Route 28 Critical Locations
Bicycling Network Connectivity

November 2017
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Introduction

Bicycling on Cape Cod is a popular activity that attracts visitors and residents as they explore the region. The Cape Cod Commission, in collaboration with local, state, and regional transportation planners, continues to identify bicycle routes and recommend projects such as bike paths throughout the region. For a review of these efforts, please consult materials available on the Cape Cod Commission website at:

www.capecodcommission.org/bikeped

During the development of the Cape Cod Metropolitan Planning Organization’s Regional Transportation Plan (RTP), the Cape Cod Commission staff developed a “vision map” for the completion of a network of shared-use paths (see Figure 1); the Route 28 corridor has been emphasized with a purple-shaded border.

Several areas of Cape Cod are fortunate to have safe and comfortable bicycle facilities (e.g., Cape Cod Rail Trail in central sections of Dennis, Harwich, Chatham and Lower/Outer Cape communities of Brewster, Orleans, Eastham and Wellfleet; Cape Cod Canal bike paths in Bourne and western Sandwich; and the Shining Sea Bikeway in western Falmouth). Unfortunately, east-west travel by bicycle along the southern areas of Cape Cod often requires the use of Route 28. Additionally, Route 28 (from downtown Falmouth through the communities of Mashpee, Barnstable, Yarmouth, Dennis, Harwich and then to downtown Chatham) is a high-traffic corridor due to the proximity of many residential areas and employment centers.

The Cape Cod Regional Transportation Plan includes a proposed southern bike route within this corridor, a so-called “Route 28 B” (“B” for bicycling) that connects these communities, for the most part, along low-volume local roads. The symbolic termini for this route are Nobska Light in Woods Hole and Chatham Light. For connectivity, some segments of Route 28 are unavoidable and are therefore prime candidates for attention within this study to develop concepts from improved bicycling safety.

The objective of this study is:

To develop concept plans to improve bicyclist safety at selected Route 28 locations between downtown Falmouth and downtown Chatham
Figure 1 - Shared Use Path Vision Map

Source: Cape Cod Commission Regional Transportation Plan
Existing Conditions

Cape Cod’s South Shore Bike Route “Route 28B “

Included within the bicycle planning section of the Cape Cod Commission’s Regional Transportation Plan is a mostly on-road bicycle route connecting the village of Woods Hole to Chatham Light within the Route 28 corridor. This route was devised to avoid the busiest parts of Route 28 and is instead aligned with lower-volume local roadways with a preference given to travel adjacent to scenic vistas such as Nantucket Sound and uses a portion of the Old Colony Rail Trail. Symbolic termini for this bike route are Nobska Light in Woods Hole and Chatham Light on the Atlantic Ocean.

Falmouth

The Route 28B bicycling route travels 13 miles from Woods Hole to the Mashpee town line (via Red Brook Road). Fortunately, a portion of the route utilizes the Shining Sea Bikeway and some scenic shore-side roadways.

Due to topography and road connectivity, bicyclists must travel on a short section of Route 28 from Central Avenue to Fresh Pond Road, a distance of approximately 0.5 miles. The route includes a crossing of Route 28 at Metoxit Road in Waquoit Village.
Mashpee

From the Falmouth town line (near Red Brook Road) to Quinaquisset Avenue/Barnstable town line (School Street), Route 28B consists of about six miles of mostly minor roads.

Due to topography and road connectivity, bicyclists must travel on a short section of Route 28 from Great Neck Road South at the Mashpee Rotary to Quinaquisset Avenue for a distance of approximately 0.4 miles as well as negotiate portions of the Mashpee Rotary. There are existing restrictions against left-turning vehicles exiting from Quinaquisset Avenue. At present, this would require a westbound bicyclist to dismount, and cross Route 28 as a pedestrian and continue west along Route 28 and then travel through most of the Mashpee Rotary to Great Neck Road South.
Barnstable

In Barnstable, Route 28B is fourteen miles long beginning at the Mashpee town line (Quinaquisset Avenue)/School Street to Willow Avenue at the Yarmouth town line.

The route includes Route 28 crossings in Marstons Mills at Route 149 and South County Road. Both of these crossings take place at signalized intersections. These crossings accommodate the route to the north of Route 28 as there is no currently
available alternate route to the south in this area. Challenges to accommodating the route south of Route 28 in this area are the proximity of the Marstons Mills River and need for permission in order to use a parallel private way known as Marquand Drive.

![Figure 4 - Barnstable portion of Route 28B](image)

**Yarmouth**

From Barnstable town line (Willow Avenue) to Dennis town line (Bass River Bridge) Route 28B consists of a variety of road types for 8.7 miles.

Due to topography and road connectivity, bicyclists must travel on two sections of Route 28. The first section of Route 28 is from Baxter Avenue to Wimbledon Drive for approximately 1.0 miles. The second section is from South Sea Avenue to Seaview Avenue, approximately 0.6 miles.

There is a third, short segment of Route 28 at the Dennis town line (Bass River Bridge). This segment includes the portion of Route 28 from Pleasant Street to the midpoint of the Bass River Bridge for a distance of approximately 0.1 miles.
Figure 5 - Yarmouth portion of Route 28B

Dennis

Route 28B in Dennis is about 4.4 miles long from the Yarmouth town line (Bass River Bridge) to Belmont Avenue at the Harwich town line.

The route includes a short section from the Yarmouth town line (Bass River Bridge) to Uncle Barneys Road for a distance of less than 0.1 miles.

Figure 6 - Dennis portion of Route 28B
Harwich

From the Dennis town line (Belmont Avenue) to South Chatham Road at the Chatham town line (Deep Hole Road) Route 28B is about 5.2 miles long.

Due to topography and road connectivity, bicyclists must travel on a section of Route 28 from Gorham Road to Julien Road for a distance of approximately 1.0 miles.

The route crosses Route 28 in Harwichport at Wyndemere Road/Miles Street (these minor streets are offset approximately 50 feet apart).

Figure 7 - Harwich portion of Route 28B

Chatham

Route 28B reaches its eastern terminus in the town of Chatham, about 7.1 miles from the Harwich town line (at Deep Hole Road) to Chatham Light.

Due to topography and road connectivity, bicyclists must travel on a short section of Route 28 from Pleasant Street to Morton Road for approximately 300 feet.

The route crosses Route 28 at the signalized intersection of Crowell Road/Depot Road/Queen Anne Road.
Figure 8 - Chatham portion of Route 28B

Alternatives Analysis

This chapter includes a discussion of types of bicycle accommodation and a development of alternatives for each of the seven Route 28 segments. Recommendations for each segment are based on the level of existing accommodations (e.g., existing shoulders or sidewalks).

Types of Bicycle Accommodation

Accommodating cyclists' needs can range from creating better visibility and safer interactions between motorists and cyclists to providing exclusive facilities for cyclists such as the construction of bike paths. The following are some general examples of bicycle accommodation strategies that are being considered for the various Route 28 locations.

Shared-Use Paths & Sidewalks

The most comfortable bicycling facility is paved surface separated from motor vehicle traffic, referred to as a “Shared-Use Path” since it is also intended to accommodate pedestrians and non-motorized transportation such as roller-blading, skateboards, wheelchairs, etc. A Shared-Use Path typically consists of a 12' wide paved surface with 2' width of unobstructed clear space on each side. Sidewalks are narrower that shared-
use paths but can be used in limited cases for low-speed bicycle accommodation. While pedestrians have priority right-of-way, bicycles can travel (at slower speeds) on some wider sidewalks (unless legally prohibited in business districts).

Bike Lanes

Bike lanes are defined by a dedicated space 5' wide on the shoulder of a roadway. Bike lanes accommodate one-way travel (meaning a two-way roadway would have two bike lanes, one for each direction) and are designated with pavement markings and signage.

Bike Shoulders

While not defined as a full-fledged bicycle accommodation technique, installation of wider shoulders can often provide an increased level of biking comfort by increasing the separation of cyclists from motorists. Bike Shoulders typically have widths less than the widths of official bike lanes and are most commonly 4' wide.

Share the Road

On lower-volume, lower speed roadways or on facilities where provision of dedicated bicycling space is infeasible, a “share the road” program may be utilized. In its most basic form, a share the road program includes signage as shown in Figure 9 that informs road users that cyclists may be in the road.

Figure 9 - Share the Road Signage

An addition to signage is the use of the shared road pavement marking known as a “sharrow” (shared + arrow) shown in Figure 10. Typically, the sharrow is placed laterally separated from curbing or parking lanes to guide cyclists away from hazards such as opening of car doors and to increase cyclists' visibility to motorists.
Segment 1: Falmouth: Central Avenue to Fresh Pond Road

This segment of Route 28 is approximately 0.5 miles long and connects Central Avenue on the west to Fresh Pond Road in the east.

Figure 11 - Route 28 from Central Avenue to Fresh Pond Road

For most of the western portion of this segment, Route 28 consists of two 12’ travel lanes, granite curbing along the south side, and a 3’ sidewalk as shown in Figure 12. Shoulder widths of less than 1’ are provided along both sides of Route 28 along most of this segment, widening to 3’ in the vicinity of Fresh Pond Road as shown in Figure 13.
The following figures show a representation of important features along the segment (such as sidewalks shown in black). Note that in addition to the sidewalk along the south side of Route 28, there are sidewalks available along the western side of Central Avenue and the western side of Fresh Pond Road. There is a crosswalk across Central Avenue at the intersection of Route 28. A crosswalk is proposed for Route 28 at the Fresh Pond Road intersection as shown in the following figure.
Figure 14 - Locations of major features and recommendation for Segment 1
Recommendations:

The following are recommendations to improve bicycling safety and convenience for this segment:

- Install bike route signage at the Route 28 intersections of Central Avenue and Fresh Pond Road.
- Construct a cross-walk across Route 28 at Fresh Pond Road to connect sidewalks of these two roads.
- It is recommended that bicycle accommodations are included such as bike-accommodating shoulders or lanes and possible sidewalk widening to create a shared-use path.

Segment 2: Mashpee: Mashpee Rotary to Quinaquisset Avenue

Segment 2 stretches 0.4 miles along Route 28 from Great Neck Road South at the Mashpee Rotary to Quinaquisset Avenue in the town of Mashpee. The segment is shown below in Figure 15. This segment has several challenges:

Connecting from Great Neck Road South to Route 28 via the Mashpee Rotary for eastbound and westbound cyclists

The Mashpee Rotary presents a difficult area for cyclists to traverse, especially in the westbound direction.

Crossing the Mashpee River

Route 28 crosses the Mashpee River a few feet to the west of Quinaquisset Avenue. The river passes under the roadway via a culvert and therefore complicates road-widening efforts.

Traffic restrictions at the Quinaquisset Avenue

Westbound Quinaquisset Avenue is restricted to right-turns only on Route 28. The geometry at this intersection allows vehicles traveling east on Route 28 to turn right at relatively high speeds.
Figure 15 - Route 28 from Mashpee Rotary to Quinaquisset Avenue

Views of Route 28 in this segment are shown below.
During a visit to the site, an abandoned road was discovered to the south of Route 28. The road (shown in Figure 18) is approximately 14 feet wide, paved, and includes a bridge crossing (see Figure 19) over the Mashpee River. An aerial photograph taken in 1938 (see Figure 20) shows the alignment of the abandoned road connection to Quinnaquisset Avenue.
Figure 18 - Abandoned road looking east from Route 28

Figure 19 – Existing crossing of Mashpee River looking north toward Route 28
**Figure 20 - 1938 Aerial View of Route 28**

**Recommendations:**

As shown in Figure 21, recommendations for this segment of Route 28 include:

- Install bike route signage at the Route 28 intersections of Great Neck Road South and Quinaquisset Avenue.
- Install crosswalk on Great Neck Road South approach to the Mashpee Rotary.
- Install pedestrian path adjacent to Mashpee Rotary from Great Neck Road South to Route 28.
- Install shared use path along south side of Route 28 from Mashpee Rotary to abandoned road.
- Construct shared use path on abandoned road from Route 28 to Quinaquisset Avenue including use of the existing bridge over the Mashpee River.
Figure 21 – Locations of major features and recommendations for Segment 2
Segment 3: Yarmouth: Baxter Avenue to Wimbledon Drive

This segment, about one mile long, connects from Baxter Avenue to the west to Wimbledon Drive to the east (shown in Figure 22).

Figure 22 - Route 28 from Baxter Avenue to Wimbledon Drive

From Baxter Avenue to Town Brook Road, Route 28 consists of two 12’ travel lanes, 1’ shoulders and a poorly maintained 4’ sidewalk on the south side separated from the traveled way by a deteriorated asphalt curb (see Figure 23). There are very few curb ramps. The roadway also includes a sidewalk throughout the entirety of the south side of Route 28 and along the north side from Town Brook Road in the west throughout the corridor to the east. Route 28 has been recently repaved and marked with 4’ shoulders.
Figure 23 - Route 28 looking east, east of Baxter Avenue

Figure 24 - Route 28 looking east, east of Rosemary Lane
Figure 25 - Route 28 looking east from Rosemary Lane

Figure 26 - Cyclists traveling west along Route 28, west of Standish Way
Figure 27 - Locations of major features of Segment 3
Recommendations:

The following are recommendations to improve bicycling safety and convenience for this segment:

- Install bike route signage at the Route 28 intersections of Baxter Road and Wimbledon Avenue.
- It is recommended that bicycle accommodations are included such as bike-accommodating shoulders or lanes and possible sidewalk widening to create a shared-use path.

Segment 4: Yarmouth: South Sea Avenue to Seaview Avenue

This 0.6 mile segment in Yarmouth connects South Sea Avenue in the west to Seaview Avenue to the east. Route 28 crosses the Parkers River approximately at the mid-point of the segment. Route 28 generally consists of two 14’ travel lanes and narrow shoulders (approximately 1’). There are sidewalks available for most of the segment on both sides or Route 28 with some notable gaps.
Figure 28 - Locations of major features and recommendation for Segment 4
Route 28 Critical Bicycling Connections

Recommendations

- Install bike route signage at the Route 28 intersections of South Sea Avenue and Seaview Avenue.
- Construct missing sections of sidewalk along the south side of Route 28.
- Restripe travel lanes to 11’ width with 4’ shoulders.
- It is recommended that bicycle accommodations are included such as bike-accommodating shoulders or lanes and possible sidewalk widening to create a shared-use path.

Segment 5: Yarmouth: Pleasant Street to Bass River Bridge to Dennis: Uncle Barneys Road

This 0.2 mile segment from Pleasant Street in Yarmouth to Uncle Barneys Road in Dennis includes the bridge over the Bass River. The bridge includes 8’ shoulders for both directions of travel and a sidewalk along the south side. There was an accumulation of sand/debris in shoulders on the bridge as noted during a recent site visit.

![Figure 29 - Route 28 from Pleasant Street (Yarmouth) to Uncle Barneys Road (Dennis)](image-url)
Recommendations:

- Install bike route signage at the Route 28 intersections of Pleasant Street and Uncle Barneys Road.
- Regular street sweeping, especially on the Bass River bridge
- It is recommended that bicycle accommodations are included such as bike-accommodating shoulders or lanes and possible sidewalk widening to create a shared-use path.

Segment 6: Harwich: Gorham Road to Julien Road

In South Harwich, this 0.2 mile segment connects Gorham Road on the west to Julien Road to the east. Route 28 consists of 11’ travel lanes and minimal (1’) shoulders in this section of Harwich. There are no sidewalks along this segment, however a sidewalk (demarcated shoulder) is provided along the north side of Route 28 starting a short distance to the east of Julien Road along the frontage of a motel.

Figure 32 - Route 28 from Gorham Road to Julien Road
The figure below includes a summary of suggested changes to improve bicycle accommodation along Route 28.
Figure 35 – Locations of major features and recommendations for Segment 6

Recommendations

- Install bike route signage at the Route 28 intersections of Gorham Road and Julien Road.
- Add crosswalk across Gorham Road.
- Add shared use path along north side of Route 28 from Gorham Road to Julien Road.
- Add crosswalk across Route 28 at Julien Road.

Segment 7: Chatham: Pleasant Street to Morton Road

This 300-foot segment of Route 28 in Chatham connects Pleasant Street on the west to Morton Road to the east. Route 28 consists of two 11’ travel lanes with a narrow (approximately 1’) shoulder along the north side. An existing poorly maintained sidewalk/shoulder is available along the south side of Route 28. There is a crosswalk available near Morton Road with signage directing cyclists to the Old Colony Rail Trail.
Figure 36 - Route 28 from Pleasant Street to Morton Road

Figure 37 - Route 28 looking east at intersection of Morton Road and Forest Beach Road
Recommendations

- Install bike route signage at the Route 28 intersections of Pleasant Street Road and Morton Road.
- It is recommended that bicycle accommodations are included such as bike-accommodating shoulders or lanes and possible sidewalk widening to create a shared-use path.
Conclusion/Summary of Recommendations

The concept of establishing a southern bicycle route ("Route 28B") to compliment the Route 28 corridor will provide cyclists a more comfortable option than traveling along Route 28 itself. For those segments of Route 28 which are unavoidable, a series of recommended strategies are summarized in the following table:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Strategy</th>
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<tbody>
<tr>
<td>1. Falmouth: Central Avenue to Fresh Pond Road</td>
<td>![List of strategies for Falmouth segment]</td>
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<tr>
<td>2. Mashpee: Mashpee Rotary to Quinaquisset Avenue</td>
<td>![List of strategies for Mashpee segment]</td>
</tr>
<tr>
<td>3. Yarmouth: Baxter Avenue to Wimbledon Drive</td>
<td>![List of strategies for Yarmouth segment]</td>
</tr>
<tr>
<td>4. Yarmouth: South Sea Avenue to Seaview Avenue</td>
<td>![List of strategies for Yarmouth segment]</td>
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<tr>
<td>5. Yarmouth: Pleasant Street to Bass River Bridge to Dennis: Uncle Barneys Road</td>
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