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Cape Cod National Seashore
Alternative Transportation Systems Long-Range Planning Study

Final Report

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PREFACE

The U.S. Department of Transportation's Volpe National Transportation Systems Center (Volpe Center) developed this Long-Range 25-Year Plan for Alternative Transportation Systems (ATS) to, from, and within the Cape Cod National Seashore (CACO). The impetus for this study is twofold. The first involves a partnership between CACO, the communities of Truro and Provincetown, and the Cape Cod Regional Transportation Authority (CCRTA) to develop the 'Provincetown-Truro Shuttle.' Operating from May through late October, it carries visitors from the North Truro campgrounds to the Province Lands area, particularly Herring Cove Beach, and eventually to the Province Lands Visitor Center. The second involves participation with newly formed Cape Cod-wide transportation planning efforts, which began with the February 2000 Cape Cod Transit Summit.

Recommendations from the Transit Summit included forming a Cape Cod Transit Task Force (CCTTF), and developing a Five-Year Public Transportation Plan. CACO is actively involved with CCTTF activities, and was instrumental in funding the Five-Year Plan. In both cases, CACO demonstrated their commitment towards developing viable, sustainable partnerships, and a willingness to address and solve Cape Cod's transportation problems now and in the future.

The Volpe Center developed this Long-Range plan in concert with the towns of Provincetown, Truro, Wellfleet, Eastham, Orleans and Brewster, the Cape Cod Commission, CCRTA, and other statewide, regional, and local organizations. This planning effort builds on current plans and proposals, and also focuses on needed partnering opportunities, and operational and capital improvements. This Long-Range plan involves the development of an ATS that will provide visitors and residents with a safe, economical, convenient and reliable alternative to the private automobile. The focus of this effort is to:

- Identify transportation system problems for the Outer Cape,
- Minimize impacts on local communities, and
- Propose solutions that will ultimately make the traveling experience to CACO more efficient, effective, and enjoyable.

The proposed system is designed to improve mobility in and around Outer Cape Cod. To make this happen will require cooperation and coordination with Federal, state and local governments, as well as the private sector.

This plan provides a starting point for comprehensive long-range planning for Outer Cape Cod in particular, and Cape Cod and the Islands of Martha's Vineyard and Nantucket, in general. Moving from the conceptual design outlined in this

plan to construction and operation will require cooperation by a large number of stakeholders, and will also require identifying funding and addressing regulatory requirements.

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This Long-Range 25-Year Plan for Alternative Transportation Systems (ATS) to, from, and within the NPS Cape Cod National Seashore (CACO) was prepared by the U.S. Department of Transportation John A. Volpe National Transportation Systems Center under the supervision of Terrence M. Sheehan, through the guidance and critical review of Ben Pearson, CACO Chief of Maintenance and Maria Burks, Superintendent of CACO. Additional review and comment came from the following:

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Executive Summary

INTRODUCTION

The U.S. Department of Transportation's Volpe National Transportation Systems Center (Volpe Center) collaborated with the National Park Service (NPS) to develop this Long-Range 25-Year Plan for Alternative Transportation Systems (ATS) to, from, and within the NPS Cape Cod National Seashore (CACO). The Volpe Center developed this Long-Range Plan in concert with the Cape Cod Commission (Commission), the Cape Cod Regional Transit Authority (CCRTA), and other statewide, regional, and local organizations. This planning effort builds on current plans and proposals, and also focuses on needed partnering opportunities, and operational and capital improvements. There are three work products that have NPS funding participation. One is the Volpe Center developed Cape Cod Transit Task Force Five-Year Public Transportation Plan, which was finalized in June 2002. Second is this CACO specific Long-Range Transportation Plan. Third is NPS involvement and partial funding for a Regional Long-Range 25-Year Transportation Plan for Cape Cod. The NPS ATS program earmarked $25,000 in funding for assistance in development of the Cape Cod Transit Task Force Five-Year Public Transportation Plan, has provided funding for Seashore specific planning, and has also set aside $100,000 for regional Capewide planning (provided it is matched by local sources).

Need for Planning for the Cape Cod National Seashore

The Cape Cod National Seashore is one of the U.S. East Coast's most pristine shoreline resources. CACO includes 40 miles of unspoiled shoreline and numerous other natural resources. It is the largest glacial peninsula in the world, and the Great Beach, on the Atlantic side of Cape Cod, is the longest expanse of uninterrupted sand shoreline on the East Coast. It is prime nesting habitat of the federally threatened piping plover and other sensitive species and contains numerous state-listed threatened plant species, including the broom crowberry. An Act of Congress (Public Law 87-126) established CACO on August 7, 1961, specifying preservation as the primary goal.

Of the five million annual visitors to CACO facilities today, one-half arrive during a ten-week period in the months of June-August. The type and duration of tourist visits has changed over the past forty years. The two-week to a full month stay that was usual in the 1960s and 1970s has, according to the Cape Cod Chamber of Commerce, been replaced by shorter trips, usually a two to three day weekend. Due to Cape Cod's geography and regulations ensuring that the historic character of a significant portion of its existing roads is maintained, it

is difficult to establish new rights of way or expand existing rights of way to improve traffic flows.

General Management Plan

Following two years of public comment, the NPS approved the 1999 CACO General Management Plan (GMP). The GMP establishes long-range strategies for resource management, visitor use, and the development of an integrated park system. A GMP vision is for visitors and residents alike to be able to look forward to improved travel conditions on the Outer Cape. It recognizes the current and future loss of wildlife habitat and vegetation posed by the ever-increasing number of private automobiles used by park visitors to access CACO facilities, and commits the NPS to find alternative transportation solutions to this burgeoning problem. There is a mandate for improved transportation systems, so visitors and residents can move around more easily and conveniently.

Cape Region and Demographic Trends

Cape Cod's has natural, coastal, historical, cultural, and other values that identify it as a unique place to live, work, visit, and recreate. The popularity of this area continues to grow, and this growth has brought with it quality of life issues including trash and water quality problems, congestion of a once-rural area, damage to irreplaceable environmental resources, and housing shortages.

The year round population of Cape Cod (Barnstable County) was reported as 222,230 in the 2000 Census. This is an increase of 19.1 percent over ten years, significantly greater than the 2.6 percent statewide population growth during the same period. Cape Cod's year round population is expected to increase to 273,000 in 2010. Cape Cod has an aging population. According to the 2000 Census, twenty-six percent of Cape residents are 65 or older, compared to a statewide figure of fourteen percent. Eleven of the twenty Massachusetts communities with the highest median age are on Cape Cod. Other trends include:

- Average annual traffic levels on the Sagamore and Bourne Bridges now exceed summer peak traffic levels experienced 15 years ago,
- Growing traffic congestion on Route 6,
- Park Service parking lots are often at capacity during the tourist season,
- Much of Cape Cod's open space has been sub-divided and developed for new permanent and seasonal homes, and
- Continued growth in traffic causing greater travel delays.

Partnerships

The establishment of the Cape Cod National Seashore in 1961 was considered, at the time, an experiment. CACO was not just another National Park carved out of publicly owned wilderness or donated lands. Rather, it was an attempt to conserve a fragile and precious resource that overlays six established communities so that residents and visitors alike might enjoy it for generations to come. Planning for the development of CACO was the result of significant partnerships with the National Park Service, the towns of Provincetown, Truro, Wellfleet, Eastham and Orleans, the Commonwealth of Massachusetts, a then newly formed Cape Cod National Seashore Advisory Commission, and residents, organizations, and businesses in and around Cape Cod. This history established a foundation for cooperation regarding planning and development of CACO and for the Park Service's cooperation in issues affecting the whole of the Cape.

Cape Cod Commission

The Cape Cod Commission was created in 1990 by an Act of the Massachusetts State Legislature and confirmed by a majority of Barnstable County voters. The Commission was established as a regional planning and regulatory agency to prepare and implement a regional land use policy plan for all of Cape Cod, to review and regulate Developments of Regional Impact, and to recommend designation of certain areas as Districts of Critical Planning Concern. The Commission is made up of 19 members that include representatives of each of Barnstable County's 15 towns; representatives of the County Commissioners, minorities, including Native Americans; and, a gubernatorial appointee. CACO works very closely with the Commission and is actively involved with proposals and concepts to solve problems and promote alternative transportation modes.

Cape Cod Transit Summits

Momentum to encourage a public discussion of public transportation on Cape Cod originated with an article in the Cape Cod Times in the spring of 1999. The article addressed a lack of coordination among transportation providers, few viable summer transportation alternatives, uncoordinated human service transportation, a perception of less than effective transit providers, and little regional thinking and vision. A key recommendation was to convene a Transportation conference of leading decision makers and stakeholders with an interest in better public transportation. The result was the Cape Cod Transit Summit I, which was held February 14, 2000 in Hyannis, MA. Various views were expressed regarding public transportation needs and priorities for Cape Cod. There was consensus that improved public transportation services were needed both to mitigate seasonal traffic congestion and to meet the mobility needs of the year-round transit-dependent population. However, there was wide

ranging opinion on the characteristics and qualities of an ideal public transportation system for Cape Cod. It was noted that additional financial resources to expand public transportation in the region should be explored with the help of federal and state leaders, and town officials. Subsequent to this initial Summit three additional Transit Summits have been convened, two Cape wide and one that focused on the outer Cape communities.

Cape Cod Transit Task Force

The Cape Cod Transit Task Force (CCTTF) was formed to respond to suggestions made during the first Cape Cod Transit Summit. The CCTTF was established as the primary advisory committee for the Five-Year Cape Cod Transportation Plan that was finalized in June 2002. The Task Force is made up of stakeholders representing Federal, State, and local officials, social service providers, as well as transportation providers for the Cape Cod region.

The Task Force recommended specific ways to improve mobility of Cape Cod's year-round residents and visitors between now and 2007, primarily through the Cape Cod Transit Task Force Five-Year Public Transportation Plan. The CCTTF recommended establishing a forum, called the Cape Cod Passenger Transportation Coordinating Council, to ensure cooperation and coordination of transportation planning and development activities on Cape Cod.

NATIONAL PARK SERVICE MISSION

The National Park Service (NPS) preserves, unimpaired, the natural and cultural resources and values of the National Park system for the enjoyment, education, and inspiration of this and future generations. The NPS cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

The implementation of proposed Alternative Transportation Systems (ATS) are consistent with the NPS's mission of preserving and protecting the country's natural, historical, and recreational resources for future generations. It recognizes the strategic importance of providing access, ensuring a safe and enjoyable park experience, and working closely with 'gateway communities' to coordinate transportation services.

TRANSPORTATION PLANNING ON CAPE COD

The NPS, the Commission, the RTA, Barnstable County, and Cape Cod towns have all either developed, or are developing plans, to address short and long term growth issues on Cape Cod. These include the GMP, Regional Policy Plan, Long Range Transportation Plan, and Local Comprehensive Plans. Transportation

is a major factor in all of these plans. Transportation goals, objectives, and in some cases recommendations, have been drafted and approved. The recommendations in this plan are designed to address these goals, objectives and recommendations.

Planning efforts have been cooperative, involving a broad array of stakeholders. The CCTTF provided a catalyst for systematic cooperative transportation planning on Cape Cod, but this effort is itself a continuation of partnerships that have been established over the past several decades. The recommendations in this plan are designed to address goals and objectives included in plans developed by the NPS, the RTA, the Commission, the CCTTF, and Outer Cape communities. This Plan provides summary information on Plans developed by the National Park Service, the Commission, the CCTTF, and Outer Cape Cod town's Local Comprehensive Plans.

CAPE COD AND ISLANDS PASSENGER TRANSPORTATION COORDINATING COUNCIL

Better coordination of existing and proposed services would help to meet transit needs identified by Cape Cod residents and businesses. To provide a forum for this coordination, the Five-Year Plan recommended the establishment of a Cape and Islands Passenger Transportation Coordination Council (the Council) that includes all Cape Cod and Islands air, surface and water public and private transportation providers, as well as regional planning, development and business interests of the region and adjacent regions. This plan recommends specific short and long-term responsibilities for the Council, a draft a mission statement, and identifies resource needs and potential sources for the development and sustainable operation of the Council.

TRANSIT PLANNING AND RECOMMENDATIONS

Transportation is an important issue on Cape Cod for a number of reasons. These include a growing year round population, continued strong tourism, limited opportunities to add roadway capacity, the need to protect open space and ground water supplies, and an aging population. The CCTTF provided a forum for identifying public transportation needs and to identify options for meeting those needs. The CCTTF found that residents of Outer Cape communities had some of the most pressing mobility issues on Cape Cod. Improved transit service can address these mobility issues and this section provides a practical vision of local and express transit for the Outer Cape.

Bermuda Model

Cape Cod and Bermuda share a number of characteristics. Both Bermuda and Cape Cod share tourism as a major economic sector, a need to preserve the environment to maintain the tourism industry, and increased tourism at certain times of year causing seasonal peaks in demand for transportation services. Bermuda and Cape Cod also have sizable year round populations that require transportation services. Bermuda's efforts to expand bus and ferry service to serve both residents and visitors provide useful lessons to guide transit planning on Cape Cod.

Provincetown-Truro Shuttle

CACO has demonstrated its commitment to partnering through the initiation of the Provincetown-Truro Shuttle, through a working agreement with the RTA. CACO procured 5 propane mini-buses for the CCRTA, and they operate them from North Truro to/from Provincetown. This shuttle operates from May through late October, and carries visitors from the North Truro campgrounds to the Province Lands area, particularly Herring Cove Beach, and eventually to the Province Lands Visitor Center. Other areas the shuttle covers include: P&B Bus stop at Dutra's Market, Guest Accommodations, Commercial Street shops & restaurants, Ferries to Boston & Plymouth, First Pilgrim's Park, Fisherman's Wharf, Heritage Museum, MacMillan Wharf, Pilgrim Monumt rx.6(man'oFishe)gmilgrimC,

Proposed Summer and Winter Outer Cape Transit Routes

Participants at Transit Summits, in CCTTF efforts, and representatives of Cape Cod communities have identified the need for better public transportation access in and between the Outer Cape Cod communities. Based on this information, Volpe Center staff developed route recommendations for local and express service to these communities. Local routes would be provided serving Brewster, Orleans, Eastham, Wellfleet, Truro, and Provincetown and an express route has been identified between Orleans and Provincetown. In most cases service on the proposed routes would be expanded during the Summer months, between Memorial and Labor Day.

INTELLIGENT TRANSPORTATION SYSTEMS

This section of the plan has been developed building on previous work identifying the transportation needs of Cape Cod residents and visitors. Providing information to visitors to CACO sites is a focus of this plan as the NPS is the primary sponsor of this work. However, because of the continued cooperative efforts on Cape Cod to address transportation needs, this section identifies opportunities to serve a wide array of Cape Cod visitors and residents. Information gathered in development of the Five-Year Plan helped identify transportation needs that could be addressed with the planning, development, and deployment of Intelligent Transportation Systems (ITS) technologies.

National Park Service ITS Objectives and Policies

The Cape Cod National Seashore General Management Plan describes the Park's mission and mission goals, along with other mandates and commitments. One of the goals for public use for the park is to "Provide opportunities for the public to access a variety of accurate and up-to-date trip planning and orientation information about the national seashore and Cape Cod before leaving home." This includes initial information, arrival and local travel information, partnership and stewardship opportunities, relationship to the national seashore visitor centers, and highway and local information signs. In short, CACO has identified Intelligent Transportation Systems as a means for meeting its mission goals and mandating a favorable experience for park visitors.

ITS Partners

The Coordinating Council is designed to serve as a forum for Cape stakeholders in transportation coordination, including ITS planning, development, deployment, and operations, to work together to address common transportation goals and objectives. ITS planning, development, and deployment will require the assistance of MassHighway and the Federal Highway Administration and will

benefit from assistance available through ITS Massachusetts, a statewide industry group that provides technical assistance on ITS issues.

Deployed and Planned ITS Projects

CACO has deployed portable Variable Message Signs (VMS) near the National Seashore, and is looking at opportunities to provide better information to CACO visitors and better manage transportation resources including parking. The CCRTA has deployed systems to provide better information on bus locations to the transit users, and is considering a number of other ITS deployments including smart kiosks and information display boards. Partners involved in the development of the Five-Year Plan are interested in opportunities to use ITS to improve and expand existing Emergency Management Systems.

In the Five-Year Plan for Public Transportation on Cape Cod, various ITS technologies were presented explaining their specific use and how they can make transportation services operate better. These technologies are primarily transit based and serve a specific purpose within a larger transportation context. They provide a starting point for integrating ITS technologies into the transportation system on Cape Cod.

ITS Recommendations

ITS technologies provide significant opportunities to better manage the Cape's transportation system, better inform the traveling public, and improve response to emergency situations. This Plan recommends ITS applications that better inform the public through Traveler Information System technologies, gather information using these technologies, improve parking management at CACO sites, and improve transit system services using advanced public transit technologies. Short-term recommendations include working with the State on the development of ITS Architecture and Standards, use of temporary variable message signs, development and installation of traveler information kiosks, establishing a transportation information center, and installation of parking management systems. Long-term recommendations include permanent variable message signs, a regional transportation operations center, and improvements to other traveler information services.

BEACH ACCESS AND ELECTIC TRAM REFURBISHMENT ISSUES

The NPS mission is to preserve and protect the natural resources within Park boundaries while making the Park experience pleasurable for visitors. Two long-range planning components that CACO should address are managing beach access and the ability to move visitors around using alternative fuel vehicles. Beaches are becoming increasingly overcrowded, with at times inadequate

lifeguard staff, and visitors are disturbing sensitive dunes and flora instead of entering beaches at designated areas. It is recommended that CACO consider using technology to limit the number of drop-offs at the beach, should it become infeasible to use Park Rangers for this duty. The second recommendation is to learn from its electric-tram experience—to determine what went wrong and why problems occurred, and to lay the necessary groundwork for redeploying electric vehicles in the future, this time successfully. The intent would be to run these trams for interpretive tours at selected sites only in modified duty. As knowledge is gained and confidence restored in their reliability, eventually they could be brought back into more active service.

NEXT STEPS

Cape residents, businesses, visitors, and public agencies have come to a consensus that transportation is a major issue affecting the long-term quality of life on Cape Cod. The recommendations in this plan are designed to address short-term and long-term transportation needs identified in this and other planning processes on the Cape, processes that have involved a broad spectrum of interests.

Two major issues need to be addressed early in implementing the recommendations in this plan. The Cape Cod and Islands Passenger Transportation Coordinating Council needs to be established, and this entity will need to be adequately supported to serve in its identified role as the focus of coordinating transportation planning, development, and implementation activities on Cape Cod. Funding is required to support on-going planning activities, for the development of identified short-term transportation improvements, and for operation and maintenance of existing and planned transportation systems.

Transportation planning goals and objectives must also be included in major development plans. For example, CACO should address transportation issues throughout its planning for the development of the Highlands Center at Cape Cod National Seashore site. Every opportunity must also be taken to educate and inform the public about the importance of a strong transportation planning process to address the mobility, environmental, and quality of life issues facing Cape residents, businesses, and visitors.

Visitors and year round residents should be surveyed on transportation issues to identify services that would benefit their particular needs to help foster a more enjoyable experience. CACO should also develop interpretive elements for the proposed local transit routes, as well as the Provincetown-Truro shuttle. Planning for the use of the Highlands Center site (the former North Truro Air Base) must address transportation, and interpretive issues within a transportation context, as part of that larger planning process.

CACO and the other Coordinating Council members need to partner with regional public and private sector leaders to state the case for a comprehensive ITS system encompassing Cape Cod. Leveraging CACO financial resources can set the stage for developing a showcase ITS network for safety, security, mobility and enhancement of the visitor experience.

The National Environmental Policy Act (NEPA), the principle US environmental statute, requires environmental input into a federal program's decision making early in the planning process. A Draft and Final Environmental Assessment along with technical analyses should be completed to satisfy NEPA compliance. This will require public forums for presenting the planned project and opportunities for public comment.

Overall, the success of the recommendations in this plan will require that people who live, work, and visit Cape Cod have input and are informed about the improvements planned, and use them.

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LIST OF ACRONYMS AND ABBREVIATIONS

3C	Continuing, Comprehensive, and Cooperative (3C) planning process
ADA	Americans with Disabilities Act
APTS	Advanced Public Transportation Systems
AVL	Automated Vehicle Locator
ATS	Alternative Transportation Systems
CAA	Clean Air Act
CACO	Cape Cod National Seashore
CCRTA	Cape Cod Regional Transit Authority
CCTTF	Cape Cod Transit Task Force
CCTTP	Cape Cod Transit Tourist Pass
CMAQ	Congestion Mitigation and Air Quality
EA	Environmental Assessments
EIS	Environmental Impact Statement
EOTC	Massachusetts Executive Office of Transportation and Construction
FEMA	Federal Emergency Management Administration
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GMP	General Management Plan
IVR	Interactive Voice Response
MBTA	Massachusetts Bay Transportation Authority
MHD	Massachusetts Highway Department
IC	Internal Combustion
LCP	Local Comprehensive Plan
LRTR	Long Range Transportation Plan
MEMA	Massachusetts Emergency Management Administration
MOU	Memorandum of Understanding
MPL	Municipal Parking Lot
NEED	National Environmental Education Development Collaborative
NEPA	National Environmental Policy Act
NFTA	Niagara Frontier Transportation Authority
NOAA	National Oceanographic and Atmospheric Administration
NPS	National Park Service
O&M	Operations and Maintenance
P&B	Plymouth and Brockton Street Railway Co.
PCB	Professional Capacity Development
PMA	Provincetown Municipal Airport
PMS	Parking Management System
PTB	Public Transport Bermuda

LIST OF ACRONYMS AND ABBREVIATIONS (cont'd)

RFI	Request for Ideas
RTOC	Regional Transportation Operations Center
RTP	Regional Transportation Plan
RTIC	Regional Traveler Information Center
TAG	Transportation Assistance Group
TEA-21	Transportation Equity Act of the 21st Century
TIP	Transportation Improvement Plan
TMA	Transportation Management Association
USDOT	United States Department of Transportation
VMS	Variable Message Sign
VTA	Martha's Vineyard Regional Transit Authority

The Great Beach is…probably the best place of all our coast to go to…I do not know where there is another beach in the Atlantic states, attached to the mainland, so long, and at the same time so completely uninterrupted.

-- Henry David Thoreau

1 INTRODUCTION

The U.S. Department of Transportation's Volpe National Transportation Systems Center (Volpe Center) collaborated with the National Park Service (NPS) to develop this Long-Range 25-Year plan for Alternative Transportation Systems (ATS) to, from, and within the NPS Cape Cod National Seashore (CACO). The Volpe Center developed this Long-Range plan in concert with the towns of Provincetown, Truro, Wellfleet, Eastham, Orleans and Brewster, the Cape Cod Commission (Commission), the Cape Cod Regional Transit Authority (CCRTA), and other statewide, regional, and local organizations. This planning effort builds on current plans and proposals, and also focuses on needed partnering opportunities, and operational and capital improvements. There are three work products that have NPS funding participation. One is the Volpe Center developed Cape Cod Transit Task Force Five-Year Public Transportation Plan, which was finalized in June 2002. Second is this CACO specific Long-Range ATS plan. Third is NPS involvement and partial funding for a Regional Long-Range 25-Year Transportation Plan for Cape Cod. The NPS ATS program earmarked $25,000 in funding for assistance in development of the Cape Cod Transit Task Force Five-Year Public Transportation Plan, has provided funding for this CACO specific Long-Range Plan, and has also set aside $100,000 for regional Cape Cod planning (provided it is matched by local sources).

THE CAPE COD REGION

Cape Cod, Massachusetts possesses myriad natural, coastal, historical, cultural, and other values that identify it as a unique place to live, work, visit, and

recreate. The popularity of this area continues to grow, and this growth has brought with it quality of life problems normally associated with rapid growth. These include trash and water quality problems, congestion of a once-rural area, damage to irreplaceable environmental resources, and housing shortages. Thoughtful and thorough planning can protect Cape Cod while allowing residents, visitors, and businesses to continue to enjoy this unique place.

NEED FOR PLANNING FOR THE CAPE COD NATIONAL SEASHORE

The Cape Cod National Seashore is one of the U.S. East Coast's most pristine shoreline resources. CACO includes 40 miles of unspoiled shoreline and numerous other natural resources. It is the largest glacial peninsula in the world, and the Great Beach, on the Atlantic side of Cape Cod, is the longest expanse of uninterrupted sand shoreline on the East Coast. It is prime nesting habitat of the federally threatened piping plover and other sensitive species and contains numerous state-listed threatened plant species, including the broom crowberry. An Act of Congress (Public Law 87-126) established CACO on August 7, 1961, specifying preservation as the primary goal.

"In order that the Seashore shall be permanently preserved in its present state, no development or plan for the convenience of visitors shall be undertaken which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing or with the preservation of such historic sites and structures."
-Public Law 87-126, Section 7 (b) (1)

Of the five million annual visitors to CACO facilities today, one-half arrive during a ten-week period in the summer months of June-August. The CACO sites are widely dispersed throughout Cape Cod and visitors frequently "site hop" from

one beach to another, multiplying the impact per vehicle on CACO resources. The majority of visitors use a private vehicle to access CACO beaches.

CACO's Natural Resource Inventory and Monitoring Program regularly collects information on the condition of natural resources to determine if the park is succeeding in one of its primary purposes: protecting its plant and animal life and the ecosystems that support them. This budding program has provided CACO with valuable insight into the environmental damage done by the onslaught of summer traffic as visitors flock to Cape Cod's beaches and wildlife areas.

The type and duration of tourist visits has also changed. In the past, visits often lasted as long as a month while the typical visit today, according to the Cape Cod Chamber of Commerce, is usually a two to three day weekend. Short-stay visitors are less willing to venture far from their personal vehicles, which serve as a sort of "home base" for recreational activities. This trend has resulted in a demand for more parking facilities that are located in, or very close to, the recreation and habitat areas visited. This close proximity of nature and automobile is increasing pressure on the fragile ecosystems that define Cape Cod, and make up the bulk of the National Seashore. Adding to the physical damage caused, excessive noise pollution from personal vehicles is proving to be an escalating problem in sensitive areas, as well.

Due to Cape Cod's geography and regulations ensuring that the historic character of a significant portion of its existing roads is maintained, it is difficult to establish new rights of way or expand existing rights of way to improve traffic flows. Also, as Cape Cod has attracted more permanent residents, travel demands have continually changed as residents' needs and preferences have evolved. CACO sites that were formerly visited only in the summer now host year-round residents. Many residents have learned how to best visit CACO areas during the "off-season" to avoid the crush of summer visitors. This demographic change threatens to completely overwhelm Cape Cod's limited existing public transportation system, necessitating the formulation of an Alternative Transportation System plan.

Compatibility with the General Management Plan

Following two years of public comment, the 1999 CACO General Management Plan (GMP) lays out the framework for park mission goals and how they are to be achieved. The GMP establishes long-range strategies for resource management, visitor use, and the development of an integrated park

system. A GMP vision is for visitors and residents alike to be able to look forward to improved travel conditions on Outer Cape Cod. It recognizes the current and future loss of wildlife habitat and vegetation posed by the ever-increasing number of private automobiles used by park visitors to access CACO facilities, and commits the NPS to find alternative transportation solutions to this burgeoning problem. There is a mandate for improved transportation systems, so visitors and residents can move around more easily and conveniently.

The siting of new, enlarged or renovated parking areas is becoming increasingly difficult, as a balance is sought that minimizes impacts on not only the beaches and natural habitats, but also on the many fresh-water kettle ponds that provide a remarkable recreational resources for Outer Cape Cod residents and visitors. Development and implementation of a regional Alternative Transportation System (ATS) may represent the only viable solution to the growing transportation problems on Cape Cod.

As stated in the 1999 CACO General Management Plan:

The Park Service can help reduce traffic congestion, facilitate circulation, enhance safety, and improve air quality through regional cooperation efforts to solve problems and promote alternative transportation modes, including innovative solutions within the national seashore.

There are three main goals regarding public use access and transportation:

GMP Goal: Provide opportunities for the public to have access to a variety of accurate and up-to-date trip planning and orientation information about the national seashore and Cape Cod before leaving home.

GMP Goal: Adopt the intermodal transportation goals of the Cape Cod Commission's *Long Range Transportation Plan* and provide support for them.

GMP Goal: Provide access to public areas that is environmentally sensitive, safe, and consistent with the desired experience and the intermodal planning initiatives; ensure that the transportation system does not detract from the Cape Cod character.

Demographics, Land Use and Transportation Interface

The year round population of Cape Cod (Barnstable County) was reported as 222,230 in the 2000 Census. This is an increase of 19.1 percent over ten years. Cape Cod's population growth is significantly greater than the 2.6 percent statewide population growth during the same period. Cape Cod's year round population is expected to increase to 273,000 in 2010.

Cape Cod has an aging population. According to the 2000 Census, 26 percent of Cape residents are 65 or older, compared to a statewide figure of 14 percent. Eleven of the twenty Massachusetts communities with the highest median age are on Cape Cod, with Orleans, at a median age of 55.5, being the oldest community in Massachusetts. The expectation is that Cape Cod will continue to experience a large influx of senior citizens (particularly as the first of wave of baby boomers begin to retire). Other trends include:

- Average annual traffic levels on the Sagamore and Bourne Bridges, the only roadways that connect Cape Cod to the rest of Massachusetts, now exceed summer peak traffic levels experienced 15 years ago,
- Growing traffic congestion on Route 6,
- Park Service parking lots are often at full capacity during the tourist season, and
- Need to expand and improve emergency management operations during emergency situations.

Demographic change has coincided with the loss of open space in every one of the fifteen towns that comprise Barnstable County. Much of Cape Cod's open space has been sub-divided and developed for new permanent and seasonal homes. Summer cottages, always popular as getaways for Cape visitors, have increased in number and size. People who for years regularly spent summer vacations in cottages and seasonal homes are now upgrading and enlarging their properties with an eye toward retirement. The following Figures 1.1-1.3 show the dramatic change in land use over the past 30 years. In 1971 (Figure 1.1) much of Cape Cod was undeveloped, in 1999 (Figure 1.2) much of this previously undeveloped land had been developed, primarily for residential uses, and under current zoning at full build-out (Figure 1.3) much of the remaining undeveloped land will be developed.

region will be so severe in 2025 that potential visitors to CACO will be forced to spend long periods on slow moving roads to reach CACO facilities.

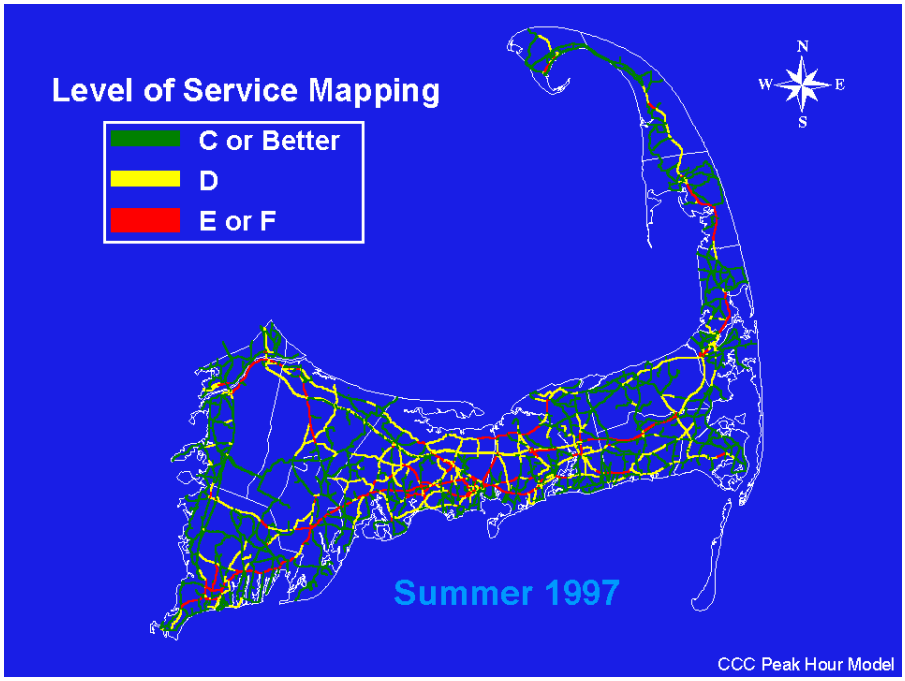


Figure 1.4
Level of Service on Cape Cod Roads, Summer 1997

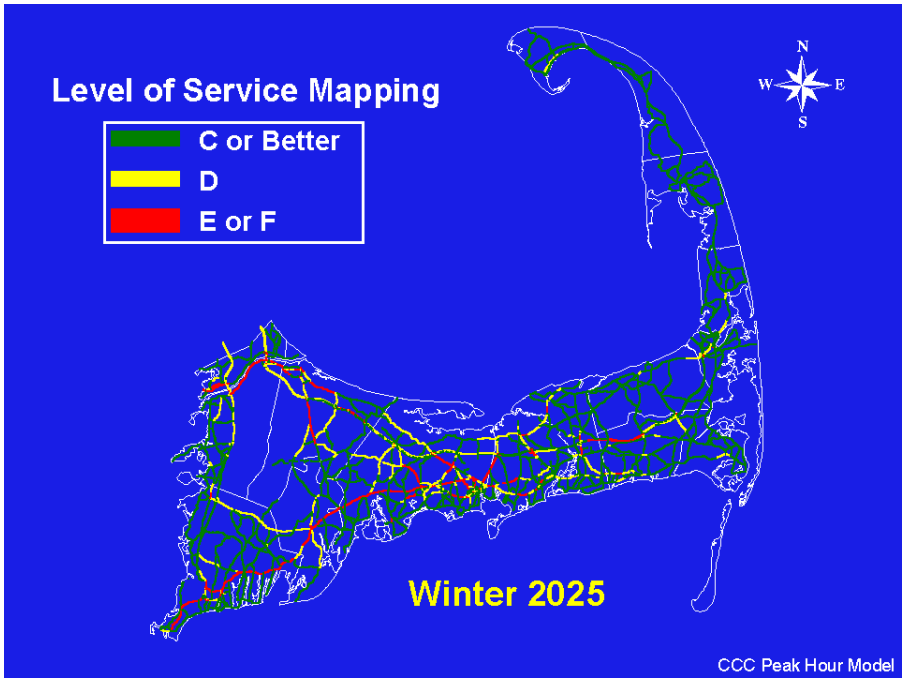


Figure 1.5
Projected Level of Service on Cape Cod Roads, Winter 2025

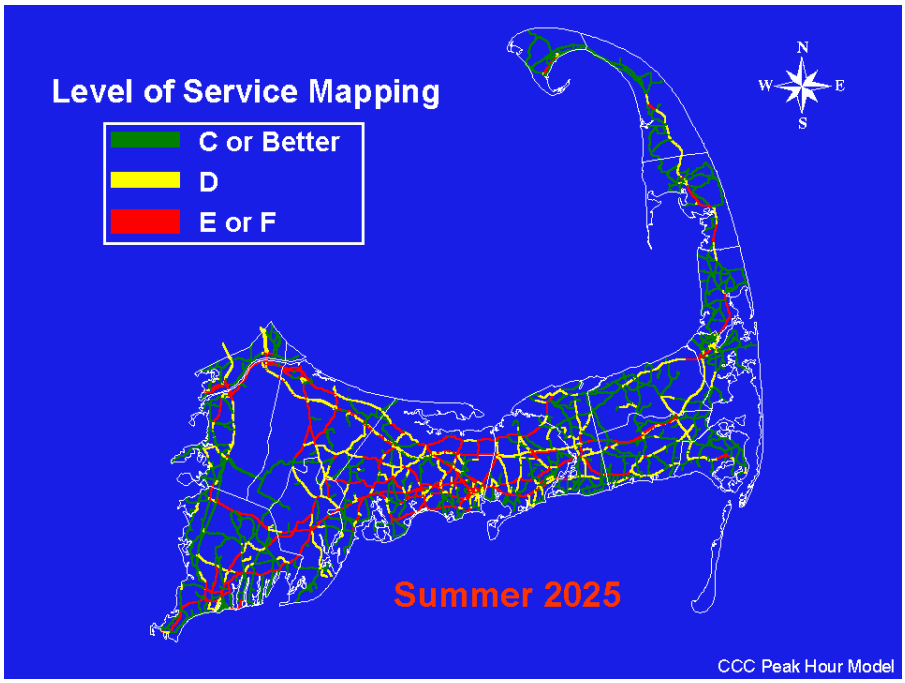


Figure 1.6.
Projected Level of Service on Cape Cod Roads, Summer 2025

The consequence of these demographic and land use changes has affected what residents' prefer for transportation services. Moving forward to meet these expressed needs is somewhat difficult due to the geography and the historic landmark status of a significant portion of Cape Cod roads. Thus, Cape Cod's recent demographic and land development trends threaten to completely overwhelm the limited existing public transportation system, necessitating the formulation of a regional transportation plan.

With continued population growth and interest nationwide in Cape Cod as a tourist destination, residents are becoming increasingly concerned with controlling growth, protecting the environment, and implementing alternative transportation solutions. In scientifically designed opinion polls, Cape Cod residents said overwhelmingly in 1991 and again in 1995 that they want the Commission to:

- Protect groundwater;
- Encourage only clean, light industries, cultural facilities and neighborhood businesses; and
- Restrict development that they feel harms the character of Cape Cod. (A majority of respondents opposed new, large hotels, malls, and factory outlets.)

PARTNERSHIPS

The establishment of the Cape Cod National Seashore in 1961 was considered at the time an experiment. CACO was not just another National Park carved out of publicly owned wilderness or donated lands. Rather, it was an attempt to conserve a fragile and precious resource that overlays six established communities so that residents and visitors alike might enjoy it for generations to come. Planning for the development of CACO was the result of significant partnerships with the National Park Service, the towns of Provincetown, Truro, Wellfleet, Eastham and Orleans, the Commonwealth of Massachusetts, a then newly formed Cape Cod National Seashore Advisory Commission, and residents, organizations, and businesses in and around Cape Cod.

The concept adopted at CACO provides for a natural/cultural park that has both the elements of a rural setting, yet is close to densely populated areas, with a unique partnership between Federal, State, and local governments and the private sector. These partnerships have been fundamental to achieving CACO's mission, and have allowed CACO to focus on protecting and preserving fragile natural and cultural resources, carefully managing sensitive resources, providing facilities and services to the public, and offering interpretive and educational programs.

Partnerships have been critical to the redistribution of responsibilities through a process of mutual agreement to engage in cooperative stewardship, such as relying on towns to review private development proposals within the National Seashore, rather than both town(s) and CACO conducting reviews. CACO managers have taken a greater role in providing assistance and technical expertise to towns and neighbors in fields like resource management. CACO provides outreach programs for local schools, groups, and civic organizations. CACO is an active partner in Cape Cod Pathways, a county program that seeks to

improve walking opportunities on Cape Cod. The Provincetown airport is on federal lands, and CACO is participating in a long-term master plan and environmental analysis for the airport.

Since its inception, CACO has effectively worked with other government's, is familiar with the State and local transportation process, and is a key partner in advocating projects involving multiple sources of funds. This proposed alternative transportation plan builds on these partnerships and establishes new partnerships.

Cape Cod Commission

The Cape Cod Commission (its predecessor was the Cape Cod Planning and Economic Development Commission) was created in 1990 by an Act of the Massachusetts State Legislature, and confirmed by a majority of Barnstable County voters. In the wake of an unprecedented growth boom in the 1980s, the Cape Cod Commission Act found that the region known as Cape Cod (which includes all fifteen towns that comprise Barnstable County) is threatened by uncoordinated or inappropriate uses of the region's land and other resources.

The Commission was established as a regional planning and regulatory agency to prepare and implement a regional land use policy plan for all of Cape Cod, to review and regulate Developments of Regional Impact, and to recommend designation of certain areas as Districts of Critical Planning Concern. The Commission is made up of 19 members that include representatives of each of Barnstable County's 15 towns; representatives of the County Commissioners, minorities, including Native Americans; and, a gubernatorial appointee. It is a department of Barnstable County, and is funded by the Cape Cod Environmental Protection Fund. The Commission's work is divided into three major areas: planning; technical assistance; and regulation.

CACO works very closely with the Commission and is actively involved with proposals and concepts to solve problems and promote alternative transportation modes.

Cape Cod Transit Summits

Momentum to encourage a public discussion of public transportation on Cape Cod originated with an article in the Cape Cod Times in the spring of 1999. The article addressed a lack of coordination among transportation providers, few viable summer transportation alternatives, uncoordinated human service transportation, a perception of less than effective transit providers, and little regional thinking and vision. A key recommendation was to convene a Transportation conference of leading decision makers and stakeholders with an

interest in better public transportation. The result was the Cape Cod Transit Summit I, which was held February 14, 2000 in Hyannis, MA. Underwritten by the Cape Cod Regional Transit Authority (CCRTA) with assistance from the Cape Cod Chamber of Commerce (Chamber), the purpose was to develop a community consensus on the future of public transportation on Cape Cod. More than 100 people attended, including US Congressman William Delahunt, Massachusetts State Transportation Secretary Kevin Sullivan, CCRTA Advisory Board Members, stakeholders, and the public.

Various views were expressed regarding public transportation needs and priorities for Cape Cod. There was consensus that improved public transportation services were needed both to mitigate seasonal traffic congestion and to meet the mobility needs of the year-round transit-dependent population. However, there was wide ranging opinion on the characteristics and qualities of an ideal public transportation system for Cape Cod.

It was noted that additional financial resources to expand public transportation in the region should be explored with the help of federal and state leaders, and town officials. It was felt that the process begun at the first summit should continue, and a task force, an experienced transportation consultant, and/or a full-time transportation planner were needed to move closer to attaining the public transportation goals. Setting the backdrop for this study, a common theme expressed at the first summit was the need to work together to develop a regional action plan supported with technical assistance and public involvement.

A Cape Cod Transit Summit II was held on March 12, 2001 in Hyannis. The Volpe Center was instructed by the Task Force in October 2000 to produce "implementable" action items that would be presented at the March 2001 Transit Summit II for implementation during the 2001 summer season, in addition to producing this Five-Year Public Transportation Plan. The Volpe Center presented the following recommendations at Transit Summit II:

- Implement schedule coordination of all public transportation modes;
- Introduce Relax and Ride – a motor coach from the Rt. 128 commuter rail parking lot to Woods Hole with a one-price ticket for bus, steamship, and the Martha's Vineyard Transit Authority (VTA);
- Develop a targeted marketing campaign to increase awareness of CCRTA routes and services;
- Introduce Sunday CCRTA service on the SeaLine, Hyannis to Orleans, and Villager fixed routes, in part to facilitate 'car-free' Cape weekends, and reduce congestion levels;

- Discontinue the Falmouth-Mashpee Trolley, the Hyannis Area Trolleys, the Hyannis Park & Ride Shuttle, and the Dennis Trolley due to low ridership and high costs;
- Shift the early morning CCRTA Hyannis to Orleans bus to trip to a late afternoon trip;
- Add three daily round trips to the CCRTA SeaLine schedule, and
- Add two summer evening bus round trips from Hyannis to the Dennisport shopping area (via Patriot Square) along the Hyannis to Orleans route to substitute for the elimination of the evening Dennis Trolley services.

Accomplishments since Transit Summit II include:

- Several schedule coordination meetings were held between transportation service providers, and they have agreed to a yearly schedule coordination summit before schedules are printed;
- The Relax and Ride service was initiated for 10 weekends commencing on July 4th weekend and ending Labor Day weekend in both 2001 and 2002 using Massachusetts Congestion Mitigation and Air Quality (CMAQ) funds, and
- The under-performing trolley services were cancelled, and the operating funds from these services were used to fund the recommended route proposals and Sunday Service. These actions were approved and implemented by the CCRTA Advisory Board. This led to a summer 2001 CCRTA ridership increase of 25 percent over the same period in 2000. Ridership on the Hyannis to Orleans route was up 111 percent, the Provincetown/Truro Shuttle was up 48 percent, and the SeaLine bus route was up 26 percent. This dramatic increase in ridership is directly related to the Volpe Center early implementation recommendations, and other innovative measures undertaken by the CCRTA staff, including an extensive marketing campaign throughout the summer[2].

On April 27, 2001, an Outer Cape Summit was held at the Council on Aging in Orleans, MA. Representatives of the towns encompassing CACO were told of on-going transportation-related efforts and offered suggestions on what could work best on the Outer Cape. Participants were unanimous in their believe that a local transportation system on the Outer Cape was desirable and feasible. With a rapidly aging population, low-income residents and traffic congestion, it was suggested that local transit service with dependable headways and comfortable

[2] RTA staff in conjunction with Chip Bishop Communications and Management coordinated the summer 2001 marketing efforts.

vehicles were the logical next step for improving the quality of life of residents and visitors on the Outer Cape.

A Transit Summit III was held on February 28, 2002 in Hyannis. This Summit was different from past summits because it consisted of working groups and breakout sessions designed to educate local officials and residents of transportation enhancements and opportunities. CACO Superintendent Maria Burks chaired a session on the Alternative Transportation Program. (The agenda for this Summit is contained in Appendix A). As at the Outer Cape Summit, residents and local officials reiterated a need for local transit on the Outer Cape, and the need for Intelligent Transportation Systems for all of Cape Cod.

Cape Cod Transit Task Force

The Cape Cod Transit Task Force (CCTTF) was formed to respond to suggestions made during the first Cape Cod Transit Summit. Then Massachusetts Secretary of Transportation and Construction Kevin J. Sullivan appointed members to the CCTTF in October 2000.

The CCTTF is the primary advisory committee for the Five-Year Cape Cod Transportation Plan that was finalized in June 2002. The Task Force is made up of stakeholders representing Federal, State, and local officials, social service providers, as well as transportation providers for the Cape Cod region. Members include representatives from:

- Representative of US Congressman William Delahunt's office;
- Massachusetts Executive Office of Transportation and Construction;
- The Cape Cod Commission;
- The Cape Cod Chamber of Commerce;
- Cape Cod Central Railroad;
- Southeastern Massachusetts Private Motor Carriers Association;
- Barnstable Assembly of Delegates;
- Lower Cape Health and Services Coalition;
- Barnstable County Human Services;
- Woods Hole and Martha's Vineyard Steamship Authority;

- Cape Cod Regional Transit Authority;
- A Transit Dependent Consumer; and
- The Cape Cod National Seashore.

The CCTTF recommended specific ways to improve mobility of Cape Cod's year-round residents and visitors between now and 2007 in the Cape Cod Transit Task Force Five-Year Public Transportation Plan. The CCTTF recommended establishing a forum, called the Cape Cod Passenger Transportation Coordinating Council, to ensure cooperation and coordination of transportation planning and development activities on Cape Cod.

2 NATIONAL PARK SERVICE MISSION

The National Park Service preserves, unimpaired, the natural and cultural resources and values of the National Park system for the enjoyment, education, and inspiration of this and future generations. The service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throu

The National Park Service (NPS) is subject to a number of legal requirements for planning, and is intended to support the best possible decision-making for the agency and the public it serves. A good planning process requires participation by a wide variety of stakeholders who will be affected by planning decisions. This brings a broad range of views into the planning process and builds consensus for the decisions made in the process. The planning process also ensures that decision-makers have adequate information about benefits, environmental impacts, and costs.

TRANSPORTATION MISSION AND ALTERNATIVE TRANSPORTATION SYSTEMS

The implementation of the proposed Alternative Transportation Systems is consistent with the National Park Service's mission of preserving and protecting the country's natural, historical, and recreational resources for future generations. It recognizes the strategic importance of providing access, ensuring a safe and enjoyable park experience, and working closely with 'gateway communities' to coordinate transportation services.

NPS Transportation Mission: Preserve and protect resources while providing safe and enjoyable access within the National Parks by using sustainable, appropriate, integrated transportation solutions.

The NPS has been committed to providing, as well as sustaining, a range of transportation services, recognizing that the provision of these services creates opportunities for the public to visit National Park sites and experience natural and historical wonders.

EVOLUTION OF THE ALTERNATIVE TRANSPORTATION SYSTEMS PROGRAM

Almost 280 million people visited US national parks in 2001. Many parks experience traffic congestion, particularly during the summer months and on holiday weekends. This detracts from visitors enjoyment of the parks and damages natural resources. To alleviate these conditions, some parks offer visitors alternatives to driving their own vehicles, such as shuttle buses and trams. Congress encouraged the use of such alternatives through enactment of the Transportation Equity Act of the 21st Century (TEA-21) in 1998. The legislation provided federal land management agencies, including the NPS, with increased responsibilities for managing transportation activities. Funding for meeting these responsibilities has been provided through the US Department of Transportation, which annually funds the NPS to initiate or expand alternative transportation systems where appropriate. To administer these funds, the NPS established the Alternative Transportation Program (ATS) in 1998. Program objectives include relieving traffic and parking congestion; reducing air, noise, and visual pollution; enhancing visitor experience; preserving natural and cultural resources; and improving safety conditions.

Section 3039 of TEA-21 required "a comprehensive study of alternatives transportation needs in national parks and related lands." The *Federal Lands Alternative Transportation Systems (ATS) Study – Congressional Report,*[3] was completed in August 2001. The report included a summary of alternative transportation system needs and estimated costs between 2001 and 2020. The project team reviewed 169 park units and found that 118 of them had ATS needs. The study identified a backlog of needed improvements to 57 existing Alternative Transportation Systems. In addition, the study showed that new or expanded Alternative Transportation Systems are needed at 105 park units. Figure 2.1 shows the breakdown of the existing backlog of ATS projects by project type.

The NPS Technical Advisory Group (TAG) conducted a site visit to CACO on November 30, 2000, to help ensure that FY-2001 Alternative Transportation Program projects proposed by CACO are well conceived and ready for initiation. After a number of recommendations, the TAG recommended funding in mid-2001 that resulted in this study.

[3] Authorized by Section 3039 of TEA-21 (Transportation Equity Act for the 21st Century). Completed in August, 2001, and delivered to the Congress in January 2002.

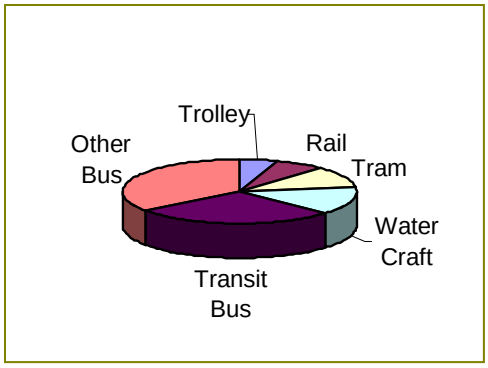


Figure 2.1.
Existing Backlog of ATS Projects by Type

ATS and Gateway Communities

The National Park Service's transportation network includes roads, parkways, and Alternative Transportation Systems. Congress requires the NPS to plan and implement ATS in cooperation with state and local agencies. A major focus has been coordinating with communities, called Gateway Communities, closest to Park Service sites. CACO is unique because it does not have one entrance or 'main-gate.' The communities from Bourne along Route 6 to Provincetown represent the Gateway Communities for CACO.

ATS systems, which frequently include high occupancy vehicles, allow the NPS to meet high levels of visitor demand, enhance mobility within the Parks, and reduce environmental impacts. They can also contribute to the historic fabric of a park, enhance the visitor experience, and promote economic development. The "Red Bus" on the "Going to the Sun Road" at Glacier National Park is an example of a system that provides historic context, adds to the overall visitor experience, and attracts visitors.

Glacier National Park Red Bus

Through innovative and cooperative partnerships with Gateway Communities, the NPS has been able to leverage federal moneys for demonstration projects at Acadia, Grand Canyon, and Zion National Parks and the Golden Gate National Recreation Area by more than five to one.

- Acadia National Park along with local towns and businesses and the Maine Department of Transportation (using Congestion Mitigation and Air Quality funds) initiated a free shuttle serving the Park and local communities, called the Island Explorer. The service is credited with reducing 1.3 million of vehicle miles traveled and measurable amounts of air pollutants.
- Zion National Park and the local gateway community jointly sponsored a shuttle bus system that has reduced pollution, helped the local economy, and provided visitors with enjoyable experiences.

Zion National Park Shuttle Bus

3 TRANSPORTATION PLANNING ON CAPE COD

The National Park Service, the Cape Cod Commission, the CCRTA, Barnstable County, and Cape Cod towns have all either developed, or are developing, plans to address short and long term growth issues on Cape Cod. Transportation is a major factor in all of these plans, and transportation goals, objectives, and in some cases recommendations have been drafted and approved. The recommendations in this plan are designed to address these goals and objectives.

Planning efforts have been cooperative, involving a broad array of stakeholders. The CCTTF provided a catalyst for systematic cooperative transportation planning on Cape Cod, but this effort is itself a continuation of partnerships that have been established over the past several decades. The recommendations in the plan are designed to address goals and objectives included in plans developed by the NPS, the CCRTA, the Commission, the CCTTF, and Outer Cape communities.

NATIONAL PARK SERVICE

The primary document that guides all planning activities is the General Management Plan (GMP) for the Cape Cod National Seashore. The GMP is described earlier in this plan. The GMP identifies three main goals regarding public use access and transportation:

- Provide opportunities for the public to have access to a variety of accurate and up-to-date trip planning and orientation information about CACO and Cape Cod before leaving home.
- Provide access to public areas that is environmentally sensitive, safe, and consistent with the desired experience and the intermodal planning initiatives; ensure that the transportation system does not detract from the Cape Cod character.
- Adopt the intermodal transportation goals of the Cape Cod Commission's Long Range Transportation Plan and provide support for them.

This long-range plan addresses these goals by developing an ATS that will provide visitors and residents with a safe, economical, convenient, and reliable alternative to the private vehicle. Formulating and evaluating the impact of alternatives will do this. One of the possible alternatives is the deployment of a new Outer Cape-wide transit service that includes CACO sites.

This Long-Range ATS planning effort for CACO focuses on:

- Identifying Transportation System problems for the Outer Cape, and
- Proposing solutions that will ultimately make the traveling experience to the National Seashore more efficient, effective, equitable, and enjoyable.

SHORT AND LONG RANGE PLANS

The stakeholders consisting of the CCTTF have pursued a two-phase regional planning program. Phase one calls for the development of a five-year plan, which was completed in June 2002, and the second phase calls for a long-range plan with a 25-year horizon. Since any meaningful regional transportation plan for Cape Cod must include the National Seashore, CACO committed approximately $25,000 of a $210,000 effort from its FY00 ATS funds to pay for relevant portions of the Five-Year Plan. The CCRTA, the Commission, private sector entities consisting of Cape Air and the Cape Cod Chamber of Commerce, and several other stakeholders provided the remainder of the funding. Table 3.1 lists each of the participants in the 5-year planning effort and the level of funding that they contributed.

Table 3.1.
Cape Cod Transit Task Force 5-Year Plan Funding

Task Force Member	Dollar Contribution
CCRTA	$50,000
Massachusetts Aeronautics Commission	$20,000
CACO National Seashore	$25,000
Steamship Authority	$30,000
Cape Cod Chamber of Commerce	$ 5,000
Cape Air	$ 5,000
Barnstable County	$50,000
Massachusetts Executive Office of Transportation and Construction (EOTC)	$25,000
TOTAL:	210,000

Note: In addition, the Cape Cod Commission has provided $60,000 of staff time, and EOTC is funding a parallel $25,000 effort to study rail options to Buzzards Bay and $150,000 to study ferry services throughout Massachusetts Bay.

As the transportation planning process for Cape Cod progresses, CACO is proposing that its long-range planning efforts be split into two projects:

- Develop/produce a long-range 25-year plan for specific Alternative Transportation System projects for the CACO National Seashore.
- Fund and provide technical assistance for a regional long-range 25-year planning effort for the entire Cape region. The NPS has pledged a $100,000 match for this long-range planning effort.

In doing so, an opportunity is created for CACO and other Cape Cod agencies, organizations and public groups concerned with transportation services to form an effective partnership. By funding an important part of the overall planning process, CACO then becomes a full-fledged participant in the Cape Cod regional planning process and ensures that any proposed solutions will satisfactorily address what they have defined as park-related transportation problems. Interest already exists by Cape Cod towns through Massachusetts Executive Order 418 planning funding (in addition to the CACO matching share) to contribute funds to the long-range regional planning effort. Simultaneously, efforts are underway to identify and secure additional funding from other government agencies, and private sector sources.

Cape Cod Transit Task Force Goals, Objectives and Vision

Building on recommendations from the GMP and Transit Summit I, the CCTTF established the following goals and objectives to guide its efforts:

Goal 1. Reduce auto dependency

- Identify existing public transportation services and determine un-met needs of year-round and seasonal residents,
- Recommend new or improved public transportation services, and
- Recommend strategies for restricting auto or Single Occupancy Vehicle use in certain, or all, areas of Cape Cod.

Goal 2. Mitigate seasonal traffic

- Consider demand management strategies, in conjunction with Cape Cod National Seashore strategies and Steamship Authority strategies, and
- Coordinate on-Cape and Cape/mainland public transportation services.

Goal 3. Meet the needs of the year-round population

- Determine origin and destination needs for the transit dependent, and

- Create an appropriate and coordinated mix of public and private transportation services.

Goal 4. Develop coordination, communication, and cooperation

- Develop a continuing forum for regional public transportation problem identification and solutions, and
- Establish cooperative marketing of public transportation services.

Goal 5. Incorporate smart growth and land use planning

- Identify critical growth and development patterns, and
- Develop public transportation services that address growth. Translating broad statements of goals and objectives into specific policies, investments, and services is a challenging process.

The formation of the CCTTF created a mechanism for implementing public transportation solutions that contribute to the preservation of natural, coastal, historical, and cultural resources, and help balance continued growth with economic, human service, and mobility objectives. The Five-Year plan is driven by the vision of a comprehensive, accessible, and integrated public transportation system that builds on the existing infrastructure to serve the

Five-Year Vision:
A comprehensive, accessible, and integrated public transportation system that builds on the existing infrastructure to serve the varied needs of Cape Cod's diverse population.

varied needs of Cape Cod's diverse population. By the end of 2007, this vision should become a reality. In support of this effort, the CCTTF has been developing communication tools for informing the public and stakeholder groups of its mission, and soliciting feedback on possible ways to improve transportation services.

Cape Cod Regional Policy Plan

The 2001 Cape Cod Regional Policy Plan (RPP) was approved effective April 29, 2002. The purpose of the Cape Cod RPP is to outline a coherent set of planning policies and objectives to guide development on Cape Cod and to protect its resources. It is both a planning and regulatory document and serves several purposes simultaneously. It establishes review and regulatory policies that the Commission will apply to Developments of Regional Impact. As such, it provides direction for developers and the general public as to the standards that the

Commission will require of development and redevelopment that falls within its jurisdiction. It also provides the framework for town Local Comprehensive Planning (LCP) efforts, and is used as a basis for the Commission's review of the town LCP for consistency with County policies. Transportation is a key element of the RPP and the following are its transportation Goals and Policies:

- To maintain an acceptable level of safety on all roads on Cape Cod for all users,
- To reduce and/or offset the expected increase in motor vehicle trips on public roadways and to reduce dependency on automobiles, and
- To maintain travel times and Level of Service on regional roads and intersections and to ensure that all road and intersection construction or modification is consistent with community character, historic, or scenic resources.

The 2001 RPP strives to strike a careful balance by addressing the need for sensible road improvements, encouraging alternate modes of transportation and promoting land preservation. The RPP recognizes the impacts that a geographically dispersed pattern of growth can have on the provision of transit. This is a key to ensuring that low-income and elderly individuals, who may not be able to drive, have access to crucial public and private services. As will be recommended later in this document, the provision of local and regional transit service for the Outer Cape is a key recommendation in this plan. Moreover, the provision of transit is specifically addressed in each Outer Cape town LCP.

Proposed Regional Transportation Plan Mission Statement and Goals

The Long Range Regional Transportation Plan (RTP) for Cape Cod is designed to recommend a multimodal and roadway transportation system appropriate for the Cape Cod region. The following proposed mission statement would guide development of this Plan:

The Regional Transportation Plan will propose a strategy that will establish and maintain a transportation system on Cape Cod for present and future year round and seasonal needs which is safe, convenient, accessible, cost-effective, and consistent with the Cape's historic, scenic and natural resources.

To achieve this mission, decision-makers on Cape Cod must implement solutions that are consistent with the character of Cape Cod and the Regional Policy Plan. These solutions will typically be non-invasive. With better management of "people-flow," and more efficient use of automobile capacity, the traditional endeavor of building our way out of congestion can be avoided. In recognition of

this, the following goals have been proposed for the RTP and projects proposed to support the plan will be evaluated with respect to these goals.

Goal 1. Make the maintenance of the system the primary goal.
"Preserve and maintain the existing transportation system, emphasizing safety and harmony with the environment".

The following concepts are proposed to support this goal:

- Ensure that adequate funds are reserved for the maintenance and operation of the existing transportation system before new capital projects are considered.
- Consider maintenance strategies rather than "improvement" approaches to scenic roadways.
- Support maintenance strategies and programs that accommodate safe travel throughout the transportation network, regardless of mode. This includes considerations that encourage bicyclists, motorists, transit riders, and pedestrians to share the transportation network safely.

Goal 2. Develop alternatives to the automobile.
"Reduce dependence on private automobiles by developing and integrating alternate modes (e.g., rail, bus, ferry, air, bicycle, and pedestrian) into the transportation system and promote substitutes for transportation."

The following concepts are proposed to support this goal:

- Promote an information-based consumer-oriented intelligent transportation system that encourages travelers to use the most environmentally sensitive and efficient means of travel.
- Promote cooperation among the various transportation agencies which have responsibility for Cape Cod's transportation system
- Support all forms of transportation demand management strategies for school and work trips, including, but not limited to, Transportation Management Associations, flexible hours, carpooling, bus pass programs, preferential parking and telecommuting.
- Develop and market incentives that encourage employers to join Transportation Management Associations.
- Encourage coordination between youth transportation, school bus service needs, and public transportation.

- Encourage the coordination and communication between human service transportation providers.
- Encourage the use of fixed-route transit service rather than paratransit, where possible.
- Coordinate public transportation services between regions and between providers.
- Support efficient connections among all transportation modes and facilities to improve these connections.
- Provide bicycle racks and/or lockers at park and ride lots, transit centers, and village and town centers.

Goal 3. Integrate Land Use and Transportation Planning.

"Coordinate land use and transportation decisions to preserve and enhance Cape Cod's character by considering the interrelationship between changes in land use and corresponding changes in transportation demand."

The following concepts are proposed to support this goal:

- Plan transportation improvements which are consistent with the needs and desires of residents and businesses of the region and which are closely coordinated with local districts such as the Old Kings Highway, the towns, and the Cape Cod Commission.
- Support higher density and affordable housing opportunities in defined concentrated development areas through the provision of public transportation.
- Support parking management principles that reduce transportation demand at employer sites and commercial areas without negatively impacting neighborhoods.
- Encourage transit-oriented development and provide alternatives to automobile travel by linking land–use decisions with transit, bikeway, pedestrian, and park-and-ride investments.
- Anticipate future mobility needs, taking into account the projected senior, youth and other potential transit-dependent use facilities. These include proposed or existing retirement communities, schools, and medical facilities.

Goal 4. Develop Transportation options that maintain Cape Cod's natural environment.

"Ensure the transportation system projects complement and enhance the natural environment of Cape Cod."

The following concepts are proposed to support this goal:

- Develop context-sensitive design measures that support the "Cape Cod Character".
- Emphasize sustainable transportation modes consistent with regional environmental policies.
- Ensure that transportation projects contribute to the protection of natural and scenic resources and open space.
- Encourage the development of designated recreational trails for pedestrians and bicycles.
- Avoid, minimize, or mitigate the impact of transportation improvements on parks, recreation areas, historic sites, environmentally sensitive areas, and other scenic and cultural resources.
- Include landscaping, pedestrian, and bicycle amenities in all transportation projects, where practical.
- Support established village and town centers with a broad range of transportation options.

Goal 5. Advance Environmental Justice.

"Promote the equitable sharing of the transportation system's benefits and burdens including consideration of income, gender, race, age, physical and mental ability, and transit dependency".

The following concepts are proposed to support this goal:

- Support self-sufficiency by providing specialized transportation services.
- Ensure that transportation projects do not subject any particular demographic groups, such as seniors, low-income individuals or children to inequitable environmental or financial impacts.
- Support programs that address the transportation needs of low income and transit dependent populations such as lifeline transit services.
- Identify and address structural and operational barriers to mobility.
- Ensure opportunities for all individuals, agencies, and communities to participate in transportation decision-making.
- Adopt measures of Environmental Justice for the region and incorporate them in the evaluation and programming of transportation projects.

OTHER PLANNING ACTIVITIES

CACO, the Commission, the CCRTA, and the CCTTF have taken leadership roles in Cape-wide transportation planning. The focus of this work has been building partnerships, improving transit services, identifying opportunities to better inform the traveling public, and identifying future transportation needs on Cape Cod. Planning activities directed at emergency response, human services, and needs of individual towns have also been completed, or are in the process of being completed.

Project Impact

Project Impact is a national initiative, funded by the Federal Emergency Management Agency (FEMA) that challenges the nation to undertake actions that protect families, businesses, and communities by reducing the effects of natural disasters. Cape Cod is at risk for serious weather events that have great potential to affect the economy and environment. There are things that the regional community of Cape Cod can do today that will help reduce likely future damage caused by inevitable weather events. The Cape Cod Commission has secured $300,000 in a combination of Federal and State Emergency funds for Pre-Disaster Mitigation. The Volpe Center team is working with Project Impact to coordinate the Intelligent Transportation Systems (ITS) component of this study with emergency response information dissemination.

Barnstable County Department of Human Services

The Cape Cod Household Transportation Survey conducted in late 2000 and early 2001 have helped to identify the transportation habits of Cape Codders. The Volpe Center was asked to prepare a survey instrument that was statistically defensible, and useful in obtaining information that could be used both for the County of Barnstable and for CACO short and long-term planning needs. Through this survey, researchers have collected considerable detail on who uses which modes of transportation on Cape Cod today. Information has been gathered on what the key destinations are relating to: employment, adult education/college, healthcare services, food/clothes shopping, and accessing social services offices. It shows when these transportation services are usually used and needed. In addition, survey respondents detailed the extent of usage of Cape Cod's existing public transportation services, such as transit buses and taxicabs. Results from this survey have helped guide the recommendations contained throughout this plan. Highlights of the survey are contained in Appendix B.

TOWN-BY-TOWN TRANSIT PLANNING

Most Cape Cod communities have identified transportation needs as part of their development of Local Comprehensive Plans. These plans identify needs on a local basis that will require regional solutions. The CCTTF found that the Outer Cape communities, defined as the communities on Route 6 from Brewster to Provincetown, had limited access to public transportation services and a growing need for these services. Each of these towns has completed or is completing Local Comprehensive Plans. CACO initiated a local planning committee consisting of local planning officials in January 2002.

Outer Cape Cod

Orleans

Orleans is located at the elbow of Cape Cod and is bordered by Eastham on the north, the Atlantic Ocean on the east, Chatham and Harwich on the south, and Brewster and Cape Cod Bay on the west. Orleans is about 22 miles from Hyannis; 88 miles southeast of Boston; 93 miles east of Providence, Rhode Island; and 270 miles from New York City.

- Total Area: 21.06 sq. miles
- Land Area: 14.14 sq. miles
- Population: 5,838
- Density: 413 per sq. mile.
- Orleans has the highest median age of 55.5 out of 351 cities and towns statewide. 2.7% of families live below the poverty level.
- Public transportation services available to Orleans residents include the Plymouth and Brockton Street Railway Co. regional bus service, the CCRTA Hyannis to Orleans fixed route bus, and the b-Bus service. There is also on-call private taxi service.

The 1999 Orleans Local Comprehensive Plan (LCP) states that the town should support public transportation services. The LCP states that while current demand for public transportation is moderate, demand could increase if accessibility and availability of various modes of transportation were more convenient. Goal 9.2 from the LCP states that Orleans should:

Establish and maintain a multi-modal transportation system for present and future year-round and seasonal needs. The system should be safe, convenient, accessible, economical and consistent with the Town's historic, scenic and natural resources, land use development and growth management policies.

Allow for less dependence on private automobiles by integrating a variety of transportation modes and by promoting alternatives which reduce travel.

As part of the Comprehensive Plan implementation program, article T-32 states that the Town Administrator should consider methods to foster a viable public transportation system, possibly targeting key needs groups such as the elderly.

Representatives from the Volpe Center, the Commission and CACO officials have had ongoing discussions about transportation improvements with town officials

and interested citizens since the commencement of this project. They formally met with the Town Administrator, Town Planner and other Town officials to solicit input and offer recommendations for local and express transit service for Orleans in July 2002.

Eastham

The Town of Eastham consists of Eastham and N. Eastham and is home to the CACO Visitors Center, and provides visitors with scenic landscapes, bike trails, picnic areas, nature trails and educational exhibits. Other points of interest include Nauset Light, the Eastham Windmill and Doane Homestead. It is located in Southeastern Massachusetts, on the forearm of Cape Cod, bordered by Wellfleet on the north, the Atlantic Ocean on the east, Orleans on the south, and Cape Cod Bay on the west. Eastham is about 25 miles east of Hyannis; 92 miles southeast of Boston; 96 miles east of Providence, Rhode Island; and 273 miles from New York City.

- Total Area: 27.26 sq. miles
- Land Area: 13.99 sq. miles
- Population: 4,462
- Density: 319 per sq. mile
- Median age of Eastham residents is 47.6 or 10th out of 351 cities and towns statewide. 4.5% of families live below the poverty level.
- Public transportation to and from Eastham is limited. The Plymouth and Brockton Street Railway Company regional bus service makes a regular stop at and across from the Town Hall on Route 6, and provides service from Hyannis and Boston to Provincetown and points in between. The CCRTA runs an on-call transportation service called the b-Bus. The Eastham Council on Aging provides a volunteer-run van service.

The 1996 Eastham Local Comprehensive Plan (LCP) provides the framework for local decision-making that will guide the town in protecting those small-town qualities that are cherished by those who live and work there. Goals 4.1.1 and 4.1.2 from the Comprehensive Plan state that Eastham should:

Foster transportation systems in Eastham for present and future year-round needs which are safe, convenient, accessible, economical and consistent with the Town's historic, scenic and natural resources. Developments of regional impact shall mitigate any traffic impacts that are created by such developments. The mitigation strategies shall include both structural and nonstructural improvements, with special

emphasis on alternatives to private automobile transportation; a contribution of funds town the necessary improvements shall be provided. Where development or redevelopment takes place, a permissible form of mitigation includes developing alternate modes of transportation so as to reduce dependence on private automobiles, including providing shuttle bus services.

Develop alternate modes of transportation so as to reduce dependence on private automobiles. Under this goal, the plan states that when development occurs, the developer make a contribution to the Cape Cod Regional Transit Authority or a private transit company approved by the Cape Cod Commission to provide public transportation.

The LCP recommends fast, reliable and frequent bus service between Eastham and other major destinations such as Hyannis, Cape Cod Community College, Boston, and the regional airports to benefit job seekers, residents and tourists. Shuttle bus service between the Outer Cape towns and the CACO beaches in Eastham and Wellfleet should be considered to relieve summer traffic congestion on Rt. 6. It recommends that the town should work with neighboring communities, the State, CACO and others to improve seasonal bus service in the Outer Cape, including increased shuttle service to CACO beaches from remote parking areas and town center locations. It further recommends that the town explore ways to expand regional transit service for Eastham. As part of the LCP, the Eastham Human Services Committee recommends that the need for transportation and housing services, which are priorities, which determine the quality of life for all citizens, must be addressed as soon as possible.

Representatives from the Volpe Center, the Commission and CACO officials have had ongoing discussions about transportation improvements with town officials and interested citizens since the commencement of this project. They formally met with the Town Administrator, a representative from the Council on Aging, Town Planner and other Town officials to solicit input and offer recommendations for local and express transit service for Eastham in June 2002. Several selectmen volunteered to form and participate in a Long-Range Planning Committee to help guide the recommendations in this plan and future plans.

Wellfleet

Wellfleet is located at the forearm of Cape Cod and is bordered by Truro on the north, the Atlantic Ocean on the east, Eastham on the south, and Cape Cod Bay on the west. Wellfleet is about 33 miles north of Hyannis; 101 miles southeast of Boston; 113 miles east of Providence, Rhode Island; and 280 miles from New York City.

- Total Area: 35.36 sq. miles
- Land Area: 19.84 sq. miles
- Population: 2,493 Density: 126 per sq. mile.
- Average median age is 47.0 or 13th out of 351 cities and towns statewide. 5.7% of families live below the poverty level.
- Regional commuter bus service in Wellfleet is provided by the Plymouth and Brockton Street Railway Company. In addition, the CCRTA operates an on-call service for residents called the b-Bus.

Because of the characteristics of the regional bus system, people in Wellfleet have been very dependent on automobiles. The Wellfleet 1995 Local Comprehensive Plan (LCP), called ***'Setting A Course For Our Future***, addresses public transportation needs. Specifically, *"In order to reduce this automobile dependency, the public transportation system needs to be improved and expanded to serve a variety of needs."* The options that should be considered include:

- Increased frequency of service in the off-season,
- Express services providing feeder services to a subregional (i.e. Orleans, Hyannis) for connections to other destinations on- and off- Cape, and
- A local 'trolley'-style bus for in-town travel, including feeder service to the regional route.

Also, the Cape Cod Commission in 1994 recommended the implementation of a summer bus shuttle service. Goals 4.1.1 and 4.1.2 from the LCP state that Wellfleet should:

Foster transportation systems in Wellfleet for present and future year-round needs which are safe, convenient, accessible, economical and consistent with the Town's historic, scenic and natural resources. Developments of regional impact shall mitigate any traffic impacts that are created by such developments. The mitigation strategies shall include both structural and nonstructural improvements, with special emphasis on alternatives to private automobile transportation; a contribution of funds town the necessary improvements shall be provided. Where development or redevelopment takes place, a permissible form of mitigation includes developing alternate modes of transportation so as to reduce dependence on private automobiles, including providing shuttle bus services.

Develop alternate modes of transportation so as to reduce dependence on private automobiles. Under this goal, the plan states that when

development occurs, the developer make a contribution to the Cape Cod Regional Transit Authority or a private transit company approved by the Cape Cod Commission to provide public transportation.

Representatives from the Volpe Center, the Commission and CACO officials have had ongoing discussions about transportation improvements with town officials and interested citizens since the commencement of this project. They formally met with the Board of Selectman in June 2002, and with the Town Administrator, Town Planner, a representative from the Council on Aging, and other Town officials to solicit input and offer recommendation for local and express transit service for Wellfleet in September and December 2002.

Truro

Truro is located at the "wrist" of outer Cape Cod. It is bordered by the Atlantic Ocean on the north and east, Wellfleet on the south, and Cape Cod Bay and Provincetown on the west. Truro is 37 miles north of Hyannis; 106 miles southeast of Boston; 117 miles east of Providence, Rhode Island; and 284 miles from New York City.

- Total Area: 26.32 sq. miles
- Land Area: 21.06 sq. miles
- Population: 1,573 Density: 75 per sq. mile.
- Average median age is 45.7, or 16th out of 351 cities and towns statewide. 4.8% of families live below the poverty level.
- Regional commuter bus service in Truro is provided by the Brockton and Plymouth Street Railway Co., and the CCRTA serves Truro with the seasonal Provincetown-Truro Shuttle and an on-call service for residents called the b-Bus.

As stated in the Truro Local Comprehensive Plan (LCP), public transportation is not a pressing issue for Truro residents who own cars and must use them for even the smallest purchase or errand. Truro does recognize the importance of reducing the number of vehicular trips to thereby reduce air pollution and traffic congestion. Public transportation of benefit to Truro would be two types: van services for the elderly, and shuttle buses to move visitors to the beaches. As stated in the LCP, specific Truro transportation goals include:

Truro will seek to foster a transportation system for present and future year-round needs that is safe, convenient, accessible, economical and consistent with the Town's historic, scenic and natural resources.

Within the limits defined by Truro's rural location, density and fiscal strength, Truro will seek to develop alternative modes of transportation so as to reduce dependence on private automobiles.

Truro will encourage a system of public and private beach and harbor parking areas that function safely and efficiently, and are linked to a public transit system that reduces vehicle trips and beach parking problems.

Representatives from the Volpe Center, the Commission and CACO officials have had ongoing discussions about transportation improvements with town officials and interested citizens since the commencement of this project. They formally met with the Town Administrator, Town Planner and other Town officials to solicit input and offer recommendation for local and express transit service for Truro in November 2002.

Provincetown

Provincetown is situated on the northern tip of Cape Cod and is bordered by Truro on the east and surrounded by the Atlantic Ocean on all other sides. It is 49 miles north of Hyannis, 78 miles east of Plymouth, 114 miles southeast of Boston, and 290 miles from New York City.

- Total Area: 17.47 sq. miles
- Land Area: 9.66 sq. miles
- Population: 3,561
- Density: 369 per sq. mile.
- Average median age is 45.4, or 18th out of 351 cities and towns statewide. 8.5% of families live below the poverty level.
- Downtown parking is limited to several large lots, including the Grace Hall and Municipal Parking Lot (MPL), and on street parking in specific locations. Parking use and availability is conditioned on characteristics at the MPL, including season, whale watch schedules, weather, and time of day.
- Regional commuter bus service in Provincetown is provided by the Plymouth and Brockton Street Railway Co., and the CCRTA provides the seasonal Provincetown-Truro Shuttle, and an on-call service for residents called the b-Bus. In the winter, the frequency of scheduled bus transportation is sharply reduced, causing difficulties for Provincetown residents with off-Cape business. Three ports in Massachusetts, Gloucester, Boston and Plymouth, offer seasonal water ferry service to Provincetown. Provincetown Municipal

Airport (PMA) is a 378-acre facility with parallel taxiways surrounded by the Cape Cod National Seashore. Year-round service is provided at PMA, with a significant number of landings and takeoffs during the summer.

The 1999 Provincetown Local Comprehensive Plan (LCP) established local priorities that are complimentary and compatible with the Commission's Regional Policy Plan. Issues relating to drinking water, wastewater facilities, health services, economic development, transportation, and other local and regional services are interrelated to provide a unified vision for the future. For example, Goal 9 of the Economic Development goals and policies provide a transportation vision that Provincetown should develop commuter access to and from Boston, Providence, and Cape Cod Community College.

Provincetown recognizes the importance of transportation in preserving and sustaining its quality of life. As stated in the LCP, Section 7.1.2 Community Facilities and Services, Goals 1, 2 & 3:

Goal 1 is to foster and maintain a multimodal transportation system for present and future year-round and seasonal needs which is safe, convenient, accessible, efficient, economical, and consistent with the Town's historic, scenic, and natural resources, and land use development and growth management policy. This includes travel demand management strategies including the development and use of transit and employee incentive programs that reduce automobile trips.

Goal 2 is to decrease dependence on private automobiles, address demonstrated public needs for convenient, accessible, economical alternatives to private automobiles, and promote energy efficiency and reduced pollution. Bus, ferry, water taxi, air and rail modes of public transportation should be encouraged, not only as alternatives to automobile trips but also to improve mobility for non-drivers, those preferring not to drive and those without access to a car. To serve residents and visitors, transit service frequency should be increased and the routes expanded.

Goal 3 is to support transportation solutions that preserve and enhance Cape Cod's character by considering the interrelationship between land use and transportation.

Representatives from the Volpe Center, the Commission and CACO officials have had ongoing discussions about transportation improvements with town officials and interested citizens since the commencement of this project. They formally met with the Town Administrator and Parking Administrator to solicit input and

offer recommendation for local and express transit service for Provincetown in July 2002.

Brewster

Brewster is at the inside bend of the elbow of Cape Cod and is bordered by Cape Cod Bay on the north, Orleans on the east, Harwich on the south, and Dennis on the west. Brewster is 16 miles east of Hyannis; 83 miles southeast of Boston; 87 miles east of Providence, Rhode Island; and 264 miles from New York City. Brewster's current year-round population of about 8,400 grows to about 20,000 in the summer season as visitors come to sample the diversions of the town.

- Total Area: 25.48 sq. miles
- Land Area: 23.01 sq. miles
- Population: 8,440 Density: 367 per sq. mile.
- Average median age is 46.9 or, 14th out of 351 cities and towns statewide. 1.6% of families live below the poverty level. Brewster is in the process of updating its comprehensive plan.

Representatives from the Volpe Center, the Commission and CACO officials have had ongoing discussions about transportation improvements with town officials and interested citizens since the commencement of this project. They formally met with the Town Administrator, representative from the Council on Aging, Town Planner and other Town officials to solicit input and offer recommendation for local and express transit service for Brewster in November and December 2002.

4 CAPE COD AND ISLANDS PASSENGER TRANSPORTATION COORDINATING COUNCIL

Public involvement in metropolitan and state transportation planning processes, including input on project alternatives, is required by federal legislation such as the Transportation Equity Act for the 21st Century (TEA-21) and the National Environmental Policy Act (NEPA). But partnering between CACO and the myriad of stakeholders on Cape Cod in the ATS planning process involves developing a continual working relationship between the parties and a commitment to work toward common goal(s) from the planning stages through project implementation. In fact, partnering is crucial to informing and moving forward the sequential steps of the transportation planning process: identification of issues and needs; development of goals and objectives; data collection and analysis; evaluation of possible solutions based on ability to meet common goals and objectives; and, selection of a preferred solution. The work of the CCTTF has already benefited CACO with data, information, evaluation and analysis expertise, funding, political support, and other resources needed to make informed transportation decisions that meet stakeholder needs, while protecting and enhancing park resources and the visitor experience.

As part of the development of the Five-Year Public Transportation Plan, the CCTTF identified a significant number of public transportation services on Cape Cod. The CCTTF also identified transit needs on Cape Cod, based on demographic changes, congestion, environmental protection, and other factors. In analyzing this information, the CCTTF found that better coordination of existing and proposed services would help to meet transit needs identified by Cape Cod residents and businesses. To provide a forum for this coordination, the Five-Year Plan recommended the establishment of a Cape Cod and Islands Passenger Transportation Coordinating Council (the Council) that includes all Cape Cod, the Islands of Martha's Vineyard and Nantucket and adjacent region's air, surface and water public and private transportation providers, as well as regional planning and development and business interests of the region.

Following the formal approval of the Five-Year Plan, the Volpe Center (as part of this Long-Range Planning project) and Cape Cod Commission staff worked to develop a structure that would define the Council. The CCTTF model has worked well for the Five-Year planning process in general, and guiding the identification of resources needed for the Council, in particular. The next step is to build and improve on what has occurred to ensure sustainable, coordinated planning well into the future. This section describes the proposed Council Mission Statement, initial, short-term and long-term roles and responsibilities, membership, and resource requirements. While this section of this Long-Range planning study

does not contain 'physical' capital procurement recommendations, it is perhaps the most important section in this plan. It is the 'glue' that can bring stakeholders into a coherent planning process to discuss problems, and ensure the development of effective, efficient and sustainable transportation solutions, including the acquisition of funding and other resources.

CAPE COD AND ISLANDS PASSENGER TRANSPORTATION COORDINATING COUNCIL MISSION STATEMENT

The Five-Year Plan provides a starting point for the establishment of the Cape Cod and the Islands Passenger Transportation Coordinating Council. Based on the agreed upon role and purpose of this Council, Commission and Volpe Center staff have developed the following draft Mission Statement for the Council:

CAPE COD PASSENGER TRANSPORTATION COORDINATING COUNCIL MISSION STATEMENT:
Promote better passenger transportation services for Cape Cod, the Islands, and adjacent regions by facilitating; planning, the communication and coordination between providers, educational programs, and forums to address the needs of the public. The Council will also provide resources and leadership for the development of new concepts that will increase the viability and appeal of alternatives to the private automobile.

Initial Roles and Responsibilities

The role of the Council focuses on it serving as the central venue for coordinating transportation planning, service, and development activities. Activities it should pursue include:

- Facilitate the implementation of recommended improvements,
- Develop and pursue sustainable funding sources for continuing improvements,
- Develop agreements among transportation providers to foster service coordination, efficiency and accountability,
- Coordinate provider schedules and cooperative services for special events,
- Sustain the Cape Cod "Smart Guide" with a continuing and reliable source of funds,
- Advocate for new services as needed, and
- Provide opportunities for continuing public review and comment.

The Council will take responsibility for some work started by the CCTTF. These include ongoing work with convening annual Public Transportation Summits to provide a public forum for feedback, participating in the updating and improvements to the "Smart Guide" resources and products, planning special events, and serving as the liaison between the CCRTA and other transportation providers. In addition, the Five-Year Plan identifies the following preliminary responsibilities for the Council:

- Developing a Memorandum of Understanding with all Transportation providers,
- Convening coordination meetings with transportation providers,
- Developing joint marketing agreements,
- Providing a forum for the examination of current regulatory and licensing agreements,
- Sustaining and improving the Smart Guide to Cape Cod, and
- Advocating consolidation of Information Systems, Ticketing, and Smart Media.

Short-Term Roles and Responsibilities

The Five-Year-Plan identifies a number of initiatives that will require involvement of the Council. In addition, the role of the Council will be to review and facilitate the development and coordination between providers in implementing the following short-term initiatives:

- Locate and design Local Transportation Centers,
- Review proposed CCRTA routes and develop recommendations for new services,
- Implementation of Joint Ticketing opportunities and Smart Cards,
- Coordinate ITS initiatives,
- Develop the Human Services Central Dispatch Center, including developing an MOU between service providers and agreements that would pool funding to sustain the Center,

- Facilitate the development of Transportation Management Associations, and
- Convene public meetings on the development of Rail proposals.

Long-Range Roles and Responsibilities

The Council will also have a role in long range transportation planning and development on Cape Cod. It is recommended that long-range roles and responsibilities should include:

- Pursuing sustainable project funding,
- Identifying benefits and drawbacks of certain modes of alternative transportation,
- Analyzing impacts of new transportation systems on area businesses, including in-park concessions,
- Determining locations of shuttle bus stops,
- Analyzing impacts of transportation alternatives on historic sites, wetlands, and other cultural and natural resources,
- Exploring parking options for motor vehicles not allowed on sections of CACO and other roads and beaches,
- Finding solutions for addressing increasing demands on CACO staff time,
- Securing funding opportunities for ATS development, operations, and maintenance,
- Developing strategies for meeting and reconciling the transit needs of CACO employees, visitors, and local residents,
- Assisting in the administration of planning contracts,
- Coordinating with the revision of the 2003 Regional Transportation Plan (as well as future RTP's),
- Reviewing development of 25-year model assumptions and demographics, and
- Incorporating long-range plan initiatives and new initiatives into Five-Year Plan/Transportation Improvement Plan (TIP).

Proposed Membership

This Long-Range Plan proposes that the Council include all Cape Cod and the Islands of Martha's Vineyard and Nantucket air, surface, and water public and

private transportation providers. The following entities are proposed as members to represent regional planning, development, and business interests:

- Cape Cod Commission
- Nantucket Planning and Economic Development Commission
- Martha's Vineyard Commission
- Barnstable County,
- National Park Service Cape Cod National Seashore
- Cape Cod Chamber of Commerce

Members are to be nominated by the Barnstable County and Island Commissioners, and then appointed by the Massachusetts Secretary of Transportation. It is recommended that the membership be reviewed and updated every three years. The following organizations and, where appropriate and applicable, individuals are recommended to serve on the Coordinating Council.

State Representation

- Executive Office of Transportation and Construction (Chair), Secretary or designee
- Massachusetts Highway Department designee
- Steamship Authority designee

County Representation

- Cape Cod Commission, designee of Commission Chair
- Martha's Vineyard Commission, designee of Commission Chair
- Nantucket Planning and Economic Development, designee of Commission Chair
- Barnstable County Commissioners designee
- Barnstable Assembly of Delegates designee

Regional Transit Authority Representation

- Cape Cod Regional Transit Authority, Board of Directors designee
- Martha's Vineyard Regional Transit Authority, Board of Directors designee

- Nantucket Regional Transit Authority, Board of Directors designee

Human Services Representation

- Barnstable County Human Services designee
- Upper/Lower Cape Coalition designee
- Cape Organization for Rights of the Disabled designee

Private Carrier Representative

- Southeastern Massachusetts Private Motor Carriers Association designee
- Cape Air designee
- Hy-Line Cruises designee

Other Representation

- CACO Superintendent or designee
- Cape Cod Chamber of Commerce designee
- John Kennedy, interested citizen

Proposed Council Technical Advisory Group

It is recommended that an Advisory Group of interested parties assist the Council. This group is to be appointed by the Council when formed and the currently proposed membership includes the following:

- Taxi providers representative
- Major Employers – representation as needed
- Barnstable County Municipal Airport designee
- Greater Attleboro and Taunton Regional Transit Authority (GATRA) designee
- Interested Citizens, to be determined
- Old Colony Planning Council designee
- Southeastern Regional Planning and Economic Development District designee
- Cape Area Transit Systems designee

Cape Cod and Islands Passenger Transportation Coordinating Council Resource Requirements

Accomplishing these tasks will require dedicating resources to facilitate the Coordinating Council's activities. Commission and Volpe Center staff has developed the following Table 4.1 that identifies resource needs.

Table 4.1.
Cape Cod and Islands Passenger Transportation Coordinating Council Resource Needs

				Annualized	
	Lump Sum	Hours	Cost	Hours	Cost
Annual Needs				**620**	**$114,360**
Annual Summit	$7,500	100	$12,800		
Smart Guide	$74,000		$74,000		
Coordination - 4 meetings/year		120	$6,360		
Participation in Smart Guide		100	$5,300		
Special Event Planning - 2 mtgs/yr		80	$4,240		
Liason between CCRTA/others		220	$11,660		
Early Tasks (Years 1-3)				**753**	**$39,927**
Local Transportation Centers		180	$9,540		
New CCRTA Routes		400	$21,200		
Joint Ticketing/SmartCard		240	$12,720		
ITS		300	$15,900		
Central Dispatch		300	$15,900		
Facilitation of TMAs		300	$15,900		
Rail		240	$12,720		
Other		300	$15,900		
Long Range Plan (years 1 and 2)				**377**	**$19,963**
Pursue Long Range Funding		100	$5,300		
Administration of Contract		200	$10,600		
Coordinate with RTP		150	$7,950		
Model Review		100	$5,300		
Long Term Tasks (Ave Annual)				**300**	**$15,900**
Revise Long range Plan		100	$5,300		
Revise Priorities		200	$10,600		
Total Annual				**2,050**	**$190,150**

Assumptions:	
Cost/hour	$25.00
Overhead	112%

In developing the resource needs, Commission and Volpe Center staff also identified potential funding sources. These sources are identified in the following Table 4.2.

Table 4.2.
Potential Council Funding Sources

Funding Source	Amount	Notes
MassHighway Planning Funds	$60,000	Current CCTTF Contribution
County Funds	$60,000	Potential Contribution
CCRTA Planning Funds	$30,000	Potential Contribution
CC Chamber of Commerce	$5,000	Potential Contribution
Steamship Authority	$10,000	Potential Contribution
National Seashore	$10,000	Potential Contribution
Mass Aeronautics	$5,000	Potential Contribution
Cape Cod Chamber	$22,000	Smart Guide
Cape Air	$5,000	Smart Guide
Cape Cod RTA	$6,000	Smart Guide
Nantucket County	$7,000	Smart Guide
Nantucket Chamber	$3,500	Smart Guide
Martha's Vineyard Chamber	$2,000	Smart Guide
TOTAL:	**$225,500**	

The successful implementation of the recommendations provided later in this plan will require coordination across agencies on Cape Cod. The goals and objectives contained in planning documents referenced later in this plan assume that this coordination will occur. The Cape Cod and Islands Passenger Transportation Coordinating Council provides the forum that will ensure that these goals and objectives are successfully addressed, that recommended transportation improvements are completed, and that the impact of future transportation decisions are maximized.

5 TRANSIT PLANNING AND RECOMMENDATIONS

Transportation is an important issue on Cape Cod for a number of reasons. These include a growing year round population, continued strong tourism, limited opportunities to add roadway capacity, the need to protect open space and ground water supplies, and an aging population. This impact is felt on Cape Cod as a whole but may be of greatest importance in the Outer Cape communities. Public transportation is a means to alleviate traffic congestion, provide mobility to those who need it, and mitigate environmental impacts caused by road improvements and run-off.

The CCTTF provided a forum for identifying public transportation needs and to identify options for meeting those needs. The CCTTF found that residents of Outer Cape communities had some of the most pressing mobility issues on Cape Cod. At a public hearing held at the CACO Salt Pond Visitors Center in January 2002 (as part of the Five-Year Transportation Plan public review and comment period), Outer Cape residents reiterated their desire for dedicated local and express transit. Improved transit service can address mobility issues and this section provides a practical vision of local and express transit for the Outer Cape.

This vision is based on the direction from the Cape Cod 2000 Regional Transportation Plan, CACO GMP, Town Comprehensive Plans, and community input at public forums. The Volpe Center has also looked at best practices on the island of Bermuda, a tourist destination that shares some characteristics with Cape Cod, to identify lessons that could be useful on Cape Cod.

CACO is a major attractor of tourists and a major property owner on the Outer Cape. Despite high demand, CACO does not desire to construct additional parking facilities at the beaches. The NPS wishes to more effectively manage current levels of visitation in cooperation with the Cape Cod towns adjacent to CACO. Public transportation is seen as a means of achieving this objective, particularly if service can be implemented between primary lodging and residential areas and the beaches, thereby eliminating the need for additional parking facilities at beaches and reducing use of private vehicles to make the trip. This has to be weighed against overtaxing the carrying capacity of the beaches, both in terms of the physical facilities and the personal experience.

As stated in the TAG report of November, 2000…"*Whereas shuttle and tram service within the immediate CACO vicinity will provide a much needed alternative to automobile access, tapping the full potential of alternative transportation systems requires taking a systematic view of travel needs related to CACO destinations and external points of origin. Effective alternative*

transportation service needs to provide for a range of travel needs beyond getting people to and from CACO attractions. For example, the current shuttle operation serves CACO seashore facilities (which are very popular on hot, sunny days) as well as in-town services and attractions (which are popular on rainy days). The ability to provide service across multiple transportation demands requires a multi-jurisdictional approach to public transportation planning."

Since the NPS envisions this as a "personal" service, reflecting the ambiance of Cape Cod, this service would not use full-size buses but mini-coaches that would be able to navigate the local street network. It is envisioned that there will be two main aspects to Outer Cape transit service: regional service from Provincetown to Orleans and beyond, and local service that will intersect with the regional service through timed transfers.

BERMUDA MODEL

Cape Cod and Bermuda share a number of characteristics. Bermuda and Cape Cod share tourism as a major economic sector, a need to preserve the environment to maintain the tourism industry, and increased tourism at certain times of year causing seasonal peaks in demand for transportation services. Bermuda and Cape Cod also have sizable year round populations that require transportation services. Both Cape Cod and Bermuda have road networks that are ordinarily overtaxed for automobile use. A key difference is that Bermuda, because there is no land link to Bermuda, is able to regulate the number of automobiles that can be operated on its roads.

The Public Transport Bermuda (PTB) provides a variety of services, including regular commuter service, school bus services, charter and sightseeing service. A total of 11 routes serve the Island, many operating on 15-minute schedules. PTB operates a fleet of 112 diesel-powered buses and many of these buses are air-conditioned. It provides over 4,000 scheduled trips per week and provides over 3.6-million passenger-rides per year.

Passengers can ride on any scheduled bus by using a pass, bus tickets, or tokens. Passes can be purchased at any Visitors Service Bureau, the main bus

terminal in Hamilton, and at the PTB headquarters at Palmetto Road in Devonshire. Tokens and tickets are available at the Bus Terminal or PTB Headquarters. In addition many hotels have passes for sale and some hotels provide bus passes to guests as part of their accommodations. There is a free bus and ferry schedule available wherever bus passes are sold and many hotels and other tourist centers have schedules and maps available.

The Bermuda public transportation system was designed for, and operates on, a standard that incorporates year round and tourist travel in a manner that is considered state-of-the-art for public transit. It is designed to serve tourist locations and major employment and residential centers in an 11-route network. Essentials of advanced dispatch and time transfer, parking and automobile restrictions, and land use, bus stop and shelter design, and route design could be incorporated for use on Cape Cod as part of the 25-year public transportation planning effort.

The vision is to build up a local and express Outer Cape transit system that builds on the best practices currently being experienced in Bermuda. This includes branded logos, dependable headways, distinctive vehicles and shelters that are keeping with the Cape Cod character, and easily available information on transit services. Routes should be devised that address mobility needs of a diverse population, including human services, youth, seasonal visitors and year-round residents. The efficiency, effectiveness and equity of this system have the possibility to be a central aspect of long-range planning on Cape Cod, and could serve as justification for potential planning recommendations.

PROVINCETOWN-TRURO SHUTTLE

CACO has demonstrated its commitment to partnering through the initiation of the Provincetown-Truro Shuttle, through a working agreement with the CCRTA. CACO procured 5 propane mini-buses for the CCRTA, and they operate them from North Truro to/from Provincetown. This shuttle

operates from May through late October, and carries seasonal laborers from the North Truro campgrounds to employment areas in and around Provincetown, and carries visitors from the North Truro campgrounds to the Province Lands area, particularly Herring Cove Beach, and eventually to the Province Lands Visitor Center. Other areas the shuttle covers include: P&B Bus stop at Dutra's Market, Guest Accommodations, Commercial Street shops & restaurants, Ferries to Boston & Plymouth, First Pilgrim's Park, Fisherman's Wharf, Heritage Museum, MacMillan Wharf, Pilgrim Monument & Museum, Restaurants & Shops, Whale watches, fishing & sailing, and the Whydah Pirate Museum.

Quoting from the draft proposal:

> *Cape Cod National Seashore is working actively with partners from Town of Provincetown, Town of Truro and the Cape Cod Regional Transit Authority to implement an area shuttle system in the Provincetown, Truro, Province Lands area. The Cape Cod Regional Transit Authority will operate this shuttle system during the summer months. This system is patterned after the one being operated at Acadia National Park in Maine, with small transit buses and vans moving people from their overnight accommodation and public parking lots to downtown Provincetown, North Truro or the National Seashore beaches. This proposal is to obtain funding for the purchase of mini-buses, to operate a 20- to 30-minute route throughout the area. We propose that the buses be alternative fuel vehicles, such as propane or hybrid electric…. These buses would be turned over to Cape Cod Transit Authority to contract out or operate themselves for this Province Lands area shuttle service.*

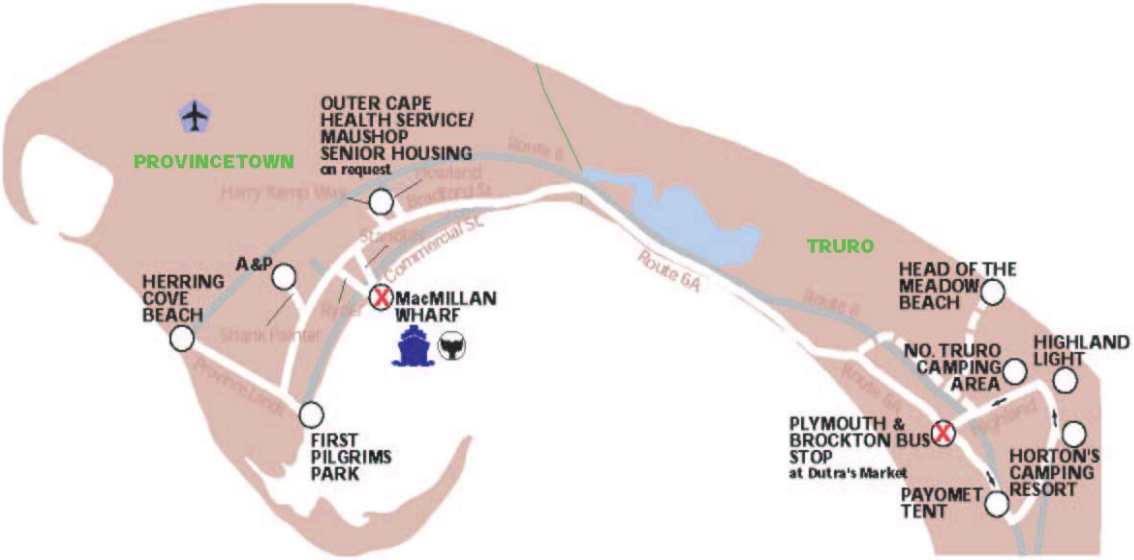


Figure 5.1
Provincetown-Truro Shuttle Route

As part of the Cape Cod Advanced Public Transportation Systems (APTS) program, CCRTA developed a demonstration project for electronic payment systems known as the Cape Cod Transit Tourist Pass (CCTTP). The CCTTP program was funded by a two-year Congestion Mitigation and Air Quality (CMAQ) grant to provide user-side subsidies using electronic payment systems to promote increased use of transit on Cape Cod. The CCTTP demonstration program was initiated in summer 2001 in cooperation with the Cape Cod Chamber of Commerce, and was expanded during the summer of 2002, the second year of the CMAQ grant. Under the program, hoteliers with Internet capabilities located within one-quarter mile of a CCRTA fixed route were recruited to participate in a demonstration of electronic fare media. Participating hotels received free passes to distribute to their guests to encourage transit use during their visit to Cape Cod. Each participating hotel was required to enter a minimal amount of information for each guest receiving a pass. In return for their effort, the hotels were also allowed to provide the passes to their employees.

Based on the survey findings[4], the availability of the Provincetown Shuttle service (regardless of the fare payment mechanism) appears to have helped to reduce vehicle-travel in the Provincetown area as well as provided a mobility benefit to both tourists and hotel staff. The fact that the majority of visitor pass users had a vehicle available for their use suggests that the shuttle service is helping to displace vehicle-trips, primarily into Provincetown and to Herring Cove Beach, where parking can be expensive and/or scarce.

LOCAL TRANSPORTATION CENTERS

The key to improving public transportation is connecting existing services and coordinating existing and proposed services. This process requires a physical facility to allow these coordinated connections to occur. The local transportation centers will be established in a manner that will promote transit-oriented development, and support land use and other local planning concerns as well as complement regional and village growth centers. The centers will be designed to support the public and private transportation services in the area and will have amenities such as information kiosks, shelter, and bicycle storage facilities and, where appropriate, parking.

An example of a successful local transportation center is currently in operation at the Southgate Plaza in West Seneca, NY depicted in Figure 5.2. Operated by the Niagara Frontier Transportation Authority (NFTA), the regional multi-modal transportation agency responsible for all air, water and surface transportation,

[4] Draft Evaluation of the Cape Cod Advanced Public Transit System – Cambridge Systematics, January 2003.

this center is located in the middle of a 60-store, suburban plaza parking lot. It is an integral component of the NFTA's HUBLINK mobility program for efficiently and effectively providing social services and welfare to work transportation options. The site provides travel information, connections between paratransit, MetroLink mini-bus, local and express bus routes, as well as shelter from the elements in an aesthetically pleasing environment. This location allows travelers to transfer or park and ride to downtown Buffalo, NY and other suburban locations, and includes stops at employment, housing, shopping, and medical centers.

Three areas are expected to require local transportation centers in the next five years. These facilities complement and are in addition to the recently built Hyannis Transportation Center. The facilities recommended by this plan are to be located in the following areas:

- **MacMillian Wharf:** This facility will serve as a linkage between the expanding ferry service at the wharf, local transit service, intercity bus service, and potential shuttle services. The facility has the promise to be developed as a joint private/public partnership with the local chamber of commerce; local businesses including whale watch companies, and the National Oceanic and Atmospheric Administration (NOAA).
- **Orleans**: This facility will provide transfer options and connections between modes, and to increase accessibility to the National Seashore and Provincetown. The connections envisioned are between the existing Hyannis to Orleans Line, the proposed service between Provincetown and Orleans, proposed Whale Watch services, potential expansion of this year's pilot service in Chatham and inter city bus service. It is proposed that a Local Transportation Center be constructed at the Cranberry Plaza parking lot, using the Southgate Plaza intermodal center as a model.
- **Upper Cape**: There is a need for a local transportation center in the upper Cape area for connections to adjacent RTA service (such as GATRA), intercity bus services, CCRTA services, ferry services, potential rail service, and potential water taxi services. Sites under consideration are near Tedechi's Market in Bourne, the Sagamore Park and Ride Lot, the Buzzard's Bay Depot, and off MacArthur Blvd. in Bourne.

Figure 5.2
Example of Local Transportation Center, Southgate Plaza – West Seneca, NY

PROPOSED SUMMER AND WINTER OUTER CAPE TRANSIT ROUTES

Input from participants at the Transit Summits, CCTTF efforts, CCRTA staff, Town Local Comprehensive Plans, as well as representatives of Cape Cod communities have all identified the need for better public transportation access in and between Outer Cape communities. Based on this information, Volpe Center staff developed route recommendations for local and express service to these communities. Design of these routes also took into account best practices learned in Bermuda. Local routes would be provided serving Brewster, Orleans, Eastham, Wellfleet, Truro, and Provincetown, and a regional route has been identified between Orleans and Provincetown.

Included in the design of the regional and local routes is a complementary interface with the existing Plymouth & Brockton Street Railway Co. (P&B) bus routes. Presently, P&B operates service to/from Provincetown through Orleans on Route 6, then to/from Hyannis, Barnstable, Boston, Logan Airport and points in between. The proposed transit routes can serve as a means for travelers to access the P&B long-haul routes to destinations further away from the Outer Cape, and increase mobility options for health and human service providers in and around Hyannis and the Boston Metropolitan area. With the creation of bus shelters at intersection points of the regional and local services on Route 6, the P&B buses have the opportunity to pull off of the highway to board/discharge passengers where passengers can be protected from the elements.

Hours of operation and routings are in some cases different during the Summer season, between Memorial Day and Labor Day, and the rest of the year, identified as the Winter Season. At present, the proposed routes assume dedicated buses serving each town, and are reflected in operating costs identified later in this section. Ultimately, we look to an 'interline' system where a bus will continue along the local routes from one town to the next (i.e., from Brewster to Wellfleet or even to Provincetown) and then return. This interline system would be the basis of further analysis and study, in concert with the Commission and CCRTA. The following descriptions identify service for the town, routes, and sites served.

Applicability of Recommendations to Goals

The transit recommendations in this section focus on establishing and maintaining a transportation system on Cape Cod for present and future year-round and seasonal needs which is safe, convenient, accessible, economical and consistent with Cape Cod's historic, scenic and natural resources. This comes directly from LCP's, the RPP, the Long Range Transportation Plan, and the Five-

Year Public Transportation Plan. An additional focus from these plans is on reducing the dependence on private automobiles by developing and integrating alternate modes (e.g., rail, bus ferry, air bicycle and pedestrian) into the transportation system.

The CACO GMP calls for expanding shuttles and related services and encourages the use of alternative modes of transportation. The recommendations in this section focus on improving transit service to CACO sites while serving the needs of residents and visitors. The improvements identified for transit service in the Outer Cape communities are designed to benefit CACO, the regional and adjacent regions.

BREWSTER ROUTE

Summer Service *(Figure 5.3)*

Service is provided hourly. Route begins at the Orleans Local Transportation Center in Cranberry Plaza, turns right onto Route 6A (Cranberry Highway) westbound, passes through the center of Orleans and the main part of Brewster, turns right onto Lower Road, turns right onto Robbins Hill Road to Saint's Landing and Robbins Hill beaches, returns on Robbins Hill Road, turns right onto Lower Road, turns left onto Route 6A eastbound, turns left into the Brewster Recreational Complex, the Council on Aging center, and the Shady Knoll Campground, continues on Route 6A eastbound, turns right onto Route 137 (Long Pond Road), turns left onto Millstone Road, turns right onto 6A eastbound and ends at the Local Transportation Center in Cranberry Plaza.

This route serves Cranberry Plaza, Nickerson State Park, the Town Hall, the Town Recreational Complex, the Council on Aging center, the Shady Knoll Campground, the New England Fire and History Museum, the Cape Cod Museum of Natural History, the commercial, retail, lodging, and eating establishments along Route 6A, the residential area bordering Millstone Road, and the Bayberry Plaza and Skaket Corner shopping areas and the center of town in Orleans. Connections are possible to the Orleans-Provincetown Route at the Bayberry Plaza and the Local Transportation Center in Cranberry Plaza in Orleans and the Orleans Summer Green Route at Bayberry Plaza.

Winter Service *(Figure 5.3)*

Service is provided hourly. Same as summer route except for elimination of the deviation to Saint's Landing and Robbins Hill beaches from Lower Road. Connections are possible to the Orleans-Provincetown Route at the Bayberry Plaza and the Local Transportation Center in Cranberry Plaza in Orleans and to the Orleans Yellow and Green Winter Routes at Bayberry Plaza.

NOTE: Stopping the routes at the Bayberry Plaza in Orleans would <u>not</u> reduce the cost of service.

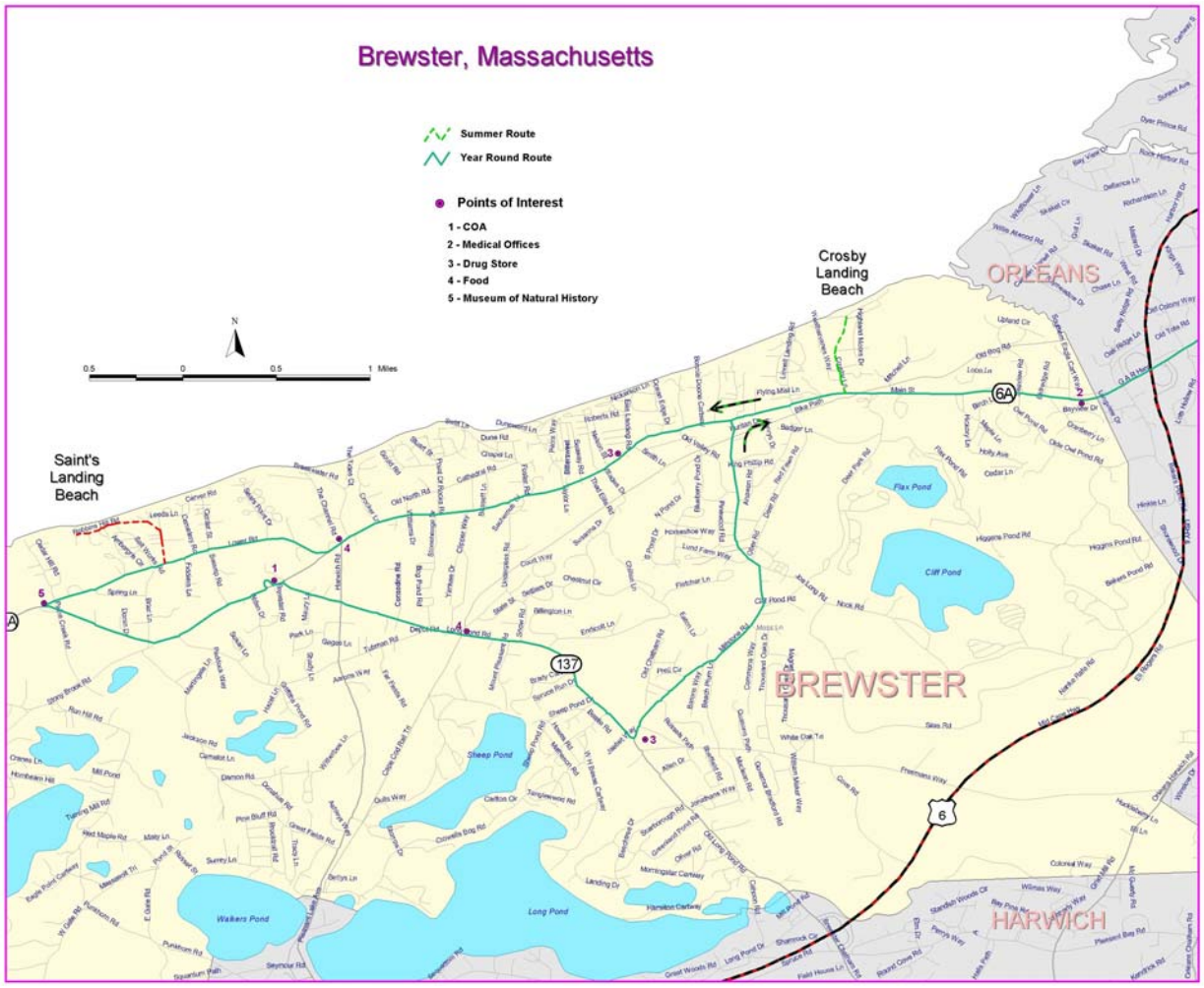


Figure 5.3
Brewster Year Round and Seasonal Service

ORLEANS ROUTES

Orleans service is divided into Green and Yellow Routes. The Green Route is provided east of the center of Orleans, and the Yellow is provided west of the center of Orleans. These routes meet at a proposed Local Transportation Center in the Cranberry Plaza.

Summer Service

Green Route (Figure 5.4)

Service is provided hourly. Route begins at the Intermodal Center in Cranberry Plaza, turns right onto Route 6A (Cranberry Highway) westbound, turns left onto Main street, continues along Beach Road to Nauset Beach, returns on Beach Road and turns right onto Brick Hill Road, turns left onto Hopkins Lane, turns right onto Main Street, crosses Route 6A, turns left onto Old Colony Way, turns left onto West Road, turns right onto Route 6A westbound to Bayberry Plaza, returns via Route 6A eastbound, turns right onto Eldredge Parkway, turns right onto Lots Hollow Road to the skating rink, returns to Eldredge Parkway eastbound, turns left onto Route 28 (South Orleans Road), bears right onto Route 6A eastbound, and ends at the Local Transportation Center in Cranberry Plaza.

Service is provided hourly. This route serves Cranberry Plaza, some of the commercial, retail and eating establishments in the center of town, the Library, the Academy Playhouse, the Town Offices, the East Orleans residential area, Nauset Beach, the residential area along Old Colony Way, the Bayberry Plaza and Skaket Corner shopping areas, the skating rink, Eldredge Parkway medical offices, Eldredge Park recreation area, the elementary and regional middle schools, and the juice bar.

Connections are possible to the Brewster Route at Bayberry Plaza, and to the Orleans-Provincetown and the Eastham Summer Green Routes at the Local Transportation Center in Cranberry Plaza.

Yellow Route (Figure 5.5)

Service is provided hourly. Route begins at the Local Transportation Center in Cranberry Plaza, turns right onto Route 6A (Cranberry Highway) westbound, bears left onto Route 28 (South Orleans Road), bears left onto Main Street, turns right onto Monument Road, turns right onto Route 28, turns left onto Main Street, crosses Route 6A, turns left onto Old Colony Way, turns right onto Namskaket Road to Skaket Beach, returns on Namskaket Road, turns left onto

Frontage Road, turns left onto Rock Harbor Road to Rock Harbor, returns on Rock Harbor Road (with deviation to the Senior Center on Rock Harbor Road on request) and Main Street, turns left onto Route 6A eastbound and ends at the Local Transportation Center in Cranberry Plaza.

This route serves Cranberry Plaza, the juice bar, the Academy Playhouse, some South Orleans residential areas, Crystal Lake, the Eldredge Park recreation area, the regional middle school, the Library, the residential area along Old Colony Way, Skaket Beach, Rock Harbor, the Senior Center (on request), and some of the commercial, retail and eating establishments in the center of town.

Connections are possible to the Brewster Route at Bayberry Plaza, and to the Orleans-Provincetown and the Eastham Summer Green Routes at the Local Transportation Center in Cranberry Plaza.

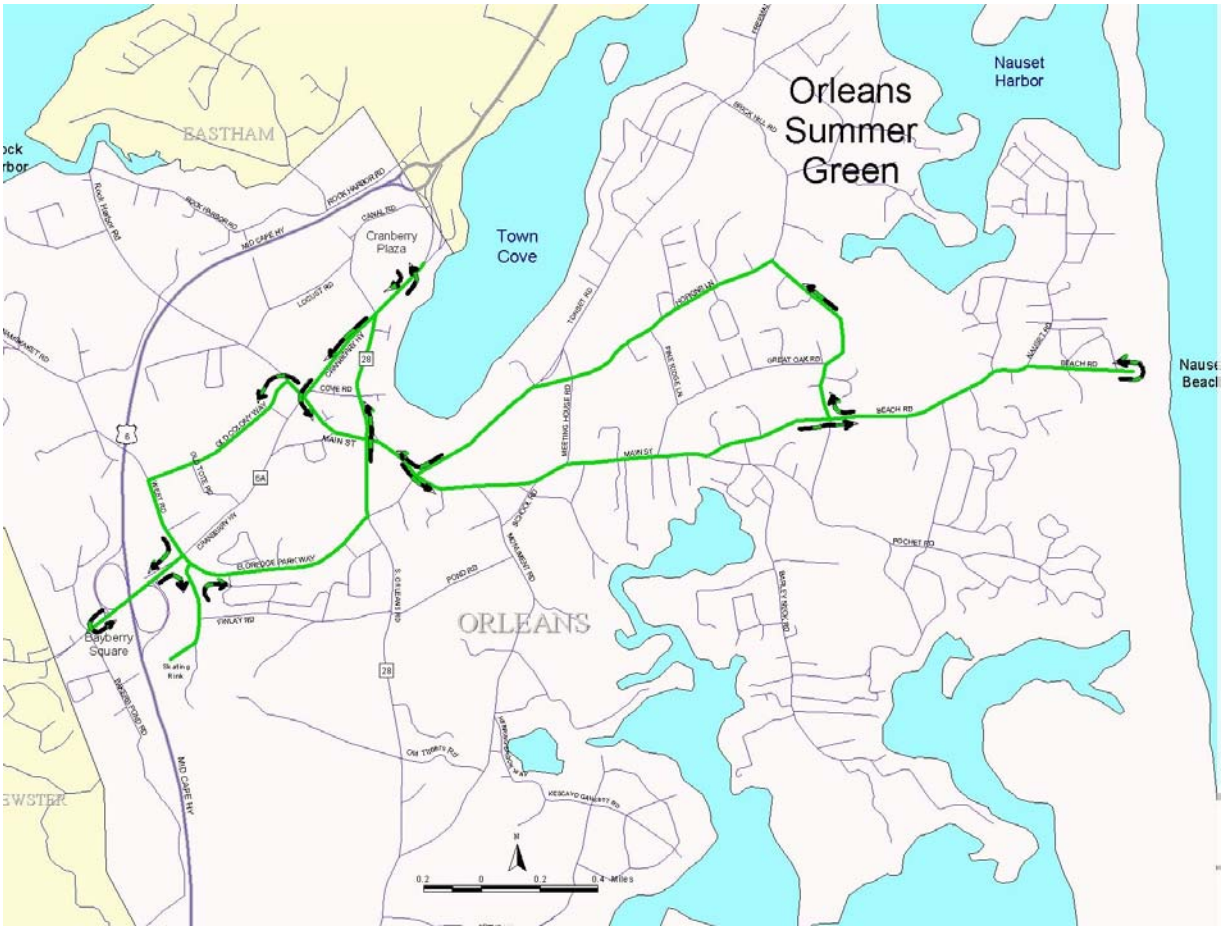


Figure 5.4
Orleans Summer Green Service

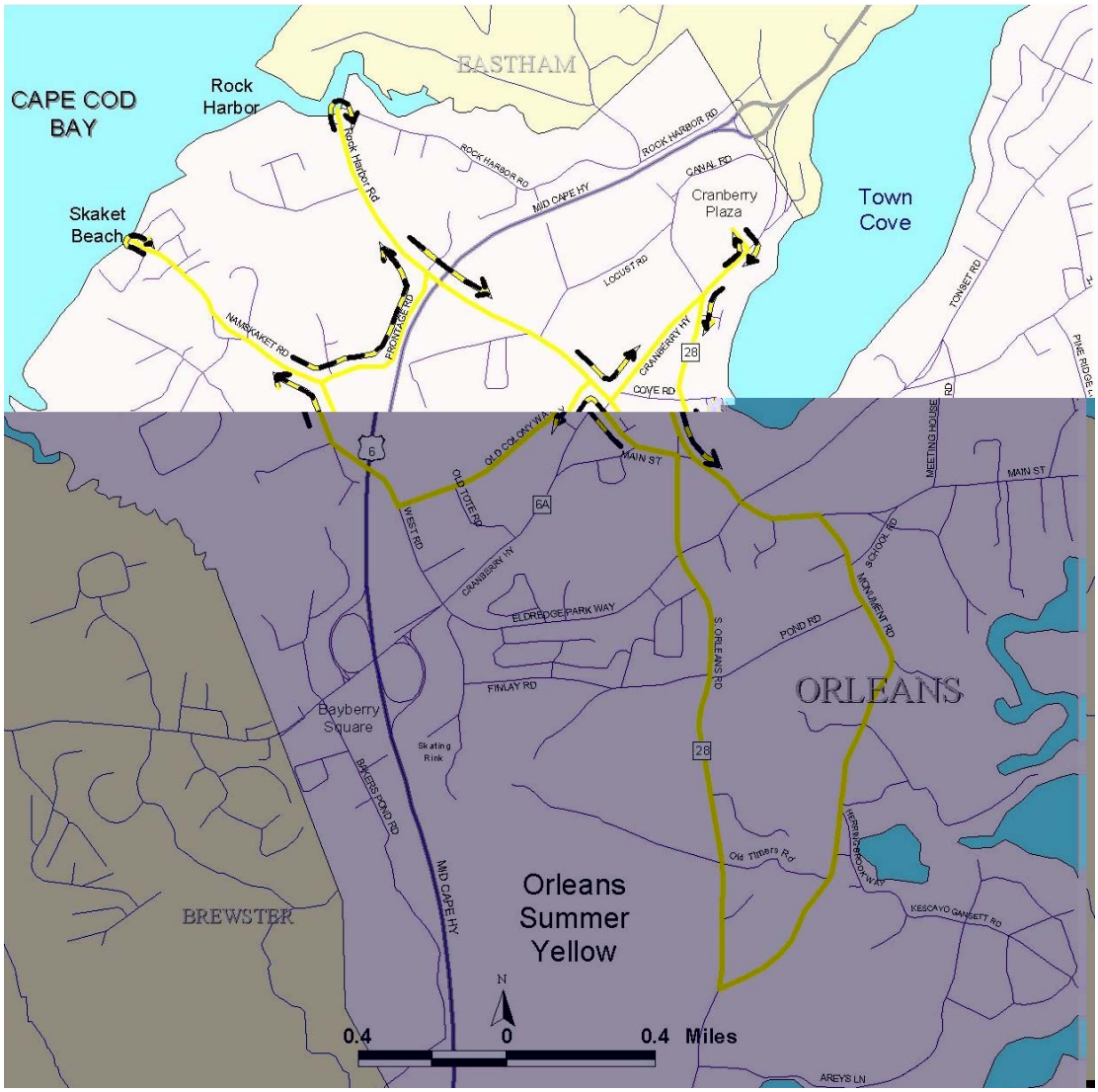


Figure 5.5
Orleans Summer Yellow Service

Winter Service

Green Route (Figure 5.6)

Service is provided hourly. Route begins at the Local Transportation Center in Cranberry Plaza, turns right onto Route 6A (Cranberry Highway) westbound, turns left onto Main street, turns left onto Brick Hill Road, turns left onto Hopkins Lane, turns right onto Main Street, crosses Route 6A, turns left onto Old Colony Way, turns left onto West Road, turns right onto Route 6A westbound to Bayberry Plaza, returns via Route 6A eastbound, turns right onto Eldredge Parkway, turns right onto Lots Hollow Road to the skating rink, returns to Eldredge Parkway eastbound, turns left onto Route 28 (South Orleans Road),

bears right onto Route 6A eastbound, and ends at the Local Transportation Center in Cranberry Plaza.

This route serves Cranberry Plaza, some of the commercial, retail and eating establishments in the center of town, the Library, the Academy Playhouse, the Town Offices, the East Orleans residential area, the residential area along Old Colony Way, the Bayberry Plaza and Skaket Corner shopping areas, the skating rink, Eldredge Parkway medical offices, Eldredge Park recreation area, the elementary and regional middle schools, and the juice bar.

Connections are possible to the Brewster Route at Bayberry Plaza, and to the Orleans-Provincetown Route at the Local Transportation Center in Cranberry Plaza.

Yellow Route (Figure 5.7)

Service is provided hourly. Route begins at the Local Transportation Center in Cranberry Plaza, travels along a short distance on Route 6A (Cranberry Highway) westbound, bears left onto Route 28 (South Orleans Road), turns left onto Monument Road, turns left onto Main street, turns left onto Route 6A westbound to Bayberry Plaza, returns via Route 6A eastbound to Eldredge Parkway, turns right onto Lots Hollow Road to the skating rink, returns to Eldredge Parkway eastbound, turns left onto Route 28, bears right onto Route 6A eastbound, and ends at Cranberry Plaza.

This route serves Cranberry Plaza, the juice bar, the Academy Playhouse, the regional middle school, the Eldredge Park recreation area, some South Orleans residential areas, the Library, some of the commercial, retail and eating establishments along Route 6A, the Bayberry Plaza and Skaket Corner shopping areas, the skating rink, Eldredge Parkway medical offices, and the elementary school.

Connections are possible to the Brewster Route at Bayberry Plaza, and to the Orleans-Provincetown Route at the Local Transportation Center in Cranberry Plaza.

Figure 5.6
Orleans Winter Green Service

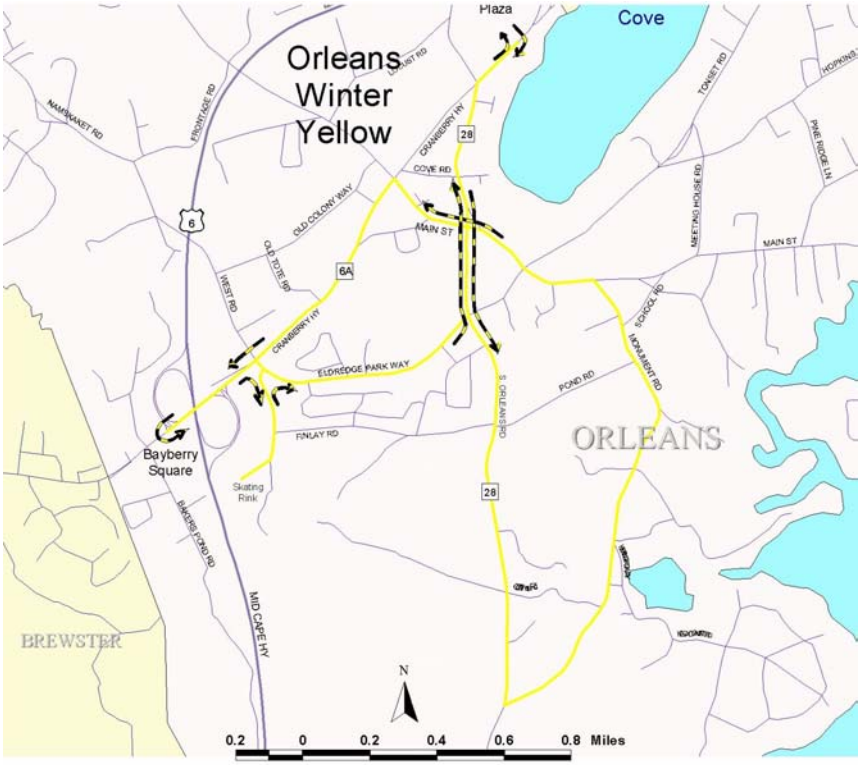


Figure 5.7
Orleans Winter Yellow Service

EASTHAM ROUTES

Summer Service

Green Route (Figure 5.8)

Service is provided hourly. Route begins at the Eastham Town Hall, crosses Route 6 onto Samoset Road, turns left onto Bridge Road, turns left onto Rock Harbor Road to the Route 6 rotary, turns right onto Route 6A westbound to the Local Transportation Center in Cranberry Plaza, returns via Route 6A eastbound to Route 6 at the rotary, travels along Route 6 past the Town Hall, turns right onto Bracket Road, turns left onto Nauset Road, turns right onto Cable Road, turns right onto Ocean View Drive, turns right onto Doane Road, continues straight along Nauset Road, and turns left onto Route 6 back to the Town Hall.

This route serves the Town Hall, the southernmost residential area to the west of Route 6, Cranberry Plaza, the establishments along Route 6, the North Eastham Center, the residential area east of Route 6, Nauset Light and Coast Guard National Seashore beaches, and the National Seashore Salt Pond Visitor Center.

Connections are possible to the Orleans-Provincetown Route at points along Route 6 and to the Orleans Yellow and Green Summer Routes at the Local Transportation Center in Cranberry Plaza.

Yellow Route (Figure 5.8)

Service is provided hourly. Route begins at the Eastham Town Hall, travels north on Route 6, turns left onto West Road in Wellfleet, continues straight onto Massasoit Road at the Eastham town line, bears right onto Herring Brook Road, turns right onto Camp Ground Road to Camp Ground Beach, returns along Camp Ground Road and turns right onto Herring Brook Road, turns right onto Samoset Road to First Encounter Beach, returning along Samoset Road back to the Town Hall.

This route serves the establishments along Route 6, the National Seashore Salt Pond Visitor Center, the North Eastham Center, the residential area to the west of Route 6, Campground and First Encounter beaches, the Wiley Park recreation area, and the Town Hall.

Connections are possible to the Orleans-Provincetown Route at points along Route 6.

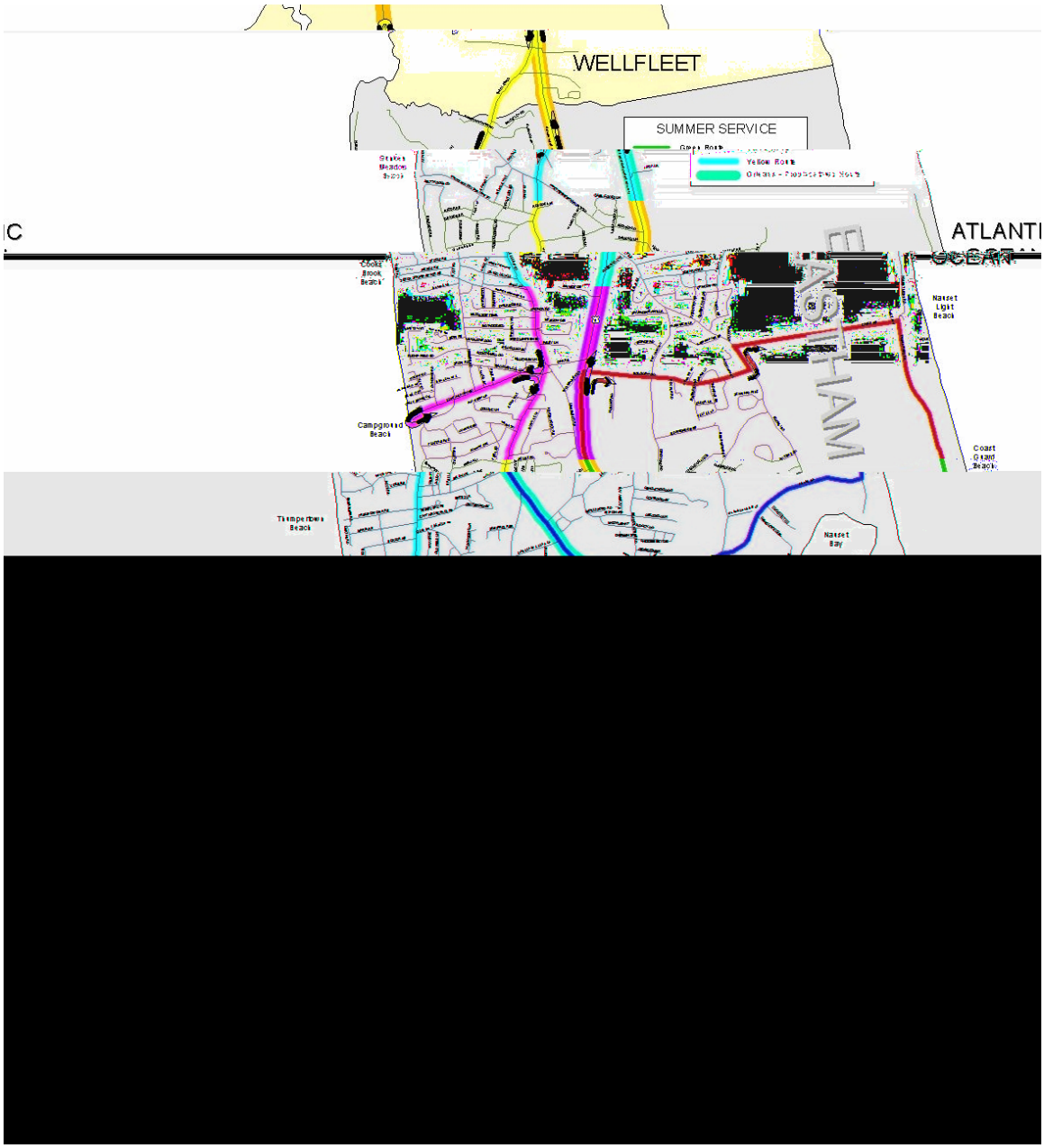


Figure 5.8
Eastham Summer Green and Yellow Service

Winter Service

Yellow Route (Figure 5.9)

Service is provided hourly. Route begins at the Eastham Town Hall, travels south on Route 6, turns right onto Governor Prence Road, turns right onto Bridge Road, turns left onto Samoset Road, turns right onto Herring Brook Road, continues on Massasoit Road to the Wellfleet town line and on West Road into Wellfleet, turns right onto Route 6, turns left onto Bracket Road, turns left onto Nauset Road, turns right onto Cable Road, turns left into the Nauset Regional High School, returns via Cable Road to Nauset Road, turns left on Nauset Road (with deviation to the Senior Center on Nauset Road on request), bears right onto Schoolhouse Road, turns right onto Nauset Road, turns left onto Route 6 and returns to the Town Hall.

This route serves the residential areas east and west of Route 6, the North Eastham Center, the Nauset Regional High School, the Senior Center, the National Seashore Salt Pond Visitor Center, and the Town Hall. Connections are possible to the Orleans-Provincetown Route at points along Route 6.

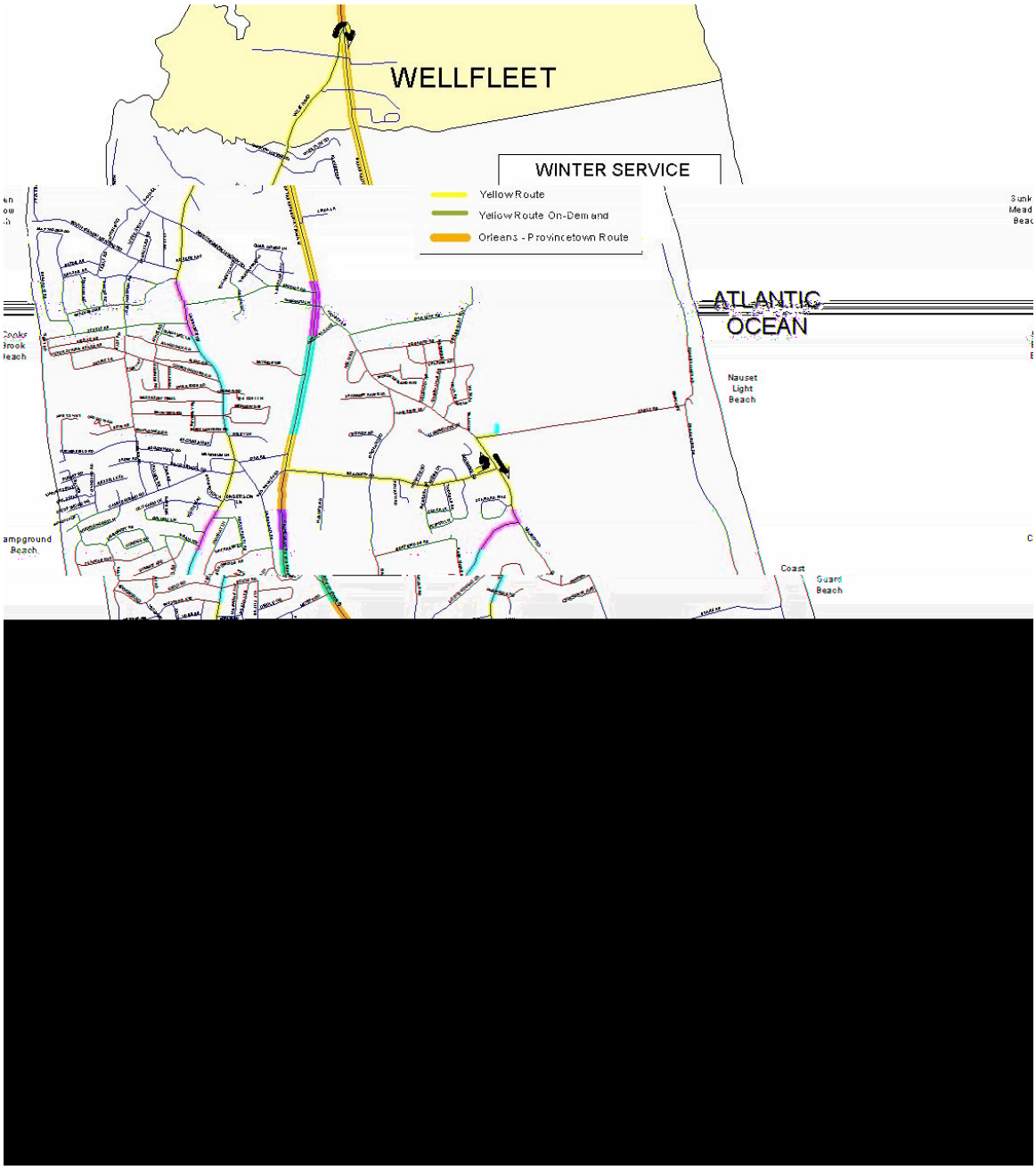


Figure 5.9
Eastham Winter Green and Yellow Service

WELLFLEET ROUTES

The Wellfleet routes have been chosen based on input from town administration and planning officials, and the Council on Aging. These routes were presented at a Selectman's meeting in December 2002, and are depicted in Figures 5.10 and 5.11. The Board of Selectman did not endorse any one recommendation, but did state that the minimum preferred transit option would be the winter routes year-round. Both summer and winter routes are proposed in this plan, but the project team is cognizant that more dialogue may be needed until a final preferred summer route could be chosen and implemented.

Summer Service *(Figure 5.10)*

Service is provided hourly. Route begins at the Town Pier, travels West on Kendrick Avenue past Mayo Beach, turns right onto Chequessett Neck Road, turns left on Holbrook Avenue, continues straight on Briar Lane, turns right onto Route 6 and left into the Outer Cape Health facility, continues South on Route 6, turns left on Cahoon Hollow Rd, turns right onto Old Kings Highway, continues on Old County Road to Route 6, turns left onto Route 6, turns left on LeCount Hollow Rd to LeCount Hollow Beach, returns on LeCount Hollow Rd and turns right on Ocean View Drive, turns into Cahoon Hollow Beach and back to Ocean View Drive, turns left onto Gross Hill Road, turns right onto Gull Pond Road, turns left onto Route 6, turns right onto School Street, turns right onto Main Street, turns left onto Baker Avenue, turns left onto Bank Street, turns right onto Commercial Street and continues on Kendrick Avenue to the Town Pier.

This route serves the Town Pier, Mayo Beach, the skateboard park, the Outer Cape Health facility, LeCount Hollow and Cahoon Hollow beaches, some residences on the East side of Route 6, the new Senior Center location, and the Town Hall and Town Center.

A limited shuttle service may be provided to the Bound Brook Island Ranch.

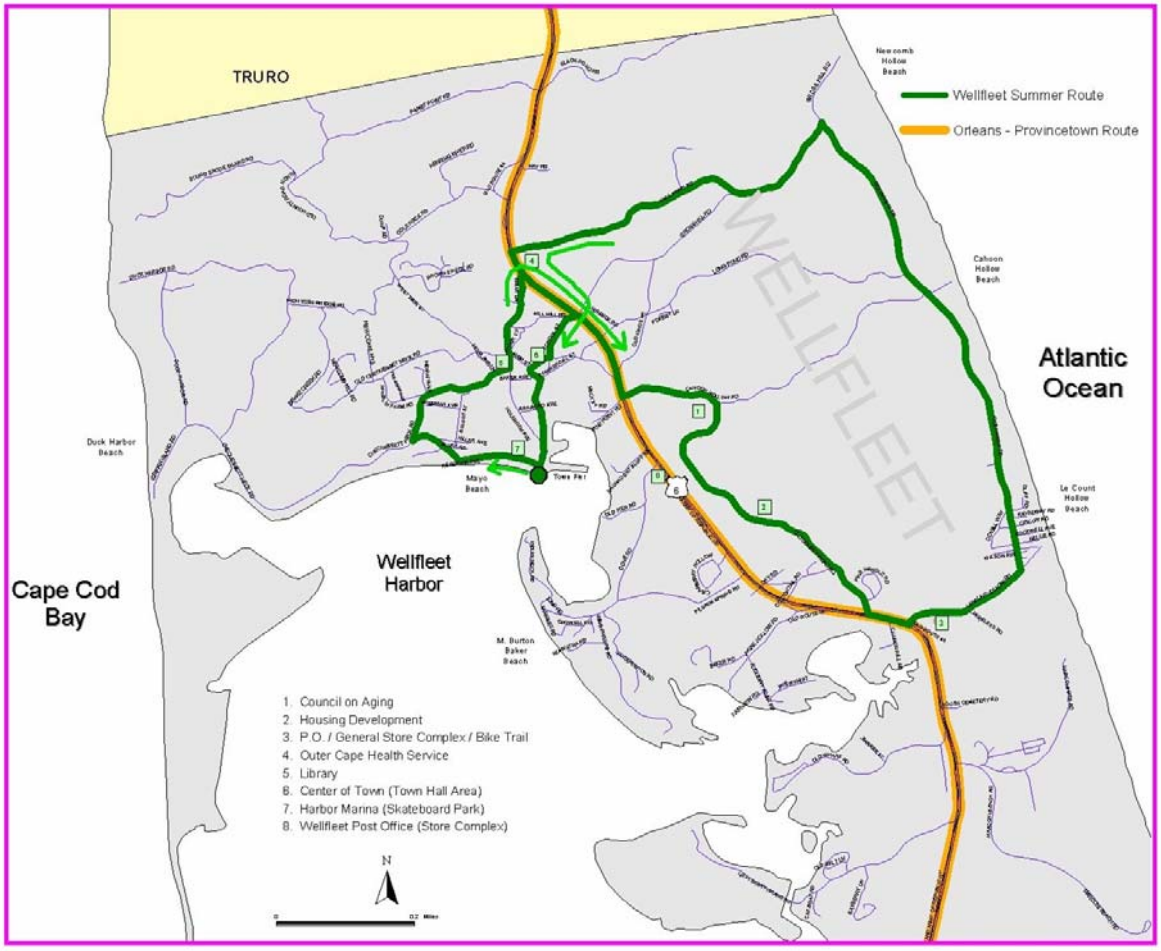


Figure 5.10
Wellfleet Summer Service

Winter Service *(Figure 5.11)*

Service is provided hourly. Route begins at the Outer Cape Health facility, turns right on Route 6 and immediately left onto Briar Lane, continues straight on Holbrook Avenue, turns left onto Commercial Street, turns left onto Bank Street, turns right onto Baker Avenue, turns right onto Main Street, turns left onto School Street, turns right onto Route 6 and left onto Lawrence Road, turns right onto Long Pond Road, crosses over Route 6 and turns left on Main Street, turns right onto Route 6 and left onto Cahoon Hollow Rd, turns right onto Old Kings Highway, continues on Old County Road to Route 6, turns around at the D&D Market on Route 6, and retraces this route back to the Outer Cape Health facility.

This route serves the Outer Cape Health facility, residences and retail, commercial, and eating establishments near the town center, the Town Hall, the Police and Fire stations, the elementary school, the existing Senior Center, the new Senior Center location, and some residences close to Route 6 on the east side.

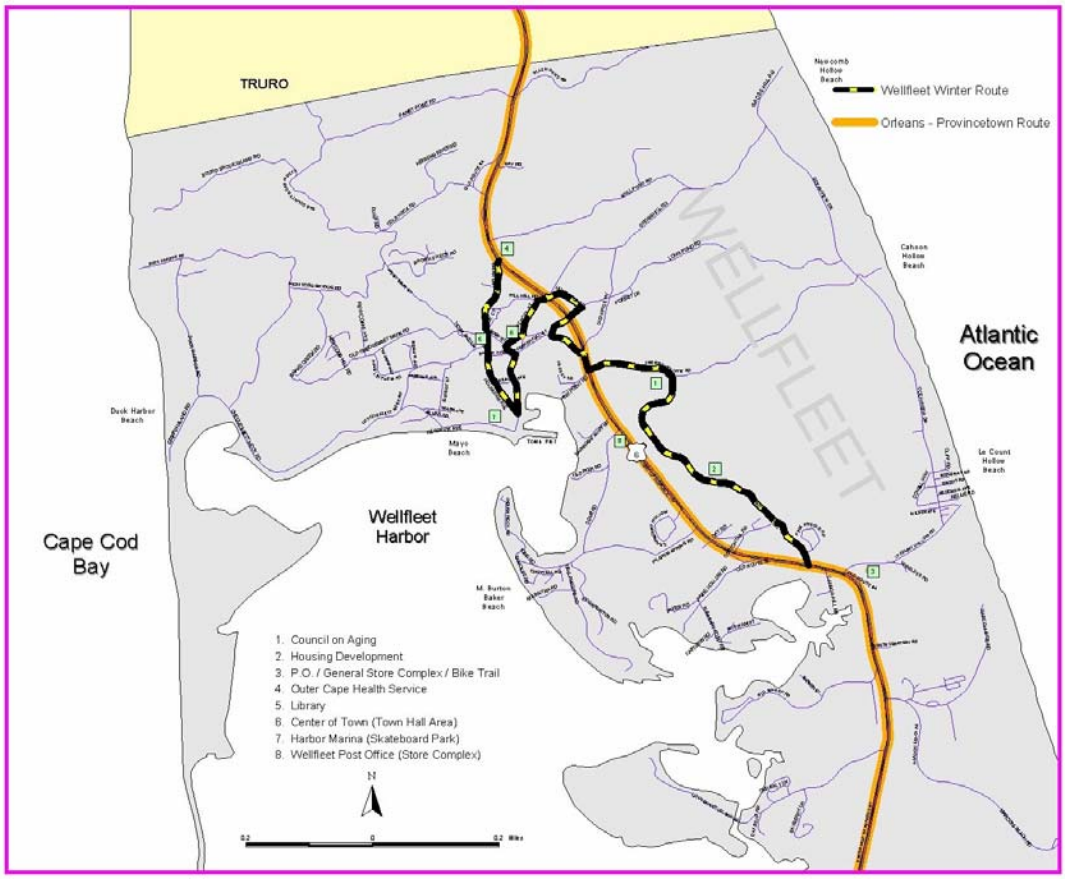


Figure 5.11
Wellfleet Winter Service

TRURO ROUTE

Summer Service *(Figure 5.12)*

Yellow Route

Service is provided hourly. Route begins at the Senior Center across from the Town Hall, travels East on Town Hall Road, turns right on Route 6A, crosses Route 6 on South Pamet Road, turns left on Osprey Way, turns right on North Pamet Road to the Youth Hostel, returns via North Pamet Road, Osprey Way, and South Pamet Road to Route 6A, turns left onto Castle Road, turns left onto Corn Hill Road to Corn Hill Beach, returns on Corn Hill Road and turns left on Castle Road, bears left onto Route 6, bears left onto 6A, turns right onto Highland Road, turns right onto Route 6, turns left onto Head of the Meadow Road to Head of the Meadow Beach, returns via Head of the Meadow Road and turns left onto Route 6, turns left onto Aldrich Road, turns left onto Soutgto HighnRo(wi11 turn1
and

Figure 5.12
Truro Summer Service

PROVINCETOWN ROUTES

Summer Service

Yellow Route (Figure 5.13)

Service is provided hourly. Route begins at the MacMillan and Fisherman's Wharf area, turns right onto Ryder Street, turns

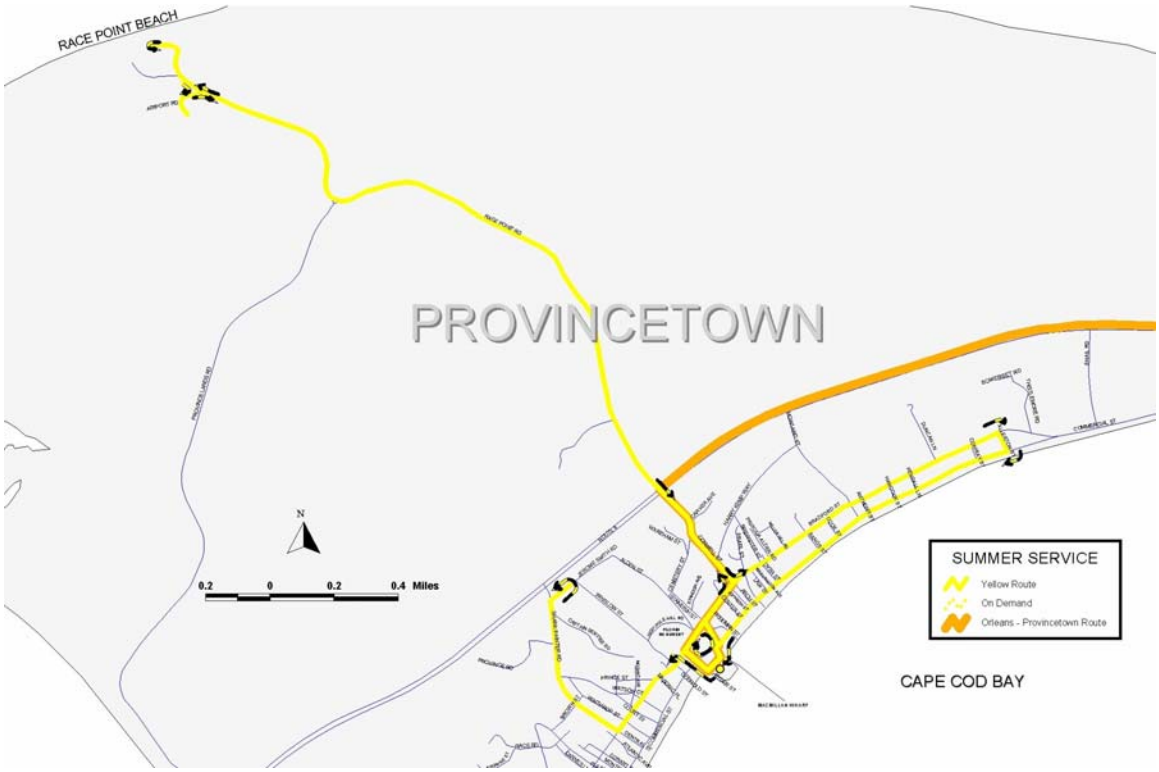


Figure 5.13
Provincetown Summer Service

Provincetown-Truro Shuttle (Figure 5.14)

Service is provided every 30 minutes. Route begins at the MacMillan and Fisherman's Wharf area, turns right onto Ryder Street, turns right onto Bradford Street (serves the Outer Cape Health Services facility via Conwell Street and Harry Kemp Way on request) and continues into Truro via Route 6A, turns left onto Highland Road, turns right onto South Highland Road to Horton's Campground, and returns to MacMillan and Fisherman's Wharf area in Provincetown via South Highland Road, Highland Road, Route 6, Standish Way, Route 6A, Commercial Street, Bradford Street, and Standish Street.

In Truro, the Shuttle primarily serves the residences and lodging establishments along Route 6A, and the campgrounds to the east of Route 6.

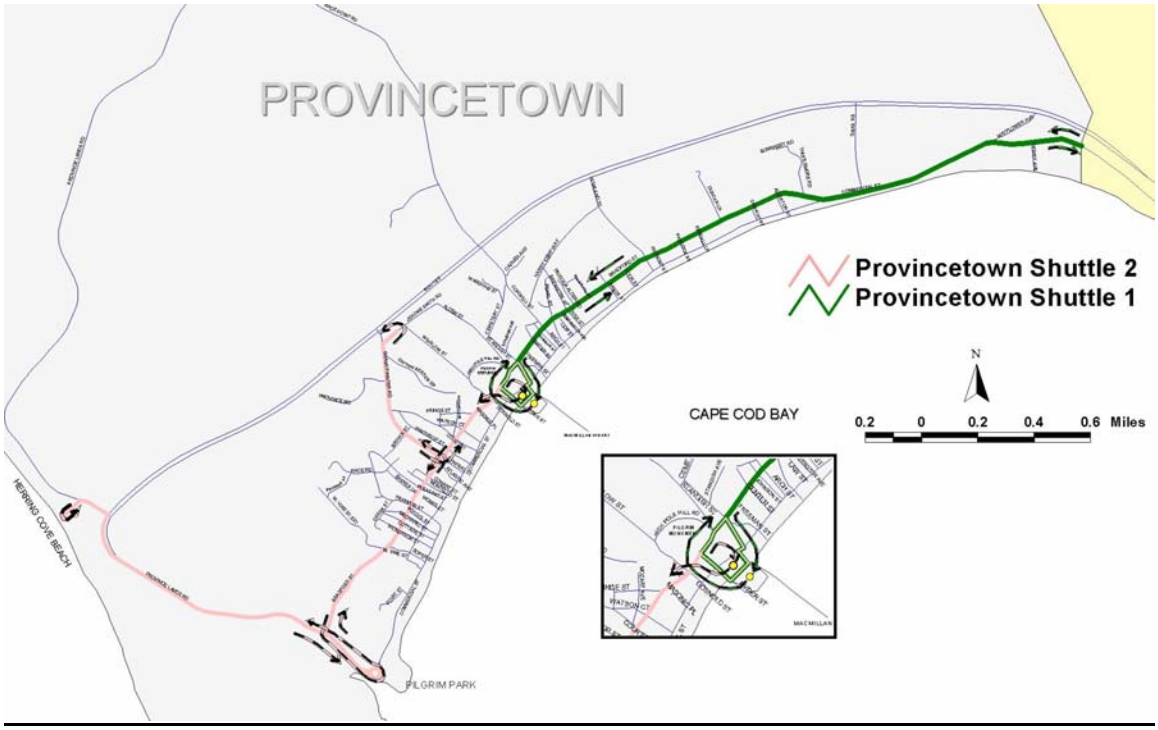


Figure 5.14
Provincetown Shuttle Service

Winter Service

Yellow Route (Figure 5.15)

Service is provided hourly. Route begins at the MacMillan and Fisherman's Wharf area, turns right onto Ryder Street, turns left onto Bradford Street, turns left onto Province Lands Road to Pilgrim Park, returns via Province Lands Road and turns right onto Bradford Street, turns left onto Shark Painter Road, to the A&P supermarket, returns via Shark Painter Road to Bradford Street, turns left on Bradford Street, turns right on Standish Street to the Wharf area, turns right onto Ryder Street, turns right onto Bradford Street, turns left onto Conwell Street (serves the Outer Cape Health Services facility via Conwell Street and Harry Kemp Way on request), crosses Route 6 and continues on Race Point Road to the condominium (apartment?) complex, returns to Bradford Street via Race Point Road and Conwell Street, turns left onto Bradford Street, turns right onto Allerton Street, and turns right onto Commercial Street, and turns left to the MacMillan and Fisherman's Wharf area.

This route serves the wharves, the commercial, retail, eating and lodging establishments and residences in the center of town, the Chamber of Commerce,

Town Hall, Pilgrims Park, the A&P supermarket, the Outer Cape Health Services (on request), and the housing complex on Race Point Road.

No winter Shuttle service is provided.

Figure 5.15
Provincetown Winter Service

Provincetown-Orleans Regional Service

The Provincetown-Orleans Regional service will serve as the spine of the Outer Cape transit route structure, shown on Figure 5.16. It is designed to provide access to retail stores throughout the region as well as the Stop & Shop supermarket at Cranberry Plaza in Orleans, health and human service facilities, access to work, residences, and overall, as a way to increase mobility without the need of a personal automobile. It is designed to provide pick-up/drop-offs at intersections with local routes along Route 6, and for on-demand pick-ups/drop-offs along the route.

The Orleans-Provincetown extension in Orleans, shown on Figure 5.17, is designed to continue from the Local Transportation Center in Orleans through the center of Orleans to the Bayberry Square area. This ensures access to residential areas, health and human services facilities, shopping and hotels/motels.

The regional service can serve as seasonal Whale Watch shuttles originating in Orleans, as well as for hotels, motels, bed & breakfasts along Route 6 ending at the McMillan Wharf in Provincetown and back to Orleans again.

Hourly service is expected initially and will be provided year round.

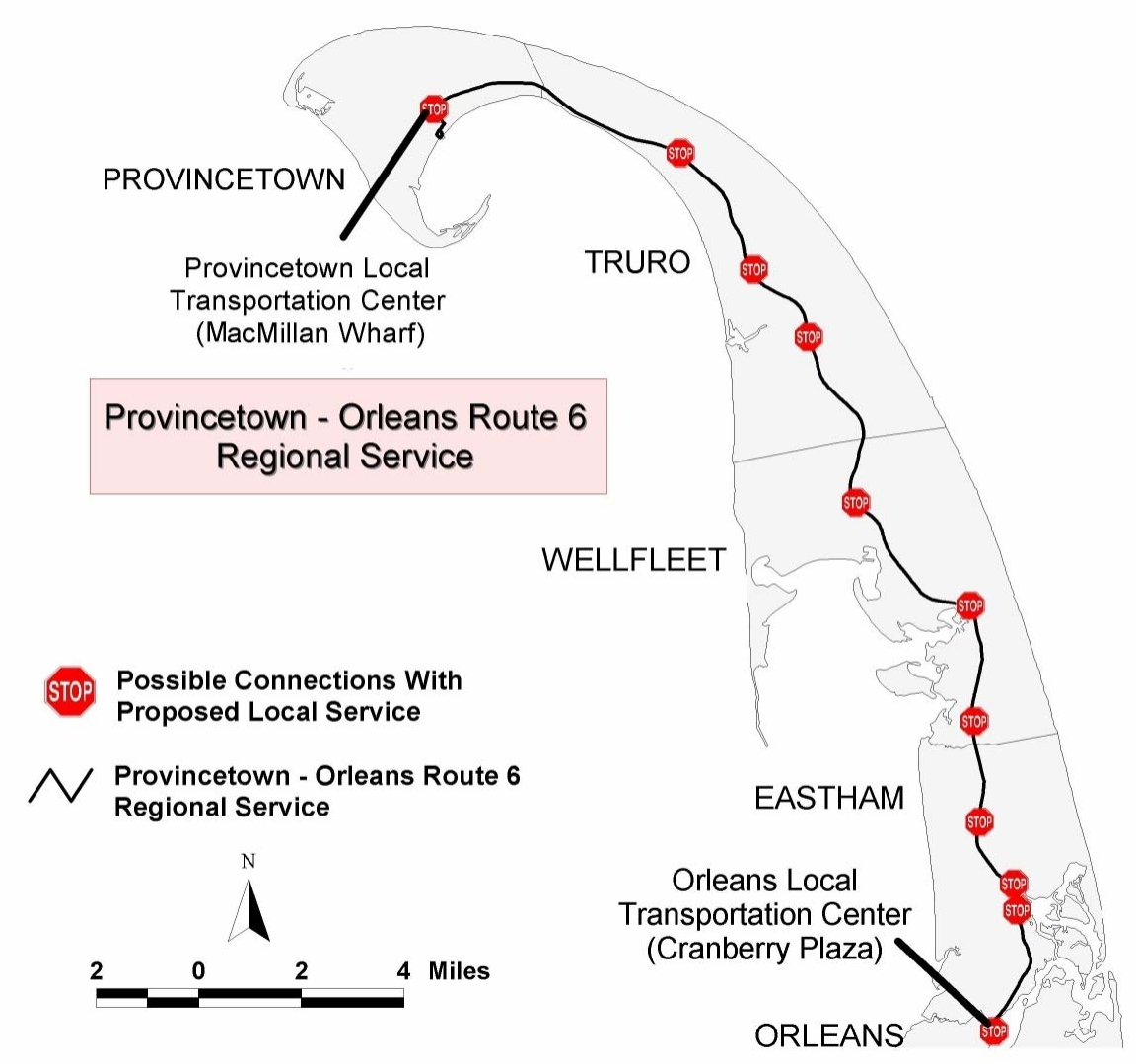


Figure 5.16
Provincetown-Orleans Route 6 Regional Service

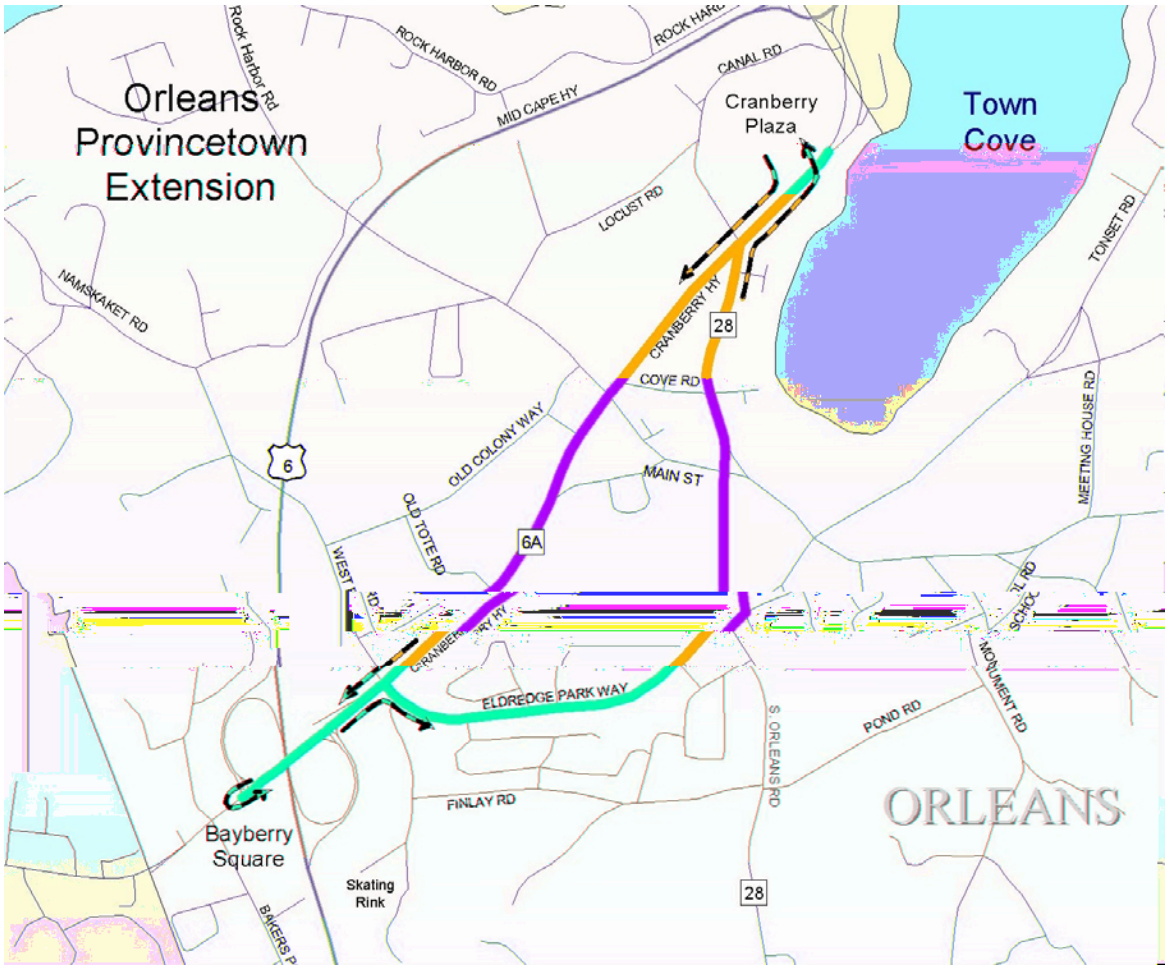


Figure 5.17
Provincetown-Orleans Extension Service

Full Build-out of Outer Cape Cod Regional and Local Service

Full summer build-out of the Outer Cape Cod Regional and Local Service is shown in Figure 5.18. Once complete, it will provide enhanced mobility throughout the region to places that people want to go, when they want to. In coordination with ferry, air and interregional bus operators, there can be direct access to/from the Outer Cape to the Lower and Upper Cape, the Islands of Martha's Vineyard and Nantucket, and points west and north, without the need for a personal automobile.

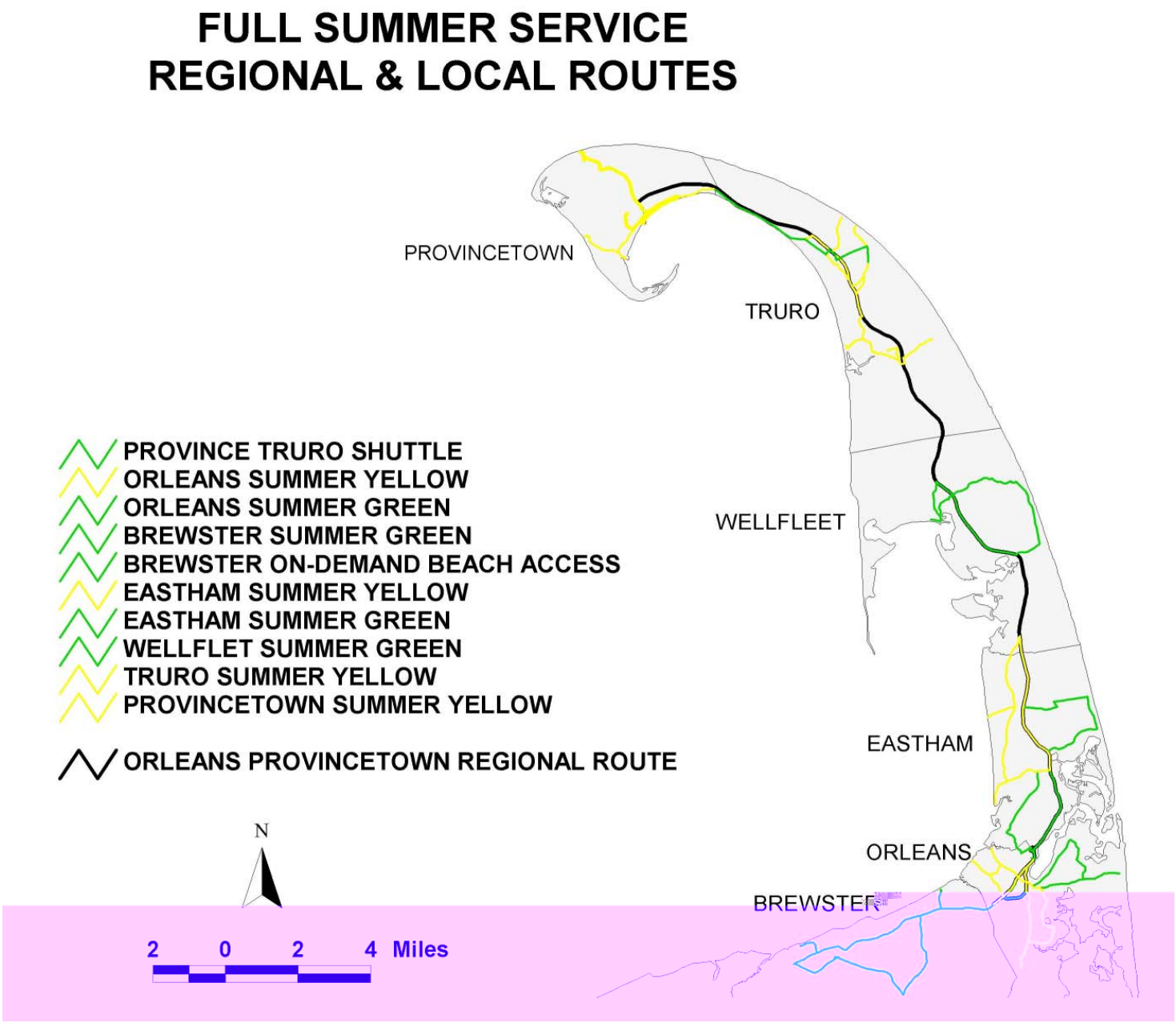


Figure 5.18
Full Summer Outer Cape Cod Regional and Local Service

Current Cape Cod National Seashore Funding Request

For the Outer Cape transit system, CACO is currently competing nationwide for the following dedicated capital ATP funding items: Bus procurements; Alternative Transportation Facility Design Prototypes; Developing transportation modeling to assist in further refining the proposed Outer Cape transit system, and National Environmental Policy Act (NEPA) (in concert with the NPS Director's Order 12) compliance to ensure that all environmental regulations are met.

The bus procurement consists of twelve 27-passenger, mid-size, low floor transit buses, using alternative clean burning fuels (as well as a 10 percent contingency factor). The Transportation Facility Design prototypes will address a variety of potential settings in residential and park areas. It will include different transit system requirements from a basic transit stop to a community transit hub. The design work would provide illustrative drawings and technical specifications that will support more detailed the system planning and financing plans. Addressing community needs and values will be the highest priority in the transit planning and facility design. These factors include maximizing visitor comfort, convenience, and safety, protecting a6c0.00contialn08 Tc0khw(a)5r

Table 5.1
FY04 NPS PMIS 89615, 89465: Procurement of Transit Related Components

Item	Quantity	Unit Cost	Total Cost
Mid-size, 27 passenger low floor, environmentally clean burning buses	12	$260,000	$3,120,000
Contingency and vehicle options	1	$312,000	$312,000
Design and conceptual drawings of shelters and ITS components in a Cape Cod	1	$350,000	$350,000
Origin and Destination, and Mode-Split Model activities	1	$100,000	$100,000
NEPA (DO 12) Compliance activities	1	$50,000	$50,000
TOTAL			**$3,932,000**

Pro-Forma Operating Costs by Town

Pro-forma operating costs by town (shown in Table 5.2) were derived through information gained during the 5-Year Public Transportation planning process, best practices around the country, and input from CCRTA and Commission staff. The assumptions for determining include the following:

- Winter travel time at speed limit (based on sight visits)
- Summer travel time at 60% of speed limit
- All service is hourly
- Cost based upon $34.46 per hour of time including inactive time between runs
- Winter service - 6 days per week, 38 weeks
- Summer Service – 7 days per week, 14 weeks (Memorial Day weekend - Labor Day weekend)

Total annual operating costs range from $1.85 million to $2.17 million depending on length of service per day.

Table 5.2
Pro-Forma Operating Costs by Town

Town	Route Time** (Minutes)	Layover Time (Minutes)	Total Time (Minutes)	Cost*** 12 hrs/day	Cost*** 15 hrs/day	Cost*** Mixed
Brewster				**$205,092**	**$242,162**	**$218,602**
Winter Route	37	10	47	$113,924	$137,484	$113,924
Summer Route	73	10	83	$91,168	$104,678	$104,678
Orleans				**$325,764**	**$393,156**	**$346,036**
Winter Route Yellow	29	10	39	$113,924	$137,484	$113,924
Winter Route Green	25	10	35	$113,924	$137,484	$113,924
Summer Route Yellow	49	10	59	$48,958	$59,094	$59,094
Summer Route Green	38	10	48	$48,958	$59,094	$59,094
Eastham				**$211,840**	**$255,672**	**$232,112**
Winter Route	33	10	43	$113,924	$137,484	$113,924
Summer Route Yellow	46	10	56	$48,958	$59,094	$59,094
Summer Route Green	52	8	60	$48,958	$59,094	$59,094
Wellfleet				**$162,882**	**$196,578**	**$173,018**
Winter Route	29	10	39	$113,924	$137,484	$113,924
Summer Route	45	10	55	$48,958	$59,094	$59,094
Truro				**$91,168**	**$104,678**	**$104,678**
No Winter Route						
Summer Route	75	10	85	$91,168	$104,678	$104,678
Provincetown				**$211,840**	**$255,672**	**$232,112**
Winter Route	26	10	36	$113,924	$137,484	$113,924
Summer Route Yellow	41	10	51	$48,958	$59,094	$59,094
Summer Shuttle	38	10	48	$48,958	$59,094	$59,094
Provincetown - Orleans				**$646,657**	**$724,773**	**$669,813**
Winter	62	10	72	$455,641	$510,601	$455,641
Summer	88	15	103	$191,016	$214,172	$214,172
TOTAL				**$1,855,243**	**$2,172,691**	**$1,976,371**
				$1,139,185	$1,335,505	$1,139,185
				$716,058	$837,186	$837,186

* Goes to Cranberry Plaza in Orleans
** Includes stops for signals and picking up passengers.

*** Includes driver preparation, end of shift, and deadheading time.

6 INTELLIGENT TRANSPORTATION SYSTEMS

This section of the plan has been developed building on previous work identifying the transportation needs of Cape Cod residents and visitors. Providing information to visitors to CACO sites is a focus of this plan as the NPS is the primary sponsor of this work. However, because of the continued cooperative efforts on Cape Cod to address transportation needs, this section identifies opportunities to serve a wide array of Cape Cod visitors and residents.

In developing this section, goals and objectives identified by the NPS in the CACO GMP, objectives identified in the Cape Cod Regional Transportation Plan, and the Cape Cod Five-Year Public Transportation Plan were of primary importance. Information and recommendations gathered in development of the Five-Year Plan helped identify transportation needs that could be addressed with the planning, development, and deployment of Intelligent Transportation Systems (ITS) technologies.

NATIONAL PARK SERVICE ITS OBJECTIVES AND POLICIES

The Cape Cod National Seashore General Management Plan describes the Park's mission and mission goals, along with other mandates and commitments. One of the goals for public use for the park is to *"Provide opportunities for the public to access a variety of accurate and up-to-date trip planning and orientation information about the national seashore and Cape Cod before leaving home."* This includes initial information, arrival and local travel information, partnership and stewardship opportunities, relationship to the national seashore visitor centers, and highway and local information signs. In short, CACO has identified Intelligent Transportation Systems as a means for meeting its mission goals and providing a favorable experience for park visitors.

CACO's mission goals are supported by the National Park Service Alternative Transportation Program, which, under Section 3039 of the transportation Equity Act for the 21st Century (TEA-21), requires the Secretary of Transportation, in coordination with the Secretary of the Interior, to *"undertake a comprehensive study of alternative transportation needs in national parks and related Federal Lands."* The National Park Service Alternative Transportation Program (ATP) is a product of the legislative mandate. Its goals are to use ITS to:

- Relieve traffic congestion and parking shortages,
- Enhance visitor mobility and accessibility,
- Preserve sensitive natural, cultural, and historic resources,

- Reduce pollution,
- Provide improved interpretation, education, and visitor information services, and
- Improve recreational and economic opportunities.

ITS PARTNERS

The Coordinating Council is designed to serve as a forum for Cape stakeholders in transportation coordination, including ITS planning, development, deployment, and operations, to work together to address common transportation goals and objectives. ITS planning, development, and deployment will require the assistance of MassHighway and the Federal Highway Administration and will benefit from assistance available through ITS Massachusetts, a statewide industry group that provides technical assistance on ITS issues.

Cape Cod and Islands Passenger Transportation Coordinating Council

To successfully develop a coordinated Intelligent Transportation System on Cape Cod, the planning, development, and deployment of these technologies must be coordinated. As stated in Section 3 of this plan, the establishment of the entity made up of task force members and other interested parties called the Cape Cod and Islands Transportation Coordination Council (the Council) is expected serve as the regional forum for coordinating transportation planning and development activities.

As the forum for coordinating the planning and development of transportation improvements on Cape Cod, the Council will have a significant role in the planning and development of Intelligent Transportation Systems (ITS) infrastructure. As a Council member, CACO will have the opportunity to coordinate ITS planning and deployment with other Cape partners. The Council will also serve as a forum for developing and adopting Regional ITS Architecture and Standards in coordination with the Commonwealth of Massachusetts.

Cooperation between the Council and the Massachusetts Highway Department will also provide the opportunity for coordination with the rest of Southeastern Massachusetts. This will be necessary to ensure that ITS planning and deployment on Cape Cod can effectively work with deployments planned for the rest of Southeastern Massachusetts, possibly allowing for the establishment of a Cape Cod/Southeastern Massachusetts transportation operations center.

The Council will provide a significant and useful resource as CACO embarks on development and implementation of a comprehensive ITS program. CACO does

not need to wait for the full establishment of the Council to move forward on ITS planning and investment, but CACO should definitely continue to work with its partners on Cape Cod to develop, through the Council, a regional forum for ITS planning and cooperation.

MassHighway

In September 2002, MassHighway Acting Commissioner John Cogliano announced that Massachusetts Highway Department issued a Request for Ideas (RFI) for Public-Private Intelligent Transportation Systems (ITS) Partnerships. *"The purpose of this RFI is to seek new and innovative ITS partnership projects between MassHighway and the private sector,"* Commissioner Cogliano said. *"By issuing this RFI, MassHighway acknowledges the innovation and ability of the private sector to develop creative ways to produce transportation products and services and that are beneficial to the general public, government, and the private sector."* Once the results of this RFI have been analyzed and released, efforts should be made to initiate a public/private ITS partnership in conjunction with the Cape Cod and Islands Passenger Transportation Coordinating Council.

MassHighway has entered into a unique partnership with the University of Massachusetts-Amherst and other regional transportation agencies to provide rural traveler information services and traffic operations support for the Pioneer Valley region of western Massachusetts. Known as the Regional Traveler Information Center (RTIC) at the University of Massachusetts, the system will serve as the information-processing hub for western Massachusetts and adjoining areas. This project is a Federal ITS earmark project designed to demonstrate the integration of existing or planned ITS projects. With lessons learned gathered from this project, a next step is for MassHighway to identify funding and program assistance to provide a similar system for Cape Cod. CACO can assist with providing capital funding, but at this time, exactly what components could be funding though the NPS is not known.

Other MassHighway initiatives should include establishing Regional Architecture and Standards for Cape Cod. A preferred first step would be to conduct a MassHighway ITS Deployment Evaluation. The purpose of the evaluation is to recommend strategies for organizational improvements that promote ITS, further program efficiency, ensure high standards of excellence, attract discretionary funding, and enhance MassHighway and the Massachusetts competitive advantage in all areas of advanced technology. Other tasks should include:

- Updating the ITS Strategic Plan for Cape Cod (it is now about 7 years old)
- Defining/Creating interfaces with adjacent regions and states

- Participating in the development of a Cape Cod Operations Plan and eventual operations center for Cape Cod/Southeastern MA
- Integration of NPS early implementation ITS elements into regional and state planning and operations
- Development of encroachment permits with District 5
- Update Cape Cod ITS efforts with current MHD ITS planning/control systems and architecture
- Technical Resource/Peer Review

Federal Highway Administration/Federal Transit Administration Roles

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have significant national roles in providing guidance and training on ITS architecture and standards and funding ITS planning, development, and deployment efforts. FHWA and FTA are expected to play the following roles in the planning, development, and deployment of ITS on Cape Cod:

- Fund the Strategic Plan for Cape Cod
- Participate/Review development of ITS programs for Cape Cod
- Ensure adherence to ITS Architecture and Standards
- Technical Resource/Peer Review

ITS Massachusetts (MA) Roles

The mission of ITS MA is to serve as a forum and a resource for ITS, increase awareness of ITS, and serve as an advocate and champion to mainstream ITS technologies and services.

Short-term actions should include:

- Brief the Cape Cod and Islands Passenger Transportation Coordinating Council, elected and appointed officials through its Awareness Committee about ITS in general, and the potential role in Massachusetts. The objective is to establish ITS MA as a resource for information on regional and local ITS projects and ITS benefits.
- Become the linkage between Cape Cod and the ITS technical community in the Commonwealth
- Become a Technical Resource through the ITS MA Professional Capacity Building Program (PCB)

- Conduct Peer Reviews to strengthen the structure of the Coordinating Council, provide technical assistance, and show best practices to avoid problems in the future.

DEPLOYED AND PLANNED ITS PROJECTS

CACO has deployed portable Variable Message Signs (VMS) near the National Seashore, and is looking at opportunities to provide better information to CACO visitors and better manage transportation resources including parking. The CCRTA has deployed systems to provide better information on bus locations to the transit users, and is considering a number of other ITS deployments including smart kiosks and information display boards.

The NPS has identified several ITS deployments it would like to accomplish in the short-term. These include expanding the existing use of portable VMS, and possibly installing permanent VMS at sites where warranted, and deploying technology to better manage parking and inform the public when Park Service parking lots are full and directing travelers to alternate parking facilities. Partners involved in the development of the Five-Year Plan are interested in opportunities to use ITS to improve and expand existing Emergency Management Systems.

Five-Year Plan Recommendations

In the Cape Cod Five-Year Public Transportation Plan, various ITS technologies were presented explaining their specific use and how they can make transportation services operate better. These technologies are primarily transit based and serve a specific purpose within a larger transportation context. They provide a starting point for integrating ITS technologies into the transportation system on Cape Cod. The ITS recommendations included in the Five-Year Plan should be adopted and deployed and should be integrated with the planning, development, and deployment of other ITS technologies.

The Five-Year Plan identified the following ITS related technologies in its recommendations:

- Use high-tech electronic networks and devices to make better and more efficient use of existing public transportation systems.
- Install a system of changeable message signs for major roads.
- Develop an integrated radio system to connect providers to ensure easy passenger connections.

- Integrate services at the new Hyannis Transportation Center including information services.
- Plan smaller scale transportation centers in Orleans, Provincetown, and the Outer Cape.
- Replace the CCRTA's operations center
- Develop and operate a central dispatching system to coordinate human service transportation.
- Improve marketing of transportation services and availability of information on these services.

NATIONAL AND REGIONAL ITS ARCHITECTURE AND STANDARDS[5]

The National ITS Architecture and Standards provide a framework that allows for the development of interoperable systems within and across transportation modes. The Regional ITS Architecture is a smaller version of the National ITS Architecture that is focused on regional ITS development and deployment. The goal is to have all regional architectures joined together to form a national architecture in the same manner that local/municipal/agency architectures merge together to form a regional architecture.

The Commonwealth of Massachusetts, through MassHighway, is responsible for developing Regional ITS Architecture and Standards and leads this effort. This is an on-going project and transportation agencies and other interested organizations on Cape Cod should work with this State on this effort. Additional detail describing National ITS Architecture and Standards can be found in Appendix C.1.

Traveler Information Systems

Providing information important to the traveling public, such as roadway conditions, planned construction delays, accidents, emergencies, congestion, and detours, are an important tool to help travelers better prepare and navigate within any area, including Cape Cod. This information is referred to as Traveler

[5] A primary source of information for this section can be found in "Advanced Public Transportation Systems: The State of the Art Update 2000," Robert Casey, Terrence M. Sheehan, et al, FTA-MA-26-7007-00-1, December 2000.

Information and it is delivered to potential users through Traveler Information Systems. These systems allow an authority such as the Park Service, the State Police, or MassHighway to provide the traveling public with advanced real time information that will assist them in making informed transportation decisions. Transportation Information Systems are comprised of the following components:

- Pre-trip Travel Information
- En-route Driver Information
- Route Guidance
- Ride Matching and Reservation
- Traveler Services Information
- Traffic Control
- Incident Management
- Travel Demand Management

Additional detail describing Traveler Information Systems components can be found in Appendix C.2. Pre-trip traveler information systems help travelers make decisions about the choice of transportation mode, route, and departure time before they begin their trip. There are three main types of pre-trip information: General Service Information, Itinerary Planning and Real-Time Information. Pre-trip information can assist a driver map a route, gather information on current roadway conditions, and identify detours around planned construction. Transit users can identify transit routes, schedules, fares, and connections. Systems can provide basic information on getting from one point to another or can provide additional information on sites and services along the travel route.

En-Route Driver Information systems provide real-time information to travelers who have commenced a trip. Information on delays, accidents, weather conditions, and emergency situations can be communicated to the traveling public. Route guidance systems can identify alternative routes that are available to by-pass delays. Traveler Services Information provides travelers with information on services and facilities during trip planning and while en-route.

Traveler Information Data Collection

Providing information to the traveling public begins by collecting data. The focus of this chapter is technologies that travelers can access to get information rather than the technologies and methods required to collect information but a brief discussion of information sources is necessary. Maps, whether old-fashion paper maps or trip planning software available on many web-based sites, and transit

schedules provide the simplest form of information useful to the travelers. Dynamic systems that collect real-time information have been developed to provide more accurate and timely information to travelers.

Automatic Vehicle Locator (AVL) systems can let a person waiting for a bus know where the bus currently is and estimate its arrival time. Data collected from vehicles equipped with AVL systems can provide information on average road speeds that can help a driver know what the travel conditions are along his or her planned route. Television cameras placed along roadways, at bridges and other major connectors, and at major intersections can allow transportation managers to monitor travel conditions. Individuals operating vehicles on routes, such as police officers, bus drivers, and highway department staff can transmit information to a central control center that can then be disseminated to the public. Detectors along roadways and at intersections can count vehicles crossing a specific point and provide data useful to determine current traffic volume.

Data once collected would be transferred to a central point for the purpose of disseminating information to travelers. For single agencies, such as the CCRTA, this information is collected and disseminated internally. To provide better assistance to travelers information can be collected from multiple sources, fed into a data collection center, and then distributed through multiple sources. This is typically done through a transportation operations center.

Traveler Information Dissemination Technologies

A large number of technologies have been adapted and developed to disseminate information to the traveling public during trip planning and while en-route. These include Interactive Voice Response (IVR) systems, web-based information, kiosks, radio services, and wayside information. They include telephone systems, kiosks, websites, Highway Advisory Radio, Television, Variable Message Signs, and Pagers and Handheld Wireless Technology.

PARKING MANAGEMENT SYSTEMS

Several technologies currently exist to assist to automate portions of a parking management system (PMS). They include pneumatic tubes, loop detectors, video cameras, and acoustic sensors. Although all of solutions are designed to make parking management more efficient and less labor intensive they vary by cost and capabilities. Table 6.1 presents a breakdown of each solution by considering its basic background information, costs, advantages and disadvantages. Additional detail describing PMS components can be found in Appendix C.3.

Table 6.1
Parking Management Technologies[6]

Sensor Technology	Background	Benefits	Disadvantages	Approximate Costs
Pneumatic Tubes	Vehicles are detected based on a change in air pressure in hollow rubber tubes stretched across the roadway.	Cost effective; traditional method - can be installed quickly.	Tubes are noticeable and easily damaged or vandalized; traffic data limited to axle count.	About $12K for 9 lots, each with tube, transmitter, & battery, and one base station with a receiver and computer.
Loop Counters	Metal loop embedded in pavement that detects vehicles using the electro-magnetic field that the vehicle generates.	Cost effective & hidden from view; traditional technology - can be installed quickly.	Require roadway maintenance in order to remain concealed; traffic data limited to vehicle and size.	About $23K for 3 pairs of loops, controller unit wireless links, cabinet, & software.
CCTV Video Cameras	Software interprets images from cameras and translates the info into vehicle numbers, speeds, and lengths.	Allows for security surveillance; one camera can handle multiple lanes of traffic; provides rich array of traffic data.	Highly noticeable and require more maintenance; affected by weather (fog); large vehicles can obscure smaller vehicles.	$45K + for 3 mounted cameras, wireless links, computer, & software.
Acoustic Sensors	Sensors measure sound levels from tire moving on roadway.	Small; can cover multiple lanes; low power consumption.	Background noise affects accuracy as well as temperature & air turbulence.	$40K + for 3 pairs of sensors, controller unit, wireless links, software, & computer.

[6] Supporting information for this table can be found in Chapter 3, Table 3, page 9 from the *Sandy Hook Gateway National Recreation Area ATS Plan, August 2002* prepared for the NPS Northeast region.

Security and Emergency Management

The current emergency and preparedness guidelines in place for Cape Cod are where developed to respond to hurricanes. The Massachusetts Emergency Management Administration (MEMA), the state agency responsible for emergency planning on Cape Cod and statewide, developed this plan based on the assumption that a hurricane is the only major emergency situation that could affect Cape Cod. Cape Cod, through Project Impact, is working to make changes to the emergency management plan to better serve Cape residents and visitors in the event of an emergency. ITS deployments, such as VMS, real-time collection of traffic data, and improved coordination of information that will facilitate better communication across emergency responders and to the general public, can serve to improve emergency preparedness and response. Emergency management services should be considered in the planning, development, and deployment if ITS technologies. Additional detail on current security and emergency preparedness, description of stakeholders, and how stakeholders can work together can be found in Appendix C.4.

ITS RECOMMENDATIONS

The overall purpose of this section is to present the various transportation and emergency management solutions available to the National Seashore and Cape Cod as a region. Cape Cod has a growing year round population and continues to be a major tourist attraction. Both put considerable constraints on a transportation system that was designed for much smaller amounts of traffic. Cape Cod is fortunate that it has many dedicated transportation agencies and stakeholders that are already working together to improve transportation on Cape Cod. These partners, with the recommended creation of the Cape Cod Transportation Council discussed earlier in this plan, are establishing a venue for planning, developing, coordinating, and deploying ITS technologies recommended in this plan.

ITS Architecture and Standards Integration

Cape Cod should work with the Commonwealth to develop its ITS deployments consistently with the other ITS components being deployed by MassHighway and other transportation agencies. The State is currently developing the ITS Architecture and Standards for the Boston Metropolitan Area and the structure developed in the process will serve as a template for Cape Cod Architecture and Standards. In the long-term, the Cape Cod region needs to be aggressive in coordinating it's ITS architecture with the Boston region. Since many of the main

transportation corridors that serve Cape Cod fall within the Boston architecture, any ITS deployment on these roads will have an affect on the Cape Cod region. Implementing ITS solutions to problems on Cape Cod does not require waiting for the establishment of a regional architecture and standards, the National Architecture and Standards provides significant guidance regarding technical issues related to ITS planning, development, and deployment. The Coordinating Council, as the regional entity designed to facilitate cooperative efforts in addressing transportation issues, provides a forum for developing the regional architecture and standards.

SHORT-TERM ITS

ITS Architecture and Standards provide a structure for ITS planning, development, and deployment and this issue should be addressed in the short-term. Numerous ITS technologies, particularly in the area of traveler information systems, are recommended for short-term deployment as well. Traveler information systems are flexible in nature this allows for components to be deployed in stages if necessary. For instance funding may prohibit the deployment of a fully integrated system during one funding cycle. Parking management systems, already identified as a priority by the NPS, can be deployed in the short-term. The short-terms deployment technologies recommended here can work independently until a larger system is developed.

Several agencies can, in the short-term, identify working agreements through Memorandums of Understanding. Specifically, the NPS should work with MassHighway to identify opportunities and methods for sharing data and information and to facilitate NPS projects aimed at informing travelers to NPS facilities before the travelers reach NPS sites. In the short-term, the Hyannis Transportation Center is a likely physical location for the collection and dissemination of ITS information.

Variable Message Signs

Commencing in the summer 2002 season, CACO operates one portable Variable Message Sign (VMS) on Route 6 near the Salt Pond Visitors Center. This sign can be somewhat difficult to read before making a driving decision. CACO and MassHighway should work together to develop a strategy of locations that will allow for optimal time for visitors to receive information and make decisions. The Volpe Center recommends that portable VMS be located only on Cape Cod. This will not only allow for a more applicable transition to the signage but also help ensure that the local business community realizes that these signs are designed to ensure more efficient mobility and not deter visitors from certain locations. Specifically, many of the signs should be placed between Orleans and

Provincetown, with several near exit ramps on Route 6 beginning near Exit 6 in Barnstable and Exit 9 in Dennis. The major reason for this is that until a comprehensive traveler information system is in place, the NPS main priority should be to provide parking availability, event information and beach conditions. Therefore, most of the portable VMS should be placed before visitors reach the various beaches and attractions throughout the National Seashore along Route 6 and Route 6A. There is also a need for the NPS Denver Service Center to become involved in helping develop signage that is in keeping with the unique Cape Cod character, yet provides necessary information that is pleasing and useful to the traveler. Figure 6.1 shows proposed locations for VMS on Cape Cod.

A Memorandum of Understanding (MOU) must be developed between CACO and MassHighway. These entities will need to agree on the type of messages that will be displayed on the variable message signs, and responsibility for maintaining and updating them. Specifically, CACO would like to update the traveling public along Route 6 of upcoming traffic conditions, parking availability, possible park events and beach conditions. Although MassHighway generally only supplies traffic conditions and construction alerts on its VMS, it is recommended that they work with CACO to broadcast the NPS messages, as it has a very direct impact on traffic along Route #6 on Upper Cape Cod. Included in this working agreement will be the NPS commitment to rent/purchase portable variable message signs to be deployed at key locations along Route 6. These locations need to be approved and permitted by MassHighway, so it is imperative that this MOU also contain a detailed description of the locations that MassHighway Region 5 and the NPS have agreed upon.

Kiosks

In addition to portable VMS, CACO in coordination with the Cape Cod Commission and other transportation stakeholders should plan and deploy smart kiosks in several major transportation/visitor centers. Specifically, CACO should procure these kiosks as soon as funding is available so those interested stakeholders can begin to present information in a uniformed manner. The various Outer Cape Chambers of Commerce are very interested in how information is presented, and they need to have active participation early. They should be designed to be user friendly and be able to provide all types of visitor service information, including transportation. Two types of kiosks, Full Service and Information Sites, are recommended in the short-term with a third type of kiosk developed as part of the development of bus shelters.

Full Service Kiosks would be located at roadside rest areas, chamber information centers, Transportation Centers, major activity centers, and they could conceivably be located in hotel lobbies and at tourist destinations. This level of kiosk would essentially be an Internet site that is fully interactive. This type of

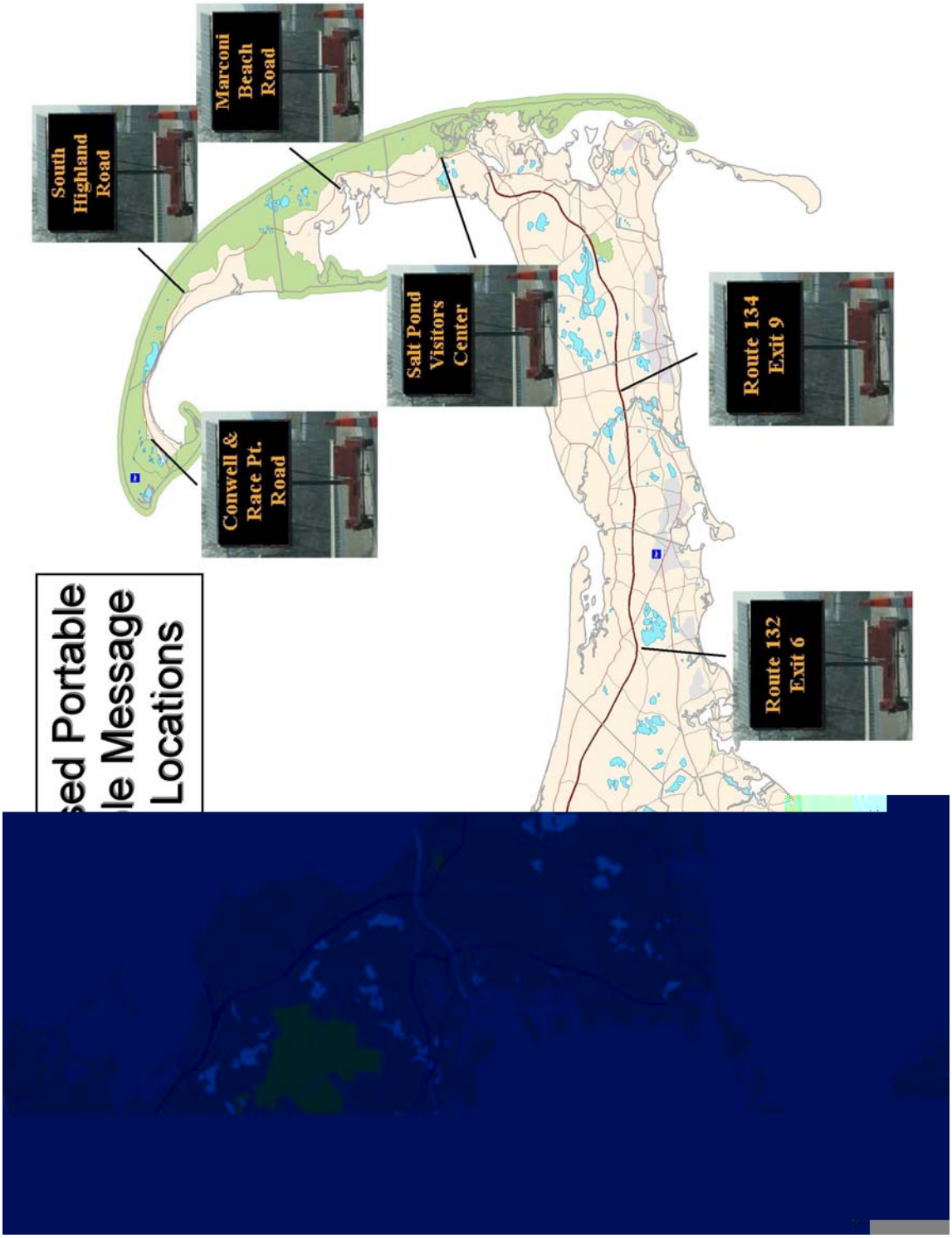


Figure 6.1
Proposed VMS Locations

kiosk would have the advantage of selling advertising and be the same format as the web site information site. Information Site Kiosks would provide information services that would be interactive to a decreasing degree and located at secondary sites requiring less of an investment than for kiosks. The type of information would be appropriate to the place the kiosk is located. Kiosks at transportation transfer sites would be capable of handling and displaying information for multiple transportation providers with simple selection menus for inquires. Estimated Time of Arrival (ETA) information displayed when the kiosk is not engaged for inquiries. Kiosks at local activity centers, such as village centers, would provide ETA signage with no capability for information inquiries. All kiosks should include capabilities for "call buttons" or emergency response alarms.

Proposed Kiosk Sites

It is proposed that 15 Full Service Kiosks be installed at the following locations (Figure 6.2):

- Provincetown – MacMillan Wharf, Provincelands Visitor Center
- Truro – Highlands Center at Cape Cod National Seashore
- Eastham – Salt Pond Visitor Center, Chamber of Commerce Info Center
- Orleans – Proposed Local Transportation Center
- Barnstable – Rte 132 Visitors information Center (food court area), Rte 132 Park and Ride lot (outside), Hyannis Transportation Center, Hyannis SSA Facility
- Bourne – Canal Visitors Center, Sagamore Park and Ride lot
- Falmouth – Woods Hole SSA facility
- Wareham – Rte. 25 Visitors Center
- Boston – South Station

It is proposed that 10 Informational Kiosks be installed at the following locations (Figure 6.3):

- Falmouth – Tedeschi's, Falmouth Depot
- Harwich – 124 Park and Ride
- Orleans – CVS at Main and 6A
- Eastham – Town Hall
- North Eastham – Village Green
- Wellfleet – D&D Market, Town Hall
- Truro – Post Office, Dutra's Market, Highland Light Parking Area

The same information available from the Full Service Kiosks should also be available on the World Wide Web. These "virtual kiosks" would allow individuals planning a transit trip to click on a point along the route to learn when the next bus should arrive. Arrival times would be based on real time tracking of buses.

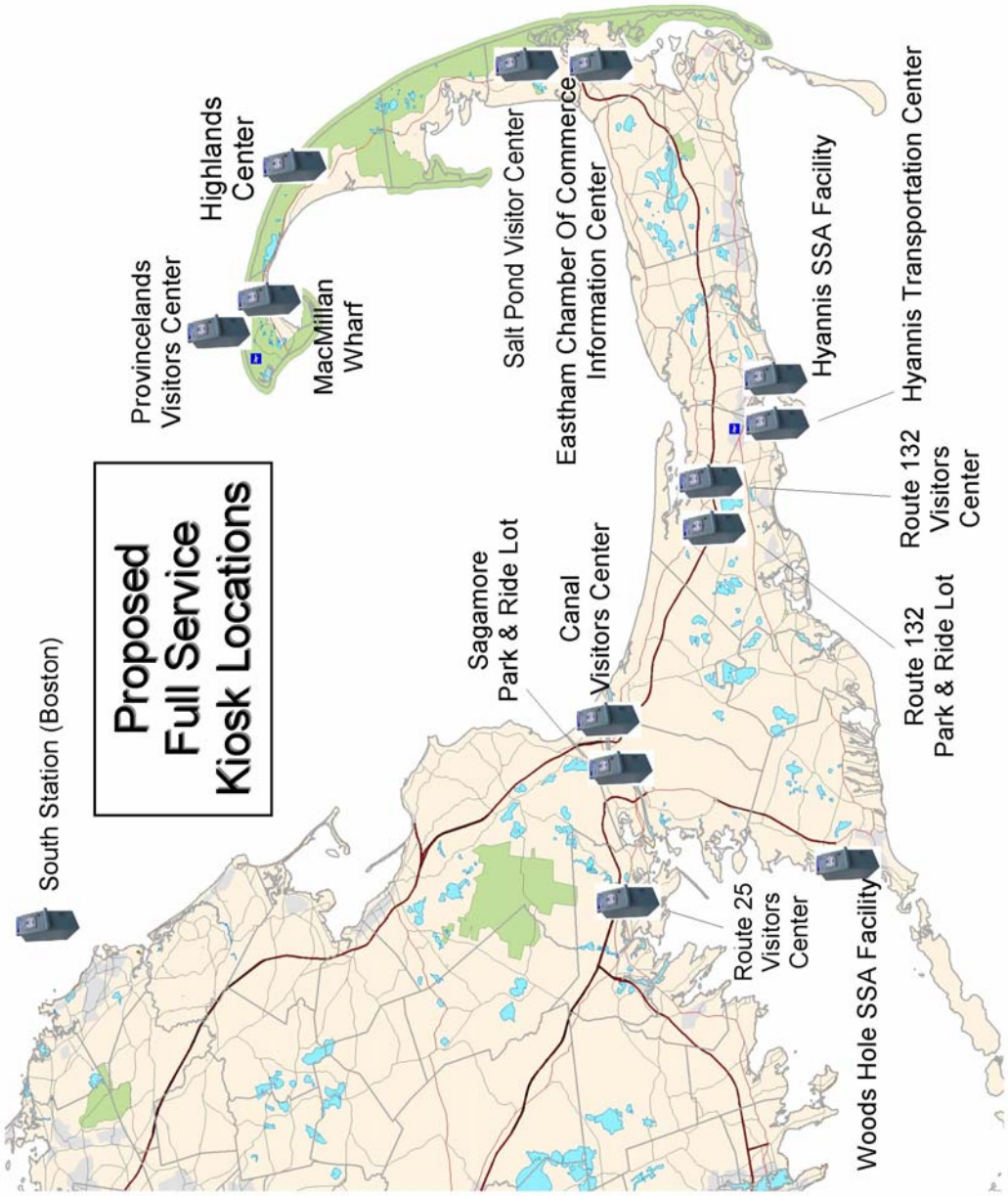


Figure 6.2
Proposed Full Service Kiosk Locations

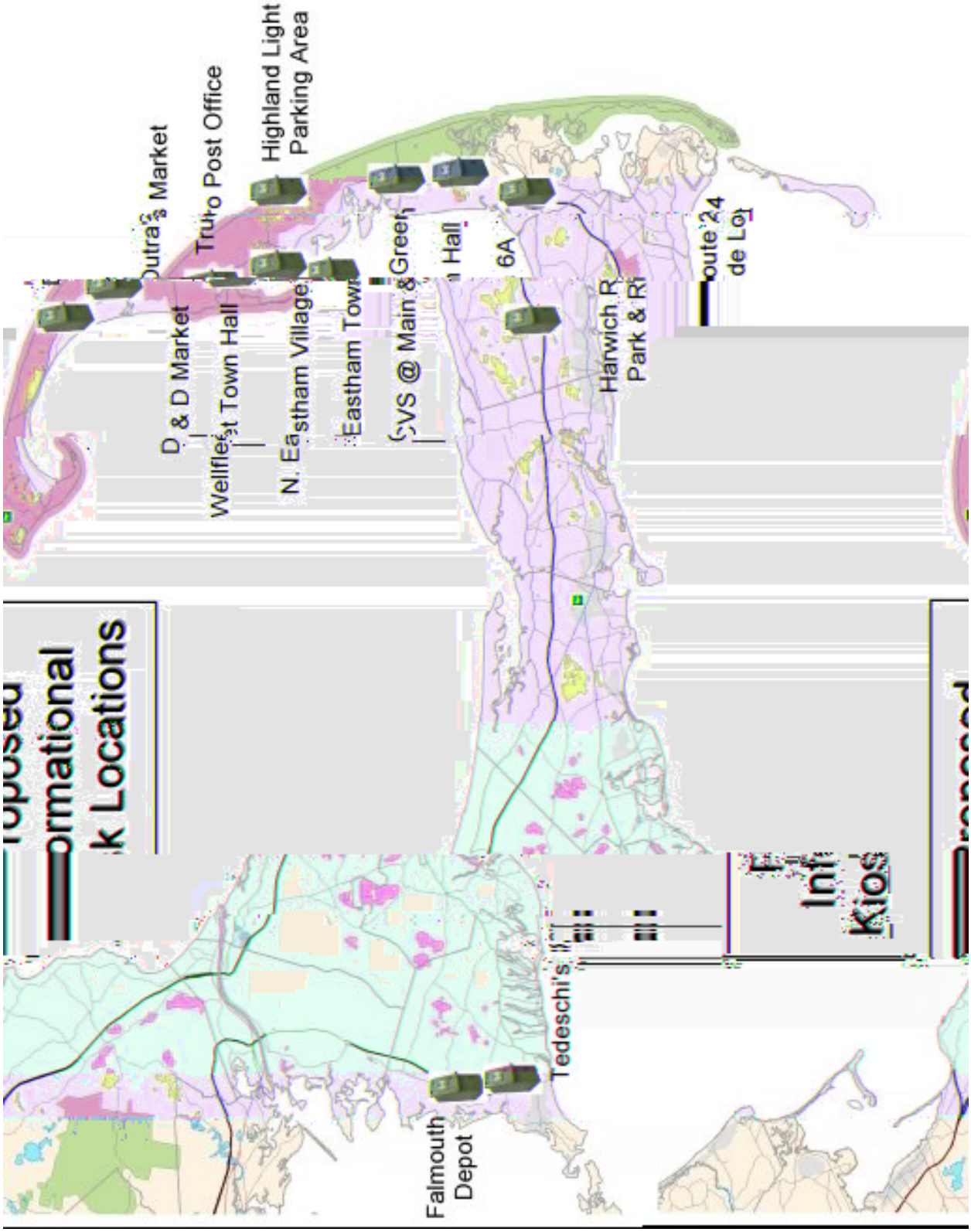


Figure 6.3
Proposed Informational Kiosk Locations

Kiosk development can be a model for cooperation between all visitor-based businesses as well as local transportation providers. Since these kiosks will be located at key public gathering locations they need to provide scheduling, transfer, price and other types of information. Local business such as hotels and restaurants should be encouraged to participate and even be allowed to provide revenue for the NPS or other agency through advertising opportunities. Further, these kiosks will allow for visitors who visit only one website such as the Steamship Authority, with alternative transportation options to arrive and depart the ferry terminals. Finally, smart kiosks are fully Internet ready and therefore can display real-time bus arrival information on buses equipped with AVL (which the CCRTA at this time can provide), current traffic reports, weather alerts, beach parking availability and emergency notifications.

CACO will procure these kiosks either by themselves or through a partnership with the CCRTA or other agencies. This may delay the deployment, however since kiosks are generally very affordable, this should not be a major issue in their deployment. In the long-term other kiosks should be deployed or at the least information coordinated with other stakeholders that are planning kiosk deployments. Examples of this could include deploying smart kiosks in Plymouth and Boston at ferry terminals that operate to Provincetown. Also, the region's hotels, restaurants and other large businesses may be interested in deploying kiosks, which should be coordinated with those recommended. This is very important; as the greatest benefit from kiosks is that they convey standardized information to individuals that may be looking for multiple types of attractions and transportation alternatives.

ITS for Public Transportation

Additional ITS solutions CACO should be pursuing in the near-term include working with the CCRTA to coordinate scheduling and trip planning for visitors and residents throughout Cape Cod. Specifically, the CCRTA could better use its AVL technology by installing real-time arrival signs at major bus stops along its current and proposed routes that will serve CACO visitors. It is also recommended that the CCRTA upgrade its trip-planning software to allow for a more user-friendly service, which will provide more transportation alternatives using other modes and providers. Through the Passenger Transportation Coordinating Council (as well as CACO), the CCRTA can work with both public and private carriers to present a unified transportation trip planning system to its customers. Although this will take considerable negotiation, it is recommended that in the near-term a MOU be signed with all public and private transportation providers and CACO to develop and deploy a more sophisticated trip planning software. This software should then be linked to all providers web sites as well as the proposed smart kiosks previously recommended.

Interactive Voice Response

The Cape Cod region, through the Cape Cod Commission, CCRTA and the Council, should maintain an active relationship with MassHighway to monitor and coordinate any activity regarding Interactive Voice Response (IVR) services, activity regarding 511 deployments. FHWA is providing MassHighway with funds ($125,000 requiring a 20% match) through a Partnership Agreement that will enable it, using ITS private sector partner SmartRoute Systems, to introduce the 511 services in the Boston metropolitan area. Contract negotiations with the wireless telephone service providers and with Verizon to convert landline telephones to the new 511 number are continuing. An anticipated rollout of the marketing campaign by SmartRoute Systems is planned for March 2003. A next step would be to work with FHWA through a Partnership Agreement to introduce 511 services to Cape Cod, possibly through the Boston provider.

Parking Management Systems

Although a parking management system is a component of an integrated traveler information system, it can be developed and deployed independently. This is very beneficial for CACO, which needs to develop a more efficient method of collect traffic/parking data while providing this data in a timely matter to make daily operations decisions.

Unlike other components of a traveler information system, parking management can be implemented in quick cost-effective manner. Currently, CACO operates 12 parking facilities with a total of 2,683 spaces for vehicles (not including the Fort Hill location), as well as 19 spaces for RV's/Buses. Figure 6.4 depicts the locations of the CACO parking facilities, and aerial photos of each location are shown in Appendix D.

As detailed earlier in this chapter, there are several different types of parking management systems that can be deployed to provide the data that the National

Park Service requires. The two most desirable parking management solutions are pneumatic tubes and loop counters. Despite the differences in both technologies they both provide a technological solution to the current parking management system used by the Park Service.

Pneumatic tubes are inexpensive and can provide both traffic counts as well as real-time information that will allow the park service to manage traffic flow and beach access. Loop counters, while initially more expensive, provide the same information while being more durable and less costly to maintain. Since these options provide a difficult choice it can be argued that the combination of the two technologies in stages is probably the most advantageous alternative.

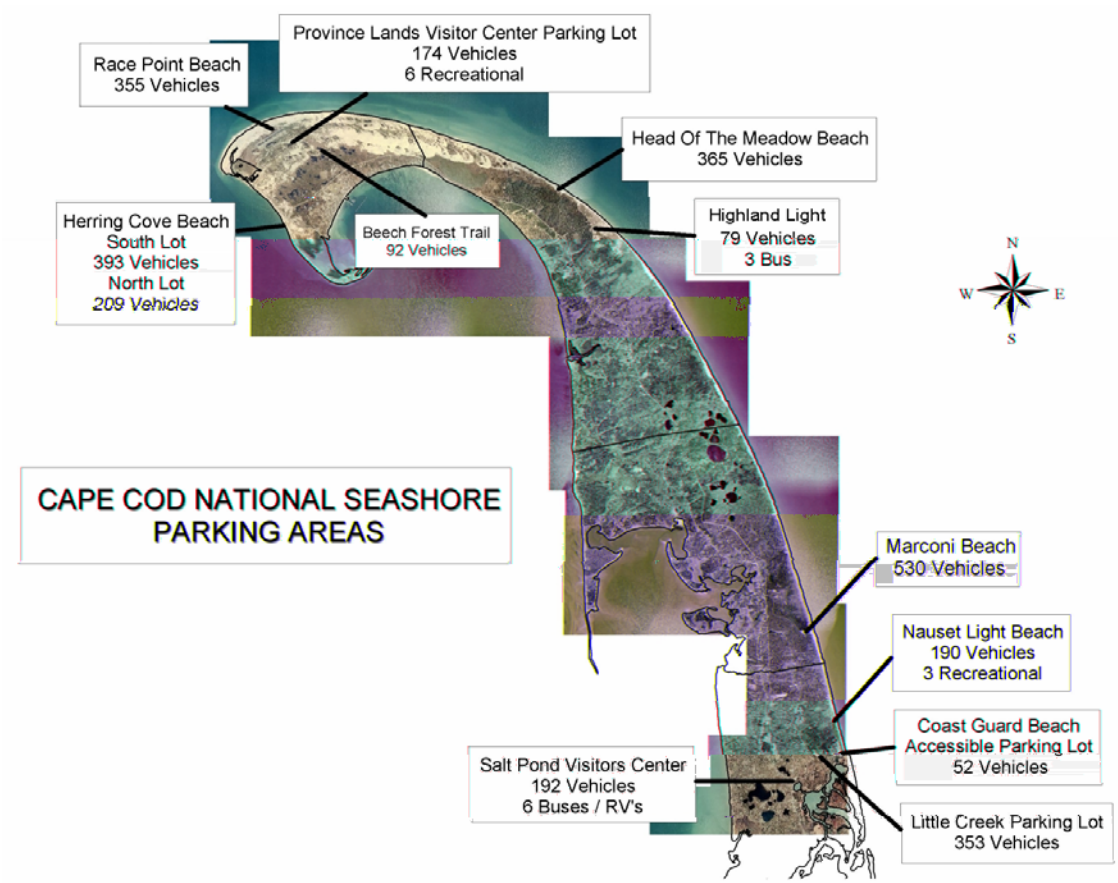


Figure 6.4
CACO Parking Facility locations with number of parking spaces

Since a pneumatic tube system could be implemented at generally any time for a relatively low cost, it is recommended that CACO adopt this type of system. However, in the long-term it is recommended that traffic data be analyzed and used to determine the most advantageous locations to replace these tubes with permanent loop counters. This will allow CACO and surrounding towns to

develop an accurate traffic database will requesting funding for a more permanent solution. Also, this option will give CACO the capability to transfer this data to VMS, HAR and other traveler information systems interfaces using both technologies.

LONG-TERM ITS ACTIVITIES

In the long-term, it is recommended that CACO in conjunction with other Cape Cod transportation agencies, MassHighway, the Cape Cod Commission, and the Passenger Transportation Coordinating Council continue to implement a comprehensive ITS system that is focused on providing accurate information to visitors and residents traveling throughout Cape Cod. Since the near-term recommendations call for the foundation of a traveler information system, the long-term needs for the region are to consolidate all information sources and transmitting devices.

Regional Transportation Operation Center

Although the near-term will require some type of communications control center that can serve as a primary source to receive and transmit traffic, parking and event data it will need to be replaced by a permanent and dedicated center. This need is not unique to Cape Cod in Massachusetts. The Strategic Plan for the Metropolitan Springfield and Pioneer Valley Region prepared for EOTC and MassHighway identifies the need for local control of communication infrastructure to coordinate better regional responses to heavy congestion levels and provide the most accurate traffic information for travelers.

A Regional Transportation Operations Center (RTOC) can be helpful in coordinating two other important transportation related activities. An integrated RTOC has the ability to monitor major roads and intersections with traffic cameras, which can identify issues such as disabled vehicles or accidents. This information allows the RTOC to quickly release emergency vehicles and tow trucks to the area to help rectify the situation. An RTOC can serve as an emergency control center to help coordinate an evacuation of Cape Cod during a natural disaster such as a hurricane. Although the Massachusetts State Police already operates such a control center at their police barracks, they are not able to coordinate their activities with local resources as efficiently as they would be able to with an operational RTOC. Currently, the CCRTA is in the process of planning a new Operations and Maintenance facility in Dennis, MA. The location could be used as the site of a RTOC, and can serve the purpose of streamlining Cape-wide transit ITS and highway ITS activities in one place.

Permanent VMS

Another long-term recommendation is the procurement and deployment of permanent variable message signs throughout Cape Cod that both convey useful information and fit into Cape Cod's landscape. These signs are recommended to replace the various portable signs that the NPS is recommended to deploy in the near-term. The NPS Denver Service Center should take the lead in designing signs keeping with the unique character of Cape Cod, and should work with the Cape Cod and Islands Passenger Transportation Coordinating Council with designs, locations, and other recommendations.

The Volpe Center recommends that where possible, small-medium sized variable message signs be deployed alongside the road to maintain the character and appeal of Cape Cod while still providing information to travelers. However, it is also recommended that some large signs be used where needed to ensure that all the necessary information needed to make informed traveling decisions is available.

EMERGENCY MANAGEMENT AND PREPAREDNESS

Traveler information systems can also provide visitors and residents with the weather and other information that emergency response officials need broadcast. It is recommended that CACO and other transportation providers become involved in the emergency planning committee (Project Impact) on Cape Cod. Since CACO is a primary visitor attraction on Cape Cod, it is recommended that CACO continue close constant contact with the State Police and local authorities to assist in information sharing and when possible in evacuations during emergency situations.

Further, emergency response information should be included in all applicable traveler information systems. An example is the AMBER Alert system to help find abducted children[7]. To make sure all of these traveler information systems are used to full capacity, the recommended coordination and interaction between the information providers and emergency management officials is necessary. The Volpe Center recommends that this become a major future activity of the Passenger Transportation Coordinating Council.

[7] AMBER Alert is a partnership between law enforcement agencies and the media to get information out as quickly as possible after the abduction of a juvenile. Massachusetts' public safety officials are working with 10 East Coast states and 2 Canadian provinces to establish a regional child abduction AMBER alert system. Once investigators determine that a child has been kidnapped, as opposed to having run away, descriptive information about the child and suspect is disseminated, including message boards and other ITS components, so the public can assist in finding the child.

OTHER LONG-TERM OPPORTUNITIES

The Cape Cod region should continue with the development of a telephone traveler information system. As recommended in the near-term the Cape Cod Commission and the NPS need to monitor and analyze any 511 developments by MassHighway. In the long-term an Interactive Voice Response system, whether it is 511 or another number such as *1 operated by MassHighway for the Boston area, would be useful for Cape Cod residents and visitors.

The Volpe Center also recommends that the same stakeholders that are involved in the 511 or phone traveler information system also work together to develop a local television channel that is dedicated to event, weather, parking and traffic information. This channel could model those currently used in hotels to promote in house events and services. Although this would require considerable coordination since many businesses trying to attract the same customer base will need to be a part of such a venture, it would serve as a very valuable method of providing visitors with the information they need. Local restaurants, hotels and visitor centers serve as excellent locations to broadcast a looped message providing the various forms of information. For instance, hotel guests could spend a couple of minutes in the morning watching a looped message to find out about NPS or local community events and what types of parking restrictions and traffic they may encounter while reaching that destination. This provides people with reliable information to make more informed and therefore better decisions about when and more importantly how to travel.

ESTIMATED COSTS OF ITS PROGRAM COMPONENTS

Volpe Center and Commission staff developed ITS cost estimates for recommended ITS elements. These cost estimates are categorized as capital, and operating and maintenance (O&M) costs. Capital costs are the cost expended for one-time, non-recurring purchases. Examples include, but are not limited to costs of equipment, system design, and development of integration software. Operations and maintenance costs, often referred to as recurring cost, are the costs that are incurred on an ongoing basis. Typical examples include utilities for a traffic operations center, wireline or wireless monthly fees, and labor costs. Estimated cost information is shown in Table 6.2.

Table 6.2
Estimate of Suggested Initial ITS Program components

Estimate of Suggested Initial ITS Program[8]

Item	Quantity	Unit Cost	Total Capital Cost	Unit Operating Cost/yr	Total
Establish HTC Communication Center	1	$100,000	$100,000		
Communication Center Staffing	1		$0	$110,000	$110,000
Variable Message Signs	11	$120,000	$1,320,000	$6,000	$66,000
VMS Tower	11	$25,000	$275,000		$0
Power Supply	11	$9,000	$99,000		$0
Roadside (Fixed) Message Sign	10	$200	$2,000		$0
Variable Message Signs (Portable)	4	$25,000	$100,000	$2,000	$8,000
Highway Advisory Radio	3	$30,000	$90,000	$250	$750
Information Kiosks (Type 1)	14	$40,000	$560,000	$2,000	$28,000
Information Kiosks (Type 2)	10	$30,000	$300,000	$2,000	$20,000
Kiosk Integration Software	1	$25,000	$25,000		$0
Remote Video Cameras	5	$10,000	$50,000	$2,000	$10,000
Remote Video Camera Towers	5	$12,000	$60,000		
Parking Management	10	$18,000	$180,000	$1,000	$10,000
Totals	Capital		$3,161,000	Operating Cost/Yr	$252,750

Evaluation

The planning, development, and deployment of all ITS technologies should include an evaluation plan to assess the effectiveness of these investments. This will allow for better decision-making in the long-run and allow for improvements to installed systems.

APPLICABILITY OF ITS RECOMMENDATIONS TO GOALS

The recommendations in this section were identified based on goals and objectives included in the GMP, the Cape Long-Rage Plan, and the Five Year Transit Plan. The Coordinating Council, identified in the Five Year Plan as the forum for coordinating transportation services on Cape Cod, is identified as the forum for coordinating ITS activities in response to goals for coordination identified in these planning documents. Other partnerships recommended for

[8] Source: Volpe Center and Cape Cod Commission staff estimates, including information from the 2001 Cal Trans Contract Cost Data book and the FHWA ITS Cost summary tables.

the planning, development, and implementation of ITS recommendations also address the goal of increasing coordination of transportation services.

Trip planning recommendations respond to goals in all three plans that focus on providing timely and accurate information to Cape residents and visitors. Transit recommendations provide accessibility to locations throughout Cape Cod without the need for a private automobile. VMS, kiosks, and other solutions recommended in this section will provide the type of information travelers need when deciding when to, how to, and where to go on Cape Cod.

Parking Management recommendations will address GMP goals for accessibility to environmentally sensitive areas without detracting from the character of Cape Cod. This limits opportunities to expand parking facilities. The Parking Management and VMS recommendations can inform visitors of parking availability and options, which can ensure that existing facilities are better used.

ITS FUNDING

There are a number of sources of funding for planning, development, and deployment of ITS technologies on Cape Cod. The CACO is currently competing for funding to procure ITS components and this request is described below. Other potential sources of funding are also described.

Current Cape Cod Seashore Funding Request

CACO is currently competing nationwide for dedicated capital ATP funding for procuring ITS components, including physical hardware, an integrated radio frequency system, and a standardized web template for integrating ITS components and present a standard user interface for transit information. The ITS components are a category of high-technology solutions incorporating electronic devices and networks for a more efficient and effect usage of the public transportation system, and as a way to inform Cape Cod visitors of important information, especially before they reach Cape Cod, that can improve their visit experience. The list of ITS components is derived from the recommendations of the Final Cape Cod Five-Year Plan. They include the following shown in Table 6.3:

Table 6.3
FY04 NPS PMIS 89465: Procurement of ITS Components

Item	Quantity	Unit Cost	Total Cost
Traffic cameras with night vision	7	$7,000	$49,000
Fixed medium-sized information displays boards	3	$150,000	$450,000
Fixed large-sized information display boards	2	$200,000	$400,000
Fixed small-sized information display boards	2	$75,000	$150,000
Integrated Radio System	1	$200,000	$200,000
Standardized web template integrating IS and standard user interface for transit information	1	$250,000	$250,000
TOTAL:			**$1,499,000**

Other Sources of Funding

- **Congressional earmarks** – There is much better opportunity for funding through Congressional earmarks given Congressman Delahunt's interest and support. It will be necessary to supply his office with a comprehensive, concise plan as well as suggestions for different avenues to explore for earmarking. For example, earmarks through MassHighway for a 511 system, for VMS an earmark in the ITS funding, for emergency routes an earmark in FEMA funding, etc.
- **EOTC funds**- Direct funding from the State is highly unlikely in the foreseeable future. The State's budget shortfall limits new funding initiatives on Beacon Hill. There may be some funds to be applied for, but they would be under existing programs.
- **FEMA – PDM** funding should return in FY 2003. The proposed planning process should fall under the grant categories. The challenge will be how the Office of Homeland Security will affect FEMA funds and possibly their structure.
- **USDOT**- this could also be challenging as funding has been cut 20% across the board
- **Homeland Security** – is an excellent opportunity. The funding will be large and the means, method and criteria for distribution have not been decided. The budget and operations is currently being debated.

- **TEA – 21 Authorizations** – There are specific provisions in TEA 21 for rural transportation planning. The Cape Cod area is a designated rural area. Most funding has been earmarked to urban areas and there is pressure within Federal Highways to distribute funds to rural areas.
- **ITS funds** – These funds are a large subset of TEA 21 funding but focus on virtually anything technologies that improve communication; most of this plan's proposed ideas use ITS technologies. ITS funding does cover implementation and capital costs. It covers only in part the planning process. As with all TEA 21 funding, these funds have traditionally gone to urban areas, although there is tremendous interest and pressure to distribute more funds to rural areas.
- **Bond issues** – Either state or local and success in raising bonds will depend solely on the desire of the local population. It would be a last resort issue and should only be used as the portion needed to secure Federal funding.
- **Congestion Mitigation and Air Quality Improvement (CMAQ) Program -**– The purpose of the CMAQ program is to fund transportation projects or programs that will contribute to attainment or maintenance of the national ambient air quality standards (NAAQS) for ozone and carbon monoxide (CO). The TEA-21 also allows CMAQ funding to be expended in particulate matter (PM) non-attainment and maintenance areas.

7 BEACH ACCESS AND ELECTRIC TRAM REFURBISHMENT ISSUES

The NPS mission is to preserve and protect the natural resources within Park boundaries while making the Park experience pleasurable for visitors. CACO is concerned about the overcrowding of some of their beaches and parking lots. The shortage of parking spaces for persons wishing to park near these beaches has resulted in queues of vehicles waiting for spaces to open up at the beaches where parking lot capacities have been reached, or to drop off beachgoers where parking at the beach is not available. Visitors are disturbing sensitive dunes and flora instead of entering beaches at designated areas. The beaches of most concern are the Coast Guard and Nauset Light Beaches in Eastham. Figure 7.1 shows a 1994 aerial photograph of this area. The parking and overcrowding situation has caused the NPS to seek a means to limit direct vehicular access to these two beaches.

CACO has successfully operated a shuttle service to Coast Guard Beach in Eastham for 12 years. In an attempt to improve the service, the park began operating two electric trams and trailers for the 1998 season. Unlike gasoline or diesel internal-combustion (IC) vehicles, electric trams are zero-emission; they are also much quieter, and represent transportation that is both more sustainable and more appropriate to a beach setting. CACO believed that use of the electric vehicles would, therefore, further enhance the visitor experience while better protecting CACO's natural resources. Unfortunately, the electric vehicles failed to live up to CACO's expectations. Due to technical and logistical problems, the trams proved unreliable, and had to be withdrawn from service. They were replaced by gasoline-powered trams, provided through ATS funding. Throughout, the service itself has been very popular, and has generated requests for additional routes. CACO has identified several existing shuttle needs connecting parts of CACO in the towns of Eastham and Wellfleet, and some experimental route options in Wellfleet and Truro, that lend themselves to electric/alternative fuel technology.

There are two long-range planning components that CACO should address. They are managing beach access, and managing the ability to move visitors around using alternative fuel vehicles. It is recommended that CACO consider using technology to limit the number of drop-offs at the beach, should it become infeasible to use Park Rangers for this duty. The second recommendation is to learn from its electric-tram experience—to determine what went wrong and why problems occurred, and to lay the necessary groundwork for redeploying quiet, non-polluting electric vehicles in the future, this time successfully.

Figure 1. -- Aerial Photo of Coast Guard and Nauset Light Beach Area

Figure 7.1
1994 aerial photograph of Coast Guard and Nauset Light Beaches

INTERIM STEPS AND FUTURE APPROACH

The beach access problem discussions and recommendations in this section of the plan are based upon limited study staff personal observations, some Little Creek shuttle counts for a few days in 1999 and 2000, a NPS Coast Guard Beach Traffic Analysis performed in 1999, and discussions with NPS officials and staff. During the summer of 2002, CACO used Park Rangers to keep visitors from being dropped off at the beaches. It appears that this approach has succeeded in limiting resource damage caused by drop-offs, but at a cost of being very labor intensive. The recommendations in this section are given that in the event that CACO chooses to re-deploy rangers for other activities, there is a plan in place to ensure that resources can be preserved and protected through the use of technology and best practices. Beach access proposals are presented generically in this section, and more detail is contained in Appendix E. Note that these proposals and tactics will likely require lengthy public comment opportunities and regulatory approvals. These include, but are not limited to, town planning and zoning board of appeal approvals, town meeting vote(s), as well as Commission and appropriate State and Federal agency oversight and approval. Some proposals may be logistically impossible currently, but are presented in the interest of completeness in the event that circumstances become favorable.

To address the electric tram dilemma, CACO agreed to establish a Cooperative Research and Development Agreement (CRADA) with the Volpe Center, the Wentworth Institute of Technology, and the Electric Transit Vehicle Institute (ETVI). Wentworth Institute, which is a private engineering university in Boston, is a member of the Alternative Fuels Training Consortium and the Clean Cities Coalition. They have resident experience with technology issues and problem definition for electric technology. They agreed to receive one of CACO's two trams, have faculty and staff rehabilitate and modify the tram (using parts from the second tram), so it could eventually be returned to service. ETVI would provide technical consultation and support. The Volpe Center, in addition to its technical and analytical contributions, would facilitate and oversee work done under the CRADA, providing project management and working with Wentworth to solve the trams' technical and logistical problems. CACO would fund the effort, in turn receiving not only the rehabilitated tram from Wentworth, but also the guidance and training needed in order to successfully use it within the park. Then, following the completion of the CRADA, CACO would have the knowledge necessary to continue long-range transportation planning activities involving electric vehicles. In the medium term, the intent would be to run these trams for interpretive tours at selected sites only in modified duty. As knowledge is gained and confidence restored in their reliability, eventually they could be brought back into more active service.

BEACH ACCESS PROPOSALS

Coast Guard Beach

Overcrowding at Coast Guard Beach and Nauset Light Beach is a serious issue for CACO. The number of persons using Coast Guard Beach (an average of 2,112 during a nine day period in 1999) has caused CACO to increase the number of lifeguard stations from three to five over the past few years. This has strained an already tight operating budget. Vehicles dropping off passengers near the Coast Guard Beach entrance cause traffic backups and pedestrian safety concerns. Restroom facilities have also been

overtaxed. Long lines at the restrooms occur late in the day. The high restroom use is one possible cause of an August 2001 Coast Guard Beach closing due to high pollution levels in the water.

There is no general public parking at Coast Guard Beach. The small parking lot adjacent to the Beach is reserved for the Coast Guard National Environmental Education Development Collaborative (NEED) Collaborative, CACO employees, and handicapped persons. CACO operates a shuttle service to the Beach from a parking lot (Little Creek) on Doane Road a little less than 0.9 miles from the Coast Guard Beach entrance station. However, until the Summer 2001 season, many beachgoers were dropped off at the Beach entrance by drivers who left the area, or parked at Little Creek or took the shuttle back to the Beach. CACO collects the $10 entrance fee (per vehicle) from vehicles parking only at Little Creek. Most drop offs occur just inside the Coast Guard Beach entrance station location or on Doane Road outside the Beach entrance. During good beach weather days in July and August, the number of drop offs occurring during the peak of the day sometimes causes backups along Doane Road. In order to control pedestrian and vehicular traffic near the Coast Guard Beach entrance, CACO often deployed supervisory personnel to help in that operation. Even so, the NPS considered the traffic congestion and risks to the public being dropped off and picked up to be at an unacceptable level. In addition, those dropped off near the entrance often sat on a section of beach well away from the guard stands, creating a safety hazard on the beach.

In order to accomplish their mission at the Coast Guard Beach area, CACO has decided to limit the number of beachgoers to the carrying capacity of the physical facilities and the lifeguard stands. To do this, access to the beach has been limited to those arriving on the shuttle from the Little Creek parking lot. Drop-offs at the beach have been eliminated. This is being accomplished by using additional Park Rangers to police the road areas near the Beach. This approach is labor intensive, but as observed during the Summer 2002 season, very effective. A second option would be to provide the same restrictions, but with the use of hardware rather than personnel. This approach is more capital intensive in that it requires fixed facilities, and software and hardware interfaces to make sure it operates correctly. It also would require coordination with limitation of access to Nauset Light Beach in order to be fully successful.

The access limitation approaches could reduce the number of persons using Coast Guard Beach, but the amount is uncertain unless drop offs are prohibited at the Little Creek parking lot. If drop offs at Little Creek are not prohibited, the number of persons using the Beach could be about the same and a larger number of persons would be using the trams to access the beach. If drop offs were prohibited at Little Creek when the lot is filled, this would reduce the

number of persons using Coast Guard Beach by about 50% (assuming an average occupancy of 3 persons per car).

Figure 7.2
Enforcement activities at Coast Guard Beach, Summer 2002

NAUSET LIGHT BEACH

The main NPS concern at Nauset Light Beach is the backup at the entrance to the Nauset Light Beach parking lot. Nauset Light Beach has a 190-vehicle parking lot adjacent to it. This lot normally gets filled early on good beach days. When this parking lot is filled, vehicles

queue up at the entrance station waiting for vehicles to exit. The backup sometimes extends beyond the short curved stretch of roadway between the Nauset Light Beach entrance station and the Cable Road and Ocean View Drive intersection. This short stretch of curved roadway is also the only access for residents owning property along Nauset Light Beach Road. When severe back ups occur, the NPS will deploy supervisory Rangers at the Cable Road-Ocean View Drive intersection to help control vehicular and pedestrian traffic. This is in addition to the two Visitor Use Assistants manning the entrance fee collection station.

When the Nauset Light Beach parking lot is filled, some drivers will drop off passengers near the Beach, drive to the Nauset Regional High School on Cable Road, park their car in the High School lot, and walk the 0.7 miles to the Beach.

In the out years, the NPS would like to eliminate both the dropping off and the queuing of vehicles at the entrance to the Nauset Light Beach parking lot. The same limitation approaches described under Coast Guard Beach would be appropriate for the Nauset Light Beach. However, restriction of drop offs at Nauset Light Beach could necessitate the establishment of a remote parking and shuttle system. This would also be true if/when the Nauset Light Beach parking lot is eroded away and unusable.

Beach Evacuation in Severe Weather

When a thunderstorm approaches or rain begins, the beaches are evacuated in a short period of time. At the present time, there are not enough shuttles to handle the heavy volume of exiting beachgoers, and sometimes can result in persons walking up the roads toward their houses or parked cars. This becomes a safety hazard with the mingling of pedestrian and public and shuttle vehicular traffic. A reduction in the number of beach users would help to ease this situation. There is an outstanding request for additional ATS funding for procuring extra trailers to help augment the movement of beachgoers. Also, one option for supplemental service would be to have standby electric trams (once they have proved reliable), and possibly school buses and drivers. With the exception of the additional trailers, these would be partial solutions, and would have financial operations and maintenance repercussions.

ELECTRIC TRAM REFURBISHMENT AND CRADA DEVELOPMENT

As an element of the park's long-term transportation plan, the CRADA comprises four phases: Lessons Learned, Operational Testing, Light-Duty Interpretive and Supplemental Service, and Full Implementation.

Phase 1: Lessons Learned

Determining what went wrong in the initial deployment of electric trams involves diagnosing both technical and logistical problems. Some of the technical problems included the deprecating effects of salt air and sand on the trams' electrical equipment, incompatibilities between the trams' batteries and charging equipment, and vehicle components that failed to work together as designed. Many of these difficulties resulted from, or were compounded by, logistical problems that resulted from having multiple equipment vendors who did not communicate well with one another regarding their equipment specifications. One of the earliest lessons learned under the CRADA is that technical problems, while they can be remedied, can be permanently solved only if the appropriate logistical support structures are in place.

Phase 2: Operational Testing

Once Wentworth completes its refurbishment of the tram, it can be used for limited operational testing. Depending on the outcome of current technical work, the tram may be available in this capacity by the end of the 2003 season.

CACO maintenance and interpretive staff will then begin to have hands-on training time with the vehicle, learning about the tram's particular vulnerabilities and how to spot and avoid potential problems. Park staff will gain experience with the vehicle and charging equipment, will become more familiar with the vocabulary of electric propulsion, and will gain the confidence necessary to use the tram in providing actual visitor service.

Phase 3: Light-Duty Interpretive and Supplemental Service

If all goes well, by the 2004 season, the refurbished tram—operated and maintained by park staff who have had the chance to gain the necessary experience—will be ready to return to visitor operation. However, in order that

the capabilities of the tram and of park staff are increased at a gradual, manageable rate, the tram will be first operated not on the intense beach-shuttle route, but on certain lighter-duty interpretive and supplemental services.

Within CACO, numerous sites that are of interest to visitors have only limited parking facilities, or have parking areas that are nearby but overwhelmed by beach visitors. Some of these sites include the Highlands Center (at the old air base), a recently restored cranberry bog/plantation farmhouse, a kettle pond in easy view from Route 6, the Atwood-Higgins historic ranch, Nauset Light (and the "three sisters" lighthouses), and the Fort Hill area[9]. The park would be able to improve visitor access to these locations—and would also be able to improve the interpretive offerings available—by inviting visitors to park their cars at less crowded locations and then board the electric tram. Visitors would then not need to worry about parking at the sites themselves; they could enjoy a pleasant (and quiet) ride while availing themselves of the interpretation provided by a ranger aboard the tram. The routes could be scheduled according to both visitor demand and the maintenance requirements of the tram—which are expected to be less as time goes on, as park staff continues to develop operations and maintenance expertise.

After successful use on interpretive services, the electric tram could even be used on the beach shuttle route, possibly to provide transportation supplementing the IC vehicles now operating, such as when dangerous weather makes it necessary to rapidly transport beachgoers back to their cars. For both interpretive and beach shuttles, there will eventually be a need to conduct an operations and maintenance and manpower assessment to determine the costs and staff necessary to ensure a safe, dependable and enjoyable experience.

Phase 4: Full Implementation

After refurbishing the electric tram, putting in place the logistical and training structures necessary to ensure successful operation, and extensively operating the vehicle on interpretive tours and supplemental routes, park staff will be fully equipped and prepared to operate electric vehicles on the heavy-duty beach shuttle. Electric trams, as a dependable, reliable, visitor-friendly alternative to IC vehicles, will be thoroughly understood as a logical component of the long-range transportation plan; and, by the time the park is ready to procure new trams, CACO will serve as an example for future implementation of electrically-powered vehicles throughout the National Park Service.

[9] Currently, there is a vacant service station along Route 6, which holds the possibility of being rehabilitated into a replica, historically themed Cape Cod-like filling station. This could also be an interpretive attraction in the future.

8 NEXT STEPS

Cape Cod residents, businesses, visitors, and public agencies have come to a consensus that transportation is a major issue affecting the long-term quality of life on Cape Cod. This Long-Range Plan for Outer Cape Cod in general, and CACO in particular, presents a blueprint to build a transportation system that goes far beyond the goal of safely and efficiently moving people and goods to one that improves the total quality of life. It sets the foundation for the *processes* which are the things the community can and will do to improve their quality of life. The recommendations in this plan are designed to address short-term and long-term transportation needs identified in this and other planning processes on Cape Cod, processes that have involved a broad spectrum of interests.

There are two major recommendations that need to be addressed early in implementing this plan. The Cape Cod and Islands Passenger Transportation Coordinating Council needs to be established and this entity will need to be adequately supported to serve in its identified role as the focus of coordinating transportation planning, development, and implementation activities on Cape Cod.

The other major issue that must be addressed is funding. Federal funding for planning and implementing transportation projects depends upon the projects being derived from a continuing, comprehensive, and cooperative (3C) planning process. The U.S. Department of Transportation, FTA, and FHWA must certify that a 3C planning process has and is being carried out on projects receiving federal funding. Part of the certification is the preparation of three documents: a Unified Planning Work Program, a Long Range Transportation Plan (LRTP), and a Transportation Improvement Plan (TIP). The Cape Cod Commission will need to include projects recommended in this plan on the metropolitan LRTP and the TIP.

Funding is required to support on-going planning activities, for the development of identified short-term transportation improvements, and for operation and maintenance of existing and planned transportation systems. The NPS has identified opportunities to access ATS funding for the planning and development of improvements that address the needs of the CACO. Additional opportunities with local, state and other federal agencies, and the private sector need to be pursued. For example, the mail-order firm L.L. Bean of Maine has recently provided funding to help underwrite the Acadia National Park Shuttle. Similar opportunities should be pursued on Cape Cod.

The Commonwealth of Massachusetts has been an important partner in planning activities to date and will continue to be looked at as a partner as activities move forward. It is possible that CMAQ funding can provide support for some project implementation, and possibly other federal funding sources. It will be incumbent on CACO to continue dialogue with the Outer Cape towns on NPS funding availability, and the ability of these towns to leverage their ability to match CACO funds for future operations, maintenance and capital improvements.

Other activities in the future include developing education materials to help the public better understand the transportation, environmental, and quality of life benefits that results from a sound planning process. This includes holding meetings and seminars with stakeholders and the public (much like the 5-Year planning public comment process), press releases, and CACO assistance in holding annual Transportation Summits. In cooperation with Washington and regional staff, CACO should embark on lessons learned projects (such as the electric tram refurbishment) and develop best practices manuals/working papers for the ATS projects, both planned and implemented.

Visitors and year round residents should also be surveyed on transportation issues to identify services that would benefit their particular needs to help foster a more enjoyable experience. This should include conducting transit surveys to gauge use and satisfaction of shuttle systems, both for the Little Creek parking facility and the Provincetown-Truro Shuttle. In concert with the Little Creek survey, there should be a CACO-wide parking inventory survey to analyze how traffic and parking constraints impact the visitor experience and carrying capacity on the Seashore's beaches

The National Park Service has the unique responsibility of identifying interpretive activities related to the development of ATS. Getting visitors from point A to point B is only part of the ATS mission and transportation improvements also must address the broader interpretive mission of the Park Service. A next step is to more fully develop interpretive components for the proposed electric tram tours (once the trams have been determined to be reliable), and interpretive elements for the proposed local transit routes, as well as for the Provincetown-Truro shuttle.

Any major future development on Cape Cod must include consideration of transportation issues and should identify opportunities to mitigate transportation impacts of developments. For example, the Highlands Center site (the former North Truro Air Base) will be redeveloped for CACO use. Facilities on this 127-Acre site include parking, barracks, and recreation facilities as well as a significant amount of ocean front and undeveloped land. CACO and others are in the process of determining how it will use this facility. The Highlands Center site offers opportunities for expanded services for visitors and residents under the

management of CACO. Planning for the use of this site must address transportation, and interpretive issues within a transportation context, as part of that larger planning process.

ITS will be an important component for future transportation improvements and development. Establishing regional ITS standards and architecture will set up a structure for the implementation of ITS. The development of the architecture and standards is led by the State (through MassHighway), with assistance from the Federal government (FHWA and FTA). CACO and the other Coordinating Council members needs to partner with regional public and private sector leaders to state the case for a comprehensive ITS system encompassing Cape Cod. Leveraging CACO financial resources can set the stage for developing a showcase ITS network for safety, security, mobility and enhancement of the visitor experience.

The National Environmental Policy Act (NEPA), the principle US environmental statute, requires environmental input into a federal program's decision making early in the planning process. NPS Director's Order #12 (DO#12) interprets NEPA compliance as a process that implements environmental consideration early in the planning decision process, and encourages citizen involvement. An environmental document (an Environmental Assessment or Environmental Impact Statement) facilitates this process and is fundamental to NEPA compliance. Thus, early focus should include satisfying NEPA and DO#12 procedural requirements. Based on discussions with the community, business, regulatory agencies and Outer Cape representatives, it is unlikely that any significant adverse environmental impacts would result from the recommendations proposed in this plan. Therefore, a Draft and Final Environmental Assessment along with technical analyses should be completed to satisfy NEPA compliance. This will require public forums for presenting the planned project and opportunities for public comment.

Overall, the success of the recommendations in this plan will require that people who live, work, and visit Cape Cod have input and are informed about the improvements planned, and use them.

APPENDIX A

Agenda for 2002 Transit Summit III

Transit Summit III

Wednesday, February 27, 2002
Sheraton Hyannis Hotel
Hyannis, MA

A conference to *implement* the
Five-Year Cape Cod Public Transportation Plan
Developed by the Cape Cod Transit Task Force

Morning Session

8:30 am Continental breakfast

9:00 am **General Session Presentation on the Final Report**
Moderator: Wendy Northcross
Remarks: Tom Cahir, Mark Forest and
Terry Sheehan

9:45 am Four one-hour, *concurrent breakout groups* on
major implementation items

1. Coming Soon: This Summer's Improvements –
Discussion Leader: Clay Schofield – Cape Cod Commission
Presenters: Joe Potzka, Terry Sheehan and Ben Pearson
Topics: Relax & Ride: Lessons from last summer – plans for 2002, NPS changeable message signs, planning for Orleans and Provincetown transportation centers

2. Human Services Coordination: Giving Kids a Lift & Getting Everyone Else Connected
Discussion Leader: Mary Lou Petitt
Presenters: Len Stewart-Barnstable County Human Service Implementation Issues; Betty Smith-Orleans COA; Paula George-RTA Human Services; Bill Henning-CORD; Mr. Putnam, President of Nauset High School Student Council.

3. Fine So Far, Now How do we Pay For It? - Long-term Financing of the Transportation Plan:
Discussion Leader: Tom Cahir
Presenters: Dan Wolf and Maria Burks

4. Making it Happen – The Role of a Public/Private Transportation Coordination Council:

Discussion Leader: Wendy Northcross
Presenters: Mary LeClair, Mark Forest

11:15 am **Breakout group reporters present recommendations to General Session**
Note: Each Discussion Leader will assign a participant to be a reporter.

11:45 a.m. **General Session discussion of findings & conclusions, public comment and wrap up**
Moderator: Wendy Northcross

12:30 pm Conclude/Boxed lunches

Afternoon Session
Professional Development in Public Transportation
Workshop Schedule

1:30-3:15 pm: **Concurrent workshops**

A. Focusing on the Big Picture: State and Federal Transit Funding
Moderator: Tom Cahir
Presenters:

- Mark Forest
- Mary Beth Mello, FTA Region 1 Deputy Administrator and Peter Butler, FTA Region 1 Director of Planning and Program Development
- Astrid Glynn, Deputy Secretary, EOTC.

B. Empowering RTA Advisory Board Members
Moderator: Ed Carr - EOTC
Presenter: Jim Mikula – Customer Contact Corporation (tentative)
Panel: Three RTA Board Chairs: Bob Parady (Cape Cod); Tim Soverino (Nantucket); John Alley (Martha's Vineyard)

3:15 pm Break

3:30–5:00 pm: **Concurrent workshops**

C. Transit Success Stories – How Provincetown, Truro and Chatham Did It!
Moderator: Joe Potzka

The Towns' Perspective: Don Richards (Provincetown); Bud Breault (Truro); Tom Bernardo (Chatham) *(invited)*
The Chamber of Commerce's Role: Candice Collins-Boden (Provincetown) *(invited)*; David Bocksch (Chatham) *(invited)*

D. Smart Growth and Transit: The Inseparable Pair

Moderator: Margo Fenn
Presenters:

- John Lipman, Chief Planner, Deputy Director, Cape Cod Commission
- John Pagini, Town of Nantucket *(invited)*
- Representative from Martha's Vineyard

Invited Audience
For Professional Development in Public Transportation:

- RTA Advisory Board Members & Administrators from Cape Cod, Nantucket and Martha's Vineyard
- Town Managers & Town Planning Directors – CC, Nantucket and MV
- Legislative Delegation (members and/or staff)
- Human Service Transportation Providers
- Barnstable, Nantucket and Dukes County Commissioners & key County staff
- Barnstable County Assembly of Delegates
- EOTC officials
- SSA Board Members
- Task Force Members
- Town Select Chairs
- Town Chamber Execs

Other Feature:

- FTA's Advanced Public Transportation Mobile Showcase will be on hand

APPENDIX B

THE CAPE COD HOUSEHOLD TRANSPORTATION SURVEY

APPENDIX B THE CAPE COD HOUSEHOLD TRANSPORTATION SURVEY

In addition to determining the extent of how transportation problems are tied to demographics, income levels, and suburban-like development patterns, the actual experience and perceptions of those who use, or would like to use, public transportation on Cape Cod are critical to developing, testing and then recommending a set of effective improvements. These perceptions can offer insight on what people want, and how they will respond and behave. They also provide insight on the travel needs of different market segments, ensuring that the portion of the population that is most vulnerable is not "left behind."

The Volpe Center was asked to prepare a survey instrument that was statistically defensible, and useful in obtaining information that could be used both for the County of Barnstable and for CACO needs. The Barnstable County Department of Human Services conducted the Cape Cod Household Transportation Survey in November 2000.[1] The intent was to determine travel behavior of Cape Cod year-round residents, and assess their perceptions of public transportation. The data illuminated the mobility needs and transportation service demands that exist Cape-wide, and among different market segments. Beyond characterizing travel demand, the data indicated the types of transportation services and improvements that need to be considered in the context of Cape-wide transportation planning.

The Cape Cod Household Transportation survey took a two-prong sampling approach to capture travel behavior and demand information. More than 550 surveys were randomly mailed to households. Over 200 additional surveys were passed out in a deliberate attempt to secure the participation of households that are frequently under-represented, but have special transportation needs. This included low income, unemployed, non-English speaking, and "zero vehicle" households.

A total of 407 Cape Cod households were surveyed successfully, representing a 54 percent response. The general view held among respondents was that:

- They do not have transportation problems as long as they have access to a suitable vehicle (automobile or light-duty truck) although more than 20 percent indicated that they did not have a working vehicle; and

[1] Part of the Human Condition 2001 Human Services Needs Assessment Project—a comprehensive three-year effort aimed at improving the human environment on Cape Cod. For further details, visit http://www.bchumanservices.net/thc2001/thc2001index.html

- Public transit buses exist primarily to serve the disadvantaged and those who are too old or too infirm to operate an automobile.

Of the households surveyed:

- 33 percent included children;
- 33 percent included one or more persons 65 or older; and
- 40 percent had incomes below the 1990 County median of $31,776.

Detailed analysis of the survey data resulted in a number of significant findings regarding: on-Cape destinations, trip types, public transportation usage, knowledge of public bus stop locations, work shifts, and suitability of available vehicles. Additional findings related to individuals' perceptions regarding the Cape's public transportation system.

Most Common Modes of Transportation

Personal vehicles are the preferred mode of transportation for the majority of respondents. Respondents' second choice of travel is catching a ride with a relative, friend or neighbor. The third and fourth most common choices are biking and walking. Fourteen percent of respondents reported that someone from their household walks or rides a bicycle to work. Ten percent of respondents live with someone who walks or bicycles to healthcare or social service appointments.

Frequent On-Cape Destinations and Trip Types

Respondents cited the Hyannis area most frequently as a travel destination for all trip types. Downtown Hyannis followed by downtown Falmouth was cited as the most frequent employment destination. Cape Cod Community College's Hyannis and West Barnstable campuses were the most frequently cited destinations for education and training trips. Respondents named Cape Cod Hospital and the surrounding medical complex in Hyannis as the most frequent destination for healthcare and social service-related trips. The most frequent destinations for shopping were the Cape Cod Mall and downtown Hyannis.

Shopping was the most common trip type, followed by healthcare/social service, employment, and school/job training program trips

Public Transportation System Usage

Thirteen percent of respondents reported that someone in their household had used a bus to travel on Cape Cod in the last 7 days.

Patronage on RTA routes varied considerably, as shown in Figure Ridership was the greatest on RTA's b-Bus, followed by the Sea Line, Hyannis to Orleans, and the Villager routes. Patronage on Bonanza and P & B routes constituted 15 percent of the total trips reported.

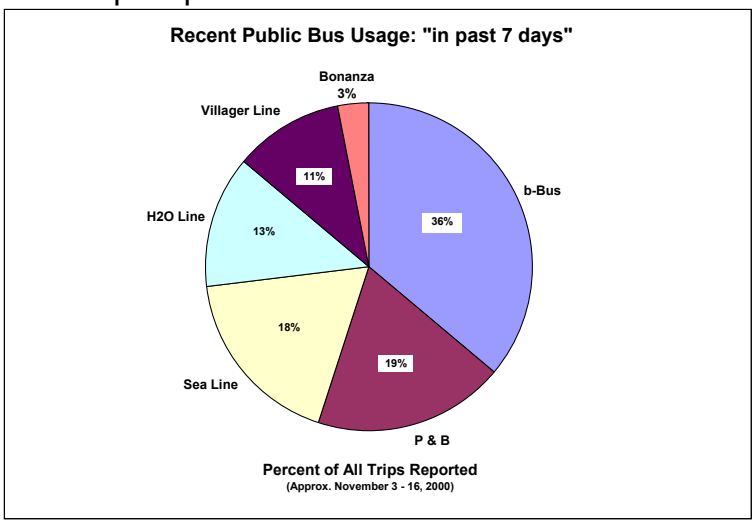


FIGURE B.1 Recent Public Bus Usage on Cape Cod

Households more inclined toward transit include adults living alone, single parents, extended families, and individuals who are unemployed or disabled. These households have substantially lower annual incomes when compared to households that exclusively rely on private automobiles. Two-thirds of participating households had incomes below the 1990 Barnstable County median.

Knowledge of Public Bus Stop Locations

Fifty-one percent of respondents believed there were no bus stops within walking distance of their home. Twenty-five percent had no knowledge of bus stops. Sixteen percent indicated they knew of a bus stop location near their home.

Time of Day for Employment Trips

Most of the employment trips reported by the respondents occur during daytime hours Monday through Friday. Fifteen percent of respondents, however, indicated that a member of their households worked either an evening or night shift. According to 12 percent of respondents, availability for work by time of day was driven by their access to affordable child-care.

Suitability of Vehicle Available

Seventy-five percent of respondents indicated that they always had a working vehicle available, 15 percent reported often or seldom availability and the remaining 10 percent reported they never have a working vehicle available.

Taxicab Service

Almost all respondents reported that taxicab fares are too high for their use.

Public Transportation Perceptions

Survey participants were asked if household members had "suffered a hardship," during the past 30 days as a result of not having accessible public transportation. They were also asked to provide written comments about their perceptions of public transportation on Cape Cod. The following are the survey results:

- Nine percent reported that some household member had "suffered a hardship". This occurred most frequently when planning or attempting to travel to jobs, and medical and social service appointments.
- Written comments indicated that limited public transportation has contributed to seniors feeling isolated, and limited teenagers' mobility.
- Primary reasons for not using the Cape's public transportation system more frequently included the lack of bus stops close to trip ends and infrequent bus schedules.
- Respondents indicated a high regard for the P & B Bus Line services, RTA's b-bus, and Council On Aging (COA) van services.

Public Transportation Needs

Survey responses indicated that more frequent use of public transportation requires:

1. Increasing headway on existing scheduled routes;
2. Evening/night bus service;
3. Additional bus stops;
4. Additional bus routes to better accommodates actual travel by trip type and destinations;

More predictable arrival and departure times; and,

5. Lower fares and targeted services that cater to families traveling with children (particularly, those requiring child-care), teenagers, seniors and the disabled.

Many of these issues, observations and limitations were also identified during the Volpe Center's review of the Cape's transportation system that was conducted as the basis for developing this Plan.

APPENDIX C

INTELLIGENT TRANSPORTATION SYSTEMS

APPENDIX C INTELLIGENT TRANSPORTATION SYSTEMS

The following sections provide more detailed information on National and Regional ITS Architecture and Standards, Traveler Information Systems, Parking Management Systems, and Security and Emergency Management.

C.1 National and Regional ITS Architecture and Standards

The National ITS Architecture is a framework that allows for the development of interoperable systems within and across transportation modes. The Regional ITS Architecture is a smaller version of the National ITS Architecture that is focused on regional ITS development and deployment. The goal is to have all regional architectures joined together to form a national architecture in the same manner that local/municipal/agency architectures merge together to form a regional architecture.

The Massachusetts Executive Office Transportation and Construction, through MassHighway, is the lead agency developing Massachusetts' Statewide and Regional ITS Architecture and Standards. Transportation agencies on Cape Cod should work with MassHighway and also should be aware of ITS architecture development activities in Rhode Island. The overriding goal of ITS Architecture and Standards development is to ensure that all ITS projects that are being developed and deployed in an area are coordinated with the other ITS projects that other transportation agencies and authorities with the same region are also developing and deploying.

National ITS Architecture[1]

The National ITS Architecture is a framework that allows for the development of interoperable systems within and across transportation modes. It identifies needs for national standards for ITS technologies to accommodate intercity travel and cross country goods movements, and to encourage manufacturers to design ITS components that can function together as an overall system. As a planning tool, the National ITS Architecture assists local and regional planners to consider all possible ITS services and facilities as they develop their own ITS architectures to suit individual needs.

[1] The information in this section is provided as a general overview of the National ITS Architecture and was developed based on the National ITS Architecture. A full version of the National ITS Architecture is available from the following website: http://itsarch.iteris.com/itsarch/index.htm

The National ITS Architecture defines the functions performed by different ITS components and ways in which they should be interconnected. It serves as guidance to develop systems and interfaces to support identified user services. These user services are based upon needs and requirements as identified when analyzing operational scenarios within the transportation environment.

In sum, the National ITS Architecture defines:

- The System Functions associated with *ITS User Services*;
- The *Physical Architecture* which includes systems and subsystems within which such functions reside;
- The *Logical Architecture* which includes the data interfaces and information flows between physical subsystems; and
- The *Communications Requirements* associated with information flow.
- Much like architectural drawings of a new building define how individual design features interact to create the building's general appearance, a system's architecture is a description of how system components interact to achieve overall system goals.

System Architecture

System architecture defines:

- Complete system operation;
- What each component does; and
- What information is exchanged among components.

In general, the more complicated a system is, the more benefit it derives from clearly identifying the complete "system," defining component functions and eliminating redundancies, and defining interconnections between various components. Meeting the first objective assures agreement on the finished system operation and that no major functions are overlooked. The second objective is to identify opportunities for shared use of components. The third objective is a definition of which components need to communicate and what information is passed among components; this is necessary to allow the successful integration of components that could be developed by separate teams.

System architecture is also useful in helping agencies form a unified vision of ITS services. In regions that have already developed an ITS architecture, participants assert that the process of meeting with other agencies to discuss regional needs and cooperation was a key element of success. The organizational relationships

forged during the architecture development process produced greater operating efficiency and a consensus vision of future ITS service.

The National ITS Architecture provides a general framework for how ITS applications can be interconnected so that agencies can share information with each other to enhance the safety and efficiency of transportation system operations. Implementation details regarding the actual design and deployment of ITS projects remain in state and local hands, including decisions regarding institutional arrangements and specific technology acquisitions.

ITS User Services

User services address a broad spectrum of functions including travel management, public transportation operations, and emergency management. To date, 31 user services have been identified and bundled into seven functional categories as shown in Table C.1.

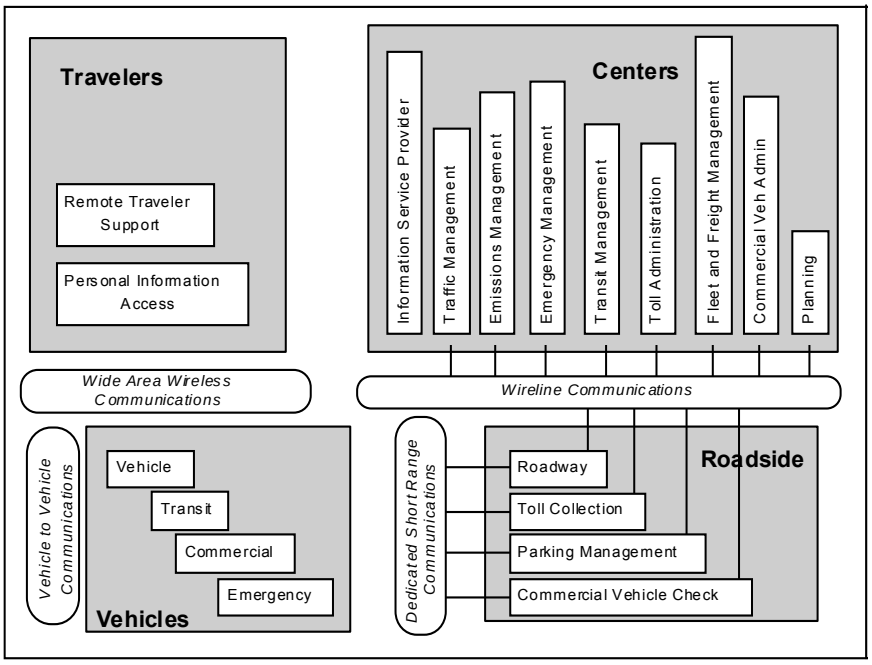
Table C.1.
User Services by Bundle

Functional Category	User Services
1. Travel and Transportation Management	Pre-trip Travel Information En-route Driver Information Route Guidance Ride Matching and Reservation Traveler Services Information Traffic Control Incident Management Travel Demand Management Emissions Testing and Mitigation Highway-Rail Intersection
2. Public Transportation Management	Public Transportation Management En-route Transit Information Personalized Public Transit Public Travel Security
3. Electronic Payment Systems	Electronic Payment Systems
4. Commercial Vehicle Operation	Commercial Vehicle Electronic Clearance Automated Roadside Safety Inspection On-Board Safety Monitoring Commercial Vehicle Administrative Processes Hazardous Material Incident Response Commercial Fleet Management
5. Emergency Management	Emergency Notification and Personal Security Emergency Vehicle Management
6. Advanced Vehicle Safety Systems	Longitudinal Collision Avoidance Lateral Collision Avoidance Intersection Collision Avoidance Vision Enhancement for Crash Avoidance Safety Readiness Pre-crash Restraint Deployment Automated Vehicle Operation
7. Information Management	Archived Data Function

Physical Architecture

The physical architecture partitions the functions defined by the logical architecture into systems and subsystems. The partitions are based on the functional similarity of the process specifications and the location where the functions are being performed. Essentially, the physical architecture describes how the functions group together. The ITS physical architecture (as depicted in Figure C.1) is comprised of four systems (Traveler, Center, Roadside, and Vehicle) and 19 subsystems. Subsystems are composed of equipment packages with specific functional attributes.

Figure C.1 Physical Architecture



Logical Architecture

The logical architecture presents a functional view of ITS services. The logical architecture defines and describes what the functions or process specifications are that are required to perform ITS user services, and the information or data flows that need to occur among these functions. It also identifies system interfaces for connecting systems and components so that data can be provided where it is needed. For example, data can be stored on several servers in a client-server system and thus information flows must be charted to show the sequence of servers to be accessed to acquire the requested data.

Communications Requirements for Information Flows

Communications requirements in the National ITS Architecture include wireless, wired line, Dedicated Short-Range Communications (DSRC), and vehicle–to-vehicle communications. Communications requirements refer to communications standards such as the Transit Communications Interface Profiles.

Regional ITS Architecture

The Commonwealth of Massachusetts, through MassHighway, is responsible for developing Regional ITS Architecture and leads this effort. This is an on-going project and transportation agencies and other interested organizations on Cape Cod should work with this State on this effort.

National ITS Standards

A fundamental ITS expectation is the ability to integrate and share information among various users across institutional and jurisdictional boundaries. Open standards are the essential ingredients for achieving the ITS interoperability and compatibility necessary to meet these expectations at regional and national levels.

To help fast track the creation of open ITS standards, the U.S. Department of Transportation (U.S. DOT) has sponsored the accelerated development of approximately 100 ITS standards by existing standards-setting organizations. These standards are being developed through the traditional voluntary consensus process in Standards Development Organizations (SDO) such as the Institute for Transportation Engineers (ITE), the Society of Automotive Engineers (SAE), and others. Over the next several years, the U.S. DOT plans to adopt national ITS standards based on the results of these efforts.

Regional ITS Standards

MassHighway is responsible for developing Regional ITS Standards. This is an on-going project and transportation agencies and other interested organizations on Cape Cod should work with this State on this effort.

C.2 Traveler Information Systems[2]

Providing information important to the traveling public, such as roadway conditions, planned construction delays, accidents, emergencies, congestions, and detours, are an important tool to help travelers better prepare and navigate within any area, including Cape Cod. This information is referred to as Traveler Information and it is delivered to potential users through Traveler Information Systems. These systems allow an authority such as the Park Service, the State Police, or MassHighway to provide the traveling public with advanced real time information that will assist them in making informed transportation decisions.

Components of a Traveler Information System

The purpose of Traveler Information Systems is not to eliminate congestion but rather help try to reduce it by providing people with information and options. Transportation Information Systems are comprised of the following components:

[2] A primary source of information for this section can be found in "Advanced Public Transportation Systems: The State of the Art Update 2000," Robert Casey, Terrence M. Sheehan, et al, FTA-MA-26-7007-00-1, December 2000.

- Pre-trip Travel Information
- En-route Driver Information
- Route Guidance
- Ride Matching and Reservation
- Traveler Services Information
- Traffic Control
- Incident Management
- Travel Demand Management

The focus of this section is service of use to the traveling public. Four of the ten components identified above are directed at travelers, these are Pre-trip Travel Information, En-route Driver Information, Route Guidance, and Traveler Service Information. The other services focus on providing tools to transportation agencies to better manage the transportation system and respond to emergencies in order to better serve the traveling public.

Pre-trip traveler information systems help travelers make decisions about the choice of transportation mode, route, and departure time before they begin their trip. There are three main types of pre-trip information: General Service Information, Itinerary Planning and Real-Time Information. Pre-trip information can assist a driver map a route, gather information on current roadway conditions, and identify detours around planned construction. Transit users can identify transit routes, schedules, fares, and connections. Systems can provide basic information on getting from one point to another or can provide additional information on sites and services along the travel route.

En-Route Driver Information systems provide real-time information to travelers who have commenced a trip. Information on delays, accidents, weather conditions, and emergency situations can be communicated to the traveling public. Route guidance systems can identify alternative routes that are available to by-pass delays. Traveler Services Information provides travelers with information on services and facilities during trip planning and while en-route.

Traveler Information Data Collection

Providing information to the traveling public begins by collecting data. The focus of this chapter is technologies that travelers can access to get information rather than the technologies and methods required to collect information but a brief discussion of information sources is necessary. Maps, whether old-fashion paper maps or trip planning software available on many web-based sites, and transit schedules provide the simplest form of information useful to the travelers.

Dynamic systems that collect real-time information have been developed to provide more accurate and timely information to travelers.

Automatic Vehicle Locator (AVL) systems can let a person waiting for a bus know where the bus currently is and estimate its arrival time. Data collected from vehicles equipped with AVL systems can provide information on average road speeds that can help a driver know what the travel conditions are along his or her planned route. Television cameras placed along roadways, at bridges and other major connectors, and at major intersections can allow transportation managers to monitor travel conditions. Individuals operating vehicles on routes, such as police officers, bus drivers, and highway department staff can transmit information to a central control center that can then be disseminated to the public. Detectors along roadways and at intersections can count vehicles crossing a specific point and provide data useful to determine current traffic volume.

Traveler Information Dissemination Technologies

A large number of technologies have been adapted and developed to disseminate information to the traveling public during trip planning and while en-route. These include Interactive Voice Response (IVR) systems, web-based information, kiosks, radio services, and wayside information. A number of these technologies are provided here. They include telephone systems, kiosks, websites, Highway Advisory Radio, Television, Variable Message Signs, and Pagers and Handheld Wireless Technology.

Interactive Voice Response (IVR)

Interactive Voice Response (IVR) telephone information systems allow customers to call a single phone-number and navigate a menu for needed information. An example of this technology is the 1-800 number that Massport is using for Logan International Airport. This free line is accessible to customers that are planning their trip to and from Logan Airport. Massport provides customers with an easy to use menu system to select various types of traveler information. This information includes ground transportation information including MBTA service, water taxi service and Logan Express. It also provides customers with updated flight schedules, parking facilities status, ADA information and real-time traffic information serving the airport. Further, this system allows customers to still contact an agent while also directing them to their website for additional information.

While this phone number has been designed to serve a large airport facility it serves as a very valuable example of how Cape Cod, and specifically the National Seashore could benefit by having a fully integrated interactive voice response

number that visitors could access. While this type of technology has been useful a number of problems, including the need to find the 1-800 number for a specific transportation route, service, or geographic area, and the fact that many of these systems are designed to provide information for one specific agency or transportation system, have been identified as problems for travelers crossing several jurisdictions. In an effort to address this problem, the USDOT developed the 511 concept.

511 is a federal designated phone number similar to 911 that the USDOT is promoting as an en-route traveler information service. The concept of 511 is not to replace the various 1-800 numbers and transportation service numbers that many agencies already operate but rather provide a single easy to use and remember number that provides information about various transportation agencies within the same region. Further, 511 is also designed to be expandable, therefore allowing the region to add other types of important traveler information such as weather, local attractions and parking information.

Kiosks

Kiosks are computer terminals located in public areas that are programmed to provide specific information of interest to those visiting a site. Transportation information kiosks have been developed and deployed by transportation and transit agencies, local governments, and others to provide a variety of information to the traveling public.

Kiosks can help provide traffic, construction and emergency notifications. Kiosks can provide a great deal of information including local attractions, transportation options, and accommodations. Kiosks can also be used to develop partnerships between public sector transportation agencies and private businesses. Businesses can provide locations for kiosks as well as add links, for a fee, on kiosks providing both information to travelers and a source of revenue to maintain kiosks.

Website

Providing traveler information through websites is a cost effective any easy way to provide real-time information to the traveling public. Transportation websites generally offer either traffic information or transit information. Websites serve as a great resource for both since web-based software has now made websites more interactive allowing customers to get more personalized information. Kiosks, discussed above, can be and are often used to access web-bases information.

Websites can be an effective method to transmit real-time traffic and transit information collected by transportation agencies and partners. Real-time traffic information is important to the traveling public. Information on weather conditions, delays caused by planned construction, and information about incidents such as accidents and equipment failures that affect traffic allow travelers to understand traffic conditions and make travel decisions based on those conditions.

Technology has been developed, and is in-place at some transit agency websites, that allow transit users to plan transit trips. The value of this service is that it allows customers to maximize their understanding of the system while minimizing their traveling time. These systems allows for more efficient use of customer service staff and, because this software is designed to allow real-time information, can provide transit users information on emergencies and construction, allowing customers to find the most efficient way to their location.

Highway Advisory Radio

Highway Advisory Radio (H.A.R.) provides regularly updated information on roadway and travel conditions using a dedicated AM radio frequency accessible to a limited geographic area. The AM radio is an interface that is available in nearly every car and home, making H.A.R. a method that provides the potential of reaching the greatest number of people in the shortest time.

For H.A.R. to be used effectively on the person in their vehicle, signage is recommended at specific points along the roadway to tell

Variable Message Signs

Variable Message Signs (VMS) are used by all modes of transportation including highway, aviation and transit. Variable message signs are often used where a relatively small amount of information needs to be displayed at a considerable distance from a transportation situation such as an upcoming accident or construction. Transit agencies use VMS to provide customers real-time transit data for buses and trains. State highway departments use these signs as a way to provide traffic information along roadways. This can be very helpful in trying to direct traffic to detours, avoid an accident or construction. Also, during 'quiet' times these signs can be directed to deliver safety information such as the use of seatbelts and roadside assistance.

Pagers and Handheld Wireless Technology

Several new technologies have emerged that can bring more detailed information more directly to the traveler. These technologies blur the distinction between pre-trip and en-route information. These technologies are alphanumeric pagers and handheld computers.

Conventional paging services provide one-way communication with a customer. This technique tends to be a mobile extension of the e-mail alert. The main difference between broadcast dissemination techniques and paging is that a user can customize a subscription and receive only those messages relevant to their travel patterns. Some of the newer pagers support limited two-way communications. This creates opportunities to distribute alerts on a conditional basis, (i.e., a brief alert would be distributed and the user could either accept or decline the follow-up message with more detailed information).

Handheld computers, such as the Palm Pilot, are appearing increasingly with wireless communications capability and Internet connectivity. In addition, a number of cellular phones now incorporate handheld computer capabilities. Transit agencies are now making system maps available to download onto a handheld so that the traveling public has the most accurate information to make their transportation decision. Although this is primarily focused on transit this information is becoming increasingly available through the private sector to get updated traffic conditions, weather alerts, and directions. Private sector companies are devising ways to make transportation information more "value added" by providing enhanced information products to subscribers.

C.3 Parking Management Systems (PMS)[3]

Several technologies currently exist to assist to automate portions of a parking management. They include pneumatic tubes, loop detectors, video cameras, and acoustic sensors, which are discussed in detail. Although all of solutions are designed to make parking management more efficient and less labor intensive they vary by cost and capabilities.

Pneumatic Tube

Pneumatic tubes are hollow rubber tubes stretched across the portion of the roadway where vehicle counts are needed. One end of the tube is attached to a transmitter or traffic counter and the other end is plugged to prevent air leakage as a vehicle crosses. When a vehicle crosses the tube, the air pressure changes due to the weight of the car. The transmitter then relays the change in pressure to a computer, which processes the pressure changes as vehicle counts. Given that each vehicle axle produces a pressure pulse, the computer recognizes two pulses as one vehicle (as vehicles towing a trailer will result in three or more pulses, the computer recognizes the vehicle combination will take more than one space). This technology does not have the ability to classify vehicle lengths, and therefore the ability to identify RVs or buses, which have two axles, but use more than one space.

The tubes are typically 1.3mm (0.5 inch) in diameter, so are visible, but not obtrusive. They are easily damaged or vandalized, but inexpensive to replace. Pneumatic tubes are relatively accurate for light traffic flows depending on lane division and approach angles. The transmitters are typically battery powered and transmit to a single receiver, which eliminates the cost of running power lines to the counter location and communication costs between the counters and base station.

Loop Detector

Loop detectors use an inductive loop of wire wound in a circular or rectangular shape that is typically placed into a precut groove in a lane of the roadway. The loops work using the concept of inductance sending an electric current through the wire "loop" and creating an electromagnetic field that can be measured. When a vehicle passes over the loop, the inductance decreases. The module that detects the inductance then outputs a signal to a computer-processing unit

[3] Primary sources of information for this section can be found in Chapter 3, Table 3, page 9 from the *Sandy Hook Gateway National Recreation Area ATS Plan, August 2002* prepared for the NPS Northeast region, and "Advanced Public Transportation Systems: The State of the Art Update 2000," Robert Casey, Terrence M. Sheehan, et al, FTA-MA-26-7007-00-1, December 2000.

(via cellular communication or cable) that processes the inductance changes into vehicle counts.

Loop counters have been used extensively over many years, allowing installers to have access to a wide variety of information on loop uses and associated problems. Loops counters are also fairly accurate. A good loop detector should be able to count vehicles to within a 5% margin of error. An integrated system (which includes communications, a processing unit, and a central computer) can count vehicles and approximate vehicle speeds. Loop detectors are also relatively inexpensive to purchase and maintain when compared to similar technologies.

Loop detectors require regular maintenance to make sure that they remain operational and accurate. The loop wires need to be tested regularly for accuracy, as weather and direct vehicle contact can affect accuracy. This maintenance is relatively simple, however, compared to maintenance and operational concerns of other technologies.

Closed Circuit TV Video Camera

Closed Circuit TV (CCTV) video cameras use video image processors to count vehicles and calculate approximate vehicle speeds. A personal computer receives the digital images from the camera. The images then are digitized and passed through a series of computer algorithms that identify changes in the image background on a pixel-by-pixel basis. Information on vehicle presence, direction, speed, length, and lane change movement can be derived from the data. Emerging camera technologies use one camera image to analyze multiple lanes of traffic. This technology provides for more extensive data than other counting technologies and can also be used for incident detection.

While the type of data provided by these high-end cameras is diverse, the data is not necessarily useful for a parking application in a small venue. The cameras also require a higher degree of maintenance and are not as effective in rain or fog. Camera technology is more costly than loop detectors, several of which can be purchased for the price of one camera.

Acoustic Sensor

Acoustic sensors track the acoustic energy generated within passing vehicles from the interaction of the vehicle's tires with roadway. Microphones are then used to detect changes in noise levels. When a vehicle enters this detection zone, a computer processor detects the increased sound level and a vehicle presence signal is generated. When the vehicle leaves the zone, the vehicle

presence signal is terminated. This signal is sent to a computer that can tabulate the counts by lane and location.

While acoustic sensors are only marginally more expensive than loop counters, traffic count information from sensors would be less accurate in the National Seashore setting where weather, ocean waves, and other noises can create background noises that may be mistaken as vehicle noise. Acoustic sensors are also temperature sensitive and can be disrupted by changes in air pressure.

C.4 Security and Emergency Management

The current emergency and preparedness guidelines in place for Cape Cod are to respond to hurricanes. The Massachusetts Emergency Management Administration (MEMA), the state agency responsible for emergency planning on the Cape and statewide, developed this plan based on the assumption that a hurricane is the only major emergency situation that could affect the Cape.

Hurricanes are easily predicted, monitored and located. There is ample warning that one could approach and land on the Cape. A major component of the existing emergency plan is the predictability of hurricanes and their advanced warning. The current plan, which is not an evacuation plan, is predicated on the fact that non Cape residents and those in low lying areas will chose to leave the Cape well in advance of a hurricane. The National Weather Bureau gives the public a twelve-hour warning of impending landfall and usually there are several days of hurricane watch and tracking.

Stakeholders

There are many different stakeholders involved in traffic control, emergency planning, and pre-disaster mitigation planning on the Cape. Stakeholders include Federal government agencies, State government agencies, local/municipal governments, statewide transportation agencies as well as various other organizations and groups including school districts and private transportation providers.

Federal Stakeholders

At the Federal level there are two different organizations involved with Cape Cod planning. They are the Federal Emergency Management Agency (FEMA) and the Army Corp of Engineers.

FEMA's role in pre-disaster mitigation for the Cape and emergency planning is to issue broad guidelines, supplying training grants and funding for planning

coordination between on-site organizations who are actually responsible for the execution of the plans.

Due to pending legislative action in Washington D.C., there is a chance that within the next eighteen months FEMA's role and relationship with local and state agencies may change. Much of this will depend on the pending legislation to establish the Office of Homeland Security and Defense. Although these details need to be completed one should assume that if these changes occur it is likely that Cape Cod's emergency preparedness and response planning will need to be modernized. This would increase the number of agencies involved in both the planning and execution of emergency plans for the Cape. In addition to FEMA the Department of Defense could become part of the process along with the Nuclear Regulatory Commission.

The other federal level agency with direct responsibilities for Cape Cod emergency situations is the Army Corps of Engineers. The Corps is responsible for the maintenance and security of both the Bourne and Sagamore bridges as part of their responsibility for the security and safety of the canal. The bridges were built by the Corps specifically to meet specific military and weight bearing standards. The Corps has the right and jurisdiction to restrict and even close the bridges to traffic under specific sets of conditions.

State Stakeholders

There are several state level agencies and organizations involved with Cape emergency planning these include the Governor's Office, Massachusetts Emergency Management Agency (MEMA), and Massachusetts State Police. The Governor's office is responsible for declaring a state of emergency and activating the plan put in place by MEMA under FEMA's guidelines. Under the hurricane plan the Governor's office is strictly tasked with informing MEMA as to expected landfall of a hurricane on any part of Massachusetts. The Governor's office is to notify fourteen hours in advance of landfall. The plan starts to take effect when landfall is expected within ten hours. Once MEMA is notified by the Governor's Office, the emergency plan is put into action by the State Police. For the Cape specifically, coordination of the plan's activation is by Troop D, which is headquartered in Middleboro, MA.

Other Stakeholders

In addition to regional or state level public agencies involved there are two non-profit agencies. They are the Red Cross of Massachusetts and the Massachusetts Emergency Animal Response Team (MEART). The Red Cross is responsible for coordinating the care for people displaced by the emergency or stranded by the emergency. MEART is responsible for coordinating the shelter and treatment of

domestic animals that belong to people who have been displaced or stranded. It is against the law in Massachusetts for people and animals to be housed together in a shelter situation. These two organizations coordinate with Massachusetts Military Reservation (MMR) (Otis Air Force base) which is where people will be sheltered. MMR is responsible only for providing space and storage for Red Cross and MEART supplies.

Most of the plan's actions devolve responsibility to the local level with oversight provided by the State Police. There are coordination plans with all of the local emergency services; police, fire, hospitals, county sheriff's office and the like. Each town under MEPA has a designated Emergency Coordinator. The Coordinator represented the town at during the planning process for the emergency plan. It is the Coordinator's responsibility to communicate with the local response personnel that the plan has been activated and at what stage of the plan.

One of the most salient facts about MEMA's plans is the length of time that is available to activate the plan. Since the plan is only for hurricanes and there is ample warning of hurricanes, the plan assumes that most non-Cape residents, faced with the onslaught of poor weather, hurricane or not, will opt to leave well before the situation becomes critical. The plan mostly accounts for full time residents and those visitors who chose to leave later or not at all. The National Weather Bureau notifies the Governor's Office two hours before they make a public announcement that there is a chance of landfall within twelve hours. The Governor's Office, MEMA and the State Police therefore have about fourteen hours to active the plan.

How do the stakeholders work together?

The current emergency plan for the Cape is dictated by a series of letters of agreement to the plan by each organization on the State level to the local level. Each participating organization did take some part in the design of the plan and was able to have its particular needs addressed.

Although the plan is under the jurisdiction of MEMA, its execution is the sole responsibility of the State Police. There are no provisions for the coordination or sharing of information technologies between the State Police and any of the local organizations tasked in the plan. According to the plan, the State Police communication protocol relies on radio communication and some web based materials. Signs directing traffic and alerting vehicles as to conditions, traffic patterns and the like, will be manually checked and installed. There is some coordination with a local AM radio station to give people information and directions.

Current Plan

The current plan is a traffic management plan. It takes into account several unique features of the Cape, namely the Bourne and Sagamore bridges. In addition to being the only two routes off the Cape the bridges are subject to traffic restrictions and even closure under high wind conditions. The determination of what type of vehicle traffic will be allowed on the bridges is subject to the Army Corps of Engineers. The Corps is notified by the State Police, who receive information from the National Weather Bureau, on wind speeds.

MEMA will declare an emergency situation and notify the State Police who then implement it. The plan is in stages. First to be moved are people in non-permanent structures such as campers in tents. They are then followed by large vehicles and finally people in permanent buildings in low-lying areas.

MEMA will also notify the Corps about wind speeds. The Corps has guidelines about wind and the bridges. When winds are sustained at 75 mph the bridges are closed to all traffic. Wind gusts of 65 mph all campers, trucks and semis are forbidden. The State Police coordinate with local area emergency personnel in notifying people and guiding them along proscribed emergency routes. The goal of the plan is to keep traffic moving and to have all traffic move on inland roads.

Current Legislation and Policies

Currently legislation regarding FEMA and subsequently MEMA is under debate and scrutiny. Major legislation regarding the operation of FEMA, the Stafford Act, is in the process of being re-written with regards to Pre-Disaster Mitigation (PDM) and Emergency Relief Efforts. Due to the change in focus after 9/11 the President's FY 2002 budget neglected to include specific funding for PDM, which is the funding pool for MEMA evacuation planning. A notification of grants has been published in the Federal Register and guidelines for grant applications are also available. A draft of the Final Rule for PDM has been released but until funding is secured the program is in limbo.

According to the Federal Register, "FEMA did not feel that it was appropriate to request the States to recommend communities for assistance" and they have notified Congress that the deadline for applications was not applied since their funding was not secured until after the application deadline. It is unclear from the Federal Register as to exactly how secure funding is.

The flux on the national level in turn affects the state. MEMA through the office of the Governor applies for PDM funding grants. The grants are either program specific or area specific and are applicable for "mitigation activities such as planning and the implementation of projects identified through the evaluation of

natural hazards." The grants stipulate, "at least 25% of the eligible costs must be provided from a nonfederal source."

APPENDIX D

Beach Parking Facilities Aerial Photos

APPENDIX D BEACH PARKING FACILITIES AERIAL PHOTOS

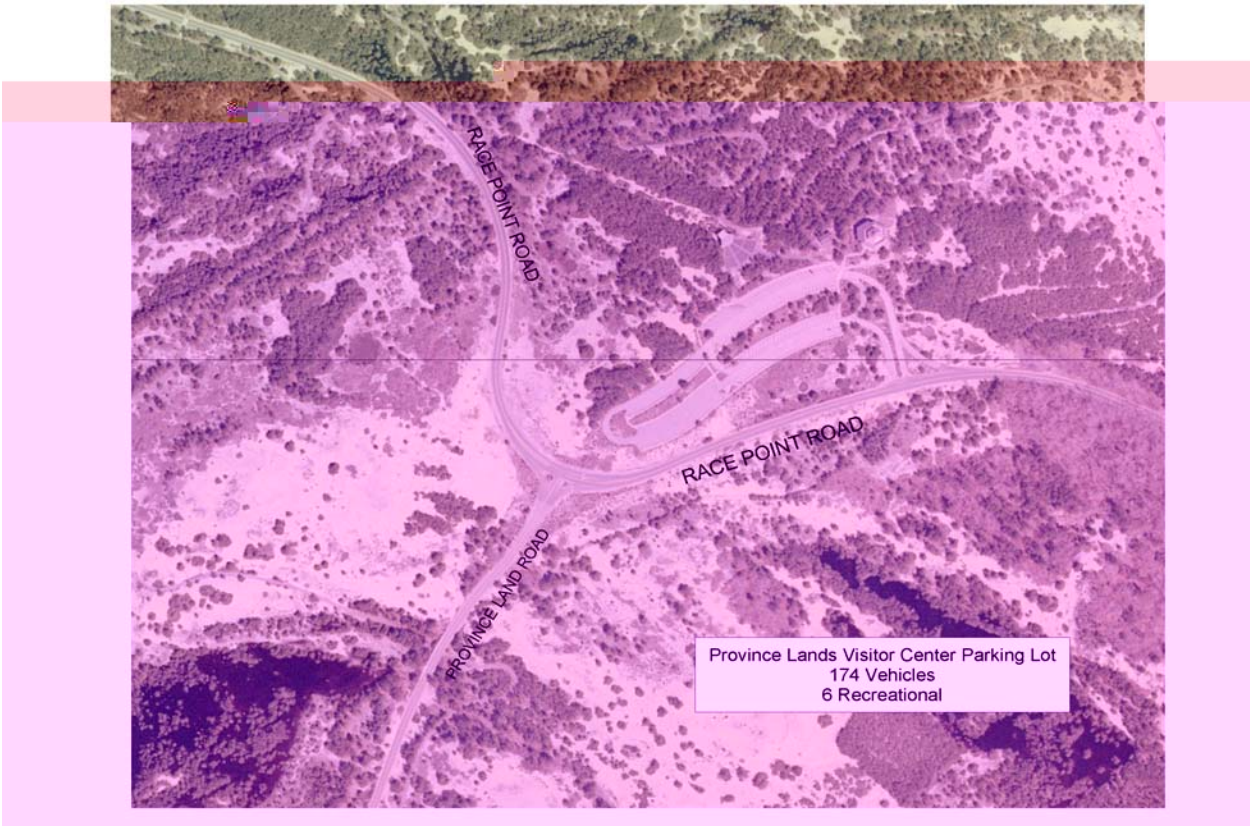
The following pictures depict the aerial views of the 11 parking facilities under control of CACO. The sites include Beech Forest trail, Head of the Meadow beach, Little Creek Parking and Coast Guard Beach, the Highland Light (former North Truro Air Station), Marconi Beach, Nauset Light, Province Lands Visitors Center, Race Point Beach, Salt Pond Visitor Center, and Herring Cove Beach.

HEAD OF THE MEADOW ROAD
Head Of The Meadow Beach
365 Vehicles

Little Creek Parking Lot
300 Vehicles
OCEAN VIEW DRIVE
DOANE ROAD
MACPHERSON WAY
PINECREST DRIVE
TOMAHAWK TRAIL
Coast Guard Beach
Accessible Parking Lot
52 Vehicles

Marconi Beach
530 Vehicles

CABLE ROAD
OCEAN VIEW DRIVE
Nauset Light Beach
139 Vehicles
3 Recreational


RACE POINT ROAD
RACE POINT ROAD
PROVINCE LAND ROAD
Province Lands Visitor Center Parking Lot
174 Vehicles
6 Recreational

COAST GUARD STATION ROAD
RACE POINT ROAD
Race Point Beach
355 Vehicles

SCHOOL HOUSE ROAD
NAUSET ROAD
ROUTE 6
Salt Pond Visitors Center
192 Vehicles
6 Buses / RV's

ROUTE 6
PROVINCE LAND ROAD
Herring Cove Beach
South Lot
393 Vehicles
North Lot
209 Vehicles

APPENDIX E

Possible Beach Access Limitation Approaches

APPENDIX E POSSIBLE BEACH ACCESS LIMITATION APPROACHES

In view of the scarcity in operating funds (as evidenced by a lack of funding for additional lifeguards), the capital approach for access limitation is recommended. This approach would eliminate the need for one or more Park Rangers to enforce the drop off restrictions and could reduce the number of lifeguards needed, but would necessitate controlled access on both Doane and Cable Roads. The recommendations in this section are given that in the event that CACO chooses to re-deploy rangers for other activities, there is a plan in place to ensure that resources can be preserved and protected through the use of technology and best practices. Note that these proposals and tactics will likely require lengthy public comment opportunities and regulatory approvals. These include, but are not limited to, town planning and zoning board of appeal approvals, town meeting vote(s), as well as Commission and appropriate State and Federal agency oversight and approval. Some proposals may be logistically impossible currently, but are presented in the interest of completeness in the event that circumstances become favorable.

The following are a compendium of possible beach access limitation approaches that could be implemented for Coast Guard and Nauset Light Beaches:

DOANE ROAD / COAST GUARD BEACH

- Relocate the entrance fee collection station from the Coast Guard Beach entrance to the middle of Doane Road just east of the entrance to the Little Creek parking lot.
- Doane Road would need to be widened at this point to accommodate the entrance fee collection station. This placement would allow the NPS to collect an entry fee for every non-pass holder vehicle.
- Equip the entrance fee collection station with a telephone and connect the station to a local communications network encompassing roadway counters, card-actuated gates, variable message signs, and the Salt Pond Visitor Center.
- Place vehicle counters at the entrance and exit lanes to the Little Creek parking lot.
- Provide Little Creek parking lot occupancy data (from the entry and exit counters) to the Rangers manning the entrance fee collection station so that parking availability can be calculated and displayed.

- Prohibit access to the Little Creek lot when all spaces are filled, including those vehicles, which would only be dropping off passengers.
- Place variable message signs (VMS) on Doane Road to inform visitors of Coast Guard Beach and Beach parking availability or direct them to other beaches. (Provide the same information to the Salt Pond Visitor Center information desk staff.)
- Possible locations for VMS include just east of the Salt Pond Visitor Center exit lane and just before the Nauset Road intersection. Pre-programmed messages would be sent by the Doane Road entrance fee collection station Rangers to the variable message signs. Possible messages include: COAST GUARD BEACH OPEN - USE PARK & RIDE SHUTTLE; COAST GUARD BEACH FILLED - HANDICAPPED ACCESS ONLY; COAST GUARD BEACH PARKING FULL - USE MARCONI BEACH.
- Place a card-actuated gate on Doane Road between the Little Creek parking lot entrance and the shuttle roadway.
- Only handicapped persons, Eastham residents living east of the gate (and their guests), and NPS employees would be permitted past the gate. The roadway would have to be widened somewhat at this location with a narrow median on which the gate mechanism would be placed.
- Equip the entrance fee collection stations with devices that would program magnetic cards (similar to hotel door cards) for the gate.
- Provide Eastham residents living east of the gate with a gate access card good for the season. Allow these residents to request limited time period gate cards for their guests.
- Provide arriving handicapped persons with a single-day gate card.
- Provide Visitor Use Assistants at the entrance fee collection station with the capability to open the card-actuated gate.
- Increase the shuttle carrying capacity (open air trams with trailers) between the Little Creek parking lot and Coast Guard Beach.

Arrival times of vehicles entering the Little Creek parking lot have not been provided. Special counts of vehicles entering the Little Creek parking lot over the period July 18 to August 7 (year 1998) averaged 461 vehicles per day. The capacity of the lot is 353 spaces. The few 1999 and 2000 tram passenger count estimates that are available (with both trams in service most of the day) show generally full passenger loads between 10:00 am and 2:00 pm going to the Beach and between 2:00 pm and when they stop running (between 5 and 6 pm) coming from the Beach. Since the tram capacity is reached on many of the trips to or from the Beach, it is certain that the trams are not currently able to accommodate all waiting passengers on every trip. On the highest counted tram

usage day, the Little Creek trams carried 1,280 persons to the Beach by 2 pm. A count of persons on the Beach between 1 and 2 pm conducted over a nine-day period in 1999 averaged 2,112. A Beach access mode count revealed an average of 829 persons were dropped off at the Beach. These 829 persons would be potential users of the tram if drop offs at the Beach were prohibited. To accommodate these individuals would require two more sets of trams and trailers. Consequently, a prohibition of drop offs at Little Creek is recommended when the lot is filled. This would not be expected to reduce the number of persons using the trams since the parking lot would be filled even though Beach use would be reduced.

Since the tram counts indicate they are operating at capacity on many trips to and from the Beach on good beach days, the procurement and operation of additional tram capacity is recommended. Another tram would serve the dual purpose of reducing passenger wait time and improving the reliability of tram service.

CABLE ROAD / NAUSET LIGHT BEACH

The recommendations for Nauset Light Beach depends on how severely the NPS wishes to limit the use of the Beach because of its crowded nature and lifeguard and restroom facility limitations. If the NPS desires to limit Nauset Light Beach access to the number of beachgoers able to park in the Nauset Light Beach parking lot while eliminating drop offs, some or all of the following actions could be implemented.

- Relocate the entrance fee collection station from Nauset Light Beach entrance to Cable Road to a position just before the easternmost Nauset Regional High School entrance road.
- This would provide an escape route back through the High School for those vehicles not following directions from variable message signs. The entrance fee collection station could be moved further east on Cable Road but a turnaround would have to be constructed.
- Equip the entrance fee collection station with a telephone and connect the station to a local communications network encompassing roadway counters, card-actuated gates, variable message signs, and the Salt Pond Visitor Center.
- Place vehicle counters at the entrance and exit lanes to the Nauset Light Beach parking lot.
- Provide Nauset Light Beach lot occupancies (from the entry and exit counters) to the entrance fee collection station so that parking availability can be calculated and displayed to the attendants.

- Prohibit vehicular access to the Beach east of the entrance fee collection station (except for handicapped persons and Eastham residents living to the east of the station) when all Nauset Light Beach parking spaces are filled.
- Place variable message signs on Nauset Road to inform visitors of Nauset Light Beach and Beach parking availability or direct them to other beaches. (Provide the same information to the Salt Pond Visitor Center information desk staff.)
- Possible locations for VMS include on Nauset Road just south of the intersection with Cable Road and just north of this intersection. Pre-programmed messages would be sent by the Cable Road entrance fee collection station Rangers to the variable message signs. Possible messages include: NAUSET LIGHT BEACH PARKING AVAILABLE; HIGH SCHOOL PARKING ONLY - WALK TO BEACH (0.7 MI.); NAUSET LIGHT BEACH FILLED - HANDICAPPED ACCESS ONLY; NAUSET LIGHT BEACH PARKING FULL - USE MARCONI BEACH.

If the NPS desires to eliminate drop offs but not restrict the number of persons using the Beach, the following actions would be required:

- Relocate the entrance fee collection station from Nauset Light Beach entrance to the middle of the easternmost Nauset Regional High School entrance road.
- Use the parking lot to the east of the High School as a dedicated NPS (summer only) parking lot.
- Prohibit non-beach related traffic from using this lot by moveable barriers.
- Force all High School related traffic and persons using the tennis courts to park in spaces to the west of or behind the High School by using the westernmost High School entrance road. (A fixed sign, placed before the westernmost High School entrance road could be used for this purpose).
- Equip the entrance fee collection station with a telephone and connect the station to a local communications network encompassing roadway counters, card-actuated gates, variable message signs, and the Salt Pond Visitor Center.
- Place vehicle counters at the entrance and exit lanes to the Nauset Light Beach parking lot and the entrance and exit to the dedicated High School parking lot.
- Provide Nauset Light Beach and High School parking lot occupancies (from the entry and exit counters) to the entrance fee collection station so that parking availability can be calculated and displayed to the attendants.
- Prohibit access to the High School lot when all spaces are filled (except for Eastham residents), including those vehicles, which would only be dropping off passengers.

- Place a card-actuated gate on Cable Road just after the easternmost High School entrance roadway.
- Only handicapped persons, Eastham residents living east of the gate (and their guests), NPS shuttles (if run), and NPS employees would be allowed past the gate. The roadway would have to be widened somewhat at this location with a narrow median on which the gate mechanism would be placed.
- Place a card-actuated gate on the roadway behind the High School to prevent illegitimate access to the dedicated NPS parking lot.
- Equip the entrance fee collection station with devices that would program magnetic cards for the gate.
- Provide Eastham residents living east of the gate with a gate access card good for the season. Allow these residents to request limited time period gate cards for their guests.
- Provide arriving handicapped persons with a single-day gate card.
- Handicapped persons could be directed to use the Coast Guard Beach parking lot if they are unable to use Nauset Light Beach or the Nauset Light Beach parking lot is filled.
- Provide Rangers at the entrance fee collection station with the capability to open the card-actuated gate.
- Operate a shuttle to carry beachgoers between the Regional High School parking lot and Nauset Light Beach when the Nauset Light Beach parking lot is full.
- One tram type vehicle with trailer should be sufficient since the dedicated NPS parking lot at the High School would only have a capacity of about 120 spaces, or approximately one-third of the capacity of the Little Creek lot. On an interim basis, school buses could be used if another tram and trailer could not be procured in time.
- If significantly more persons are found to be riding the shuttle than would be expected based upon the utilization of the dedicated NPS lot, users could be required to show an entrance fee receipt or an Eastham pass in order to ride the shuttle.
- The receipt might need to show the number of persons in the party. The shuttle drivers would have to check this.

Off Season

After Columbus Day all beach staffing will terminate. Fee collection stations will be manned on weekends only between Labor Day and Columbus Day. After

Columbus Day, the fee collection stations would be removed and stored for the winter. All gate mechanisms would remain in place, but the gate barriers would be removed. The variable message signs would be deactivated.

CAPITAL AND OPERATING COST IMPLICATIONS

The option of having NPS staff police the Coast Guard and Nauset Light Beach areas to prohibit drop offs, with no other change in beach operations, would require the use of Park Rangers to roam between the two beaches or the stationing of a Ranger at each beach. The option of using card-actuated gates to prevent all but handicapped persons and Eastham residents living east of any gates from proceeding through the gates would require capital expenditures but would eliminate the need for Rangers for enforcement duties. If a significant reduction in the number of beachgoers results from vehicular beach access limitation, the number of lifeguard stations at Coast Guard Beach could be reduced. At Nauset Light Beach, there would be no expected reduction in staffing from current levels.

Regardless of the manner in which they are prohibited, the elimination of drop offs at Coast Guard Beach would necessitate additional shuttle capacity. This could be provided by the purchase and operation of another tram and trailer combination or by the purchase of additional trailers to attach to existing trams.

In addition to the extra trams or trailers needed, other capital expenditures would be required. Widening of Doane Road would be necessary at the new location for fee collection and at the card-actuated gate. Widening of Cable Road or the modification of the easternmost entrance to the High School would have to be modified to accept the relocated fee collection station. Placement of a card-actuated gate on Cable Road would require widening at that point. Depending upon the option selected, a turnaround on Cable Road might be necessary. New counters would be needed at the entry and exit points at the Little Creek lot, the Nauset42 he purost entranc.12Che option 8f using card