

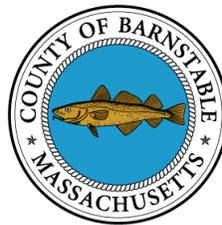


CAPE COD
COMMISSION

Town of Bourne

Complete Streets Prioritization Plan

April 25, 2022



Prepared by Cape Cod Commission staff on behalf of the Town of Bourne

Acknowledgements

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Executive Summary

The Town of Bourne is seeking to improve the travel experience for all users of its streets – motorists, pedestrians, and bicyclists – through the development of a Complete Streets Prioritization Plan. With funding provided by the Massachusetts Department of Transportation (MassDOT), Bourne has retained the services of the Cape Cod Commission (CCC) transportation staff to develop this plan. The purpose of this study is to explore transportation improvement alternatives that will reduce conflicts, improve traffic flow, and incorporate multi-modal transportation options in Bourne, while furthering the creation of vibrant, pedestrian- and bicycle-oriented mixed-use centers throughout the town.

The plan includes discussion of the town’s characteristics and existing conditions to help identify problem areas. With a population of over 20,000 people (year-round) and an even larger summer population, summer traffic demands can be challenging, especially for pedestrians, who must use many town streets that lack sidewalks. Additionally, bicyclists and pedestrians must contend with the large amount of pass-through bridge traffic, as Bourne is the site of both bridges onto and off the Cape. Additional factors are also considered such as speed limits and areas with reported pedestrian or bicyclist crashes.

Potential need for pedestrian/bicyclist travel is affected by the distributions of the residential population, including Environmental Justice (EJ) populations designated by the state based on 1.) Low-income populations in parts of Mashpee, Pocasset, and in the lightly populated section of the town between Route 28 and Route 6 (Joint Base Cape Cod); and 2.) Minority populations in the Sagamore Bridge area. Other areas that are well suited to access via walking and bicycling are business and community activity areas. Consequently, the study group identified such areas within Bourne.

CCC and the Town of Bourne held a Virtual Public Input Session in February of 2021 to gather input and prepare a list of potential projects (there was an initial public meeting scheduled for March of 2020, which was cancelled due to the COVID-19 pandemic). After the 2021 meeting, staff then developed criteria to evaluate project characteristics including type of project (e.g., sidewalk, paved shoulders, etc.), crash history and anticipated safety benefit, gap analysis / mobility improvement, presence of vulnerable populations, ease of implementation, and several others. These criteria were shared with staff from the Town of Bourne, who worked with CCC staff to develop a project ranking for the forty projects shown in the following table. A second public workshop was held in December 2021 for public feedback on the list and ranking of the forty projects in the Prioritization Plan.

Following MassDOT review, an approved prioritization plan allows the Town of Bourne to apply for up to \$400,000 of Complete Streets Tier 3 funding from MassDOT.



Complete Streets Project Ranking

Project Priority Ranking	Project Name	Estimated Project Cost Range	Funding Requested from MassDOT
1	Shore Road @ Barlows Landing Road Intersection Improvements	>\$400,000	\$400,000
2	County Road @ Barlows Landing Road Crosswalk and Pedestrian Signal	\$100,000 - \$250,000	\$200,000
3	Bourne Rail Trail	>\$400,000	\$400,000
4	Barlows Landing Road Shared Use Path (Route 28 to future Bourne Rail Trail)	>\$400,000	\$400,000
5	Buzzards Bay Bypass Road and Memorial Circle Upgrades *	>\$400,000	\$0
6	Barlows Landing Road crosswalk @ Wings Necks Road	<\$50,000	\$45,000
7	County Road Sidewalk (Barlows Landing to Shore Road)		
8	Sandwich Road Shared Use Path (Adams Road to Bourne Bridge) *	>\$400,000	
9	Shore Road @ Beach Street/Worcester Court Intersection Redesign	>\$400,000	\$400,000
10	Shore Road/Sandwich Road/Trowbridge Road/County Road Intersection Redesign	>\$400,000	\$400,000
11	Shore Road Sidewalk (Monument Beach to Pocasset River Bridge)	>\$400,000	\$400,000
12	Shore Road bridge over Pocasset River upgrades	>\$400,000	\$400,000
13	Lincoln Road/Puritan Road Sidewalk (Buzzards Bay Rotary to Head of the Bay Road)	>\$400,000	\$400,000
14	County Road Sidewalk (Shore Road to Route 28A)	>\$400,000	\$400,000
15	County Road Sidewalk (Shore/Trowbridge Road to Clay Pond Road)	>\$400,000	\$400,000
16	Old County Road One-way Reconfiguration and sidewalk	>\$400,000	\$400,000
17	Shore Road Sidewalk (Island Dr to Shipyard Lane)	>\$400,000	\$400,000
18	Barlows Landing Road Crosswalk Upgrades at Pocasset Park	<\$50,000	\$15,000
19	Adams Street Bike-Lane Reconfiguration	<\$50,000	\$10,000
20	Buzzards Bay transit stop upgrades	<\$50,000	\$15,000
21	Head of the Bay Road Sidewalk (Belmont Circle to Town Line)	>\$400,000	\$400,000
22	Trowbridge Road Sidewalk Reconstruction	>\$400,000	\$400,000
23	Multi-Use Path: Adams Street to CC Canal Service Road Path	\$100,000 - \$250,000	\$200,000



24	County Road Sidewalk (Clay Pond Road to Barlows Landing Road)	>\$400,000	\$400,000
25	Valley Bars Road Path (Through Pocasset Town Forest)	>\$400,000	\$400,000
26	Scraggy Neck Road Sidewalk (County Road to Depot Road)	\$250,000 - \$400,000	\$350,000
27	Hunters Brook Road Sidewalk (Canal Street to Old Plymouth Road)	>\$400,000	\$400,000
28	Depot Road Sidewalk (Scraggy Neck Road to County Road)	>\$400,000	\$400,000
29	Scusset Beach Road Sidewalk (Old Plymouth Road to Williston Road)	\$100,000 - \$250,000	\$225,000
30	Route 28A Transit Stop Installation *	<\$50,000	\$15,000
31	Route 28A Sidewalk Extension (County Road to Long Pond Way) *	>\$400,000	\$400,000
32	Mashnee Road	>\$400,000	\$400,000
33	Clark Road/Robinson Road Sidewalk	>\$400,000	\$400,000
34	Williston Road Sidewalk (Old Plymouth Road to Clark Road)	>\$400,000	
35	Crosswalk/ped upgrades at Shore Road and Midway Road	\$50,000 - \$100,000	\$50,000
36	Crosswalk and sidewalk extension north of Pocasset River Bridge (Shore Rd)	\$50,000 - \$100,000	\$50,000
37	County Road Crosswalk @ Midway Road	<\$50,000	\$15,000
38	Standish Road Signage	<\$50,000	\$10,000
39	Old Plymouth Road Sidewalk (Norris Road to Clark Road)	>\$400,000	\$400,000
40	Bournedale Road Sharrows	>\$400,000	\$400,000

**To be funded outside of Complete Streets Program*



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Introduction

The Town of Bourne has agreed to join MassDOT's Complete Streets program to provide streets that address the mobility needs of all users – pedestrians, cyclists, drivers, persons with disabilities, and transit riders. Providing safer, more accessible, and comfortable means of travel between home, school, work, recreation, and retail destinations helps promote a more livable community.

The Cape Cod Commission, serving as the regional planning agency for the fifteen towns on Cape Cod, has reviewed transportation issues at many locations over the years during various planning activities, including the Regional Transportation Plan, the Transportation Improvement Program, Developments of Regional Impact, and various planning projects that examined existing safety issues and potential improvements.

The project team has reviewed the roadways in Bourne and collected needed data from Automatic Traffic Recorders (ATRs), as well as Turning Movement Counts (TMCs). High traffic volumes, particularly in the summer months, have caused congestion and crashes along some of the main routes, such as Shore Road, Route 6, and Sandwich Road, as well as at busy intersections along these routes.

The study relies on public participation to better understand how street design can impact the quality of life in Bourne neighborhoods. Cape Cod Commission staff has met with stakeholders and interested members of the public to facilitate the project direction, develop alternatives, and create a list of priority projects to improve Bourne streets.

STUDY OBJECTIVES

The purpose of this study is to explore transportation improvement alternatives that will reduce conflicts, improve traffic flow, and incorporate multi-modal transportation options in Bourne, while furthering the creation of vibrant, pedestrian- and bicycle-oriented mixed-use centers throughout the town. The safe accommodation of pedestrians and bicycles has been previously identified by the Cape Cod Commission as critical to achieving the goals of the town to create nodes of mixed-use development.

The study aims to establish a preferred roadway redesign which addresses multi-modal transportation improvements, including pedestrian and bicycle connectivity. The study includes recommendations for roadway changes that accommodate projected traffic volumes while accommodating all users of the roadway. This evaluation of preferred alternatives results in a Complete Streets Prioritization Plan for the Town of Bourne.



TOWN CHARACTERISTICS

According to the 2020 United States Census, Bourne has an estimated population of 20,452, making it the 4th most populous town in Barnstable County. As of September 2021, Bourne also ranks 5th in employment on the Cape, with 10,161 employees, according to the U.S. Bureau of Labor Statistics. Employment is higher in all Cape communities in the summer. For example, in Bourne, employment totaled approximately 11,000 in July and August of 2021, according to the U.S. Census Bureau.

The Commonwealth of Massachusetts classifies Environmental Justice (EJ) areas in different ways. The types of classification that apply to Bourne are listed below:

- **Minority:** The block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of municipality containing the block group is $< 150\%$ of the Massachusetts median household income. (Massachusetts’s median household income in 2020 was \$85,843).
- **Income:** At least 25% of households have a median household income 65% or less than the state median household income. 65.49% (the cutoff) of \$85,843 is \sim \$56,220.

According to the 2020 U.S. census, there are four different census block groups in Bourne that fall into EJ classifications. As shown in Figure 1, there is a single block group that falls under the Minority classification (located immediately south of the Sagamore Bridge). There are three Income-based blocks in Bourne (one in Mashnee, one in Pocasset, and one in the eastern portion of Bourne, running all the way north-south from the Sagamore Bridge area to the Falmouth town line). This eastern block group is located on Joint Base Cape Cod.

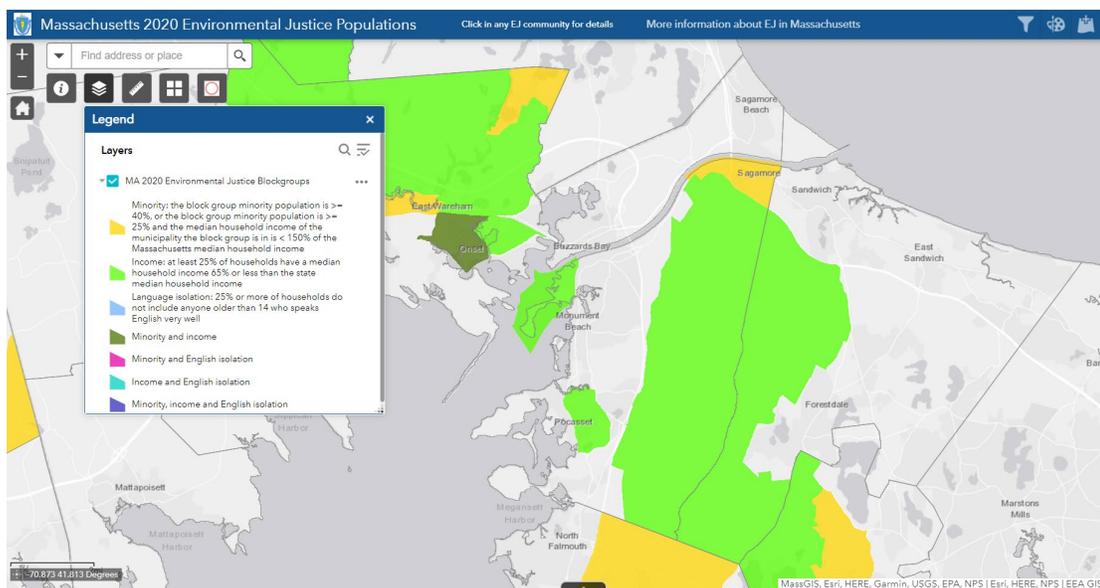


Figure 1 – Environmental Justice Population Areas



Review of Previous Studies

Over the past several years the Cape Cod Commission and other agencies have undertaken transportation planning studies – several of which are listed below, including summaries of relevant recommendations.

TOWN OF BOURNE OPEN SPACE & RECREATION PLAN (2018)

[This document](#) guides the planning, acquisition, development, and maintenance of open space and recreational facilities in Bourne. While most of the document focuses on environmental and open space planning, there are goals and objectives relating to active transportation and complete streets, as listed below:

- Goal 3: Enhance, maintain, and preserve passive and active recreational opportunities for Bourne residents and visitors of all ages, abilities, and interests.
 - Improve pedestrian access to Bourne’s open space and recreational assets, including working with the US Army Corps of Engineers (USACE) to provide additional entry points to the Cape Cod Canal, and improved signage and markings for historical buildings and features such as herring runs.
 - Renew the effort to work on developing a north-south bikeway to the Falmouth/Bourne boundary.
- Goal 12: Enhance public access to and appropriate use of existing conservation lands; establish green corridors/connections.
 - Identify additional potential greenbelts connecting existing private/undeveloped and conservation parcels to maintain wildlife areas. Such corridors may also be used as walking/bicycling trails that are also being discussed for the Greenbelt Pathways program and the North/South bike trail.

TOWN OF BOURNE LOCAL COMPREHENSIVE PLAN (2019)

The transportation element of Bourne’s [most recent comprehensive plan](#) was reviewed. Transportation policies relating the complete streets are as follows:

- Improve the flow of through traffic crossing Bourne and separate through traffic from local traffic to allow both to move freely without interfering with each other.
- Encourage alternatives to automobile use and expand travel option for person who cannot or prefer not to drive.

To support the Policies listed above, actions relating to complete streets include:

- Extend the Shining Sea Bicycle/Pedestrian Trail from North Falmouth to the Cape Cod Canal, and partner with the Cape Cod Commission to expand the Cape’s bike path network.
- Reconfigure intersections to increase safety at Five Corners, County and Clay Pond Roads, Shore and Barlows Landing Roads, and County Road at Route 28A.



- Investigate building a new bicycle/pedestrian path between MacArthur Blvd, Clay Pond Road, and Monks Cove, generally following the layout of Valley Bars Road.
- Complete the proposed pedestrian/bicycle path between Gallo Ice Arena and the split on Sandwich Road.

ROAD SAFETY AUDIT: ROUTE 28 BETWEEN BOURNE ROTARY AND OTIS ROTARY (2013)

This road safety audit (RSA) was completed by Howard/Stein-Hudson Associates. [This RSA](#) examined the safety of the two rotaries, the intersection of Route 28 and Waterhouse Road, and the connecting corridor, for all road users. The planning team made numerous recommendations, but the primary one relating to active transportation and complete streets was:

- As part of long-term reconstruction efforts, consider providing pedestrian and bicycle accommodations, such as the planned shared-use path parallel to Route 28.
 - Consider pedestrian and bicycle crossing infrastructure in conjunction with the proposed Route 28 parallel shared-use path.

ROAD SAFETY AUDIT: SANDWICH ROAD AT CRANBERRY HIGHWAY (2012)

This RSA was completed directly by the Cape Cod Commission. [The RSA](#) examined the safety of this three-legged intersection in Bourne (located between the Sagamore Bridge and Sandwich Marina). This report doesn't focus significantly on active transportation users. However, it notes that planners could "consider improved accommodation for bicyclists and pedestrians with future improvements or maintenance projects" over a medium- to long-term time horizon.

SHINING SEA BIKEWAY EXTENSION FEASIBILITY STUDY (2017)

This feasibility study, completed by the Cape Cod Commission, detailed the costs and benefits (in monetary and non-monetary terms) of connecting the Shining Sea Bikeway and the Cape Cod Canal Bike Path. Specifically, this report analyzed three options: 1.) "Rail-to-Trail" (removing the existing rail infrastructure and creating a paved bike path using the existing rail bridges); 2.) "Rail-with-Trail" (keeping the rail line and constructing a paved bike path with their own bridges adjacent to the existing rail line); and 3.) "Rail-with-Trail with At-Grade Crossings" which would include keeping the rail line active and constructing a new bike path beside the existing rail line. However, some low-volume at-grade road crossings would be used for crossings in lieu of bridges).

This document made no definitive recommendation between the three alternatives. However, total cost estimates were provided. The most expensive option was the "Rail-with-Trail (with new bridge crossings)" option, which was an estimated \$25 million. The most inexpensive option was the "Rail-to-Trail" option (at \$9 million). The "Rail-with-Trail (with at-grade crossings) option was estimated at \$14.7 million.



Problem Identification

Besides synthesizing ideas from a review of previous studies, the project team also identified current transportation issues and concerns, as well as proposed improvements from the following sources:

INITIAL OUTREACH TIMELINE

After coordinating with Town of Bourne staff and the Town Administrator's Advisory Committee on Pedestrian Bicycle Pathways in early 2020, the Cape Cod Commission and town staff prepared a public meeting for March 11, 2020; this was cancelled at the last minute because of the COVID-19 pandemic. The project was restarted in 2021, and an initial Virtual Public Input Session was held in February 2021.

VIRTUAL PUBLIC INPUT SESSIONS

Virtual Public Input, Session 1

The Cape Cod Commission coordinated with the Town of Bourne to host a Virtual Public Input Session on February 24th, 2021, at 6:00 PM. In that meeting, the Commission presented the following project components to members of the public, town officials, and other interested parties:

Part 1: Presentation

The topics presented include:

1. What is a Complete Street?
 - a) Definition and scope of a Complete Street(s).
 - b) Benefits of Complete Streets and Complete Street Needs
 - Improved Health
 - Crash Reduction
 - Benefits for People with Disabilities
 - Benefits for Children
 - Benefits for Aging Population
 - Economic Benefits
 - Environmental Benefits
 - c) Importance of Context Sensitivity
 - d) Funding Available for Complete Streets (MassDOT program)
 - Explanation of Tier 1 (Training and Complete Streets Policy Development) and Tier 2 (Prioritization Plan Development) in MassDOT's Complete Streets program
 - e) Explanation of the Bourne Complete Streets Policy (adopted by the Bourne Select Board in 2020)
2. What is a Prioritization Plan?
 - a) Components of the Prioritization Plan and Scope
 - Complete Streets Projects by Type
 - Traffic Flow and Driver Safety
 - Bicycle Facilities
 - Pedestrian Facilities



- Transit Facilities
- Complete Streets Project Types by Effort
 - Short-Term/Low Cost
 - Long-Term/High Cost
- b) Prioritization Plan Process
- 3. Bourne Existing Conditions
 - a) Relevant Studies
 - b) Ongoing Projects in Town
 - c) Existing Conditions Map

Part II involved interactive brainstorming sessions (with participants using breakout rooms) in which participants were asked to consider the following:

- What locations present challenges for motorists? Pedestrians? Bicyclists?
- Where could safety be improved?
- What projects would you prioritize?
- Any new suggestions?
- Are there places bicyclists and pedestrians could more easily access?
- Are there specific challenges for different groups? (i.e., children, seniors, people with mobility challenges, seasonal workers, etc.)

Participants were introduced to—and reminded to use—the interactive public comment tool to submit answers to the above questions (described in more detail below). The breakout rooms also gave an opportunity for attendees to provide general comments to CCC Staff as well as potential locations for a Complete Street project. Staff also received email suggestions.



Complete Streets Prioritization Plan: Improving Safety & Accommodating All Users Town of Bourne – Virtual Public Meeting



PUBLIC INPUT SESSION

Wednesday, February 24, 2021 at 6:00 pm

Join with the link below:

<https://capecodcommission.org/outreach/join>

If prompted for a passcode, enter: join

Phone: (929) 205-6099

Meeting ID: 961 1903 7671

Q: What is a “Complete Street”?

A: A Complete Street provides accommodations for all users including motorists, pedestrians, bicyclists and persons with disabilities.

What do you think would improve Bourne's streets for bicyclists and pedestrians? The Town of Bourne and the Cape Cod Commission want to hear your thoughts. Join us for a public meeting to help us understand the multimodal issues and opportunities in your town. Based on the information from this meeting, improvements in Bourne will be listed in a Prioritization Plan that will help your town gain access to state and federal funding.



For more information, please visit

www.capecodcommission.org/BourneCompleteStreets or call 508-362-3828

Figure 2: Advertisement for the Virtual Public Input Session

Virtual Public Input, Session 2

A second Virtual Public Input Session occurred on Wednesday, December 15, 2021. At that meeting, the project's progress and timeline were summarized. Additionally, CCC staff presented on the proposed top 40 projects, using the [Draft Priorities Tool](#) (described in more detail below). Participants were then placed into breakout rooms, with the following prompts:

- What projects stick out?
- Where are there projects that are ranked too high? Too low?
- Where are projects missing entirely?



ONLINE TOOLS

While the Bourne Existing Conditions Map, the Public Comment Tool, and the Draft Priorities Map were demonstrated at Virtual Public Input Sessions, these tools were also made available on the Commission’s website. By placing these tools on the website—and publicizing them—the Commission was able to capture a broader range of community views (while supporting individuals who could not attend the Virtual Public Input Sessions).

The Bourne Complete Streets Online Project Viewer included the [Existing Conditions Map](#), the [Public Comment Tool](#), and the [Draft Priorities Map](#).

The Existing Conditions Map showed the following conditions:

- Sidewalks and Destinations
- Roadway Classification
- Crashes and Traffic Volume
- Bike, Pedestrian, and Transit Infrastructure

The Public Comment Tool was more interactive and allowed people to add points and lines to the map to identify the type of recommendation, the proposed solution and action (install or update), and other comments. This tool received over 150 comments during the comment period.

At the December 15th meeting, the Draft Priority Map was released. This draft map showed the top 40 projects and was released to the public (and was demonstrated at the second Public Input Session, in the main room and in breakout rooms). Those top 40 projects were determined based on feedback from the Town staff and the first Virtual Public Input Session. Participants were then asked to complete a SurveyMonkey survey, which asked them to rank projects as “Project should be higher priority,” “Ranked just right,” or “Project should be lower priority.” Participants could also submit open-ended responses. The survey received responses from 129 unique individuals. Additional comments via email were also encouraged and received. This feedback was then fed into the final ranking of projects.

The Public Comment Tool and the Draft Priority Maps assisted the Commission and Town of Bourne staff in identifying:

- 1) The locations of problematic areas in which to walk, bike or take transit.
- 2) The types of Complete Streets projects most favored by participants.
- 3) The relative ranking of individual projects.

Roadway Functional Classification

Roadway functional classes were also examined, with the jurisdiction and typology of roads impacting whether a road is under Bourne jurisdiction, and whether a certain treatment is appropriate. Most of the roads in Bourne are contained in the Census-designated Urbanized Area (UZA) for Cape Cod. (Most of the areas outside of the UZA are in the eastern portion of the town, in Joint Base Cape Cod jurisdiction). Additionally, roadways under MassDOT jurisdiction are not eligible for Complete Streets funds (for example, Route 6 and Routes 28, 25, and 28A). Other Bourne streets included in this study fall into lower classifications such as minor arterial,



collector, or local road. These classifications indicate the relative importance of mobility vs. accessibility and are used to guide design characteristics.

Participants were able to view road classification in the Bourne Complete Streets Online Project Viewer [here](#).

Sidewalk Availability and Locations of Activities

For the most part, sidewalks in Bourne are limited to the central Buzzards Bay area. Even in this area, however, many streets lack sidewalks. Additionally, there are a few sidewalk segments scattered throughout the town (areas southwest of the Bourne Bridge and near Monument Beach). The most significant piece of bicycle infrastructure is the Cape Cod Canal Bike Path, which runs east-west through the northern section of the town. Many of Bourne's commercial attractions are in Buzzards Bay, north of the Cape Cod Canal and west of the Bourne Bridge. A high number also line Route 28, south of the Cape Cod Canal. Civic/community activities are more dispersed throughout the town.

Participants were—and are—able to view sidewalk availability and the locations of business and community activities in the Bourne Complete Streets Online Project Viewer [here](#).

Bike, Pedestrian, & Transit Accommodation

The [Bourne Complete Streets Online Project Viewer](#) offers users a view of the locations of community activities, bike accommodations (lanes, existing paths, proposed paths, and future portions of the Claire Saltonstall Bike Route), and existing transit routes.

Traffic Volumes and Crash History

Traffic volumes and crash pattern data are accessible in the Bourne Complete Streets Online Project Viewer [here](#). Specifically, these data include:

- **Traffic Volumes:** Route 28, Route 25, Route 3, Route 6, and Sandwich Road / Route 6A are by far the heaviest traveled roads and are represented in dark green colors. There is also heavy traffic along Trowbridge Road and Barlows Landing Road (*source: Cape Cod Commission/MassDOT traffic counting programs*).
- **Crash Data:** Over the most recent three years on record (2018-2020), there were 12 reported crashes in Bourne that involved either a pedestrian or a bicyclist. The greatest concentration of crashes occurred in the central area of Bourne north of the Cape Cod Canal. Shore Road was also a high-crash location (*source: MassDOT Crash Portal*). The [Bourne Complete Streets Online Project Viewer](#) shows bike or pedestrian crashes over an earlier period of time (2012-2017).



Project Evaluation

Following the initial public workshop, the study team met to narrow down/combine the suggestions to create a list of forty projects for evaluation, scoring, and ranking. The rankings were also modified slightly based on feedback from the second meeting and from the online [Draft Priorities Map](#).

PROJECTS FOR EVALUATION

Forty complete streets projects have been identified as shown in Table 2. Proposed projects include categories such as:

- Bicycle Infrastructure
- Crosswalk Improvement/Signage
- Intersection Improvement
- Multi-use Paths
- Traffic Calming
- Sidewalk Construction
- Sidewalk Reconstruction

Projects are ranked in order, with the highest scores corresponding to projects that are the highest priority. The priority listing does not necessarily indicate the order of implementation, however. Additional factors—such as available funding, project readiness, and whether the project can be combined with another project or with routine maintenance work—will be used by the Town to determine the exact order of implementation.



EVALUATION METHODOLOGY

The following rating system was developed by CCC staff and was used specifically for evaluating Bourne’s list of projects. Points were summed up and were assigned a final score. The top performing projects received scores of 30.

Table 1: Project Evaluation Scores

Safety	Points
1 Highest: Addresses a High Crash Location or RSA location	15
2 High: Project will improve safety significantly for all modes at a location/roadway with a ped/bike crash history	12
3 Medium: Project will improve safety significantly for all modes	8
4 Low: Project provides a moderate safety improvement for all modes	5
5 Lowest: Project with minimal safety improvement for all modes	1
6 Neutral: Addresses a location with no known crashes	0
Mobility	Points
1 Highest: Provides a regional connection	10
2 High: Provides accommodations on a high-speed, high-volume roadway	7
3 Medium: Fills a gap in the existing network or extends an existing network	5
3 Lowest. Provides a new disconnected link	1
Access	Points
1 High: Project directly supports bike/ped/transit access to a vulnerable population (e.g., school children or seniors)	5
2 Medium: Project improves ped/bike/transit access to major pedestrian-oriented destinations (beaches, parks) or a large population area	3
3 Low: Improves bike/ped/transit access to a smaller population area	1
4 Lowest: Project does not greatly improve multimodal access	0
Ease of Implementation	Points
1 Easy: Project under design and needs more funding	5
2 Simple: Within public ROW, no takings, no wetlands, historic or archeological issues	3
3 Moderate: Project is viable with minor impacts to ROW or environmental	2
5 Negative: Major concerns with ROW and environmental impacts	-1
Project Support	Points
1 Highest: Project is supported by town officials/boards	5
2 High: Project has significant public support	3
3 Moderate: Project has some public support	1
4 Negative: Project has mixed or negative public support	0



Recommendations & Project Prioritization

BOURNE COMPLETE STREETS PRIORITIZATION TABLE

The ultimate recommendation of this study is the implementation of projects in the Bourne Complete Street Prioritization Table. While Routes 28 and 6 are under MassDOT jurisdiction and are outside the scope of the Complete Streets Program, they are nevertheless critical corridors for pedestrian and cyclist travel in Bourne as denoted with four (4) state road projects listed in the Prioritization Plan. As MassDOT proceeds with implementation of complete street upgrades to facilities under their jurisdiction, the following are recommended for on state-owned roadways in Bourne:

- Construct ADA-compliant sidewalks, curb ramps and crosswalks
- Provide pull-off areas for bus stops
- Provide wayfinding signage guiding users to best routes connecting to beaches, recreation areas, the future Bourne Rail Trail, and other destinations

Based the scoring evaluation methodology previously discussed, a ranked list of projects is presented in Table 2. A complete printout of the prioritization plan worksheet is available in the Appendix.



Table 2 - Project Ranking

Project Priority Ranking	Project Name	Project Description	Estimated Project Cost Range	Funding Requested from MassDOT
1	Shore Road @ Barlows Landing Road Intersection Improvements	Geometric improvements to the intersection, reducing curb cuts at abutting driveways, and upgrading pedestrian accommodations and improving multi modal infrastructure at the intersection of Shore Road and Barlows Landing Road. This project is already designed.	>\$400,000	\$400,000
2	County Road @ Barlows Landing Road Crosswalk and Pedestrian Signal	This project is already designed and includes signal upgrades and provides upgraded bicycle and pedestrian infrastructure at the intersection.	\$100,000 - \$250,000	\$200,000
3	Bourne Rail Trail	Multi-use path along the existing railroad ROW from the CC Canal Service Road near the RR Bridge to the existing Shining Sea Bikeway in N. Falmouth. This project is being phased over 4 sections, with Phase 1 currently on the 2024 STIP for a half mile portion from the CC Canal Service Road Path to Monument Neck Road.	>\$400,000	\$400,000
4	Barlows Landing Road Shared Use Path (Route 28 to future Bourne Rail Trail)	Upgrade existing sidewalk to a shared use path from the intersection of Route 28 to the future Bourne Rail Trail. This project is roughly 1.5 miles in length.	>\$400,000	\$400,000
5	Buzzards Bay Bypass Road and Memorial Circle Upgrades *	Transformation of Buzzards Bay Bypass Road and Memorial Circle into a Complete Street with all elements of a Complete Streets project including, sidewalk, crosswalks, bicycle infrastructure, etc. Buzzards Bay Bypass Road and Memorial Circle are state owned roadway and not eligible for Complete	>\$400,000	\$0



		Streets funding through this program but is a high priority project and roadway within the Town of Bourne.		
6	Barlows Landing Road crosswalk @ Wings Necks Road	Installation of an already designed crosswalk across Wings Neck Road at the intersection of Barlows Landing Road. The project includes the tightening of the intersection.	<\$50,000	\$45,000
7	County Road Sidewalk (Barlows Landing to Shore Road)	This project is already designed and includes a sidewalk from Barlows Landing Road to Shore Road. The length of this project is roughly 1.9 miles.		
8	Sandwich Road Shared Use Path (Adams Road to Bourne Bridge) *	Installation of a shared use path along Sandwich Road from Adams Street to the Bourne Cape Flyer stop off of Sandwich Road under the Bourne Bridge. This shared use path would allow adjacent bicycle and pedestrian facilities to the Canal Service Road Path and create opportunities to provide connections between the two paths. This project is roughly 3.5 miles in length.	>\$400,000	
9	Shore Road @ Beach Street/Worcester Court Intersection Redesign	A redesign of the Shore Road at Beach Street and Worcester Court intersection to include upgraded bicycle and pedestrian facilities.	>\$400,000	\$400,000
10	Shore Road/Sandwich Road/Trowbridge Road/County Road Intersection Redesign	A redesign of the intersection to include upgraded bicycle and pedestrian facilities.	>\$400,000	\$400,000
11	Shore Road Sidewalk (Monument Beach to Pocasset River Bridge)	Sidewalk along Shore Road from Monument Beach to the Pocasset River Bridge. The project is roughly 1.5 miles in length along the western side of Shore Road	>\$400,000	\$400,000
12	Shore Road bridge over Pocasset River upgrades	Improvements to the existing bridge over the Pocasset River bridge on Shore Road. The existing bridge is unsafe for bicyclists to navigate currently.	>\$400,000	\$400,000



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13	Lincoln Road/Puritan Road Sidewalk (Buzzards Bay Rotary to Head of the Bay Road)	A sidewalk on Lincoln Road from the Memorial Circle (Route 6) to Puritan Road, sidewalk would continue for the length of Puritan Road to the intersection of Head of the Bay Road. The length of this project is roughly 1.4 miles.	>\$400,000	\$400,000
14	County Road Sidewalk (Shore Road to Route 28A)	A sidewalk along County Road from the intersection of Shore Road to Route 28A. This project is roughly 1 mile in length.	>\$400,000	\$400,000
15	County Road Sidewalk (Shore/Trowbridge Road to Clay Pond Road)	Installation of a sidewalk from Shore/Trowbridge Road to Clay Pond Road. The length of this project is roughly	>\$400,000	\$400,000
16	Old County Road One-way Reconfiguration and sidewalk	Reconfiguration and signage installation on Old County Road to convert the roadway into a one-way travel roadway and the installation of wider shoulders and a sidewalk along Old County Road from County Road to Picture Lake.	>\$400,000	\$400,000
17	Shore Road Sidewalk (Island Dr to Shipyard Lane)	Installation of a sidewalk along Shore Road from Island Drive to Shipyard Lane. This project will connect the existing portion of sidewalk on Shore Road with more neighborhoods in the Cataumet/Pocasset villages. The length of this project is roughly 0.7 miles.	>\$400,000	\$400,000
18	Barlows Landing Road Crosswalk Upgrades at Pocasset Park	Installation of ADA compliant curb ramps at the two existing crossings on Barlows Landing Road near Pocasset Park.	<\$50,000	\$15,000
19	Adams Street Bike-Lane Reconfiguration	Several years ago, Adams Street converted from a 2-way road to a one-way road with bike lanes on either shoulder. This project suggests the bike lanes should be reconfigured to contraflow bike lanes to provide safer and easier access for cyclists on Adams Street.	<\$50,000	\$10,000



20	Buzzards Bay transit stop upgrades	Upgrades to the existing transit stop at Buzzards Bay Park near the CC Canal Railroad Bridge.	<\$50,000	\$15,000
21	Head of the Bay Road Sidewalk (Belmont Circle to Town Line)	Sidewalk installation on Head of the Bay Road from Belmont Circle to the Town Line. This project is roughly 2.7 miles in length.	>\$400,000	\$400,000
22	Trowbridge Road Sidewalk Reconstruction	Reconstruction of the sidewalk on Trowbridge Road to include ADA compliant curb ramps and appropriate curbing to provide protection for pedestrians. This project is roughly 0.8 miles in length. There are portions where there are no existing sidewalks on Trowbridge Road.	>\$400,000	\$400,000
23	Multi-Use Path: Adams Street to CC Canal Service Road Path	Construction of a multi-use path from the CC Canal Service Road Path to the intersection of Sandwich Road at Adams Street.	\$100,000 - \$250,000	\$200,000
24	County Road Sidewalk (Clay Pond Road to Barlows Landing Road)	Installation of a sidewalk from Clay Pond Road to Barlows Landing Road. The length of this project is roughly 1.6 miles.	>\$400,000	\$400,000
25	Valley Bars Road Path (Through Pocasset Town Forest)	Conversion of dirt path to a paved path through Pocasset Town Forest from Valley Bars Road to County Road. The length of this project is roughly 0.7 miles.	>\$400,000	\$400,000
26	Scraggy Neck Road Sidewalk (County Road to Depot Road)	Installation of a sidewalk along Scraggy Neck Road from County Road to Depot Road. This project is roughly 0.3 miles in length.	\$250,000 - \$400,000	\$350,000
27	Hunters Brook Road Sidewalk (Canal Street to Old Plymouth Road)	Installation of a sidewalk on Hunters Brook Road from Canal Street to Old Plymouth Road. The length of this project is roughly 0.4 miles in length.	>\$400,000	\$400,000



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28	Depot Road Sidewalk (Scraggy Neck Road to County Road)	Installation of a sidewalk along Depot Road from Scraggy Neck Road to County Road. This project is the entire length of Depot Road and is roughly 0.5 miles long.	>\$400,000	\$400,000
29	Scusset Beach Road Sidewalk (Old Plymouth Road to Williston Road)	Installation of a sidewalk along Scusset Beach Road from Old Plymouth Road to Williston Road. There is a sidewalk on Meetinghouse Lane that ends at the intersection of Old Plymouth Road where Scusset Beach Road begins. This portion of sidewalk is roughly 0.2 miles in length.	\$100,000 - \$250,000	\$225,000
30	Route 28A Transit Stop Installation *	Installation of a CCRTA transit stop on Route 28A at the intersection of County Road. The existing Bourne Run line provided by the CCRTA would best serve this stop and provide greater transit access to nearby neighborhoods and businesses.	<\$50,000	\$15,000
31	Route 28A Sidewalk Extension (County Road to Long Pond Way) *	Extension of the existing sidewalk on Route 28A from County Road to Long Pond Way. The length of this project is roughly 0.5 miles.	>\$400,000	\$400,000
32	Mashnee Road	Installation of a shared use path on Mashnee Road from Presidents Road to the causeway and a new bicycle parking area at the terminus on the causeway. This project is roughly a half mile in length.	>\$400,000	\$400,000
33	Clark Road/Robinson Road Sidewalk	Installation of a sidewalk on Clark Road and Robinson Road to connect Old Plymouth Road to Sagamore Beach neighborhood. The length of this project is roughly 0.6 miles.	>\$400,000	\$400,000
34	Williston Road Sidewalk (Old Plymouth Road to Clark Road)	Installation of a sidewalk along Williston Road from Old Plymouth Road to the intersection of Clark Road. The length of this project is roughly 1.6 miles.	>\$400,000	



35	Crosswalk/ped upgrades at Shore Road and Midway Road	Installation of a crosswalk and other pedestrian upgrades at the intersection of Shore Road and Midway Road. ADA compliant curb ramps and advanced warning signs would be a part of this project	\$50,000 - \$100,000	\$50,000
36	Crosswalk and sidewalk extension north of Pocasset River Bridge (Shore Rd)	Installation of a short segment of sidewalk north of the Pocasset River bridge on Shore Road with a crosswalk and ADA compliant curb ramps to allow access to the gravel parking lot on the east side of Shore Road.	\$50,000 - \$100,000	\$50,000
37	County Road Crosswalk @ Midway Road	Installation of a crosswalk with ADA compliant curb ramps across County Road. Currently there are no sidewalks on County Road at this location but there is still a desire for pedestrians to cross County Road at this location.	<\$50,000	\$15,000
38	Standish Road Signage	Installation of share the road signage on Standish Road.	<\$50,000	\$10,000
39	Old Plymouth Road Sidewalk (Norris Road to Clark Road)	Installation of a sidewalk on Old Plymouth Road from Norris Road to Clark Road. The length of this project is roughly 0.4 miles.	>\$400,000	\$400,000
40	Bournedale Road Sharrows	Installation of sharrows and signage on Bournedale Road to encourage motorists to share the road with bicyclists.	>\$400,000	\$400,000

**To be funded outside of Complete Streets Program*



NEXT STEPS/NOTES

The study team has submitted a draft plan to MassDOT for feedback and has received approval and suggested edits. The Town of Bourne is now eligible to apply for Complete Streets funding up to \$400,000 (competitive process). This phase is referred to as Tier 3 of the Complete Streets Program. Project considerations include the following:

General Comments

- 1) Proprietary items are not eligible for Complete Streets funding (e.g., bike racks & gear lockers must not be proprietary).
- 2) Wayfinding signs should comply with the Manual on Uniform Traffic Control Devices.
- 3) The shared lane marking is a pavement marking with a variety of uses to support a complete bikeway network; it is not a facility type and should not be considered a substitute for bike lanes, or other exclusive bicycle facility. The MUTCD outlines guidance for shared lane markings in section 9C.07.
- 4) Adjacent to a proposed bus shelter, a boarding/alighting area shall be provided, with an 8.0' depth (from edge of curb) and 5.0' width.
- 5) When designing a new sidewalk segment, the project limits must meet an existing sidewalk network or terminate with compliant curb ramps. If terminating at an intersection, include a reciprocal curb ramp and crosswalk.
- 6) At marked crossings, the bottom of the ramp run (4'-0" by width of ramp opening), exclusive of flared sides, shall be wholly contained within the marked crossing. Refer to AAB 521 CMR: 21.2.1.
- 7) Pushbuttons/Pedestrian Beacons/RRFBs/HAWKS should be accessible from a level landing. Refer to AAB 521 CMR 21.10.4 for reach and clearance guidance.
- 8) Consider including bicycle-friendly drain gates to bicycle facility improvements where applicable.
- 9) Shared-use paths are preferred to be [sic] 12 feet wide or a minimum of 10 feet wide.
- 10) The MUTCD does not recommend using the SHARE THE ROAD (W16-1P) plaque in conjunction with the Bicycle (W11-1) and other vehicular traffic. (https://mutcd.fhwa.dot.gov/knowledge/faqs/faq_part9.htm)

Specific Comments

1. Provide proposed sidewalk, bicycle lane/buffer and shared use path widths in the Project Descriptions.
2. Many projects list potential sources of supplemental funds. Please note that when applying for Tier 3, the supplemental funding source needs to be known if the project exceeds \$400,000.
3. Project Descriptions should provide a clear description of the work being proposed. When proposing "improvements" (e.g. geometric improvements)

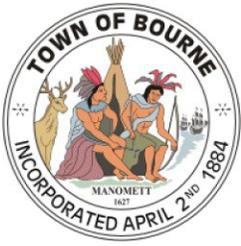


- better define which improvements are being proposed in the Project Description and the associated Complete Streets Project Type.
4. Provide Complete Streets Funding Request and Construction Schedule fields for all projects.
 5. When applying for Tier 3 funding, feasibility of the sidewalk installation on corridors with constrained ROW should be known.
 6. If the Total Estimated Project Cost is greater than the Complete Streets Funding Requested, provide/identify Other Funding Source(s) or indicate as TBD.
 7. For Ranks 3, 5, 8 and 30, provide clarification. State-owned roadways are not eligible for Complete Streets Funding Program reimbursement. Please revise the Complete Streets Funding Requested and Other Funding Source(s) and Amount, or indicate as TBD.



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Appendix A: Town of Bourne – Selectmen Policy on Complete Streets



TOWN OF BOURNE BOARD OF SELECTMEN

24 Perry Avenue
Buzzards Bay, MA 02532
Phone 508-759-0600 – Fax 508-759-0420
Town Administrator: Anthony Schiavi
Asst. Town Administrator: Glenn Cannon



February 4, 2020

COMPLETE STREETS POLICY

I. VISION AND PURPOSE

Complete Streets are designed and operated to provide safety and accessibility for all the users of our roadways, trails, and transit systems. These users include pedestrian, bicyclists, transit, transit riders, motorists, commercial vehicles, emergency vehicles, and people of all ages and of all abilities. Furthermore, Complete Streets principles contribute toward the safety, health, economic viability, and quality of life in a community by providing greater opportunities in multi-modal and non-motorized transportation, along with accessible and efficient connections between home, school, work, recreation and retail destinations by improving the pedestrian and vehicular environments throughout communities.

The purpose of Bourne's Complete Streets Policy, therefore, is to accommodate all users by creating a road network that meets the needs of individuals utilizing a variety of transportation modes. The Town will integrate the planning, design, operation and maintenance of streets so that they are safe for all users of all ages and abilities as a matter of routine. This policy directs decision-makers to consistently plan, design, and construct streets to accommodate all anticipated users including pedestrians, bicyclists, transit, motorists, emergency vehicles, and freight and commercial vehicles.

II. CORE COMMITMENT

The Town of Bourne recognizes that all users of all modes, including, but not limited to, pedestrians, cyclists, transit and school bus riders, motorists, delivery and service personnel, freight haulers, and emergency responders, are legitimate users of streets and deserve safe facilities. "All Users" includes users of all ages and abilities.

The Town of Bourne recognizes that all projects, new, maintenance, or reconstruction, are included as opportunities to implement Complete Streets design principles. The Town will, to the maximum extent possible, design, construct, maintain, and operate all streets to provide for a comprehensive and integrated street network of facilities for people of all ages and abilities.

Complete Streets design recommendations shall be incorporated into all publicly and privately funded projects, as appropriate. All transportation infrastructure and street design projects requiring funding or approval by the Town of Bourne, as well as projects funded by the State and Federal Government, such as Chapter 90 funds, Transportation Improvement Program (TIP), the MassWorks Infrastructure Program, Community Development Block Grants (CDBG), and other state and federal funds for

street and infrastructure design shall adhere to the Town of Bourne's Complete Streets Policy. Private developments and related street design components or corresponding street-related components shall adhere to the Complete Streets principles. In addition, to the extent practical, State-owned roadways within the Town of Bourne shall comply with the Complete Streets Policy, including the design, construction, and maintenance of such roadways within Town boundaries.

The Engineering Department and Department of Public Works shall use its best judgement regarding the feasibility of applying Complete Streets principles for routine roadway maintenance and projects. Other transportation infrastructure projects, including but not limited to roadway reconstruction, roadway reconfiguration, subdivisions, or transportation improvements may be excluded upon approval by the Director of Public Works and/or designee, where documentation and data indicate that:

- Specific users are prohibited by law, such as interstate freeways or pedestrian malls. An effort will be made, in these cases for accommodations elsewhere.
- Cost of accommodation is excessively disproportionate to the need or probable use.
- There is an absence of current and future need.
- Protected scenic, historic, and/or environmental features/qualities would be adversely impacted.

III. BEST PRACTICES

The Town of Bourne's Complete Streets Policy will focus on developing a connected, integrated network that serves all road users. Complete Streets will be integrated into policies, planning, and design of all types of public and private projects, including new construction, reconstruction, rehabilitation, repair, and maintenance of transportation facilities on streets and redevelopment projects.

Implementation of Bourne's Complete Streets Policy will be carried out by Town departments with multi-jurisdictional cooperation, to the greatest extent possible, among private developers, neighboring Towns, and regional, state, and federal agencies.

The Town of Bourne recognizes that "Complete Streets" may be achieved through single elements incorporated into a particular project or incrementally through a series of smaller improvements or maintenance activities over time.

Complete Streets principles include the development and implementation of projects in a context sensitive manner in which project implementation is sensitive to the community's physical, economic, and social setting. The context sensitive approach to process and design includes a range of goals by considering stakeholder and community values on a level plane with the project need. It includes goals related to livability with greater participation of those affected in order to gain project consensus. The design process may incorporate flexibility to balance user's needs. The overall goal of this approach is to preserve and enhance scenic, aesthetic, historical, and environmental resources while improving or maintaining safety, mobility, and infrastructure conditions.

The latest design guidance, standards, and recommendations available will be used in the implementation of Complete Streets including, but not limited to:

- Massachusetts Department of Transportation (MassDOT) Project Development & Design Guide
- American Association of State Highway Transportation Officials (AASHTO) A Policy on Geometric Design of Highway and Streets (latest edition)
- United States Department of Transportation Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD)
- Architectural Access Board (AAB) 521CMR Rules and Regulations

- National Association of City Transportation Officials (NACTO) Urban Street Design Guide and Urban Bikeway Design Guide
- Cape Cod Commission's Complete Streets/Living Streets Design Manual
- Cape Cod Metropolitan Planning Organization's Cape Cod Regional Transportation Plan
- Documents and plans created for Bourne, such as the Local Comprehensive Plan (LCP), and bicycle and pedestrian network plans.

The Town of Bourne's Complete Streets Policy will be consistent with project selection criteria for multi-purposed pathway and pedestrian projects utilized by the Town of Bourne Department of Public Works. Guidance for selection criteria may be found in the above cited references. Generally, selection criteria favor projects that meet one or more of the following categories:

- Continuity - These projects alleviate network gaps or deficiencies. The facilities integrate with or improve an existing network or link to either complete or extend systems. However, a project that is the first element of a planned multi or walkway system will also be valued. Isolated projects with no clearly defined origin or destination will be avoided.
- Destinations/attractions - The purpose of these facilities is to provide pedestrian or multi-modal links to destinations including transit stops, business districts/ shopping centers, beaches, and playgrounds and other pedestrian oriented destinations.
- Highly populated areas - These facilities support internal circulation and connectivity for denser residential neighborhoods.
- Schools - These facilities serve streets and the network surrounding schools. These may augment other programs such as Safe Routes to Schools.
- Regional connections - These projects integrate with regionally recognized routes or networks that extend through adjacent towns.
- Projects consistent with the goals and policies of the Town's Local Comprehensive Plan and Open Space & Recreation Plan.

IV. IMPLEMENTATION

The Town of Bourne shall make Complete Streets practices a routine part of everyday operations, shall approach every transportation project and program as an opportunity to improve streets and the transportation network for all users, and shall work in coordination with other departments, agencies, and jurisdictions to achieve Complete Streets.

The Town of Bourne will maintain a comprehensive inventory of pedestrian and bicycle facility infrastructure that will prioritize projects to eliminate gaps in the sidewalk and bikeway network.

The Town of Bourne will incorporate Complete Street Projects into its Capital Improvement Priority Plan for Roadway Improvements.

All roadway projects in the Town of Bourne, including municipal road repairs, upgrades, or expansion projects, shall incorporate Complete Streets elements and principles as appropriate.

The Town of Bourne will review and either revise or develop proposed revisions to incorporate Complete Streets principles into the Town's Protective Zoning Bylaw, Subdivision Rules and Regulations, bylaws, and policies.

The Town of Bourne will train pertinent town staff on the content of Complete Streets principles and best practices for implementing policy.

The Town of Bourne will utilize inter-department coordination to promote the most responsible and efficient use of resources for activities within the public way.

The Town of Bourne will seek out appropriate sources of funding and grants for implementation of Complete Streets policies. The Town will maintain complete streets facilities under its jurisdiction and provide methods for the public to provide input on needed repairs/maintenance.

V. EVALUATION OF EFFECTIVENESS

Complete Streets implementation and effectiveness should be constantly evaluated for success and opportunities for improvements. The Director of Public Works and/or designee will develop performance measures to gauge implementation and effectiveness of Complete Streets policies using appropriate measures of effectiveness, which may include:

- A. Linear feet of new bicycle accommodations
- B. Linear feet of new or rehabilitated pedestrian facilities
- C. Improved Level of Service (LOS) for vehicles, pedestrians, and bicyclists
- D. Crash rates by mode of Transportation
- E. Rate of children walking or bicycling to school, and/or
- F. Number of trips by mode

These measures of effectiveness will be compiled into a report by the Department of Public Works and presented as needed, but no less than annually.

WITNESS our hands and seals this _____ day of _____, 20____

BOARD OF SELECTMEN:

Judith MacLeod Froman

James L. Potter

George G. Slade Jr.

Peter J. Meier

Jared P. MacDonald

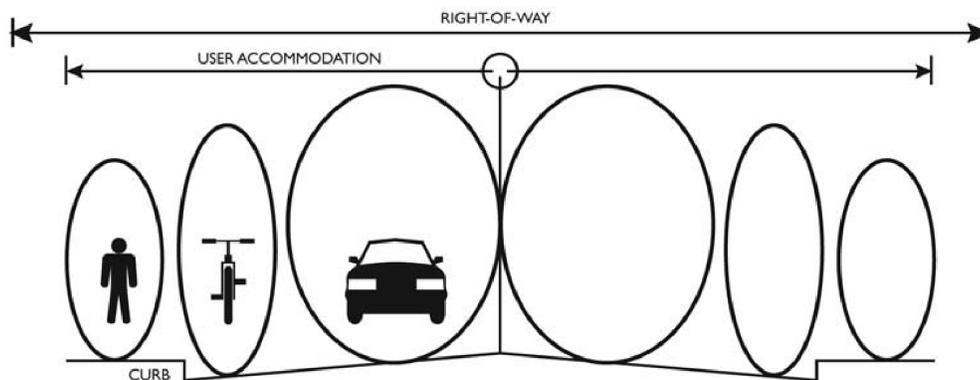


Appendix B: MassDOT Design Guide: Bicycle/Pedestrian Accommodation

The following are excerpted from the Massachusetts Department of Transportation's Design Guide. The Cape Cod Commission has included applications of each case identified with **parentheses**.

Case 1 - Separate Accommodation for All Users **(Bike Lane)**

- Often the preferred option to provide safe, convenient, and comfortable travel for all users.
- Appropriate for areas with moderate to high levels of pedestrian and bicycle activity.
- Appropriate for roadways with moderate to high motor vehicle speeds.
- Appropriate in areas without substantial environmental or right-of-way constraints.

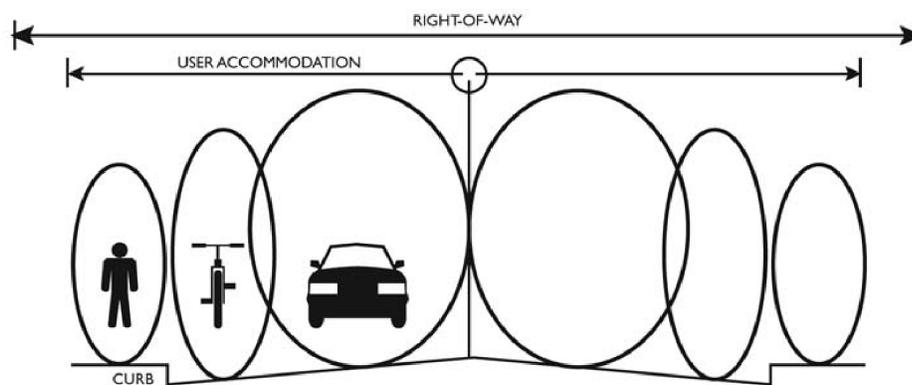


MassDOT Design Guide: Case 1 - Separate Accommodation for All Users



Case 2 - Partial Sharing for Bicycles and Motor Vehicles (**Wide Shoulder**)

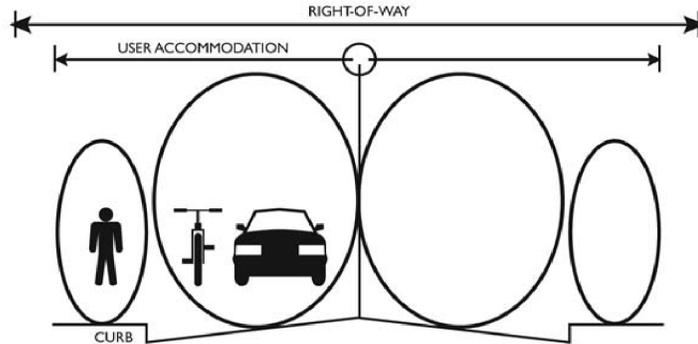
- Used in areas where the width necessary to provide Case 1 accommodation is not available.
- Under Case 2, pedestrians are provided with a sidewalk or separate path while space for bicyclists and drivers overlap somewhat.
- Appropriate in areas with low motor vehicle speeds and low to moderate motor vehicle volumes.



MassDOT Design Guide: Case 2 - Partial Sharing for Bicycles and Motor Vehicles

Case 3 - Shared Bicycle/Motor Vehicle Accommodation (**Sharrow**)

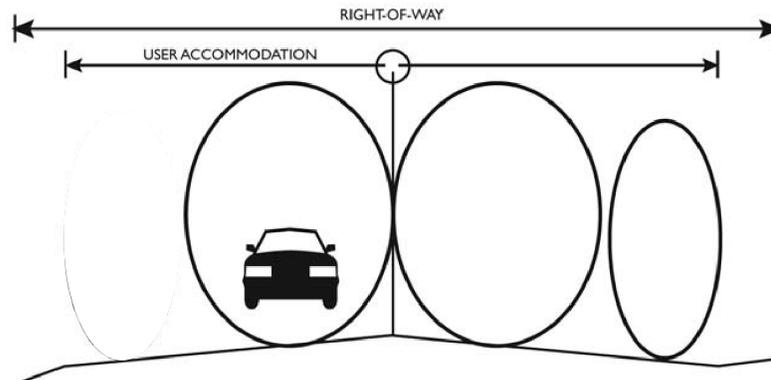
- Under Case 3, pedestrians remain separate, but bicycle and motor vehicle space are shared.
- Used in densely developed areas where right-of-way is constrained.
- Also, applicable to most residential/local streets where speeds and traffic volumes are low.



MassDOT Design Guide: Case 3 - Shared Bicycle/Motor Vehicle Accommodation

Case 4 - Shared Bicycle/Pedestrian Accommodation

- Under Case 4, pedestrians and bicyclists share the shoulder.
- Common in rural or sparsely developed areas.
- Appropriate for areas with infrequent pedestrian and bicycle use.

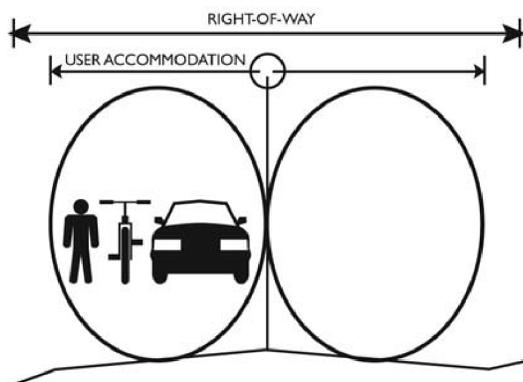


MassDOT Design Guide: Case 4 - Shared Bicycle/Pedestrian Accommodation

The Bikeways Committee has identified wider sidewalks and preferably multi-use paths as strategies for Case 4.

Case 5 - Shared Accommodation for All Users

- Under Case 5, all users share the roadway.
- Appropriate where user demands, and motor vehicle speeds are very low or when severe constraints limit the feasibility of providing separate accommodation.



MassDOT Design Guide: Case 5 - Shared Accommodation for All Users



Appendix C: Unit Costs of Improvements

The following tables of unit costs of bicycle and pedestrian accommodation techniques were used to determine project costs used in this prioritization plan. The first table has the latest costs based on MassDOT projects. The second table includes costs for certain additional items and was originally included in the “Bicycle Feasibility Study: Integrated Bicycle Plan for Cape Cod” published by the National Park Service/Cape Cod National Seashore in partnership with the Cape Cod Commission in 2011.

Town of Eastham, Massachusetts
MassDOT Complete Streets Funding Program Project Prioritization Plan
Conceptual Construction Cost Estimate (Unit Cost Summary)

Item	Unit Price	Unit	Comment
<i>Pedestrians</i>			
HMA Sidewalk (1 side)	\$ 8.00	per SF	
Concrete Sidewalk (1 side)	\$ 12.00	per SF	
Granite Curbing (1 side)	\$ 50.00	per LF	
R&R Granite Curbing (1 side)	\$ 25.00	per LF	
Concrete ADA Curb Ramp	\$ 3,000.00	per EACH	
Crosswalk	\$ 500.00	per EACH	Crosswalks are based on 10 feet wide per linear foot cost
Pedestrian crossing sign	\$ 100.00	per EACH	
RRFB (one on either side of a street)	\$ 15,000.00	per EACH	
Install APS Signal Head and Push Button on existing Post	\$ 3,000.00	per EACH	
Install new APS Signal Head and Push Button and Post	\$ 7,000.00	per EACH	
Install new post for APS Signal Head	\$ 4,000.00	per EACH	
<i>Reconstruction/Widening</i>			
Remove existing pavement and replace with loam and seed	\$ 18.00	per SF	
Roadway Widening	\$ 11.00	per SF	
Utility Pole Relocation	\$ 5,000.00	per EACH	
Tree Removal - diameter under 24 inches	\$ 1,200.00	per EACH	
Tree Removal - diameter 24 inches and over	\$ 2,500.00	per EACH	
<i>Bike</i>			
Remove existing pavement markings	\$ 1.00	per LF	
4" ReflectORIZED White Markings for bike lane (1 side)	\$ 1.00	per LF	
Bicycle Lane Symbol	\$ 280.00	per EACH	Every 500 feet and/or after every intersection
Sharrow Symbol	\$ 350.00	per EACH	Every 250 feet and/or after every intersection
Bike Sign and Post	\$ 240.00	per EACH	Every 1,000 feet or so
<i>Drainage</i>			
1 catchbasin, 1 manhole, and a 10 foot lateral pipe	\$ 10,000.00	per EACH	Every 300 feet, needed with every sidewalk installation
Main line (12" or 15" RCP)	\$ 78.00	per LF	If roadway does not have existing drainage, then closed drainage system is needed with sidewalk installation (as well as drainage structures above)
Stormceptor Unit	\$ 12,000.00	per EACH	Assume 1 per 5 catchbasins

References:

- Unit Prices: based on MassDOT Average Weighted Unit Prices (Statewide and District) and unit price from limited local projects. (Verification by the City is recommended)

Assumptions:

- All pavement markings unit cost price are based on thermoplastic
- All signs cost includes rebuild 2' x 2' existing sidewalk panel for sign installation

Cost Adjustments:

- Add 20% for Contingencies
- Add 8% for Police Detail



Table 4 Bicycle & Pedestrian Accommodations Unit Costs

Accommodation	Requirements	Unit	Unit Cost
On-road bikeway	Signing & striping	LF	\$ 2.00
On-road bikeway	Widen existing roadway to provide shoulder/bike lane	LF	\$ 95.00
Off-road bikeway	Construct shared use path adjacent to existing roadway, including utility pole relocation	LF	\$ 145.00
Off-road bikeway	Construct rail to trail path using abandoned railroad bed, minimal grading required	LF	\$ 125.00
Off-road bikeway	Construct shared use path on new alignment	LF	\$ 165.00
Off-road bikeway	Construct shared using existing corridor, minor grading and clearing required	LF	\$ 150.00
Roadway Crossing, residential	Pavement markings, and curb cuts/ADA curb ramps	EA	\$ 1,500.00
Roadway Crossing, signalized	Mast arms, signal heads, pedestrian signals, pavement markings, and curb cuts/ADA curb ramps	EA	\$ 70,000.00
5' Sidewalk, bituminous	Sidewalks located on both sides of street	LF	\$ 120.00
5' Sidewalk, concrete	Sidewalks located on both sides of street	LF	\$ 140.00
Bicycle/pedestrian bridge	Total lump sum construction	LS	\$1,200,000.00
Wayfinding Signage	Complete signage for wayfinding including directional and distance signs, route signs, destinations, etc.	LM	\$ 18,400.00
Bicycle rack (parking)	Installation on existing slab, drill & grout bolts	EA	\$ 1,500.00
Parking lot, trailhead		EA	\$ 50,000.00



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Appendix D: Prioritization Worksheet

