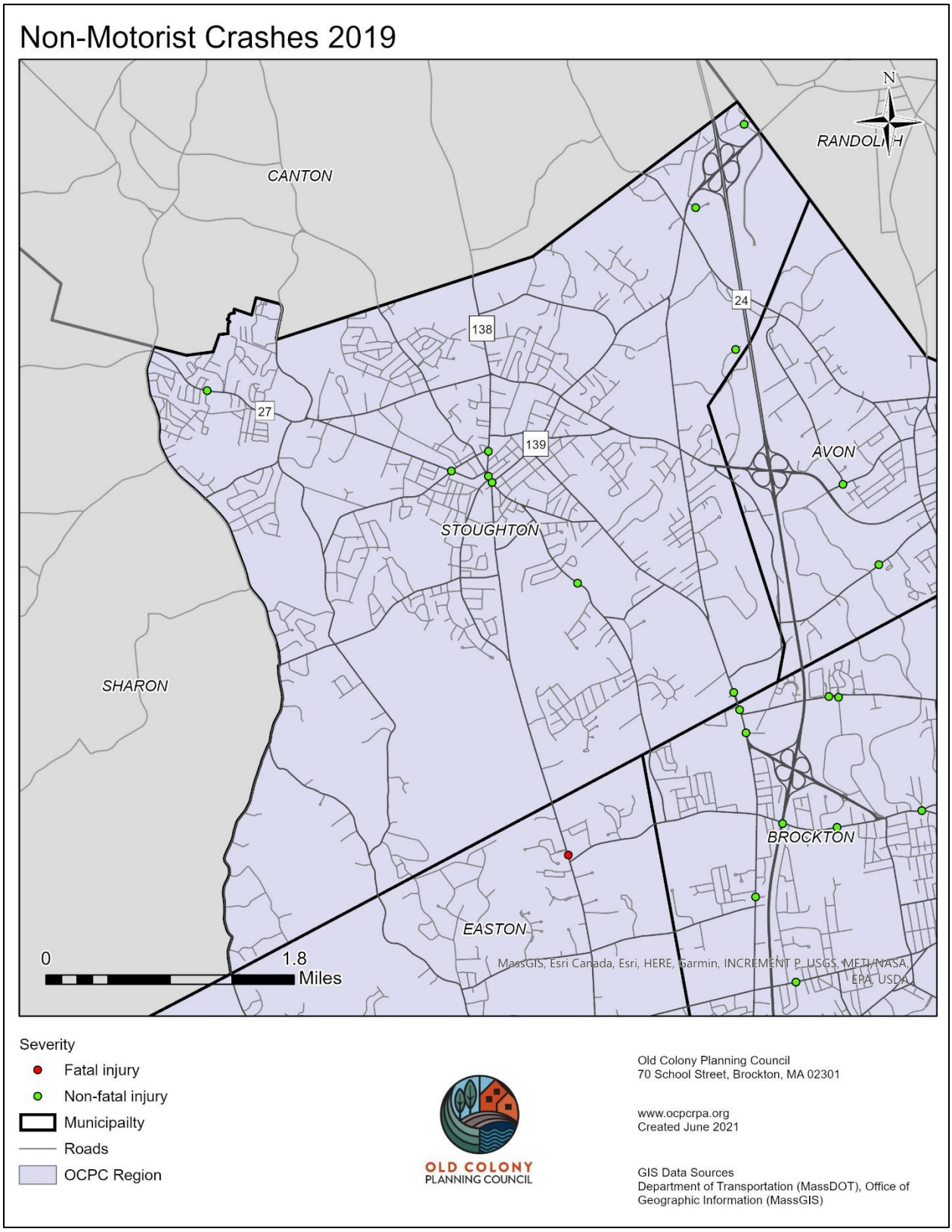

Non-Motorist Crashes 2019
N
CANTON
RANDOLPH
24
138
27
139
AVON
STOUGHTON
SHARON
BROCKTON
EASTON
0
1.8
Miles
MassGIS, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA
Severity
Fatal injury
Non-fatal injury
Municipailty
Roads
OCPC Region
OLD COLONY PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created June 2021
GIS Data Sources
Department of Transportation (MassDOT), Office of Geographic Information (MassGIS)

Figure 5 shows pedestrians crossing the Route 123 Belmont Street at West Street intersection in Brockton without crosswalks or pedestrian actuated signals. The Route 123 Belmont Street arterial is a commercial corridor with high vehicle volumes and speeds and is within walking distance of residential neighborhoods. The corrdior was designed with vehicle mobility as a priority; however, this section of the road is currently part of a MassDOT improvement project. The improvement project is currently under construction and will provide consistent roadway cross-sections, bicycle accommodating shoulders, and accessible sidewalks. In addition, traffic signals will be reconstructed to provide crosswalks, pedestrian signal actuation, and ADA accessible pedestrian accommodations.

Figure 5

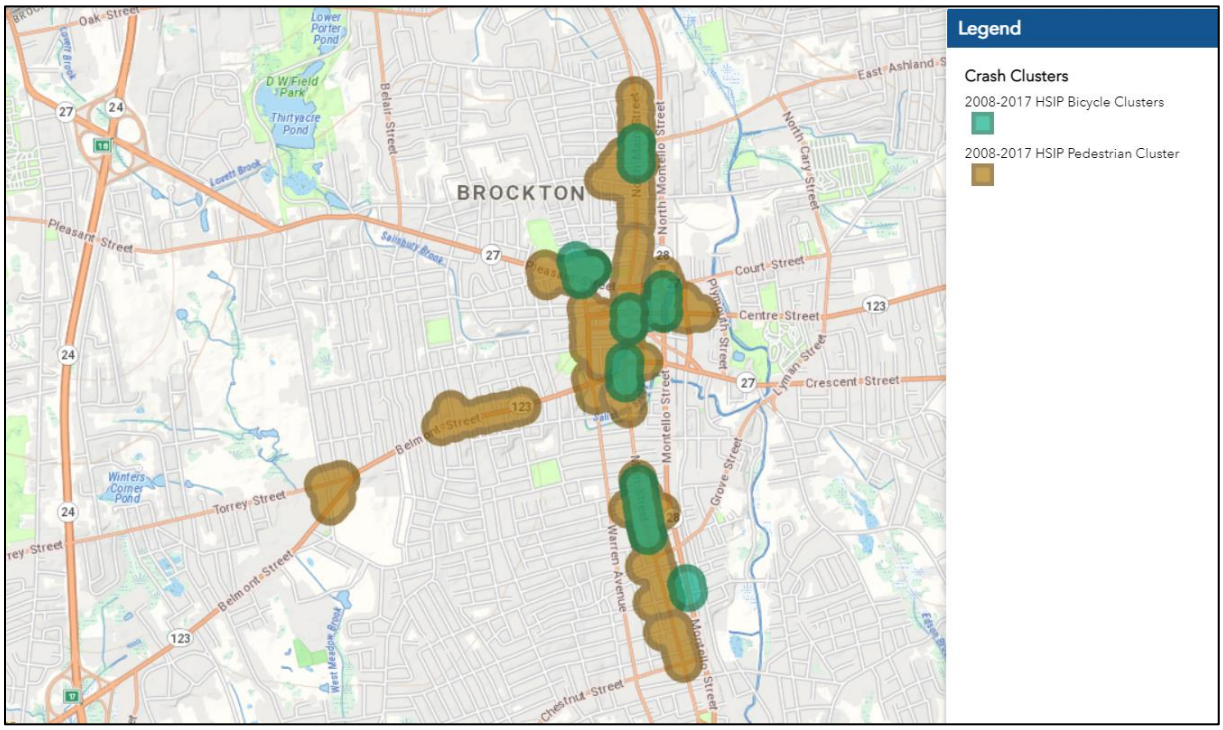
Bicycle and Pedestrian Crash Clusters

The Massachusetts Department of Transportation (MassDOT) obtains crash data from the Registry of Motor Vehicles' (RMV) collection of state and local police crash reports. The RMV maintains crash data records to help MassDOT compile crash data for safety analysis. MassDOT developed maps based on the data to show the crash clusters for vehicle crashes and crashes involving pedestrians and bicycles. The clusters for pedestrian and bicycle crashes consist of the highest five percent crash locations within the Old Colony region. Figures 6 and 7 show the crash clusters within the Old Colony Region for the three-year period 2015, 2016, and 2017, which represents the latest available crashes for MassDOT cluster analysis. As shown in Figures 6 and 7, the non-motorized (pedestrian and bicycle) crash clusters are located in Brockton and Bridgewater.

Brockton's crash clusters are more extensive than Bridgewater. The pedestrian crash clusters are dispersed along Main Street from West Chestnut Street north to Dover Street. It picks up again along Main Street from Allen Street at the Brockton Library north through Brockton Downtown to Battles Street. There are clusters on Belmont Street at Torrey Street, Boylston Street to Wall Street, and on Belmont Street at Warren Avenue. The cluster on Warren Avenue continues north to Pleasant Street

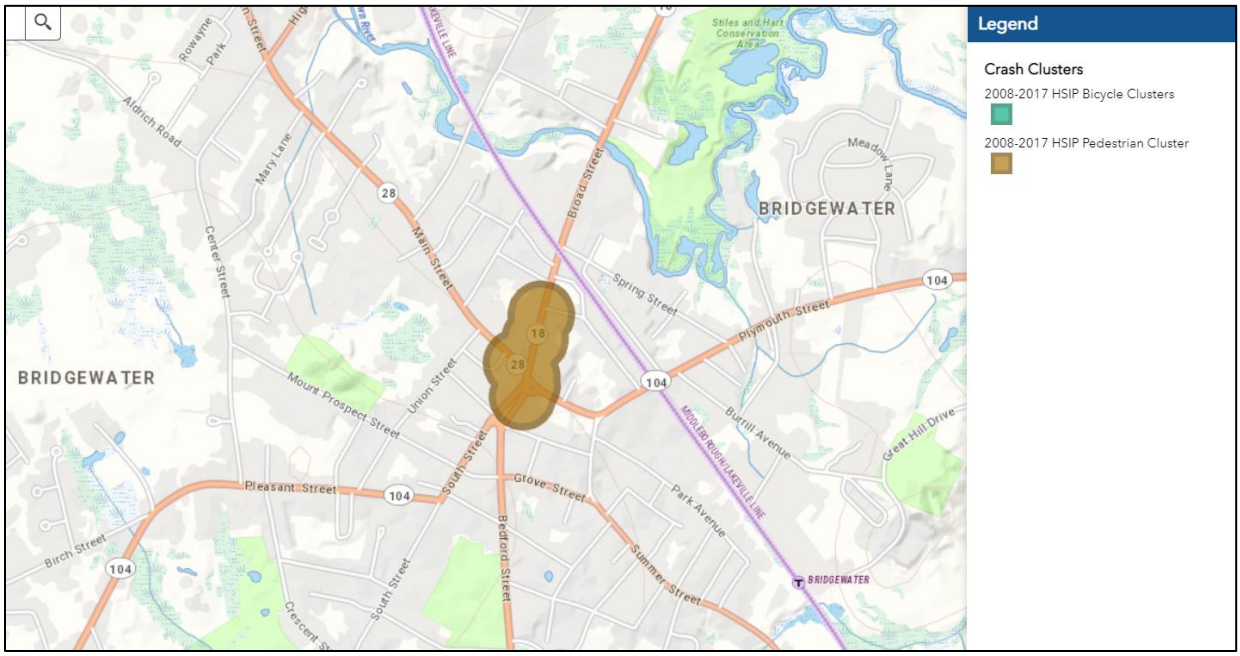
and on Pleasant Street west to Spring Street and Newbury Street. West Elm Street, Frederick Douglass, and Legion Parkway are within the pedestrian cluster in Brockton Downtown and the cluster spreads out east on Centre Street including the Montello Street intersection to the Brockton Area Transit Centre. The pedestrian crash cluster in Bridgewater includes most of Central Square and part of Main Street extending north on Broad Street to Hale Street.

Figure 6



The bicycle crash clusters in the Old Colony region are all contained within Brockton and located on the same corridors or adjacent to the pedestrian crash clusters. These are located mostly in the downtown except for a bicycle cluster north of the downtown at Main Street and East Ashland Street and two south of the downtown north and south of Forest Avenue at Main Street and at Montello Street and Nilsson Street.

Figure 7



Safe Routes to Schools

In 2005, with the passing of SAFETEA-LU legislation, Congress approved funding for implementation of the Safe Routes to School (SRTS) program. It required that each state have a SRTS coordinator. Safe Routes to School initiatives were funded through a standalone federal SRTS program from 2005 to 2012. This program provided more than $1 billion in funding in all states to support infrastructure improvements and programming to make it safer for children to walk and bicycle to and from school.

In June 2012, Congress passed an updated transportation bill, MAP-21. This legislation made significant changes to funding for bicycling, walking and Safe Routes to School. The federal Safe Routes to School program was combined with other bicycling and walking programs into a program called Transportation Alternatives. Safe Routes to School projects are eligible for Transportation Alternatives funding. This funding stream has been provided subsequentially as Congress passed the new transportation law, the FAST Act, in December 2015.[3]

The purpose of the SRTS program in Massachusetts is to increase safe biking and walking among elementary and middle school students. The program uses a collaborative, community-focused approach utilizing the "Six E's" to implement its program, Education, Encouragement, Engagement, Evaluation, Engineering, and Equity. The level of participation for each school in the SRTS program varies depending upon needs and interests of participants. The level of participation is divided into two categories, 1. Non-Infrastructure and, 2. Infrastructure. Non-Infrastructure support involves education, evaluation of conditions, and support in engagement. This includes activities such as school transportation surveys, walkability assessments, bicycle and pedestrian safety training, walking school

[3] Safe Routes to School partnership, (saferoutespartnership.org)

buses, events such as walk/bike to school week, bicycle rodeos, bike and pedestrian safety curricula, and student and parent mentoring. Infrastructure improvements include constructing sidewalks, traffic calming and speed reduction treatments, crossing improvements, and on-street bicycle improvements and bicycle parking improvements.

Table 1 summarizes the SRTS participation in the OCPC Region by community:

Table 1 SRTS Participation Summary

Community	School	Infrastructure project	Signs and Lines	Comments
Abington	Beaver Brook	No	No	
	Woodsdale	No	No	
Avon	Butler School	No	No	Ped and Bike safety training and mentoring
Bridgewater	None			
Brockton	Angelo	No	Yes	Walking assessment. Bike rodeo, Bike safety. Ped safety
	Arnone	No	No	Winter walk to school event
	Ashfield	No	No	Winter walk to school event
	Baker	No	No	Winter walk to school event
	Brookfield	Yes	No	Winter walk to school event
	Downey	No	No	Winter walk to school event
	Davis	No	No	Winter walk to school event
	Hancock	No	No	Winter walk to school event, I-Walk event
	Kennedy	No	No	I-Walk event
	Manthala George	No	No	
	Raymond	No	No	
	West	No	No	
Duxbury	Alden	No	No	I-Walk event
	Chandler	No	No	
	Duxbury MS	No	No	
East Bridgewater	Central	No	No	
	Mitchell	No	No	
Easton	Center	No	No	Ped safety training
	Parkview	No	No	
	Olmstead	Yes	No	
Halifax	Halifax Elementary	No	No	
Hanover	None			
Hanson	Indian Head Elementary	No	No	
Kingston	None			
Pembroke	Bryantville	No	No	
	Hobomock	No	No	
	North Pembroke	No	No	
	Pembroke Community MS	No	No	

Table 1 SRTS Participation Summary (continued)

Community	School	Infrastructure project	Signs and Lines	Comments
Plymouth	Cold Spring	No	No	I-Walk event, pedestrian safety, bike assembly event,
	Federal Furnace	No	No	
	Hedge	No	No	I-Walk event, pedestrian safety, pedestrian safety mentoring,
	Manomet	No	No	
	Nathaniel Morton	No	No	Winter walk, I-Walk event, pedestrian safety training, Bicycle rodeo, bicycle assembly
	Plymouth Community	No	No	I-Walk event,
	South MS	No	No	
	South Elementary	No	No	
	West Elementary	No	No	Pedestrian safety mentoring, pedestrian safety training, Bicycle safety assembly
Stoughton	Dawe	No	No	I-Walk event, Pedestrian safety mentoring, Bike safety assembly, Bike rode, pedestrian safety training
	Hansen	No	No	I-Walk event, Bike safety assembly,
	Gibbens	No	No	Winter walk, I-Walk event, Bike rodeo, Trivia wheel table event, Pedestrian safety training, pedestrian safety mentoring
	O'Donnell	No	No	
	South	No	No	I-Walk event, Pedestrian safety training
	Wilkins	Yes	No	Pedestrian safety training, Pedestrian safety mentoring, Bike safety assembly
West Bridgewater	Howard	No	No	
	MacDonald	No	No	
	Spring Street	No	No	
	WB Middle School	No	No	
Whitman	None			

Complete Streets

A new design strategy, referred to as "Complete Streets", enables safe road access and operation for all users including pedestrians, bicyclists, motorists, and public transportation users of all ages and abilities. Complete Streets make it easy to cross the street, walk, and bicycle to and from destinations (shops, work, school, etc.) by integrating safety for non-motorized travel in the design and construction of roads. The Federal Highway Administration (FHWA) defines Livability in the following way: "Livability is about tying the quality and location of transportation facilities to broader opportunities such as access to good jobs, affordable housing, high quality schools, and safe streets. This includes addressing safety and capacity issues on all roads through better planning and design." Complete Streets can be achieved through a variety of ways including ordinances and resolutions, design manuals, executive orders from elected officials, directives, and formally policies adopted by an elected board of officials. An effective Complete Streets policy is sensitive to the type of neighborhood and the land uses along a roadway.

Complete Streets policies and design are flexible and take into account cost, available right of way, and context sensitivity.

Elements of the Complete Streets concepts are included in the MassDOT design guide, which set two important goals for selecting an appropriate roadway cross-section and the design of roadside elements. These goals were: 1. To develop a transportation infrastructure that provides access for all, a real choice of modes, and safety in equal measure for each mode of travel, and 2. To ensure that transportation facilities fit their physical setting and preserve scenic, historic, aesthetic, community, and environmental resources to the extent possible.

The Massachusetts Complete Streets Funding Program under MassDOT was created through legislative authorization in the 2014 Transportation Bond Bill. The intent of the program is to fund projects for those municipalities that adopt Complete Streets policies and practices. There are several requirements and criteria that a municipality must satisfy for eligibility; however, the major requirement is that a municipality adopt a Complete Streets ordinance via its legislative body. The Complete Streets ordinance formalizes a community's intent to plan, design, operate, and maintain streets so they are safe for all users of all ages and abilities. These ordinances direct decision-makers to consistently fund, plan for, design, and construct community streets to accommodate all anticipated users, including pedestrians, bicyclists, public transportation users, motorists, and freight vehicles. The MassDOT Complete Streets Funding Program process contains three tiers to shows where municipalities are in the development of their policy; Tier 1. Complete Streets Training and Policy Development, Tier 2. Complete Streets Prioritization Plan Development, Tier 3, Project Construction Funding. Municipalities must have staff attend training, pass a Complete Streets Policy, and complete a Complete Streets Prioritization Plan in order to be eligible for technical assistance and project funding. Table 2 shows the Complete Streets program status for OCPC Communities.

Table 2 shows that only two of the OCPC communities have not participated in the MassDOT Complete Streets funding program, Kingston and Plympton. Nine OCPC communities have approved projects for funding, three communities are working on completing their prioritization plans, and three communities are awaiting approval of projects.

Table 2 Complete Streets Program Status

Community	Registered	Approved Policies (Tier 1)	Prioritization Plan (Tier 2)	Approved Projects (Tier 3)
Abington	X	X	X	X
Avon	X	X		
Bridgewater	X	X	X	X
Brockton	X	X	X	
Duxbury	X	X		
East Bridgewater	X	X	X	X
Easton	X	X	X	X
Halifax	X	X	X	
Hanover	X	X	X	
Hanson	X	X	X	X
Kingston				
Pembroke	X	X		
Plymouth	X	X	X	X
Plympton				
Stoughton	X	X	X	X
West Bridgewater	X	X	X	X
Whitman	X	X	X	X

Bicycle Transportation

In the 1890s, Massachusetts had the largest per capita membership of women and men in the League of American Wheelmen.[4] At the turn of the twentieth century, improvements in bicycle technology and refinement, led to the proliferation of the bicycle, which rode and looked more like bicycles used today. At approximately the same time, the automobile was also improved, and Henry Ford and other auto manufacturers began mass producing autos. While industry turned out both motor vehicles and bicycles for the masses of people, America lacked good roads to travel on. Both motorists and bicyclists advocated that the states and federal government build better roads, and the Bureau of Public Roads was established by the federal government in 1918 for the purpose of administering federal aid for roads, which became the Federal Highway Administration.

The purpose of creating a regional bicycle network is to connect bicyclists from one location to another on dedicated bicycle lanes or bicycle infrastructure consisting of paved ways, bicycle boulevards, and multi-use paths. This network would preferably connect bicycle routes throughout the Old Colony region, with connections to other regions. This inter-regional network is incomplete; however, improvements to the network continue. While design and engineering of roads over the past 100 years have focused on motor vehicles, the focus is changing with the implementation of Complete Streets policies that include accommodations for all road users including bicycles.

[4] Healey Library, University of Massachusetts Boston website

The bicycle network in the region consists of roads with varying accommodation for bicycles, including roads or right-of-way shared with motor vehicles, paved shoulders, separate paved bicycle lanes along a road, and off-road paths (sometimes shared with pedestrians). Much of the bicycle network in the region exists along roads, either shared with motor vehicles or along paved shoulders or separate lanes. These roads vary in motor vehicle volumes and speeds, which affect the comfort level of bicycle riders. Novice bicycle riders are most comfortable on local roads and separate bicycle paths. Advanced riders are able to use roads such as arterials with high speeds and heavy vehicle volumes, and intermediate riders are comfortable on collector roads and minor arterials with slower speeds and less traffic volume.

Elements of the Bicycle Network

Shared Roads

In Massachusetts, it is legal to ride a bicycle on any public road, street, or bikeway, unless specified otherwise; however, riding a bicycle on a limited access highway is prohibited. Motorists are required to share the road and pass bicycles at a safe distance. Motorists must yield to oncoming bicyclists when making left turns and in the case of parked vehicles, passengers must check for passing bicyclists before opening their door. Bicyclists must obey all traffic laws and regulations of the Commonwealth and give pedestrians the right of way.

Sharrows, also known as Shared Use Arrows, are often used as pavement markings to inform motorists and cyclists that the travel lane is to be shared. A Sharrow is most effective if the marking is placed in the middle of the travel lane rather than to the side of the road. Figure 8 shows a shared road with Sharrow markings.

Figure 8

Dedicated Bicycle Lanes

Dedicated bicycle lanes are delineated with a white line, pavement markings, and signage for exclusive bicycle use along the side of the road. Bicycle lanes must be five-feet wide to meet MassDOT requirements. Figure 9 shows a typical dedicated bicycle lane on West Elm Street in Brockton.

Figure 9

Off-Road Trails

Off-road infrastructure such as shared use paths increase the feeling of comfort for bicyclists over riding alongside traffic on a busy street. Providing off road infrastructure, which connects to open space and recreation areas allows riders to cycle with minimum interaction between vehicles. Providing such infrastructure can increase the number of riders in a community. Off-road trails or paths can either be exclusive to bicycles or shared-use with pedestrians. Figure 10 shows an example of an off-road bicycle trail.

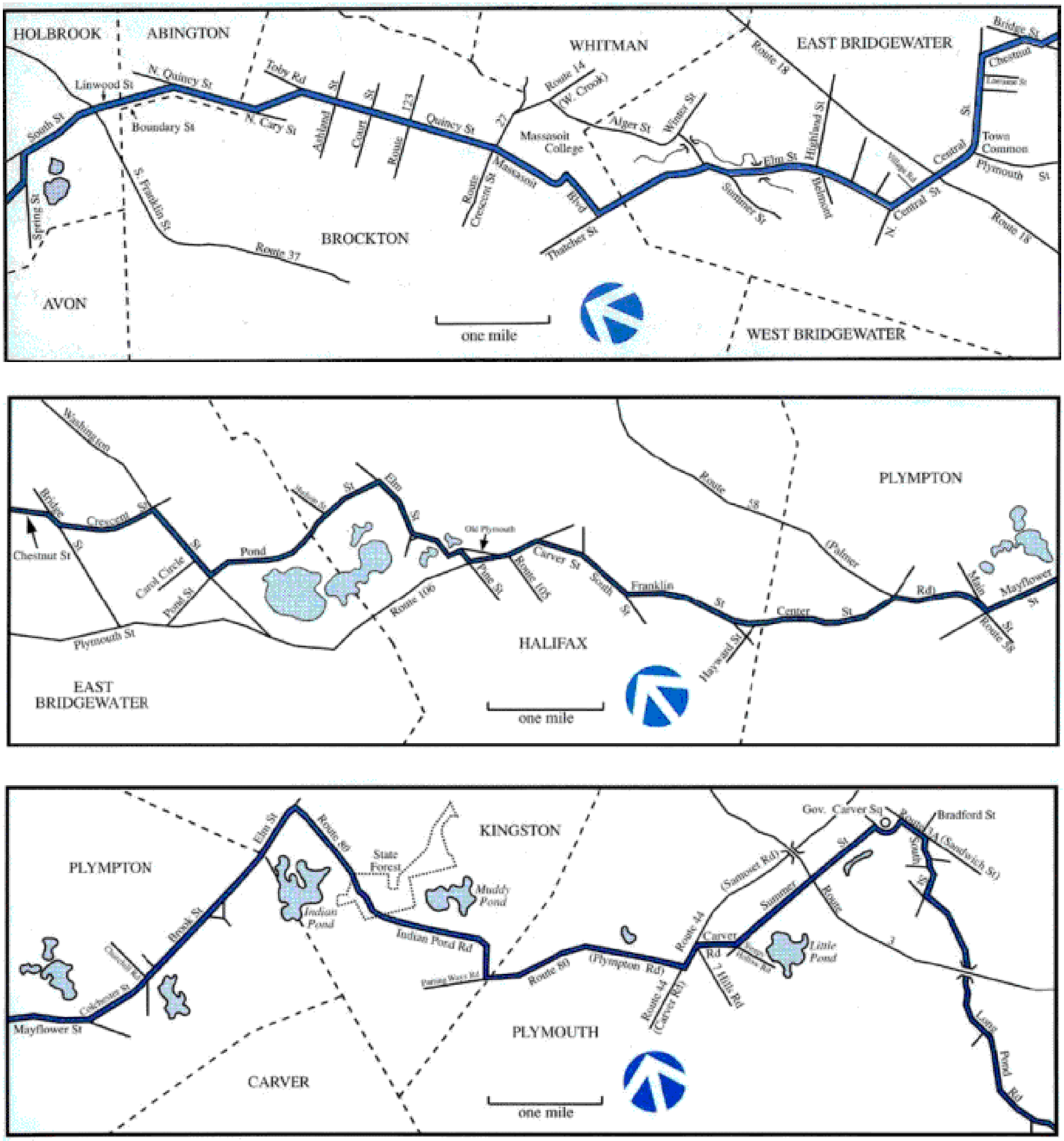
Figure 10

Established Inter-Regional Bicycle Routes

The Claire Saltonstall Bikeway

The Claire Saltonstall Bikeway was established in 1987 by the Massachusetts state legislature. The inter-regional bicycle route is also known as the Boston to Cape Cod Bikeway. The bikeway is 135 miles long and begins at the Charles River Bike Path near Boston University in Boston. It utilizes mostly low traffic volume back roads and bike paths with occasional stretches of secondary highway to maximize bicycle rider comfort and stretches south to Cape Cod ending in Provincetown. The roads along the bikeway are paved and provide enough room to comfortably ride in a bike lane. The Sagamore Bridge across the Cape Cod Canal is the exception where bike riders must walk their bike across the bridge due to state safety regulations. The bikeway includes state parks south of Boston, including Blue Hills Reservation, Ames Nowell State Park, Pilgrim Memorial State Park, Myles Standish State Forest, Scusset Beach State Reservation, Nickerson State Park, and Cape Cod National Seashore. The bikeway accommodates long distance recreational trips providing bicyclists with opportunities to visit points of interest such as historical sites, shopping districts, and parks. The bikeway bike route is marked by road signs. In the OCPC region, the bikeway traverses the Massasoit Community College Campus in Brockton. Figure 11 shows the bikeway's path through the OCPC communities including Abington, Brockton, East Bridgewater, Halifax, Plympton, and Plymouth.

Figure 11

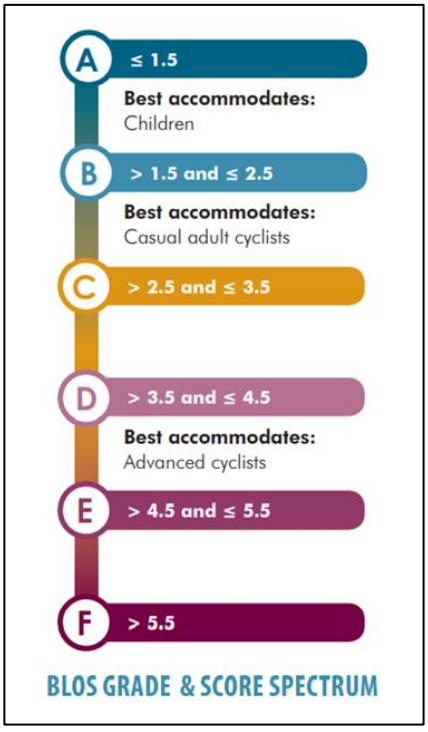

HOLBROOK
ABINGTON
WHITMAN
EAST BRIDGEWATER
BROCKTON
AVON
WEST BRIDGEWATER
Linwood St
N. Quincy St
South St
Boundary St
N. Cary St
Toby Rd
Ashland St
Court St
Route 123
Quincy St
Route 27
Route 14 (W. Crook)
Massasoit College
Alger St
Winter St
Route 18
Highland St
Elm St
Bridge St
Chestnut St
Town Common
Plymouth St
Central St
N. Central St
Belmont
Summer St
Massasoit Blvd
Thatcher St
Route Crescent St
S. Franklin St
Spring St
Route 37
one mile
Washington
Bridge
Crescent St
Chestnut St
Carol Circle
Pond St
Pond
Elm St
Old Plymouth
Carver St
Route 106
Pine St
Route 105
South St
Franklin St
Route 58
(Palmer Rd)
PLYMPTON
Center St
Main St
Mayflower St
Route 58
Hayward St
Plymouth St
HALIFAX
EAST BRIDGEWATER
one mile
PLYMPTON
KINGSTON
Elm St
Route 80
State Forest
Muddy Pond
Indian Pond
Indian Pond Rd
Brook St
Churchill Rd
Colchester St
Mayflower St
Route 80
(Plympton Rd)
Route 44
Carver Rd
Route 44 (Carver Rd)
7 Hills Rd
Little Pond
Summer St
Gov. Carver Sq
Bradford St
Route 3A (Sandwich St)
South St
Route 3
Long Pond Rd
PLYMOUTH
CARVER
one mile

The Bay Circuit Trail

The Bay Circuit Trail is a two-hundred-mile-long recreation trail that begins in Newburyport stretching southwest in a circuitous route around Boston through western suburbs and then east through several OCPC communities and ending in Kingston and Duxbury. Along this route, the trail connects parks, open spaces, and waterways in eastern Massachusetts. In all, the route traverses 50 cities and towns and consists of more than 200 miles of multi-use, passive recreational trails. The Bay Circuit Trail (BCT) varies in surface type, including earthen hiking trails and paved shared-use trails. A map of the BCT is included in the appendix of this report. The BCT traverses the communities of Easton, West Bridgewater, Bridgewater, East Bridgewater, Hanson, Pembroke, Kingston, and Duxbury.

Bicycle and Pedestrian Levels-of-Service

OCPC has, on an ongoing basis, developed levels-of-service (LOS) for bicycle and pedestrian travel on the state numbered route network and roadways identified by stakeholders as priority routes. These levels-of-service were first developed for the OCPC Bicycle and Pedestrian Connectivity Study, completed in 2013. Bicycle Level-of-Service (BLOS) and Pedestrian Level-of-Service are nationally used measures of on-road comfort level as a function of a roadway's geometry and traffic conditions. The methodology was developed by a consultant for the FHWA's Highway Capacity Manual. The input criteria for Bicycle LOS includes number of through lanes, width of travel lanes, the existence of paved shoulders or bike lanes, traffic volumes, posted speeds, percent of heavy vehicles in the traffic flow, pavement conditions, and the existence of parking. The Bicycle LOS ranges from LOS A through F, with LOS A and B suitable for all bicycle riders, LOS C and D for intermediate riders, and E and F for advanced bicyclists. The Bicycle LOS on state numbered routes and major roads in the OCPC region are shown in the Appendix to this report. The input for Pedestrian Level-of-Service includes, through lanes per direction, traffic volume, traffic speeds, percentage of heavy vehicles, ranges of development types, road widths, paved shoulders and bike lanes, on-street parking percentages, sidewalk widths and sidewalk buffer widths and types.



Bicycle Levels-of-Service

Transit

The Old Colony region has two Regional Transit Authorities (RTAs) operating within its communities. The Brockton Area Transit Authority (BAT) services the City of Brockton including the adjacent communities of Abington, Avon, Bridgewater, Easton, East Bridgewater, Hanson, Rockland, Stoughton, West Bridgewater, and Whitman. BAT also services the City of Boston (along with Randolph and Milton) via its route 12 Ashmont line. The Greater Attleboro Taunton Regional Transit Authority (GATRA) provides service to the greater Taunton / Attleboro area, and several other areas in southeastern Massachusetts including the towns of Duxbury, Hanson, Kingston, Pembroke, and Plymouth within the Old Colony region.

In addition to services provided by BAT and GATRA, the Massachusetts Bay Transportation Authority (MBTA) provides bus and commuter rail service throughout the region. Brockton Area Transit, GATRA, and the MBTA all work towards the common goal of reducing traffic congestion on the roadways system by providing a service that encourages mode shift away from single occupancy vehicle trips to trips via transit. Inter-connections between the transit providers is provided through the provision of connecting services such as the Route 12 Ashmont operated by BAT, the GATRA Pembroke Shuttle that provides service to the MBTA Hanson Commuter Rail Station, and the three MBTA (3) Commuter Rail lines servicing 11 Commuter Rail Stations working to accomplish this goal.

The Brockton Area Transit Authority (BAT) has an average yearly ridership of over 2.7 million boardings and over $3.6 million in annual fare revenue in FY 2018. BAT operates 15 fixed bus routes primarily within the City of Brockton with lines branching out to neighboring communities. These routes along with a “pulse system” that operates out of the BAT Intermodal Centre in Downtown Brockton allow for high frequency service during peak hours. BAT also provides service to six MBTA Commuter Rail Stations and the Ashmont MBTA Red Line Station. These MBTA Commuter Rail and Red Line connections allows BAT to provide multimodal links between the Old Colony Region and the City of Boston, as well as communities outside the region. In addition, BAT provides buses to Bridgewater State University as well as Massasoit Community College.

The Greater Attleboro Taunton Regional Transit Authority (GATRA) operates in 28 communities, including Duxbury, Hanson, Kingston, Pembroke, and Plymouth in the Old Colony region. In Fiscal Year 2017, the system had a system-combined ridership of 2,696,018 boardings and $911,865 in farebox revenue. Within the Old Colony region GATRA’s service includes the Plymouth Area (PAL), the Sea Area Inter-Link (SAIL), and the Pembroke Shuttle serving Pembroke and Hanson. The PAL system consists of four routes serving Plymouth and Kingston. The SAIL operates within the towns of Marshfield, Duxbury, and Kingston. In addition to the PAL and SAIL systems, GATRA provides service between Pembroke Town Center and the MBTA Hanson Commuter Rail Station. GATRA service makes intermodal connections with the Plymouth and Brockton (P&B) intercity motor coaches at the Plymouth Park-and-Ride lot (Exit 5 on Route 3), and the MBTA Commuter Rail at the Plymouth and Kingston stations. This connection to P&B at Route 3 Exit 5 connects local service with an intercity carrier that travels north to Downtown Boston and Logan Airport, and south to Cape Cod. Figures 12 and 13 show the BAT and GATRA bus routes and walking time to each of the bus route services. Figure 12 shows that BAT covers most of Brockton’s major arterials that are accessible within walking distances to dense neighborhoods almost throughout the BAT system, with major commercial destinations along the route. Figure 13 shows that GATRA’s routes are much more widespread in the Plymouth area, and the densest areas served are in Plymouth Downtown and North Plymouth. BAT routes cover the most 5 minute and ten minute walking time areas.

Figure 12

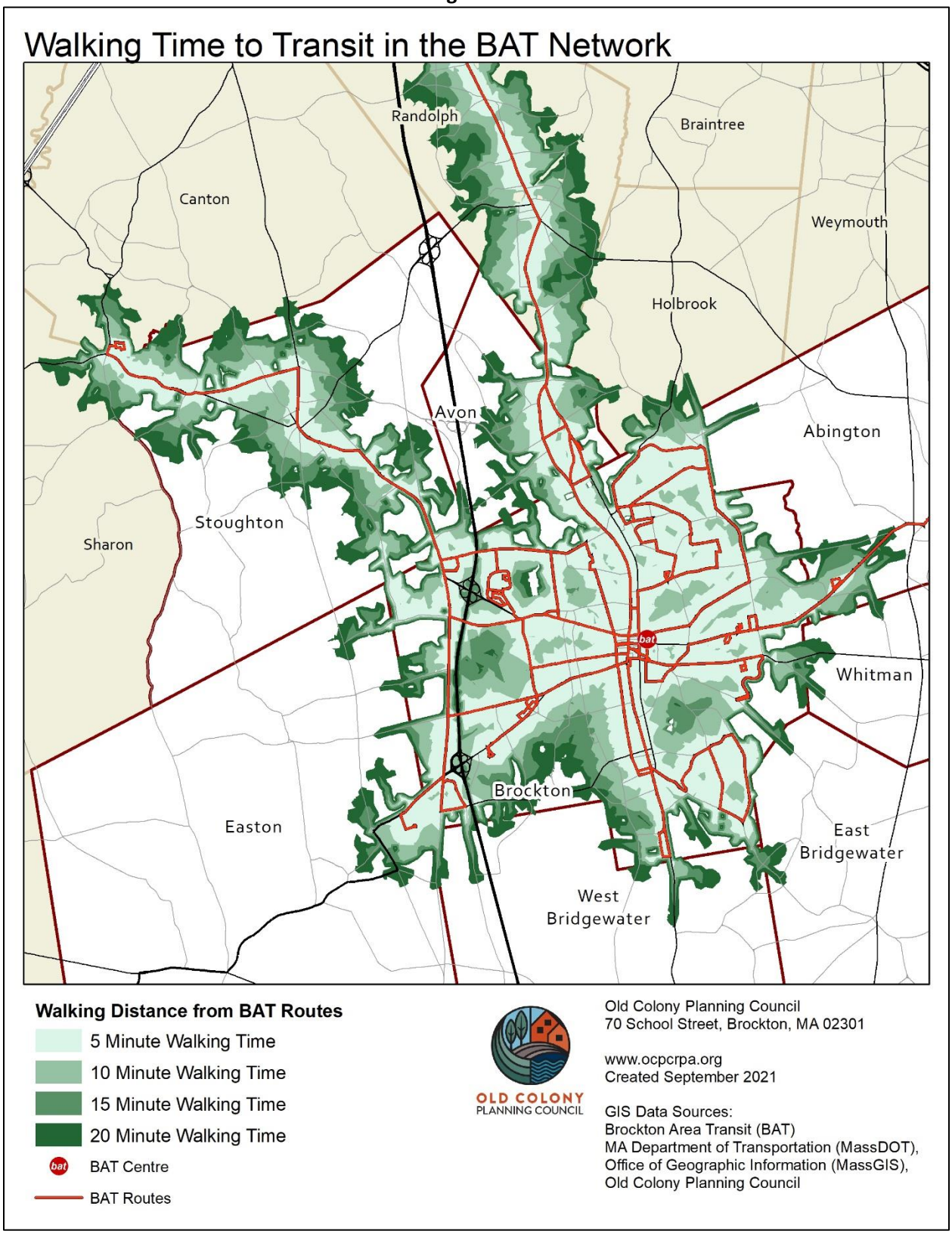
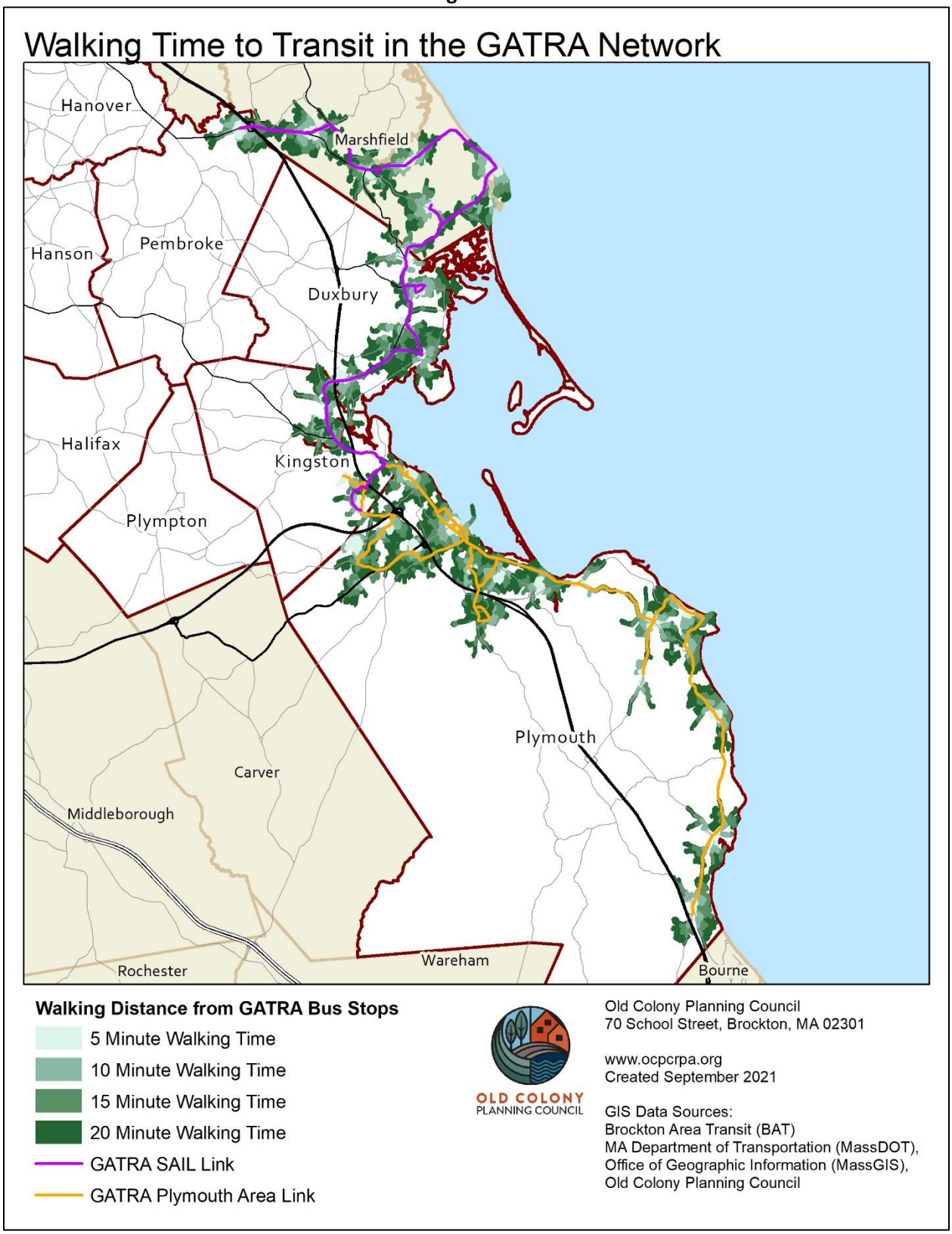

Walking Time to Transit in the BAT Network
Randolph
Braintree
Canton
Weymouth
Holbrook
Avon
Abington
Stoughton
Sharon
bat
Whitman
Brockton
Easton
East
Bridgewater
West
Bridgewater
Walking Distance from BAT Routes
5 Minute Walking Time
10 Minute Walking Time
15 Minute Walking Time
20 Minute Walking Time
BAT Centre
BAT Routes
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created September 2021
GIS Data Sources:
Brockton Area Transit (BAT)
MA Department of Transportation (MassDOT),
Office of Geographic Information (MassGIS),
Old Colony Planning Council

Figure 13


Walking Time to Transit in the GATRA Network
Hanover
Marshfield
Hanson
Pembroke
Duxbury
Halifax
Kingston
Plympton
Plymouth
Carver
Middleborough
Rochester
Wareham
Bourne
Walking Distance from GATRA Bus Stops
5 Minute Walking Time
10 Minute Walking Time
15 Minute Walking Time
20 Minute Walking Time
GATRA SAIL Link
GATRA Plymouth Area Link
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created September 2021
GIS Data Sources:
Brockton Area Transit (BAT)
MA Department of Transportation (MassDOT),
Office of Geographic Information (MassGIS),
Old Colony Planning Council

OCPC Regional Pedestrian and Bicycle Network Objectives

The main objective in the development of the region's pedestrian and bicycle network is to achieve Universal Access for all road users. The implementation of Complete Streets as a strategy is one of the means of achieving Universal Access. Universal Access means to provide complete access to the transportation network for every citizen through various modes of transportation including walking, wheelchair, biking, transit, and motor vehicle. Universal Access enables everyone access to mobility regardless of age, physical ability, or economic class. University Access calls for the accommodation of all users of the road without bias by using engineering guidelines and directives set out by agencies including the Federal Highway Administration, Massachusetts Department of Transportation (MassDOT), and the Old Colony Planning Council, in conformance with laws and policies including the Americans with Disability Act and Title VI, as well as others as applicable. Creating infrastructure with Universal Access in mind where persons with disabilities are accommodated ensures that everyone will benefit.

Throughout each of the OCPC communities, there are some similarities in the needs of the pedestrian network. Many sidewalks and crossings lack ADA accommodations and there is a need for sidewalk connections between residential areas and destinations. A community without safe walking connections limits access for residents choosing non-motorized transportation and does not provide access for those who may have mobile impairments or lack the financial ability to afford a vehicle. Enhancing the pedestrian network helps foster sustainable, healthy, and livable communities ensuring equity for all road users.

Bicyclists traveling long distances between communities can find that bicycle accommodations vary between communities. Most cyclists prefer a bicycle rack for parking or wayfinding signs tailored to cyclists along their journey, but many communities in the OCPC region are not able to provide sufficient service to cyclists in all places. Some amenities that could be provided in the region include bicycle repair stations, bicycle racks, and wayfinding signage, as well as bicycle tracks (off-road bike paths for safer non-motorized travel). Other advanced accommodations could include showers, lockers, and bicycle parking garages as well. The purpose of providing such amenities is to accommodate those who currently travel by bicycle as well as to encourage new cyclists. In addition, provision of such amenities could provide a more comfortable riding experience.

OCPC Community Non-Motorized Network

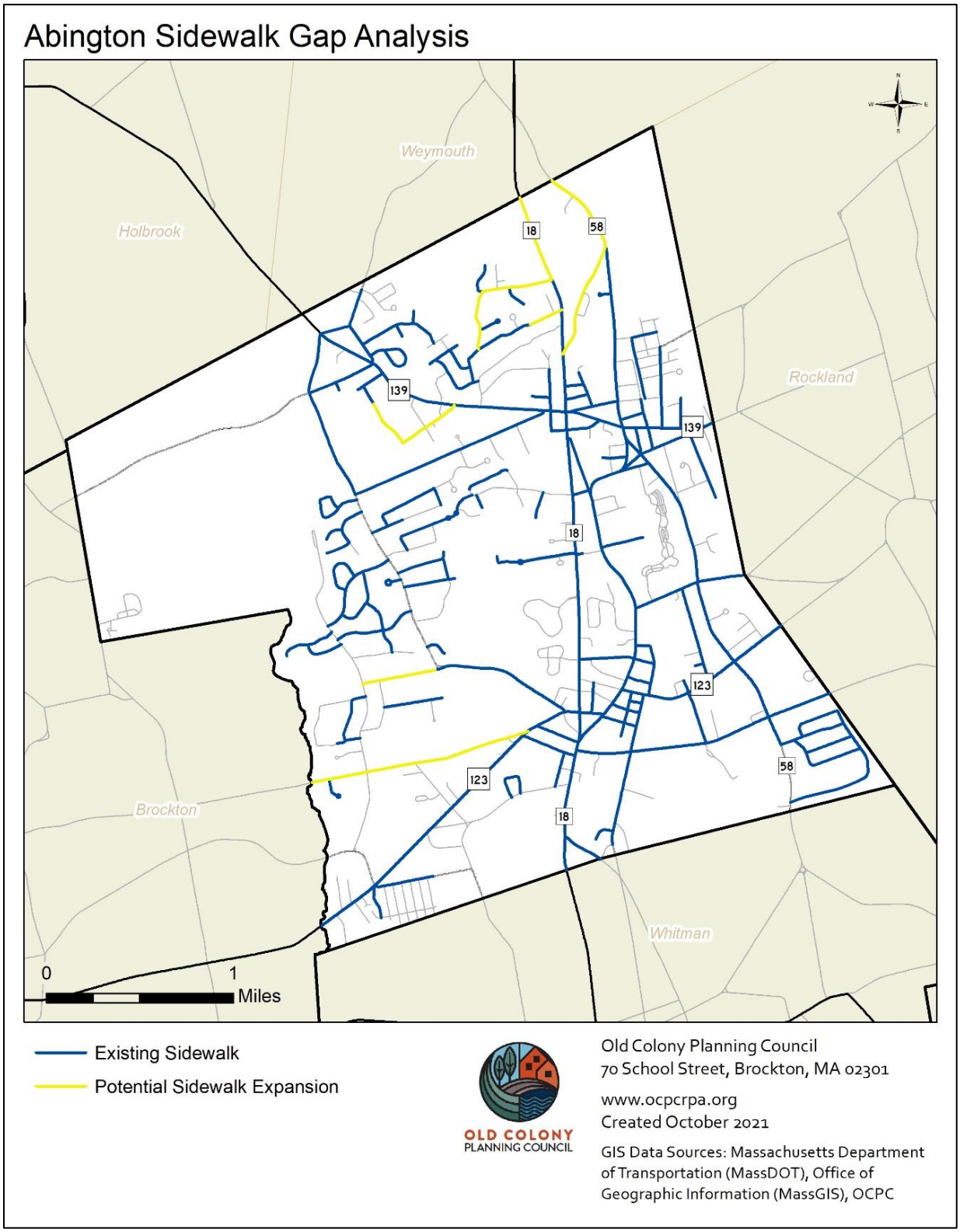
Town of Abington

Existing Conditions

Abington is a suburb of Boston and Brockton with a population of 17,062 people (2020 Census). Abington's residential land use is mostly suburban style single-family detached homes. The town is auto oriented with shopping centers and strip retail locations. Much of Abington's commercial businesses and large employers are located along three major corridors: Route 18, Route 123, and Route 139. Abington does have an historic town center. The town does have an extensive sidewalk network as shown in Figure 16.

The Bicycle network in Abington is currently along the existing roads, mostly shared with motor vehicles or along paved shoulders where provided. Connecting major corridors with neighboring communities and bridging connections within the community is essential to building the bicycle network in the town. It is also important to increase functioning amenities such as repair stations and bicycle racks placed in key areas such as the Arnold Park area, Route 18 Washington Street, and the Lincoln Boulevard area. The creation of bicycle boulevards aids in the accommodation of bicyclists and pedestrians. Bicycle boulevards establish the priority for cyclists and pedestrians while raising awareness of their presence, at the same time limiting vehicle conflict with other multi-modal users.

Figure 16 Abington Sidewalk System



Despite the low-density automobile-oriented development pattern of the town, it has made efforts in providing sidewalks throughout the community, especially along high traffic volume roads. The town continues to expand and enhance the pedestrian network in areas needing pedestrian transportation infrastructure, improving the ability to walk to destinations in Abington in a safe and efficient manner.

Planned Improvements

A number of programmed projects are planned based on the OCPC Transportation Improvement Program (TIP). Other non-motorized projects (pedestrian and bicycle) are included in Abington's Complete Streets Prioritization Plan. This prioritization plan is available on-line at the Massachusetts Complete Streets Funding Portal. The top priority project in Abington's prioritization plan, a shared use path on Lincoln Boulevard, has been approved for funding in the Complete Streets Funding Program.

The Lincoln Boulevard Shared-Use Path project consists of installing an eight-foot wide asphalt shared-use path with granite curbing for approximately 1,600 feet along the northern side of Lincoln Boulevard from the Abington High School eastern entrance to Washington Street. It includes providing ADA curb ramps and crossings as necessary. This project will provide a bicycle and pedestrian route to accommodate school access. The town also has future plans of expanding these bicycle connections to other points of interest such as the Hanover Branch Rail Trail off of Monroe Street, less than a mile north of this project. The proposed shared-use path will improve pedestrian and bicycle access to Abington Track, the town library, Abington High School, and Beaver Brook Elementary School.

Reconstruction and Widening of Route 18

This project, which is currently under construction, consists of the widening of Route 18 in Abington and Weymouth beginning at Route 139 in Abington. The roadway widening will provide an additional travel lane in each direction on Route 18 and includes bridge work as well. The proposed roadway cross section will consist of four 11-and-a-half-foot travel lanes, two five-foot shoulders and two five-and a-half-foot sidewalks. Although this project is mainly a road widening project, it includes consistent sidewalks on both sides of the road as well as shared accommodations for all users in accordance with Complete Streets guidelines.

Pedestrian and Bicycle Improvements on Route 123

This project, which is currently under design, involves the improvement of a section of Route 123 at the Brockton line to the Wal-Mart intersection to accommodate pedestrians and bicycles. There are sidewalks on the south side of Route 123, no sidewalks on the north side of Route 123, and no pedestrian actuation at the signalized Wal-Mart Driveway/Route 123 intersection.

Figure 17 - Although Route 123 has a sidewalk on the south side, there are no crosswalks and no pedestrian signals and actuation at the Wal-Mart/Route 123 intersection in Abington.

Figure 18 - Route 123 in Abington on the north side has no sidewalks but shows a path worn by pedestrians who access the Wal-Mart on Route 123.

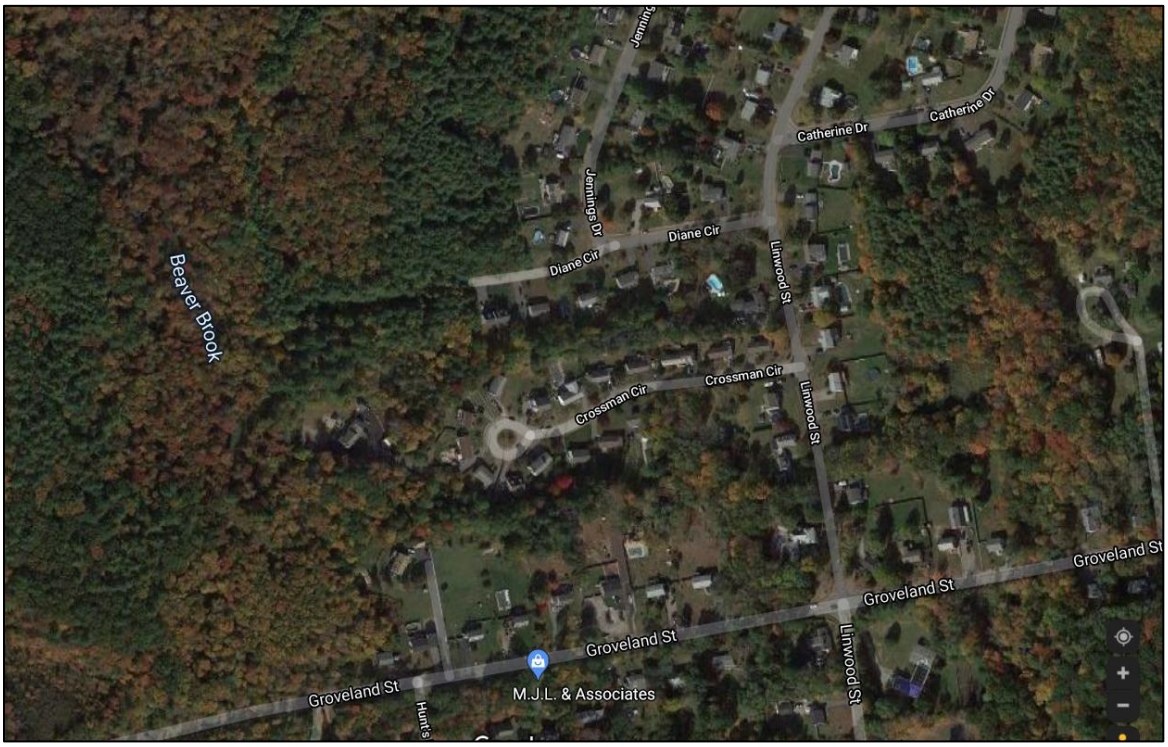
Potential Improvements

Potential improvements to the sidewalk network in Abington were developed based on the latest town master plan as well as through the town's Complete Streets Prioritization Plan. The goals stated in the master plan included the desire to connect sidewalks with abutting communities to provide access to businesses with signage along the road to alert motorists of pedestrians. Improve pedestrian livability and walkability by not only about providing short distances between points of interest but also designing a system that fosters an enjoyable and safe walking experience. The goals included improving the public spaces in the downtown, and along the main corridors, with street trees and other vegetation, including seating, wider sidewalks, and other public amenities where possible.

Specific locations for potential improvements include:

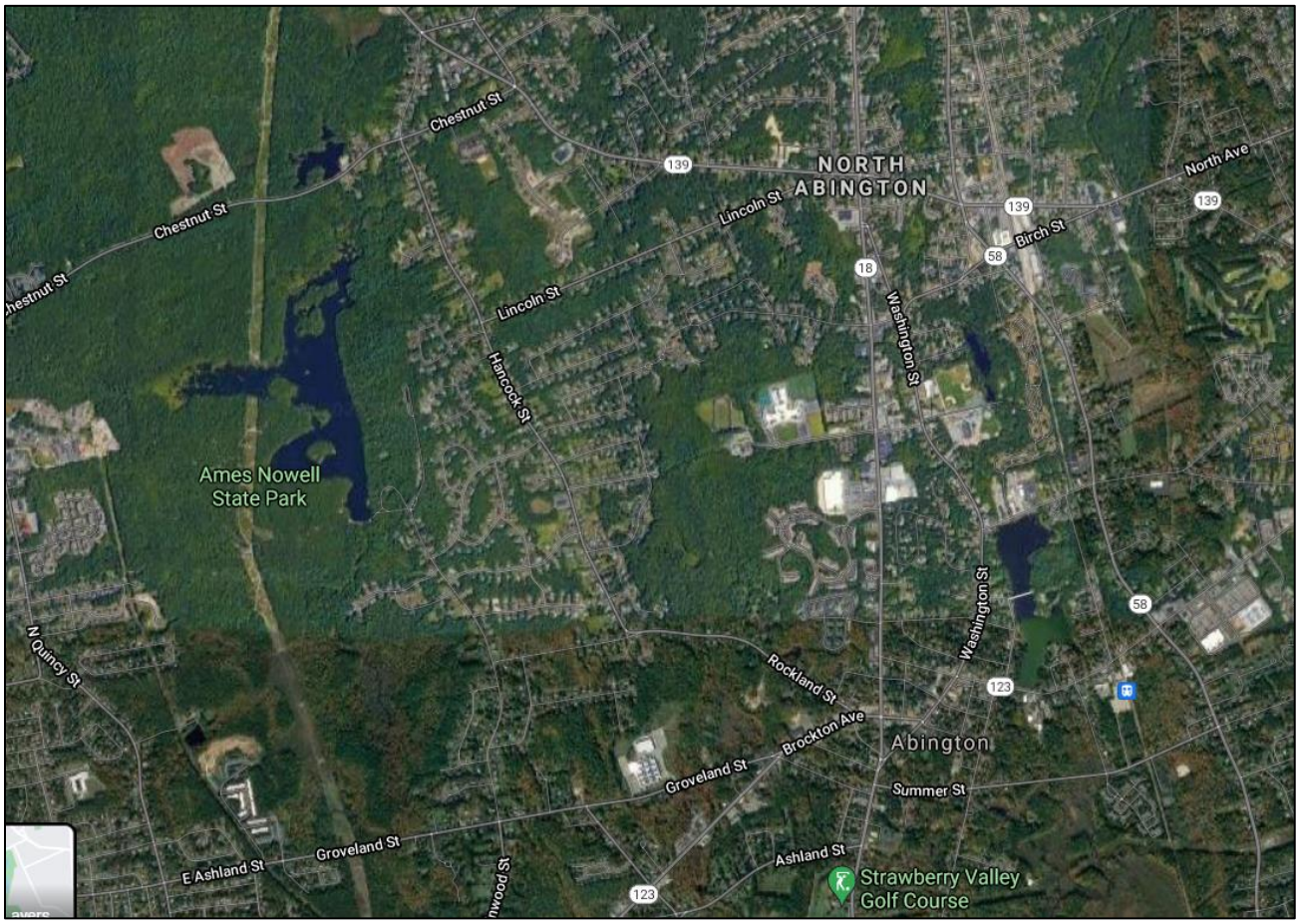
- Expand existing multi-use trails in the Beaver Brook Conservation Area to create access from the Abington side, this would require that Abington assess potential access through town-owned land such as the Linwood St. Conservation Area and/ or Diane Circle.

Figure 19 – Beaver Brook and Diane Circle in Abington



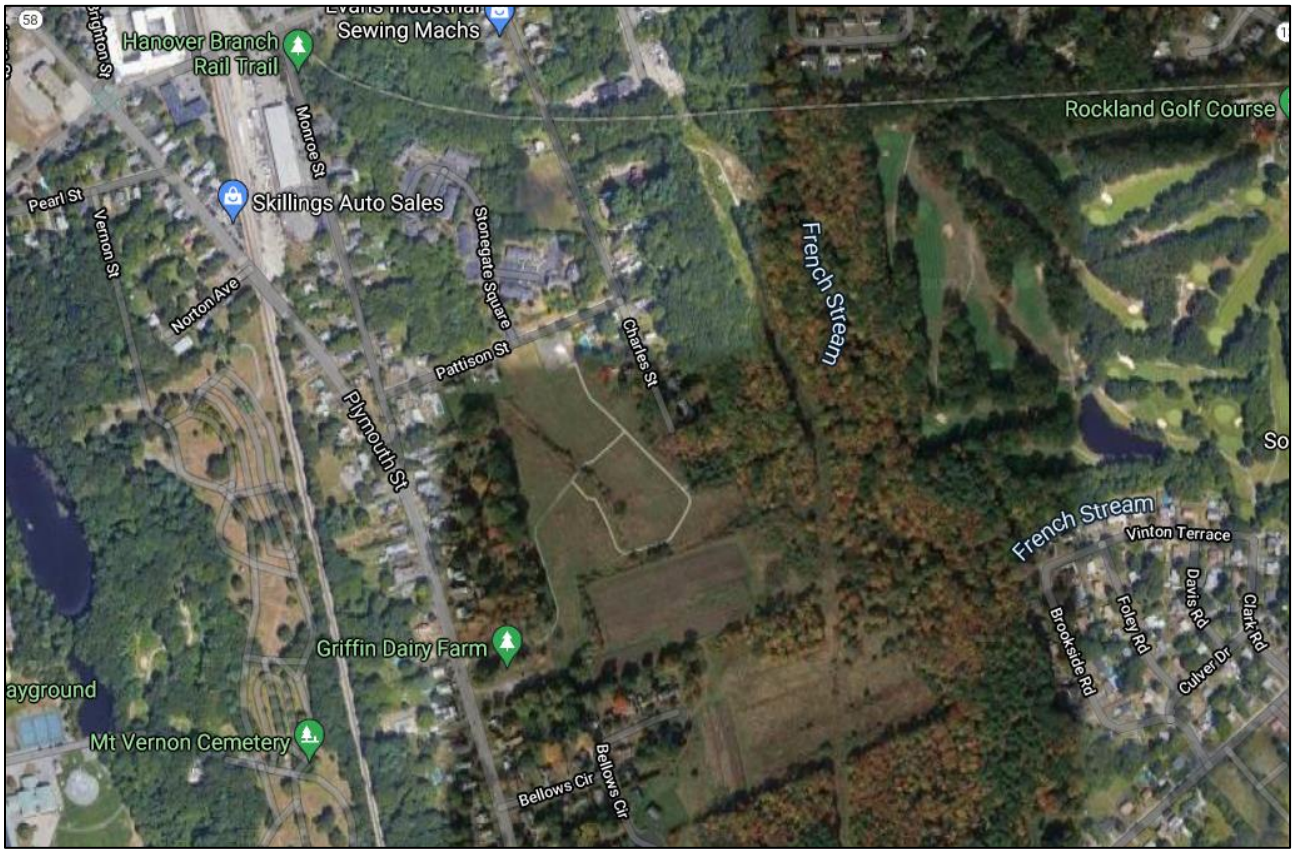
- Work with the Department of Conservation and Recreation to better connect Beaver Brook Conservation and Ames Nowell State Park through creating more trails. Any new trails should have clear signage and the town should further assess options for parking at trail heads.
- Explore the possibility of expanding trails north of Ames Nowell into the unprotected area north of Chestnut Street via trail easements and use of current Town-owned land. Study the potential and environmental impacts of adding trails. Investigate the possibility of adding a crosswalk on Chestnut Street to improve pedestrian safety and access as well as a parking area and trail head.

Figure 20 – Chestnut Street and Ames Nowell State Park



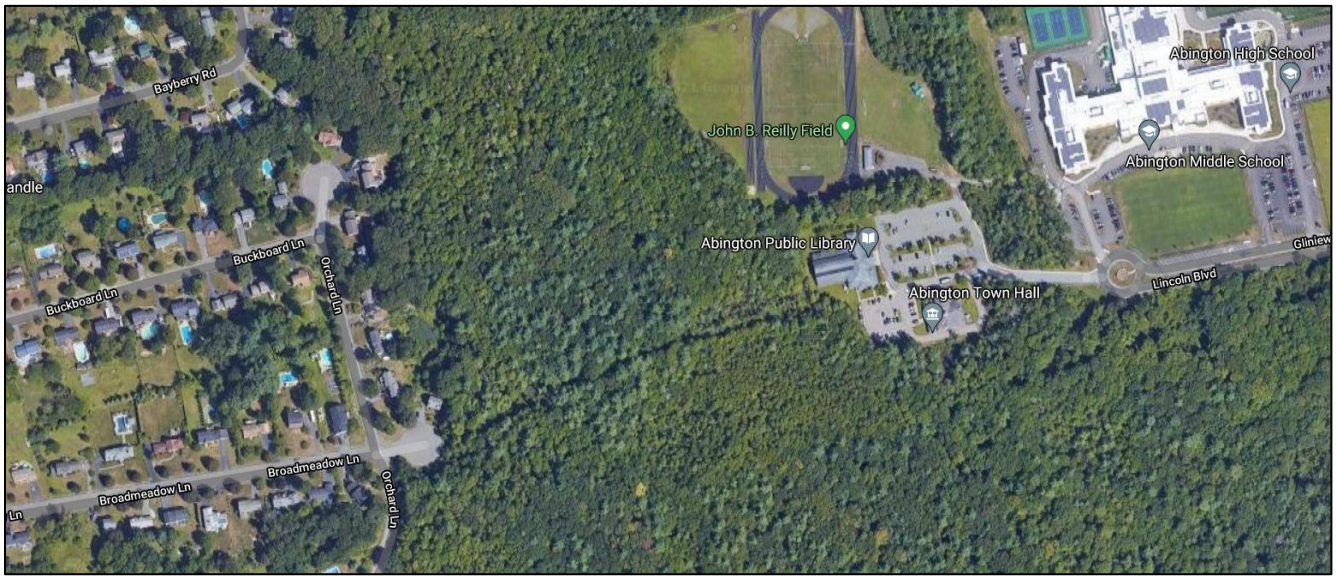
- Create a connection, via Charles Street and the wooded path at the end of it, between Griffin's Dairy Farm and the Hanover Rail Trail. Add signs at the rail trail and Griffin's Dairy to direct people. Discuss with Charles Street residents the possibility of adding a sidewalk and bike lane down Charles Street to accommodate pedestrians and bikers.

Figure 21 – Charles Street and Hanover Rail Trail



- Investigate the possibility of creating a multi-use path between the high school, middle school, and town offices at the end of Lincoln Boulevard/ Gliniewicz Way and the neighborhoods to the west via an existing town-owned sewer easement. Assess the level of safety for those using the path and make sure would be well lit. Consider implementing porous pavement and green low impact development techniques to control runoff from the path to protect wetlands.

Figure 22 – Gliniewicz Way and Town Hall



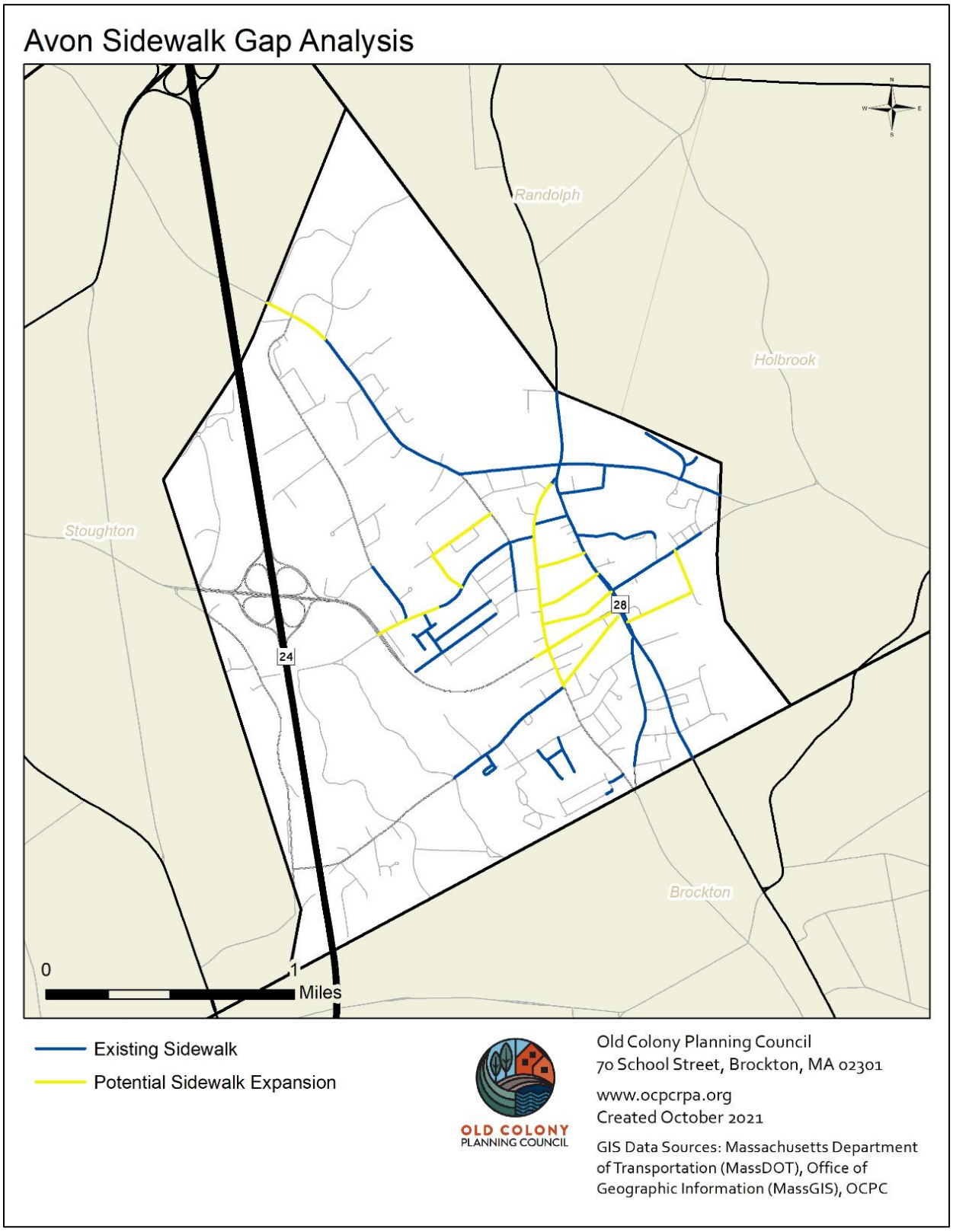
Town of Avon

Existing Conditions

The Town of Avon is bound by the City of Brockton to the south, Town of Holbrook to its east with Route 24 on its west and Randolph on its northern side. Avon has a population of 4,777 (2020 Census) with a median age of 43.9 years. The residential land use is primarily detached single family suburban homes. The Town of Avon has direct connection to Route 24 giving the town access regional automobile network. Along with Avon's access to the regional automobile network, the town is serviced by the Brockton Area Transit Authority (BAT), giving the town access to the region's public transportation network and is also served by the Massachusetts Bay Transportation Authority (MBTA), providing additional public transit service and transportation access to Boston and the communities served by the MBTA. Within the town, Avon has a busy industrial park containing a multitude of businesses and a Merchants Park, which contains large retailers.

The town's previous master plans included a series of goals and recommendations that were built upon each succeeding plan. They list goals and objectives the town would like to achieve in their pedestrian network. In general, the town seeks to increase opportunities for walking by improving existing pedestrian infrastructure as well as establishing integrated pedestrian routes through and between neighborhoods, employment centers, and parks and recreation areas. Figure 23 shows the existing sidewalk system in Avon.

Figure 23 – Avon Sidewalk System



The Town of Avon has an extensive network of sidewalks as shown in Figure 15. The condition of the sidewalks varies throughout the town. Along major corridors like Main Street, some of the sidewalks need repair. In the sections of town with the older sidewalks, there is a lack of ADA accommodations such as sidewalk ramps and a reasonable width for a pedestrian using a wheelchair to pass fixed objects. These accommodations are met on the newer sidewalks in the town.

The Town has worked towards improving bicycle infrastructure by installing bicycle parking at a number of locations utilizing Old Colony's Bicycle Parking Program, which is funded through the Old Colony Transportation Improvement Program (TIP). These bike parking locations include the Avon Public Library, the Police and Fire Station (Route 28), and the bus stop at Saint Michael's (Route 25). There is still potential for bicycle infrastructure improvements in the town, for example, more bicycle lanes in high traffic areas can improve the number of riders and help keep bicyclists off of sidewalks. Interconnections between communities such as Brockton and Randolph can also incentivize mode shift.

Planned Improvements

There are no specific programmed alternative transportation projects (bicycle or pedestrian focused); however, the projects that are programmed have pedestrian and bicycle accommodations included in the design. Currently, there are two TIP projects programmed in Avon:

- Intersection improvements at Harrison Boulevard and Pond Street. This project consists of minor geometric improvements, installing new upgraded traffic signal equipment, and upgrading bicycle and pedestrian infrastructure and accommodations at the intersection. This proejct is currently under construction.
- Intersection improvements at two intersections, Route 28 at Harrison Boulevard and Route 28 at East and West Spring Street. This intersection has been the subject of previous traffic studies and a Road Safety Audit was completed for the Route 28/East and West Spring Street intersection in 2012. Recommended improvements include improve pedestrian accessibility, monitor/enforce travel speed, re-evaluate crosswalk locations, improve signage, evaluate potential changes in lane usage, and consider geometric modifications and changes to traffic control by coordination of the existing signals and the operational benefits of a new signal at Route 28 at East/West Spring Street. This project is currently under design.

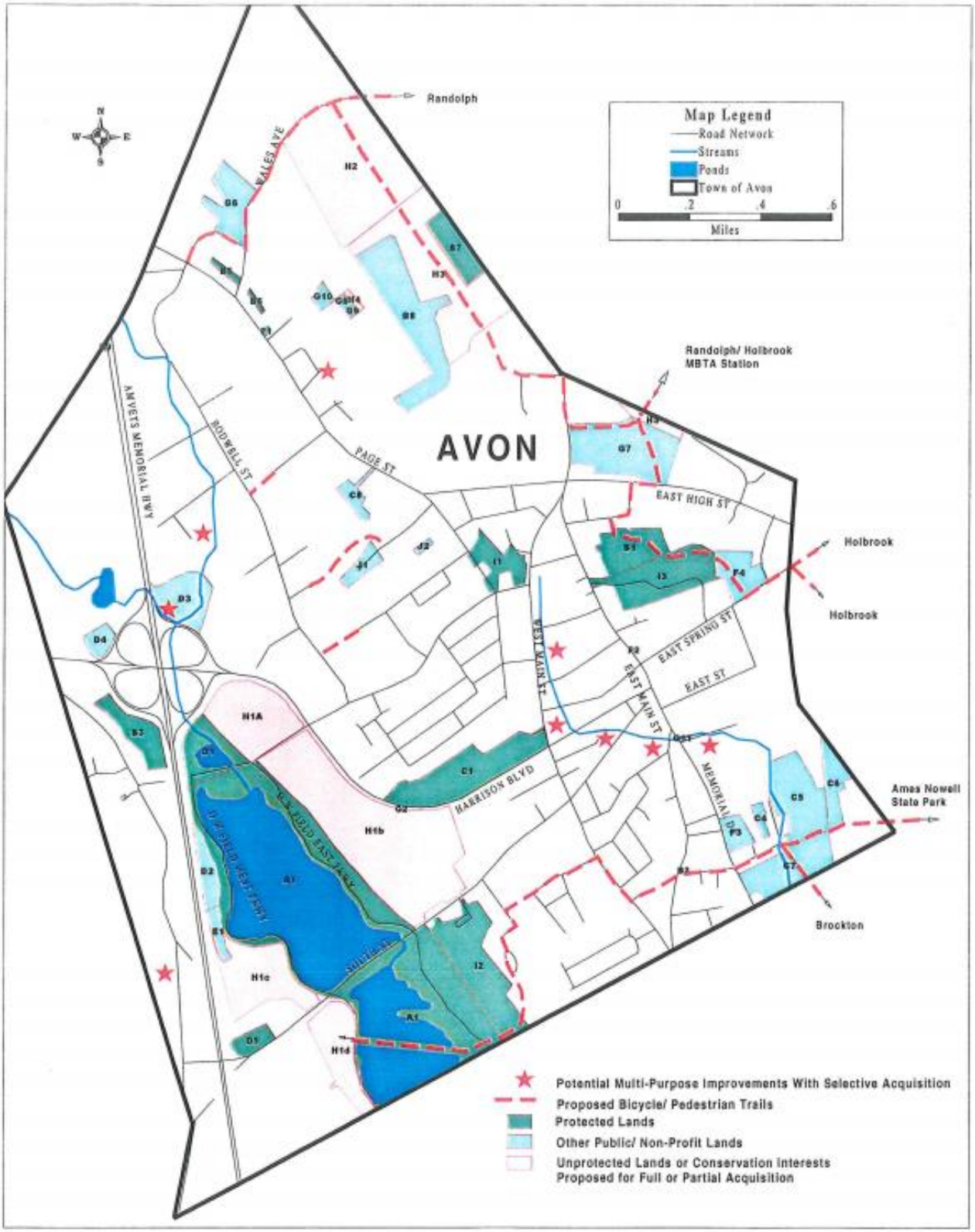
Potential Improvements

Potential pedestrian and walking improvements for Avon are based upon previous Avon master plans as well as previous regionwide pedestrian and bicycle connectivity studies. The *Old Colony Bicycle and Pedestrian Connectivity and Livability Study* of 2018 included general recommendations for the town. This study stated that Avon should continue building for pedestrians and ensuring ADA compliant infrastructure and create a Sidewalk Master Plan and ADA Transition Plan. Figure 24 shows the potential pedestrian and bicycle paths in Avon.

- Connect Nichol's Avenue to Leo's Lane to D.W. Field Park.
- Connect Bow's Lane from West Main Street to East Main Street and continue along Connolly Road across Route 28 to Holbrook and Ames Nowell State Park.
- Extend Freeman Street to connect between Page Street and Bodwell Street.
- Extend Granite Street in the vicinity of Avon Fish and Game to Bodwell Street.

- Create a path from East High Street through Robbins Street to East Spring Street and continue along East Spring Street into Holbrook.
- Create a path between East Main Street (Route 28) and East High Street and continue to Randolph.
- Create a path from East Main Street at the Randolph line running northwest through the Lokitis Conservation area connecting with a path from Wales Avenue and continuing into Randolph.

Figure 24


Map Legend
Road Network
Streams
Ponds
Town of Avon
0 .2 .4 .6
Miles
Randolph
Randolph/ Holbrook MBTA Station
Holbrook
Holbrook
Ames Nowell State Park
Brockton
AVON
AMVETS MEMORIAL HWY
WALES AVE
PAGE ST
EAST HIGH ST
EAST SPRING ST
EAST ST
EAST MAIN ST
MEMORIAL DR
HARRISON BLVD
Potential Multi-Purpose Improvements With Selective Acquisition
Proposed Bicycle/ Pedestrian Trails
Protected Lands
Other Public/ Non-Profit Lands
Unprotected Lands or Conservation Interests Proposed for Full or Partial Acquisition

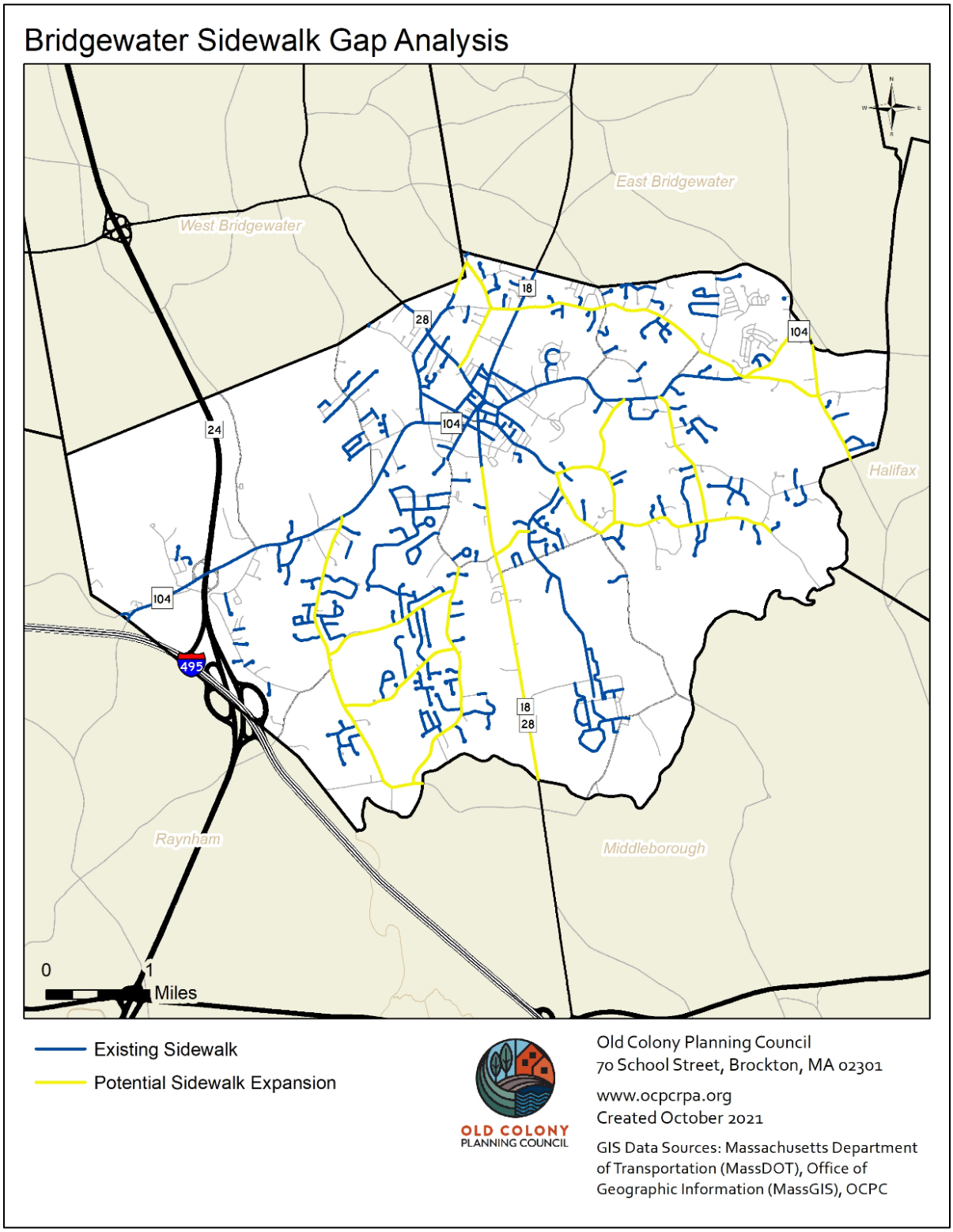
Town of Bridgewater

Existing Conditions

Bridgewater is located approximately 25 miles south of Boston. The town has a number of transportation choices and is accessible by bus, commuter rail, and highway. The junction of Routes 24 and 495 is located in the southwest portion of Bridgewater. Bridgewater has a history of industry and agricultural and has a historic town center with a central common area. Bridgewater's population is 28,633 (2020 Census) and serves as home to Bridgewater State University (BSU). BSU offers a diversity of activities and is located to the southeast of the town center.

Many roads in Bridgewater have sidewalks as well as marked crosswalks for pedestrians; however, the sidewalk network can use improvements in some areas. These include the need for pedestrian countdown signals at some intersections, shortening crosswalks and crossing distances on wide roadways, (which can expose pedestrians to vehicular traffic for extended time), and adding more off-street direct pathways along key desire lines. Figure 25 shows the existing sidewalk system in Bridgewater.

Figure 25


Bridgewater Sidewalk Gap Analysis
East Bridgewater
West Bridgewater
Halifax
Raynham
Middleborough
18
28
104
24
495
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

In its previous master plans, the town expressed the desire to expand opportunities for ways that will connect schools, municipal services, houses of worship, other transportation facilities and open space. A reoccurring issue in the town is to enhance Central Square infrastructure making it more pedestrian and bicycle friendly. In addition, improving non-motorized conditions to and around Central Square will improve non-motorized connections to and from Bridgewater State University.

The Town of Bridgewater currently has an extensive sidewalk network throughout most of the town, especially in and around the Central Square area, which is adjacent to Bridgewater State University. Current sidewalk conditions vary depending on location within the town. In areas on the edges of town, sidewalks are newer and tend to be in better condition than in the older more walkable sections around the Central Square and those corridors leading to the university. The sidewalks in the older sections of town tend to be worn some stretches. In areas where there has been recent sidewalk construction as part of a roadway project, sidewalks have been upgraded to include ADA standard ramps and the concrete or asphalt is in better condition. Some sections of the town's sidewalks lack appropriate ADA accommodations and are too narrow to allow two individuals utilizing wheelchairs to pass safely and comfortably.

Potential Improvements

Pedestrian Improvements

There are a number of potential improvement priorities for sidewalks and pedestrian accommodation in Bridgewater. Bridgewater is participating the Massachusetts Complete Streets Program and has completed its *Complete Streets Funding Program Project Prioritization Plan*. This prioritization plan is available on-line at the Massachusetts Complete Streets Funding Portal. There are 15 projects listed in the priority plan with the top priority focusing on Central Square.

The prioritization plan project for Bridgewater's Central Square includes:

- Converting existing parking to parallel parking within the square.
- Extending existing curb bump outs in the square and adding bump outs at key locations to shorten crossing distances and provide traffic calming.
- Install new traffic controllers to implement Leading Pedestrian Intervals (LPI) to improve pedestrian mobility and limit conflict with turning vehicles at Main St./Broad St./Summer St. intersection.
- Provide bicycle lanes through the square and bicycle treatments through intersections.
- Extending median and paint to better define vehicle paths at southern end of Square (School/ Bedford/South/Church).
- Consider pedestrian signals at crossings in southern end of Square (southern Central Square NB and SB crossings, School Street, Bedford Street, South Street).
- Reconstruct sidewalks; all curb ramps in Central Square will be reconstructed for ADA compliance.

The Bridgewater *Complete Streets Funding Program Project Prioritization Plan* also includes as a second highest priority, improvements to a mid-block crossing on Plymouth Street. This location is between

Hale Street and Burrill Avenue just west of a railroad crossing. The current mid-block crossing across Plymouth Street is used by hundreds of BSU students per day when school is in session as students access the BSU campus from a parking lot located north of Plymouth Street. The improvement project involves moving the mid-block crossing further west of the existing location and installing a raised crosswalk. In addition, the existing pedestrian crossing signs at both approaches to the railroad crossing will be replaced with a flashing LED pedestrian crossing signage. The sign for the eastbound approach will be moved further west to be in front of a utility pole (about 30 feet west of crosswalk). Its current location is redundant with a Rapid Rectangular Flashing Beacon sign and is partially obstructed behind utility pole. To reduce the number of students crossing Plymouth Street at this location, the town will also coordinate with the university to shift more BSU parking from the lot north of Plymouth Street to the commuter rail lot and the parking garage on campus.

Another area of concern in Bridgewater, which was recommended at a Road Safety Audit (RSA) facilitated by OCPC September 15, 2021, includes the area surrounding the Plymouth Street/Pond Street (Route 104)/High Street intersection. One of the concerns discussed at the RSA was the lack of pedestrian and bicycle accommodations at the intersection. Currently, this intersection has a short stretch of sidewalk only on the south side of Plymouth Street extension (Route 104) from High Street west to the entrance to a sand and gravel operation. This stretch of Plymouth Street extension is consistently used as a pick-up and drop-off point for school bus routes. Figure 26 shows the intersection and the available right-of-way for installing sidewalks on Plymouth Street, Plymouth Street Extension, Pond Street, and High Street.

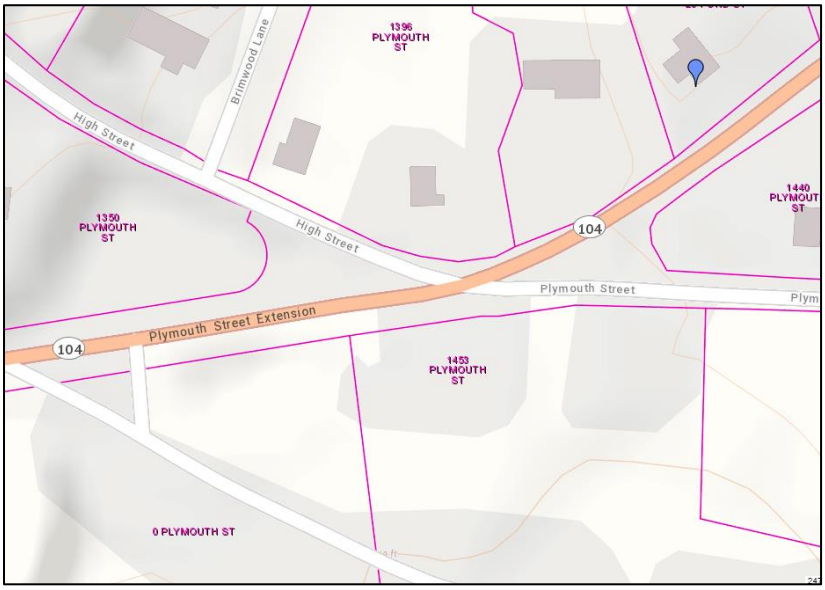


Figure 26 Right of Way at Plymouth Street/High Street/Pond Street intersection in Bridgewater

Bridgewater's Master Plan cites a number of potential pedestrian improvements that can be implemented in the short-term and long-term, including:

- Stripe crosswalks with Continental, Zebra, or Ladder-style to enhance pedestrian visibility, (use patterned crosswalks that are ADA-compliant).
- Add curb extensions at key crosswalks and intersections at high volume areas.
- Raised pedestrian plaza and bulb-outs around Central Square.

- New pedestrian path from Central Square through to BSU connecting Between Plymouth Street School Street and Central Square.
- Improving pedestrian functions at signalized intersections utilizing countdown signals thereby enhancing safety and reducing delay by indicating the safest time in the overall signal cycle to cross the roadway.
- The town should consider adding a leading pedestrian interval at concurrent intersections with heavy turning movements.
- The town should consider modifying cycle lengths and retiming signals to reduce pedestrian wait times at locations with reduced pedestrian crossings and using exclusive pedestrian signals at heavy pedestrian areas.
- There are numerous pedestrian connections that could be made safer and easier to cross through improved or new crosswalks and curb extensions including the crosswalks at the southern end of Central Square. These could be realigned to create a more direct route between the Central Square Green and the sidewalk on the other side of the street.
- The northern end of Central Square also has several diagonal crosswalks that could be straightened and shortened, potentially in conjunction with an intersection redesign.
- The link through the municipal parking lot to Bridgewater State College should be designated and promoted as a pathway. The path could be delineated with simple paint or other materials.
- The Town should pursue a pedestrian link to the Nunckatessett Greenway via the Town lot on Spring Street.

<u>Bicycle Improvements</u>

Bicycle facilities are similar to roads in that they have a more regional scope than pedestrian facilities, as bicycle trips are usually longer than walking trips. Connectivity of existing bicke lanes and facilities should be taken into account when planning bicycle lanes on one block of a street. The overall master plan bicycle recommendations for Bridgewater include:

- A comprehensive approach to bicycle planning creates a useful network connecting key destinations in Bridgewater.
- Plan for a for parallel infrastructure, if the town adds a bicycle link to one side of Central Square, the other side should also have a bicycle facility.
- Although some people cycle for recreational reasons, creating a network that connects to places encourages and facilitate access for a full range of users.
- Designating safe routes for cycling to building connected bicycle facilities.
- Add visible short-term bicycle parking such as visible bike racks, located near the front doors of buildings.
- The town should work with BSU in developing a comprehensive bicycle plan to include elements such as Sharrow markings, bicycle boxes at signalized intersections, and five-foot bicycle lanes on shoulders.
- In March of 2014, OCPC completed the *Central Square Parking Bicycle Pedestrian and Traffic Operations Improvement Plan.* This plan includes bicycle improvements in and around Central Square. The town should build on this plan to pursue a town-wide bicycle plan.

Approved Complete Streets Funding Program Projects

Three of Bridgewater's projects in its Complete Streets Funding Program Prioritization Plan have been approved for funding in the program. These include:

1. Broad Street Crossing Improvements (ranked 5 on the prioritization plan) - Relocate the crosswalk on Broad Street located 160 feet north of Main Street further north by 25 feet to avoid driveway and add curb bump outs; remove southern curb cut at 59 Broad Street lot, repaint crosswalk 515' north of Main Street to be perpendicular to Broad Street and add curb bump outs; repaint crosswalk 390' south of Spring Street and add curb bump outs; resurface roadway and reconstruct all curb ramps for ADA compliance as needed.
2. Main Street Buffered Bicycle Lanes (ranked 12 on the prioritization plan) - Add bicycle lanes on Main Street with painted buffer zone from High Street/Central Street to Central Square (4,400 feet). Transition to sharrows at Central Sq. if needed.
3. Main Street Crossing Improvements (ranked 13 on the prioritization plan) - Add crosswalks across Main Street at the north side of Union Street and at Kingswood Park Village; construct curb ramps. Install Rapid Rectangular Flashing Beacon on Main Street at Union Street and Heritage Circle (school bus stop and housing authority). Additional lighting is needed throughout corridor. Consider additional treatments to crossing visibility at Kingswood Park Village and Pearl Street.

City of Brockton

Existing Conditions

The City of Brockton is the largest community in the OCPC region with a population of 105,643 (2020 Census). Brockton has a substantial minority and immigrant population and is located 25 miles south of the City of Boston. Brockton is commuter oriented to Boston, but also attracts commuters from surrounding suburban communities as it contains some of the largest employers in the Old Colony Region. Brockton is mostly built out and its residential land-use patterns consist of multi-family as well as suburban style single-family home patterns in some sections.

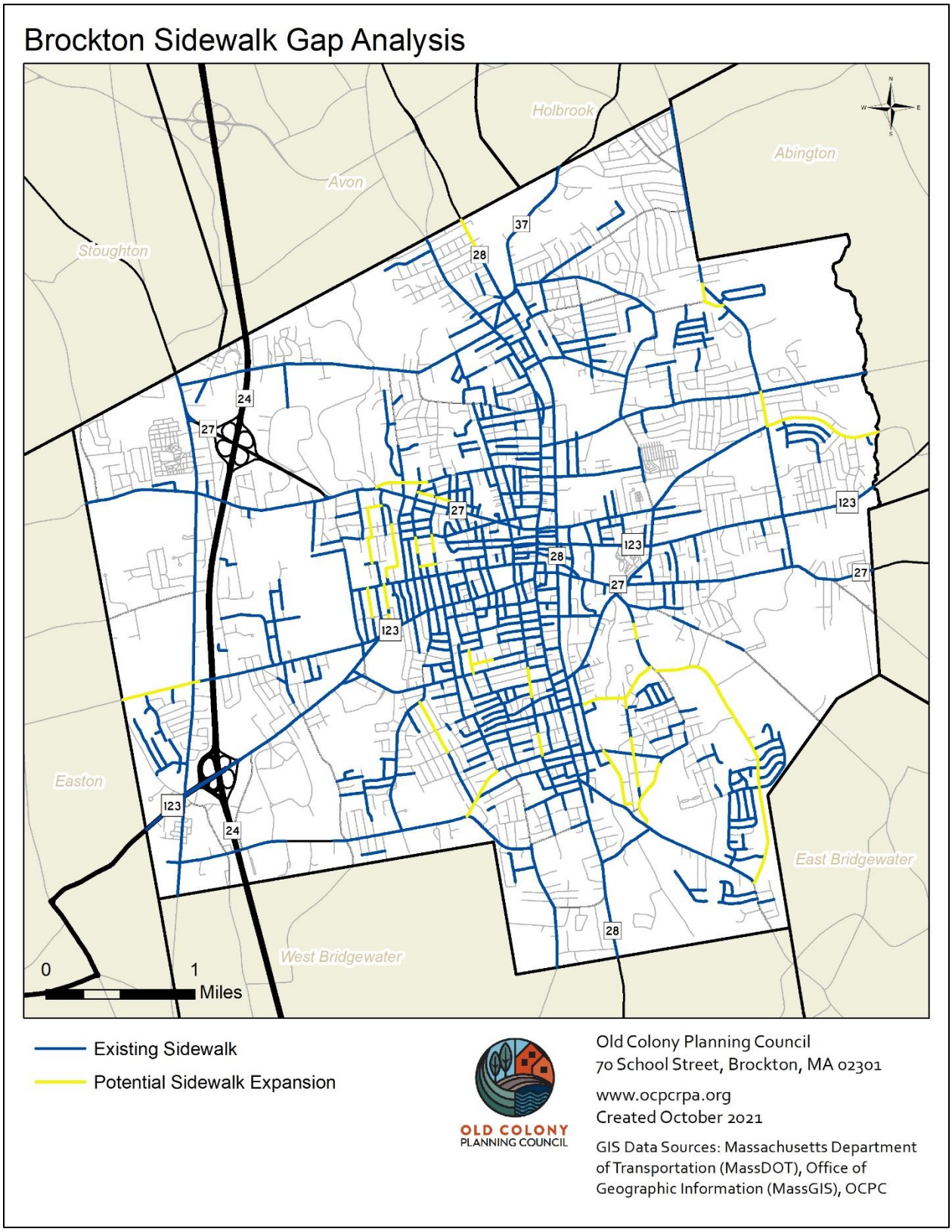
Brockton is a historic industrial city built up long before the automobile became the dominate mode of transportation. It has a high degree of walkability due to its extensive sidewalk network and street-car history. Brockton has many transportation options available to its residents. The Brockton Area Transit Authority (BAT), with its offices and Intermodal Centre located in Downtown Brockton, operates mostly within the city; however, BAT also services surrounding communities including Stoughton, Bridgewater and BSU, and the Ashmont MBTA station in Dorchester for connections to the MBTA and other Boston destinations. Brockton is also services by two MBTA bus lines and three MBTA commuter rail stations (Montello, Downtown Brockton, and Campello). In addition to the public transportation options, Brockton is also serviced by two Route 24 ramp interchanges giving the city access to the regional transportation network. In addition to Route 24, Brockton is serviced by a number of state routes through the city including Route 27, Route 28, Route 37, and Route 123 for access to the Greater Brockton Area and surrounding communities.

Brockton has a comprehensive sidewalk network, which is a legacy of its industrial past before the automobile became the dominate mode of transportation and people walked and traveled by others means of transportation. This legacy, which gave Brockton an extensive sidewalk network and patterns of development conducive to walking also resulted in an aging sidewalk infrastructure. As a result of the age of sidewalks, most are not ADA complaint and the surfaces of the sidewalks in some areas are uneven, posing safety issues for those who walk and those who depend on mobility devices. As the outermost single-family oriented sections of the city were developed after the automobile became dominant, they are the areas of the city that are most lacking in sidewalks.

It has been the goal of the City of Brockton through the planning and master planning process to incentivize pedestrian activity in the city to ease traffic congestion, encourage economic activity, improve the health of residents through physical activity, and improve the overall, safety, aesthetic, and quality of life. In addition to greater economic activity and improving the quality of life, the city seeks to utilize better pedestrian infrastructure to support more MBTA Commuter Rail Stations and BAT bus activity as studies show that safety and access improvements to walking infrastructure in proximity to transit connections improves mass transit ridership.

Figure 27 shows the current pedestrian network in Brockton.

Figure 27


Brockton Sidewalk Gap Analysis
Holbrook
Abington
Avon
Stoughton
Easton
West Bridgewater
East Bridgewater
37
28
24
27
123
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Brockton has made progress over the last several years in providing dedicated bicycle lanes especially in the Downtown and on roads to and from the Downtown. Dedicated bicycle lanes have been implemented on Main Street from Crescent Street to Court Street, on Centre Street from Montello Street to Main Street, on West Elm Street from Warren Avenue to West Street, and on Forest Avenue from Main Street to West Street.

Figure 28 Bicycle lanes on Centre Street in Downtown Brockton.

Some of Brockton's high traffic corridors such as Pleasant Street, Centre Street, Warren Avenue, and Crescent Street have a low level of comfort for bicycle riders. Brockton needs improved rider comfort and safety on its road network providing wayfinding and amenities such as bike racks and repair stations in key locations including the Brockton Area Transit Intermodal Center, for example.

Brockton's Master Plan includes goals to implement Complete Streets by developing pedestrian and bicycle transportation plans, a sidewalk management plan, increasing sidewalk repair and construction, and implementing a Safe Routes to Schools program. In addition, it includes the goal to expand the range and locations for active and passive recreation such as increasing off-road pedestrian and bike trails.

The *Campello Visioning Report* developed by the City of Brockton in 2018, stated that bicycle and pedestrian accommodations in the Campello neighborhood are limited and in need of significant improvement. According to the report, there is little bicycle transportation infrastructure in the Campello neighborhood and design and investment in bicycle infrastructure is required. There are no designated bicycle lanes within the Campello area and improvements in bicycle infrastructure could improve access between the business and residential areas, particularly areas where residential and commercial areas are located within close proximity.

Planned Improvements

Bicycle and Pedestrian Improvements

Brockton has recently completed its project prioritization plan for MassDOT's Complete Streets Funding program with 30 projects included in the plan. This prioritization plan is available on-line at the Massachusetts Complete Streets Funding Portal. The top three projects include:

- At the Crescent Street/Lyman Street intersection, install crosswalks at the eastbound Crescent Street approach and at the northbound Lyman Street approach including the installation of pedestrian signals, signage, and ADA-compliant curb ramps as well as restriping existing

crosswalks to a more visible pavement marking. This project involves adding new pedestrian treatments to an existing signal.

- Provide pedestrian signals and upgrade curb ramps to current ADA compliance at the Warren Avenue/Legion Parkway intersection. This project involves adding new pedestrian signals, crosswalks, and ADA ramps and accommodations at an existing signalized intersection that currently lacks any pedestrian accommodations.
- At the Belmont Street (Route 123)/West Street intersection, install crosswalks at the eastbound and westbound Belmont Street approaches. Add pedestrian signals, signage, and ADA-compliant curb ramps at the Belmont Street/West Street intersection. Install a bus turnout area on Belmont Street just east of the High School entrance (Angus Beaton Drive). These improvements are currently part of a TIP project under construction.

Current Brockton TIP projects that include pedestrian and bicycle improvements along with roadway improvements for vehicles include:

- Route 123 Belmont Street Corridor Improvements from Angus Beaton to West Street - the project includes resurfacing and box cut widening along Route 123 to provide a consistent roadway cross section, bicycle accommodation, shoulders, and ADA accessible sidewalks. Traffic signals will be reconstructed to provide ADA accessible elements. Install crosswalks at the eastbound and westbound Belmont Street approaches. At the Belmont Street/West Street intersection, add pedestrian signals, signage, and ADA-compliant curb ramps. Install a bus turnout area on Belmont Street eastbound side just west of the West Street intersection. The pedestrian portions of this project are also included in the Brockton Complete Streets Prioritization Plan. Construction has already commenced on this project.

Figure 29 Belmont Street (Route 123) at West Street.

- Intersection Improvements at Crescent Street (Route 27)/Quincy Street/Massasoit Boulevard - This project consists of traffic signal upgrades and geometric improvements as well as new sidewalk extensions and bike lanes proposed to improve access at the intersection and along Massasoit Boulevard. This project is under design.
- Intersection improvements at Centre Street and Plymouth Street, the project is under design.
- Intersection Improvements and Related Work at Centre Street (Route 123), Cary Street and Lyman Street. This project is under design.
- Intersection Improvements at Lyman Street/Grove Street/Summer Street & Replacement of Grove Street Bridge, B-25-005, Over Salisbury Plain River. This project is under design.

- Add pedestrian improvements, sidewalks (north side of Route 123) and crossings (including pedestrian actuation), on Route 123 in Brockton and Abington, from the Brockton line to the Wal-Mart signalized intersection.

The Downtown Brockton Traffic Study was completed by a consultant for the City of Brockton in 2020. The study specifically addressed the potential analysis and design for converting the current one-way system in Brockton Downtown to a two-way system. In addition to addressing vehicular circulation and levels-of-service, the study also addressed the potential for improving pedestrian and bicycle infrastructure in the downtown. Although the downtown has a widespread sidewalk network, it does not have extensive bicycle infrastructure and with the exception of Centre Street, West Elm Street, and Main Street, Brockton Downtown lacks bicycle lanes. The design concepts for the two-way conversion, includes extending bicycle facilities in the downtown with separate protected or marked bicycle lanes depending upon the available right of way. The design concept alternatives included expanding the bicycle lane network to both sides of the road or at least on one side of the road on Legion Parkway, Crescent Street, Commercial Street, and Main Street.

Potential Improvements

Even though Brockton enjoys a large sidewalk network, there are areas of opportunity where the city can achieve greater walkability. In the outermost suburban portions of the city, sidewalks on residential street are rare. The lack of sidewalks on residential streets puts pedestrian in the roadway, forcing them to negotiate moving automobiles which poses a safety risk to pedestrians.

Individuals dependent on wheelchairs for their mobility commonly operate their chairs in city streets due to current sidewalk conditions. Sidewalks that have not been recently built or rebuilt need to be updated to meet the ADA standards. City sidewalks lack ADA compliant ramps along a number of sidewalks throughout the city or have uneven surfaces that pose a hazard and or have obstructions, which wheelchairs cannot reasonably pass in a safe manner or at all. The city needs to tackle these issues of ADA compliance in order to foster greater pedestrian access and infrastructure for all users.

Pedestrian amenities are lacking within the City of Brockton or need more attention in order to facilitate greater pedestrian activity. Pedestrian crosswalks need to be brought up to current best practices and pedestrian crosswalk signals should give pedestrian priority over motor vehicle traffic to ensure greater safety and less conflict between motorists and pedestrians.

The bicycle level of comfort in Brockton depicts a need of support for the bicycle network. Utilizing Strava's Heat map (a map that depicts the most often traveled routes for cyclists and joggers who are tracking miles/routes) shows that there has been a decrease in use of high traffic corridors between 2014 and 2015. These corridors include Pleasant Street, Warren Avenue, and Crescent Street to name a few. Brockton needs a strengthened bicycle network that provides wayfinding and amenities such as bike racks and repair stations in key locations such as the Brockton Area Transit Intermodal Center for example.

Town of Duxbury

Existing Conditions

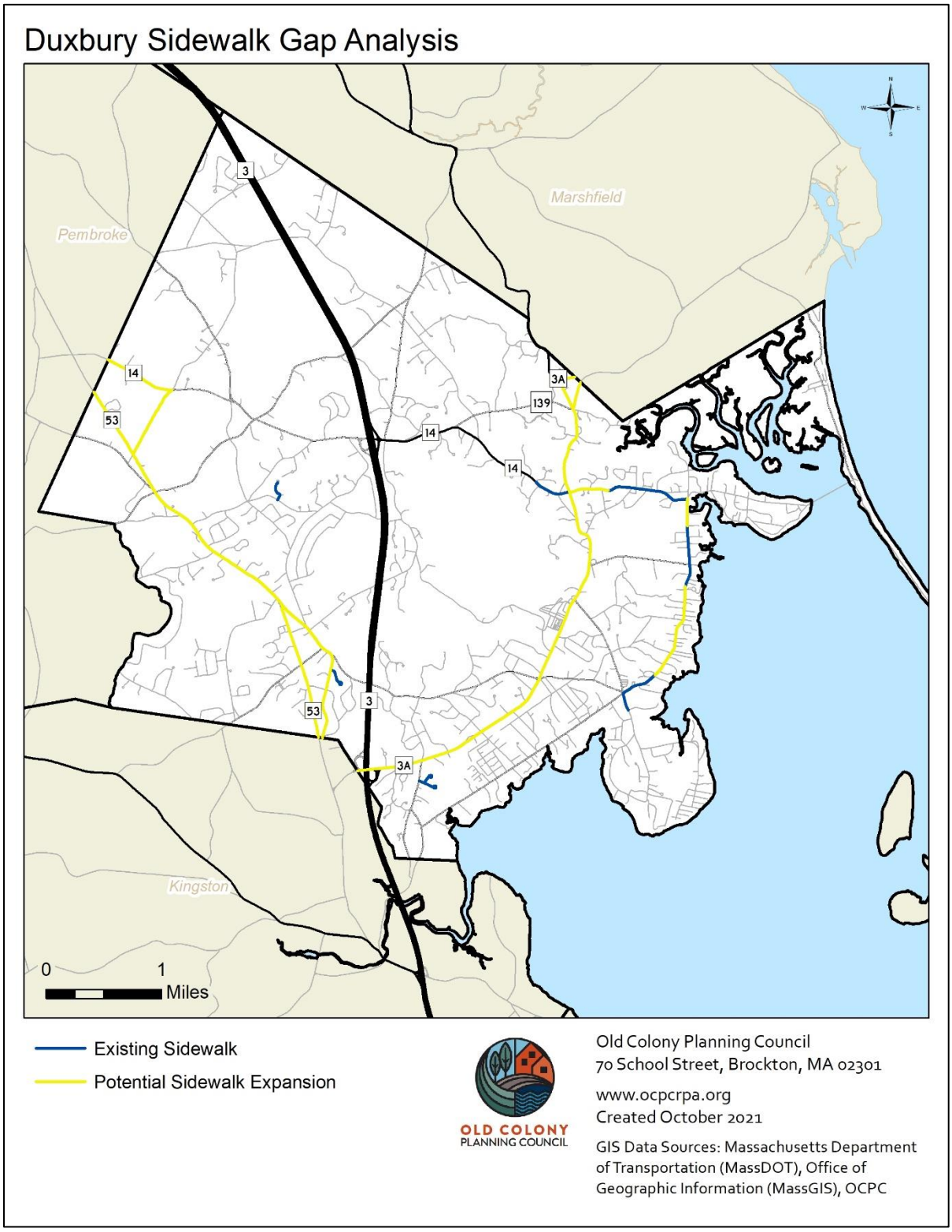
Duxbury is one of the oldest towns in Massachusetts. It is located 35 miles south of the City of Boston and sits along Cape Cod and Duxbury Bays. Duxbury is a low-density coastal community. It's median household income is higher than the Massachusetts average, and it has a population of 16,090 (US Census). The major mode of transportation in the town is by private automobile. Route 3 in Duxbury provides access to the inter-regional highway network. State numbered routes in Duxbury providing regional access include Route 3A, Route 14, Route 53, and Route 139. The Town of Duxbury is served by the Greater Attleboro Taunton Regional Transit Authority (GATRA) Marshfield/Duxbury/Kingston bus route, which provides the town access to the region's public transit system.

The Town of Duxbury has a bicycle network that uses available paved shoulders or shared use roads. Sidewalks in Duxbury are mostly in the town center and are limited on arterials and collectors, which requires motorists to share the road with bicyclists and walkers. Although the Bay Circuit Trail cuts through Duxbury, the Town has no official bicycle network in place for cyclists. Most of the trail is on arterial roads where bicyclists share the road with vehicles, which is limited to mostly advanced experienced bicyclists.

A review of the goals in past community plans and open space and recreation documents calls for a more comprehensive pedestrian network in the town. The goals include the development of a network of multiuse paths to connect the town to areas of open space via existing walking paths. In addition to making connections to existing pedestrian paths and creating new ones that will provide Duxbury residents greater access to open space and recreational areas, another goal laid out in these planning documents is to create multiuse paths and link them to commercial areas and municipal services. By linking the commercial areas of the town via these multiuse paths, the town will seek to meet its goal of providing pedestrians a dedicated space to travel by foot safely and bring residents to commercial areas for greater economic activity.

The current pedestrian network in the Town of Duxbury has coverage limitations. There are sidewalks along some sections of roads in town, and not in others. Most sidewalks in Duxbury are located in Halls Corner and along roads like Washington Street. Even on corridors were there are sidewalks, they often are not contiguous , presenting an inconsistent walking environment. The Duxbury Sidewalk Gap Analysis can be seen in Figure 30.

Figure 30


Duxbury Sidewalk Gap Analysis
Pembroke
Marshfield
Kingston
3
14
53
3A
139
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Planned Improvements

There are no specific programmed alternative transportation projects (bicycle or pedestrian focused); however, in January 2021, Duxbury instituted a Complete Streets Policy. The implementation of this policy includes:

- The Town of Duxbury will approach every transportation project and program as an opportunity to improve streets and the transportation network for all users.
- Maintaining an inventory of pedestrian and bicycle facility infrastructure that will highlight projects that eliminate gaps in the sidewalk and bikeway network.

Potential Improvements

It is recommended that Duxbury expand its pedestrian network by creating sidewalks when building and repairing roadways. When traveling through the Town of Duxbury one may notice the "goat trails" along arterial roads, this is a tell-tale sign that pedestrians are present and in need of accommodation. There is also a strong need for ADA accommodations such as improved crosswalks and pedestrian signals; ADA tactile ramp should be placed at intersections and crosswalks.

More work needs to be done on the Bay Circuit Trail in Duxbury; the town should also build upon the established route and create connections into the town. Wayfinding signs will help direct cyclists to key destinations and attract tourists as well.

There are many narrow streets in Duxbury resulting in restrictions that could be remedied by installing shared lane markings, improved wayfinding, and better lighting. Cyclists will not feel comfortable if there is an increased sense of vulnerability while cycling through a certain route. A map of the Bay Circuit Trail is provided in the appendix to this report.

Town of East Bridgewater

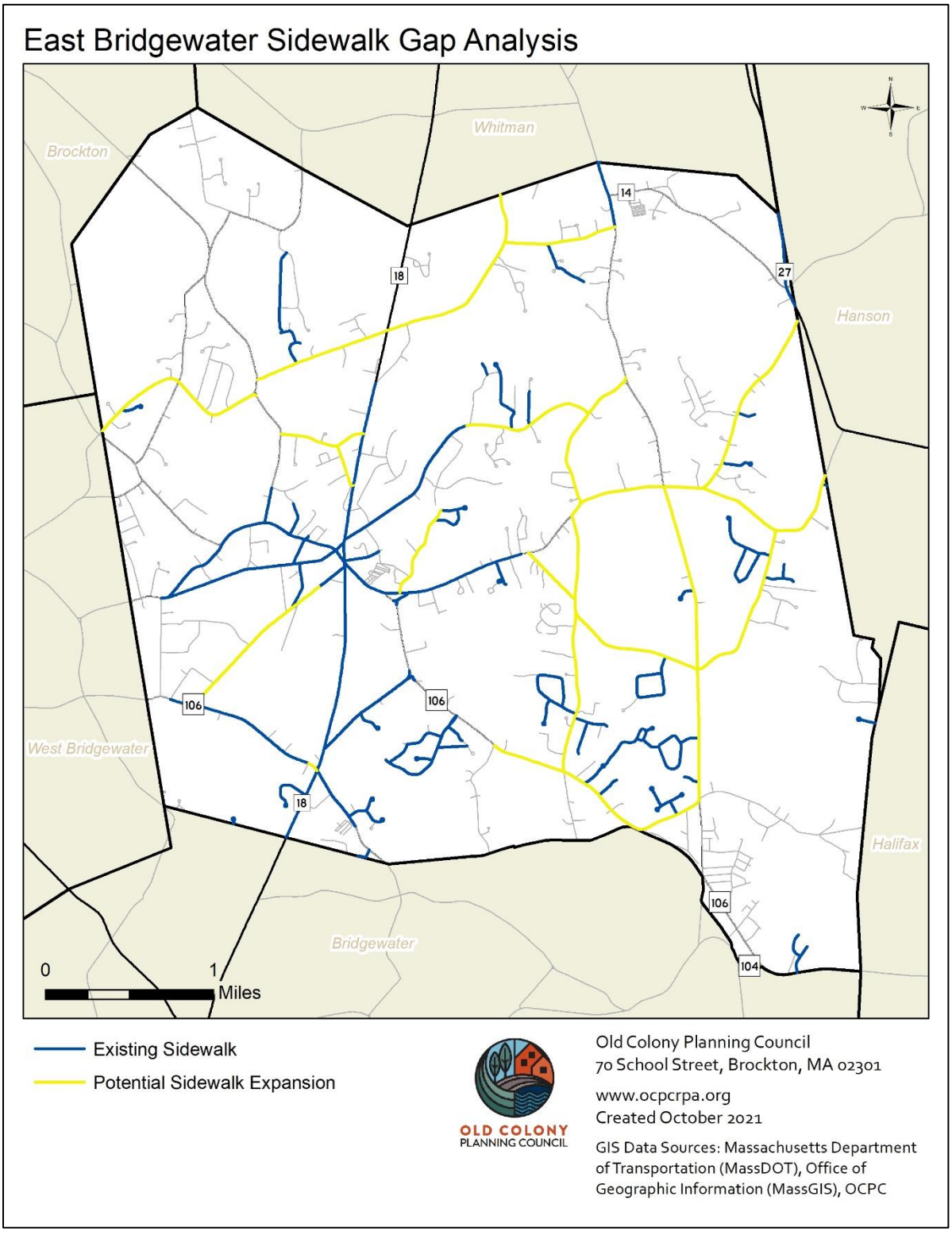
Existing Conditions

East Bridgewater is located southeast of the City of Brockton. The major state routes traversing the town are Route 18 and Route 106. East Bridgewater has a population of 14,440 according to the 2020 U.S. Census and a median household income of $88,534 per year.

There is no fixed route public transportation service in the town (bus), but East Bridgewater seniors are able to ride the Brockton Area Transit Authority's DIAL-A-BAT service, a demand response public transportation service for those 65 years and older. The primary mode of transportation for East Bridgewater residents is mostly by private automobile.

The Town of East Bridgewater does have sidewalks available with most sections of sidewalk located in and around the town center, and also along Route 18. The available sidewalks have shown a need for maintenance and upgrades to meet ADA compliance. The East Bridgewater Sidewalk Gap Analysis can be found in Figure 31.

Figure 31


East Bridgewater Sidewalk Gap Analysis
Brockton
Whitman
Hanson
West Bridgewater
Bridgewater
Halifax
14
18
27
106
106
18
106
104
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Planned Improvements

It is recommended that safety focus should be on the center of town where there are popular destinations such as restaurants on Central Street or the United States Post Office on West Union Street and where vehicular congestion poses a greater risk to pedestrians. There is currently one project under construction in East Bridgewater focused on bicycle and pedestrian improvements. That project consists of Resurfacing and Sidewalk Construction on Bedford Street (Route 18), from Whitman Street (Route 106) to Central Street. East Bridgewater has completed its Complete Streets Funding Program Project Prioritization Plan, which was submitted to MassDOT for approval. The plan can be found on-line at the Massachusetts Complete Streets Funding Program portal. There are 41 priority projects in East Bridgewater's plan.

Two of the projects in East Bridgewater's prioritization plan have been approved for funding. These include Sidewalk Construction on Plymouth Street Between Morse Avenue and 226 Plymouth Street (Phase 1), and Speed Feedback Signage on Plymouth Street.

1. Sidewalk Construction on Plymouth Street includes constructing a five-foot wide ADA compliant sidewalk on the east side of the street between Morse Avenue and 226 Plymouth Street, a stretch where sidewalk is currently only on the west side and where there are no crossings. The first phase of this project will be from Morse Avenue to 136 Plymouth Street. A new crosswalk across Plymouth Avenue is proposed at the school entrance to connect the proposed sidewalk to the existing network, with accessible curb ramps and an RRFB for increase safety. This project will also add new bike racks at the East Bridgewater Senior Center and Satucket Trailhead to encourage students and residents to access these destinations by bike.
2. The other approved project addresses a speeding problem on Plymouth Street. Two speed feedback signs will be installed near East Bridgewater Junior/Senior High School and East Bridgewater Senior Center. Rectangular Rapid Flashing Beacons will be added at three existing crosswalk locations: senior center, YMCA, and intersection with Allen Street. Tactile warnings will be added at Senior Center and Allen Street crossings. Shared lane markings (sharrows) will be added along Plymouth Road between Central Street and Wainor Terrace.

Potential Improvements

The Old Colony Planning Council recommends creating a Sidewalk and ADA Transition Plan so the town may be able to plan events catering to pedestrians such as walking marathons or community play-ways where streets are temporarily shut down and provide limited access to pedestrians.

Town of Easton

Existing Conditions

Easton encompasses 29.18 square miles or 18,675.2 acres and had an estimated population of 25, 058 according to the 2020 US Census. The town is located near Routes 24, I-95, and I-495 and is bordered on the north by Stoughton and Sharon, on the east by Brockton and West Bridgewater, on the south by Raynham, Taunton, and Norton, and on the west by Mansfield. The Town of Easton has a small village feel in its northern section and a rural residential nature in its southern section; however, it does have

commercial areas along arterials as well as and industrial park off of Route 138 south of Route 123. The Stonehill College Campus is also located off of Route 138 north of Route 123.

The condition of Easton's pedestrian network varies depending on location within the town. In North Easton, the pedestrian network has better connectivity due to past investments in pedestrian infrastructure, which occurred before the automobile became the dominant mode of transportation and more walking was required. In South Easton, the pedestrian network experiences far more discontinuity because this section of the town developed after the automobile had taken hold as the primary means of transportation.

Town of Easton does not have an established bicycle network; however, the town of Easton is working toward creating a strong bicycle network for the community. The Envision Easton plan calls for a robust bicycle network while making improvements to the built environment such as intersection improvements, safety audits, and prioritizing high crash locations within the town boundaries.

Planned Improvements

The Town of Easton has one project under construction programmed in the Transportation Improvement Program (TIP) for 2021; corridor Improvements on Depot Street (Route 123), from Newell Circle to Washington Street (Route 138). This project is intended to address deteriorated pavement and multi-modal accommodation through reconstruction of the roadway (minor widening) to provide bicycle accommodation in addition to reconstructed sidewalks and extensions. The project is two miles in length. A traffic signal is proposed at the Depot Street/Center Street/Porter Street intersection. The project also includes drainage upgrades and new pavement markings and signs.

The Town of Easton has two projects under design involving multi-modal improvements. The first is corridor improvements on Route 138 including intersection improvements at Route 138 (Washington Street) and Elm Street. This project is programmed for the year 2025 of the TIP. Installation of traffic signals including pedestrian signals is proposed at this location. In addition, the realignment of the west leg of Elm Street is proposed to align this approach with the opposite Elm Street approach. The intersection improvements will involve reconstructing approximately 500 feet of Washington Street, 100 feet of the east leg of Elm Street, and 500 feet of the realigned west leg of Elm Street. Sidewalks will be constructed on both sides of Washington Street and on both sides of the west leg of Elm Street, connecting to an existing sidewalk west of Frothingham Drive. Bicycle accommodating shoulders will also be provided on Washington Street within the existing right-of-way. Proposed related work includes constructing sidewalks along Washington Street northerly both sides between Elm Street and Union Street, a distance of approximately 3,500 feet. The existing closed drainage system will also be modified within the project limits to better capture and treat stormwater runoff. Five-foot bike lanes are proposed on the intersection approaches and on the Washington Street corridor between Elm Street and Union Street. Pavement rehabilitation will generally be accomplished through milling and overlay, with full depth box widening where necessary at the intersection. The realignment of Elm Street will require full depth construction.

The second project under design is Resurfacing and Related Work on Route 138. Work on this project consists of mill and overlay on Route 138 from Roosevelt Circle to the Easton/Stoughton Town Line

(excluding the section from Elm Street to Union Street). The project will include sidewalk reconstruction and construction drainage improvements, pavement marking and signs.

Three of Easton's projects on its Complete Streets Prioritization Plan have been approved by MassDOT. These include:

1. Protected Crosswalks at the intersection of Lincoln Street and Barrows Street and at Friends Road. - This project represents two priorities from the plan (ranked numbers one and eight.) The project includes wheelchair ramps and Rectangular Rapid Flashing Beacon (RRFB) at an existing crosswalk at Barrows Street and at new crosswalk at Friends Road to improve visibility and improve accessibility. Existing ramps at Barrows do not meet current AAB/ADA and will be brought up to standards. At Friends Road, there is no crosswalk to connect the sidewalk on the south side of Lincoln Street east of Friends Road to the sidewalk on north side of Lincoln Street west of Friends.
2. Improve Crosswalk Signage (Townwide, project was ranked number three) - Update signage and pavement marking at existing crosswalk at eight locations in the town.
3. Bike Racks and Repair Stations, (project ranked 6th) - Install bike racks and repair stations at Town Hall and Memorial Hall.

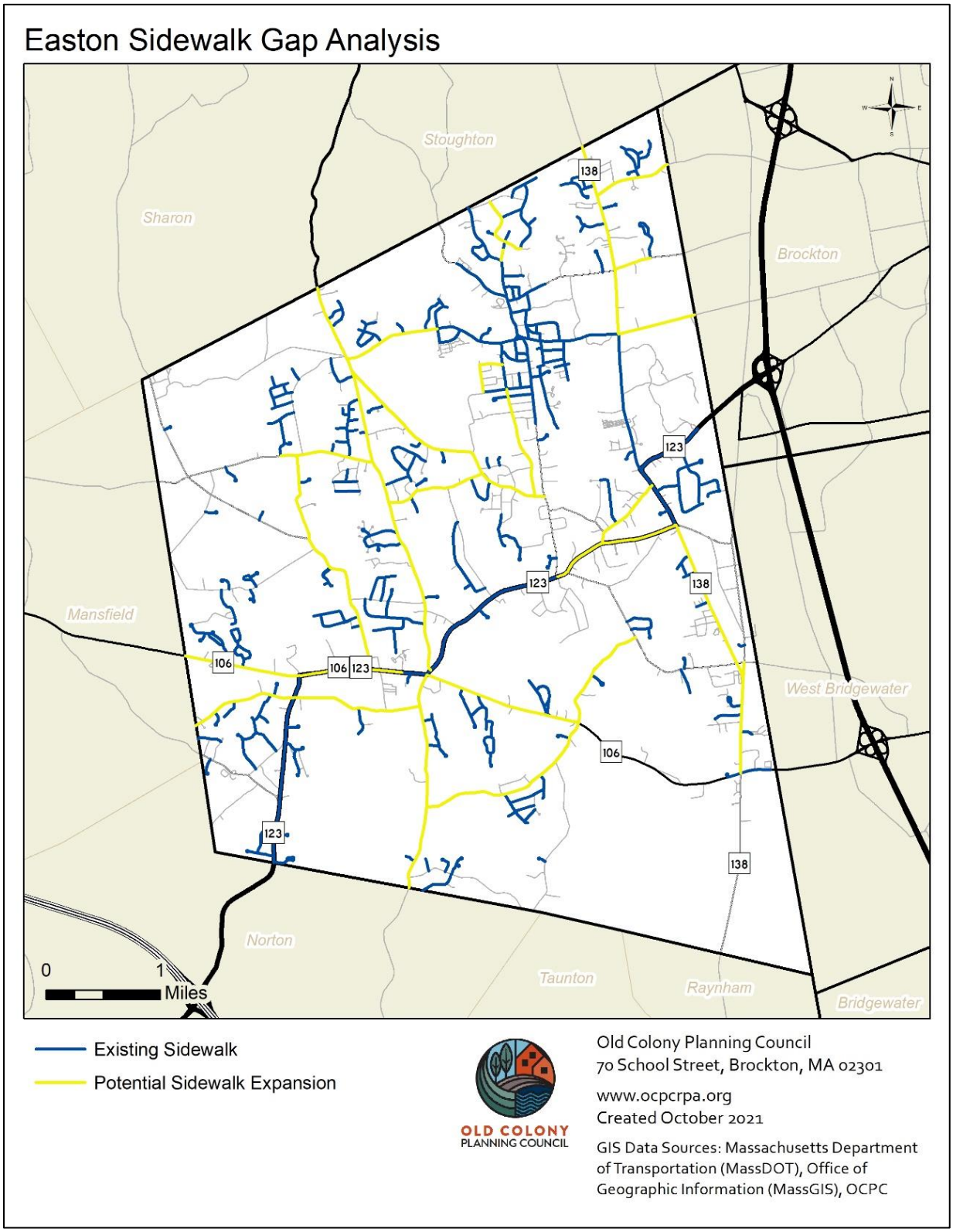
Potential Improvements

The Easton Sidewalk Gap Analysis (Figure 24) shows an extensive gap between major arterial corridors and pocket neighborhoods in the town. Sidewalk connections are absent between Depot Street (Route 123) and Foundry Street (Route 106) where there is a high concentration of businesses and potential desire for pedestrian access.

To diminish the gap, a coordinated effort is necessary. Town of Easton has submitted its Complete Streets Prioritization plan to MassDOT. There are 18 potential projects listed in the Easton Complete Streets Prioritization Plan. The Easton prioritization plan is available on-line at the Massachusetts Complete Streets Funding Portal. The top priority project includes improvements at the Lincoln Street/Barrows Street intersection.

Additional recommendations include creating a wayfinding system for the downtown and planning for the South Coast Rail implementation with a potential station in the downtown to ensure uniformity between the South Coast Rail Plans and the plans of the community.

Figure 32



Town of Halifax

Existing Conditions

The Town of Halifax is a small rural town located east of the Town of Bridgewater, west of the Town of Kingston, north of the Town of Plympton, and south of the Town of Hanson. It has a population of 7,749 (US Census 2020). Although the town is residential, it does have small agricultural operations spread throughout the community. The prominent housing types are single family detached homes. The private automobile is the dominant mode of transportation.

Sidewalks in Halifax exist along most of the length of Route 106, along some sections of Route 58, and along all of Route 36 within town boundaries. Along most neighborhood roads, sidewalks are absent. Halifax does not currently have a bicycle network.

Planned Improvements

Halifax currently does not have any planned multi-modal improvement projects.

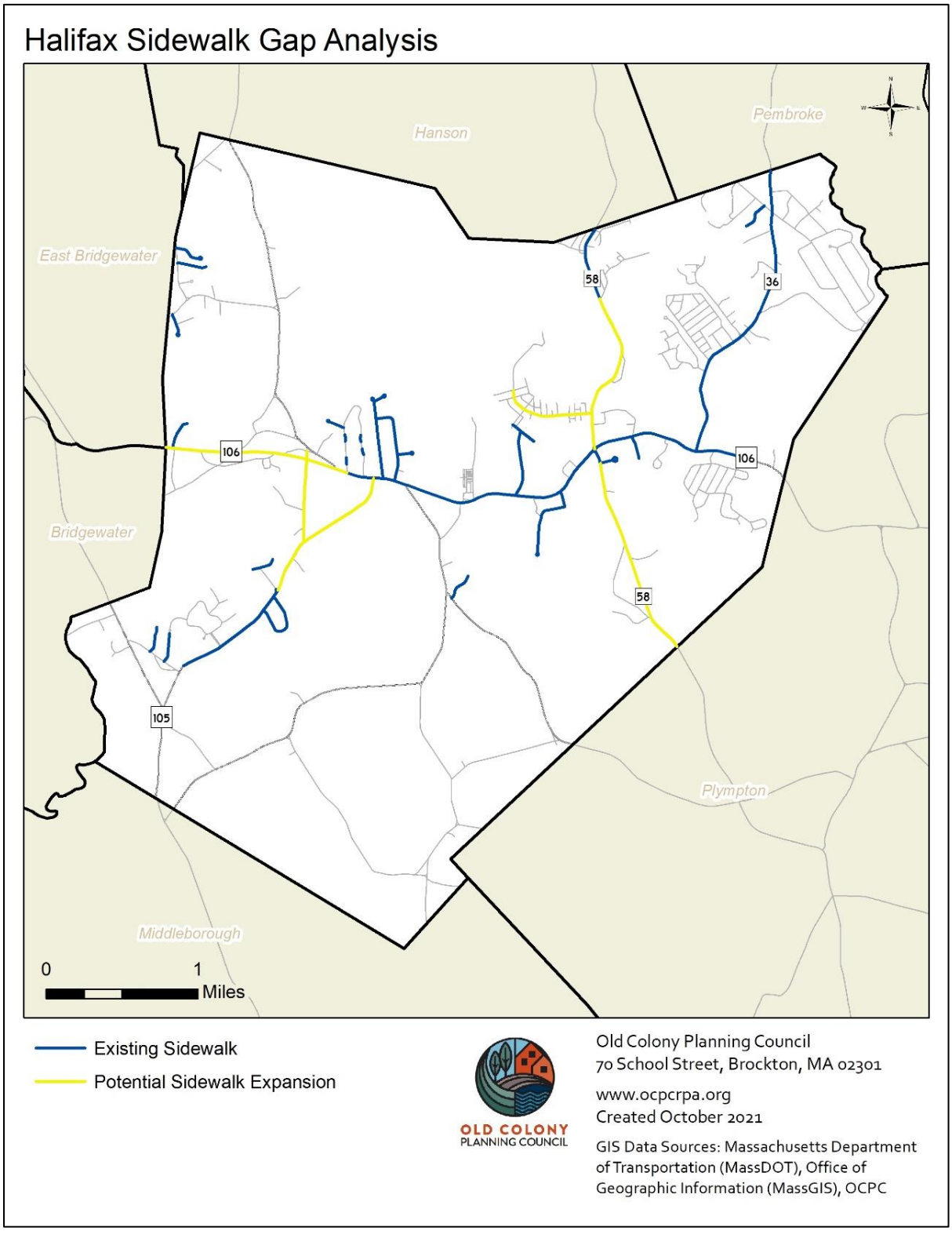
Potential Improvements

Although the 2010 Master Plan was never officially adopted by the Town, within the document was a series of goals and objectives the community should strive to achieve. The document stated that Halifax should seek to expand its sidewalk network where needed and develop multi-use paths to help community residents and visitors gain access to nature. Along with expanding the sidewalk network were appropriate and providing access to nature via multi-use paths, the Town's unadopted Master Plan suggests further bicycle and pedestrian accommodations should be sought to help improve circulation within town by providing access between neighborhoods and business areas by connecting cul-de-sacs to allow pedestrian and bicycle egress.

The Pedestrian network in Halifax would benefit from stronger and increased connections between existing sidewalks. Halifax residential streets are limited in accommodating for sidewalks; walking corridors may be a low-cost effective way of providing a safe environment for pedestrians in Halifax. The Halifax Sidewalk Gap Analysis Map illustrates several Walking Corridors suggested for implementation within the Town (Figure 33).

Recommendations for bicycle transportation improvements include creating a bicycle network connecting cyclists to essential destinations such as the Plymouth Street (Route 106) and Monponsett Street (Route 58) intersection.

Figure 33


Halifax Sidewalk Gap Analysis
Hanson
Pembroke
East Bridgewater
Bridgewater
Middleborough
Plympton
58
36
106
106
58
105
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Halifax has submitted a Complete Streets prioritization plan to MassDOT. There are 21 potential projects in the plan, which is available on-line at the Massachusetts Complete Streets Funding Portal. The top priority is to construct new sidewalks on Plymouth Street (Route 106) from Cranberry Drive (East) to Cranberry Drive (West) where there is a significant sidewalk gap.

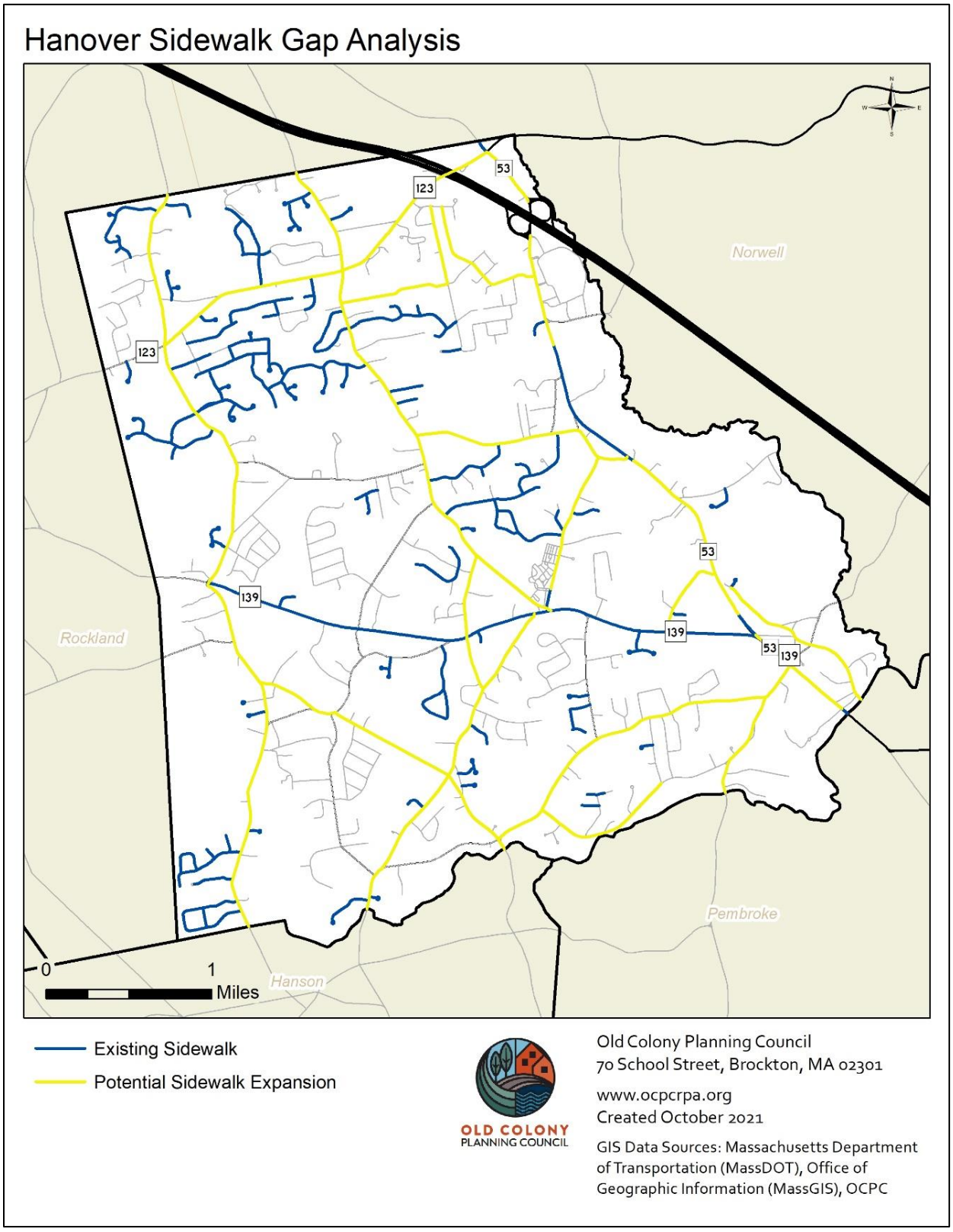
Town of Hanover

Existing Conditions

Hanover is a residential town with commercial corridors along state number numbered routes and arterials. There are also open space areas within the town. The dominate mode of transportation for most Hanover residents is by private automobile. The population of Hanover is 14,833 (2020 US Census). The town has a major shopping area off of Route 53, which is a major traffic generator. Route 63 connects to Route 3, a major limited access corridor in Southeastern Massachusetts.

Hanover has a number of roadways with sidewalks, but these sidewalks lack connectivity. This lack of sidewalk connectivity leaves pedestrian walking in town streets, which can deter residents from walking and creates unsafe conditions for all roadway users. The lack of sidewalk connectivity can contribute to traffic congestion since most people would choose to drive rather than walk even if their destination is within a reasonable walking distance due to the perceived lack of safety in the pedestrian network. Hanover's Sidewalk Gap Analysis can be seen in Figure 26. The Hanover Sidewalk Map reveals that there are many sidewalks within the neighborhoods of Hanover, but sidewalks are absent on main arterial roads with the exception of Rockland Street (Route 139) and portions of Washington Street (Route 53).

Figure 34


Hanover Sidewalk Gap Analysis
Norwell
Rockland
Pembroke
Hanson
123
53
139
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Planned Improvements
Currently there are no planned projects involving multi-modal improvements.

Potential Improvements
Old Colony Planning Council recommends the Town of Hanover increase sidewalk connections on main arterial roads and develop a Sidewalk and ADA Transition Plan in order to define opportunities for enhanced connections and accessibility.

Bicycle recommendations for the Town of Hanover include expanding the bicycle network throughout the town. Washington Street and Hanover Street would be the two main high traffic bicycle routes within Hanover. These two corridors also connect cyclists to other communities and businesses. Strengthening connections through these corridors may also assist in spurring economic vitality in neighboring communities. Hanover has 49 potential projects listed in its Complete Streets Prioritization Plan, which is posted on-line at the Massachusetts Complete Streets Funding Program portal. The number one priority in the plan consists of pedestrian improvements at the Washington Street and Broadway intersection, (unsignalized intersection in Four Corners Village). This project includes extending sidewalks from 381 Washington Street north for 1,800 feet on the north side of the road. In addition, the project calls for installation of high-visibility crosswalks with ADA-compliant curb ramps on all four corners of the Washington Street and Broadway intersection.

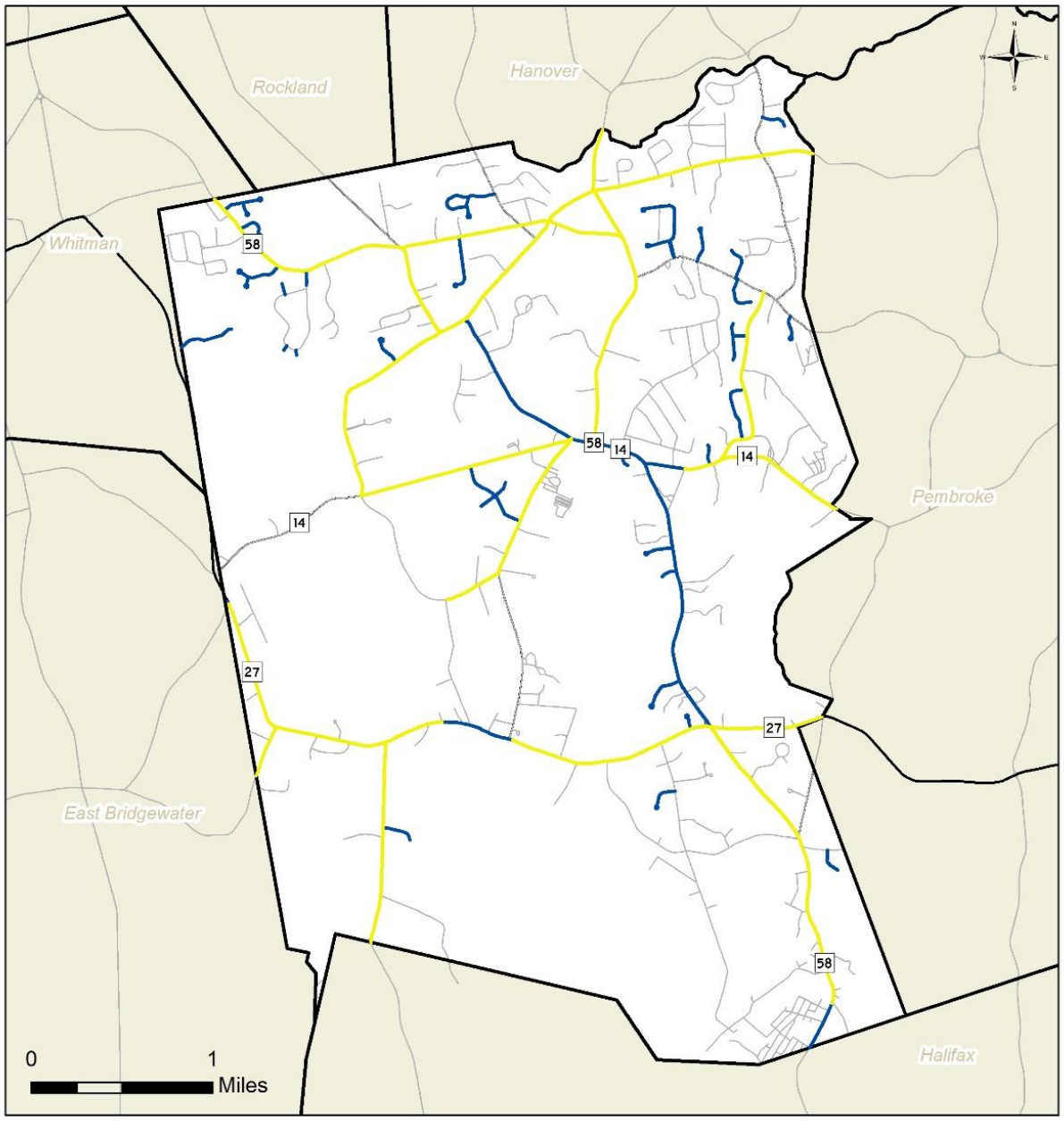
Town of Hanson

Existing Conditions
Hanson is a suburban community located 25 miles southeast of Boston, and accessible by routes 58, 27 and 14. Originally agricultural, today Hanson consists of several commercial centers and residential subdivisions. The population is 10,639 (2020 US Census). It is bordered on the east by Pembroke, on the south by Halifax, on the west by East Bridgewater, on the north and west by Whitman, and on the north by Rockland and Hanover. The growth in Hanson continues as residential as a result of the continuing suburbanization of the Boston and Brockton metropolitan areas.

Hanson's current pedestrian network is small and dispersed. The longest stretch of sidewalk in Hanson is along Route 58. Hanson's Sidewalk Gap Analysis can be seen in Figure 35.

Figure 35

Hanson Sidewalk Gap Analysis



Existing Sidewalk

Potential Sidewalk Expansion

OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created October 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Planned Improvements

There is one TIP programmed project (FFY 2026) for Hanson involving multi-modal improvements; Corridor Improvements on Route 14 (Maquan Street), from the Pembroke town line to Indian Head Street. Work on this project consists of roadway reconstruction, minor widening, improved bicycle and pedestrian accommodation, stormwater upgrades, pavement markings and signs along the corridor for a length of 1.3 miles. Geometric improvements are proposed at the Route 14 and Route 58 intersection.

Hanson has submitted its Complete Streets Funding Program Project Prioritization Plan to MassDOT. The plan has 18 potential projects and is posted on-line at the Massachusetts Complete Streets Funding Program portal. The number one priority in the plan consists of pedestrian and traffic signal improvements at the Liberty Street (Route 58) and County Road Intersection. This signalized intersection falls along a frequently walked route for students between the nearby Hanson Middle School and several businesses. The signals are outdated and are without pedestrian signals and actuation making it a hazardous intersection for pedestrians. The proposed project includes a new traffic signal system at the intersection to provide improved signal layout, pedestrian countdown signal heads, APS push buttons, ADA compliant curb ramps and bicycle detection. The project will include sidewalk improvements along the southern side of Liberty Street, west of the intersection to improve pedestrian access and safer vehicular circulation, as well as ADA compliant sidewalks and curb ramps throughout the intersection. This project has been approved through the Massachusetts Complete Streets Funding Program for $398,670.

Potential Improvements

Recommendations for the Town of Hanson include connecting dead end neighborhood sidewalks to major arterial roads such as Cross Street and Crescent Street. The Maquan Street and Crescent Street intersection would benefit from the installation of pedestrian signals. The intersection of Indian Head Street and Main Street is also in need of improvements including crosswalks and pedestrian signals.

Old Colony Planning Council recommends a number of improvements for Hanson's bicycle transportation network to help Hanson become more bicycle friendly. One recommendation includes providing bicycle lanes on high traffic routes including Main Street, Indian Head Street, School Street, and along moderate traffic routes including County Road (Route 14), Liberty Street, and Maquan Street. Bicycle network needs in Hanson include the establishment of a bicycle network, and accommodations for cyclists such as bicycle parking and refuge areas and wayfinding signage for visitors and residents alike.

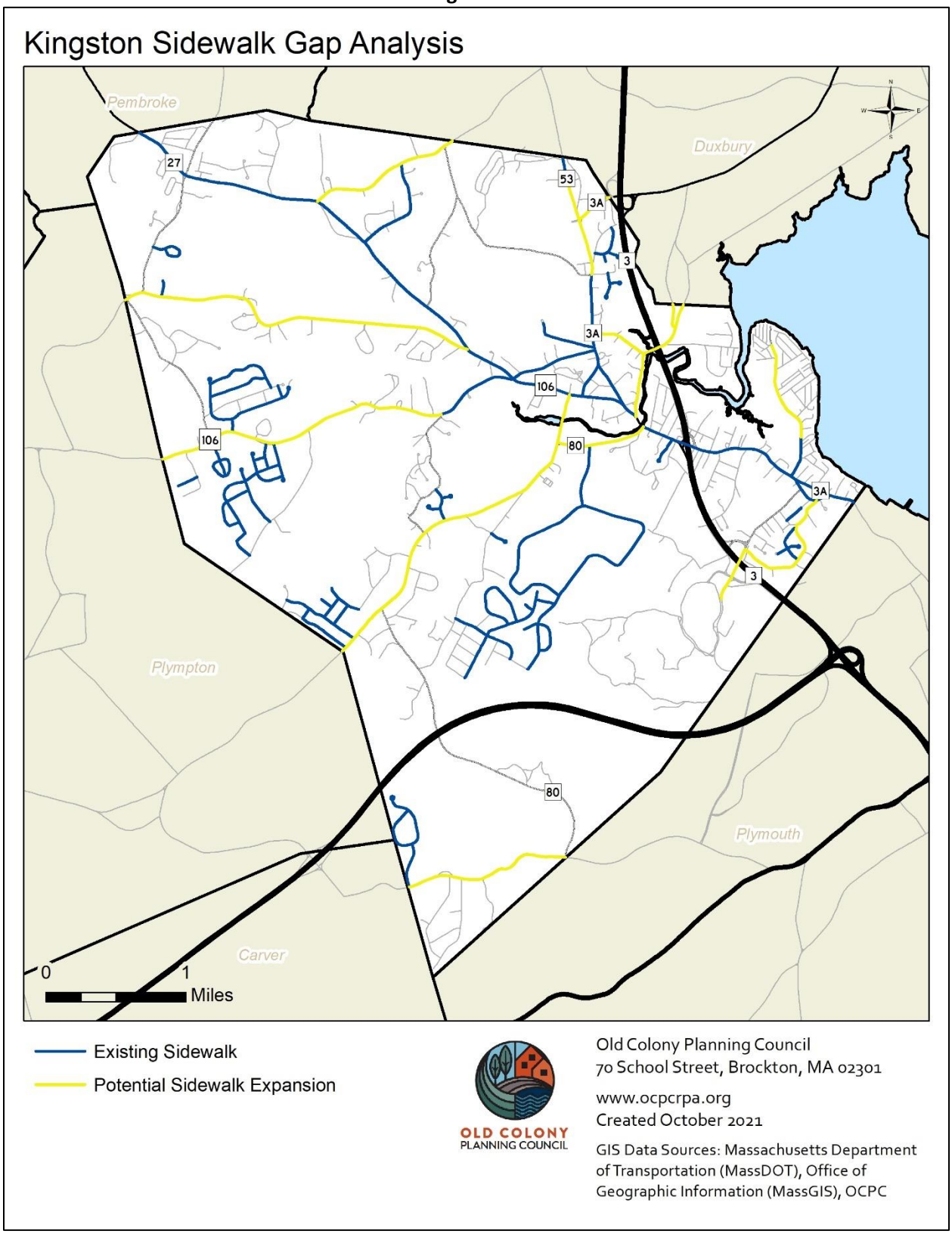
Town of Kingston

Existing Conditions

The Town of Kingston is a suburban community 35 miles south of Boston and situated on the shore near the towns of Plymouth and Duxbury. With a small-town atmosphere and featuring several waterways that extend to Kingston Bay, Kingston residents enjoy a scenic setting with a historic Main Street, cranberry bogs, and seaside access. The primary housing form is single family detached homes on large lots in a suburban style rural nature. While the primary mode of transportation in Kingston is by private automobile, town residents do have the benefit of a MBTA commuter rail station and GATRA service. The population of Kingston is 13,708 (2020 US Census).

According to current and past planning documents produced by the town and consultants, the Town of Kingston recognizes the need for better pedestrian accommodations. In both its 1998 Master Plan and its most current Open Space and Recreation Plan, creating additional sidewalks is a stated goal. Although the Town has more sidewalks along major roads than other communities in the region, Kingston could also benefit from the increased connectivity that more sidewalks provide.

Figure 36


Kingston Sidewalk Gap Analysis
Pembroke
Duxbury
Plympton
Carver
Plymouth
27
53
3A
3
106
80
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Sidewalk coverage is inconsistent and denser parts of the town are more likely to have sidewalk coverage. Outside of the historic town center, roads are less likely to have a sidewalk. The lack of sidewalks in the outskirts of Kingston make town residents car dependent, which puts additional strain on the road network and parking availability. It also leaves those town residents who do not have access to a private automobile with fewer choices and to walk in the street thereby being subject to walking conditions that lack safe pedestrian accommodations.

Kingston is in need of bicycle infrastructure and lacks bicycle accommodations. There is; however, potential to create bicycle connections not just within Kingston but with neighboring communities as well.

Planned Improvements

Currently there are no planned projects involving multi-modal improvements in the Town of Kingston.

Potential Improvements

OCPC recommends the Town of Kingston create an ADA Transition Plan that will coincide with a Sidewalk Transition Plan to help provide a simple transition to a pedestrian friendly community. The Kingston Sidewalk Gap Analysis map will also help the community identify areas that lack sidewalks and shape improvements to the network. The map shows a need for sidewalks on arterial roads, like Elm Street (Route 80), which connects Kingston to neighboring Plympton but also proposes expanded sidewalk connections from Elm Street on to Main Street (Route 106).

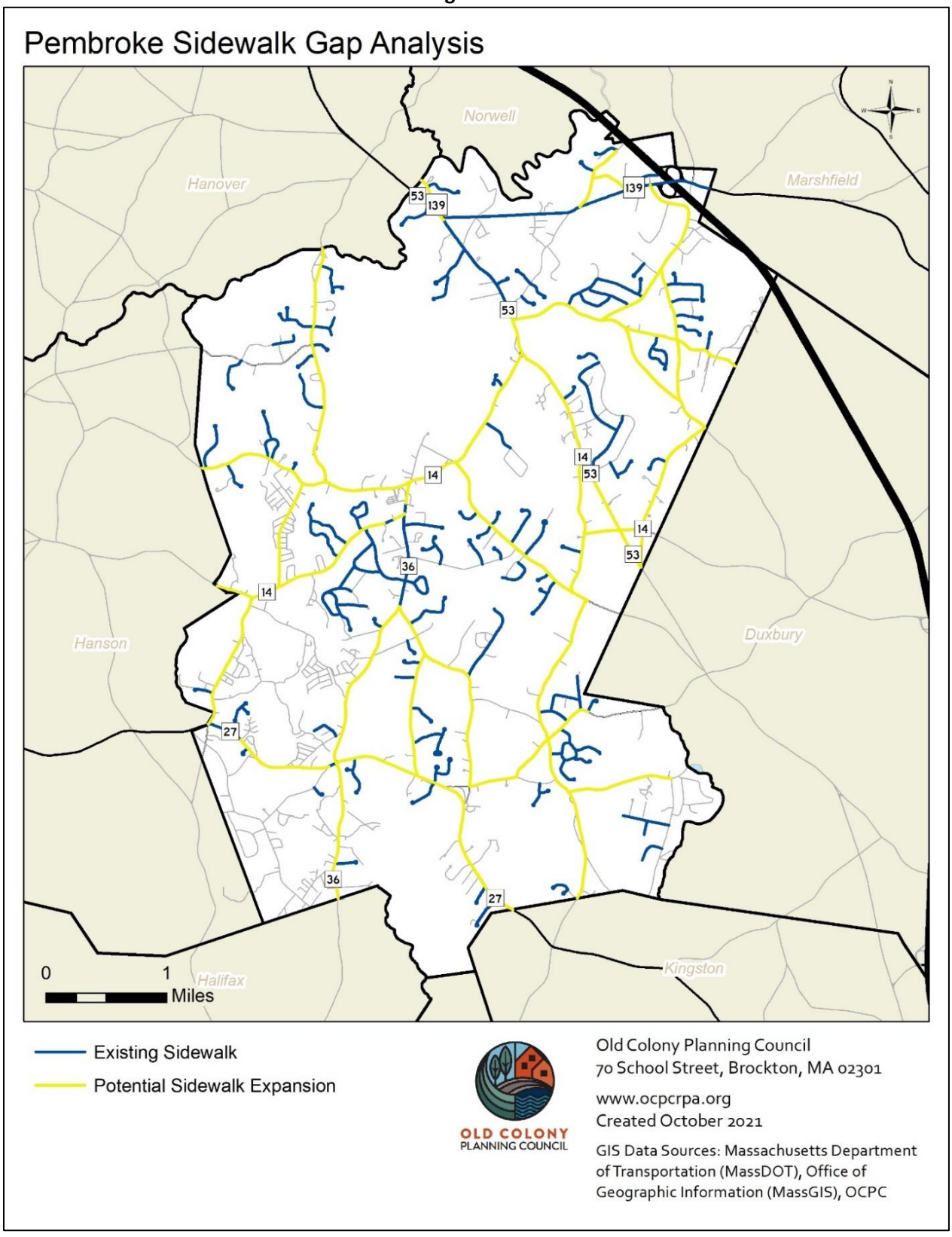
Town of Pembroke

Existing Conditions

Pembroke is a suburban community located in the South Shore area of southeastern Massachusetts. Pembroke is located 26 miles south of Boston, 16 miles north of Plymouth and 14 miles east of Brockton. The Town can be characterized by single-family homes and commercial and industrial areas along arterials. The Town's population is 18,361 (2020 (US Census). Route 3 traverses through the Pembroke in the upper northeast section of the town.

Due to Pembroke's rural nature, the primary mode of transportation is the private automobile. The reliance on automobiles by Pembroke residents along a dispersed pattern of development has led to a road system that lacks accommodations for alternative modes such as walking and bicycling. The sidewalk network has gaps in the connectivity. A number of sidewalks in Pembroke are located in housing subdivisions and lack connections that would allow people to walk between neighborhoods or to commercial areas. Limited on nonexistent connections between neighborhoods leave pedestrians the choice to either walk in the roadway or over rely on automobile transportation.

Figure 37


Pembroke Sidewalk Gap Analysis
Norwell
Hanover
Marshfield
Hanson
Duxbury
Halifax
Kingston
53
139
14
36
27
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Currently the Town of Pembroke does not have an established bicycle network.

Planned Improvements

There are two proposed projects in the Old Colony Transportation Improvement Program (TIP) that involve pedestrian accommodations and improvements in the Town of Pembroke.

1. Resurfacing and Related Work on Route 53 - This approved project, which is currently underway and was funded under the FFY 2020-2024 TIP under FFY 2020, consists of mill and overlay work on Route 53. In addition to reconstruction of existing sidewalks, the drainage will be upgraded, & pavement markings and signs will be added.
2. Rehabilitation of Route 36 (Center Street) from Route 27 to Route 14 - This proposed project, listed in the FFY 2022-2026 TIP under FFY 2022, will consist of resurfacing/ rehabilitation and full depth reconstruction of certain segments of Route 36 (Center Street). The length of the project will begin from the intersection at Route 27 to the south to the intersection at Route 14 to the north. Sidewalks will be constructed where they currently do not exist and where sidewalks currently exist will be reconstructed. The existing drainage will also be updated, and sign & pavement markings are also included in the scope of work.

Potential Improvements

In its current form, the sidewalk network is limited to neighborhood streets which are not connected to main arterial roads and are essentially dead-end sidewalks. In order to improve this situation, the Old Colony Planning Council recommends the town of Pembroke create a Sidewalk and ADA transition Plan utilizing the Pembroke Sidewalk Gap Analysis Map to identify major gaps in the network and to locate where sidewalk connections can be made.

Providing wayfinding in the Town of Pembroke may improve patronization of businesses by helping direct cyclists towards key destinations. OCPC recommends creating a uniform sign design for wayfinding to be implemented throughout the town. It would be in the interest of the town to coordinate the amenities for cyclists to coincide with key destinations.

Town of Plymouth

Existing Conditions

The Town of Plymouth is 40 miles south of Boston and 24 miles east of the City of Brockton. Plymouth has a storied historical past, as it was the place the Pilgrims landed in 1620 arriving from England. Plymouth is the largest Massachusetts town in area with suburban or rural land-use, commercial and industrial areas, as well as a compact downtown, which is fairly dense with a charming town village feel. Plymouth is one of the largest towns by land area in the Commonwealth with a population of 61,217 (2020 US Census). Plymouth is serviced in public transit by both the Greater Attleboro Taunton Regional Transit Authority (GATRA) which provides bus service, and commuter rail service provided by the MBTA, giving Plymouth access to Boston by rail. In addition, a private bus company transports passengers to Boston and Providence.

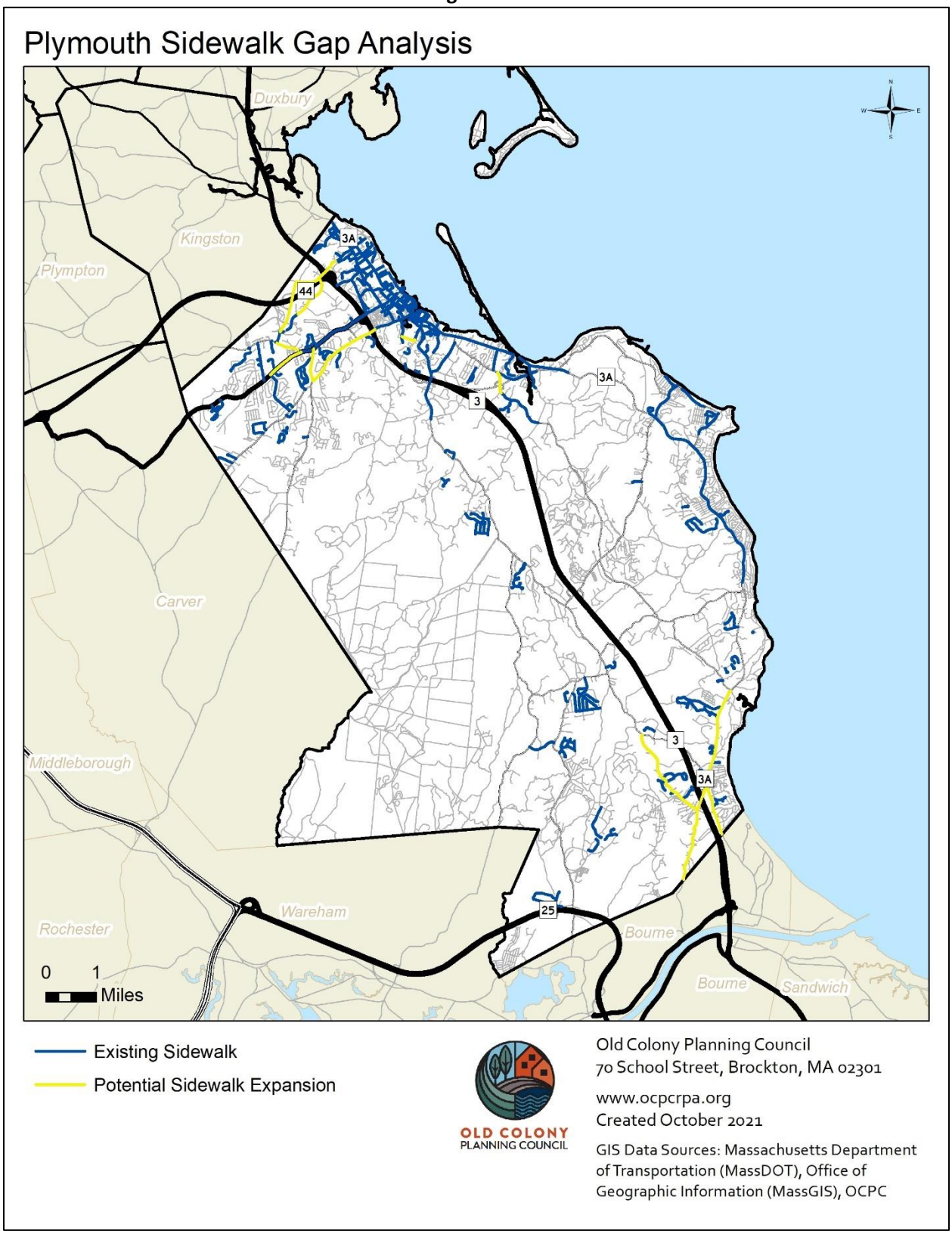
In its planning documents, including its master plan, the Town of Plymouth recognizes its bicycle and pedestrian accommodations are in need of improvement throughout the community. In the master plan, town leaders call out the need to expand the bicycle and pedestrian network to facilitate more walking and biking between neighborhoods and commercial centers to help alleviate automobile traffic and foster greater economic activity. Additionally, these planning documents expressed the need for

more sidewalks and bike facilities in order to protect those residents that choose to walk rather than drive to a destination. Further, these documents state the need for safe facilities that help travelers in town transit over Route 3 in a safe and comfortable manner that provides linkages to open space and recreation areas.

The current pedestrian network in the Town of Plymouth is highly concentrated in the downtown and in the neighborhood of North Plymouth. Outside of these two sections of the community, sidewalk expansion is in need to improve connections to destinations. Due to this small and highly concentrated network of sidewalks, many Plymouth residents have a lack of choice and drive to their destination.

An interconnected bicycle network does not exist in Plymouth, although the town has made many improvements such as the reconstruction of Obery Street from South Street to the High School, which has designated bike lanes and sidewalks on both sides of the road. There are also bicycle facilities located on Water Street behind the downtown and the town intends to expand its bicycle network.

Figure 38


Plymouth Sidewalk Gap Analysis
Duxbury
Kingston
Plympton
Carver
Middleborough
Wareham
Rochester
Bourne
Sandwich
3A
44
3
25
0 1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Planned Improvements

Currently there are no planned projects involving multi-modal improvements in the Town of Plymouth. The Town of Plymouth is a third tier community in the MassDOT Complete Streets Funding Program. It has submitted its Project Prioritization Plan with 75 bicycle and pedestrian projects. Its number one priority project has been approved for funding in the program. This project consists of complete streets improvements on Allerton Street. The project on Allerton Street, from Samoset Street to Alden Street, includes new sidewalks to be reconstructed along both sides of this roadway. Allerton Street is a key connector street providing access for a large residential neighborhood, affordable senior housing, Cold Spring Elementary School (Safe Routes to School), and the National Monument to the Forefathers which is on the U.S. National Register of Historic Places.

Potential Improvements

There has been a need identified to add a sidewalk along Route 80 to provide safe travel for pedestrian destined for the West Elementary School and surrounding land uses. Old Colony Planning Council recommends the Town of Plymouth create a Sidewalk and ADA Transition Plan, which will help guide the development of sidewalks and ADA Accommodations within the Town. OCPC would also recommend looking at expanding Safe Routes to School (SRTS) participation to all schools throughout the community. He SRTS will help educate the youth on proper pedestrian etiquette and safety.

Plymouth needs an enhanced bicycle network especially within Town Center. The Town of Plymouth also has dirt or unpaved trails utilized by off-road cyclists. A wayfinding system can encourage more cyclists to use the off-road trails, which may also serve as a connection for cyclists looking to commute through certain parts of the town, while providing a safe way of getting there.

With Plymouth being a tourist centric community, consideration should be given to participating a bicycle share program within the Town of Plymouth. Accompanied by a wayfinding system and improved bicycle infrastructure, a bicycle share program may increase tourism and spur economic activity by saving tourists money on gas and parking and increasing expendable income.

Town of Plympton

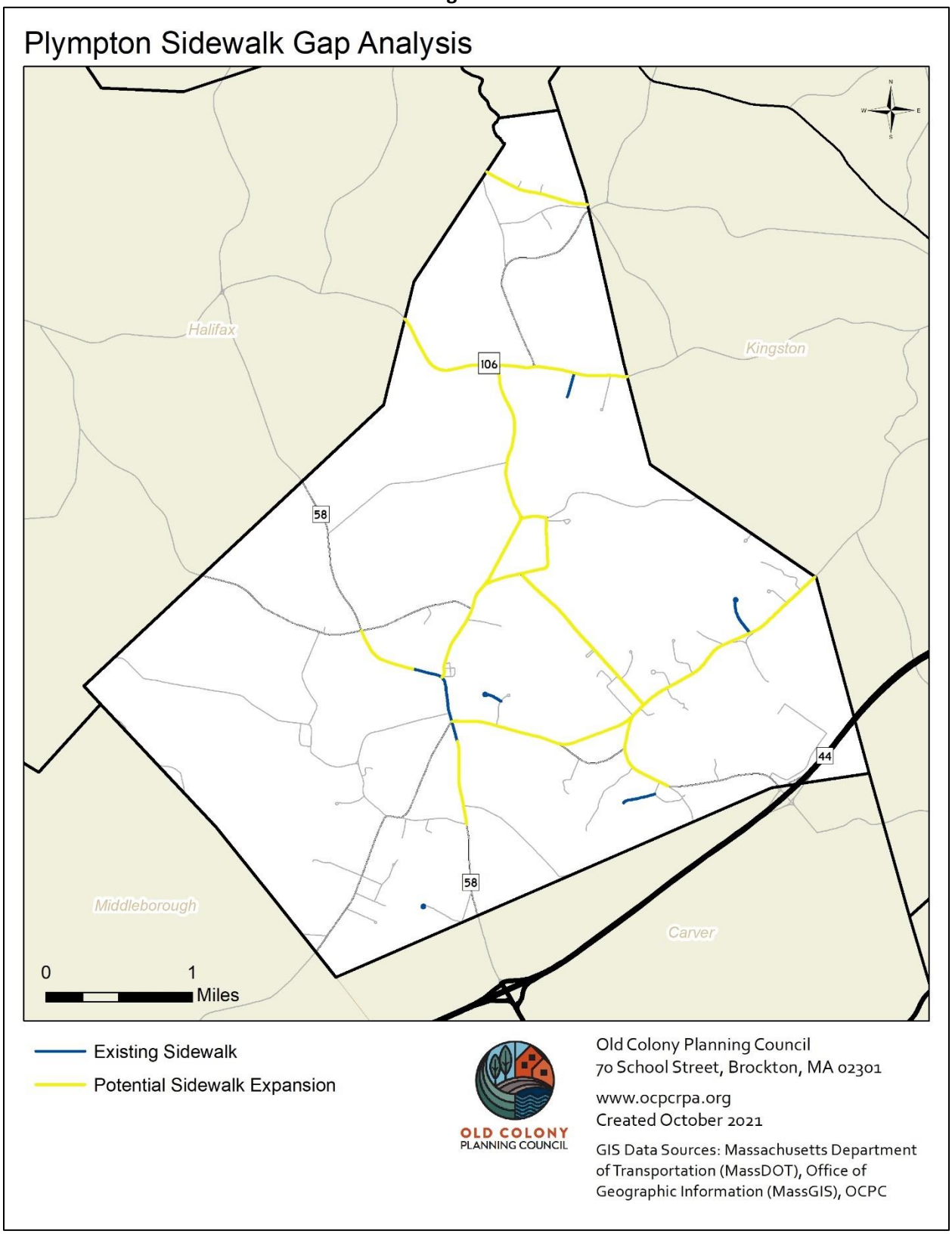
Existing Conditions

Situated 35 miles south of Boston and 15 mile east of Brockton, the Town of Plympton is a rural suburban community with and a population of 2,930 (2020 US Census). Besides dispersed residences, the town can be characterized by woods, farms, and cranberry bogs. As the result of this suburban and rural landscape, the primary mode of transportation in Plympton is by private automobile.

According to the Plympton Open Space and Recreation, the Town proposes to create a series of multiuse paths traversing the community. The Town proposes to make new developers building in the community fund and incorporate sections of the multiuse path in their proposed development. Plympton will be seeking to include this requirement of building multiuse paths in new developments in its subdivision rules and regulations.

Plympton's current sidewalk network is very small and only lies along a stretch of Route 58 near Town hall and in a few neighborhood subdivision. Outside these limited areas, Plympton lacks sidewalks and pedestrian amenities. The Town of Plympton does not have a bicycle network within the community.

Figure 39


Plympton Sidewalk Gap Analysis
Halifax
Kingston
Middleborough
Carver
106
58
58
44
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Planned Improvements
Currently there are no planned projects involving multi-modal improvements in the Town of Plympton.

Potential Improvements
Old Colony Planning Council will recommend that the Town of Plympton create a Sidewalk and ADA Transition Plan and utilize the Sidewalk Gap Analysis Map provided by OCPC to coordinate efforts of expanding the sidewalk network in Plympton. OCPC also recommends considering creating walking corridors where there is not efficient right of way for sidewalks.

Cyclists are known to utilize high traffic routes such as Main Street (Route 58) and County Road (Route 106). Cyclists are also using light traffic roads such as Brook Street and Upland Road. OCPC recommends creating a wayfinding system for new and visiting cyclists.

Town of Stoughton

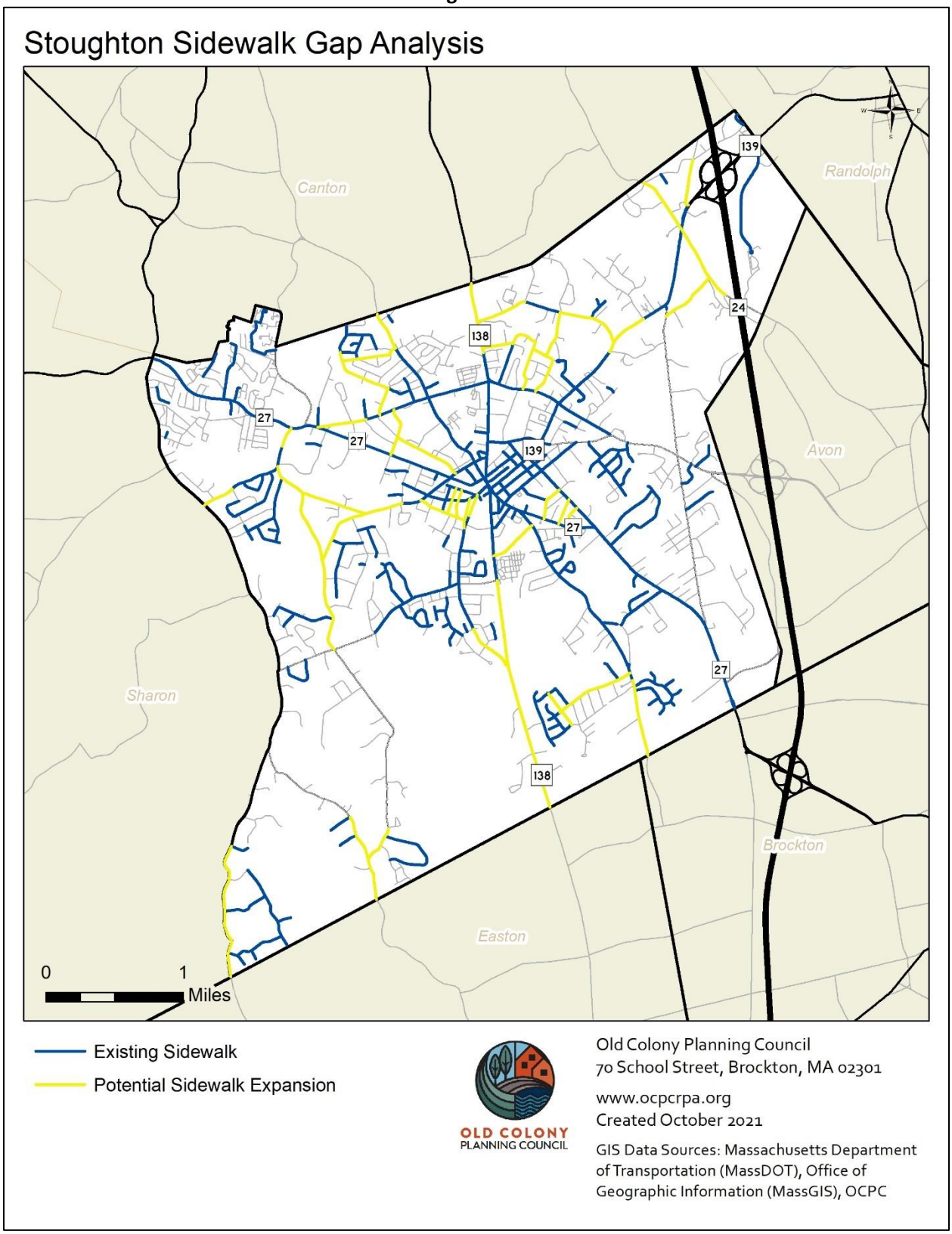
Existing Conditions
The Town of Stoughton is the third largest community in the Old Colony Planning Council region, with a population of 29,281 (2020 US Census). Although Stoughton is a suburb, it is a suburb with an urban feeling in its downtown. Stoughton has an industrial park as well as commercial areas outside its downtown, with connections to Route 24 and the regional highway system. The primary means of transportation in the town is by private automobile. In addition to private automobile travel, Stoughton has public transportation options. Operating in the town is the Brockton Area Transportation Authority's Route 14 bus line, connecting Stoughton residents to the City of Brockton and to the Town of Canton . The MBTA Commuter Rail Providence/Stoughton line provides a rail link between the town and Boston's Back Bay station, which is very popular in the region because it brings commuters directly to Boston's Financial District.

The goal, objectives, and policies of the Town of Stoughton, based on its master plan, are to increase walking and biking in the community by enhancing its transportation network. Stoughton seeks to establish a bicycle and pedestrian circulation system that gives safe and convenient access to schools, public libraries, commercial areas, neighborhoods, and other locations of interest in the town.

The Town of Stoughton's pedestrian network varies in connectivity depending on location. The location with the most connected pedestrian network is the town center and especially around the MBTA station. Sidewalks are present in outlying areas but tend to have missing links to the rest of the pedestrian network leaving some sections of Stoughton without connection the rest of the pedestrian network, forcing pedestrians to walk in town streets.

A bicycle network does not currently exist in Stoughton.

Figure 40


Stoughton Sidewalk Gap Analysis
Canton
Randolph
Avon
Sharon
Brockton
Easton
139
24
138
27
27
139
27
27
138
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Planned Improvements

There are three proposed projects in the Old Colony Transportation Improvement Program (TIP) that involve pedestrian and bicycle accommodations/improvements in the Town of Stoughton.

1. Improvements at the Richard L. Wilkins Elementary School (SRTS) - This approved project, which is currently underway and was funded under the FFY 2021-2025 TIP under FFY 2021, primarily includes sidewalk construction and reconstruction on the southern side of Central Street between Pratts Court and Pearl Street. The Safe Routes to School (SRTS) project also involves minor road widening to accommodate 5-foot bicycle lanes on both sides of Central Street, ADA-compliant curb ramps with pedestrian warning signage, school zone flashing signs, and the installation of a hybrid traffic signal at the Fire Station on Central Street. This project is the number one priority in the town's Complete Streets Funding Program Project Prioritization Plan, which has been submitted to MassDOT and includes 14 Complete Streets projects. This project is the only project in the plan approved by MassDOT for Complete Streets funding.
2. Corridor Improvements on Route 138 - This proposed project, listed in the FFY 2022-2026 TIP under FFY 2023, will address safety issues, congestion problems, and a lack of multi-modal accommodations. The primary proposed improvements for this project will consist of roadway rehabilitation, construction of new sidewalks and ADA-compliant curb ramps, restriping of travel lanes to provide bicycle accommodations on the shoulders. Also included in the project' scope of work is drainage upgrades, pavement markings, and new signs.
3. Intersection Improvements and Related Work at Central Street, Canton Street, and Tosca Drive - This proposed project, listed in the FFY 2022-2026 TIP under FFY 2023, will consist primarily of a new traffic signal system (where currently only stops signs exist on all approaches except the Central Street approach from the west) and minor geometric improvements. Other improvements include multi-modal accommodations (pedestrian and bicycle) as well as signs and pavement markings. This project is being proposed in conjunction with the SRTS Project at the Richard L. Wilkins Elementary School.

Potential Improvements

Old Colony Planning Council recommends that the Town of Stoughton create a Sidewalk and ADA Transition Plan in collaboration with the Old Colony Sidewalk Gap Analysis Map.

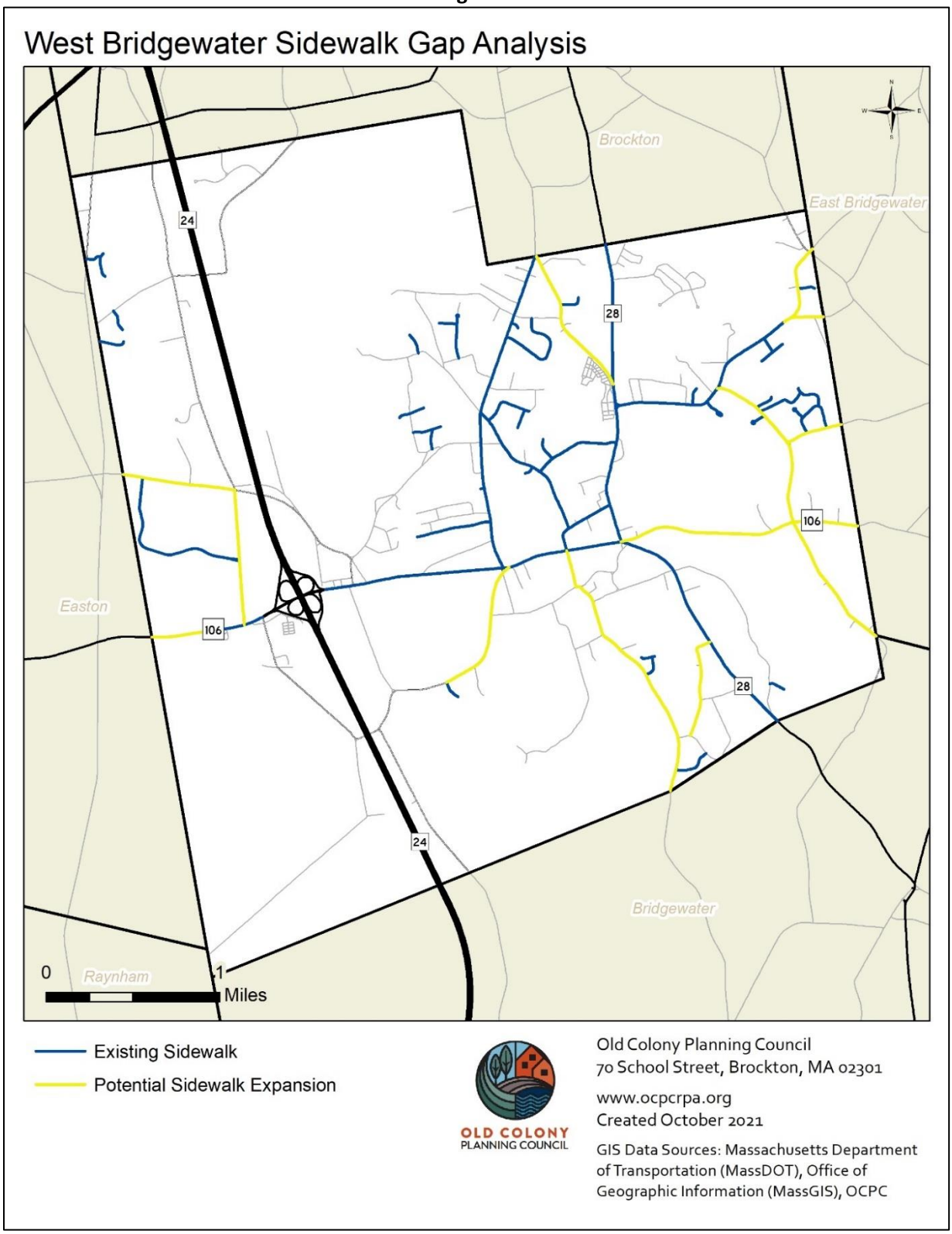
OCPC recommends that the Town of Stoughton identify key bicycle routes and consider providing bicycle amenities including bicycle racks and repair stations throughout the community. Washington Street has adequate space for a protected bicycle lane except where it enters the downtown where the road width narrows. The recommendation on downtown Washington Street would be to provide a shared marked lane, (sharrows).

Town of West Bridgewater

Existing Conditions

West Bridgewater is a residential town with the City of Brockton bordering on its north. The population is 7,707 (2020 US Census). West Bridgewater is located at the junction of Routes 24 and 106. The Town is characterized as suburban with many single-family homes on large lots. It is also rural in nature due to the number of working farms and the abundance of open space within town boundaries. West Bridgewater is a suburb community to the City of Brockton and the City of Boston. West Bridgewater does have industrial areas as well as busy commercial areas along its arterials on Route 28 as well as Route 106. The West Bridgewater Center traffic signals were recently upgraded, along with updated signal timing, phasing, as well as pedestrian signals and accommodations.

Figure 41



Planned Improvements

Town of West Bridgewater submitted its Complete Streets Funding Program Project Prioritization Plan to MassDOT. There are 31 projects in the plan. The number one priority project in the plan, the West Center Street (Route 106) and Howard Street Intersection Improvement Project, has been approved by MassDOT for the Complete Streets Funding Program. This project has been divided into two projects:

1. Install vehicular and pedestrian signals at the West Center Street (Route 106) and Howard Street Intersection and remove the existing flashing beacons. Reconstruct curb ramps with detectable warning panels and crosswalks to provide fully ADA-compliant pedestrian crossings across the north and west legs of this intersection. Install bicycle detection on all four approaches of intersection.
2. Construct a five-foot-wide HMA sidewalk with curb along the west side of Howard Street south of West Center Street to River Street (1,100 Linear Feet). A short section of sidewalk on River Street will also be constructed for connectivity purposes. Construct curb extensions on the north leg of the intersection of Howard Street at River Street and install ADA-compliant curb ramps with detectable warning panels and stripe crosswalks across Howard Street and River Street to connect to the existing sidewalk along South Street at River Street. New sidewalk shall tie in with proposed curb ramp in West Center Street & Howard Street Intersection Improvement Project.

Potential Improvements

Old Colony Planning Council recommends that the Town of West Bridgewater create a Sidewalk and ADA Transition Plan utilizing the West Bridgewater Sidewalk Gap Analysis. The Town of West Bridgewater is in need of an enhanced bicycle network to provide access for residents of West Bridgewater, but also to those who are looking to connect to neighboring communities such as Bridgewater or Brockton. OCPC recommends West Bridgewater create a bicycle network by identifying key location and routes along with creating a wayfinding system that will inform cyclists how long their destination will be from the point of origin.

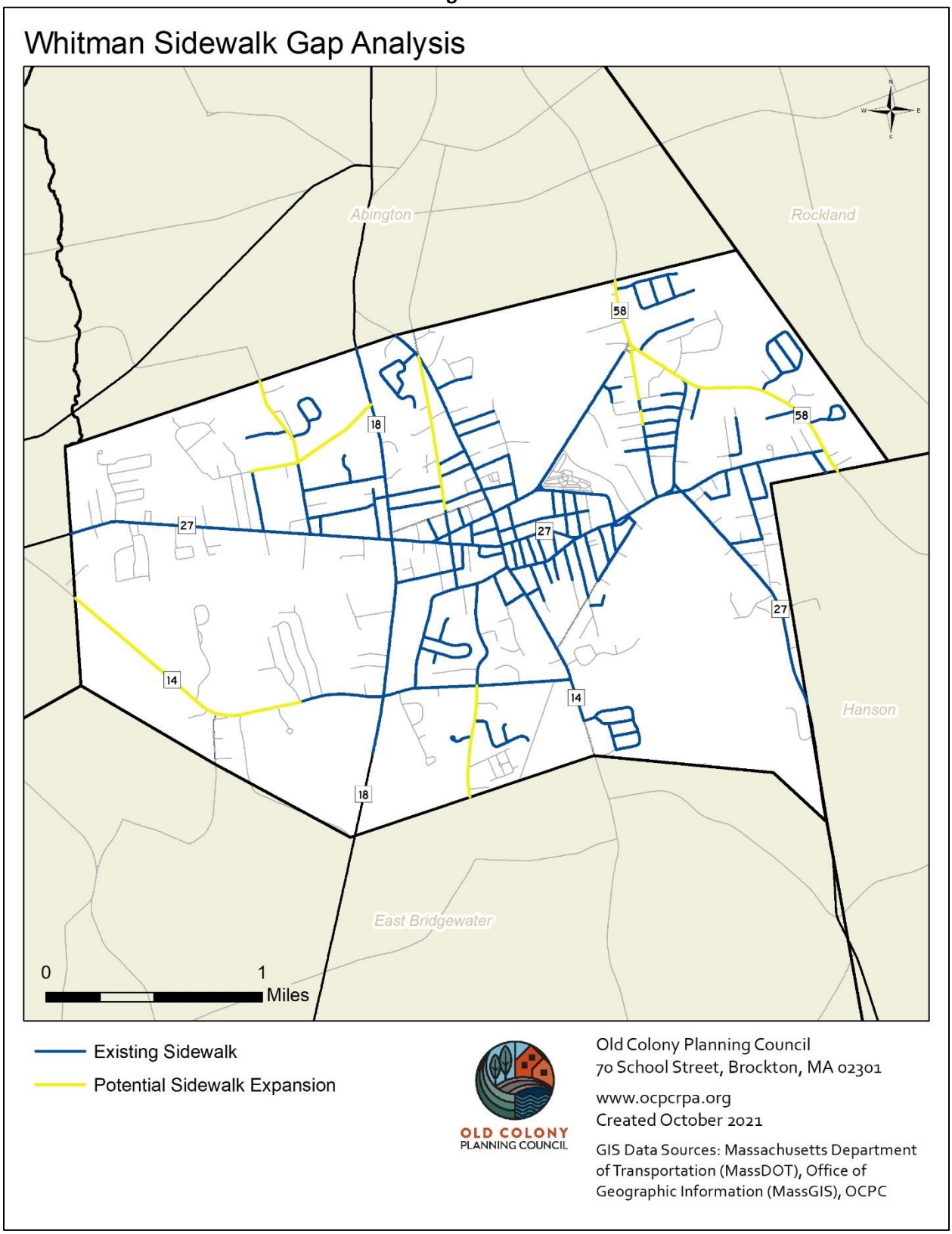
Town of Whitman

Existing Conditions

The Town of Whitman is a suburban community to both the Cities of Boston and Brockton. The population is 15,121 (2020 US Censu). The Town of Whitman lies east of the City of Brockton, south of the Town of Abington and west of the community of Hanson. The Town of Whitman has its own MBTA commuter rail station and is traversed by a number of state numbered roads including Routes 14, 18, 27 and 58. Most of Whitman can be characterized by its single-family homes. It has a small village center with shops, restaurants, and retail opportunities.

Whitman has an extensive network of sidewalks throughout the community, especially compared to other communities in the Old Colony region. The neighborhoods that lie outside the downtown area are those that mostly lack sidewalks. The conditions of the sidewalk vary with many of them being uneven and cracked; however this is not a situation unique to the Town of Whitman. The Town of Whitman does not have an established bicycle network.

Figure 42


Whitman Sidewalk Gap Analysis
Abington
Rockland
Hanson
East Bridgewater
58
18
27
14
0
1
Miles
Existing Sidewalk
Potential Sidewalk Expansion
OLD COLONY
PLANNING COUNCIL
Old Colony Planning Council
70 School Street, Brockton, MA 02301
www.ocpcrpa.org
Created October 2021
GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Planned Improvements

The Town of Whitman has submitted its Complete Streets Funding Program Project Prioritization Plan with MassDOT, which is available on-line at the Complete Streets Funding Program Portal. There are 34 Complete Street projects listed on Whitman's plan. Whitman's top priority in the plan has been approved for funding. This project, Pedestrian and Traffic Improvements at the Park Avenue and Essex Street Intersection, includes the following improvements: Reconfiguring the expansive Park Avenue at Essex Street intersection located directly adjacent to the Town Park , Police Station ,Senior Center and Memorial Field with sports and recreational fields to improve access, safety and comfort for pedestrians as well as motorists. This is also a main pedestrian route for residents that walk to the commuter rail station and Hobarts Pond Recreation area, which are less than a half mile away. The intersection is to be converted from providing two-way traffic along three sides of an oval island to a conventional "T-type" intersection to reduce high driving and turning speeds, eliminating the existing flared right turn movements by tightening the corners, and dramatically shorten the pedestrian crossings between the Town Park and parking lot by more than 50 percent, thereby improving pedestrian safety and comfort. This project involves adding a crosswalk across Park Avenue that would create access the Town Park. It also includes reconstructing the cement concrete sidewalk along the northern side of Park Avenue between Washington Street and the Whitman Police Station, a distance of approximately 1,300 feet. The existing crosswalk on Essex Street will be upgraded to be more visible and all curb ramps along the length of the project will be improved to become ADA compliant. All pedestrian accommodations will connect to existing pedestrian facilities or ADA compliant ramps at the project limits.

Potential Improvements

Whitman should make every effort to improve the appeal of its pedestrian network. Encouraging walking in the community can help reduce traffic congestion, and spur greater economic activity. Although the Town of Whitman is covered extensively with sidewalks with only a few roads in need of sidewalk installation, not much pedestrian activity takes place outside the town center. In order to spur more pedestrian activity, there is a need to focus on the quality of its pedestrian amenities. Providing pedestrian amenities like street trees to offer shade and protection from rain along with the removal of obstacles and clutter from sidewalks can increase pedestrian enjoyment.

Old Colony recommends that the Town of Whitman create a bicycle network by utilizing high traffic routes such as Temple Street (Route 27), Auburn Street (Route 14), Washington Street, and Franklin Street (Route 27). Beulah Street is designated as a moderate traffic route and can be utilized as an alternative for Bedford Street (Route 18) due to Bedford Street's heavy traffic. OCPC would also recommend that the Town of Whitman provide bicycle amenities for cyclists such as repair stations and bicycle parking racks and facilities where warranted.

- **National Highway Performance Program System (NHPP):** This consists primarily of existing Interstate Highway routes and portions of the Primary System. This program was established to focus federal resources on roads that are the most important to interstate travel, national defense, inter-modal connections, and international commerce.
-

Appendix

Funding for Improvements

The implementation of projects includes taking transportation improvements from the concept stage through to design and construction. Funding is an essential element in ensuring the implementation of recommended improvements. The MassDOT publication, *Project Development and Design Guide,* explains the project development process in Massachusetts and design standards for transportation projects.

MassDOT initiates new projects through a formal 3-step process using the Massachusetts Project Intake Tool (MaPIT). A GeoDOT account to log into MaPIT is needed to initiate new projects.

Step one – The proponent identifies the project need.
Step two – Using MaPIT, project proponent works with a MassDOT District Office (District 5) or other MassDOT Section to define project scope, costs, timeline, impacts and responsibilities.
Step Three – The District Office or other MassDOT Section submits project to the Project Review Committee for approval.

The MassDOT project development process includes the following:

- Problem/Need/Opportunity Identification
- Planning (A project planning report is completed)
- Project Initiation
  - ✓ Identification of Appropriate Funding
  - ✓ Definition of Appropriate Next Steps
  - ✓ Project Review Committee Action
- Environmental Design and Right of Way (ROW) Process (Includes Plans, Specifications, and Estimates, P, S, & E)
  - ✓ Environmental Studies and Permits
  - ✓ Right-of-Way Plans
  - ✓ Permits
- Programming (Old Colony TIP and State Transportation Improvement Program, STIP)
  - ✓ Programming of Funds
- Procurement (Construction bids and contractor selection)
- Construction
- Project Assessment

On sections of roadway owned and maintained by the municipality, the community typically initiates a project (utilizing MaPIT), and providing for project planning and design. Similarly, for state owned facilities, the MassDOT initiates projects, providing planning and design on their section of roads.

Many funding options are available for project construction, and are outlined below. Note that some funding programs, such as the Congestion Mitigation and Air Quality (CMAQ) Program, are for specific types of projects that meet specific criteria, while other programs such as Chapter 90 can be utilized on a much broader range of projects. Federal aid eligible regional transportation needs have outpaced available funding in the Transportation Improvement Program (TIP) for the past several years. All projects on the TIP go through a comprehensive evaluation process to determine priority for funding;

therefore, the programming of the TIP is a competitive process. In general, the process to fund a project through the TIP may take up to five years. Therefore, due to this limitation of TIP funding, communities are encouraged to seek alternate funding avenues for their high priority projects. Examples of such options include using Chapter 90 funds, developer mitigation, or public/private partnerships with local stakeholders.

Funding Programs

- **Capital Improvement Program (CIP) and Local Funding:** This program has historically been utilized to help provide the design and engineering of highway projects.
- **Exactions (Developer Mitigation Agreements):** Communities have increasingly turned to exactions as a means to meet new infrastructure and public service needs. Cities and towns use developer exactions as a strategy to offset the burdens of new development on the community. Exactions contribute to regional equity by ensuring that a new development pays a fair share of the public costs that they generate. Exactions consist of a developer's payment of funds to offset the cost of necessary construction, design, or maintenance of public infrastructure directly connected to the new development. Developers commit to an agreement for funding or constructing off-site improvements in exchange for the approvals to proceed with a development project.
- **Bridge Replacement and Rehabilitation Program:** This program provides funds for rehabilitation and replacement of any bridge on a public road. Bridges on the federal aid system or off the federal aid system are eligible for these funds.
- **Chapter 90:** This program provides State funding for highway construction, preservation, and improvement projects that create or extend the life of capital facilities. The level of funding is determined by a formula that is based upon public way mileage, population and level of employment in each community. The Chapter 90 Program is a reimbursement program, as the community must initially pay the cost of a particular project.
- **Community Development Block Grant (CDBG) Program:** This program provides for the development or expansion of economic opportunities and the provision of decent housing and public facilities. Eligible use of funds includes community development (construction or reconstruction of streets, water and sewer facilities, neighborhood centers, recreation facilities, and other public works).
- **Congestion Mitigation and Air Quality Improvement Program (CMAQ):** This directs funds toward transportation projects in Clean Air Act non-attainment areas for ozone and carbon monoxide. OCPC is located in the Boston non-attainment area for ozone.
- **Highway Safety Improvement Program (HSIP):** This program is a core Federal-aid program with the objective of achieving a significant reduction in traffic fatalities and injuries.
- **National Highway Performance Program(NHPP):** This consists primarily of existing Interstate Highway routes and portions of the Primary System. This program was established to focus federal resources on roads that are the most important to interstate travel, national defense, inter-modal connections, and international commerce.
- **Non-Federal Aid (NFA):** This program provides state funds for projects that due to federal fiscal constraints would not be able to receive federal funding. Projects under this category are listed for informational purposes only.
- **Surface Transportation Block Grant Program (STBG):** This is a block grant type program that may be used for any roads (including NHS) that are not functionally classified as local or rural minor collectors. These roads are collectively referred to as federal-aid eligible roads.

- **Transportation Alternative Program (TAP):** The TAP program provides Federal-aid funding for programs and projects defined as transportation alternatives, including on and off road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; safe routes to school projects; and projects for planning, designing, or constructing boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways.
- **Transportation Bond Bill (TBB):** This authorizes and directs the MassDOT to expend monies for transportation projects such as reconstruction, resurfacing, rehabilitation or improvements of highways, bridges, and parking facilities. From this, the State will issue either general obligation or special obligation bonds.
- **Federal appropriations:** These allocate federal funding for federal aid eligible projects.
- **Massachusetts Complete Streets Program:** This program provides $12.5 million dollars for two years beginning in 2016 to municipalities to implement Complete Streets projects. Municipalities must adopt Complete Streets policies, develop a priority plan, and send staff for training for eligibility.
- **MassWorks Infrastructure Program**: In September of 2010, the MassWorks Infrastructure Program was instituted to provide a one-stop shop for municipalities and other eligible public entities seeking public infrastructure funding to support economic development and job creation in Massachusetts. The Program is an administrative consolidation of six former grant programs:

  Public Works Economic Development Grant (PWED)
  Community Development Action Grant (CDAG)
  Growth Districts Initiative (GDI) Grant Program
  Massachusetts Opportunity Relocation and Expansion Program (MORE)
  Small Town Rural Assistance Program (STRAP)
  Transit Oriented Development (TOD) Program

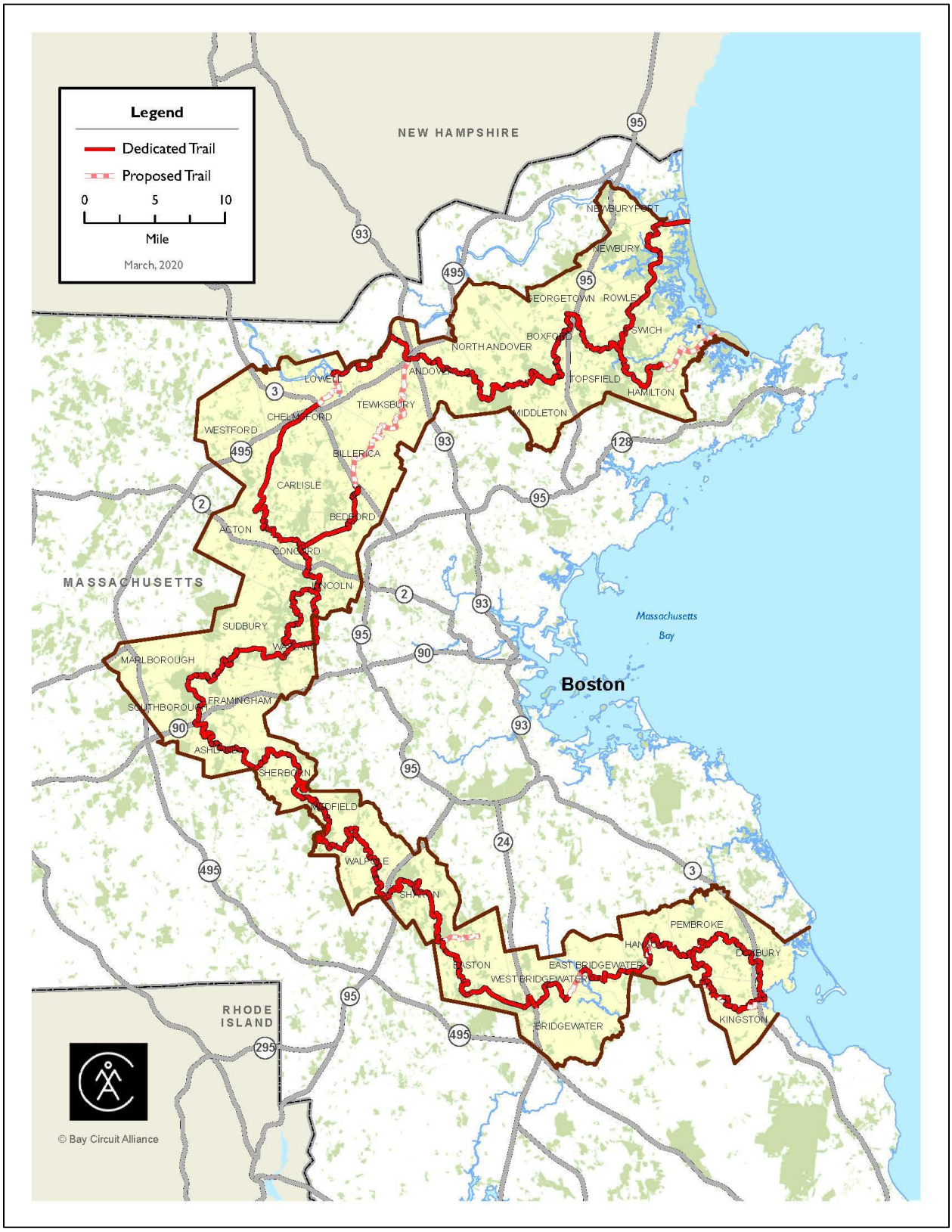
The MassWorks Infrastructure Program is administered by the Executive Office of Housing and Economic Development, in cooperation with the Department of Transportation and Executive Office for Administration & Finance.

MassTrails provides matching grants to communities, public entities and non-profit organizations to design, create, and maintain the diverse network of trails, trail systems, and trails experiences used and enjoyed by Massachusetts residents and visitors.
Eligible grant activities include project development, design, engineering, permitting, construction, and maintenance of recreational trails, shred use pathways, and the amenities that support trails. The grant amounts are dependent on the project and its needs, but generally range from $5,000 to $100,000 with grants of up to $300,000 awarded to projects demonstrating critical network connections of regional significance.

- MassTrails grants are REIMBURSABLE, meaning grantees must first pay for expenditures themselves and then submit for reimbursement using the required documentation.
- MassTrails grants are MATCHING grants and require that proponents provide a minimum of 20% of the total project cost. Projects with higher match commitments will be given greater consideration.
- Eligible projects require documented land owner permission and community support.

Applications are accepted annually for a variety of well-planned trail projects benefiting communities across the state. The new grant application round is expected to open in November, 2021 with a deadline of February 1, 2022.
For more information on this program, please visit: MassTrails Grants | Mass.gov

Map of the Massachusetts Bay Circuit Trail



Bicycle and Pedestrian Levels-of-Service in the OCPC Region

Bicycle Level of Service/Pedestrian Level of Service OS Data Input Fields

The following provides further information on the BLOS and PLOS data inputs. Roadway parameters will often change, and averaging could be done depending on the situation.

Through lanes per direction:	Do not include medians, turn lanes, or continuous-left-turn lanes.
Width of outside travel lane, to outside stripe (in feet):	Width of right-most travel lane, excluding striped paved shoulders, bike lanes, and marked parking stalls.
Paved shoulder, bike lane, OR marked parking area, outside lane stripe to pavement edge (in feet):	Besides a paved shoulder or a bike lane, this width may also be marked (striped or hashed) parking stalls. For diagonal parking, use the perpendicular distance from the end of the parking stripes to the pavement edge. This calculator does not work when there are BOTH bike lanes and parking stalls - please see the reference for this case.
Bi-directional Traffic Volume (in ADT):	Daily average. Assumed Directional factor (0.565) and Peak Hour Factor (0.091) values are used in a conversion to peak 15-minute volume.
Percentage of heavy vehicles:	As defined in the Highway Capacity Manual.
Percentage of road segment with occupied on-street parking:	Exclude driveways. Either one side or an average of both sides may be considered at a time.
Percentage of segment with sidewalks:	Again, either one side or an average of both sides may be considered.
Sidewalk width (in feet):	If a sidepath bike trail exists instead of a sidewalk, use its width.
Sidewalk buffer/parkway width (in feet):	Average distance from pavement edge to sidewalk edge. Include any gutter pan width.
Buffer/parkway average tree spacing (in feet):	Between tree trunks.

Model parameter ranges

The BLOS model was developed using roads with the following parameter ranges:

• Through lanes per direction - 1 to 3 (2 to 6 lane roads)
• Width of outside travel lane, to outside stripe - 10 to 16 feet
• Paved shoulder or bike lane, outside lane stripe to pavement edge - 0 to 10 feet (no rumble strips)
• Bi-directional traffic volume - 550 to 36,000 ADT (Average Daily Traffic)
• Posted speed limit - 25 to 50 mph
• Percentage of heavy vehicles - 0 to 10%
• FHWA's pavement condition rating - 5 (very good) to 2 (poor)
• A wide range of development types and parking conditions

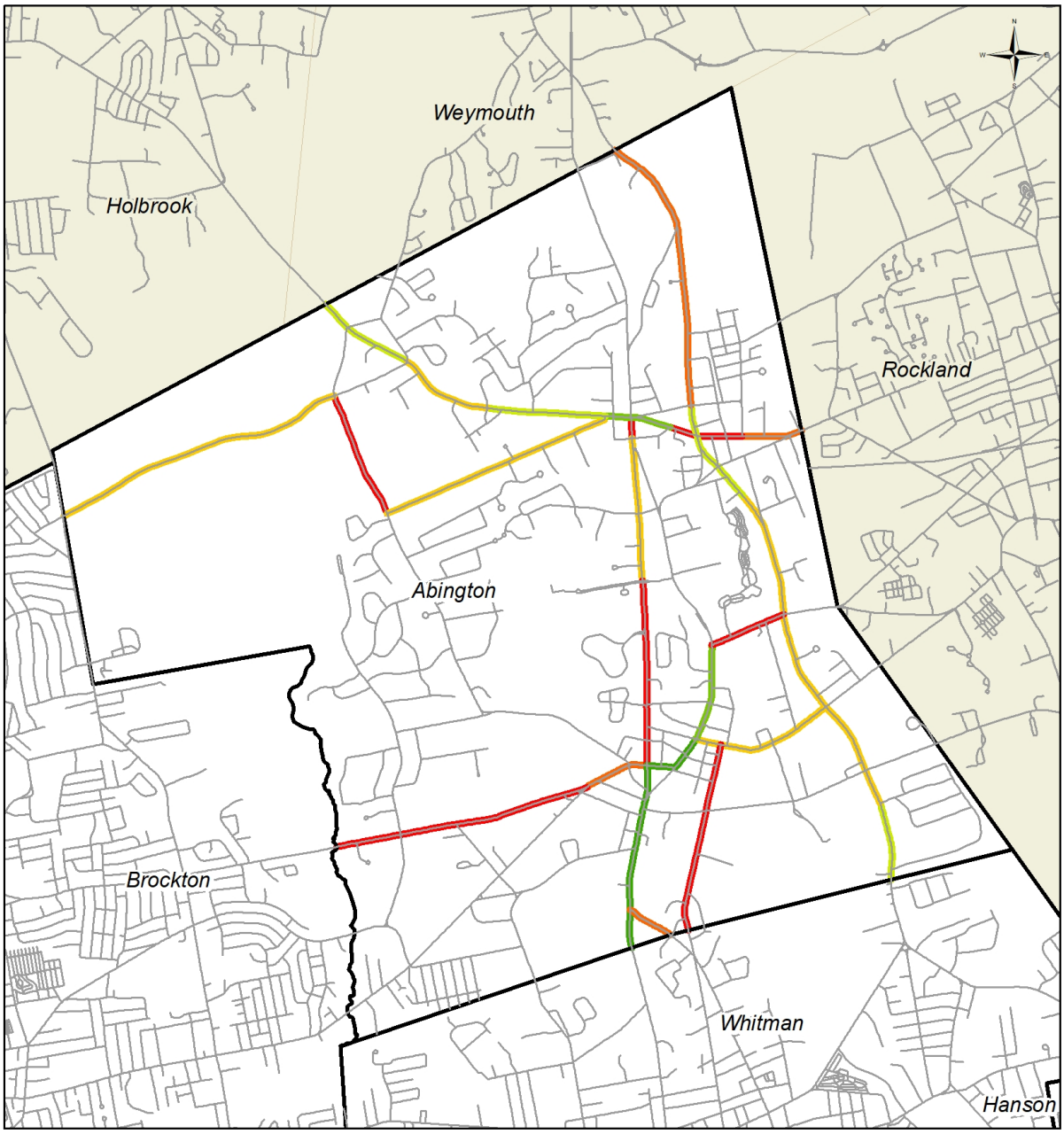
(Be aware of model use outside these ranges, particularly for paved shoulders much over 6 feet and more than a few percent heavy vehicles.)

The parameter ranges used in developing the PLOS model include:

• Through lanes per direction - 1 to 2 (2 to 4 lane roads)

• Bi-directional traffic volume - 200 to 18,000 ADT (Average Daily Traffic)
• Traffic speeds - 15 to 75 mph
• Percentage of heavy vehicles - 0 to 10%
• Ranges of development types, road widths, paved shoulders and bike lanes, on-street parking percentages, sidewalk widths and sidewalk buffer widths and types

Bicycle Level of Service: Abington



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

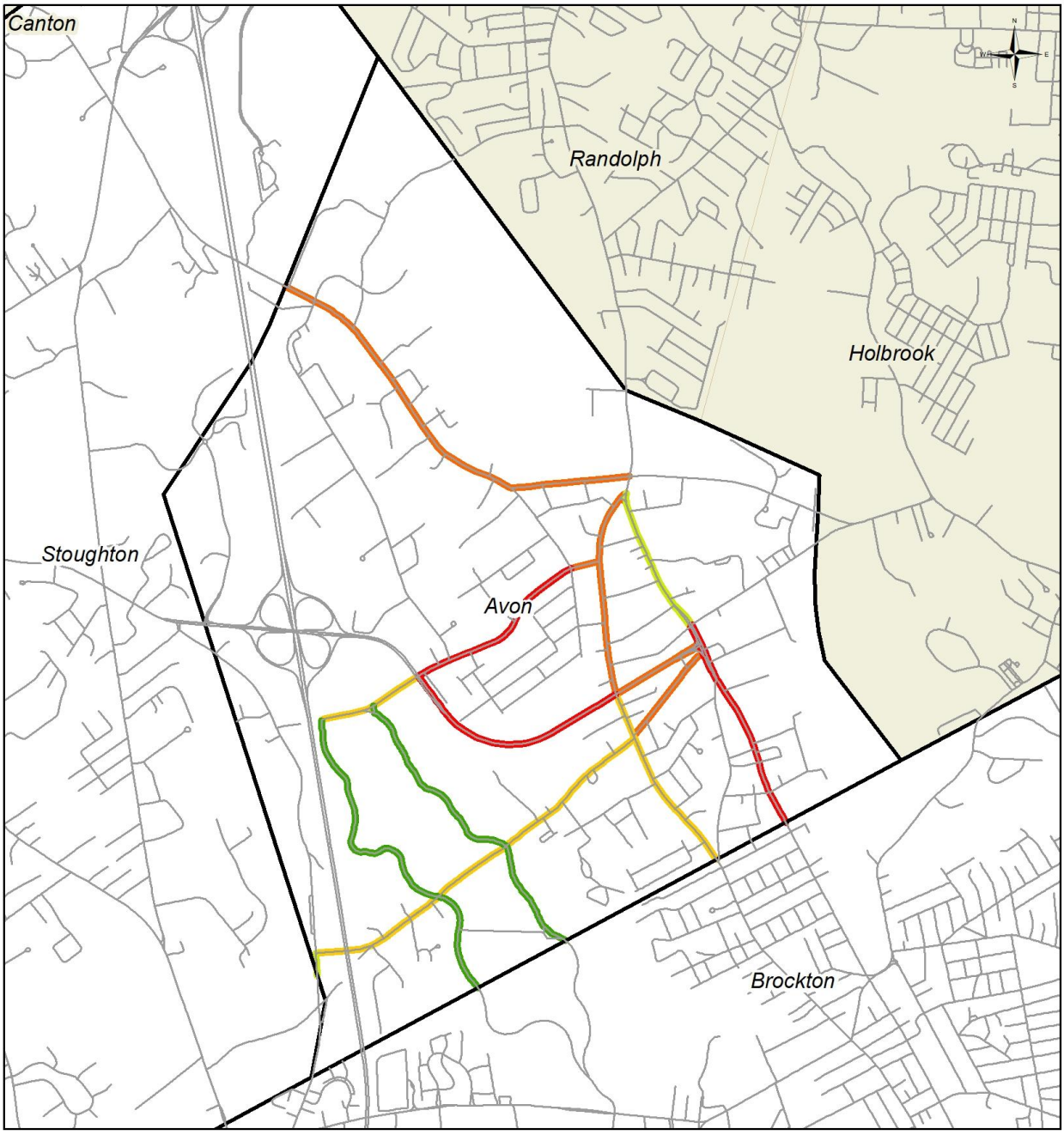
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Avon



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

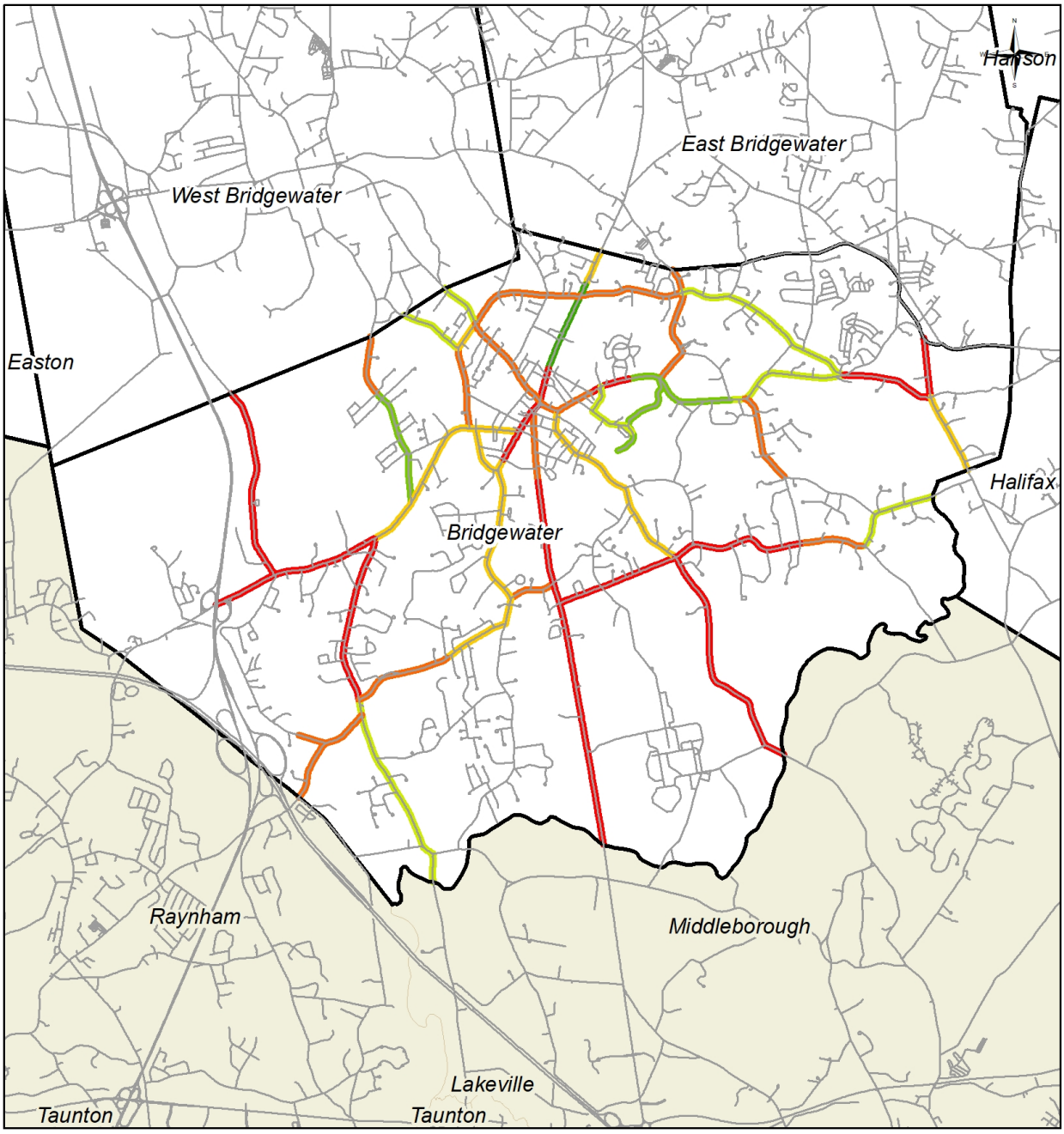
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Bridgewater



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

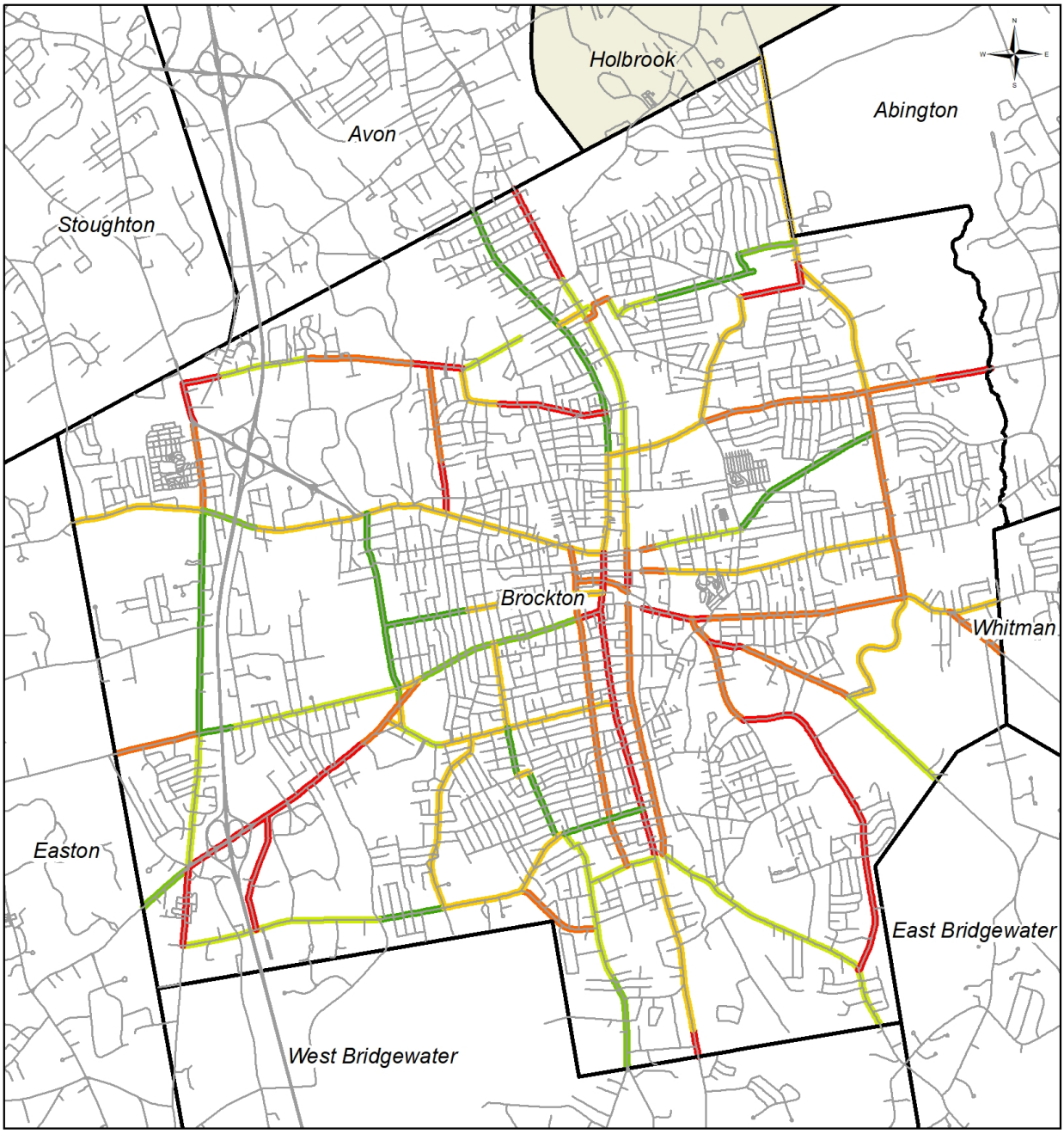
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Brockton



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

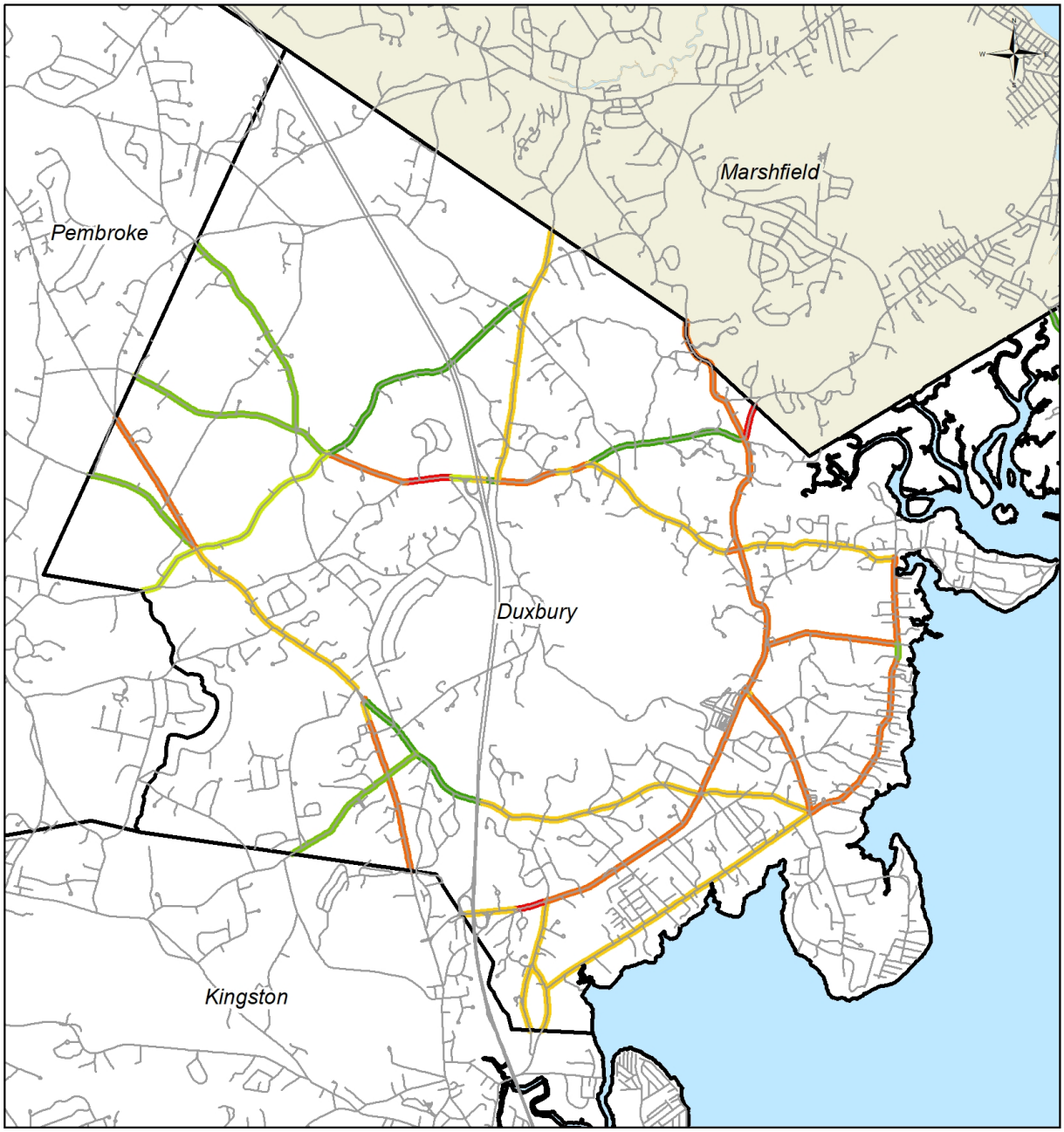
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Duxbury



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

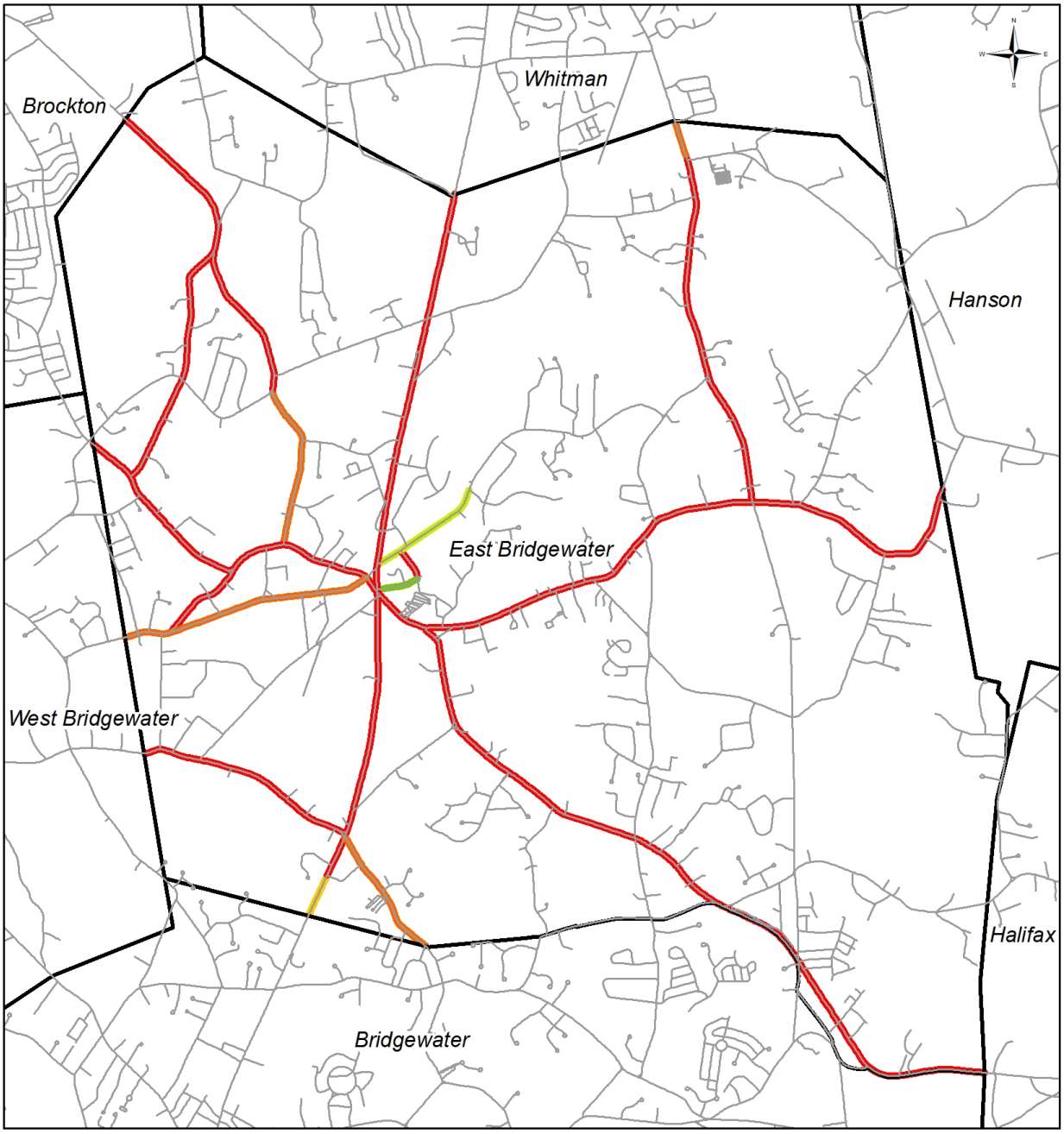
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: East Bridgewater



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

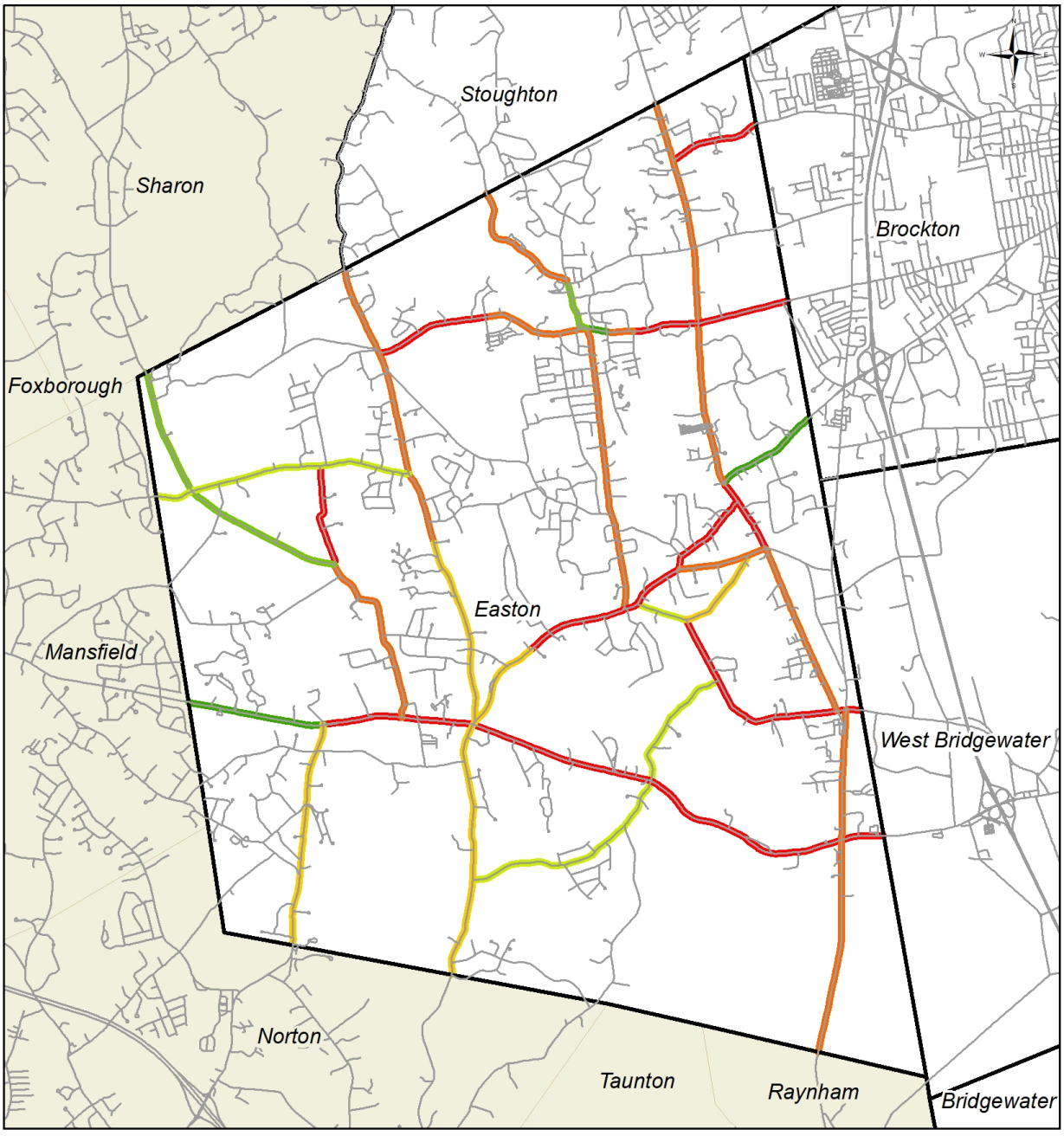
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Easton



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

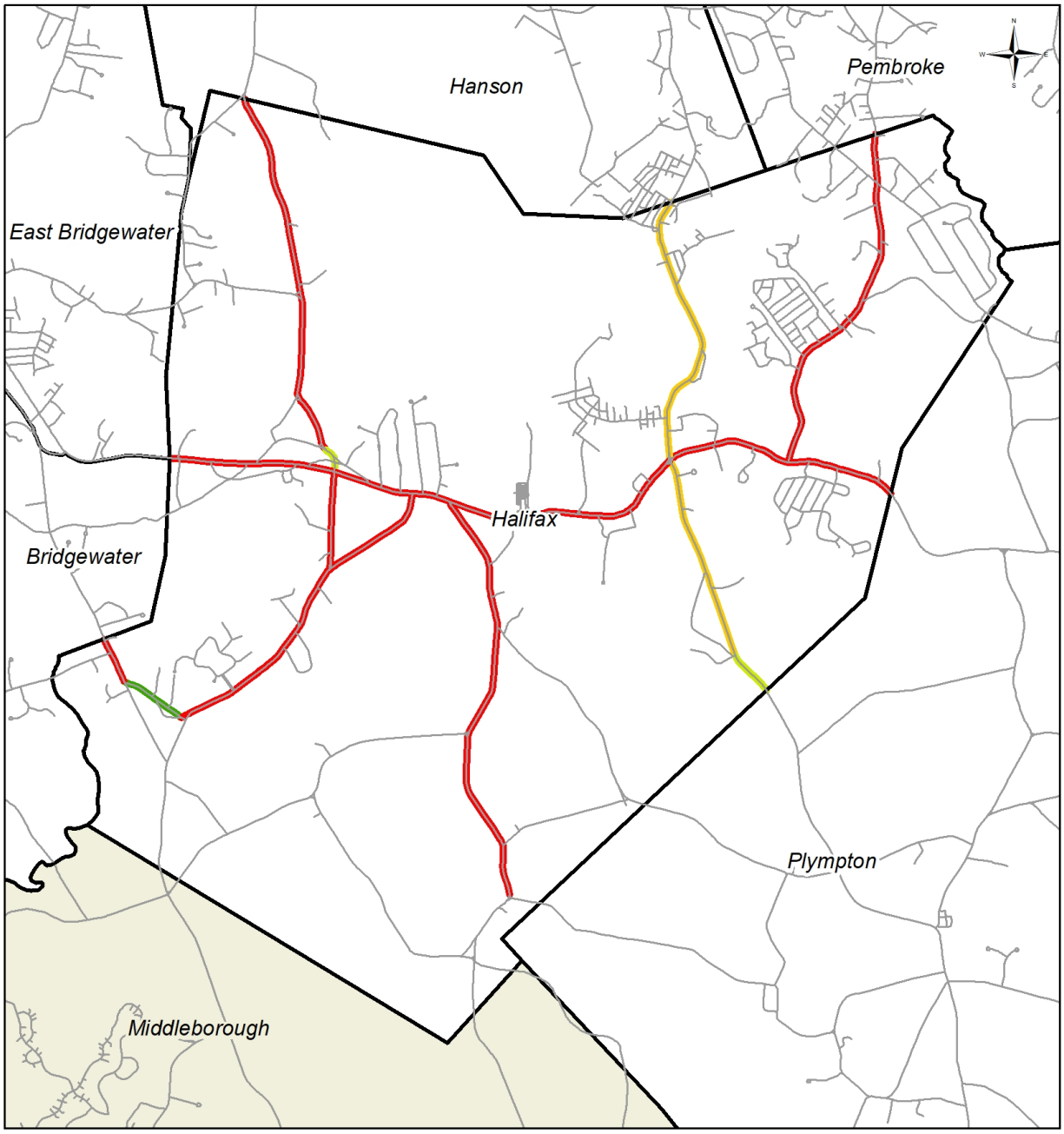
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Halifax



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

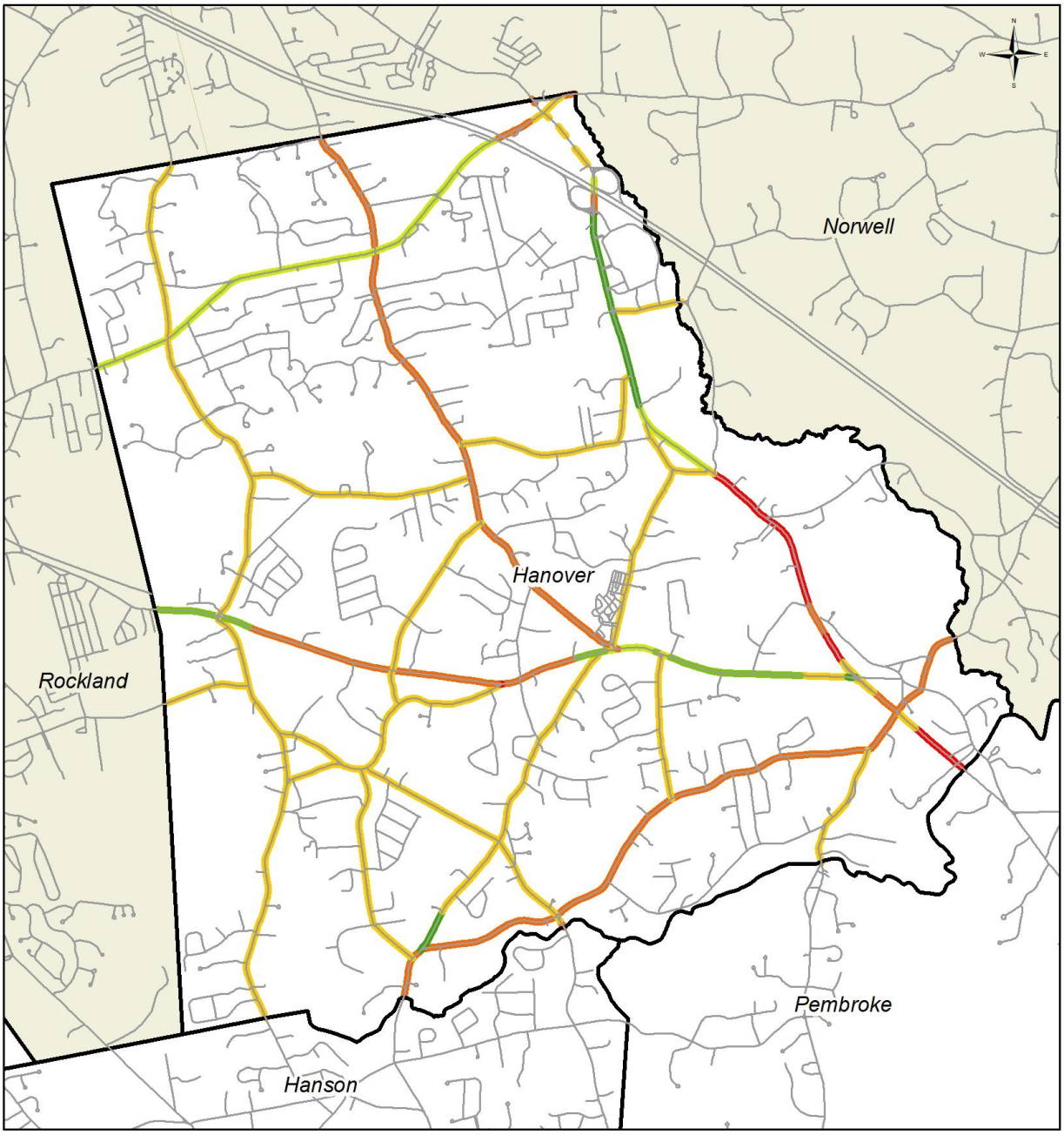
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Hanover



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

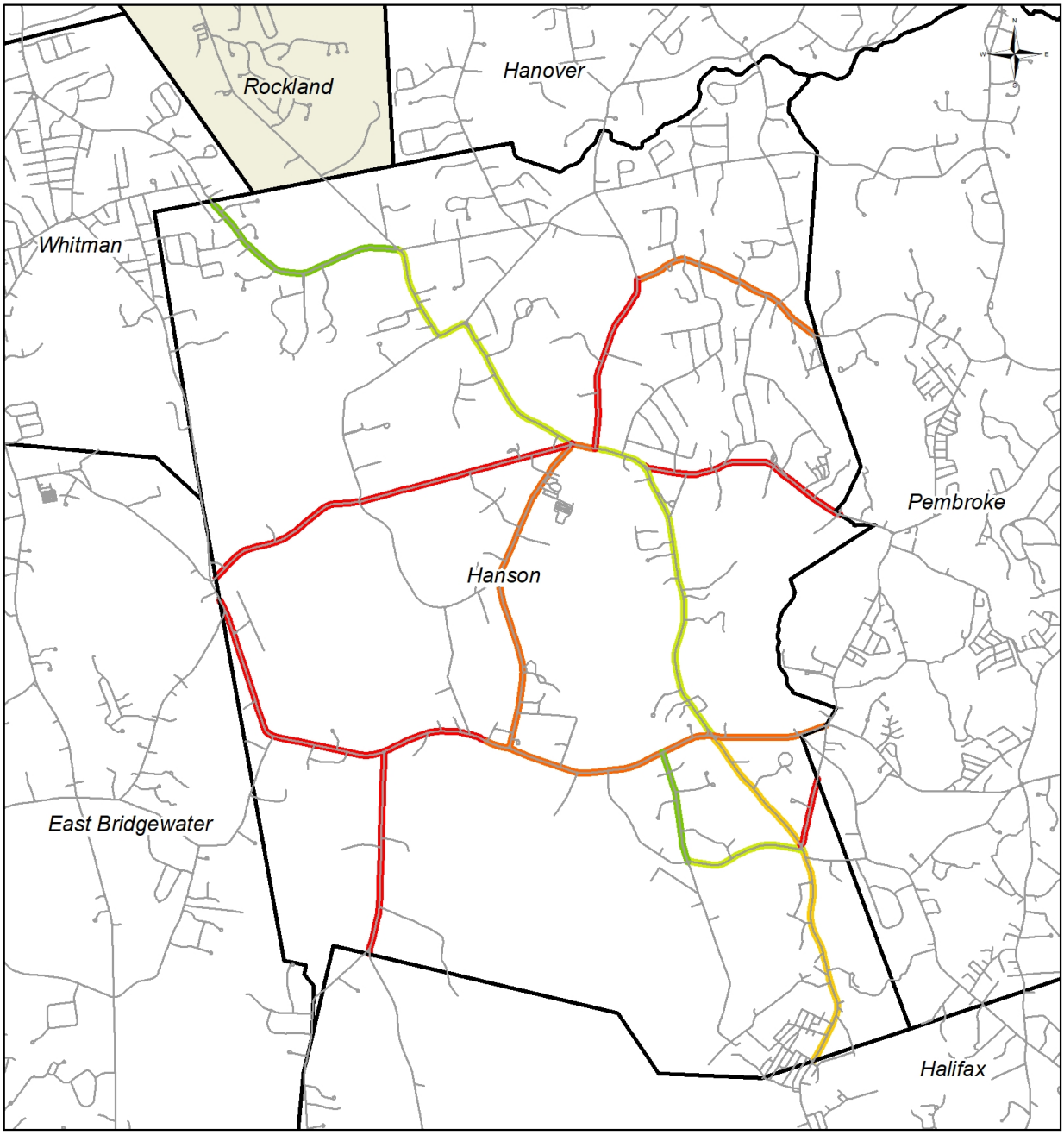
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Hanson



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

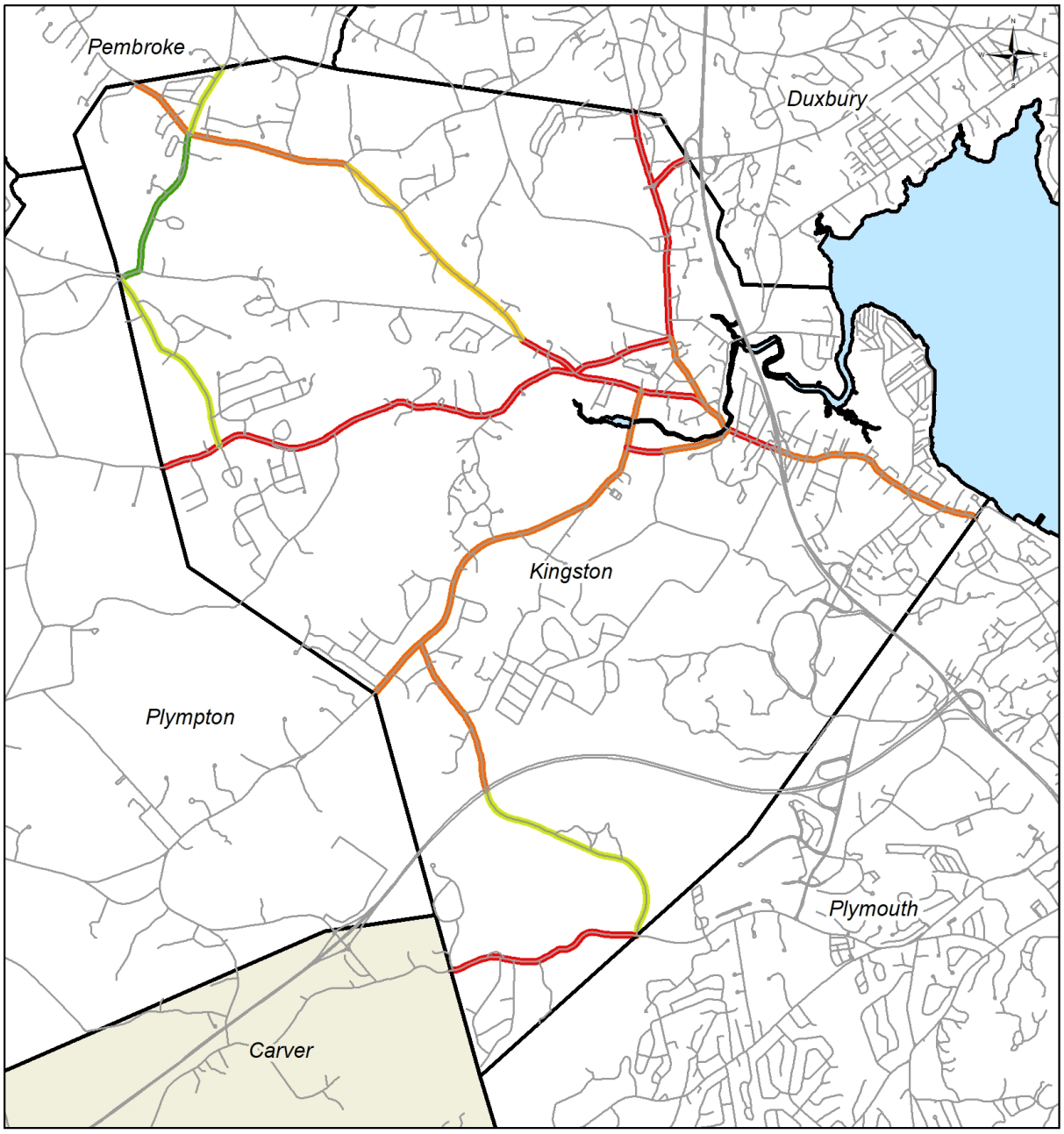
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Kingston



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

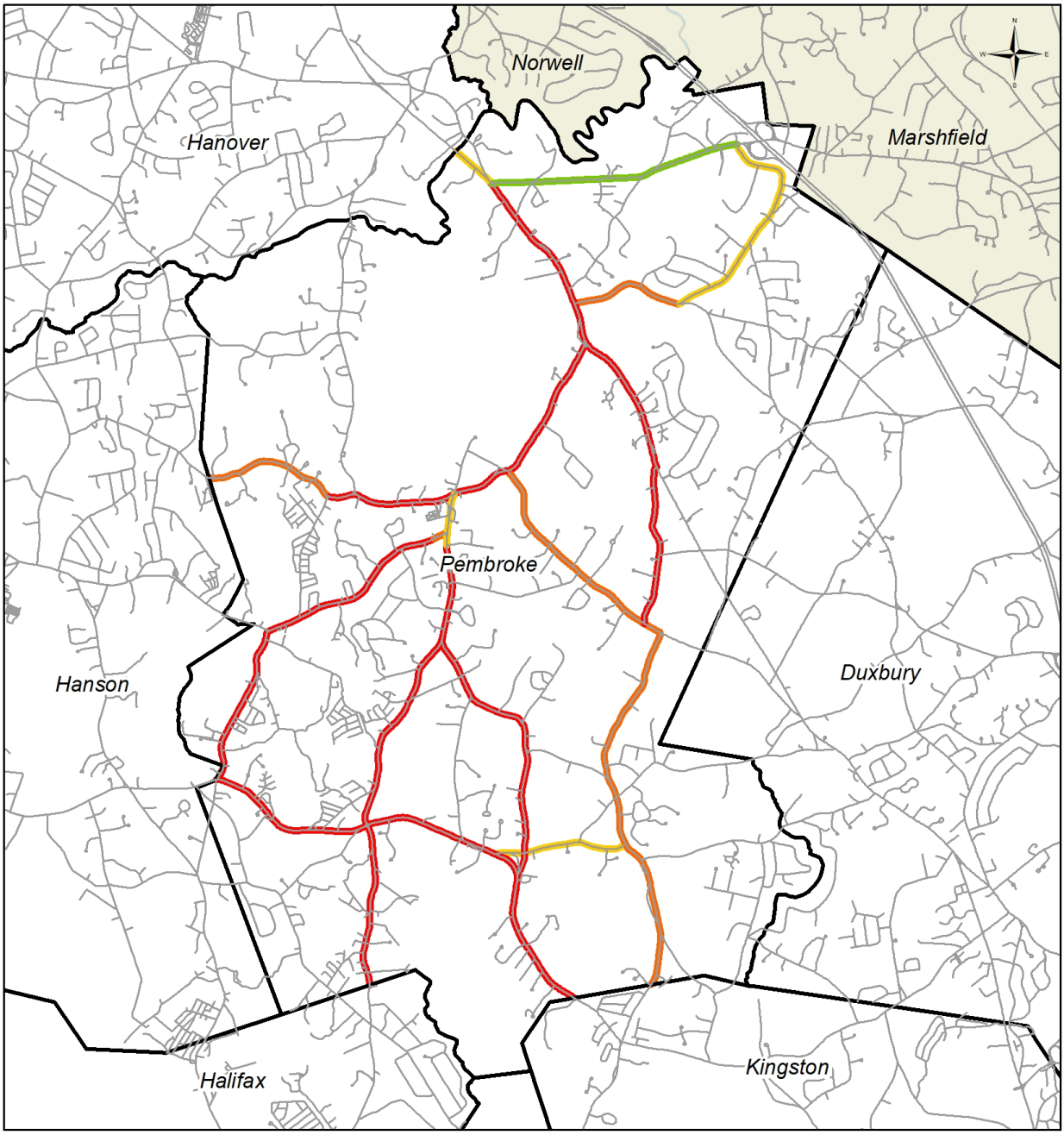
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Pembroke



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

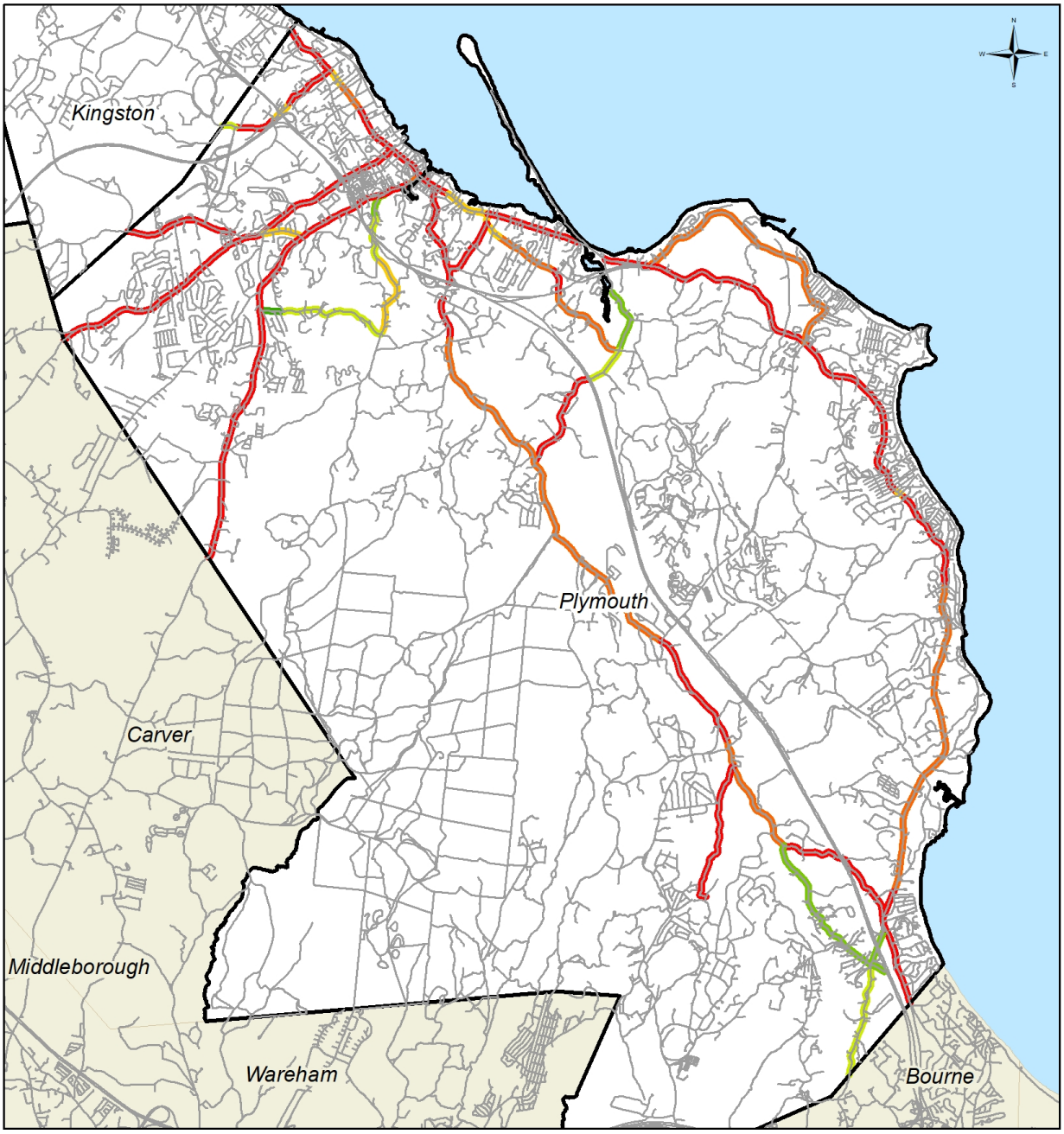
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Plymouth



- A
- B
- C
- D
- E
- F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

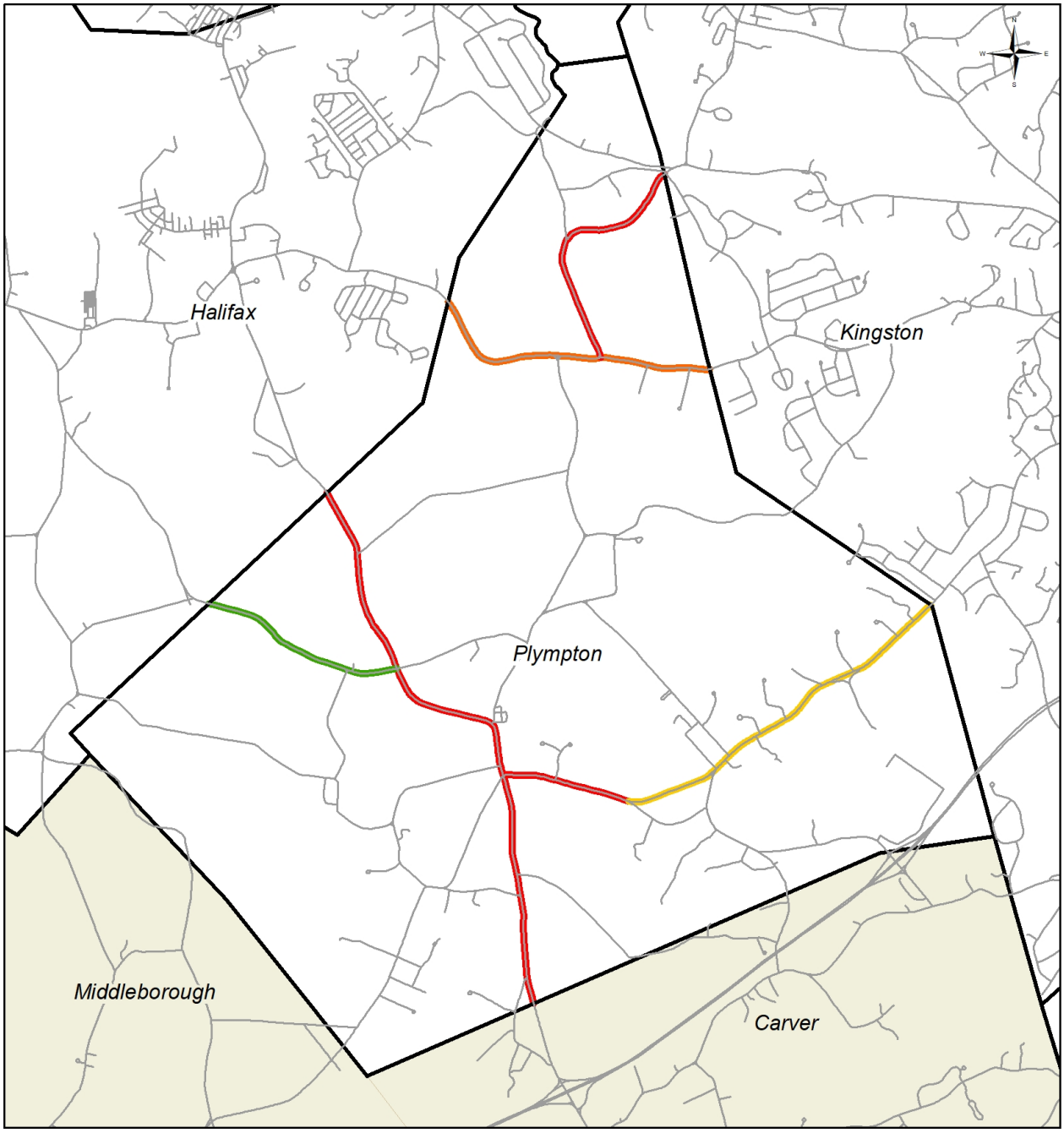
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Plympton



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

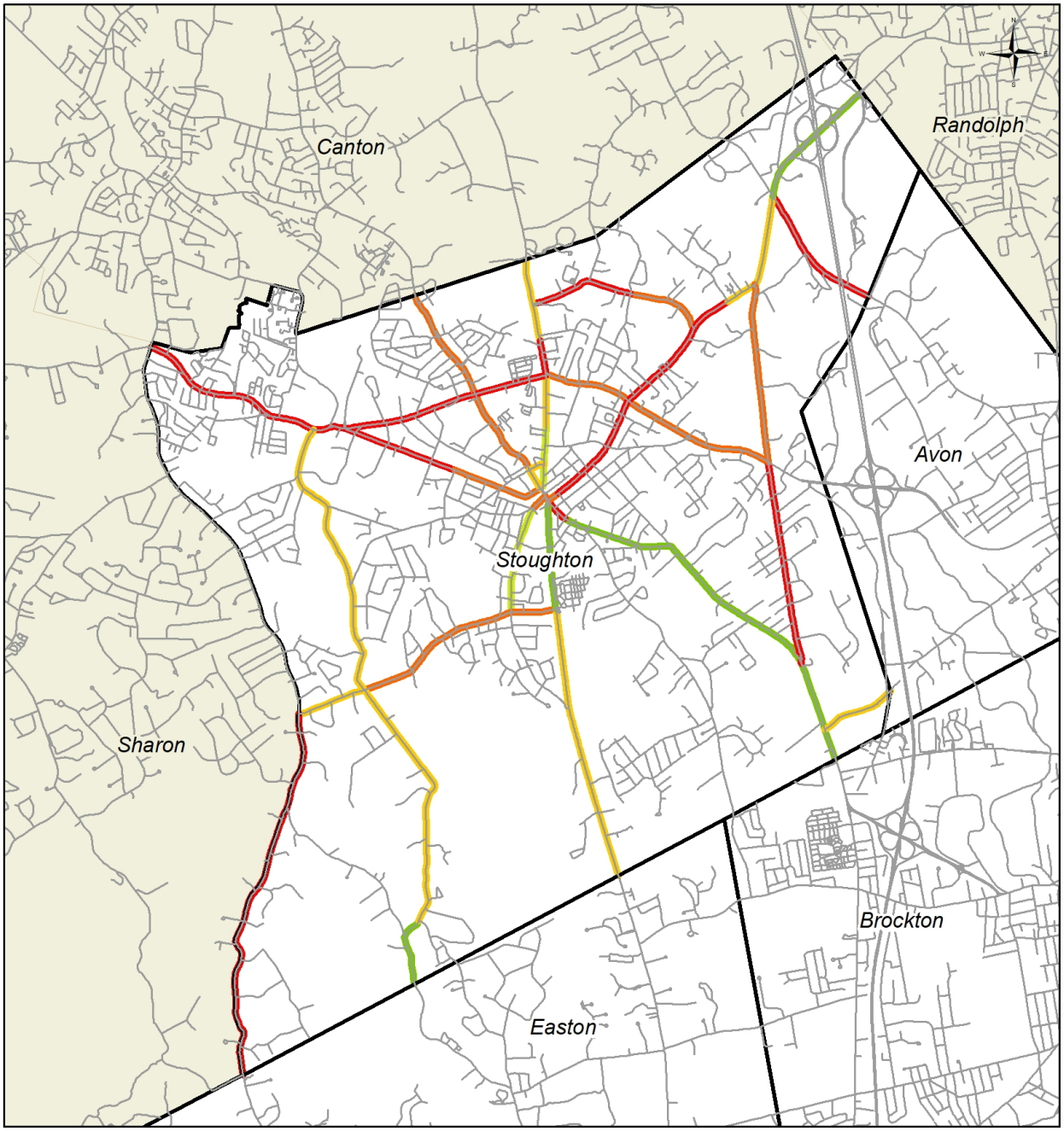
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Stoughton



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

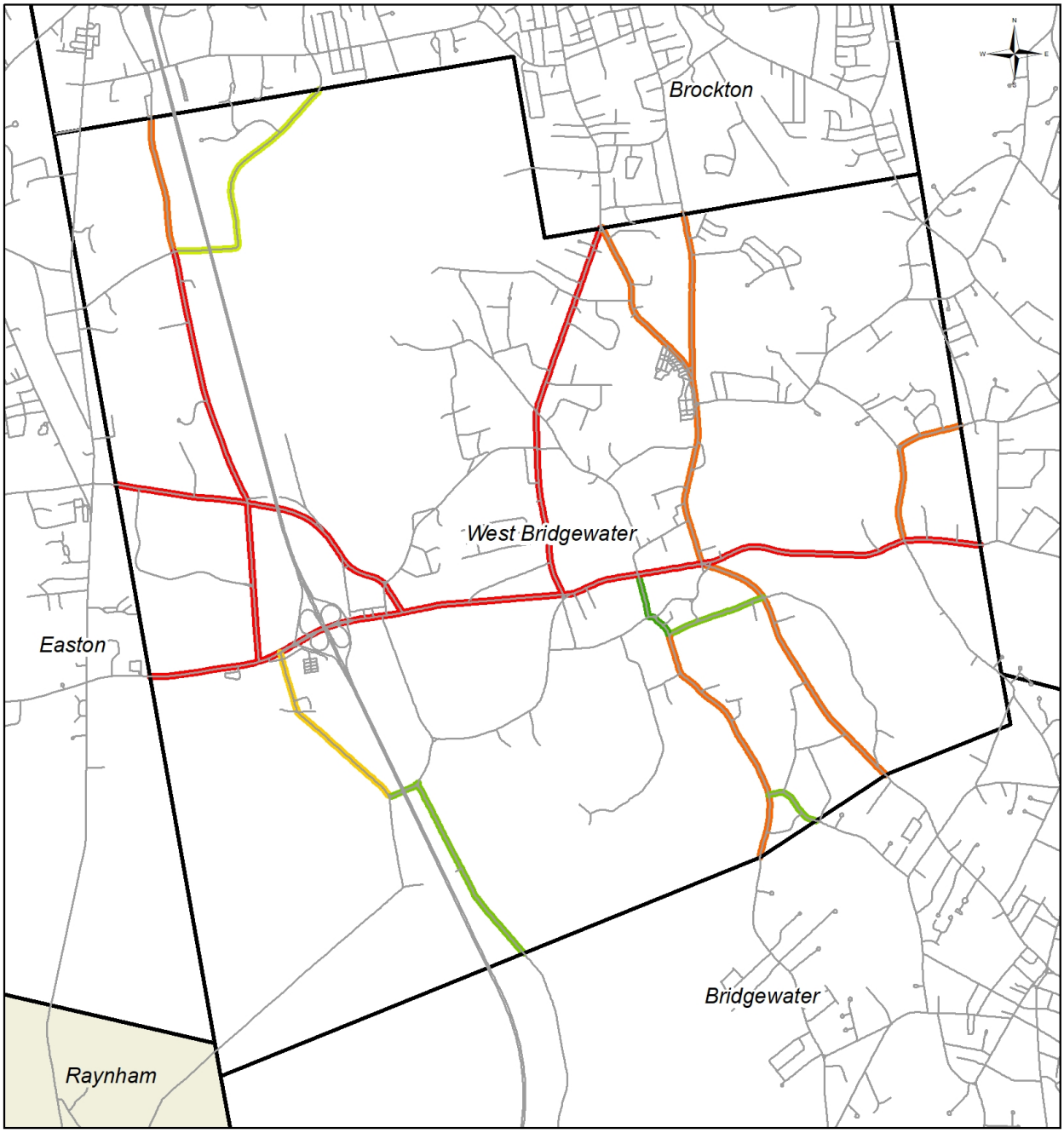
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: West Bridgewater



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

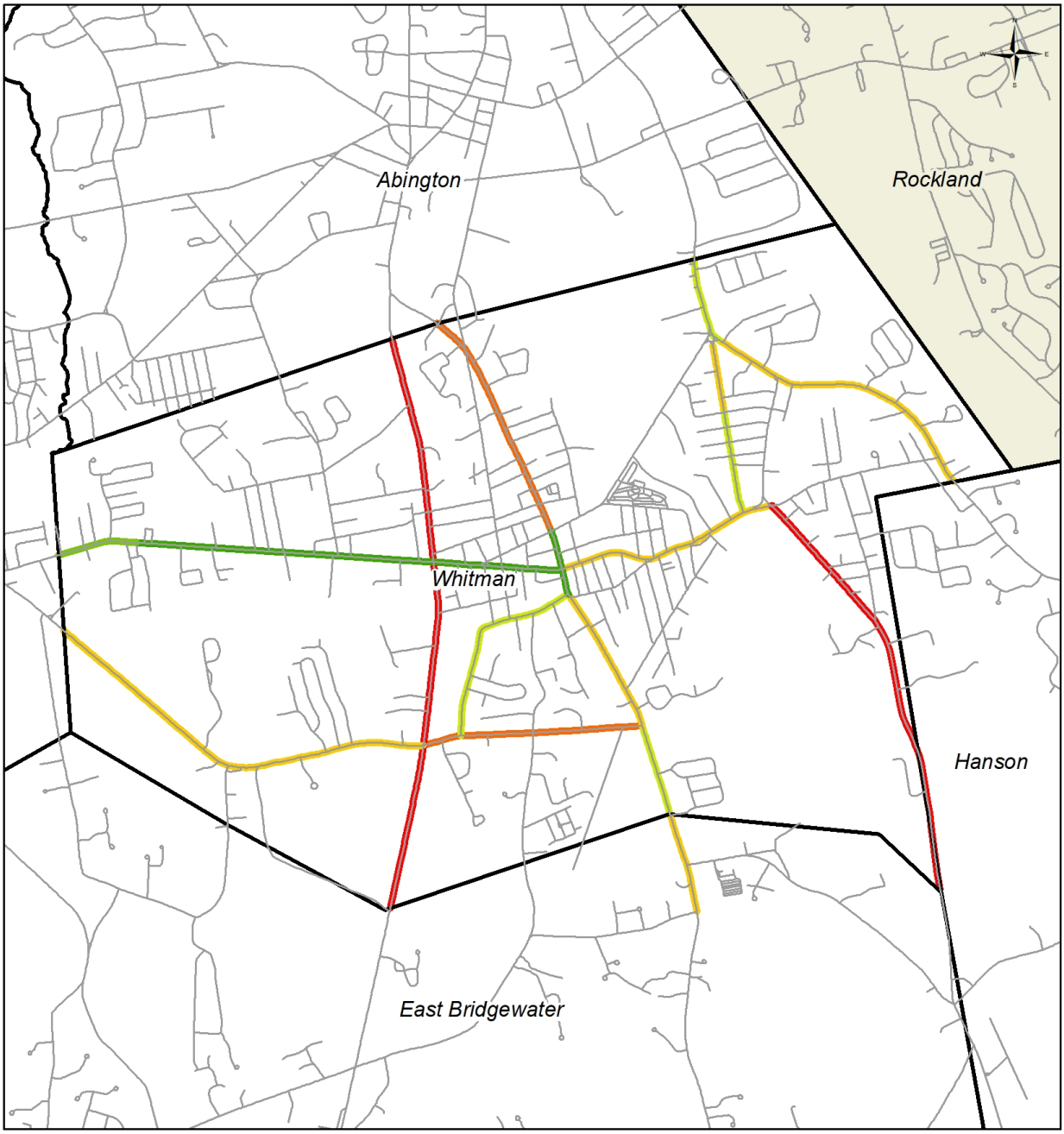
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Bicycle Level of Service: Whitman



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

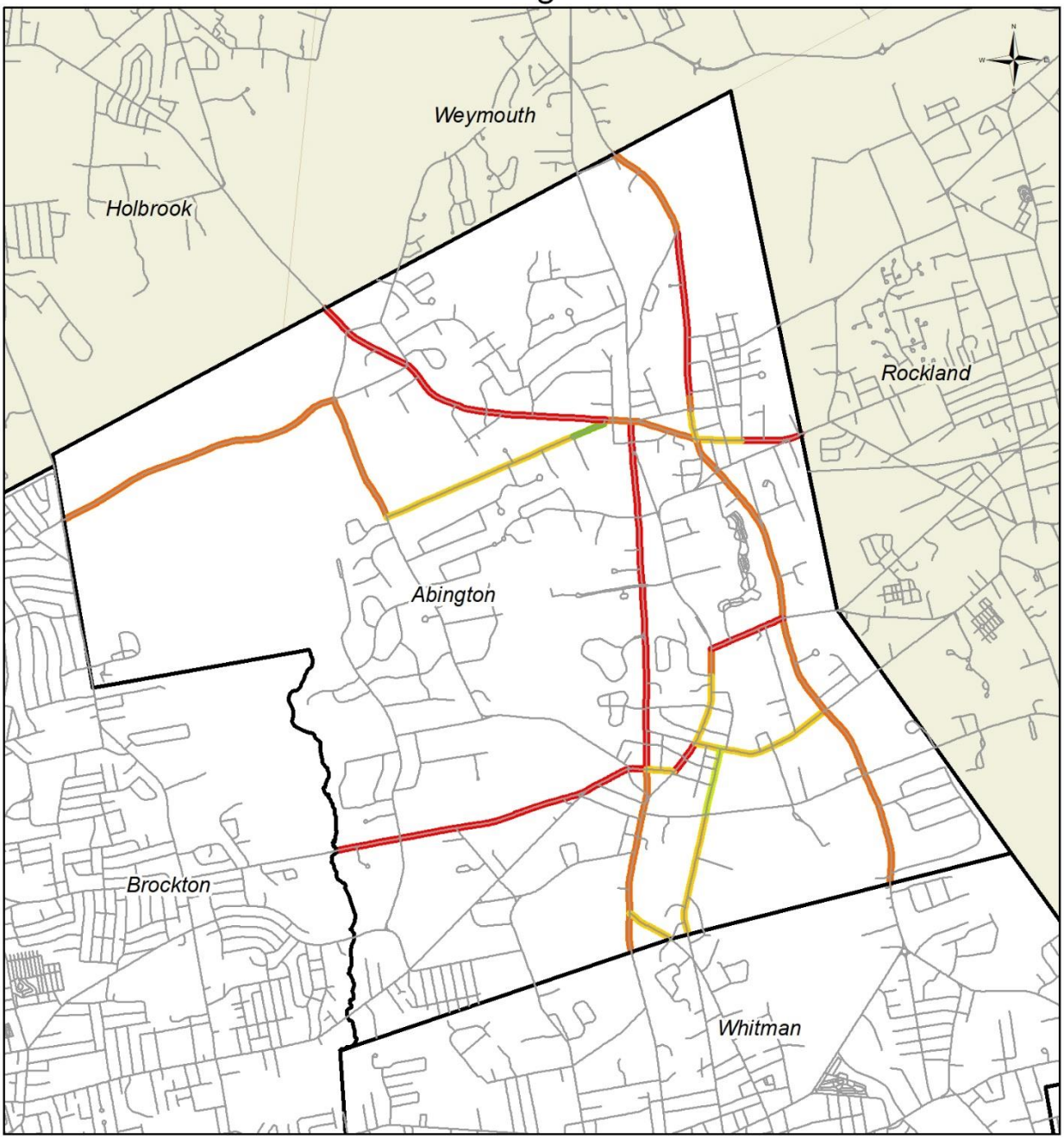
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Abington



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

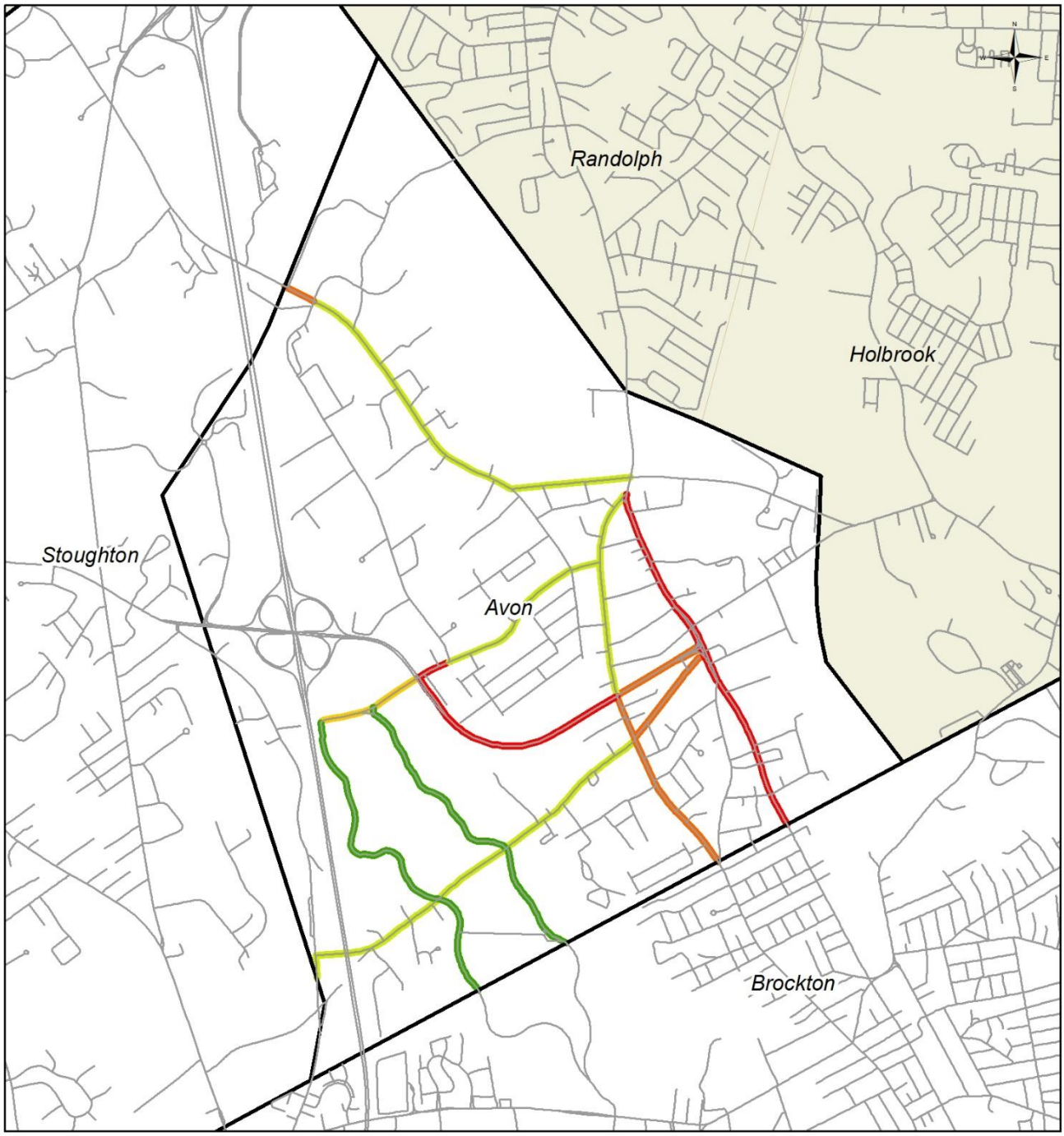
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Avon



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

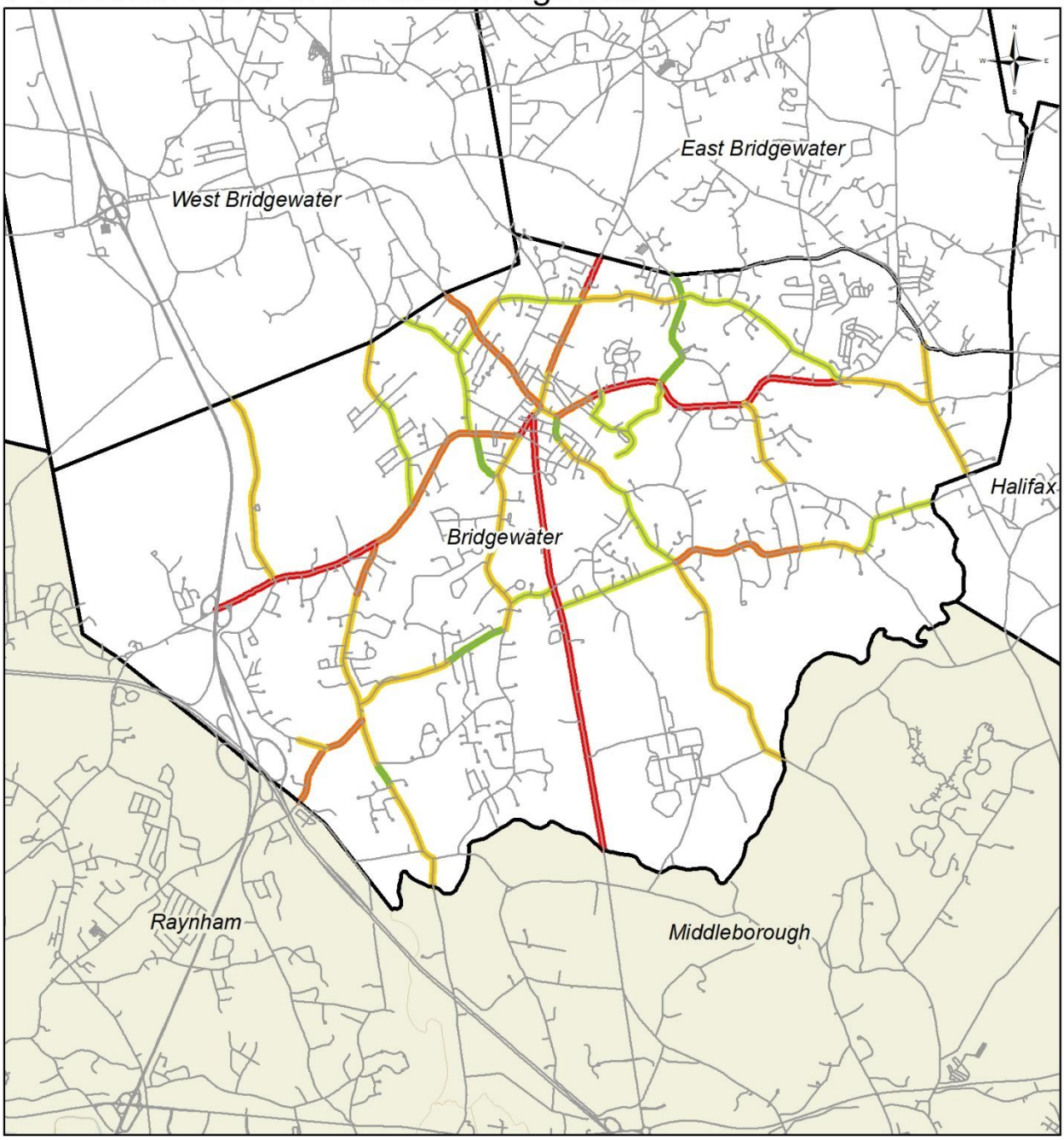
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Bridgewater



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

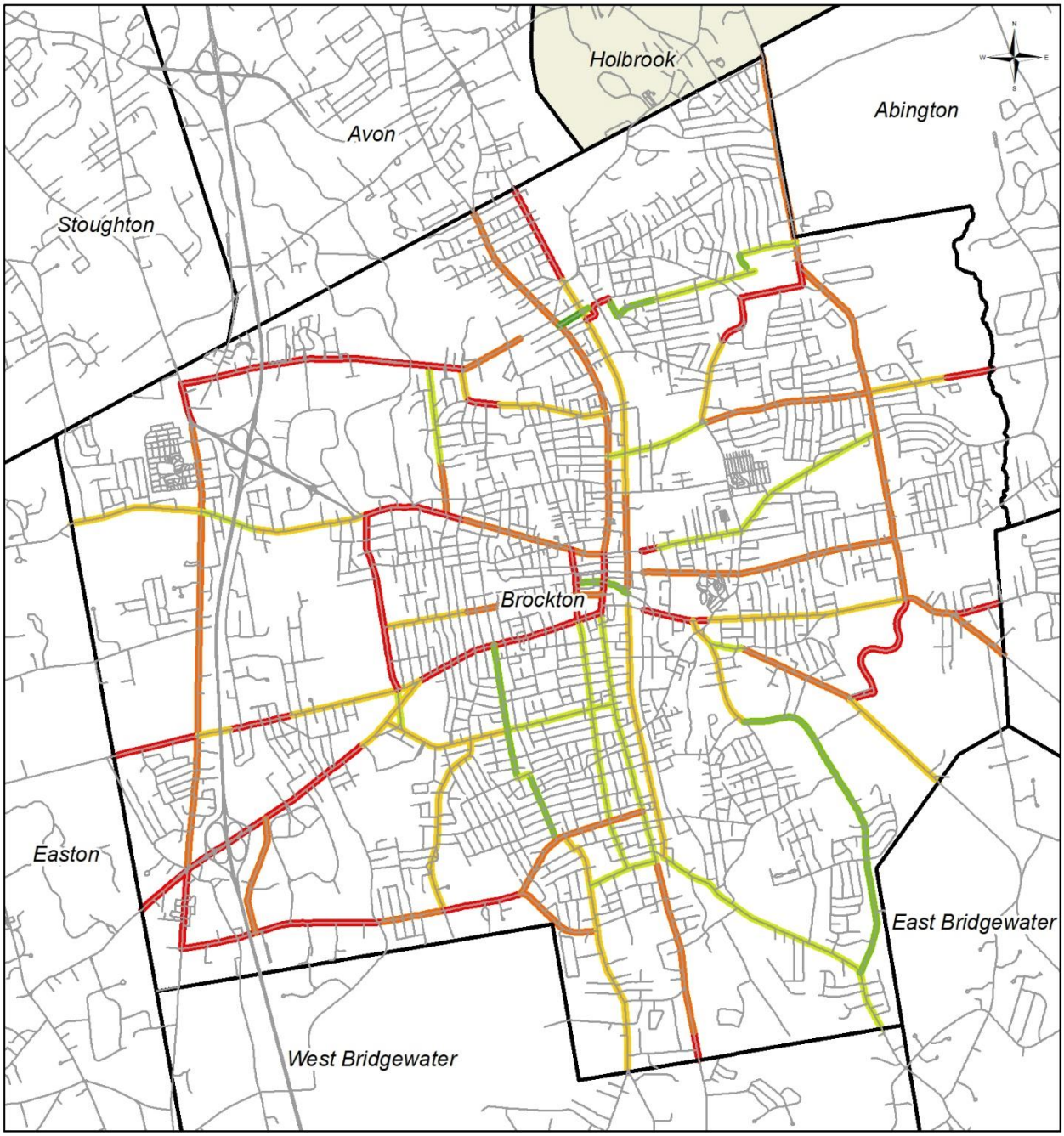
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Brockton



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

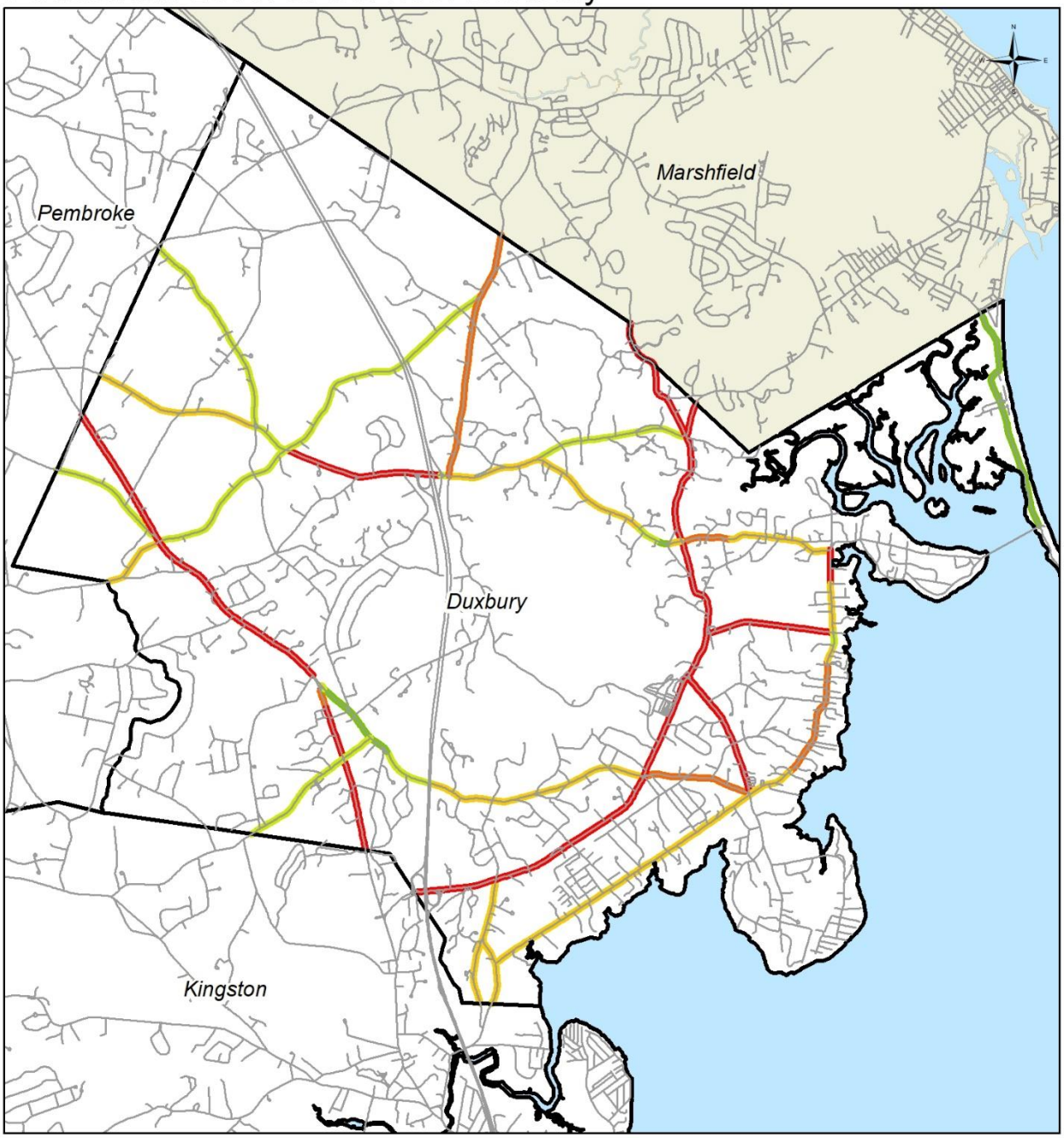
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Duxbury



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

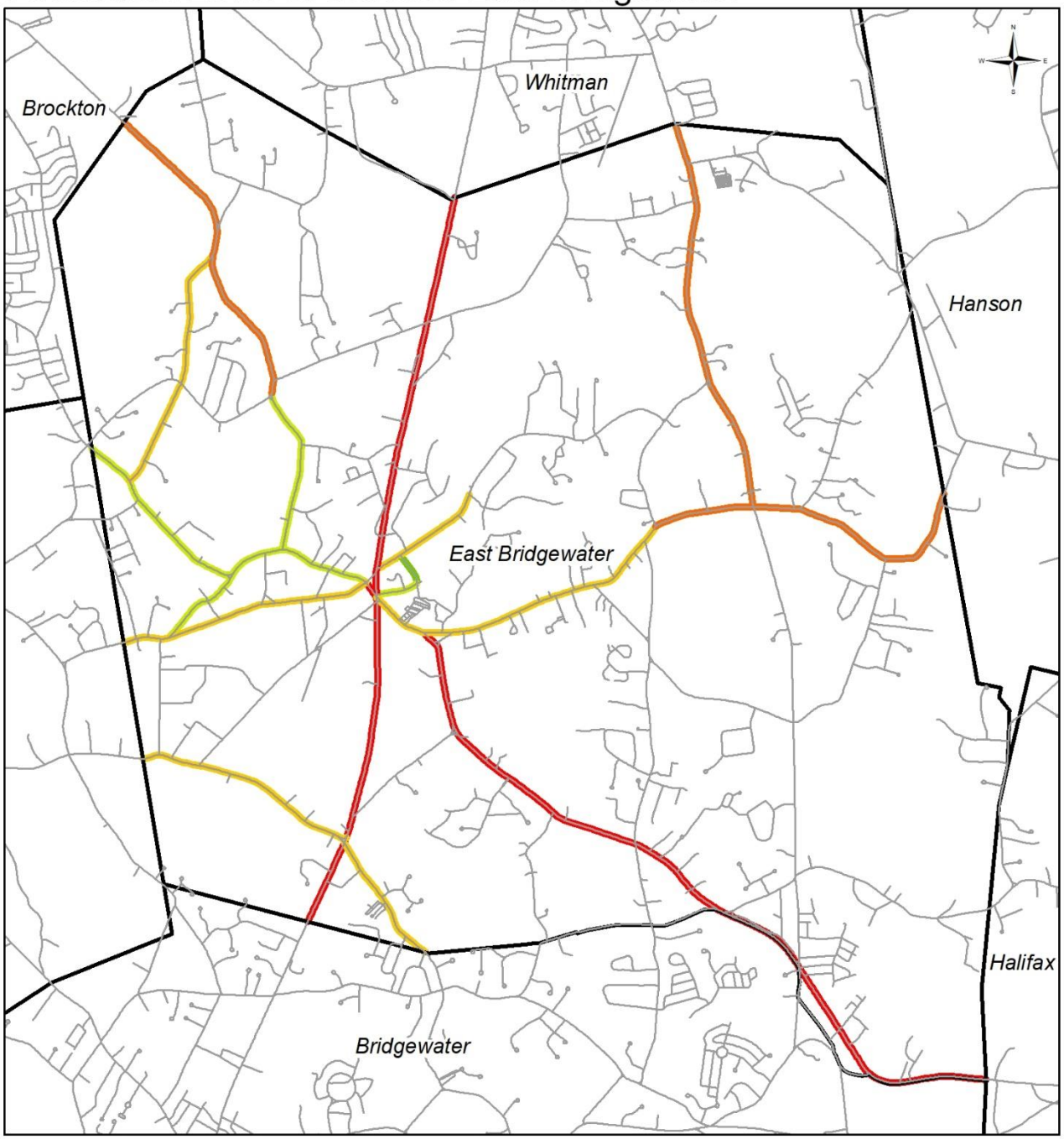
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: East Bridgewater



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

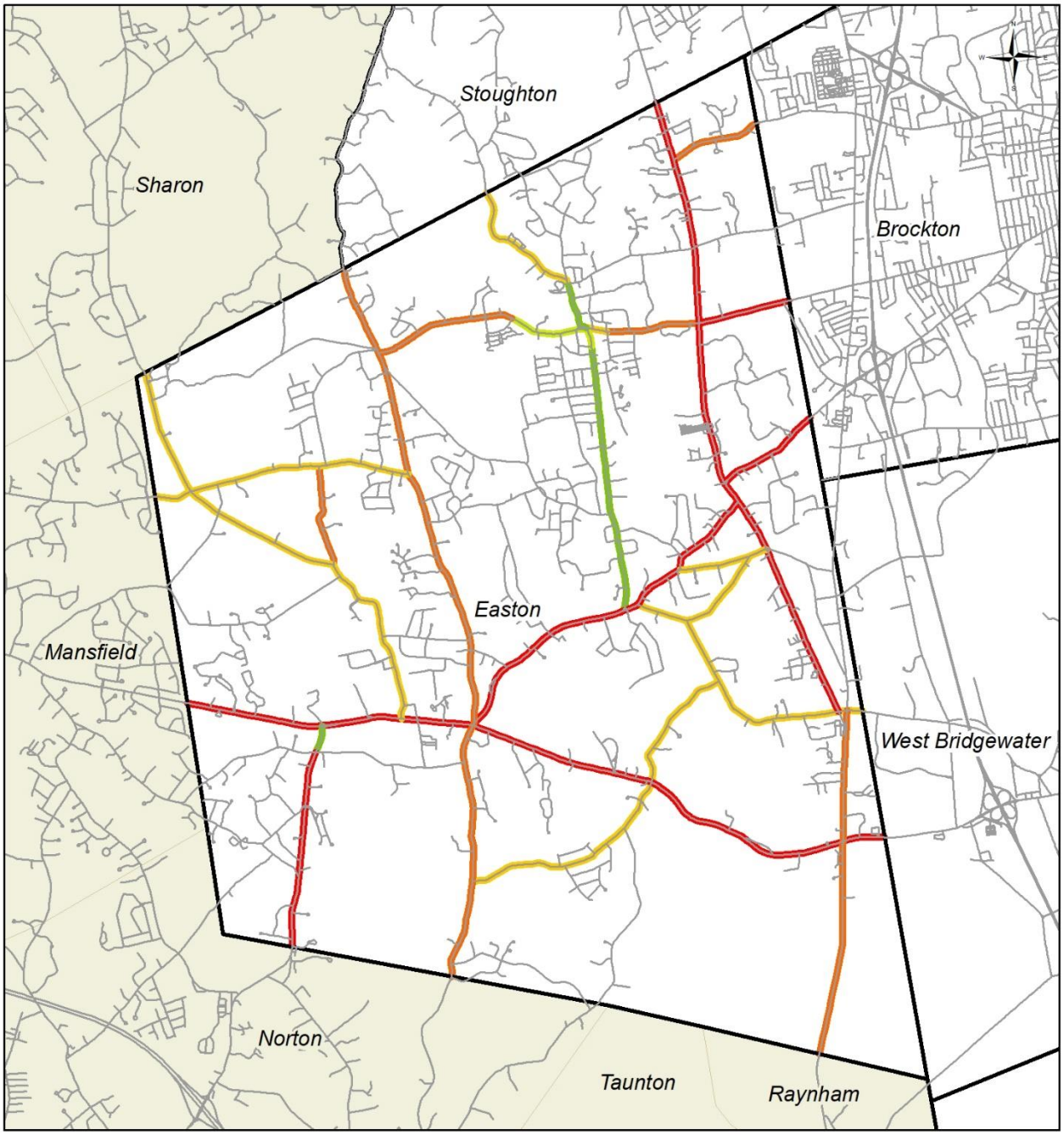
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Easton



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

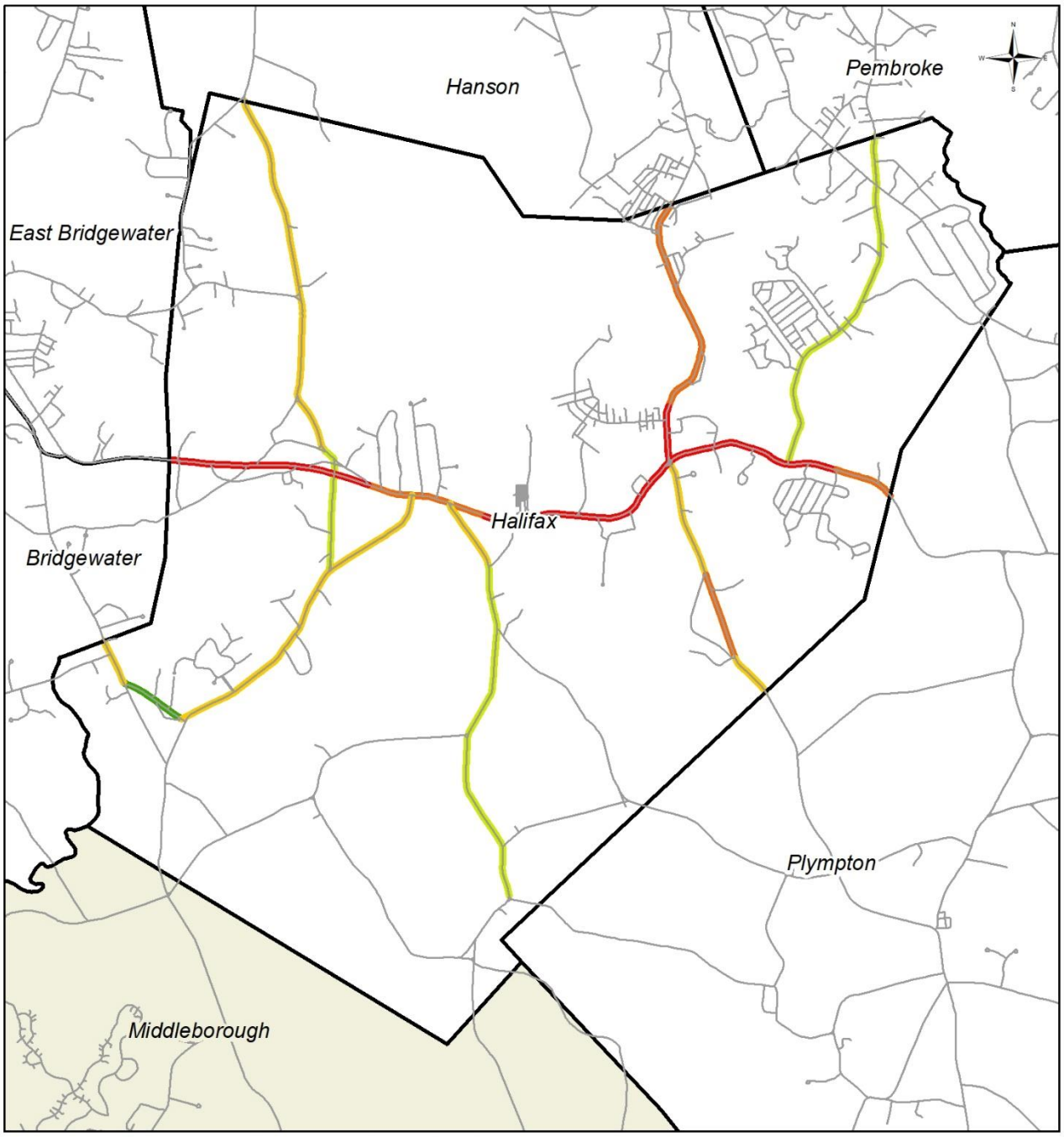
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Halifax



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

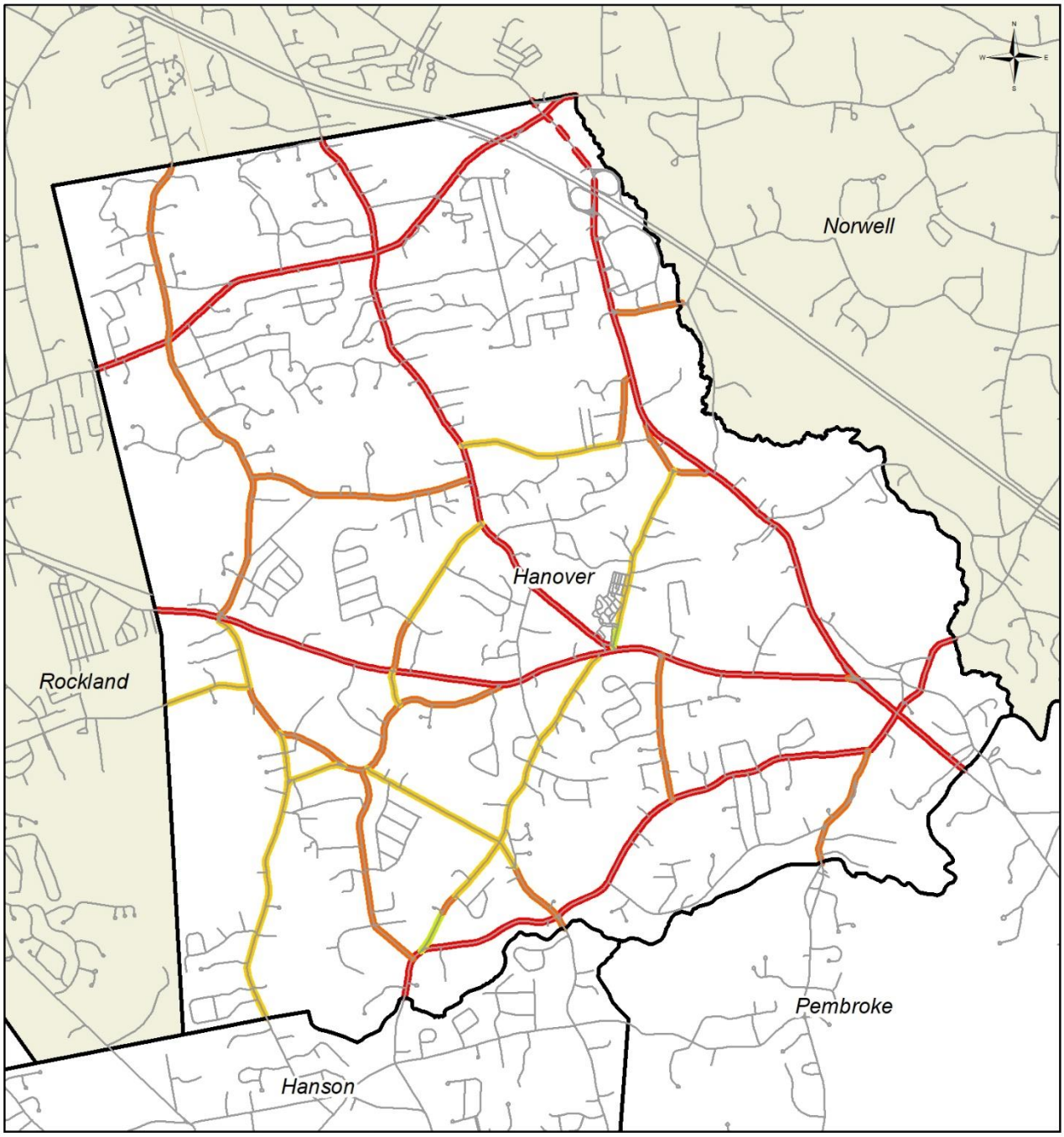
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Hanover



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

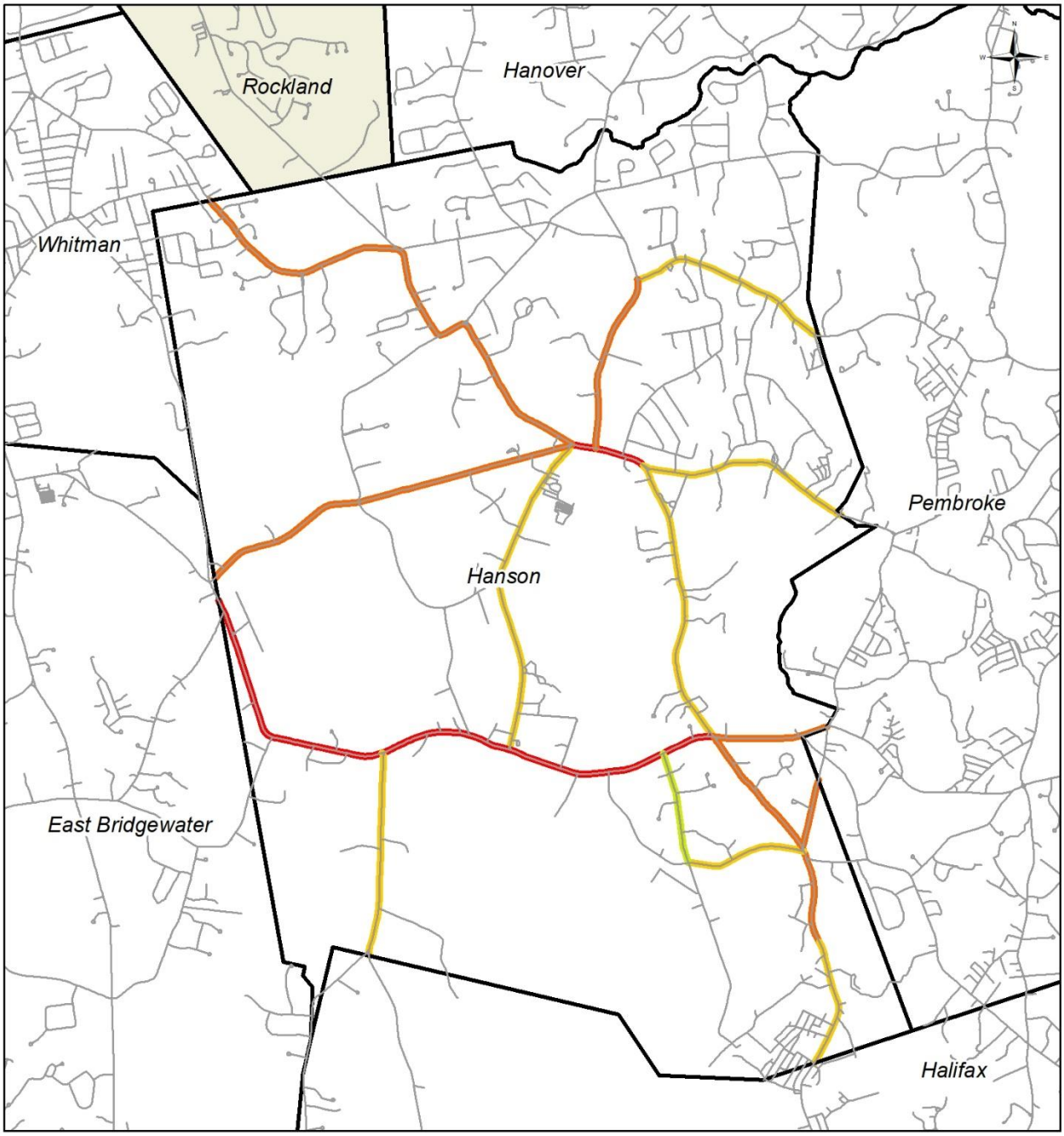
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Hanson



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

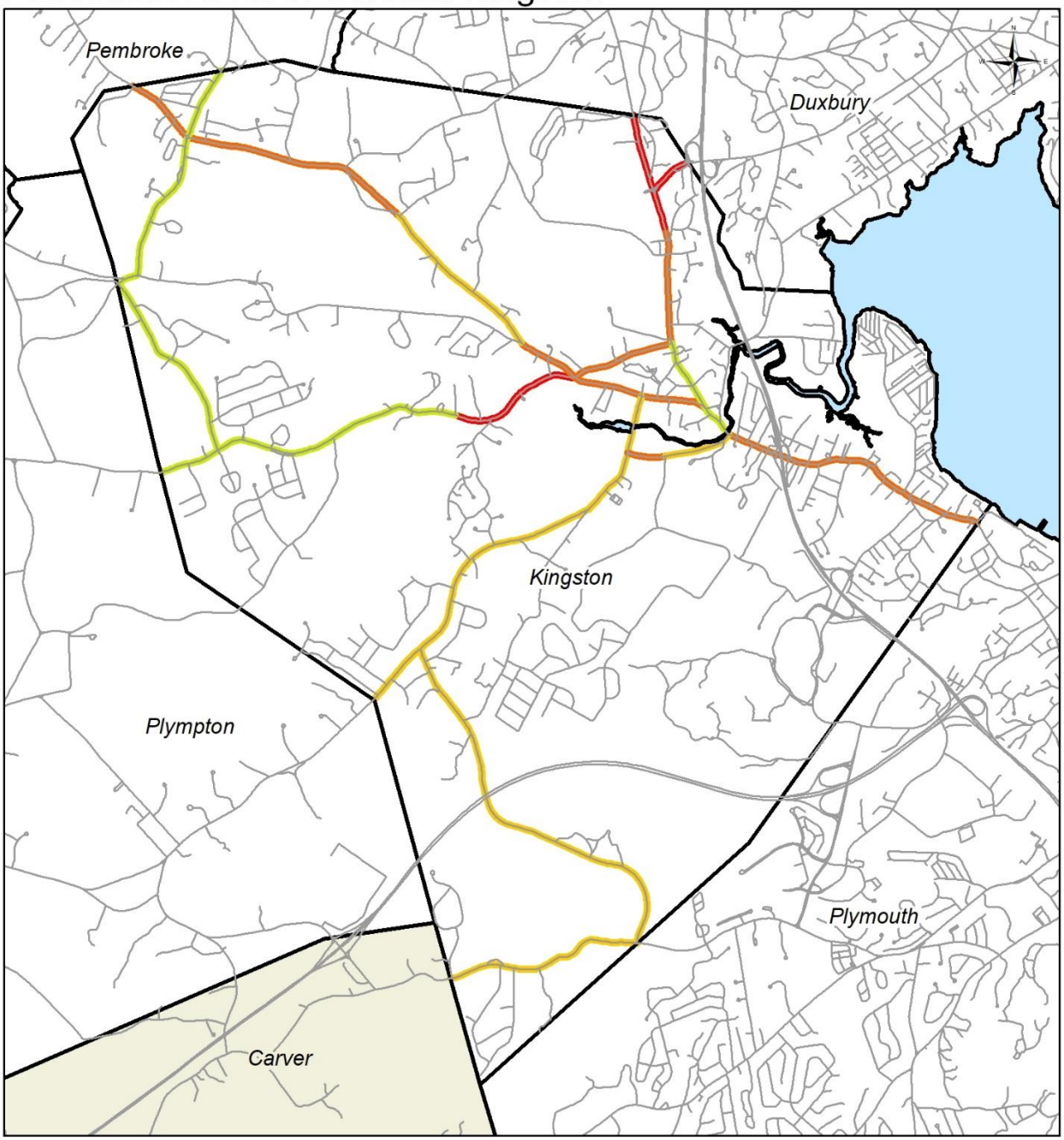
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Kingston



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

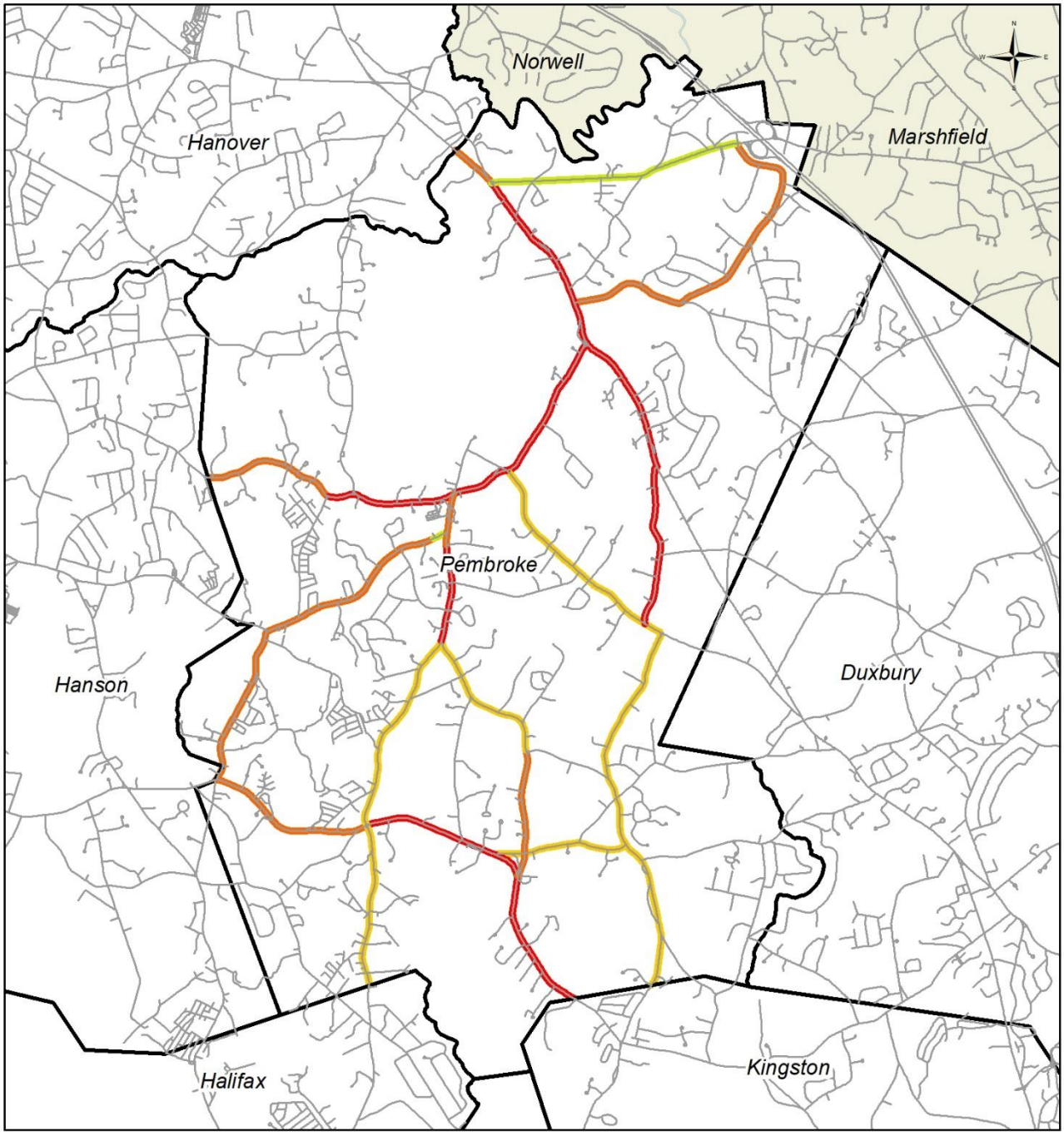
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Pembroke



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

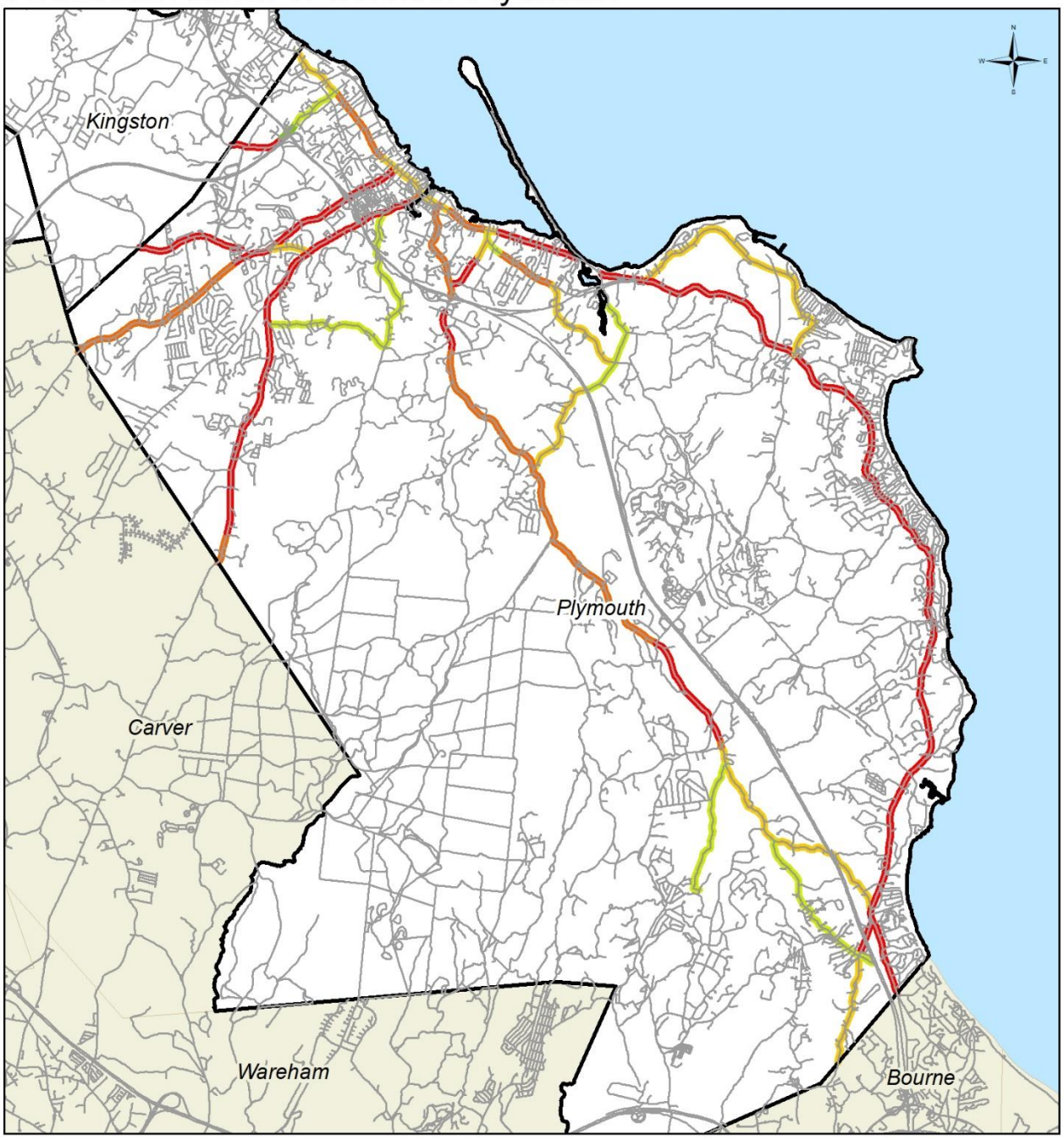
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Plymouth



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

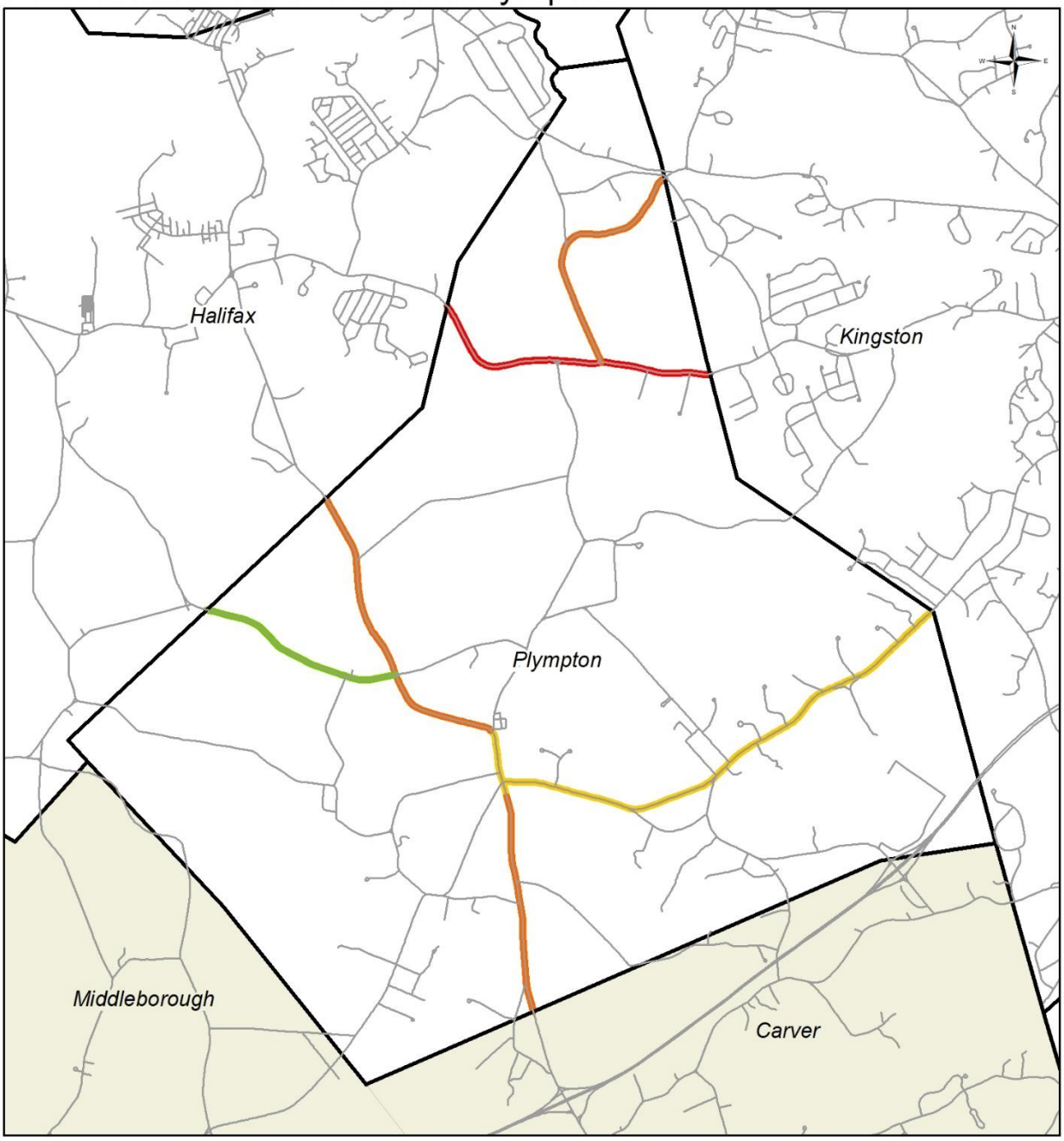
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Plympton



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

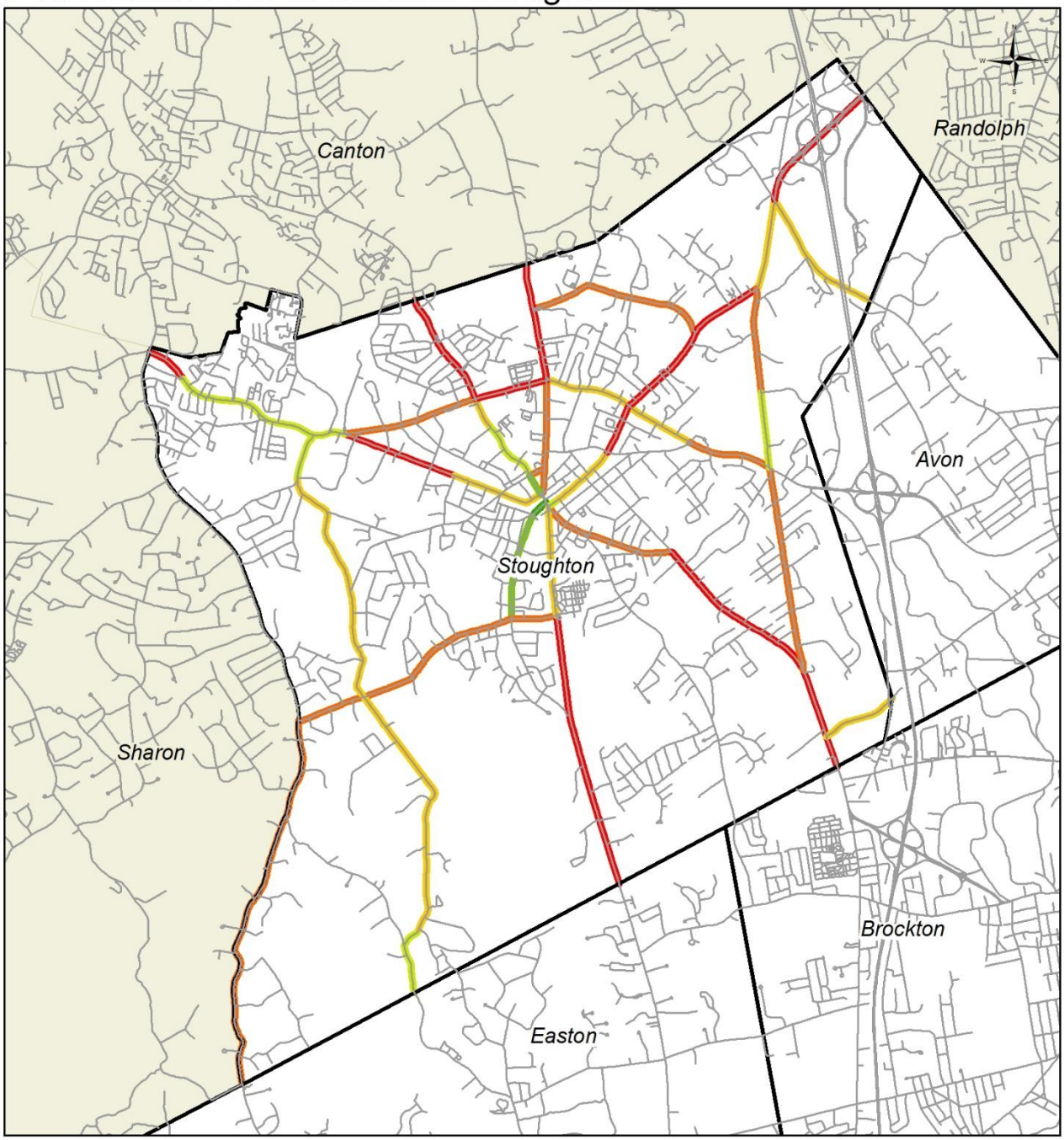
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Stoughton



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

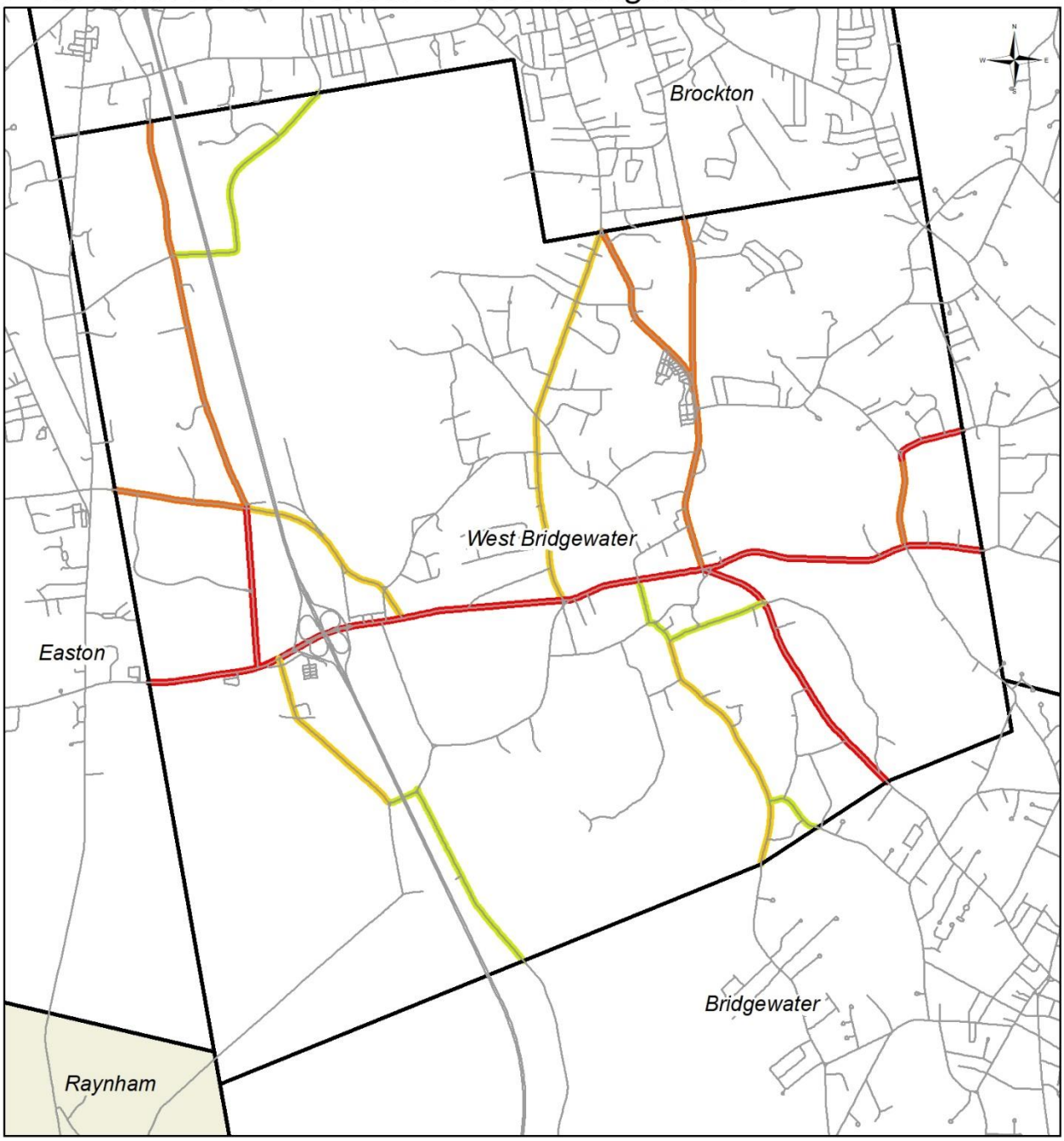
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: West Bridgewater



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

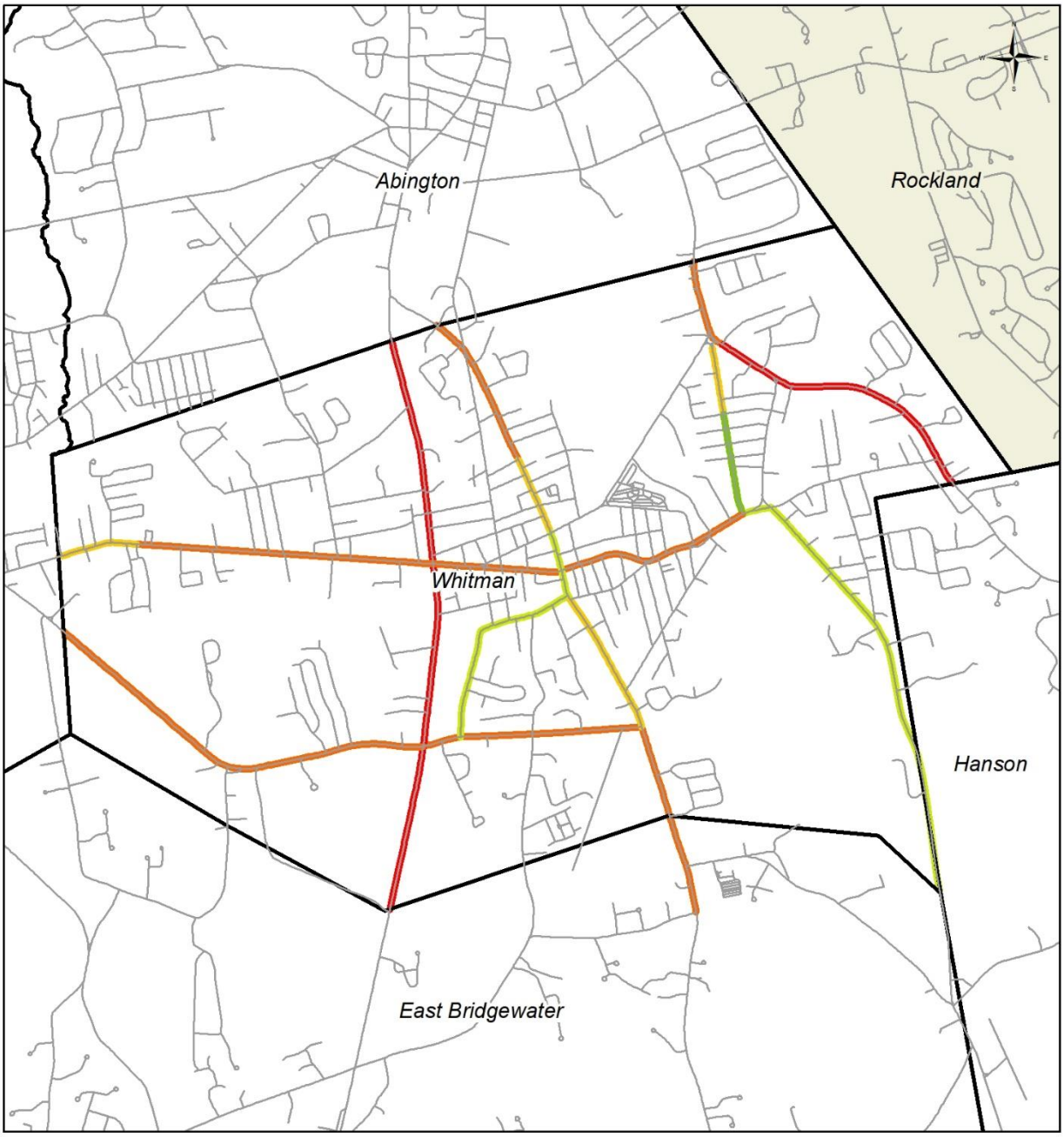
OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC

Pedestrian Level of Service: Whitman



A
B
C
D
E
F

Level of Service is a grade assigned to a roadway based on factors that facilitate or impede connectivity.

OLD COLONY PLANNING COUNCIL

Old Colony Planning Council
70 School Street, Brockton, MA 02301

www.ocpcrpa.org
Created November 2021

GIS Data Sources: Massachusetts Department of Transportation (MassDOT), Office of Geographic Information (MassGIS), OCPC