

2.8 SUB-REGIONAL ISSUES

Each town, village, business district, and even each neighborhood will have a slightly different (and in a handful of cases a drastically different) set of options and conditions that affect, and are affected by, travel. For a document of this scope it would be impossible, and imprudent, to provide such detail. Some comparisons and evaluation can be made at a larger scale. Therefore, transportation at the “local” scale is discussed for Sub-Regions identified in the following figure and described in the following sections.

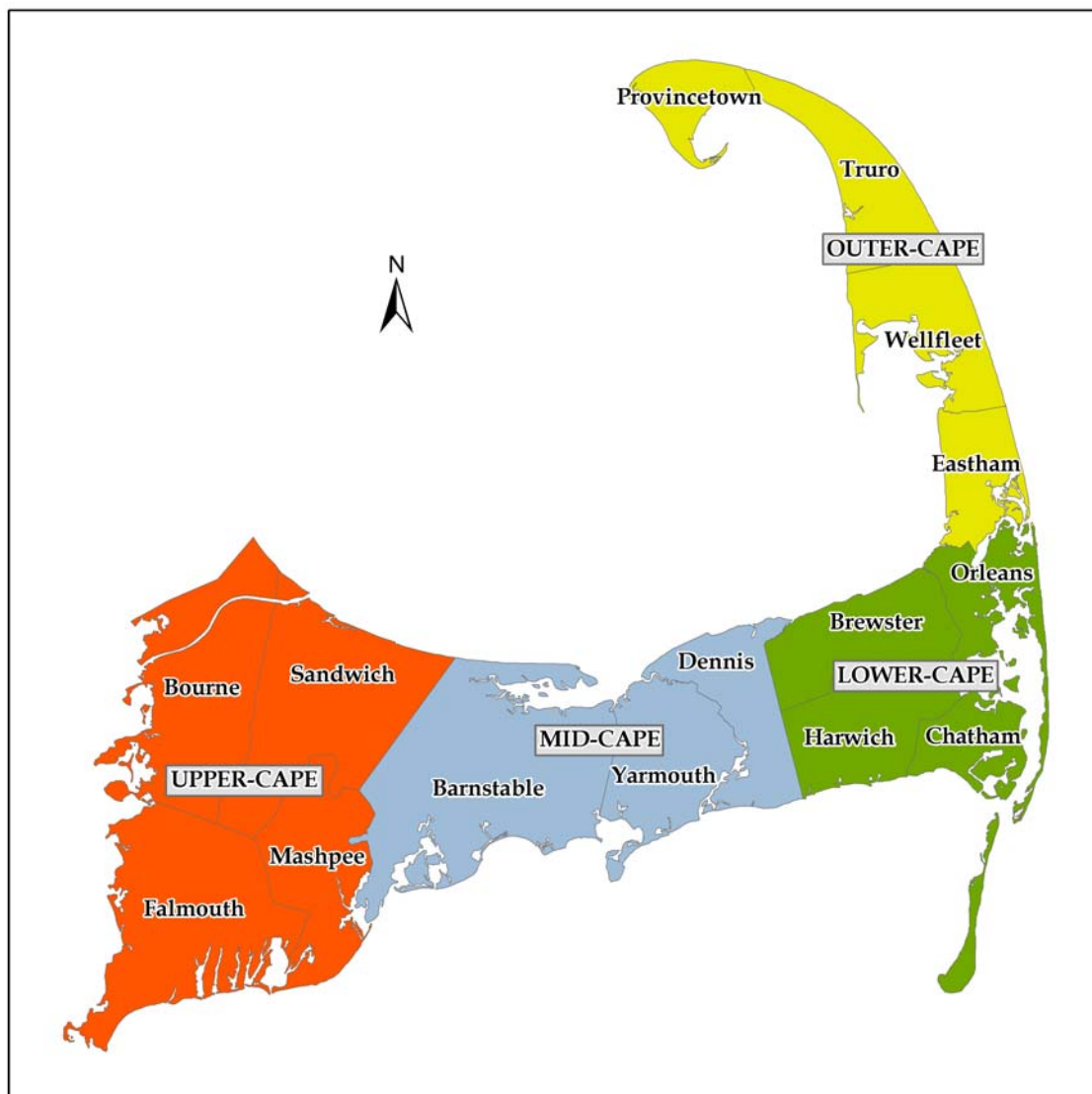
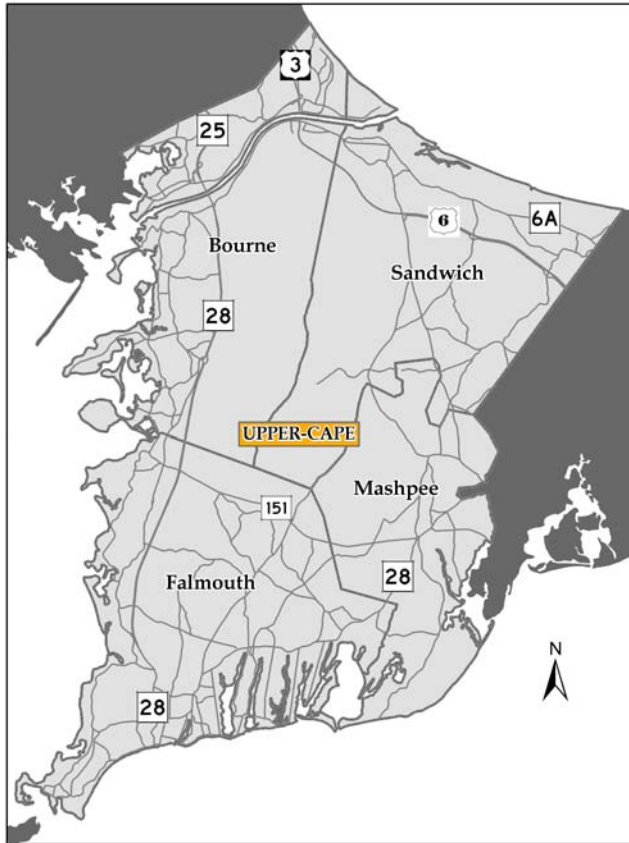


FIGURE 1 - CAPE COD SUB-REGIONS



2.8.1 UPPER CAPE

The Upper Cape includes the towns of Bourne, Sandwich, Falmouth, and Mashpee. The Upper Cape is also dominated by the Massachusetts Military Reservation (MMR). There is a portion of the MMR in all four Upper Cape towns. Transportation facilities are located within the MMR, including freight rail service, connections between Sandwich and Bourne, and the Otis Air Force Base. In addition, schools and jobs are located within the base.

The Upper Cape towns make up the mainland gateway to the Cape. They consist of 38% of the land area of Cape Cod, and contain 86,526 (2009 Census estimates) residents or 39.1% of the Cape's population. For Cape residents, they also contain 35.1% (31,051 of 88,409) of the jobs in the county. The Upper Cape area

includes regional and local services, such as the transportation connections, shopping centers, and Falmouth Hospital.

This area is identified as the Upper Cape (despite its compass-orientation compared to other sub-regions) since it is the closest to the mainland (and rising elevations).

2.8.1.1 Transportation Facilities

The transportation infrastructure in this sub-region includes approximately 1,200 miles of roadway, intercity and local bus services, limited rail service, and ferry service.

Roadway Network

The Cape Cod Canal bisects the towns of Bourne and Sandwich and is bridged in just three places, two for vehicular traffic and one for rail. The three major corridors that connect this sub-region to other parts of Cape Cod are Route 6A, Route 6, and Route 28. Regarding both Falmouth and Mashpee, both Route 6A and Route 6 have functions distinct from roadways such as Route 28. Since Route 6 and Route 6A provide only provide service well beyond the boundaries of these towns, their function is limited to longer-distance regional travel for travelers to or from Falmouth or Mashpee. Additional

regional corridors serve as a network for the sub region. Route 151 from Route 28 in Falmouth near the Bourne town line crosses through North Falmouth and connects to Route 28 in Mashpee. Route 130 from Route 6A to Route 6 in Sandwich and on to Route 28 in Barnstable just east of Mashpee/Barnstable town line connects Mashpee with Sandwich and allows access to Route 6.

Transit Service

Bonanza Bus Lines/Peter Pan provides intercity service from this sub-region to Boston and Logan Airport and Providence, Rhode Island. The CCRTA operates the SeaLine; a regional year-round fixed route bus service that travels from Falmouth through Mashpee primarily on Route 28 to the Hyannis Transportation Center. The Park-and-Ride commuter lot in Sagamore is serviced by P&B for trips to and from Boston. The CCRTA operates the “WHOOSH,” a summer trolley shuttle, between downtown Falmouth Mall and Woods Hole. Additionally, the Greater Attleboro Regional Transit Authority (GATRA) operates the “OWL” (Onset-Wareham Link) with service to the Massachusetts Maritime Academy, Main Street in Buzzards Bay, and across the Bourne Bridge to Tedeschi’s (convenience store) near the Bourne Rotary. The Cape Cod RTA b-bus/Dial-A-Ride Transportation (DART) service is a paratransit service operating seven days a week for any resident in the upper Cape.

Ferry Service

This sub-region also has links by water between Falmouth and Martha’s Vineyard. The Steamship Authority ferries operate between Woods Hole and the Vineyard carrying passengers, bicycles, automobiles, and trucks. In the summer of 2010, the SSA operated close to 30 round trips per summer weekday (some of these trips were freight deliveries, and would only take passengers if space was available). In addition, two private ferry operators provide passenger service between Falmouth Harbor and Martha’s Vineyard during the summer season.

Bike Facilities

The Boston to Cape Cod Bikeway, also known as State Bicycle Route 1 and the Claire Saltonstall Bikeway reach the Cape Cod region on Route 3A in Bourne and follows Route 3A to Meetinghouse Road that connects to the Sagamore Bridge. Once over the Bridge, this bicycle route connects with Route 6A to the intersection with Route 130 in Sandwich. State Bicycle Route 1 proceeds south on Route 130 to its junction with the Service Road in Sandwich. The bike route continues on the Service Road in Sandwich and into the Town of Barnstable. Other bicycle trails include the bike paths along both sides of the Canal in Bourne and the Shining Sea Bike Path which connects North Falmouth to Woods Hole passing the downtown.

Rail Service

The third bridge across the Cape Cod Canal is the railroad bridge. Typical Cape Cod freight shipments by rail are made three to four times per day year round; this is primarily to transport trash to the SEMASS waste-to-energy plant in Rochester. The Cape Cod Central Railroad operates excursion train service between Hyannis and Sandwich (typically four round trips during the tourist season).

2.8.1.2 Transportation Issues and Problems

- Under-utilized third (rail) bridge over the Cape Cod Canal;
- Most of freight shipment is by trucks;
- Recent land development which is auto-oriented;
- A need for more local transit service;
- Motor vehicle traffic congestion on highway bridges;
- Improved ferry service from off-Cape locations to the islands; and
- Maintenance of Bridges

Cape Cod Canal Area

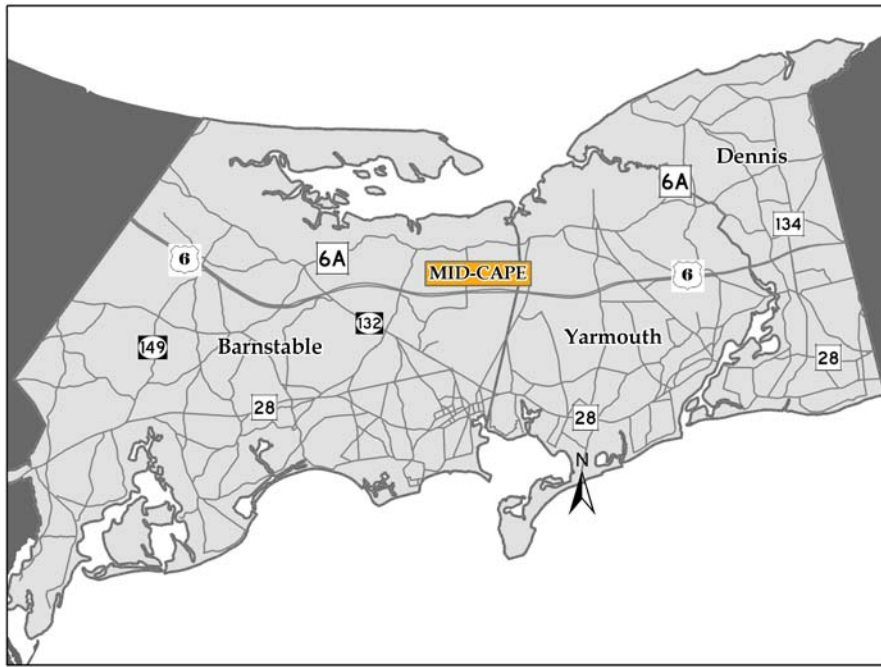
An important transportation subset of the Upper Cape contains the roads and bridges along and over the Cape Cod Canal. The Canal Area includes the approaches to the Sagamore and Bourne Bridges and the roadway systems that serve the area. This area has been the subject of a number of studies that have looked at improvements and major new construction such the replacement of the old Sagamore Rotary.

A number of promising projects have been developed by the Canal Area preliminary planning study which includes:

- Sandwich Road Parkway
- Relocation of Interchange 1
 - Interim closures of the westbound Exit 1 on-ramp to help improve traffic flow over the Sagamore Bridge in the off-Cape direction
- Median Barrier for the Scenic Highway
- Scenic Highway/Route 25 Ramp
- Canal Area Intelligent Transportation Systems (ITS)

Two of these projects (Sandwich Road Parkway and the Scenic Highway/Route 25 Ramp) have been adopted by the Bourne Planning Board. These promising projects need to be pursued further as they appear to have significant potential benefits. The Cape Cod Canal area transportation system is discussed in greater detail in the previous sub-chapter (2.7).

2.8.2 MID-CAPE



The Mid-Cape includes the towns of Barnstable, Yarmouth, and Dennis and form the “urban core” of the Cape. They include 27% of the land area of Cape Cod, and contain 85,550 residents or 38.7% of the Cape’s population. They also contain 44.1% (38,956 of 88,409) of the jobs in the county.

2.8.2.1 Transportation Facilities

The transportation infrastructure for this sub-region includes approximately 800 miles of roadways, intercity and local bus services, limited rail service, commercial airline service and ferry service. An intermodal transportation center to coordinate these different transportation services in Hyannis was opened in 2002 near the existing bus and railroad stations. Mobility to and within this “urban core” is beneficial for access to regional and local services, such as the transportation connections, the Cape Cod Hospital, Route 132 retail areas and downtown Hyannis. Other facilities in the Barnstable/Yarmouth area include Cape Cod Community College, located on Route 132, the YMCA, the Cape Cod Conservatory, and the Barnstable County Complex on Route 6A.

The major west-east corridors (Route 6, Route 6A, and Route 28) link the towns of Barnstable, Yarmouth, and Dennis both amongst each other and the other sub-regions of Cape Cod. Rail right-of-way comes into the Town of Barnstable from the west and forks with one section heading through Yarmouth and Dennis to Route 134 and the other

turning south, terminating in Hyannis. This sub-region also has links by air and water in the Hyannis area of Barnstable. Commercial air services are available at the Barnstable Municipal Airport and ferries operate from Hyannis Harbor to the islands.

Roadway Network

The three primary roadway corridors are Route 6, Route 28, and Route 6A. Route 6 is a four-lane freeway divided by a vegetated median. Route 28 is mostly a two-lane roadway with occasional turning lanes, with a short, four-lane section in Centerville. Route 6A is an historic/scenic byway with two narrow lanes and roadside features such as stone walls and large trees.

The limited-access, four-lane, median-divided, Mid-Cape Highway, or Route 6, has five access points through this section of Cape Cod. Major regional roadways emanate in both northerly and southerly directions from the Route 6 exits. Commercial areas have developed on four of these north/south connectors increasing travel demand and leading to sections of widened four-lane roadway on Route 132 and three lanes on Union Street/Station Avenue.

Transit Service

Scheduled Plymouth & Brockton Street Railway Co. bus service operates from Boston into Hyannis on Route 6 stopping at the Park-and-Ride commuter lot in Barnstable and continuing down Route 132 and Barnstable Road to the transportation center in downtown Hyannis. The Cape Cod RTA operates a regional year-round fixed route bus service called the SeaLine from Falmouth to the Hyannis Transportation Center. Along Route 28 from Hyannis to Orleans, the Cape Cod RTA operates the H2O Line, a year-round bus service. The Cape Cod RTA also operates a paratransit service called the b-bus/Dial-A-Ride Transportation (DART). The b-bus/DART operates in all towns of the mid-Cape, 7 days a week, year round.

Bike Facilities

The State Bicycle Route 1 or Claire Saltonstall Bike Route follows the Service/Access Road in Barnstable from the Sandwich town line across Route 149 to Route 132, Route 132 to Phinneys Lane, Phinneys Lane/Hyannis Road to Route 6A, and east to Setucket Road in Yarmouth. This route continues along Setucket Road as a bike path into Dennis and Brewster. The western trailhead of the Cape Cod Rail Trail is located on Route 134.

A north/south bicycle path branches from the Claire Saltonstall route at Route 149 and heads south along Old Stage Road leading to a path along the south side of Route 28 which runs east to Bearses Way in Hyannis. Many bicyclists are making trips in the sub-region though few roadways comfortably accommodate bicycle use.

Air Service

This region contains the major commercial airport on Cape Cod, Barnstable Municipal Airport. Air service is available several times each day on several different carriers between the Barnstable Municipal Airport and other destinations including the Islands and Boston.

Rail Service

The Cape Cod Central Railroad operates excursion train service between Hyannis and Sandwich. Service includes four round trips of various types of excursions on Tuesdays through Sundays during the tourist season.

Ferry Service

The Steamship Authority operates passenger, automobile, and truck ferry service between Hyannis and Nantucket year-round. Private companies operate passenger service between Hyannis and Nantucket year-round and passenger service between Hyannis and Martha's Vineyard during the summer.

North/South Transportation Links

There are five areas within the Mid-Cape that provide north/south transportation connections from the transportation “spine” of Route 6:

Roadway Links

- In the western part of Barnstable, Route 149 (a two lane roadway) connects Route 6A and 28 as well as providing access to Route 6 at exit 5.
- Route 132 in Barnstable/Hyannis provides a link from Route 6A and Route 6 at Exit 6 to the Barnstable Municipal Airport and Route 28 at the Airport Rotary where Route 132 terminates. Route 132, the Cape's largest commercial and retail corridor, is two lanes from Route 6A to just before the signalized intersection at Phinneys Lane where it widens to an undivided four lane roadway. The four lane roadway continues through three more signalized intersections to the Capetown Plaza and the Cape Cod Mall entrances where a small median barrier exists. Route 132 narrows as it approaches and connects with Route 28 at the Airport Rotary.
- Willow Street in Yarmouth at Route 6, exit 7 connects with Route 6A to the north and Yarmouth Road at the Barnstable town line which leads to Route 28 and into Hyannis for an alternative to 132 for access to the downtown area. This access to Main Street, Hyannis passes the new Steamship Authority parking lot at the corner of Yarmouth Road and Main Street; this lot is just east of the railroad tracks and the Hyannis Transportation Center. In addition, this exit is the primary access route to the Cape Cod Hospital from Route 6. From Willow Street near the Route 6 exit ramps, Higgins Crowell Road provides a connection to Route 28 in West Yarmouth. Higgins Crowell Road also intersects with Buck Island Road, an alternative to Route

28 for east-west traffic in the area and may be realigned at the Willow Street end to improve traffic flow at Exit 7. Further south from Route 6 down Willow Street is Camp Street which also connects both to Buck Island Road and Route 28. Though travel demand is high in this area, few alternative provisions are present. The Town of Yarmouth has recently constructed improvements for Buck Island Road which include bicycle accommodation. Route 28 has bicycle traffic, especially in the summer season when seasonal workers commute via bicycle, yet the roadway has many access points and no markings for bicyclists.

- Union Street/Station Avenue at Exit 8 in Yarmouth is a main connector between Route 6A and Route 28 for destinations in Yarmouth and Dennis. This corridor includes an undivided roadway and offers few alternatives to the automobile.
- Route 134 in Dennis provides a link from Route 6A in the north and Route 28 in the south to Route 6. Local road connections at either end serve neighborhoods and beaches. This roadway is two lanes except for a four-lane section between Route 6 and Upper County Road. This section, near the Patriot Square shopping center also includes a center lane for turning. Traffic signals are located at Route 6A, Setucket Road, Bob Crowell Road, Patriot Square, T.F. Smith Road, Upper County Road, and at Route 28. Adjacent to Route 134 is the parking lot for the western end of the Cape Cod Rail Trail. The interchange at Route 6 and 134 is the first full-cloverleaf (directional ramps at all four quadrants) on Cape Cod.

Transit Service

- A year round bus service connecting the villages of Cotuit, Marstons Mills, and West Barnstable via Route 149 was tried from November 1995 through June 1996 and had little ridership. The area is primarily low-density housing north of Route 6.
- The Cape Cod Regional Transit Authority operates a local bus service called the Villager. The *Villager* service begins at the Barnstable County complex, travels along Route 6A to Route 132 and connects with each of the Malls and to the Barnstable Municipal Airport and terminates at the Hyannis Transportation Center. The bus operates eleven daily round-trips, Monday through Friday, and seven round-trips on Saturdays.

2.8.2.2 Transportation Issues and Problems

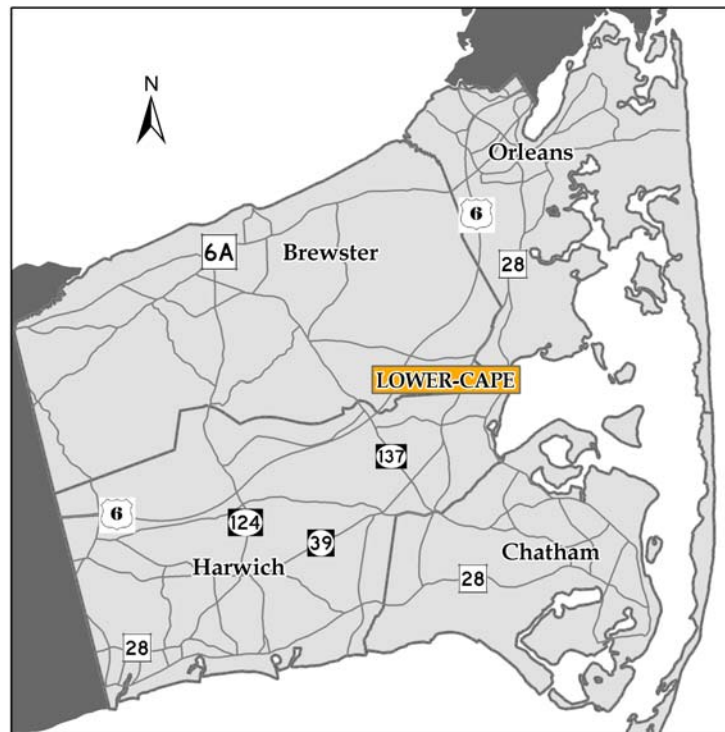
Geography, environmental constraints, cost, character issues, and policy restraints generally make it difficult to building additional highway systems or add capacity to the existing roadways. Many in the area have expressed a strong desire to find alternatives to widening roadways.

Development of a more balanced and coordinated system will improve the efficiency of the Barnstable/Yarmouth area infrastructure in a cost-effective and environmentally friendly manner thereby improving the quality of life. Town-level policy and land use decisions affect the operation of the transportation assets and must include consideration of the transportation implications. Growth centers must be chosen which provide for efficient transit connections to encourage this alternative. With

redevelopment or new development along major routes, the responsible agencies should require a transit oriented connection to the major roadways and require parking to be located at the back or side of the development. To support development of these alternate modes in the Barnstable/Yarmouth area, some alternatives have been identified:

- The intermodal center in Hyannis has the potential to create a more efficient, connected system for transfers between modes which will aid in allowing for more trips without an automobile. In addition, increased trips by pedestrians and bicyclists will be encouraged with improvements for safety of these trip types.
- Accommodation of bicycles with the addition of lanes for this mode should be considered for major routes such as Routes 28 and 132.
- A bicycle connection to the intermodal center site as a spur from the westerly extension of the Cape Cod Rail Trail into Yarmouth and Barnstable will provide additional alternative mode benefits for the region.

2.8.3 LOWER CAPE



The Lower Cape includes the towns of Harwich, Chatham, Brewster, and Orleans and lies east of the heavily developed Mid-Cape and south of the Outer Cape. These towns make up the “elbow” of Cape Cod. This sub-region is approximately 19% of the land area of the Cape. In 2000, these towns contained 35,231 residents (15.9% of the Cape) and 15% (13,241 of 88,409) Cape Cod’s jobs.

2.8.3.1 Transportation Facilities

This region has an extensive network of roads; 63 miles of state highways and over 400 miles of local roads. However, it has a limited transit system. It does, however, contain several bikeways and roads appropriate for biking. Mobility across this region is important because it provides the only land connection to the Outer Cape. It also contains several regional destinations such as Nickerson State Park, Cape Cod National Seashore sites, and the commercial center of Orleans.

Roadway Network

Routes 6, 6A, and 28 all traverse the region from the Dennis boundary to the Orleans rotary, where they all meet. In addition, Routes 134, 124, and 137 cross the sub-region from north to south, Route 39 also cuts across Harwich and Chatham, providing a shorter route than Route 28 across the southern part of the sub-region. In 1996 a Park-and-Ride lot with room for 77 cars opened at the Route 6/Route 124 interchange in Harwich (exit 10).

It is interesting to note that the directional signs on some state routes in this sub-region are confusing due to the geography of the sub-region. For example, Route 28 is signed as Route 28 South as it heads from Dennis to Orleans despite the fact that it travels first east, then north before ending at the Orleans Rotary.

Transit Service

P&B operates 6 round-trips per day along Route 6 from Hyannis to Provincetown during the summer. The Cape Cod RTA runs six trips per day on the H2O Line along Route 28 from Hyannis to Orleans. Introduced in 2006, the *Flex* service provided fixed-schedule service with deviations of up to $\frac{3}{4}$ mile from its main route. *Flex* service included major corridors and destinations in the towns of Harwich, Brewster, Orleans, Eastham, Wellfleet, and Truro, in addition to coordination with Provincetown shuttle service.

Rail Service

Tracks coming from the west have been abandoned east of the Yarmouth transfer station. There is no longer any rail service in this sub-region. The tracks that formerly crossed into the region have now been replaced by the Cape Cod Rail Trail.

Bike Facilities

The main bike facility in this sub-region is the Cape Cod Rail Trail, built on the old rail right-of-way from Dennis to Wellfleet. This route provides a major east-west corridor for (mostly recreational) bike traffic across the elbow of Cape Cod. This bike path is uninterrupted and serves many villages, beaches, and Nickerson State Park where

additional bike facilities exist. The Harwich-Chatham Spur connects downtown Chatham to the Rail Trail near Harwich center.

Air Service

There is only one airport in this region, Chatham Airfield, and no scheduled commercial traffic uses this airfield.

Ferry Service

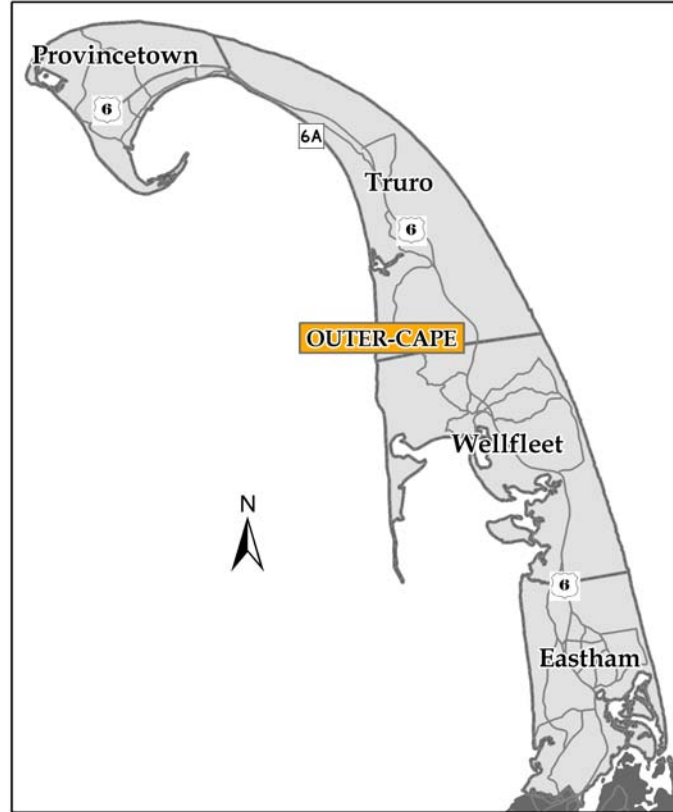
High speed passenger ferry service, which accommodates bicycles, operates from Harwich to Nantucket during the summer. This service operates from late May until Columbus Day and includes 3 round trips per day.

2.8.3.2 Transportation Issues and Problems

This area is generally less congested than other areas of the Cape, although certain road segments such as Main Street in Chatham, west of downtown, operate well over capacity during peak hours. However, as noted in the Monomoy Capacity Study, the roads of this region are predicted to become considerably more congested in the next ten years if current land use patterns and growth rates continue. If the current trend of converting seasonal housing to year-round use continues, congestion could continue to worsen, and may persist for longer portions of the year.

The Lower -Cape region is also where Route 6 becomes a limited access highway with one lane in each direction (between exit 9 in Dennis and exit 10 in Harwich). This is an unusual configuration, particularly because an entire section of the highway is built along only half of the right-of-way. The right-of-way was acquired as part of the original plan to build a four lane highway all the way to the Orleans rotary from the Cape Cod Canal. Lane separation, a center berm, and delineation improvements were installed in the late 1980s and early 1990s to improve safety for two-lane operation.

2.8.4 OUTER CAPE



The Outer Cape includes the towns Eastham, Wellfleet, Truro, and Provincetown. Much of the Outer Cape is protected from development by the National Seashore. The Outer Cape towns include 16% of the land area of Cape Cod, and contain an estimated 13,844 year round residents (6.3% of the Cape). They also possess 5.8% (5,161 of 88,409) of the jobs in the county.

2.8.4.1 Transportation Facilities

Transportation infrastructure includes over 430 miles of state and town maintained roadway, limited intercity and local bus services, commercial airline service, and passenger ferry service. Various bicycle paths exist through the area; pedestrian facilities are primarily located in village centers.

Route 6 is the major north-south corridor that links the Outer Cape towns - both to each other and the other sub-regions of Cape Cod. Small-scale commercial air services are available at the Provincetown Airport. Passenger ferries between Provincetown and Plymouth or Boston operate 6 round trips during the summer.

Roadway Network

The main road in the region, Route 6, includes a four lane undivided cross-section through most of Eastham without shoulders. From South Wellfleet to Truro, Route 6 is restricted to two lanes with shoulders and occasional turning and through lanes at intersections. In North Truro to Provincetown, Route 6 is four lanes with a vegetated median in some sections.

Transit Service

Scheduled Plymouth & Brockton Street Railway Co. bus service operates from Provincetown to Hyannis. Currently the service operates 5 round trips per day, including stops in Provincetown, North Truro, Truro, Wellfleet, South Wellfleet, North Eastham, and Eastham. A paratransit service called the b-bus/Dial-A-Ride Transportation (DART) is available in these towns and is provided by the Cape Cod Regional Transit Authority (Cape Cod RTA) on an "on call" basis. Introduced in 2006, the *Flex* service provided fixed-schedule service with deviations up to 3/4 mile from its main route. *Flex* service included major corridors and destinations in the towns of Harwich, Brewster, Orleans, Eastham, Wellfleet, and Truro, as well as in coordination with the Truro-Provincetown shuttle service.

Bike Facilities

The Cape Cod Rail Trail connects the area from other parts of the Cape. The original route used Rock Harbor Road; the bicycle bridge in Orleans allows the trail to follow former railroad right-of-way all the way through Eastham to LeCount Hollow Road in Wellfleet. The State Bicycle Route 1 or Claire Saltonstall Bikeway (which uses the trail) continues along side roads and bike path segments until North Truro and Provincetown where it follows Route 6A.

Air Service

This region contains Provincetown Airport. Typical air service from and to Boston runs between 5 and 8 trips in each direction per day in the summer and 6 trips per day in the winter.

Ferry Service

Passenger ferry service operates from Provincetown to Boston and Plymouth during the summer. For 2010, there are 3 round trips per day scheduled between Provincetown and Boston with an additional excursion trip on summer Saturdays. One roundtrip is scheduled to and from Plymouth. These services operate in the tourist season. The Cape Cod Commission Strategic Plan for Expanded Water Transportation to Provincetown had several recommendations for expanding the service to the "shoulder seasons" due to increasing demand for service.

2.8.4.2 Transportation Issues and Problems

Some Outer Cape roadways are operating near design capacities, due to the rise in tourism and year-round populations in the region and an increased reliance on single-occupant vehicles. However, geographic, cost, character issues, and policy restraints largely preclude building additional highway systems or adding capacity to the existing roadways. In other parts of the country where roadway widening has been possible, mobility was generally not enhanced for the long term. Public consensus indicates a strong desire to find alternatives to widening roadways.

Some alternatives have been identified. Creation of a convenient trolley shuttle system and facilities to encourage use of bicycles for commuting will help by providing alternatives to driving alone.

2.8.5 CONCLUSION

Transportation to, from, and within Cape Cod is in many ways unique. Each its own microcosm – the Cape’s sub-regions are faced with their own limitations and opportunities. The roughly linear geography of the Cape means that transportation decisions in one sub-region will affect its neighbors to varying degrees. Therefore, decisions made for a particular sub-region are usually not amenable to a “one-size fits alls” approach.

The Upper Cape transportation system serves as a gateway to all fifteen Barnstable County towns, and decisions should respect the needs of local travelers in addition to inter-regional travel. The Mid-Cape area includes many of the regional services (e.g., Airport, Hospital, etc.) and is a major employment center. The Lower Cape communities mark a transition to more seasonal activity. Home to most of the Cape Cod National Seashore’s attractions, the Outer Cape’s relative remoteness from urban centers corresponds to the largest annual cycle of low-to-high levels of traffic.