



CAPE COD  
COMMISSION

# Town of Eastham

## Complete Streets Prioritization Plan

MassDOT Approved – March 4, 2019



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

## **Acknowledgements**

*This report was funded in part through grants from the Massachusetts Department of Transportation (MassDOT). The views and opinions expressed herein do not necessarily state or reflect those of the MassDOT.*



## **Executive Summary**

The Town of Eastham 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), Eastham 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 Eastham while furthering the creation of vibrant, pedestrian and bicycle oriented mixed-use centers throughout the town.

The plan includes discussion of the towns characteristics and existing conditions to help identify problem areas. With a population of nearly 5,000 people (year-round) and a summer population two to three times as large, summer traffic demands can be challenging, especially to pedestrians, on many town streets which currently do not have sidewalks. 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 two Environmental Justice populations designated by the state based on low income in northern Eastham and an adjacent area in northern Orleans. The study group identified business and community activity areas throughout Eastham. These consist of destinations that are well-suited for access via walking or cycling. CCC staff performed a Gap Analysis for all segments of Eastham's streets to identify highly-desirable pedestrian/bicycling corridors on roadways that currently do not include facilities.

CCC and the Town of Eastham held a public workshop in February 2018 to gather input and prepare a list of potential projects. Staff then developed criteria to evaluate project characteristics including type of project (e.g., sidewalk, paved shoulders, etc.), traffic levels, speed levels, crash history, gap analysis and several others. Evaluation of these criteria resulted in a benefit score for each project that was then adjusted for project cost. These project benefit/cost scores were provided to Town of Eastham officials to develop a project ranking for the twenty-eight projects shown in the following table.

Following MassDOT review and resubmissions as necessary, an approved prioritization plan will allow the Town of Eastham to apply for up to \$400,000 of Complete Streets funding from MassDOT.



*Complete Streets Project Ranking*

Project I.D.	Rank	Projects	Total Cost	Funding Requested
p24	1	Samoset Rd (E): Sidewalk & Shoulders	\$725,000	\$400,000
p23	2	Samoset Rd (W): Sidewalk & Shoulders	\$1,301,000	\$400,000
p02	3	Brackett Rd (W): Additional Sidewalk	\$256,000	\$256,000
p19	4	Old County Rd: Sidewalk & Shoulders	\$154,000	\$154,000
p01	5	Brackett Rd (E): Sidewalk & Shoulders	\$1,179,000	\$400,000
p15	6	Nauset Rd: Sidewalk & Shoulders	\$1,679,000	\$400,000
p07	7	Great Pond Rd: Shoulders	\$227,000	\$227,000
p10	8	Locust Rd & Salt Pond Rd: Shoulders	\$454,000	\$400,000
p27	9	Massasoit Rd (N): Sidewalk & Shoulders	\$2,318,000	\$400,000
p16	10	Nauset Rd (N): Sidewalk & Shoulders	\$187,000	\$187,000
p11	11	Massasoit Rd (S): Sidewalk & Shoulders	\$1,319,000	\$400,000
p25	12	Schoolhouse Rd: Sidewalk & Shoulders	\$1,149,000	\$400,000
p08	13	Herring Brook Rd: Sidewalk & Shoulders	\$3,460,000	\$400,000
p06	14	Governor Prence Rd: Shoulders	\$318,000	\$318,000
p18	15	Ocean View Rd: Shoulders	\$409,000	\$400,000
p26	16	Dyer Prince Rd: Shoulders	\$323,000	\$323,000
p09	17	Kingsbury Beach Rd: Shoulders	\$545,000	\$400,000
p21	18	Rock Harbor Rd: Sidewalk	\$150,000	\$150,000
p22	19	Rock Harbor Rd/Bridge Rd: Sidewalk	\$652,000	\$400,000
p04	20	Cable Rd: Sidewalk & Shoulders	\$1,112,000	*
p05	21	Campground Rd: Shoulders	\$404,000	\$400,000
p28	22	Bridge Rd (S): Sidewalk	\$512,000	\$400,000
p03	23	Bridge Rd (N): Sidewalk & Shoulders	\$675,000	\$400,000
p17	24	Nauset Rd (S): Sidewalk & Shoulders	\$1,917,000	\$400,000
p13	25	Mill Rd: Shoulders	\$139,000	\$139,000
p12	26	McKoy Rd: Shoulders	\$303,000	\$303,000
p20	27	Old Orchard Rd: Sidewalk & Shoulders	\$2,372,000	\$400,000
p14	28	Nauset Bike Trail Extension	\$456,000	\$400,000

*\*Located in Cape Cod National Seashore – to be funded outside of Complete Streets Program*

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## Introduction/Background

The Town of Eastham 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- making streets safer, sustainable, and more accessible to a wide variety of people. 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, and Developments of Regional Impact, and various planning projects considering the existing safety issues and potential improvements.

The project team has reviewed all streets in Eastham and collected needed data from Automatic Traffic Recorders (ATR) as well as Turning Movement Counts (TMCs). High traffic volumes, particularly in the summer months, has caused congestion and crashes along some of the main routes, such as Route 6.

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



## TOWN CHARACTERISTICS

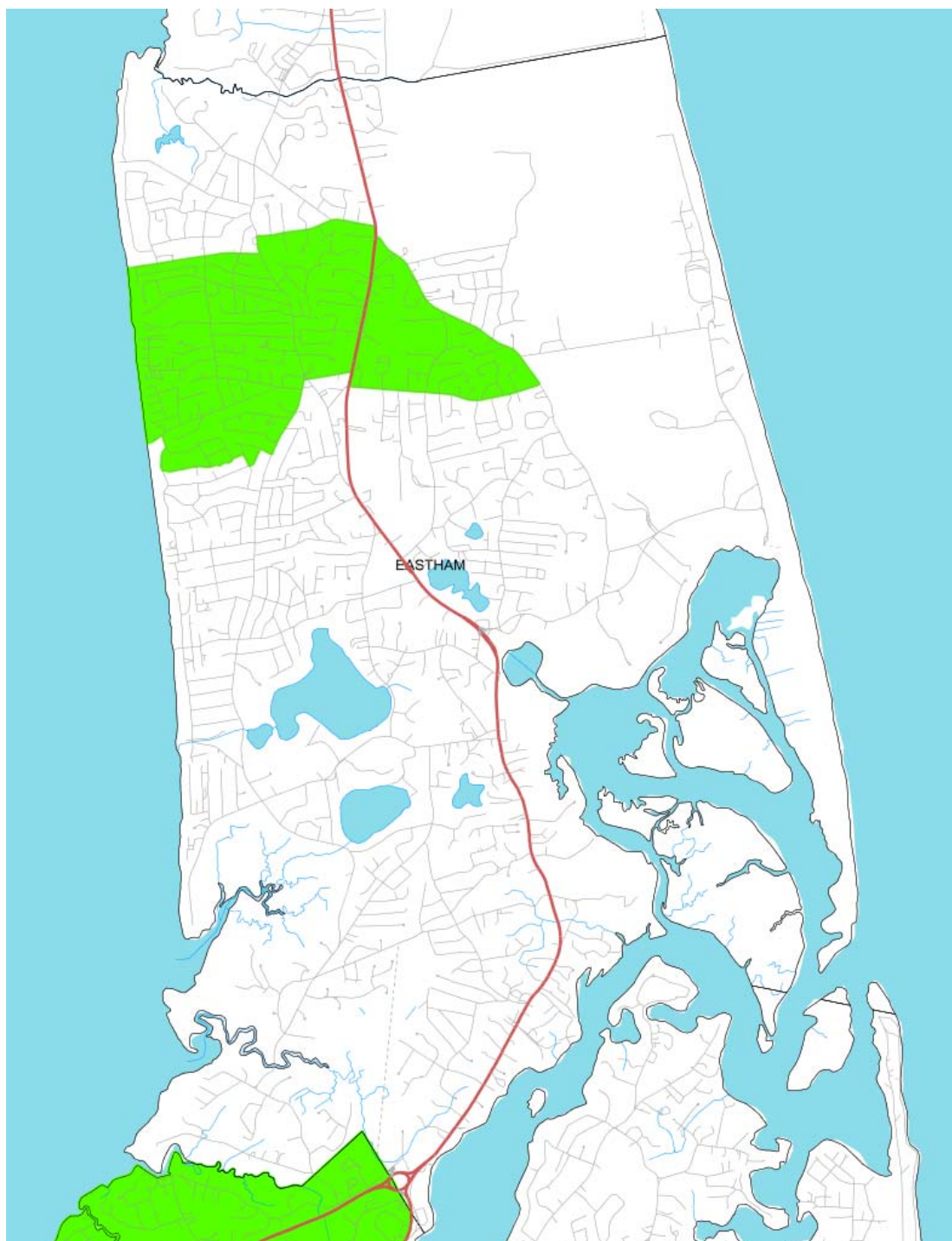
According to the United States Census’ American Community Survey for 2016, Eastham has an estimated population of 4,924, making it the 12<sup>th</sup> most populous town in Barnstable County. Eastham ranks 13<sup>th</sup> in employment with 1,272 employees according to the U.S. Bureau of Labor Statistics.

According to the U.S. 2010 census, a portion of northern Eastham and an adjacent area in northern Orleans contain an Environmental Justice Population categorized as low income as shown in Figure 1. “Low income” in this case is defined based on state criteria as follows. The 2010 Massachusetts state median income used is \$62,133, released by the USDA Economic Research Service. 65.49% of this value is \$ 40,673. Any census block group with a median household income in 2010 less than or equal to this value was identified as an Environmental Justice population.

Also shown are the Functional Classifications of Eastham’s roadways. Functional Classification is used by federal and state transportation authorities as a tool to allocate funding and specify road design parameters. For a distance of over seven miles, the highest classified roadway in Eastham, Route 6 (Principal Arterial) provides the greatest level of mobility and accommodates the greatest amount of capacity. The lowest classification (Local) contains the greatest mileage of roadways (111 miles) and provides access to many residences. The remaining classifications are intermediate to the two extremes, and each higher level often combines the traffic from the lower classifications, as well as, consists of higher levels of roadway capacity and fewer local access driveways.

*Table 1 - Functional Classification Road Mileage in Eastham*

Functional Classification	Total Mileage in Eastham
Principal Arterial	7.2
Minor Arterial or Collector	19.9
Local	111.1
<b>Total Road Miles:</b>	<b>138.2 miles</b>



*Figure 1 - Environmental Justice Population areas – Low Income*



## 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 Eastham*

#### *Road Safety Audit*

#### *Route 6 (Grand Army of the Republic Highway) at Nauset Road/Wampum Lane*

Cape Cod Commission, 2017

- Add an ADA-compliant pedestrian push button/signal head (includes countdowns both audible, visual, and vibrotactile), and crosswalk to cross Route 6 at Nauset Road (this also requires a ramp system on the east side of Route 6)
- Install ADA-compliant curb ramps on sidewalk along west side of Route 6.
- Provide crosswalks on all four approaches of the Nauset Road/Wampum Lane intersection and on the Aspinet Road approach
- Provide a sidewalk along Nauset Road from Route 6 to the Cape Cod Rail Trail
- Provide a sidewalk along the eastern side of Route 6.
- Consider a “road diet” for Route 6, which reduces number of travel lanes, and add bike lanes

### *Living Streets – Route 6 Eastham -South Wellfleet*

Cape Cod Commission, 2016

- Add a 6 to 10-foot sidewalk on the east side of Route 6
- Install a pedestrian phase at the signalized intersection of Nauset Road
- Construct median on Route 6 from Oak Road to Brackett Road

### *Eastham*

#### *Road Safety Audit*

#### *Route 6 and Governor Prence Road Intersection*

Cape Cod Commission, 2012

- Continue enforcement of the speed limit
- Consider a roundabout or other traffic calming via a partial median combined with a pedestrian crossing near the information booth
- Install a partial median to calm traffic in the intersection area
- Consider a roundabout for this intersection
- Consider a pedestrian beacon north of the intersection at the information booth, probably with a median
- Consider improved bicycle/pedestrian accommodation when reconstruction planning for Route 6 or the intersection occurs

### *Complete Streets/Living Streets*

#### *A Design Manual for Cape Cod*



Cape Cod Commission, 2012

This guide includes suggestions for road segments, intersections, pedestrian accommodations, bicycle accommodations, transit, and land use/streetscape ecosystem. The guide can be found on the Cape Cod Commission website:

[www.capecodcommission.org/resources/design/CompleteStreetsLivingStreetsDesignManual2012.pdf](http://www.capecodcommission.org/resources/design/CompleteStreetsLivingStreetsDesignManual2012.pdf)

*2008 Transportation Safety Report*

*Eastham: Route 6/Brackett Road*

Cape Cod Commission, 2009

- Install additional stop signs at the Cape Cod Rail Trail crossing
- Increase sight distance at the corners of Brackett Road/Cape Cod Rail Trail
- Construct a “Gateway Entrance” (signage and Landscaping) on Brackett Road to alert motorists entering the North Eastham Village Area
- Consider conversion of signalized intersection to a modern roundabout

*Route 6 Safety & Traffic Flow Study*

*Eastham – Wellfleet – Truro – Provincetown*

Cape Cod Commission, 2004

- Provide bus turnouts and shelters at strategic locations to compliment local services and destinations
- “Attractions” Shuttles: provide ride-sharing service for Provincetown excursions, National Seashore, other attractions
- Route 6 from Eastham/Orleans Rotary to Eastham post office: lanes for left turning vehicles plus single through travel lane. Signalization at Gov. Prence Road



## Problem Identification

The Cape Cod Commission prepared several maps to help community officials and members of the public better understand the challenges to biking and walking and identify areas in need of improvement. These maps were presented at a public workshop held at the Eastham Library on February 28, 2018. Approximately 40 people attended the meeting, the majority of whom were Eastham residents. The meeting included a presentation that explained the goals of the Complete Streets program and the elements of a prioritization plan. The attendees broke into smaller groups, each of which were invited to write their comments down on one of several maps.

Problem identification maps are described in the following sections:

### ROADWAY FUNCTIONAL CLASSIFICATION

A majority of the roads in Eastham are contained in the Census-designated Urbanized Area for Cape Cod as shown in Figure 2. Eastham streets included in this study (U.S. Route 6, under state jurisdiction, is not eligible) all 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.



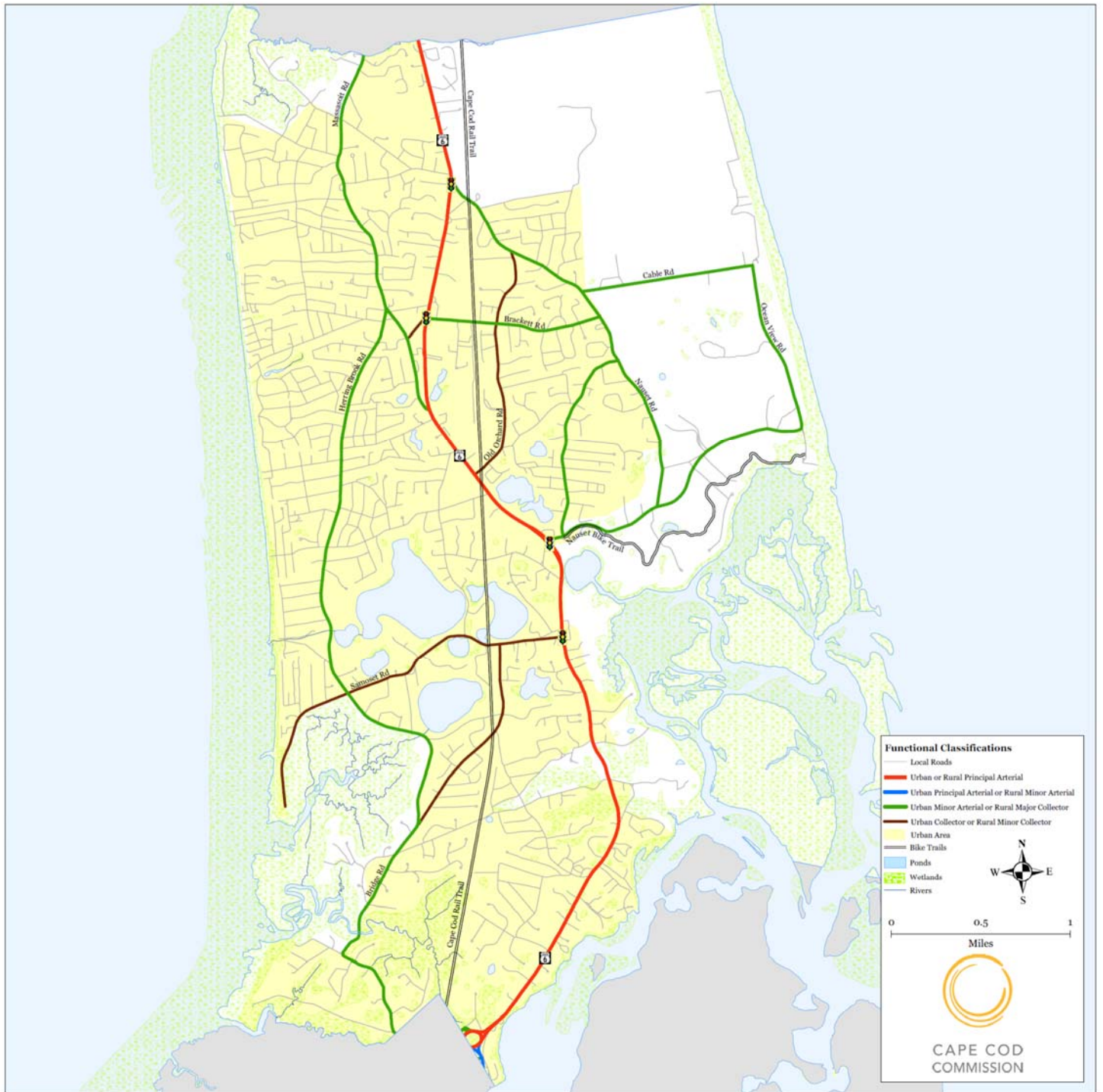


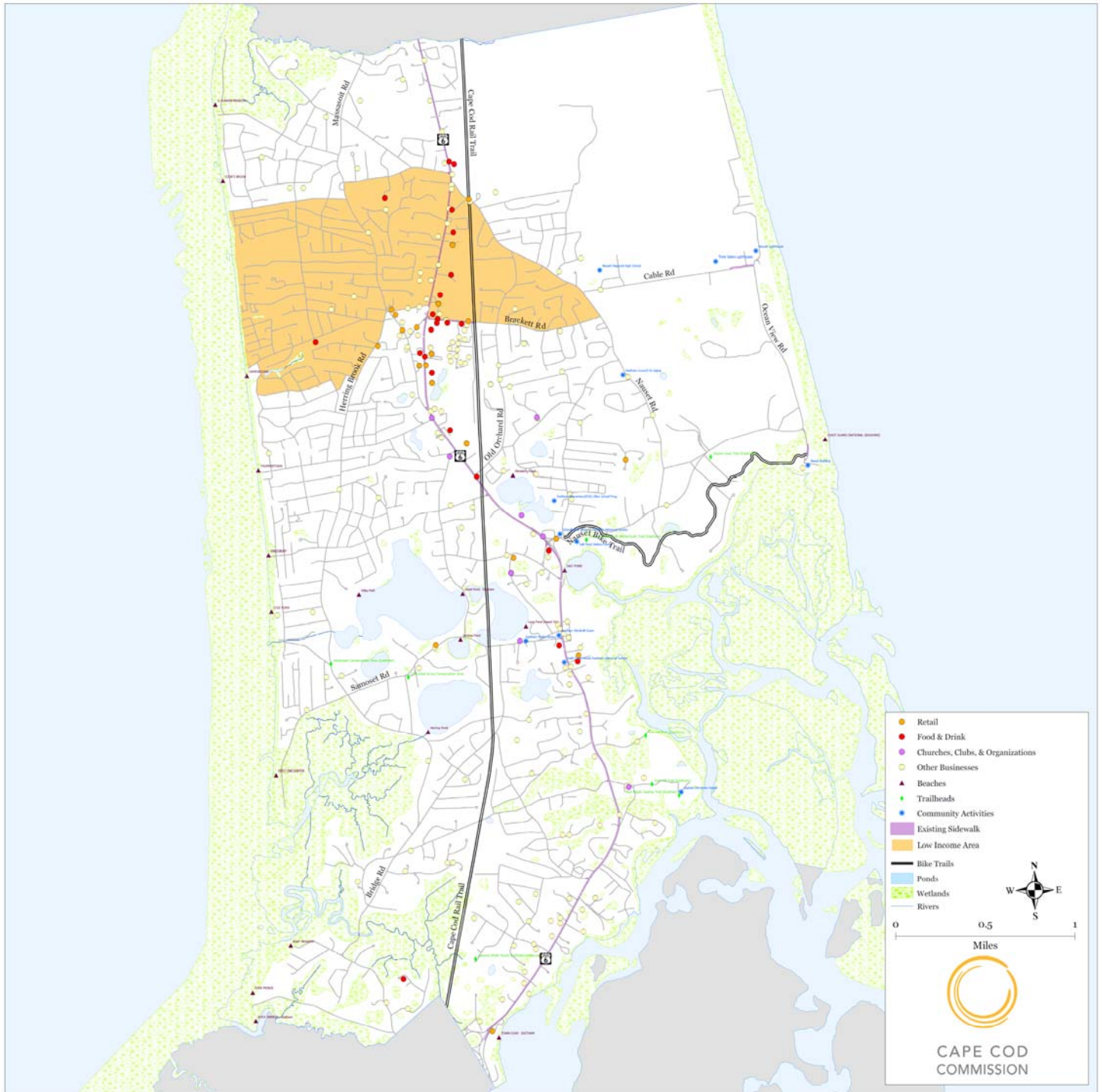
Figure 2 - Roadway Classification and Urban Boundary



## SIDEWALK AVAILABILITY AND LOCATIONS OF ACTIVITIES

For the most part, sidewalks in Eastham are limited to Route 6 along its west side as shown in Figure 3. In addition to a few sidewalk segments scattered throughout the town, the most significant amount of bicycling/pedestrian infrastructure consists of the Cape Cod Rail Trail connecting Eastham to Orleans and Wellfleet and the Nauset Bike Trail connecting Route 6 to the Atlantic side of town. Many of Eastham's commercial attractions are located along Route 6 and a high concentration of civic/community activities are along and near Samoset Road.





*Figure 3 - Sidewalk Availability and Locations of Activities*



## TRAFFIC VOLUMES, SPEED LIMITS, CRASH HISTORY

Several types of data are shown in Figure 4. These data include:

- **Traffic Volumes:** Route 6 is by far the heaviest traveled road with average daily traffic of 22,117 vehicles per day and is represented as the thickest line width. The busiest Eastham street is Samoset Road with average daily traffic of 3,307 vehicles per day (*source: Cape Cod Commission/MassDOT traffic counting programs*).
- **Speed Limits:** Route 6 also has the highest posted speed limit of 40 mph. Bridge Road and Bracket Road both have the highest posted speed limit (35 mph) of streets under Eastham's jurisdiction (*source: MassDOT Roadway Inventory File*).
- **Crash Data:** Over the most recent three years on record (2013-2015), there were ten reported crashes in Eastham that involved either a pedestrian or a bicyclist. These included one pedestrian fatality and one bicyclist fatality, both on Route 6. On Eastham streets there were four reported bicycle crashes and one pedestrian crash (*source: MassDOT Crash Portal*).

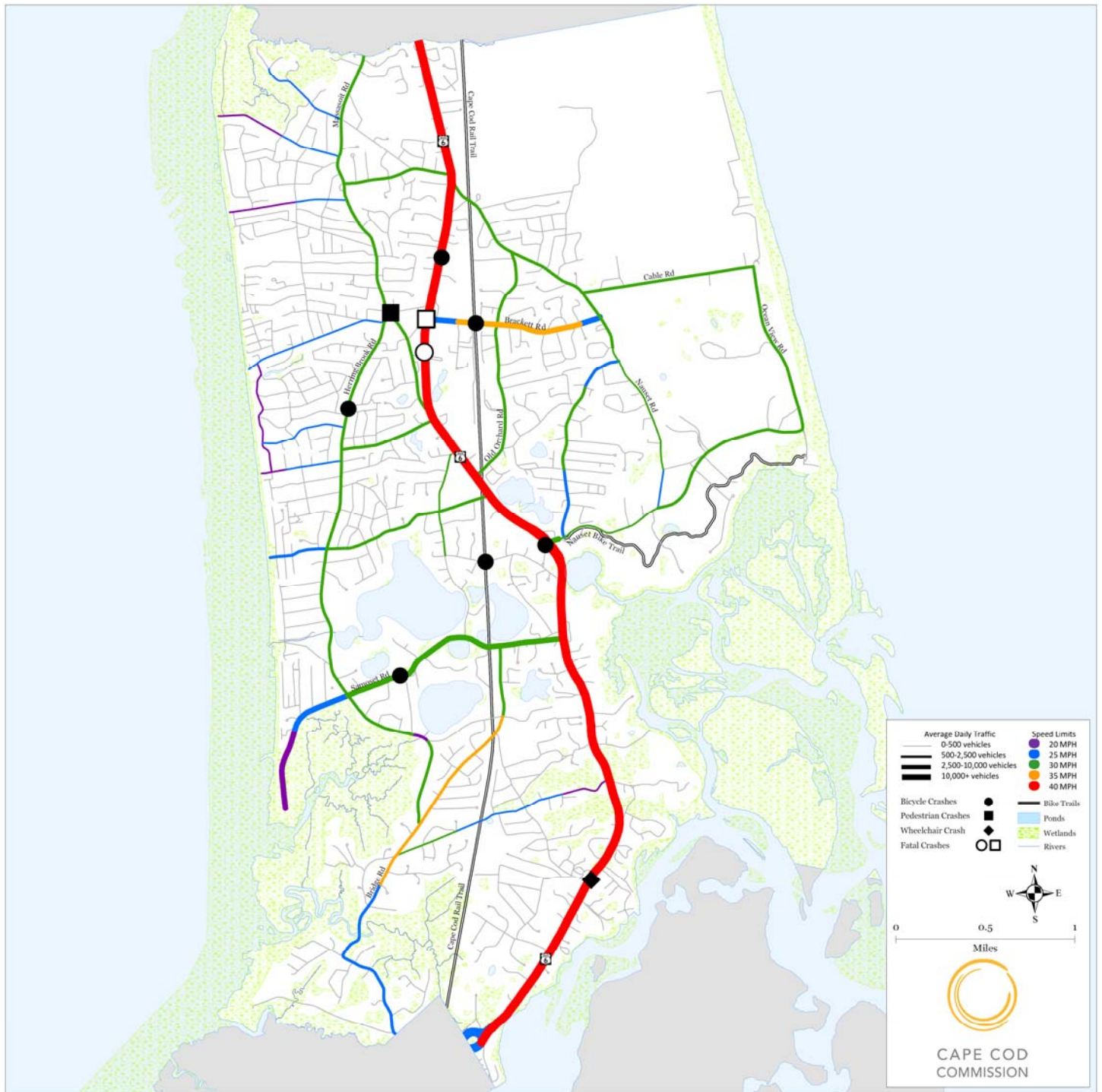


Figure 4 - Traffic Volume, Speed Limit, and Crash Locations



Cape Cod Commission GIS staff have developed a gap analysis tool to help identify priority gaps in the pedestrian network. The tool provides “Gap Scores” for roadway segments by analyzing the travel distance to various activity areas. The color-coded roadways shown in Figure 5 comprise Eastham’s streets (excluding Route 6) that currently are not classified as “walkable.” A walkable street is defined in this case to include the presence of a sidewalk or a combination of low-speed limit, low average daily traffic, and no centerline.

Gap Scores are calculated based on travel distance using network analysis to activity sites. Activity sites include community activities (CA) and business activities (BA), as described in the following lists:

**Community Activity Sites:**

- Schools
- Colleges
- Libraries
- Hospitals
- Arts and culture facilities
- Recreational facilities
- Community centers
- Senior centers
- Beaches
- Trailheads

**Business Activity Sites:**

- Retail trade
- Accommodation and food services
- Galleries

Using GIS network analysis for each road segment, determine the number of community activity sites and business activity sites within  $\frac{1}{4}$  mile,  $\frac{1}{2}$  mile, and 1 mile. For each activity type, determine a Gap Score using the following weighting system:

$$3 * (\text{sites within } \frac{1}{4} \text{ mile}) + 2 * (\text{sites within } \frac{1}{2} \text{ mile}) + 1 * (\text{sites within 1 mile})$$

For each activity type, Gap Scores are normalized on a 0-100 range. These are then added together and finally normalized again on a 0-100 range. These results are presented in the color-coded map of Figure 5. The areas which have the highest Gap Scores, and therefore the highest utility for pedestrians (and bicyclists) once safe and comfortable facilities are created are shown in red (e.g., Samoset Road).





*Figure 5 - Gap Analysis*

## PUBLIC WORKSHOP

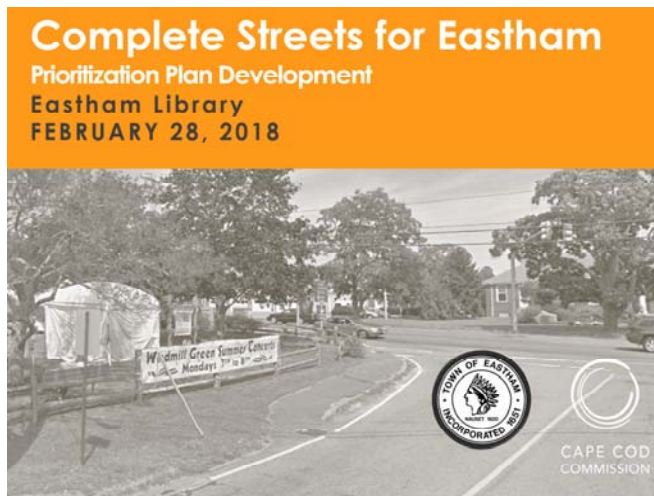
On February 22, 2018, Cape Cod Commission and Town of Eastham staff held a public workshop at the Eastham Public Library for members of the public, town officials, and other interested parties. With nearly 40 participants, the workshop consisted of two parts:



## Part 1: Presentation

The topics presented include:

- Definition of a Complete Street
- Benefits of Complete Streets
  - Safety Benefits
  - Health Benefits
  - Benefits for People with Disabilities
  - Benefits for Children
  - Benefits for Aging Population
- Funding Available for Complete Streets
- Prioritization Plan Template
- Complete Streets Project Types:
  - Traffic Flow and Safety
  - Bicycle Facilities
  - Pedestrian Facilities
  - Transit Facilities
- Complete Streets Needs
- Context Sensitivity
- Existing Conditions
  - Sidewalks and Destinations
  - Roadway Classification
  - Speed Limits, Crashes, Traffic Volume
  - Gap Analysis



*Figure 6 - Presentation slide for public workshop*



*Figure 7 - Presentation at Eastham Public Library*

## Part 2: Table Top Exercise

After a period of questions and comments, workshop participants were divided into four separate groups for a tabletop exercise. Using a set of paper maps laid on the tables, the participants added written comments and drew linework to identify problem areas and make suggestions for improvement.



*Figure 8 - Audience participation in problem identification/project development*





## Project Identification & Evaluation

Following the public workshop, the study team met to narrow down/combine the suggestions to create a list of twenty-five projects for evaluation, scoring, and ranking. Following an initial review, the study team identified three additional projects for a total of twenty-eight.

The following sections includes a discussion of potential projects, scoring methodology, and project evaluation.

### PROJECTS FOR EVALUATION

In Figure 9, twenty-eight complete streets projects have been identified. Most of the proposed projects include additions to Eastham's streets such as:

- Sidewalks on one side of the road and paved shoulders (shown in green)
- Sidewalks on one side of the road (shown in blue)
- Paved shoulders (shown in red)

The project list includes an extension of the Nauset Bike Trail from Route 6 to the Cape Cod Rail Trail (shown in light blue with a black border).

Complete Streets projects are identified by an identification number (e.g., P01 – P28) that has generally been assigned based on alphabetical order and are shown on the map and included in the listing in Table 2.





*Table 2 - List of Projects*

<b>Project I.D.</b>	<b>Projects</b>	<b>Total Cost</b>
p01	Brackett Rd (E): Sidewalk & Shoulders	\$1,179,000
p02	Brackett Rd (W): Additional Sidewalk	\$256,000
p03	Bridge Rd (N): Sidewalk & Shoulders	\$675,000
p04	Cable Rd: Sidewalk & Shoulders	\$1,112,000
p05	Campground Rd: Shoulders	\$404,000
p06	Governor Prence Rd: Shoulders	\$318,000
p07	Great Pond Rd: Shoulders	\$227,000
p08	Herring Brook Rd: Sidewalk & Shoulders	\$3,460,000
p09	Kingsbury Beach Rd: Shoulders	\$545,000
p10	Locust Rd & Salt Pond Rd: Shoulders	\$454,000
p11	Massasoit Rd (S): Sidewalk & Shoulders	\$1,319,000
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p14	Nauset Bike Trail Extension	\$456,000
p15	Nauset Rd: Sidewalk & Shoulders	\$1,679,000
p16	Nauset Rd (N): Sidewalk & Shoulders	\$187,000
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p18	Ocean View Rd: Shoulders	\$409,000
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p20	Old Orchard Rd: Sidewalk & Shoulders	\$2,372,000
p21	Rock Harbor Rd: Sidewalk	\$150,000
p22	Rock Harbor Rd/Bridge Rd: Sidewalk	\$652,000
p23	Samoset Rd (W): Sidewalk & Shoulders	\$1,301,000
p24	Samoset Rd (E): Sidewalk & Shoulders	\$725,000
p25	Schoolhouse Rd: Sidewalk & Shoulders	\$1,149,000
p26	Dyer Prince Rd: Shoulders	\$323,000
p27	Massasoit Rd (N): Sidewalk & Shoulders	\$2,318,000
p28	Bridge Rd (S): Sidewalk	\$512,000



Projects identified through the public workshop and stakeholder meetings include new sidewalks, shared-use paths, and shoulder improvements. Some of the criteria are evaluated using MassDOT's Project Intake Tool (MAPIT) – an online mapping application that identifies various affected geographies (e.g., environmental resources, environmental justice areas, crash clusters, etc.). The following procedures are proposed specifically for evaluating Eastham's list of projects.

**Stage 1:**

Evaluate project benefits based on following criteria:

- **[1a] Improvement in pedestrian safety:** in an area with reported pedestrian crashes, provision of pedestrian facilities where no accommodation exists gains maximum score of 10. Considers traffic volumes and vehicle speeds and problem areas identified as part of a Road Safety Audit. Facilities on both sides of the road can gain an extra 5 points.
- **[1b] Improvement in pedestrian mobility:** provision of fully-separated pedestrian facilities where no accommodation exists gains maximum score of 10. Facilities on both sides of the road can gain an extra 5 points.
- **[1c] Improvement in bicycling safety** in an area with reported bicyclist crashes, provision of bicycling facility where no accommodation exists gains maximum score of 10. Considers traffic volumes and vehicle speeds and problem areas identified as part of a Road Safety Audit. Facilities on both sides of the road can gain an extra 5 points.
- **[1d] Improvement in bicycling mobility:** provision of fully-separated bicycling facility where no accommodation exists gains maximum score of 10. Facilities on both sides of the road can gain an extra 5 points.
- **[1e] Improvement in network connectivity:** providing safe & comfortable connections to existing shared-use paths and along roadways with high Gap Scores gains a maximum score of 20. Projects that are regional in nature (e.g., provide connections to adjacent towns and support the regional bicycling/pedestrian networks) can score an additional 5 points.

Combine benefit scores from above criteria and multiply by project length (in miles) to find Stage 1 Score.

$$\text{Stage 1 Score} = (1a + 1b + 1c + 1d + 1e) \times \text{Project Length}$$

**Stage 2:**

Evaluate project benefits based on supplemental criteria:

- **[2a] Access to Environmental Justice areas:** providing safe & comfortable facilities within or near Environmental Justice Areas gains a maximum score of 10. Environment Justice areas are identified using MAPIT, projects located in adjacent areas are given progressively lower scores based on proximity.
- **[2b] Public/Stakeholder support:** projects supported by both public and stakeholders gain a maximum score of 10.
- **[2c] Compatibility with community goals:** projects identified in local plans (e.g., LCP, transportation studies) can gain a maximum score of 10.



- **[2d] Environmental impacts:** projects that increase impervious surfaces or impact sensitive areas can receive a negative score up to -10. Scoring is based on number of environmental resource areas impacted as identified using MAPIT. Projects that include improvements to environmental areas (e.g., low-impact design, stormwater management) can receive a positive score up to 10.

Combine benefit scores from above to find Stage 2 score

$$\text{Stage 2 Score} = 2a + 2b + 2c + 2d + 2e$$

### **Total Benefit Scoring**

In consultation with task force members, identify weighting factors for each scoring stage. These weighting factors have been determined to be:

$$\text{Stage 1 Weighting Factor} = 1.0$$

$$\text{Stage 2 Weighting Factor} = 1.0$$

Multiply stage scores by weighting factors and combine to find Total Benefit Score

$$\text{Total Benefit Score} = \text{Stage 1 Score} \times \text{Stage 1 Weighting Factor} \\ + \text{Stage 2 Score} \times \text{Stage 2 Weighting Factor}$$

### **Benefit/Cost Scoring**

Project costs are calculated for each project type depending on length from the table available in Appendix C. It is expected that funding is limited and would not be available for implementation of all considered projects. To maximize overall benefits, a Benefit/Cost Score is calculated for each project by dividing the Total Benefit Score of each project by its cost:

$$\text{Benefit/Cost Score} = \text{Total Benefit Score} / \text{Project Cost}$$

### **Prioritization & Implementation**

After determining Benefit/Cost scores for each project, create ranked list with highest scores corresponding to projects that are the highest priority. The priority listing does not necessarily indicate the order of implementation. Additional factors will be considered in project selection such as:

- Available funding
- Project readiness
- Project can be combined with another non-complete streets project

## PROJECT EVALUATIONS

Using the criteria described above, the study team evaluated each project resulting in the scores presented in Table 3.





*Table 3 - Initial Evaluation of Projects*

Proj. ID	Project Name	1a	1b	1c	1d	1e	Stage 1 Score	2a	2b	2c	2d	Stage 2 Score	Total Benefit Score	Benefit/Cost Score
p01	Brackett Rd (E): Sidewalk & Shoulders	6	10	4.8	8	2.4	21.8	10	7	6	-3	20.0	41.8	46
p02	Brackett Rd (W): Additional Sidewalk	7.15	13	5.5	10	4.3	8.0	10	6	6	-3	19.0	27.0	135
p03	Bridge Rd (N): Sidewalk & Shoulders	4	10	3.2	8	1.5	16.0	5	6	6	-3	14.0	30.0	58
p04	Cable Rd: Sidewalk & Shoulders	3.5	10	2.8	8	8.2	26.0	7.5	10	6	-5	18.5	44.5	51
p05	Campground Rd: Shoulders	1.5	5	1.5	5	3.4	13.2	10	7	6	-4	19.0	32.2	102
p06	Governor Prence Rd: Shoulders	1	5	1	5	4.7	11.7	5	6	6	-5	12.0	23.7	95
p07	Great Pond Rd: Shoulders	1.25	5	1.25	5	12.9	12.7	2.5	6	6	-5	9.5	22.2	125
p08	Herring Brook Rd: Sidewalk & Shoulders	4.5	10	3.6	8	6.7	104.9	10	7	6	-7	16.0	120.9	45
p09	Kingsbury Beach Rd: Shoulders	1.75	5	1.75	5	8.2	26.0	5	6	6	-5	12.0	38.0	89
10	Locust Rd & Salt Pond Rd: Shoulders	1.5	5	1.5	5	14.8	25.1	2.5	10	6	-4	14.5	39.6	112
p11	Massasoit Rd (S): Sidewalk & Shoulders	4.5	9	3.6	8	5.8	18.5	7.5	7	6	0	20.5	39.0	38
p12	McKoy Rd: Shoulders	1.75	5	1.75	5	3.9	8.7	7.5	6	6	-2	17.5	26.2	111
p13	Mill Rd: Shoulders	1	5	1	5	19.1	15.6	2.5	6	6	-3	11.5	27.1	250
p14	Nauset Bike Trail Extension	4.5	15	4.5	15	25.0	25.6	5	6	6	-1	16.0	41.6	117
p15	Nauset Rd: Sidewalk & Shoulders	3.5	10	2.8	8	4.7	29.0	10	7	6	-3	20.0	49.0	37
p16	Nauset Rd (N): Sidewalk & Shoulders	6	10	4.8	8	4.3	3.3	10	7	10	-3	24.0	27.3	187
p17	Nauset Rd (S): Sidewalk & Shoulders	2.5	10	2	8	7.1	53.3	7.5	6	6	-7	12.5	65.8	44
p18	Ocean View Rd: Shoulders	1.75	5	1.75	5	9.0	20.3	5	6	6	-5	12.0	32.3	101
p19	Old County Rd: Sidewalk & Shoulders	4.5	10	3.6	8	5.2	3.1	7.5	6	6	0	19.5	22.6	193
p20	Old Orchard Rd: Sidewalk & Shoulders	3.5	10	2.8	8	4.7	37.7	10	6	6	-2	20.0	57.7	31
p21	Rock Harbor Rd: Sidewalk	2.7	9	2.1	7	13.6	6.9	10	7	6	-7	16.0	22.9	196
p22	Rock Harbor Rd/Bridge Rd: Sidewalk	2.7	9	2.1	7	7.4	28.2	10	6	6	-8	14.0	42.2	83
p23	Samoset Rd (W): Sidewalk & Shoulders	5.5	10	4.4	8	10.5	53.8	2.5	8	6	-8	8.5	62.3	61
p24	Samoset Rd (E): Sidewalk & Shoulders	4.5	10	3.6	8	23.1	19.7	2.5	10	10	-3	19.5	39.2	69
p25	Schoolhouse Rd: Sidewalk & Shoulders	3.5	10	2.8	8	8.6	36.2	7.5	6	6	-4	15.5	51.7	58
p26	Dyer Prince Rd: Shoulders	1	10	1	8	8.2	22.5	7.5	6	6	-6	13.5	36.0	143
p27	Massasoit Rd (N): Sidewalk & Shoulders	4.5	10	3.6	8	2.8	43.3	7.5	6	6	-4	15.5	58.8	33
p28	Bridge Rd (S): Sidewalk	1.8	10	1.4	8	0.9	15.4	7.5	6	6	-7	12.5	27.9	70







## Recommendations & Project Prioritization

The ultimate recommendation of this study is the implementation of projects in the Eastham Complete Street Prioritization Tables presented at the end of this chapter.

Additionally, recommendations for local and state roads are listed in the following sections.

### TOWNWIDE ROADS

To provide a comprehensive network for safe and comfortable walking and bicycle use, the following town roads have been identified as candidates for vegetation clearing and provision of shoulders (paved or unpaved). This list has some overlap with the proposed priority plan and is included in this report for informational purposes.

#### **Bay Side**

1. Bridge Road to Rock Harbor Road including over bridge
2. Dyer Prince Road
3. South Eastham Street
4. Hay Road
5. Governor Prence Road Extension
6. Governor Prence Road
7. Herring Brook Road
8. Massasoit Road
9. Lawton Road
10. Samoset Road to beach
11. Depot Road
12. Salt Pond Road
13. Mill Road
14. Locust Road
15. Great Pond Road
16. Kingsbury Beach Road from R0ute 6 to beach
17. Thumpertown Road
18. Western Road
19. McKoy Road
20. Weir Road
21. Edgewood Road
22. Old County Road
23. Oak Road
24. Aspinet Road
25. North Sunken Meadow Road to Eldredge Drive
26. South Sunken Meadow Road to beach
27. Cook's Brook Road to Higgins Road
28. Campground Road
29. Shurtleff Road
30. Steele Road

#### **Ocean Side**

1. Schoolhouse Road
2. Brackett Road from bike trail to Nauset Road
3. Alston Avenue
4. Meetinghouse Road
5. Old Orchard Road
6. Railroad Avenue
7. Ocean View Drive



8. Nauset Road (Route 6) to  
MacPherson

9. Hemenway Road

## STATE ROADS (ROUTE 6)

While outside the scope of the Complete Streets Program, Route 6 is nevertheless a critical corridor for pedestrian and cyclist travel in Eastham. As MassDOT proceeds with implementation of complete street upgrades to facilities under their jurisdiction, the following are recommended for Route 6 in Eastham:

- Construct an ADA-compliant sidewalk along the east side
- Reconstruct the existing sidewalk to ADA-compliant standards along the west side
- Provide pull-off areas for bus stops
- Provide wayfinding signage guiding users to best routes connecting to beaches, recreation areas, Cape Cod Rail Trail, and other destinations



## EASTHAM COMPLETE STREETS PRIORITIZATION TABLE

Using the scoring evaluation methodology discussed above, a ranked list of projects is presented in Table 4. A complete printout of the prioritization plan worksheet is available in the appendix.

*Table 4 - Project Ranking*

Project I.D.	Rank	Projects	Total Cost	Funding Requested
p24	1	Samoset Rd (E): Sidewalk & Shoulders	\$725,000	\$400,000
p23	2	Samoset Rd (W): Sidewalk & Shoulders	\$1,301,000	\$400,000
p02	3	Brackett Rd (W): Additional Sidewalk	\$256,000	\$256,000
p19	4	Old County Rd: Sidewalk & Shoulders	\$154,000	\$154,000
p01	5	Brackett Rd (E): Sidewalk & Shoulders	\$1,179,000	\$400,000
p15	6	Nauset Rd: Sidewalk & Shoulders	\$1,679,000	\$400,000
p07	7	Great Pond Rd: Shoulders	\$227,000	\$227,000
p10	8	Locust Rd & Salt Pond Rd: Shoulders	\$454,000	\$400,000
p27	9	Massasoit Rd (N): Sidewalk & Shoulders	\$2,318,000	\$400,000
p16	10	Nauset Rd (N): Sidewalk & Shoulders	\$187,000	\$187,000
p11	11	Massasoit Rd (S): Sidewalk & Shoulders	\$1,319,000	\$400,000
p25	12	Schoolhouse Rd: Sidewalk & Shoulders	\$1,149,000	\$400,000
p08	13	Herring Brook Rd: Sidewalk & Shoulders	\$3,460,000	\$400,000
p06	14	Governor Prence Rd: Shoulders	\$318,000	\$318,000
p18	15	Ocean View Rd: Shoulders	\$409,000	\$400,000
p26	16	Dyer Prince Rd: Shoulders	\$323,000	\$323,000
p09	17	Kingsbury Beach Rd: Shoulders	\$545,000	\$400,000
p21	18	Rock Harbor Rd: Sidewalk	\$150,000	\$150,000
p22	19	Rock Harbor Rd/Bridge Rd: Sidewalk	\$652,000	\$400,000
p04	20	Cable Rd: Sidewalk & Shoulders	\$1,112,000	*
p05	21	Campground Rd: Shoulders	\$404,000	\$400,000
p28	22	Bridge Rd (S): Sidewalk	\$512,000	\$400,000
p03	23	Bridge Rd (N): Sidewalk & Shoulders	\$675,000	\$400,000
p17	24	Nauset Rd (S): Sidewalk & Shoulders	\$1,917,000	\$400,000
p13	25	Mill Rd: Shoulders	\$139,000	\$139,000
p12	26	McKoy Rd: Shoulders	\$303,000	\$303,000
p20	27	Old Orchard Rd: Sidewalk & Shoulders	\$2,372,000	\$400,000
p14	28	Nauset Bike Trail Extension	\$456,000	\$400,000

*\*Located in Cape Cod National Seashore – to be funded outside of Complete Streets Program*



The study team is re-submitting a draft plan to MassDOT for feedback and resubmit as required. Following approval of the prioritization plan, the Town of Eastham will be 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 costs of several of the projects listed in the priority plan exceed the \$400,000 threshold. At the time of applying for Tier 3 funding, additional funding sources must be identified.
- Wayfinding signs should comply with the Manual on Uniform Traffic Control Devices.
- 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.
- The use of brick within the pedestrian access route is not recommended. Due to independent movement during freeze thaw cycles, over time it becomes difficult for brick to maintain compliance.
- Shared us paths are preferred to be 12 feet wide or a minimum of 10 feet wide.
- The National Committee on Uniform Traffic Control Devices has recommended that the SHARE THE ROAD (W16-1P) plaque no longer be used in conjunction with the Bicycle (W11-1) and other vehicular traffic



## **Appendix A: Town of Eastham – Selectmen Policy on Complete Streets**

### **1.0 Authority**

The Board of Selectmen hereby adopt a Complete Street Policy.

### **2.0 Purpose**

The fifteen towns of Barnstable County make up a distinctive region known for its coastlines, historic villages, and environmental resources. It can be challenging to accommodate all users on narrow roadways that follow colonial layouts and are constrained by historic buildings and environmental resources, especially when the volume of users swells during the summer tourist season. The goal of Eastham’s Complete Streets policy is to make sure that all users and resources are considered when designing roadway improvements, and that accommodations for a full array of users are balanced with the elements that are important to both the character and the economy of the town and the region.

Complete Streets are designed and operated to provide safety, comfort, and accessibility for all the users of our roadways, trails, and transit systems, including pedestrians, bicyclists, transit riders, motorists, commercial vehicles, and emergency vehicles. “All users” includes users of all ages, abilities, and income levels. Furthermore, Complete Streets principles contribute toward the safety, health, economic viability, and quality of life in a community by improving the pedestrian and vehicular environments in order to provide safe, accessible, and comfortable means of travel between home, school, work, recreation and retail destinations. Complete Streets also furthers equity objectives by providing safe forms of travel for residents of all income levels. The purpose of the town of Eastham’s Complete Streets policy, therefore, is to accommodate all users by creating a context-sensitive roadway network that meets the needs of individuals utilizing a variety of transportation modes. It is the intent of the town of Eastham to formalize the planning, design, operation and maintenance of roadways so that they are safe for all users of all ages and abilities and all income levels as a matter of routine. This policy directs decision-makers to consistently plan, design, construct, and maintain roadways to accommodate all anticipated users including but not limited to pedestrians, bicyclists, motorists, transit riders and vehicles, emergency vehicles, and freight and commercial vehicles.

### **3.0 Core Commitment**

The town of Eastham recognizes that users of various modes of transportation, including but not limited to pedestrians, cyclists, transit and school bus riders, motorists, delivery and service personal, freight haulers, and emergency responders, are legitimate users of streets and deserve safe facilities. “All users” includes users of all ages, abilities, and income levels.



The Town of Eastham recognizes that all projects, including new construction, maintenance and reconstruction, are potential opportunities to apply Complete Streets design principles. The town will, to the maximum extent practicable, 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 Eastham, as well as projects funded by the State and Federal government, including but not limited to Chapter 90 funds, City improvements grants, Transportation Improvement Program (TIP), the MassWorks Infrastructure Program, Community Development Block Grants (CDBG), Capital Funding and other state and federal funds for street and infrastructure design shall adhere to the Town of Eastham Complete Street Policy. Private developments and related roadway design components shall also adhere to the Complete Street principles. In addition, to the extent practical, state-owned roadways will comply with the Complete Streets Policy, including the design, construction and maintenance of such roadways within town boundaries.

Town Departments, will use best judgment regarding the desirability and feasibility of applying Complete Streets principles for routine roadway maintenance and projects such as repaving, restriping and so forth.

#### **4.0 Exemptions**

Transportation infrastructure projects, including but not limited to roadway reconstruction, roadway reconfigurations or subdivisions may be excluded upon approval by the Board of Selectmen with consultation from the appropriate town departments and the Eastham Planning Board where documentation and data indicate that any of the following apply:

- Where it is demonstrated that costs or impacts of accommodation are excessively disproportionate to the need or probable future use.
- Other town policies, regulations or requirements contradict or preclude implementation of Complete Streets principles.

#### **5.0 Best Practices**

The Town of Eastham Complete Streets policy will focus on developing a connected, integrated network that serves all 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. As practicable, recommendations from the appropriate town departments, Boards and Committees for incorporating complete streets elements will occur in projects' beginning stages prior to design.

Implementation of the Town of Eastham Complete Streets Policy will be carried out cooperatively within all departments in the Town of Eastham with multi- jurisdictional cooperation and, to the greatest extent possible, among private developers and state, regional and federal agencies.



The Town of Eastham will work cooperatively with neighboring communities and regional entities in an effort to strengthen regional connectivity options for all users.

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 giving significant consideration to stakeholder and community values. It includes goals related to livability with greater participation of those affected in order to gain project consensus. 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 Town of Eastham 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

The latest design guidance, standards and recommendations available will be used in the implementation of Complete Streets, including the most up-to-date versions of:

- The Massachusetts Department of Transportation Project Design and Development Guidebook
- American Association of State Highway Transportation Officials (AASHTO)  
A Policy on Geometric Design of Highways and Streets
- The United States Department of Transportation Federal Highway Administration's Manual on Uniform Traffic Design Controls
- The Architectural Access Board (AAB) 521 CMR Rules and Regulations
- The 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 the Town of Eastham including but not limited to:
  - Local Comprehensive Plan
  - Open Space and Recreation Plan
  - Downtown Improvement or Historic District plans
  - Bicycle and pedestrian network plans.

The Town of Eastham will implement a balanced and flexible approach to Complete Streets implementation that utilizes the latest design guidance, standards and recommendations while providing flexibility to best accommodate all users and modes given the unique characteristics of the surrounding community.

## **6.0 Evaluation of Effectiveness**

The Town will develop performance measures to periodically assess the rate, success, and effectiveness of implementing the Complete Streets Policy. The Town will determine the



frequency of assessment and utilize appropriate metrics for analyzing the success of this policy. These metrics may include:

- Total miles of new on-street bicycle routes defined by lane markings or signage,
- Linear feet of new pedestrian accommodation,
- Number of new curb ramps or other retrofitted pedestrian facilities,
- Increase in the number of users of public transportation,
- Decrease in the number of traffic accidents involving vehicles, bicycles and pedestrians in Complete Streets areas.

These metrics will be compiled into a report by the Town and presented as needed, no less than annually. Implementation strategies will be adjusted as needed based on the findings in these reports.

### **7.0 Implementation**

The town 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 Town departments, boards, committees, State and Federal agencies, and jurisdictions to achieve Complete Streets.

The Eastham Planning Department shall integrate Complete Streets principles in all new planning documents, as applicable (master plans, open space and recreation plan, etc.), laws, procedures, rules, regulations, guidelines, programs and templates, and make recommendations for zoning and subdivision codes to encourage contextual design of complete streets policies, respecting the presence of important scenic, environmental and historic resources. In facilitating new projects, the Eastham Planning Department may convene a workgroup composed of multi-disciplinary stakeholders, including members of relevant departments, committees and members of the community to ensure that the perspectives of the community are considered and incorporated as appropriate.

The town shall maintain a comprehensive inventory of pedestrian and bicycle facility infrastructure that will highlight projects that eliminate gaps in the sidewalk and bikeway network.

The Town will evaluate projects within the Capital Improvement Plan to encourage implementation of this Policy.

The town will secure training for pertinent town staff and decision-makers on both the technical content of Complete Streets principles and best practices, as well as community engagement methods for implementing the Complete Streets Policy. Training may be accomplished through workshops and other appropriate means.

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





The town will seek out appropriate sources of funding and grants for implementation of Complete Street policies.

**8.0** The Board of Selectmen or their designee reserves the right to revise this policy at any time.

**9.0 Effective Date**

The policy is effective as of \_\_\_\_December 19, 2016\_\_\_\_\_

*This policy was adopted by the Board of Selectmen at a public meeting on  
\_\_\_\_December 19, 2016\_\_\_\_\_*

Signed,  
Eastham Board of Selectmen.

Signature\_\_\_\_\_ Date\_\_\_\_\_  
John Knight, Chairman

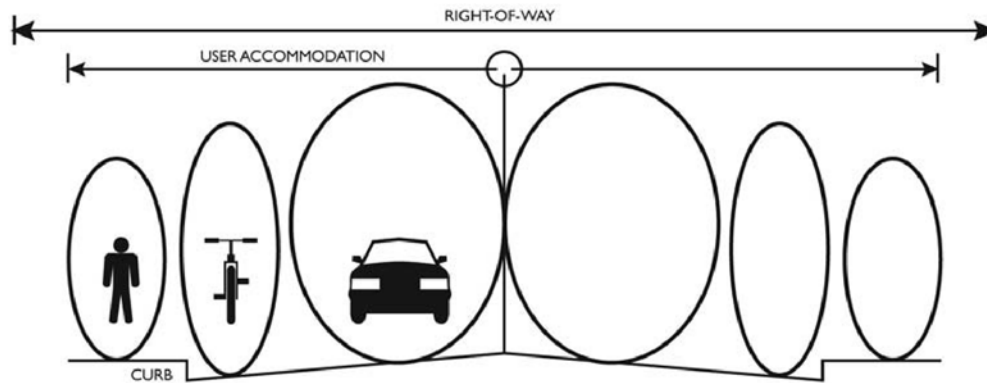


## Appendix B: MassDOT Design Guide Bicycle/Pedestrian Accommodation

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.

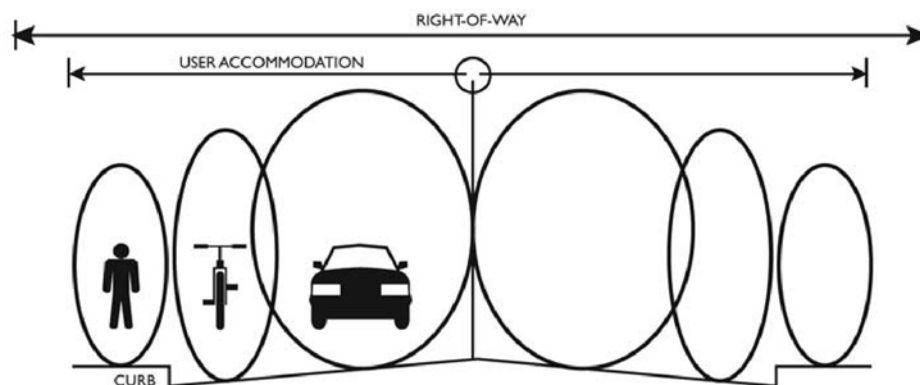


*MassDOT Design Guide: Case 1 - Separate Accommodation for All Users*



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

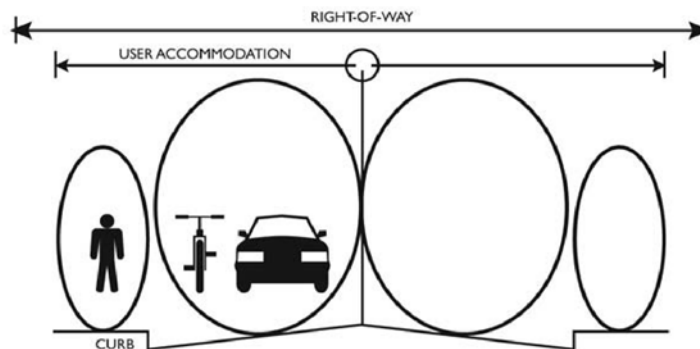
- Used in areas where the width necessary to provide Case 1 accommodation is not available.
- Under Case 2, pedestrians are provided with a sidewalk or separate path while space for bicyclists and drivers overlap somewhat.
- Appropriate in areas with low motor vehicle speeds and low to moderate motor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

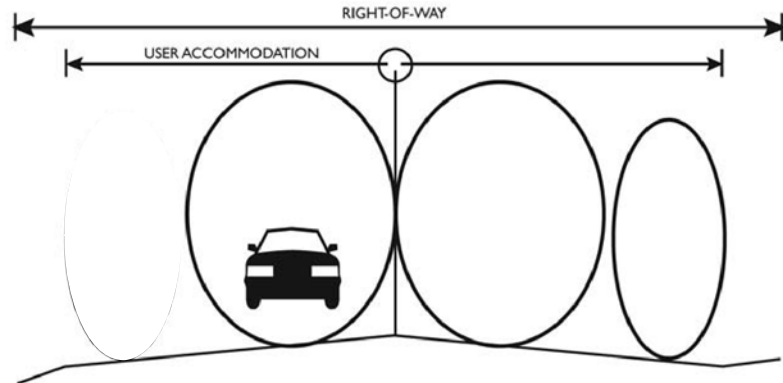


*MassDOT Design Guide: Case 3 - Shared Bicycle/Motor Vehicle Accommodation*



### 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.

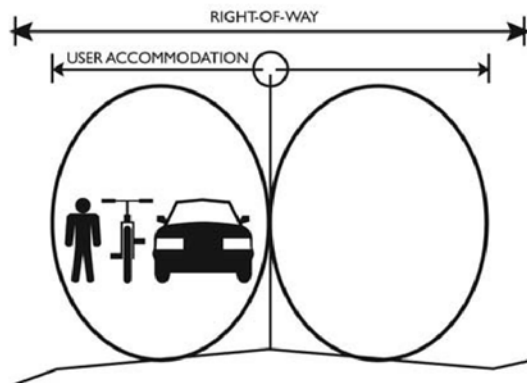


*MassDOT Design Guide: Case 4 - Shared Bicycle/Pedestrian Accommodation*

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



## **Appendix D: Prioritization Worksheet**

[insert spreadsheet]





## Appendix E: Wayfinding

As part of ongoing planning for the revitalization of Eastham and as an effort to connect parts of Eastham (for example, points of interest with the Cape Cod Rail Trail), the Cape Cod Commission is providing an example of a wayfinding plan that includes some graphics originally produced for other towns.

This section of the report is intended to provide a summary of wayfinding standards, design specifications for wayfinding kiosks and conceptual site plans for placement of signage. The proposed signage program could be integrated into a regional signage plan moving forward.

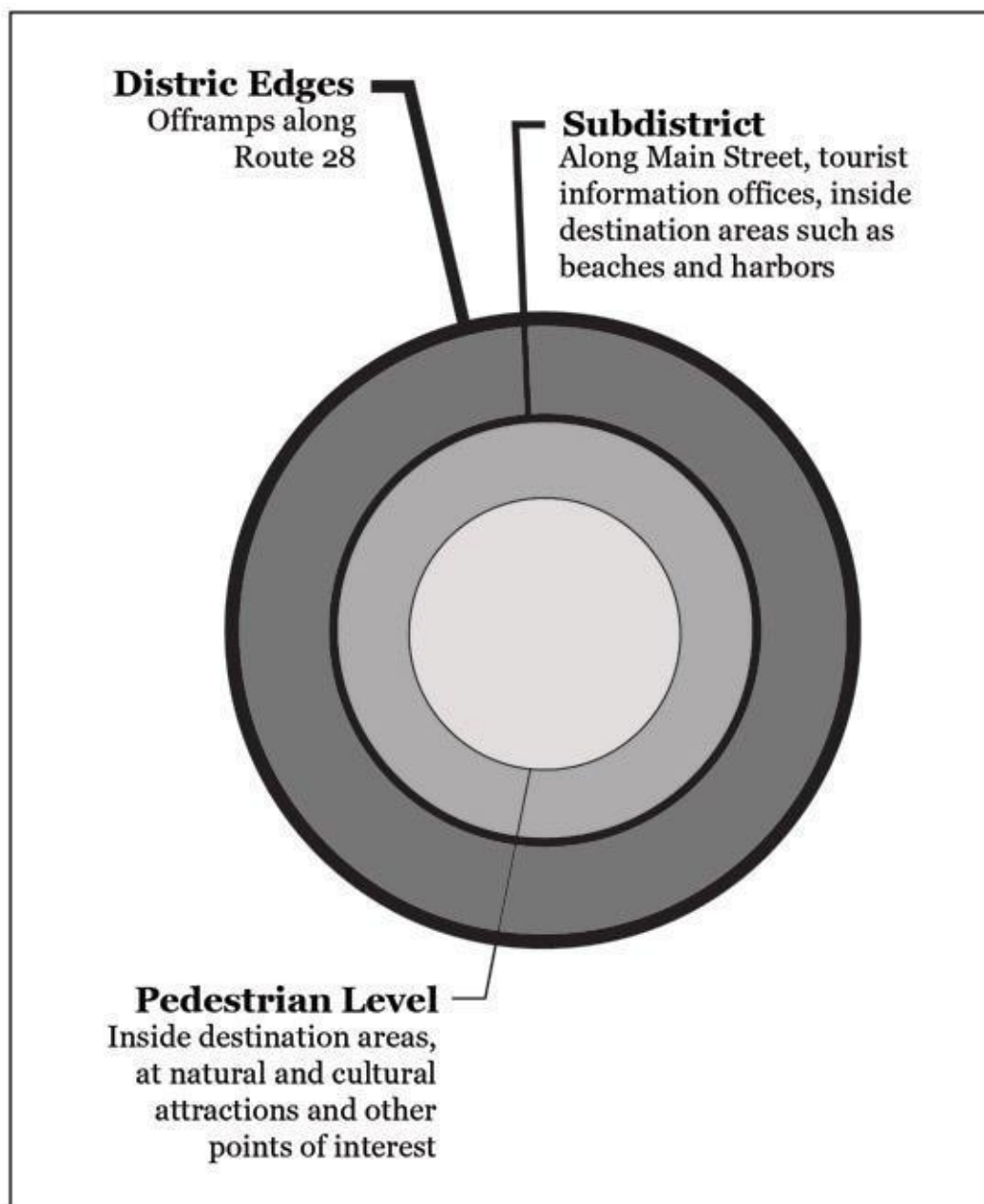
Wayfinding plans provide visual aid to direct visitors between destinations and spaces; they should not only be attractive, but also a cohesive part of the community identity with an intention of giving the visitor visual cues that they are in a specific place. Wayfinding should be oriented to resident's familiar with the landscape as well as visitors new to a community.

The common method for establishing wayfinding signs is to use a hierarchy of community elements to direct the motorist, pedestrian or bicyclist to their eventual destination without use of excessive signage. This "peeling the onion" approach to planning has been effective in creating plans throughout the world.

### Wayfinding in Eastham

Currently, Eastham has a partial collection of directional signs. Many of these signs are appropriate and helpful to the visitor; however, a fully integrated wayfinding program would incorporate these signs into an interconnected system to help visitors successfully navigate in unfamiliar surroundings. Signage should be designed to indicate a sense of place. At the same time, it is of great importance to carefully avoid wayfinding signage directing to specific businesses by name, as this opens issues of equity and fairness.

This report gives examples of potential signage types. Moving forward, it is recommended that the town work with a graphic designer to develop actual design standards. A potential signage hierarchy & placement in Eastham would include features shown on the following graphic.



*Wayfinding Hierarchy*



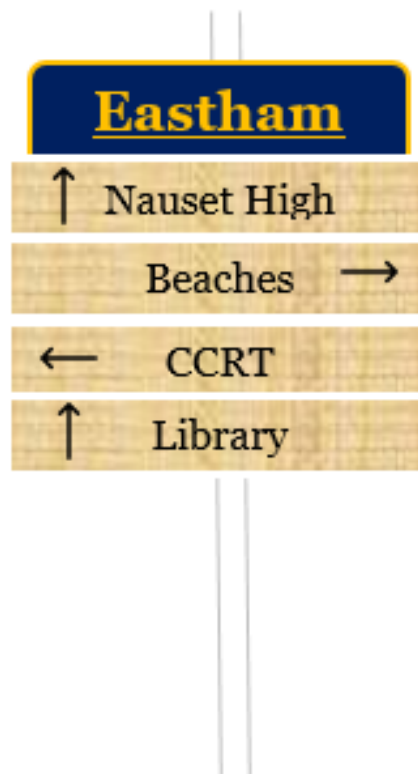
### *District Edges*

The following examples could be located at natural entrances to Eastham attractions.

**Direct to:** Smaller sub-districts, major landmarks (e.g., Harbors, Beaches, Parks, Main Street, etc.).

*District Edge Signage could include:*

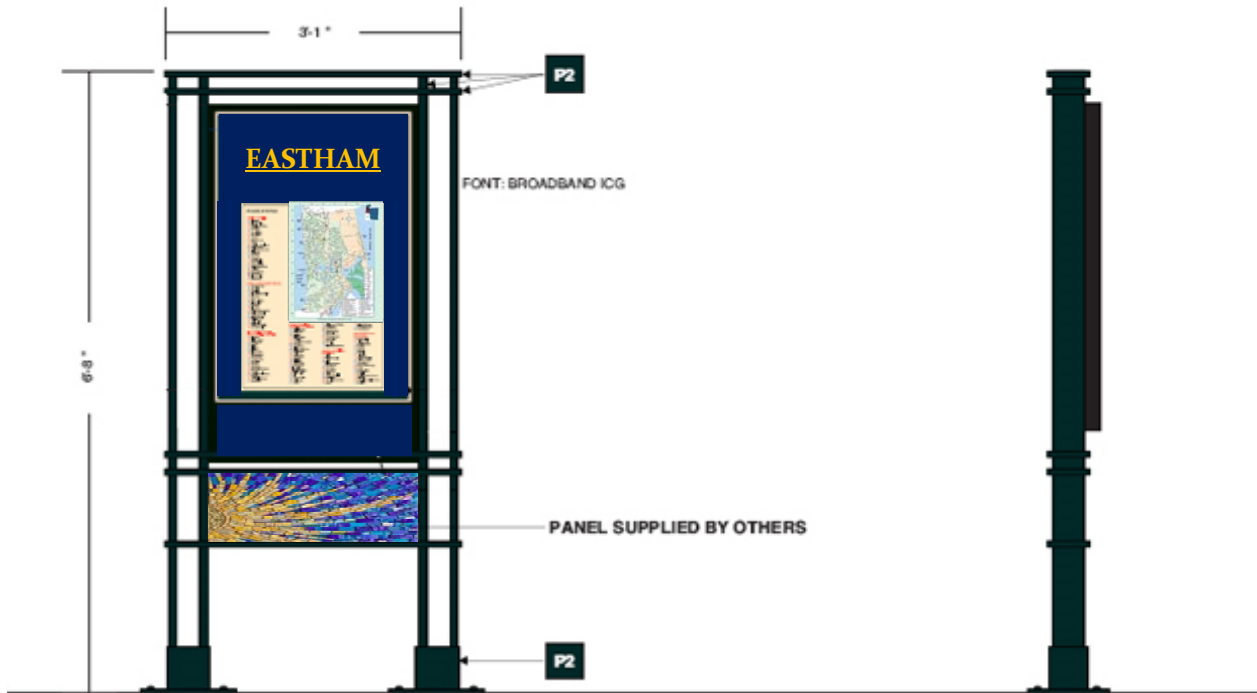
**Directional Signage:** Routes pedestrian or vehicular traffic. Should have no more than four important destinations listed (e.g., “Downtown,” “Beaches,” “CCRT”, etc.).



*Example of Directional Signage*



**Wayfinding Kiosks:** Small structure located at pedestrian based connections. May have 1-4 panels of information including directional signage, maps, interpretive signs or advertisements.



*Example of wayfinding kiosk with 2 information panels*



*Inside Sub-district*

The following examples could be sited along main streets, at the tourist information office and inside destination areas such as harbors and beaches.

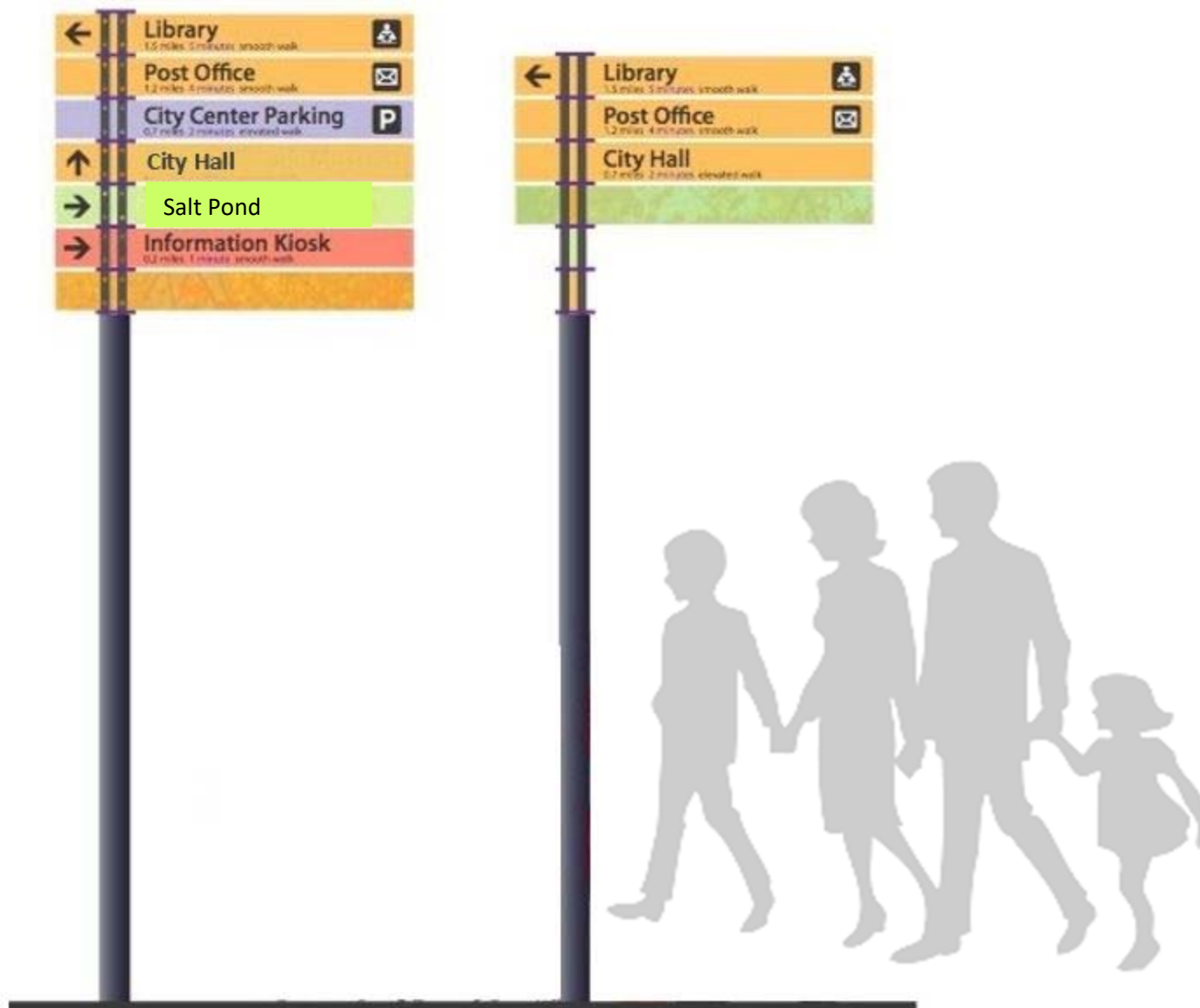


*View of example wayfinding signage in Chatham, MA*

Direct to: Larger destinations and parking.

*Sub-district signage could include:*

**Informational and Parking signage:** Routes pedestrian or vehicular traffic. Design should be clearly recognizable; message content should be simple. If symbols used, they should be those that are internationally recognized.



*Example of Informational and Parking signs*





**Logo Trailblazers:** Signs for Rail Trail, nature trails or waterfront boardwalks. Should be distinctive, still keeping with the design scheme of the overall signage plan.



*Example of Logo Trailblazer Concept versus the Standardized Bicycle Signage*

**Pedestrian Level**

The following examples could be located inside destination areas, at natural and cultural attractions and at other points of interest. Any or all of these examples can be combined into a wayfinding kiosk at appropriate pedestrian connection points.

Direct to: Points of Interest.

**Identity Banners/Signs:** Decorative flags or banners (usually affixed to light posts or poles) which designate a place, exhibition, or event. Can be easily replaced to vary the pedestrian experience.





*Examples of identity banners*



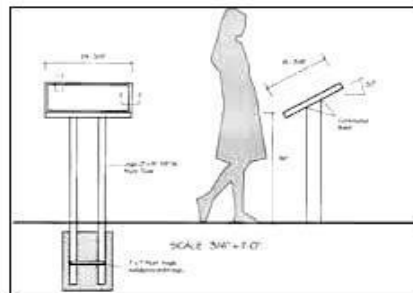
**Interpretive Signage:** Interpretive information about specific local attractions (cultural or natural). Interpretive signs can be highly illustrative and can be more distinctive than other signs in the overall wayfinding plan.



*Example of Interpretive Signage at the Shining Sea Bikeway Bike Trail in Falmouth*



SKETCH EXAMPLE OF INTERPRETIVE SIGNAGE AND APPROPRIATE DIMENSIONS WITHIN A SITE

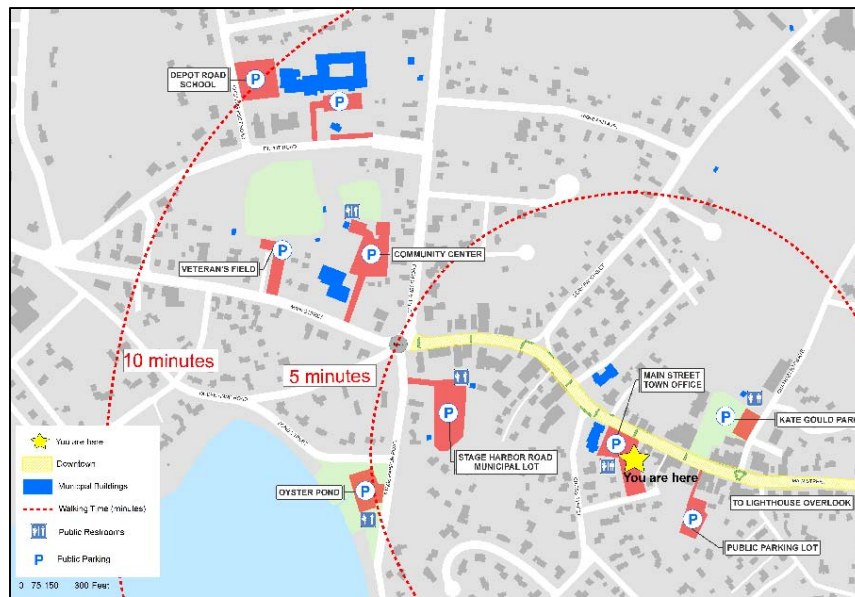


*Sketches of Interpretive Signage*

**Maps/Directories:** These signs offer visitors an overview of their surroundings in the form of comprehensive site maps and directories. Most maps show a 'you are here'



indicator. Outdoor maps show boundaries of an area, entry points, major buildings and pertinent sites. Maps should be simplified for clarity of use. For districts with a high rate of turnover, establishments can be assigned a letter/number, and listed on a replaceable directory as part of a kiosk.



*Example of map signage currently in use in Chatham*

## INDUSTRY SIGNAGE STANDARDS

For wayfinding to function as it is intended, it must display useful information, be placed at an accessible point at a proper viewing height, and be adequately illuminated. Additional considerations include:

### **Typeface**

Typefaces on directional, informational, and logo trailblazing signs, as well as main points that should be viewed at a distance from interpretive signs and maps, should be at a minimum 3 inches in height. Letter styles should be simple and avoid flourishes. Text which includes a mixture of capital letters and lowercase is more readable than text in all caps. Text must contrast clearly against the background. The demands of the aging eye especially need clear text styles including fonts such as Helvetica (a sans serif), and Garamond (a serif, more easily read for blocks of text).

### **Color**

Foreground and background colors should contrast to ensure readability. Darker colors work best for backgrounds. Limit the number of different colors on general signage to 3-4. On interpretive signs and maps, a good rule of thumb is to have at most 8-9 colors in text, legend, or design elements.



Bicycle signs are standardized to adhere to certain color standards:

- Yellow = warning
- Green = guiding signs
- Red, White or Black = Regulatory signs

The mixing or misusing of these sign types can lead to confusion for bikers accustomed to a signage standard. In order to incorporate a standardized bicycle sign into a wayfinding program, 'Logo trailblazer' signs could be matched with appropriate guiding signs.

### **Symbols and Logos**

Internationally-recognized symbols are best to use, such as "P" for parking or "H" for hospital (see attached for examples). Logos should be kept small and should not compete with the message on a sign. Logos for districts or sub-districts should be used in conjunction with a text message.



**Figure 21 - Example of directional sign integrating logo & text**

## MATERIALS & FABRICATION





**Panel Height:** Signs must be 7' from ground to satisfy ADA requirements. For interpretive signs, panels should be positioned to be easily readable.

**Width:** Generally, 40" or less.

**Horizontal Clearance:** Panels should be at least 12" from street curbs to accommodate vehicles turning in parking areas.

### **Materials:**

Standard bicycle signage is fabricated of powder coated steel from transportation sign fabricators. For larger signage, such as interpretive signs and maps shown on a scale of 18"x24", 24"x36" up to 40" in width, materials include:

- HPL (High Pressure Laminate) where high resolution prints are laminated under high pressure
- Polycarbonate/Aluminum Composite
- Fiberglass embedded Inkjet
- Porcelain Enamel, where graphics are molecularly fused to porcelain enamel (the most durable and expensive option).
- Additionally, the use of glass encased bulletin boards is often used for areas where signage is frequently changed. Signage materials can be produced stand alone and shipped for inclusion in a self-made stand, or fabricated to fit into bases to be installed by the buyer.

Depending on the design, signs can be designed by a graphic artist with print-ready files sent directly to the sign fabricator.

### **Exhibit Bases:**

Bases and kiosks to hold sign panels must be sturdy and weather-resistant, made from materials such as powder-coated or Corten steel, treated wood or recycled plastic composite. Breakaway footers (which secure posts to concrete footings with bolts) are recommended for their intrinsic replaceability if outdated, damaged or vandalized.

### MAINTENANCE

Vandalism of sign panels is a common occurrence - approximately 3-5% of elements in a wayfinding program are damaged or destroyed every year – therefore, wayfinding plans should develop ongoing maintenance and replacement programs. Additionally, prevention measures which can be put into place to deter vandals include placing signage at a height that is difficult for vandals to reach and choosing a signage material that does not easily scratch and can be easily cleaned (HPL or porcelain).



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