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# Connecting Town Centers to the Regional Pedestrian & Bicycling Network on Cape Cod

July 2014







# Table of Contents

Table of Contents .....	1
Introduction.....	2
Background and Purpose .....	2
Guide to Terminology .....	2
Study Area .....	4
Methodology.....	4
Data Collection.....	7
Usage Data – Multi-Use Paths .....	7
Intersection data .....	7
Bicycle and Pedestrian Facility Implementation Considerations .....	8
Facility types and treatments:.....	8
Town Center Connections.....	16
Barnstable (Hyannis) .....	17
Bourne (Buzzards Bay).....	19
Brewster .....	21
Chatham .....	23
Dennis .....	25
Eastham.....	27
Falmouth.....	29
Harwich.....	31
Mashpee .....	33
Orleans .....	35
Provincetown.....	37
Sandwich .....	39
Truro .....	41
Wellfleet .....	43
Yarmouth.....	45
Conclusion .....	48
Summary of Recommended Connections.....	49



# Introduction

## BACKGROUND AND PURPOSE

Cape Cod's town centers represent the region's primary locations for economic and social activity. These "hub" locations generally contain a mix of residential, commercial and civic uses and attract people for shopping, dining, and other services as well as for jobs/work. Making the region's town centers easily accessible to bicycles and pedestrians is important for increasing transportation options and encouraging people to bicycle or walk, rather than drive – especially for short trips. This is beneficial for traffic congestion, for the environment, for public health, and for personal convenience. For people who don't drive, having safe and convenient bicycle and pedestrian connections to town center services and activities is essential.

This study reviews connectivity between town center areas and existing bicycle paths and routes and includes identification of town center areas where sidewalks are needed. The purpose of the study is to identify key areas appropriate for new or improved bikeway connections, as part of the regional goal to facilitate bicycling and walking as viable transportation modes on Cape Cod

## GUIDE TO TERMINOLOGY

Bicycle and pedestrian related terminology is not always used consistently and terms may have different meanings, depending on the user. For the purposes of this report, the following terms will be used as identified below. (See also "Bicycle and Pedestrian Facility Implementation Considerations" section of the report.)

**Bicycle boulevard** – Also called "local street bikeways," bike/walk streets," and "priority bike streets," bicycle boulevards are low-volume and low-speed streets that have been optimized for bicycle travel through treatments such as traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments.

**Bicycle facility** - A bikeway that is designated specifically for bicycles through signage or pavement markings. Bicycle facilities may be on or adjacent to the roadway (e.g., bike lanes or paved shoulders) or an independent facility (bike paths). Bicycle facilities also include associated bicycle accommodations such as bicycle shelters, parking, and bicycle-oriented traffic control devices.

**Bicycle lane** - A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists. Bike lanes are striped at the outer edge of vehicle travel lanes, on the shoulder or between a vehicle travel lane and parking or turn lanes. The width of the bike lane will vary depending upon the roadway geometrics and operations (such as on-street parking, presence of curb or shoulder, etc.). Minimum width is four feet (five feet with a curb or gutter).



**Bicycle path** - A right of way, separate from a roadway, designated for bicycle or other non-motorized use. The term bicycle path is used interchangeably with “shared-use” path and “multi-use” path in this report.

**Bicycle route** - A suggested route for bicycle travel. It may be an on-road route where bicyclists and motor vehicles share the travel way, and it may include stretches of other designated bicycle facilities. In general, a bicycle route designation does not require that the road include any special bicycle facilities. (See also “signed shared route.”)

**Bikeway** - A generic term that refers to a travel way upon which bicycles can travel. A street where people can ride bicycles is a bikeway. Not all bikeways are bicycle “facilities” (see definition above).

**Level of service** – A qualitative measure that characterizes operational conditions within a traffic stream and their perception by motorists and users.

*Bicycle Level of Service* – a model used to estimate bicyclists’ perception of how well a roadway accommodates bicycles.

*Pedestrian Level of Service* – a model used to estimate pedestrians’ perception of how well a roadway accommodates pedestrians.

**Multi-Use Path** – See “Shared-Use Path.”

“Share the Road” program – a public education initiative directed at cyclists and motorists to encourage safe roadway behavior and promote safe travel spaces for all road users. State and local transportation departments throughout the country promote such programs through signage workshops, brochures, and other informational materials. Providing Share the Road warning signage on roads that are too narrow to provide a separate space for bicycles alerts drivers that cyclists may be in the road. Share the Road signage includes pavement markings such as sharrows (see below).

**Shared Use Path** - A path or trail that is physically separated from motor vehicle traffic located either within the road right-of-way or within an independent right-of-way. Also referred to as “multi-use” pathways, they include bicycle paths, rail-trails or other facilities built for bicycle and pedestrian traffic and allowing other non-motorized travel modes such as skateboards and horses. (The terms “multi-use,” “shared-use,” and “bicycle” path are used interchangeably in this report.)

**Sharrow** - A “shared-lane” marking (share + arrow) used to indicate that bicycles and cars operate in the same lane. Sharrow placement – depending on the width of the travel lane – guides bicyclist position in the roadway.

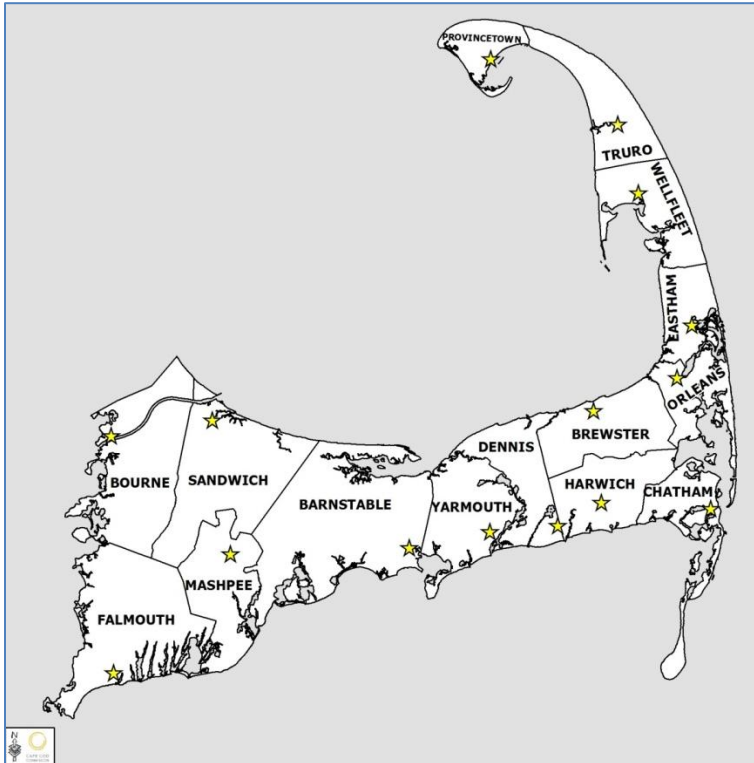
**Shoulder** – The portion of a roadway contiguous with vehicle travel lanes, for accommodation of stopped vehicles and emergency use, often used by cyclists where paved.

**Signed Shared Route** – A bicycle route that has been identified as a preferred route with signage. (See also Bicycle Route.)



## STUDY AREA

The study area for this project is the town centers for the 15 Cape Cod towns<sup>1</sup>. A map of each town's study area is provided in the Town Center Connection section of this report.



STUDY AREA MAP. THE STARS IDENTIFY APPROXIMATE TOWN CENTER LOCATIONS (FOR THE PURPOSES OF THIS REPORT).

## METHODOLOGY

### TOWN CENTER LOCATIONS

The project team identified a “town center” location for each of the 15 Cape Cod towns and prepared maps of each location using Geographic Information Systems (GIS), to show existing bicycle paths, bicycle routes, and sidewalk (for main roads) data. For towns without a designated town center, the project team consulted Local Comprehensive Plans and land use vision maps to identify locations that function as a town’s primary “activity” locations and (for the purpose of this study) chose one “center” location for each town. In towns with multiple town centers and/or activity centers, the project team selected one location based on the locations selected for the 2012 *Town*

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<sup>1</sup> For towns without a designated town center, the project team reviewed Local Comprehensive Plans and land use maps to identify activity /economic activity areas. For towns with multiple town centers, one study area was chosen for this study based on consistency with previous studies. See Methodology.



*Center Bicycle and Pedestrian Level of Service* study<sup>2</sup>. The team reviewed each town center's connections to the existing network of bike paths and routes. In town centers without a connection, the team looked for low-volume roads that would provide the most direct route to the nearest bicycle route or path. Site visits provided opportunities to confirm connector selection and identify potential treatment options. The project team also consulted recent studies including *Closing the Gaps – Connecting Cape Cod's Transit to the Bicycle and Pedestrian Network (2013)*, the *2010 Integrated Bicycle Plan for Cape Cod ("Feasibility Study")*, the *Town Centers Bicycle and Pedestrian Level of Service Report (2012)*, and several town bicycle/pedestrian plans, including Harwich, Barnstable, and Chatham, for additional guidance and consistency with previous recommendations and proposals.

The project team gave an overview of the project at a public meeting of the regional bicycle/pedestrian working group. Draft maps of the proposed town center connections were provided later to designated town bicycle/pedestrian representatives or at local bicycle committee meetings for review and comment. Following distribution to the town representatives, the team further revised the maps and the report.

## PUBLIC PARTICIPATION

### Cape Cod Regional Bicycle and Pedestrian Working Group

The Cape Cod Regional Bicycle and Pedestrian Working Group is composed of a representative from each town (primarily town planners and DPW staff), and representatives from the Cape Cod Regional Transit Authority, MassDOT, MassBike, Mass In Motion, and Senator Wolf's office. Town representatives on the regional group serve as liaisons to local bicycle/pedestrian committees. The purpose of the working group is to help coordinate regional and local bicycle and pedestrian planning and provide a public forum for discussion of related issues. It meets periodically as needed. CCC staff presented an overview of the report to the working group at a public meeting in December 2013.

### Website

The Cape Cod Commission's website contains a Bicycle/Pedestrian Initiative page that provides notice of upcoming meetings, updates on projects in the region, plans, reports and bicycle/pedestrian related documents.

### Cape Cod Commission Online Survey

The Cape Cod Commission launched a bicycle and pedestrian planning survey in December 2011 that ran on its web-site through August 2013. Both Cape Cod residents and visitors to the region took the survey. Respondents indicated they would walk and bicycle more often, for both transportation purposes and recreation/exercise, with better bicycling accommodations. 70 percent of respondents said that they would be "very likely" to bicycle or walk to "conduct errands/shopping/to eat" if it were safe and convenient.

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<sup>2</sup> Available on the Cape Cod Commission website:  
<http://www.capecodcommission.org/resources/transportation/townctrblosrep.pdf>



Other responses include:

- 70 percent of respondents felt that capitalizing on opportunities to improve bicycle network during planned construction was “extremely important” for improving bicycling in the region.
  
- Respondents felt that providing off-road multi-use paths where feasible and widening road shoulders where feasible are extremely important for improving bicycling conditions in the region - 62 percent and 66 percent, respectively.





# Data Collection

## USAGE DATA – MULTI-USE PATHS

Cape Cod Commission staff collects usage data at multi-use paths throughout the region. Observations are usually taken during the summer, for a period of 12 hours (from 7 a.m. – 7 p.m.). The counts report contains a summary of over 25 data collection efforts from the counting program. Each record describes the location where the data were collected, the total number of users (by direction of travel and combined), and the type of users. The following categories are counted:

- Bicyclists
- Skaters
- Walkers
- Joggers
- “Child in Carrier” (e.g. child in trailer or on child bicycle seat)
- Wheelchairs
- Other (e.g., horses)

In addition, the percentage of helmet use by bicyclists and skaters is noted.

The bicycle/pedestrian counts are available on the Cape Cod Commission website at:

[http://www.capecodcommission.org/resources/transportation/counts/pdf\\_count/BikePed.pdf](http://www.capecodcommission.org/resources/transportation/counts/pdf_count/BikePed.pdf)

## INTERSECTION DATA

Cape Cod Commission staff conducts manual turning movement counts for motor vehicles each year at intersections throughout the region. Bike and pedestrian counts are taken as well. Counts at intersections near town center locations may be useful for understanding the volume of motor vehicle traffic and bicycling in and around the town center area and prioritizing implementation of improvements along connector segments. (See Cape Cod Commission website link above for bicycle and pedestrian counts.) Additional counting data is also available on the website:

<http://www.capecodcommission.org/counts>



## Bicycle and Pedestrian Facility Implementation Considerations

This section of the report identifies common bicycle/pedestrian facility types and “suitability” factors to consider for implementation. Bicyclists with different levels of experience, confidence, and purpose for riding have varied accommodation needs. The range of needs should be taken into consideration when deciding which type of facility to implement. Bicycle facility planners and designers typically consider these three levels/groups when planning a facility:

- Group A - Advanced Bicyclists: Experienced riders who can operate under most traffic conditions and who desire direct routes and higher speeds.
- Group B - Basic Bicyclists: Casual or new adult and teenage riders who desire low-speed, low-volume streets or designated bicycle facilities.
- Group C: Children: Pre-teen riders whose key destinations are within or adjacent to residential streets areas and who prefer low volume streets with slow traffic or clearly defined separate bicycle paths.

Other factors such as traffic volumes, vehicle speeds, right-of-way width, and topography are also important factors in planning and design of bicycle facilities.

Many of Cape Cod’s roads, particularly those with little traffic and low speeds are adequate for bicycling and may not necessitate additional safety treatments. (This type of road is often suitable for a “bike boulevard”). In some cases, relatively simple measures such as adding pavement markings to delineate shoulder space for bicycles on the road or installing sharrows for shared lanes may provide a safety improvement for little cost. Other roads, with higher vehicle speeds and traffic volumes may not be suitable for even experienced cyclists without separation from motor vehicles.

This report identifies road segments to connect town center areas to the existing bicycle network (designated on-road routes and bicycle or multi-use paths). The connections generally are on low-volume streets where “Share the Road” and directional signage and/or pavement markings are recommended as initial treatments. With further study, some segments may also be suitable for wider shoulders, either through road or lane diets, or through minimal pavement widening to provide more space for bicyclists.

### FACILITY TYPES AND TREATMENTS:

#### PAVED SHOULDERS

Paved shoulders are the areas at the sides of the road that are outside of the vehicular travel lanes, but are paved. Shoulders are distinguished from the travel lanes by striping.



Paved shoulders should be at least four feet wide to accommodate bicycle travel, but if that is not possible, any additional shoulder width is better than none at all. Riding in the shoulder area may be challenging for inexperienced bicyclists who lack the skills and confidence to ride in close proximity to cars. Paved shoulders should be provided in both directions on a roadway, with bike traffic travelling in the same direction as motor vehicle traffic in the adjacent lane. Curbs can be hazardous to cyclists; in areas where curbs are present, additional shoulder space should be provided if possible to protect the cyclist from hitting the curb.

Road paving and reconstruction projects provide ideal opportunities to add or improve shoulders for bicyclists. Paved shoulders also can be added to existing roads as a separate construction project, but that is generally more expensive than adding them during other road work projects. It also may be possible to create shoulders within the existing road footprints (i.e. no widening necessary) through a lane or road “diet” that reduces the number of vehicle lanes and/or their width to produce room for a shoulder or a bike lane. (See “Road Diet” below.)

<b>Paved Shoulders Suitability Factors</b>
Rural roadways where bicycle travel is common
Secondary roadways without curb and gutter
Roadways with few commercial driveways and intersections
Roads already heavily used by cyclists
Designated bike routes without improvements
Roads that establish a network or close a gap

### BICYCLE LANE (TRADITIONAL)

A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists. Striped bike lanes can be effective as a safety treatment, especially for less-experienced bicyclists. Bike lanes are not appropriate under all roadway conditions such as high speed roads. Streets with bicycle lanes should be part of a connected bikeway system rather than being an isolated feature.

<b>Bicycle Lane Suitability Factors</b>
Right of way can accommodate minimum bike lane width of 4 feet (for roads without curbs or gutters; 5 feet if there are).
Bike lane will be at least one-half mile in length.
Two-lane residential/collector streets with lower traffic volumes, low-posted speed limit, and an absence of complicated intersections.

### ADVISORY BICYCLE LANE

An advisory bike lane is a treatment option for roads that may be too narrow for standard bike lanes. Using dashed lines that create a separate space for bikes, it can be



used by motor vehicles when no bike is present. (See photo.<sup>3</sup>) Advisory bike lanes may be appropriate treatments on Cape Cod roads where bike lanes are desired but sufficient pavement width is not available.



TRADITIONAL BIKE LANE ON MOORS ROAD IN PROVINCETOWN (L) AND AN "ADVISORY" BIKE LANE IN MINNEAPOLIS (R).

### CYCLE TRACK

A cycle track is an exclusive “protected” bicycle facility within the street layout, like an on-street bike path, separated from vehicle travel lanes, parking lanes, and sidewalks by pavement markings or coloring, bollards, curbs/medians or a combination of these elements. Cycle tracks provide increased comfort for bicyclists since they provide a separate space that, unlike bike lanes, is protected from vehicles. Cycle tracks are relatively new to the United States and are growing in popularity as preferable options to bike lanes. They generally are found in urban areas on high traffic volume roads.



TWO WAY CYCLE TRACK IN SEATTLE.<sup>4</sup>

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<sup>3</sup> Minneapolis advisory bike lane photo from <http://www.minneapolismn.gov/bicycles/bicycling101/advisory-bike-lane>. Note the road lacks a centerline, which some consider a safety benefit as it encourages drivers to slow down and give more room to the cyclist by moving over more to the left, without being “boxed in” by centerline.

<sup>4</sup> Photo from *Downtown Seattle* website: <http://www.downtownseattle.com/2014/04/safer-peddaling-ahead-bike-master-plan-approved/>



## BICYCLE BOULEVARD

Also called “local street bikeways,” “bike/walk streets,” and “priority bike streets,” bicycle boulevards are low-volume and low-speed streets that have been optimized for bicycle travel through treatments such as traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments. These treatments allow through movements for cyclists while discouraging similar through trips by non-local motorized traffic. Motor vehicle access to properties along the route is maintained. Bicycle boulevards are often more feasible, easier to implement than multi-use paths and less expensive and more appropriate, particularly for providing connections - to paths, transit, downtowns, etc. Many bike routes and bikeways have the elements of a bike boulevard but are not referred to as such.



BIKE  
BOULEVARDS  
IN BERKELEY,  
CALIFORNIA<sup>5</sup>

## SHARED/MULTI-USE PATH

Shared or multi-use paths are often preferred facilities for less experienced bicyclists and children because they do not have to share the path with motor vehicles. Design standards require adequate width for two-directional use by both cyclists and pedestrians, provision of good sight distance, avoidance of steep grades and tight curves that force bicyclists to make awkward movements, and minimal cross-flow by motor vehicles. Multi-use pathways need continuity with other facilities.

Shared Path Suitability Factors
Pathway will have connection/continuity with other bike/ped facilities so that cyclists are not stranded without a nearby bikeway connection.
Minimal road cross-flow from motor vehicles (i.e. driveways, road intersections).
Sufficient land area to accommodate minimum width standards, while avoiding steep grades and tight curves.

## SHARROW

Sharrows delineate the “shared” lane for motor vehicles and bicycles and guide bicycle position in the road. They are a potential treatment option on roads that lack the width

<sup>5</sup> Photos from City of Berkeley website: <https://www.cityofberkeley.info/bicycleboulevards/>



needed for a bike lane or shoulder. Sharrows may be appropriate on roads where motor vehicle speeds are less than 35 miles per hour (mph) but not on busy roads where the bicyclist constantly has to negotiate the shared space with passing motor vehicles. They are best on low traffic volume, low-speed roads. Sharrows are not a substitute for bike lanes but are a benefit on narrower streets where bikes and motor vehicles must share space.

Sharrows Suitability Factors
Posted speed limit 35 mph or less
Low traffic volume, "quiet" roads are best.
Placement should be at least 12 feet from curb if parking lane is present.



PHOTO: SHARROWS ON A STREET IN SALEM, MASSACHUSETTS.<sup>6</sup>

### SIGNAGE (for bicyclists and pedestrians)

*“Wayfinding”* signage provides directional information to guide travelers to destinations. It is useful for directing bicyclists and walkers to the safest route to their destination. *“Safety”* signage communicates safety regulations and warning (i.e. “yield to bicycles,” “stop,” “Share the Road,” “use shoulder only” etc.). Both types of signage are important features of bicycle routes.

### SIGNED SHARED BICYCLE ROUTE

Signed routes are a cost-effective way to inform bicyclists of the safest route to reach their destinations and should be part of a comprehensive, connected bikeway network. Routes should be located on roads with physical or operational characteristics that are favorable to bicycling such as wide travel lanes, bike lanes, paved shoulders, and/or low traffic speeds and volumes. Directional signage and/or pavement markings should be provided along the route to guide riders.

Signed Shared Route Suitability Factors
Routes should be located on roads with physical or operational characteristics that are favorable to bicycling such as wide travel lanes, bike lanes, paved shoulders, and/or low traffic speeds and volumes.
Route connects to destination(s)
Signage and/or pavement markings should be provided along route to guide riders.

<sup>6</sup> Photo from City of Salem: [http://www.salem.com/Pages/SalemMA\\_PressReleases/IO3150577](http://www.salem.com/Pages/SalemMA_PressReleases/IO3150577)



Questions about potential liability issues can discourage towns from designating routes, and town officials should consult with legal counsel for advice. In general, liability for designating bike routes should not be a concern, provided the route is generally compliant with state and national standards and policies<sup>7</sup>. MassDOT’s policy provides useful guidance to consider when designating a route. It can be viewed at:

<http://www.massdot.state.ma.us/Portals/8/docs/engineeringDirectives/policy/p-98-003.pdf>

## WIDE OUTSIDE LANE

A wide outside lane (or wide curb lane) is a shared-use lane that is wider than a standard lane and allows a motorist to safely pass a cyclist while remaining in the same lane. They are often used in urban locations where curbing and a parking lane preclude the ability to widen the roadway. Some cyclists prefer wide outside lanes over bike lanes because they provide sufficient space for the motor vehicles to pass and do not restrict the cyclist to a (relatively) narrow bike lane. Also, by widening the outside lane by a few extra feet both motorists and bicyclists have more space in which to maneuver. However, bicycle lanes do provide a designated space for the cyclist, and some cyclists feel that the delineation of separate lanes exclusively is safer than sharing even a wide lane.

Wide Outside Lane Suitability Factors
Road can accommodate minimum of 14 foot outside lane width
15 feet preferred width where extra space is required for maneuvering (e.g. on steep grades) or to keep clear of on-street parking or other obstacles

## CONFLICT ZONES

“Conflict” zones are painted (or thermoplastic) road surface areas that guide cyclists through locations where motor vehicles might cross into a bike lane or shoulder area occupied by bicycles. Blue or green paint alerts bicyclists that they are entering a “conflict” area (such as right-turning lanes, merging lanes, etc.) and provides a visible “zone” to guide them through it. Painted conflict zones also alert motorists of cyclists’ presence and their right of travel.

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<sup>7</sup> MassBike Executive Director David Watson (email October 16, 2013). A useful resource on liability and bicycle facilities can be found in:  
[http://www.bikeleague.org/sites/bikeleague.org/files/bikeleague/bikeleague.org/programs/bicyclefriendlyamerica/communities/pdfs/nchrp\\_liability\\_aspects\\_of\\_bikeways.pdf](http://www.bikeleague.org/sites/bikeleague.org/files/bikeleague/bikeleague.org/programs/bicyclefriendlyamerica/communities/pdfs/nchrp_liability_aspects_of_bikeways.pdf)



#### PAINTED CONFLICT ZONE GUIDES CYCLIST PLACEMENT ACROSS INTERSECTION AND HIGHLIGHTS



CYCLISTS' TRAVEL SPACE TO MOTORISTS.

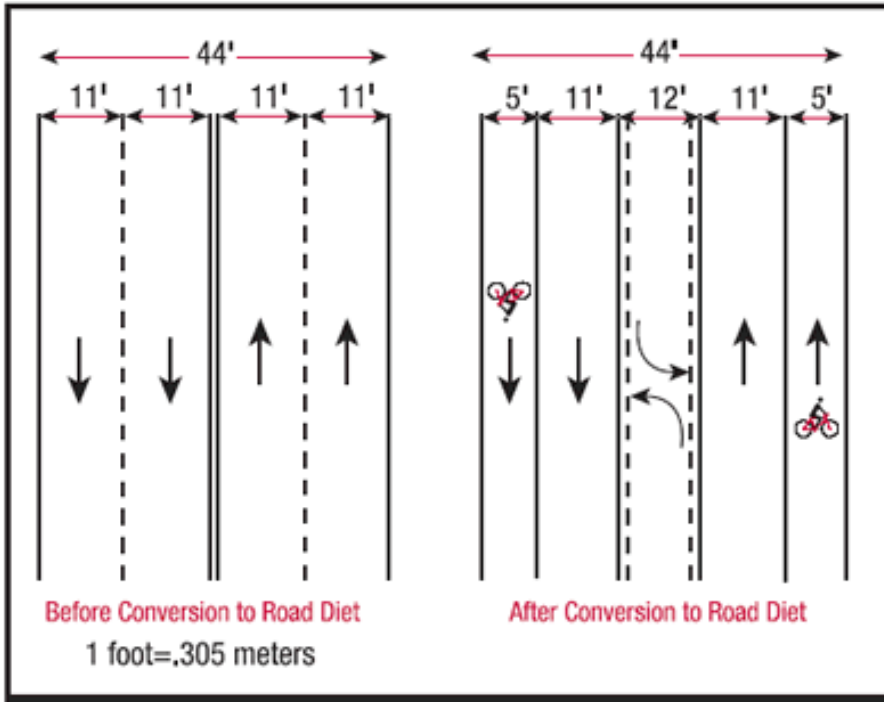
#### ROAD DIETS

The number of travel lanes and/or their width can be reconfigured within the existing pavement footprint to create shoulders or bike lanes from the road space “gained” by reducing vehicle travel lane(s). A road “diet” reduces the number of motor vehicle travel lanes; a lane diet reduces the lane width. Any roadway reconfiguration/diet requires careful consideration of traffic characteristics and other factors to understand potential level of service and safety impacts. The road diet shown in the image below (two through lanes and a center turn lane and two bike lanes) represents a common reconfiguration of a former four lane (two travel lanes in each direction) road. According to the Federal Highway Administration (FHWA), under most average daily traffic (ADT) conditions tested, this type of road diets has minimal effects on vehicle capacity, because left-turning vehicles are moved into a common two-way left-turn lane.<sup>8</sup>

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<sup>8</sup> See *Summary Report Evaluation of Lane Reduction Road Diet measures and Their Effect on Crashes and Injuries.*, Federal Highway Administration. Publication Number: FHWA-HRT-04-082, March 2004. Available on line at <http://www.fhwa.dot.gov/publications/research/safety/humanfac/04082/>







## Town Center Connections

The following section of the report contains a map for each of the 15 Cape Cod towns that shows:

- A “town center” area;
- The existing pedestrian and bicycling network (designated bicycle routes, bicycle/shared use paths, and sidewalks);
- Recommended on-road connections between the town center area and the existing network;
- A brief description of the existing network and recommended connector, plus notes/observations, accompanies each map.

“Share the Road” program treatments such as signage and/or pavement markings where feasible are recommended for the connections as initial low cost treatments, except where other bicycle facilities have already been proposed for the connector. With further study, some connector segments may be suitable for wider shoulders or bike lanes, either through reconfiguration (i.e. road or lane diets) or through minimal pavement widening to provide more space for bicyclists.



## BARNSTABLE (HYANNIS)

### *Existing Bicycle Network: Connected*

Downtown Hyannis is connected to the existing bicycle network by a bicycle path on Barse’s Way and designated bike routes on East Main Street/Main Street and Ocean Street. A bicycle path is also located at the Hyannis Transportation Center. It eventually will tie into the proposed Yarmouth Road shared-use path (which will connect to the proposed Cape Cod Rail Trail extension through Yarmouth and Barnstable). A designated bicycle route is located towards the west end of Hyannis, along Pitcher’s Way. The *Barnstable Bikeway Network Plan* map shows a future shared-use path on Main Street/West Main Street.<sup>9</sup> This would provide a connection to the Pitchers Way bicycle route.

Town Center Recommended Bicycle Connection		
Connector	Description/Treatment	Notes
Main Street/West Main Street (additional connection)	This is shown as a future shared-use path connection on the <i>Barnstable Bikeways</i> plan map.	Share the Road signage and/or pavement markings could be provided until proposed path is constructed.

*Pedestrian Connections:* Downtown Hyannis sidewalks generally extend beyond the “center” area and connect to abutting neighborhoods.

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<sup>9</sup> *Barnstable Bikeway Network Plan:*  
<http://www.town.barnstable.ma.us/PropertyManagement/Barnstable-Bikeway-Network.pdf>



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## BOURNE (BUZZARDS BAY)

### *Existing Bicycle Network: Connected*

The Cape Cod Canal bicycle path is located a short distance (0.3 mile or less depending on location) from Main Street. A designated bicycle route on the Route 6/Buzzards Bay Bypass connects to Main Street at the far west end and on the east end near the Belmont Rotary. (The bypass is not an ideal road for a designated bike route. Main Street, with lower vehicle speeds and more pedestrian activity may be a preferable.) The west end of Main Street also connects to the Cape Cod Canal bike path behind the train station (through Canal Avenue and the parking lot).

An additional network connection to the bicycle network is possible from Main Street to the Canal Bike Path on Old Bridge Road. Old Bridge Road provides direct access to the bike path through a small public parking area and provides a convenient connection to Main Street. With the Cape Flyer train service likely to bring more cyclists into Buzzards Bay, increased route connectivity is important, especially as they explore Main Street and the canal bike path.

Town Center Recommended Bicycle Network Connections		
Connector	Description/Treatment	Notes
Old Bridge Road (an additional connection)	0.3 mile connection, Share the Road treatment options - signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists' presence.	

*Pedestrian connection:* The town of Bourne completed a streetscape improvement project in 2012, and all of Main Street now has sidewalks on both sides. As the town proceeds with redesign of the Belmont Rotary, a safe pedestrian connection from Main Street to the rotary should be considered.



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## BREWSTER

### *Existing Bicycle Network: Not connected*

Stony Brook Road and Tubman Road are the nearest designated bike routes to the mapped town center area. The Cape Cod Rail Trail is located about a half-mile from the town center area/Route 6A. The shortest on-road connection between the town center and the CCRT is via Route 124 from Route 6A/Route 124 to Route 137, which intersects with the CCRT. Travel lanes on both roads are approximately 10.5 -11 feet, with narrow shoulders (1-2 feet) and high traffic volumes. Adding “Share the Road” signage and pavement markings may help make them suitable for experienced bicyclists, but less experienced riders might not feel comfortable. Adding shoulder width would improve the bicyclist level of service but may require road widening. Underpass Road (just east of the mapped town center area) also provides a direct connection to the CCRT.

Route 6A runs through Brewster center but is hazardous for bicycling given the narrow pavement width, lack of shoulders, high traffic volumes, and vehicle speeds. Providing alternative travel routes for bicyclists, particularly the rail trail and adjoining roads, is recommended where possible.

Town Center Recommended Bicycle Network Connections		
Connectors	Description	Notes
Underpass Road (from Route 6A) to CCCT	Share the Road treatment options - signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists’ presence.; striping if shoulder room is available; 0.50 mile connection	Sidewalk on one side for almost full length
Route 124 – Route 137 to CCRT (and Tubman Road bike route)	Approximately 1-mile connection (0.4 mile segment on Route 124, 0.6 mile segment on Route 137).Share the Road treatment options - signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists’ presence.	Adding shoulder space would be beneficial for bicyclists and pedestrians but may require expansion of the road footprint.

*Pedestrian connection:* Route 6A has sidewalks in the town center area but lacks them in on the eastern end of the corridor. Major connecting roads such as Route 124 and Route 137 lack sidewalks. A sidewalk connection on either road would help pedestrians access the rail trail.



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## CHATHAM

*Existing Bicycle Network: Not connected*

The terminus of the Old Colony Rail Trail is located about one-third of a mile from the mapped town center area. The nearest bicycle routes to the downtown/town center are located near the town center on Old Harbor Road and Shore Road (Route 28)<sup>10</sup>. Old Harbor Road to Depot Road to Hitching Post Road to Tip Cart Lane to Crowell Road provides an on-road connection to the rail trail. Chatham Bars Road provides an on-road connection between the town center and the Shore Road bicycle route.

Town Center Recommended Bicycle Network Connections		
Connectors	Description/Treatment)	Notes
Old Harbor Road - Depot Road - Hitching Post Road - Tip Cart Lane - Crowell Road <i>to rail trail</i>	0.75 mile connection. Share the Road treatment options - signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists' presence.	Connects Main Street/downtown to the rail trail.
Chatham Bars Road <i>to Shore Road bike route</i>	Chatham Bars Road connection is about 0.35 mile. Share the Road treatment options - signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists' presence.	Connects Main Street/downtown to Shore Road bike route.

*Pedestrian connections:* Main Street through the town center has sidewalks on both sides.

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<sup>10</sup> See also *Bicycling in Chatham* [http://www.chatham-ma.gov/Public\\_Documents/ChathamMA\\_Bikeways/OCRT\\_Poster09\\_11x17.pdf](http://www.chatham-ma.gov/Public_Documents/ChathamMA_Bikeways/OCRT_Poster09_11x17.pdf)



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## DENNIS

### *Existing Bicycle Network: Not connected*

The Cape Cod Rail Trail is located about 1.3 miles from the town center (Dennisport) area. The nearest designated bicycle route is located on Lower County Road, about a half-mile from the town center area. Depot Street provides a direct connection from Dennisport center to the rail trail but lacks shoulders. Lower traffic volume streets between Upper County Road and the rail trail provide an alternative route connector to a portion of the busier Depot Street. Sea Street provides a direct connection from Route 28 to the Lower County bike route (and is identified in the Dennis Local Comprehensive Plan as a connecting route for bikes). Depot Street is an alternative. Directional signage would be useful to guide bicyclists.

Town Center Recommended Bicycle Network Connection		
Connectors	Treatment	Notes
<i>Connection to rail trail from Route 28/Sea Street: Upper County Road (~320') – Clipper Road (~550') – Stafford Circle (~1300') – Depot Street (~3000'). Connection to Lower County bike route: Sea Street.</i>	Share the Road treatment options: signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists' presence.	Speed limit on Depot Street is 30 MPH. Lacks room for adequate shoulders within existing road footprint. Interconnecting residential streets provide an alternative route except for ~3,000 feet.

*Pedestrian connections:* Depot Street and Sea Street have sidewalks in the town center area but neither has sidewalks beyond the center area. Route 28 has sidewalks through Dennisport center. New sidewalks have been installed on Upper County Road.



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## EASTHAM

### *Existing Bicycle Network: Not connected*

The Cape Cod Rail Trail is located just under a half mile from Eastham Town Hall/ town center Route 6 area. Samoset Road provides a direct connection between the town hall and the Cape Cod Rail Trail. “Share the Road” signage and and/or pavement markings on Samoset Road would help direct bicyclists and alert drivers that bicycles are sharing the road.

Town Center Recommended Bicycle Network Connection		
Connector	Description/Treatment	Notes
Samoset Road	Approximately 0.4 mile in length. Share - the-Road treatment options: signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists’ presence.	A portion of Samoset Road is within a local historic district, so new signage may need to comply with district regulations.

*Pedestrian connections:* Samoset Road does not have a sidewalk. Route 6 has a sidewalk on the west side only.



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## FALMOUTH

### *Existing Bicycle Network: Connected*

Existing on-road bicycle routes connect to the Falmouth town center area and connect the town center to the Shining Sea bike path.

*Pedestrian connections:* Main Street in the town center has sidewalks on both sides and connects to sidewalks on intersecting roads such as Palmer Avenue and Gifford Street.



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## HARWICH

### *Existing Bicycle Network: Connected*

Existing on-road bike routes run through Harwich town center area and connect it to the Old Colony bike path.

*Pedestrian connections:* Sidewalks on Route 39 (Main Street and Sisson Road), Pleasant Lake Avenue (Route 124), and Oak Street run through the town center, with Sisson Road and Oak Street sidewalks extending beyond the center. Route 124 (Pleasant Lake Avenue) has sidewalks on both sides and connect to the bike path.



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## MASHPEE

### *Existing Bicycle Network: Connected*

An existing on-road bicycle route on Great Neck Road runs through the town center area and connects it to the Route 130 bike path and to on-road bike routes on Meetinghouse Road and Lowell Road.

*Pedestrian connections:* Great Neck Road has sidewalks that connect to Route 130.



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## ORLEANS

*Existing Bicycle Network: Connected*

The Cape Cod Rail Trail runs through Orleans center.

*Pedestrian connections:* Sidewalks are located throughout the town center area and extend beyond it along Route 6A, on Route 28 to Eldredge Parkway. Main Street lacks sidewalks in the residential neighborhoods adjacent to the town center area.



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## PROVINCETOWN

### *Existing Bicycle Network: Connected*

Commercial Street is a designated bicycle route through the east end and downtown. The route travels along Bradford Street in the west end and continues along the Moors Road bike lane and beyond Herring Cove. Conwell Street is also mapped as a bike route that continues along Race Point Road and connects to the Cape Cod National Seashore bike paths.

*Pedestrian connections:* Sidewalks are located on Commercial Street in the town center area and beyond and along Bradford Street in the town center area. Conwell Street lacks sidewalks; the Provincetown Local Comprehensive Plan notes the Cape Cod Commission's Conwell Street Corridor recommends them, although the study notes that it is infeasible to provide a sidewalk between Cemetery Road and Bradford Street and keep Conwell Street a two-lane road.



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## SANDWICH

### *Existing Bicycle Network: Connected*

Sandwich's town center is connected to the existing bicycle network by an on-road designated bicycle route that runs along Main Street and continues outside the town center area.

*Pedestrian connections:* Sidewalks are located in the town center area and extend outside to adjacent areas along Route 6A and Route 130.



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## TRURO

### *Existing Bicycle Network: Connected*

An on-road bicycle route travels through Truro town center along Town Center Road and Castle Road. The route continues outside the “center” area to the southwest on Depot Road towards Wellfleet and to the north and east along Castle Road, Town Center Road, North Pamet Road and on Route 6.

*Pedestrian connections:* No sidewalks are located on the town center roads or roads in the vicinity.



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## WELLFLEET

### *Existing Bicycle Network: Connected*

An on-road bicycle route travels through Wellfleet town center/downtown along Main Street and continues west/northwest on West Main Street to Old County Road and to the east on Long Pond Road. The Wellfleet Bikeways Committee has raised a concern that while it is an existing bike route (part of the state-designated Claire Saltonstall Bikeway), the roads are narrow and winding. Bicyclists with less experience sharing the road with motor vehicles may not feel comfortable on it.

*Pedestrian connections:* Main Street has sidewalks in the downtown but lacks them outside the center area, between Commercial Street and Route 6. A worn footpath between the marsh and the guard rail along Main Street near Route 6 indicates significant pedestrian use.



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## YARMOUTH

### *Existing Bicycle Network: Not connected*

The nearest bicycle path to the Route 28/town center area is located to the west on Forest Road. The nearest bicycle route runs along Buck Island Road and Winslow Gray and continues east across Station Avenue, with a southward spur along Station Avenue, across Route 28 to Main Street. A connection to the Forest Road bike path is recommended along low-volume neighborhood streets from Route 28 to Lyman lane, Mercury Drive, Hervey Lines Lane, Clifford Street and Historic Brook Road. An extended “bike boulevard” connection (that avoids Route 28) is available along Lyman Lane –Great Pond Drive-Icehouse Road –Wood Road (sidewalk available as alternative to road) –Indian Memorial- Station Avenue.

Town Center Recommended Bicycle Connection		
Connector	Description/Treatment	Notes
<i>To Forest Road bike path from Route 28:-Lyman Lane- Mercury Drive-Hervey Lines Lane –Clifford Street-Historic Brook Road.</i>	Approximately 0.65 mile in length. Treatment options: Share the-road signage, sharrows. Since route includes short segments on several streets, directional signage (vertical signs or pavement markings) would be useful	
<i>Neighborhood street connectors for cyclists traveling from Lyman Lane to Station Ave bike route: Great Pond Drive –Icehouse Road – Wood Road –Lakeland Avenue –Indian Memorial Drive – Station Avenue.</i>	Approximately 1-mile connection. Treatment options: Share the-road signage, sharrows. Since route includes short segments on several streets, directional signage (vertical signs or pavement markings) would be useful.	300’ segment on Wood Road has sidewalk as an option for bicyclists not wanting to share the lane with cars.



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RED LINE SHOWS CONNECTIONS FROM FOREST ROAD BIKE PATH/HISTORIC BROOK ROAD TO STATION AVE BIKE ROUTE SEGMENT THROUGH NEIGHBORHOOD STREETS (SEE EXISTING NETWORK AND PROPOSED CONNECTIONS ON PREVIOUS PAGE).



## Conclusion

Connecting Cape Cod's town center and downtown areas to the regional network of on-road bicycle routes and bicycle/multi-use paths is an important step in expanding transportation options and reducing dependency on automobiles, especially for short trips. Most of Cape Cod's town centers are located within short proximity of the existing network and can be "connected" to it on low traffic volume roads using signage (directional and/or safety) and/or pavement markings (striping, sharrows, etc.). In locations where sufficient pavement area or right of way is available, wider shoulders could be provided as well, either through lane or road diets or by pavement expansion, giving cyclists additional space on the road.



## SUMMARY OF RECOMMENDED CONNECTIONS

The table below provides a summary of recommended town center connectors to the existing bicycling network. (For town centers already connected to the existing network of bicycle routes or paths and no additional connection is identified, “N/A (Existing Connection)” is entered under Recommended Connectors column.

Town	Recommended Connectors	Description - Treatment	Notes
Barnstable	<i>Main Street/West Main Street</i> is shown as future multi-use path in town’s bikeway network plan.	Proposed future multi-use path, but until then the connection is on road. Share the Road treatment options: signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists’ presence.	Downtown is connected to bike network but not on west end. This is an additional future connection.
Bourne	<i>Old Bridge Road</i> connects Cape Cod Canal bike path to Main Street.	0.3 mile segment length. Share the Road treatment options - signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists’ presence.	Main Street bypass is designated bike route. The town might want to consider designating Main Street as a designated on road route through Buzzards Bay instead.
Brewster	<i>Route 124 to Route 137</i> to CCRT. Connects Route 6A/town center to CCRT.	Approximately 1-mile connection (0.4 mile segment on Route 124, 0.6 mile segment on Route 137). Share the Road treatment options - signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists’ presence.	Share the Road OK for experienced cyclists but less experienced might not feel comfortable without providing additional shoulder room which would require expansion of the road footprint. Lower volume/speed road connector is preferable but no such on-road connection from Route 6A in town center area.
	<i>Underpass Road</i> connects Route 6A to CCRT.	0.50 mile connection. Share the Road treatment options signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists’	



Town	Recommended Connectors	Description - Treatment	Notes
		presence.	
Chatham	<i>Old Harbor Road - Depot Road - Hitching Post Road - Tip Cart Lane - Crowell Road</i> connects downtown to rail trail.	0.75 mile segment. Share the Road treatment options - signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists' presence.	
	<i>Chatham Bars Road</i> connects downtown/Main Street to Shore Road/Road 28 bike route.	0.5 mile connection. Share the Road treatment options - signage, sharrows.	
Dennis	From <i>Sea Street/Route 28 - Upper County - Clipper - Stafford - Depot Street</i> to CCRT.	Share the Road treatment options: directional signage, (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists' presence.	Speed limit on Depot Street is 30 MPH. Lacks room for adequate shoulders within existing road footprint. Combination of connected neighborhood streets provides partial alternative route to CCRT.
	<i>Sea Street</i> suggested connector between Route 28 and Lower County bike route.		
Eastham	<i>Samoset Road</i> connects town center/town hall area to CCRT.	Approximately 0.4 mile connection. Share the Road treatment options: signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists' presence.	
Falmouth	N/A (Existing connection)		
Harwich	N/A (Existing connection)		
Mashpee	N/A (Existing connection)		
Orleans	N/A (Existing connection)		
Provincetown	N/A (Existing connection)		
Sandwich	N/A (Existing connection)		
Truro	N/A (Existing connection)		
Wellfleet	N/A (Existing connection)		



Town	Recommended Connectors	Description - Treatment	Notes
Yarmouth	Connection from Route 28 to Forest Road bike path along low-volume neighborhood streets <i>Lyman lane, Mercury Drive, Hervey Lines Lane, Clifford Street and Historic Brook Road.</i>	Approximately 0.65 mile segment. Share the Road treatment options: signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists' presence.	
	Additional connectors from Lyman Lane to Station Ave bike route: <i>Great Pond Drive –Icehouse Road – Wood Road –Lakeland Avenue – Indian Memorial Drive.</i>	Approximately 1 – mile segment. Share the Road treatment options: signage (vertical signs and/or pavement markings) to guide bicyclists and to alert car drivers of cyclists' presence.	300 foot segment on Wood Road has sidewalk as an option for bicyclists not wanting to share the lane with cars.

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