Cape Cod Regional Policy Plan

Barnstable County • Massachusetts

Cover image: Taken by the NASA/GSFC/JPL, MISR Science Team, with a vertical-viewing (nadir) camera on April 13, 2000, during Terra orbit 1708. From the Web site: www-misr.jpl.nasa.gov/gallery/galhistory/

Cape Cod Regional Policy Plan

Approved by the Cape Cod Commission, the Barnstable County Assembly of Delegates, and the Barnstable County Commissioners
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Table of Contents

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A Vision

The Regional Policy Plan is an expression of the shared aspirations of Cape Codders for the future. It is also a commitment by Barnstable County, in exercising its authority under the Cape Cod Commission Act, to serve as steward and trustee of the natural and cultural resources of Cape Cod and to work toward the development of a sustainable regional economy.

It is a Plan that recognizes the Cape as a fragile and beautiful place: a land of pine barren, kettle pond and sand dune; piping plover and gray seal; beach, salt marsh, and bay; village lane and stone wall. It is a Plan that seeks to protect habitat, in the awareness that Cape Cod is home to endangered species of global significance. It is a Plan to conserve a cultural landscape shaped slowly over 10,000 years of human habitation.

The Regional Policy Plan seeks to define the essence of Cape Cod, to assure its distinctiveness, and to discover a way for us to inhabit and enjoy the Cape without turning it into merely another place.

The Plan also recognizes that Cape Cod is home to more than 222,000 year-round residents, provider of jobs for more than 85,000 and the destination for millions of visitors. It is a Plan about creating the conditions for good jobs and decent, affordable housing. And it is necessarily a Plan to address problems such as traffic jams, waste disposal, and contaminated groundwater, and deal with a range of land uses and forms of development from rural to urban.

The Plan recognizes that Cape Cod is a place of finite resources, with a limited capacity to sustain new growth. It is a Plan that seeks to articulate a collective vision, to define the essence of Cape Cod, to assure its distinctiveness, and to discover a way for us to inhabit and enjoy the Cape without turning it into merely another place. It is a Plan to protect the best of Cape Cod and repair the mistakes of the past.

Not merely a vision, the Regional Policy Plan is a set of expectations and standards: high expectations that the quality of development on Cape Cod will be good, and clear standards to ensure that those seeking to develop Cape Cod face predictable requirements.

The Regional Policy Plan will come to life only through the continuing work of many individuals—those who serve on the Cape Cod Commission and weigh the benefits and detriments of Developments of Regional Impact, delegates to the Barnstable County Assembly who designate Districts of Critical Planning Concern, members of Local Planning Committees who prepare Local Comprehensive Plans, state and federal officials who seek to make their agency's actions compatible with the goals and policies of the Plan, developers who build the new Cape Cod, and, above all, citizens who actively participate in the formulation of a vision for their individual communities. For all of them, this Plan will serve as a guide to the future of Cape Cod.

I. Introduction

The Regional Policy Plan is both a planning and a regulatory document.

Background

The Cape Cod Commission Act was approved by the voters of Barnstable County in March 1990. Under the Act, the purpose of the Cape Cod Commission is to further "the conservation and preservation of natural undeveloped areas, wildlife, flora, and habitats for endangered species; the preservation of coastal resources including aquaculture; the protection of groundwater, surface water, and ocean water quality, as well as the other natural resources of Cape Cod; balanced economic growth; the provision of adequate capital facilities, including transportation, water supply, and solid, sanitary, and hazardous waste disposal facilities; the coordination of the provision of adequate capital facilities with the achievement of other goals; the development of an adequate supply of fair affordable housing; and the preservation of historical, cultural, archaeological, architectural, and recreational values."

The Commission is charged with reviewing and regulating Developments of Regional Impact, recommending designation of Districts of Critical Planning Concern, and preparing and overseeing implementation of a regional land use policy plan. The purpose of the Regional Policy Plan is to outline a coherent set of planning policies and objectives to guide development on Cape Cod and to protect its resources. The Act requires that the Regional Policy Plan identify the Cape's critical resources and management needs, establish a growth policy for the Cape, set regional goals, and develop a policy for coordinating local, regional and other planning activities.

The Regional Policy Plan is both a planning and a 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

Credit: NASA/GSFC/JPL, MISR Science Team

of development and redevelopment that falls within its jurisdiction. It also provides the framework for town local comprehensive planning efforts, and is used as a basis for the Commission's review of Local Comprehensive Plans for consistency with County policies. Finally, the Plan identifies key resources of regional concern that may deserve special recognition and protection through the creation of Districts of Critical Planning Concern or other types of planning efforts.

Planning Process

The Regional Policy Plan was originally created in 1990, the product of a planning process that was initiated shortly after the formation of the Cape Cod Commission. The Cape Cod Commission Act requires that the Regional Policy Plan be reviewed and updated every five years. The Commission began the first five-year review of the Plan in the summer of 1995 and the second review in the summer of 2000. This latest update was drafted under the direction of the Planning Committee of the Commission, and was formed after extensive public participation and comment. The Commission hosted a series of public hearings and workshops to examine different aspects of the Plan. Staff members with expertise in the areas of water resources, transportation, solid and hazardous waste management, land use, open space, housing, historic preservation, economic development, wetlands, wildlife, and coastal resources participated in formulating the recommendations in their areas of interest. Members of the Planning Committee and the full Commission conducted a detailed review of all draft materials as they were produced, and supervised the revisions in response to public comments.

Residents Survey

In 1990, the Commission contracted with Clark University to conduct an in-depth opinion survey of Cape Cod residents as part of the planning process for the Regional Policy Plan. The purpose of the survey was to ascertain residents' views on a broad range of questions relevant to the Plan such as:

- What kinds and levels of economic development are preferred by Cape residents?
- What resources are residents prepared to commit to support preferred levels of development?
- What are residents' environmental concerns and priorities for Cape Cod and their individual towns?
- What issues do residents feel the Commission should work on?
- What are residents' views about various regulations and guidelines the Commission might implement?

The survey was distributed to 4,000 Cape residents who were selected through a scientifically developed random sample. The large sample size was needed in order to compare results town by town. More than 2,400 questionnaires were returned, for an exceptionally strong response rate of 67%. The findings of the survey indicated strong support for protection of the Cape's water supply and surface waters, preservation of historic areas and open space, and control of traffic congestion

as well as support for clean light industry and new cultural facilities.

For the 1995 update of the Regional Policy Plan, the Commission engaged the Center for Survey Research at the University of Massachusetts at Boston to gather citizen input by means of a similar sample survey. The study validated and reaffirmed the results of the 1990 survey, indicating strong support for protection of natural resources, open space, and community character. The results of the surveys have been an important part of the background material for both the creation and the updates of the Plan, including this one.

Public Meetings and Hearings

The Commission conducted a series of public meetings and hearings during the update of the Regional Policy Plan in order to solicit input from citizens, town officials, and interest groups. The staff also held numerous meetings with technical experts, scientists, citizen advocates, and state officials to research specific topics of concern.

The 2001 update started in the summer of 2000. The Commission held four regional hearings, one each on the Upper and Lower Cape and two Mid Cape, to highlight the most important issues to be addressed in the Plan update and

Regional Policy Plan workshop with town planners and officials. Credit all photos this page: Van Morrill/CCC

to gather public input. During the fall of 2000, the Commission held a series of six topical workshops covering in greater detail the individual sections of the Plan, including land use/growth management, water and coastal resources, economic development, affordable housing, capital facilities, waste management, energy, wetlands and wildlife, open space and recreation, and historic preservation and community character. More than 700 individuals and organizations received notices inviting them to attend.

Starting in January 2001, Commission staff worked with the Planning Committee of the Commission to redraft each section of the Regional Policy Plan, based on the input received at the public hearings and workshops. The Commission held five more regional hearings on the revised draft of the Plan in June and August 2001, before forwarding it to the Barnstable County Assembly of Delegates. The Assembly of Delegates and the County Commissioners must approve the amended Plan as a County Ordinance in order for it to take effect.

Organization of the Regional Policy Plan

Section I of the Regional Policy Plan contains an Introduction and Definitions for key terms contained in the Plan, as well as a listing of common abbreviations. Section II of the Plan presents a Growth Policy for Cape Cod and contains background/issue presentations that define the scope of issues and the nature of problems to be addressed in the Plan. This section also contains numbered Goals and

Cape Cod Commission meeting in progress. Credit: Tana Watt/CCC

Policies that cover each of the issue areas. Finally, this section of the Plan addresses Implementation, with specified Commission Actions and Recommended Town Actions. The Commission Actions are listed in order of priority and contain activities that the Commission or staff will undertake in order to further the goals and policies in the Regional Policy Plan. It is anticipated that these actions will be undertaken over a period of years utilizing existing staff and funding. The activities listed as Recommended Town Actions comprise actions that towns will be encouraged to carry out in order to further the goals and policies in the Regional Policy Plan. Towns are expected to consider each of these actions in their Local Comprehensive Plans. The Commission has developed Guidelines for Local Comprehensive Plans as a separate document.

Section III of the Plan delineates Resources of Regional Importance on Cape Cod. Those resource areas that may benefit from better management are likely candidates for nomination as Districts of Critical Planning Concern. Section IV outlines a strategy for coordinating regional and local planning efforts, including the activities of private parties and local, state and federal governmental authorities.

The Regional Policy Plan and the Regulatory Process

Application of the Regulations

The Regional Policy Plan includes broad goals that set the direction for the future, and more detailed policies that specify how those goals can be accomplished.

The Regional Policy Plan does not change or alter any existing local, state, or federal regulations. The requirements set forth in the Plan are in addition to other regulatory requirements and do not exempt any person from complying with applicable local, state, and federal laws.

The Regional Policy Plan includes broad goals that set the direction for the future and more detailed policies that specify how those goals can be accomplished. Included in these policies are both Minimum Performance Standards and Other Development Review Policies. The Minimum Performance Standards of the Regional Policy Plan set forth the minimum standards that future development on Cape Cod is required to meet. Developments of Regional Impact are required to comply with all the Minimum Performance Standards of the Plan. The towns that choose to prepare Local Comprehensive Plans are encouraged to incorporate consistent standards in their Local Comprehensive Plans and implementing regulations in order to have those plans certified by the Commission.

The Other Development Review Policies of the Plan are standards that the County desires to promote. The attainment of these standards shall be considered as a benefit in the Commission's weighing of benefits and detriments of a Development of Regional Impact as required by the Act. These are also the standards that the County urges towns to support through their Local Comprehensive Plans. Because these Policies are recommended rather than required, they contain terms such as "should" and "encouraged."

Preapplication meeting about a DRI proposal. Credit: Tana Watt/CCC

The Regional Policy Plan also references numerous Technical Bulletins. The Technical Bulletins are policy guidance documents that explain in greater detail how some of the technical standards (such as traffic, nitrogen loading, open space, natural resources, lighting, and design) of the Plan can be met. The Technical Bulletins are not regulations but they provide guidance for preparing technical studies needed to demonstrate compliance with the Minimum Performance Standards of the Plan.

The Regional Policy Plan also references four official maps that are hereby adopted as part of the Plan: the Cape Cod Water Resources Classification Maps I and II, the Cape Cod Significant Natural Resource Areas Map, and the Functional Classification of Cape Cod Roadways Map.

In general, the Minimum Performance Standards and Other Development Review Policies of the Regional Policy Plan are intended to be used by both the Commission and local regulatory authorities such as planning boards, boards of health, conservation commissions, historical commissions, and similar bodies once a town has adopted a Local Comprehensive Plan certified by the Commission. In some instances, however the Standards apply only to Developments of Regional Impact (DRIs); when this is the case, the text of the Regional Policy Plan

specifies that the Standard is for DRIs. In other instances, there are Minimum Performance Standards and Other Development Review Policies that are designed for projects that are not subject to Commission review as DRIs. In these instances, the Standards and Policies are intended for the towns to apply through their local regulations.

Flexibility

The Minimum Performance Standards are mandatory standards, hence, they use the word "shall." If it can be demonstrated by an applicant, however, that the interests protected by a given Minimum Performance Standard can be achieved by an alternate approach including appropriate mitigation, the Commission or the Local Permitting Authority may modify the application of these standards. In approving such a modification, the Commission or the Local Permitting Authority must make a finding that the proposed use will not be more detrimental to the protected resource than would be allowable under the applicable Minimum Performance Standard. The burden of proof to demonstrate that such a modification is acceptable on that basis shall be on the applicant.

Private Property Rights

In some circumstances, property subject to regulation may be left with no remaining reasonable use due to the application of one or more of the Minimum Performance Standards of the Plan. In such cases, the Commission or the Local Permitting Authority (e.g., the planning board, conservation commission, board of health, etc.) may modify the application of such standards provided that the applicant demonstrates that he or she has complied to the maximum extent feasible with the relevant Performance Standards. Local authorities should incorporate into their bylaws and regulations provisions for special permits or variances to deal with such situations. The intent of this section is to ensure that reasonable use may be made of such property; however, the extent of use shall be limited insofar as is necessary to protect the resources of interest, and to ensure that there is no foreseeable danger to public health or safety. The burden of proof shall be on the applicant to demonstrate maximum feasible compliance with the relevant Performance Standards.

Development of Regional Impact Thresholds

The Regional Policy Plan does not alter any of the standards and criteria for Developments of Regional Impact set forth in Chapter A, Section 3 of the Code of Cape Cod Commission Regulations (Enabling Regulations for the Purpose of Reviewing Proposed Developments of Regional Impact). In accordance with Section 12(f) of the Act, the Commission may review those standards and criteria in light of its experience with the regulatory process, and make recommendations to the Assembly of Delegates as to necessary modifications in the future. The Commission may propose and the Assembly may adopt different standards and criteria for Developments of Regional Impact for different areas of Barnstable County.

Definitions

The definitions outlined below are designed specifically for their application in the Regional Policy Plan. They may not be identical to definitions used in the Cape Cod Commission Act or in other state and local programs. Except where specifically defined herein, all words in the Regional Policy Plan carry their customary meanings.

Affordable Housing – Dwelling units available at a cost of no more than 30% of gross household income to households at or below 80% of the county median income as reported by the US Department of Housing and Urban Development (HUD), including units listed under MGL c. 40B and the state's Local Initiative Program.

Falmouth Housing Corporaion's Gifford Street affordable project. Credit: Nancy Hossfeld/CCC

Archaeological Site – Any area where artifacts, remains, or any other evidence of a historical or prehistorical nature of 100 years old or more are found below or on the surface of the earth. These artifacts must have archaeological significance as determined by the Massachusetts Historical Commission or other knowledgeable persons or agencies. Artifacts may include, but are not limited to objects of antiquity; Native American, colonial, or industrial relics; or fossils.

Cape Cod Metropolitan Planning Organization (MPO) - The official body having the responsibility for making decisions about transportation investments and related matters for Barnstable County, as required under Title 23 of the US Code. Currently, the members of the Cape Cod MPO include the Chairman of the Cape Cod Regional Transit Authority, the Chairman of the Cape Cod Commission, the Secretary of the Executive Office of Transportation and Construction and the Commissioner of the Massachusetts Highway Department or their representatives. The Cape Cod Joint Transportation Committee acts in an advisory capacity to the Cape Cod MPO. The structure of the MPO may change from time to time, in accordance with state and federal requirements.

Cluster Development – A form of development that permits a reduction in lot area requirements, frontage, and setbacks to allow development on the most appropriate portions of a parcel of land in return for provision of a compensatory amount of permanently protected open space within the property subject to a development application.

Coastal Bank – The seaward face or side of any elevated land form, other than a coastal dune, that lies at the landward edge of a coastal beach, land subject to tidal action, or other wetland. Any minor discontinuity of the slope notwithstanding, the top of the bank shall be as defined in the Massachusetts Department of Environmental Protection's (DEP) Policy 92-1, Definition and Delineation Criteria for Coastal Bank, dated March 3, 1992, or any superceding guidance that is subsequently issued by the Department.

Coastal Engineering Structure – Any breakwater, bulkhead, groin, jetty, revetment, seawall, weir, rip-rap, gabion, marine mattress, sandbag, or any other structure that is designed to alter waves, tidal action, or sediment transport processes.

Crash – An event that produces death(s), injury or injuries and/or property damage, involves a motor vehicle, and occurs on a

road or while a vehicle is still in motion after running off a road.

Critical Nitrogen Loading Rate – Also referred to as the critical nitrogen loading standard, this rate expresses the nutrient loading threshold for surface water bodies. Nutrient loads above the critical nitrogen loading standard will result in eutrophication. The critical loading rate is the annual critical nitrogen load, usually expressed in kilograms, divided by the area of the watershed, usually expressed in acres.

Developed Area – Any area that currently contains buildings, paved parking, and other development-related infrastructure or that has had such infrastructure removed but was in use within the past five (5) years. Developed areas do not include those areas or portions of sites that are vegetated.

Development – Any of the following undertaken by any person: any building, construction, mining, extraction, dredging, filling, excavation, or drilling activity or operation; the division of land into parcels; the clearing of land as an adjunct to construction; or the deposit of refuse, solid or liquid waste, or fill on a parcel of land or in any water area.

Flood Zones – Zones designated by the Federal Emergency Management Agency (FEMA) to represent the potential extent of flooding based on 100-year storms. The Regional Policy Plan refers to several zones, including A-zones, a designation that applies to areas subject to still-water flooding; AO-zones, a designation that applies to areas subject to still-water flooding at depths between one and three feet; and V-zones, a designation that applies to areas subject to wave actions.

Growth/Activity Centers – Existing and/or new areas designated by the towns and certified by the Commission through Local Comprehensive Plans as suitable locations for new growth and redevelopment. There are three categories of Growth/Activity Centers:

- **Village Growth/Activity Centers** – Small pedestrian-oriented settlements that are suitable for a mix of residential and compatible small-scale commercial uses. Additional growth in these areas may be limited, although some intensification and reuse of existing structures is usually appropriate.

- **Regional Growth/Activity Centers** – Densely developed areas providing a wide range of commercial goods and services for the immediately surrounding area as well as for a larger region. These areas also have or support different types of residential uses and are usually served by urban-scale infrastructure, such as sewer.

- **Industrial Growth/Activity Centers** – Special districts designed to accommodate manufacturing, warehousing, transportation terminals, wholesale business, and related uses.

Revisions to designated Growth/Activity Centers must take place through modifications of Local Comprehensive Plans.

Growth Incentive Zones – Areas suitable for concentrated mixed-use development that qualify for more streamlined regulatory standards under the Regional Policy Plan for projects reviewed as Developments of Regional Impact (DRIs). These zones are proposed by a municipality and designated by the Commission through a process separate from that of Certified Growth/Activity Centers. This process does not require that a town have a certified Local Comprehensive Plan.

Hazardous Material – Any chemical, combustible liquid, compressed gas, explosive, flammable aerosol, gas, liquid or solid, health hazard, mixture, organic peroxide, oxidizer, physical hazard, pyrophoric, unstable (reactive) or water reactive, as defined under Title 29 of the Code of Federal Regulations, Section 1910.1200(c) and any other chemical, material, or substance identified by the Cape Cod Commission as hazardous based on available scientific evidence. This includes, but is not limited to, petroleum products, solvents, oil-based paint, and pesticides. Hazardous Materials do not include Hazardous Wastes (see definition below), tobacco products, wood products, foods, drugs, alcoholic beverages, Articles, Cosmetics, Consumer non-food grocery products, latex paint, soap, and any Hazardous Material used by employees in the workplace in Household Quantities as defined below.

NOTE: The definition of "hazardous material" was revised in July 2003, effective September 10, 2003.

Credit: Marilyn Lopes/Cape Cod Cooperative Extension

• Articles: A manufactured item other than a fluid or particle (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design; and (iii) which under normal conditions of use does not release more than very small quantities (e.g., minute or trace amounts of a hazardous chemical).

• Cosmetics: (i) fluids, particles, or articles intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance, and (ii) fluids, particles, or articles intended for use as a component of cosmetics.

• Consumer non-food grocery products: A non-food grocery product, including a disposable paper or plastic product, household cleaning product, laundry detergent, or fabric softener.

Hazardous Waste – Any waste material as defined in the Massachusetts Hazardous Waste Regulations, 310 CMR Section 30.010. This includes, but is not limited to, waste oil, waste solvents, waste oil-based paint, and waste pesticides.

Hazardous Material or Waste, Household Quantity of – Any or all of the following:

(a) 275 gallons or less of oil on site at any time to be used for heating of a structure or to supply an emergency generator; and

(b) 25 gallons (or the dry weight equivalent) or less of other hazardous materials on site at any time, including oil not used for heating or to supply an emergency generator; and

(c) a quantity of hazardous waste at the Very Small Quantity Generator level as defined in the Massachusetts Hazardous Waste Regulations, 310 CMR Section 30.353.

Truro Town Hall. Credit: MA Executive Office of Environmental Affairs

Historic Structure – Any building, structure, or site that is now listed or is qualified to be listed on the National or State Registers of Historic Places as determined by the State Historic Preservation Officer in consultation with the applicable local historical commission. Qualifications for listing shall be those administered by the Massachusetts Historical Commission, including but not limited to:

(a) association with events that are historically significant;

(b) association with person(s) significant in our past;

(c) embodiment of distinctive characteristics of a type, period, or method of construction; and

(d) likelihood of yielding information significant in history or pre-history.

Impact Fees – An assessment paid by a person undertaking a development to a municipality or municipalities pursuant to the provisions of Section 15 of the Cape Cod Commission Act, designed to offset the impacts of a development. Impact fees may be applied to items such as creation or improvement of streets, sewers, water supplies, parks, schools, affordable housing, and similar capital facilities, in compliance with Section 15(c) of the Act.

Improvement Dredging – Any dredging under a license or permit in an area which has not been previously dredged or which extends the original dredged width, depth, length, or otherwise alters the original boundaries of a previously dredged area.

Infill – The development of new housing, commercial, or other buildings on scattered vacant or underutilized sites within existing substantially built-up areas.

Infrastructure – Facilities and services needed to sustain residential, commercial, and industrial development including, but not limited to, water supply and distribution facilities, sewage collection and treatment facilities, streets and roads, communications, energy, and public facilities such as schools and fire stations.

Intersection Widening – Any increase in the width of pavement or constructed roadway surface at the junction of two or more roads or driveways, or a combination thereof.

Land Subject to Coastal Storm Flowage – Land subject to inundation caused by coastal storms up to and including the 100-

year flood, surge of record, or flood of record, whichever is greater. The 100-year flood (or base flood as it is also referred to) means the flood having a one-percent chance of being equaled or exceeded in any given year. The seaward limit is mean low water.

Level of Service (LOS) – A measure of public facility and service quality for a variety of services such as roads, schools, parks, open space, police and fire protection, and other related services; in particular, for roads, a standardized, qualitative measure of vehicle operating conditions on a roadway based on criteria including speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs. The LOS for roads shall be determined based on the most recent edition of the Transportation Research Board's Highway Capacity Manual.

Maintenance Dredging – Dredging in accordance with a license or permit in any previously authorized dredged area which does not extend the originally dredged depth, width, or length.

Marine Infrastructure – Docks, piers, and wharves that service commercial fisheries, marine transportation, and derricks, navigational aids, and existing coastal engineering structures that preserve navigable channels to harbors supporting marine transportation and fishing.

Maritime Forest – A type of forest typically occurring on barrier beaches, estuarine fringes, and coastal banks. Underlying soils are usually well-drained, consisting of sand or loamy sand. They are often sheltered to some extent from extreme winds and salt spray by topographic features or distance from the ocean. Stratification of the vegetative layer varies but is often pronounced with a thick canopy above a low shrub layer or close ground cover. Maritime forests are often co-dominated by species of oak, although holly, beech and tupelo are common associates and may dominate in some locations. Maritime forests are important fringe communities that provide the transition from the coastal to the upland environment. Due to the distribution of vegetative cover and their proximity to dense cover and open foraging habitat, they are often significant for large mammals such as deer, fox, and coyote as well as passerine species.

Mitigation – Appropriate measures that, at a minimum, offset any adverse impacts of a proposed development.

Open Space – Upland set aside and permanently restricted for conservation, agriculture, or passive recreation purposes by a municipality, nonprofit conservation organization or land trust, homeowners association, or person. As appropriate to the site, open space may include woodlands, pasture, passive recreation areas, walking and riding trails, and similar areas, but shall not include structures such as tennis courts, buildings, swimming pools, or other impervious areas. Where projects located on severely degraded areas such as gravel pits and landfill sites are regraded and revegetated, the revegetated areas may be counted toward meeting the open space requirement. Undisturbed naturally vegetated areas of golf courses or vegetated areas of golf courses that are minimally maintained may be counted as open space. Open space may be available for public use, or access to such areas may be restricted.

Barnstable Harbor. Credit: Nancy Hossfeld/CCC

Passive Recreation – Recreation that involves the use of existing natural resources and does not require any development or alteration of existing topography. Certain kinds of passive recreation may necessitate minimal alteration of existing vegetation for trail creation, maintenance, and other management activities.

Redevelopment – The reconstruction, reuse, or change in use of any developed property, including but not limited to the following: any increase in the intensity of use of already developed land, such as an increase in the number of dwelling units in a structure or change to a commercial or industrial use from a less intensive use; enlargement of a structure; additions to usable interior floor area within residential, commercial, and industrial buildings; and the conversion of a seasonal use or dwelling to year-round use. Construction on portions of a site other than developed areas does not constitute redevelopment.

Regional Facilities – Publicly or privately owned facilities and services used by residents of more than one town, including but not limited to, streets, schools, parks, recreational facilities, water supplies, waste disposal facilities, social services, health care facilities, transportation facilities, and emergency services.

Regional Intersection – The area where two or more regional roads meet, join or cross, including the approaches and the traffic controls for motorized and non-motorized movement within it.

Regional Road – Any way or section of a way with a functional classification higher than a Local Road, as adopted by the Cape Cod Metropolitan Planning Organization.

Regional Road Links – The portions of a regional road between two regional intersections or the portions of a regional road between the access and egress points of a development or redevelopment and the adjacent regional intersections.

Rehabilitation – The act or process of making possible a compatible use of a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

Replacement Value – The cost of replacing a structure (only) with a structure of like kind and the same dimensions using present-day costs for labor and materials.

Resource Area – Any wetland, coastal bank, habitat area, coastal dune and/or coastal beach, filled tidelands, or other site characteristics defined herein.

Road Widening – Any increase in the width of pavement or constructed roadway surface.

Roundabout – A circular intersection with specific design and control features, including yield control of all entering traffic, channelized approaches, and appropriate geometric curvature to ensure that travel speeds on the circulatory roadway are typically less than 30 miles per hour.

Roundabout in Marstons Mills. Credit: John Jannell/CCC

Seasonal Structure – A residential, commercial, or industrial structure that lacks one or more of the basic amenities or utilities required for year-round occupancy or use such as a permanent heating system, insulation, and/or year-round usable plumbing.

Seasonal Use – Occupancy and use of a seasonal structure or use of any other structure less than year-round.

Significant Natural Resource Area – Areas as shown on the Cape Cod Significant Natural Resource Area Map dated January 10, 2002, as amended, including wellhead protection areas, designated potential public water supply areas, rare species habitat, priority natural communities, wetlands, critical upland areas, unfragmented forest habitat, and land within 350 feet of vernal pools and 300 feet of ponds.

Sole Source Aquifer – A US Environmental Protection Agency designation under the Safe Drinking Water Act that recognizes that the sole source of drinking water to a community is groundwater in the aquifer. The Cape Cod aquifer received its designation as a Sole Source Aquifer in 1982.

Specimen Tree – A native, introduced, or naturalized tree that is important because of its impact on community character, its significance in the cultural landscape, or its value in enhancing the functions of wildlife habitat. Although size is an important consideration, the classification of a specimen tree is not determined solely by its diameter at breast height (4 feet above ground surface), but also by whether it has a significant impact on its surroundings.

Strip Development – Continuous or intermittent linear roadside development generally one building deep, characterized by multiple roadway access points, highly visible off-street parking, and an assortment of commercial or other uses with direct access to abutting roads.

Total Maximum Daily Load (TMDL) – A term, also referred to as critical load, commonly used to convey the nutrient loading threshold for surface water bodies. Nutrient loads above the TMDL will result in eutrophication. The federal Clean Water Act requires that TMDLs be identified for priority waters across the nation.

Transfer of Development Rights (TDR) – A mechanism that allows owners of land to transfer all or some of the rights to develop the land or a portion thereof to another designated area or entity.

Trip Generation – Traffic volume as measured at the site drive(s) of development or redevelopment over a specified time.

Trip Reduction – A volume of vehicular traffic to be removed from the site drive of a development or redevelopment or from existing traffic on the adjacent road system.

Untreated Drinking Water – Water that is not treated for anthropogenic contamination. Includes public water supplies of Cape Cod that receive treatment to neutralize naturally acidic conditions and, in some instances, naturally high iron.

Vernal Pool – A seasonal freshwater body contained in a confined basin depression that holds water for at least two consecutive months in most years, is free of adult fish populations, and provides breeding and other important habitat for amphibians and invertebrates. Vernal pools must be mapped and certified by the Massachusetts Natural Heritage and Endangered Species Program or identified in the field as eligible for certification by a professional wildlife biologist.

Water-dependent Use – Any use that requires direct access to or location in fresh or marine waters, and that cannot be located away from said waters including but not limited to those uses identified by MGL Chapter 91 regulations. Such uses include commercial or recreational boating and fishing facilities, water-based transportation and recreational facilities, pedestrian facilities that promote appropriate public use and enjoyment of the shoreline, facilities that are related to marine research and education, aquaculture facilities and cranberry bogs, beach nourishment, dredging, shoreline protection structures, water-level control facilities, and any other uses or facilities that cannot be reasonably located away from the shoreline.

Orleans cranberry bogs. Credit: MA Executive Office of Environmental Affairs

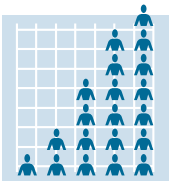
Wetland – An inland area of 500 square feet or greater or a coastal area including wet meadows, marshes, swamps, bogs, and areas of flowing or standing water, such as rivers, streams, and ponds. Wetlands may border water bodies or may be isolated. Wetlands are characterized by the presence of wetland vegetation and hydrology as generally described in the Wetlands Protection Act and delineated in accordance with the boundary delineation methods set forth in the relevant sections of 310 CMR 10.00. These include 10.32(2), 10.33(2), 10.35(2), 10.55(2) with the exception of the "bordering" requirement, and 10.56(2).

Zone II – A wellhead protection area or zone of contribution, approved by the Massachusetts Department of Environmental Protection under a rigorous "New Source Approval" program, that is the area of land receiving the rainfall that replenishes the portion of the aquifer from which a well derives its water.

Zone II map, Massachusetts Military Reservaton. Credit: CCC GIS Office

Abbreviations

AASHTO	American Association of State Highway Transportation Officials
ACEC	Area of Critical Environmental Concern
C&D	Construction and Demolition
CCAMP	Cape Cod Aquifer Management Project
CCC	Cape Cod Commission
CCEDC	Cape Cod Economic Development Council
CCMP	Massachusetts Bays National Estuary Program's Comprehensive Conservation and Management Plan
CCMPO	Cape Cod Metropolitan Planning Organization
CCNS	Cape Cod National Seashore
CCPEDC	Cape Cod Planning and Economic Development Commission
CCRTA	Cape Cod Regional Transit Authority
CMR	Code of Massachusetts Regulations
DCPC	District of Critical Planning Concern
DEM	Massachusetts Department of Environmental Management
DEP	Massachusetts Department of Environmental Protection
DRI	Development of Regional Impact
EPA	US Environmental Protection Agency
EOEA	Executive Office of Environmental Affairs
EOTC	Executive Office of Transportation and Construction
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
gpd	gallons per day
HHW	Household Hazardous Waste
HUD	US Department of Housing and Urban Development
ISWMF	Integrated Solid Waste Management Facility
LCP	Local Comprehensive Plan
LHA	Local Housing Authority
LOS	Level of Service
MCZM	Massachusetts Coastal Zone Management
MEMA	Massachusetts Emergency Management Agency
MEPA	Massachusetts Environmental Policy Act
MGL	Massachusetts General Laws
MHC	Massachusetts Historical Commission
MHD	Massachusetts Highway Department
MPO	Metropolitan Planning Organization
MPS	Minimum Performance Standard
ODRP	Other Development Review Policies
ppm	parts per million
PSTF	Private Sewage Treatment Facility
RIF	Regional Infrastructure and Facilities Plan
RPP	Regional Policy Plan
SCS	Soil Conservation Service
SEMASS	Southeastern Massachusetts Resource Recovery Facility
SMAST	University of Massachusetts-Dartmouth's School for Marine Science and Technology
TDR	Transfer of Development Rights
TMDL	Total Maximum Daily Load
USGS	US Geological Survey
VOC	Volatile Organic Compounds
WTE	Waste-to-Energy
ZOC	Zone of Contribution



II. Issues, Goals and Policies, Implementation

Between 1990 and 2000, Barnstable County's growth rate was the third highest in Massachusetts.

A Growth Policy for Cape Cod

Concern about the rate of population growth and land use change on Cape Cod was one of the major factors leading to the passage of the Cape Cod Commission Act. From 1980 to 1990 the population of Barnstable County grew by 38,680 persons, a growth rate of 26%. The population of Massachusetts as a whole grew only 5% during the same period. This trend continued from 1990 to 2000, when the population grew by 35,625, a growth rate of 19.1%, while the population of Massachusetts grew by only 5.5%. This makes Barnstable County's growth rate the third highest in the state, behind only Nantucket and Dukes counties. The number of housing units on the Cape has more than doubled since 1970 (from 65,676 to an estimated 153,501).

With the increase in population have come other changes. Portions of Cape Cod's sole source aquifer have been contaminated by incompatible uses, discharges of hazardous materials, and excessive densities; traffic congestion has worsened steadily, approaching gridlock conditions in some locations during the summer months; thousands of acres of shellfish beds have been closed due to pollution; open space and scenic vistas have been lost to residential

Barnstable County Population Growth Rates and Rank in Massachusetts, 1920–2000

Years	Rank in State	Growth Rate	Population (in latter year)	Gain in Population in Decade
1920–1930	3	21.1%	32,305	5,635
1930–1940	1	15.4%	37,295	4,990
1940–1950	1	25.5%	46,805	9,510
1950–1960	1	50.2%	70,286	23,481
1960–1970	1	37.5%	96,656	26,370
1970–1980	1	53.0%	147,925	51,269
1980–1990	2	26.1%	186,605	38,680
1990–2000	3	19.1%	222,230	35,625

Source: U.S. Census 1920–2000.

subdivisions; and the architectural quality and economic viability of the Cape's historic villages have been undermined by commercial sprawl.

In the 1995 Cape Cod Residents' Survey, respondents indicated that the following factors were very important in their decision to live on Cape Cod: 60% cited the air and water quality, 60% cited safety from crime, 55% cited proximity to the coast, 52% cited the rural character of the Cape, and 48% cited the small-town life style. Respondents ranked traffic congestion, population growth, groundwater pollution, pollution of coastal waters, loss of open space, and tax increases as the most serious problems facing the Cape in the next five years. Fifty-four percent (54%) of the respondents indicated that during the previous 25 years population growth in their town had worsened the quality of life. Six years later, these problems and concerns have only intensified.

Residents, visitors, and local officials are asking how much capacity we have in our water supply, transportation network, natural systems, and municipal fiscal resources. How much additional growth can the natural resources, municipal services, and human services of the Cape accommodate before the quality, integrity, or efficiency of those systems is compromised? The answer to the question of how much growth the Cape can accommodate hinges to a great extent on the pattern, type, and location of growth.

"Suburban sprawl"—a medium-density, decentralized, haphazard, and fragmentary pattern of development characterized by large-lot residential subdivisions, strip commercial areas along roadways, and orientation toward automobile use—is particularly consumptive of both our natural and municipal capacity. Sprawl destroys much more habitat, consumes more groundwater, results in more vehicle miles traveled, and—when dependent upon septic systems for wastewater disposal—pollutes more waterways than the Cape's historical pattern of dense village centers and rural countryside. This means that each man, woman, and child consumes more of the Cape's limited resources. This per capita "ecological footprint," made large by sprawl, ultimately limits the sheer numbers that can be accommodated within the Cape's capacity constraints.

When the Regional Policy Plan was first developed in 1990, the Growth Policy stated that it was not the intention of the Regional Policy Plan to set a maximum desirable population level for the Cape. Rather, the Plan outlined the standards of environmental protection and public investment needed to protect natural and human-made systems. Therefore, the population that can ultimately be accommodated depends in large part on the land-use patterns, locations of growth, and infrastructure choices used to serve the Cape's growing population.

During the 1990s, the Commission developed a methodology for analyzing capacity limits. An Outer Cape Capacity Study, covering the towns of Provincetown, Truro, Wellfleet, and Eastham, showed that the growth of the Outer Cape is severely constrained by its transportation infrastructure and water supply. Without changes in local zoning, projected build-out levels will produce severe traffic congestion and degraded drinking water quality in the future. The Monomoy Capacity Study, which examined the Lower Cape towns of Dennis, Harwich, Brewster, Orleans,

and Chatham, reached similar conclusions. While the findings may differ from place to place, it seems clear that the Cape has a finite capacity to grow without endangering its environmental health and quality of life. The towns and region must address not only the rate and pattern of growth but also the total amount of growth that can be accommodated.

Pleasant Bay watershed map. Credit: CCC GIS Office

In 2000, the Cape Cod Commission, working in partnership with the Massachusetts Executive Office of Environmental Affairs, conducted a "build-out" analysis for all 15 Cape towns. This analysis examined local zoning and other growth-related regulations currently in place, and made projections about future growth based on the amount of remaining developable land. The analysis revealed that, with no additional growth management or land-protection efforts, the Cape could add 37,000 houses and at least 50,000 people at build-out.

It is the purpose of the Regional Policy Plan to protect the resources and interests identified in the Cape Cod Commission Act and to ensure that land-use planning and management on the Cape are coordinated, especially across municipal boundaries. It is also the responsibility of the Regional Policy Plan to recognize the Cape's capacity constraints and to provide guidance to the towns as to how to control growth. To that end, the following broad principles will apply:

Rate of Growth – The rate of growth for any town should not exceed the ability of that town to provide the services necessary to support that growth. New development should be required to pay its own way—either to provide or to contribute to the provision of the necessary facilities and services to manage the demands created by that development. The provision of those services should be timed to meet the demand created by new development. Public and private investments should be coordinated both to control the rate of growth and to direct new development into appropriate locations.

Pattern of Growth – Redevelopment and "infill" (intensification of existing development) should be encouraged to revitalize existing Growth/Activity Centers and Growth Incentive Zones, enhance community character, and protect remaining open space from sprawl development. In such areas, a high-density mix of residential and commercial uses, which facilitates pedestrian travel, should be encouraged through changes in conventional zoning. New development and redevelopment should be served by nitrogen-reducing wastewater infrastructure to allow higher

on-site densities while ensuring water quality protection. Undeveloped lands outside of town centers should be preserved through downzoning, clustering, and land preservation.

Location of Growth – Population growth and economic development should not damage the natural environment or the character of the Cape's communities. Sensitive resources such as high quality groundwater and surface water, wetlands, and plant and wildlife habitat should be identified and protected. Growth should be concentrated in or adjacent to existing village centers, Growth/Activity Centers, and Growth Incentive Zones.

Amount of Growth – The Commission and the towns must assess both regional and local capacity limits, especially in light of the type, pattern, and location of expected growth, and take steps to ensure that the amount of future growth is sustainable. The cumulative effects of even small changes in land use can create major strains on the Cape's resources and character. Both changes in local zoning regulations and more aggressive land acquisition efforts may be needed to control future population growth. Ultimate build-out levels for each town should be based not only on the carrying capacity of the natural environment to sustain the impacts of development, but on the vision of the residents of each community concerning what kind of place they want their community to be.

Type of Growth – New development should respect the integrity of the Cape's scenic, historic, and architectural character and its compact village centers. Homes and businesses that are sited or designed in an inappropriate fashion can detract from the Cape's scenic beauty. Economic development efforts should enhance the Cape's environmental and cultural strengths and provide a diversity of employment opportunities for Cape residents. Businesses such as high technology, clean, light manufacturing, and resource-based industries (e.g., shellfishing, ecotourism, farming) can foster economic development that is dependent upon the preservation of open space and protection of natural resources. Projects that confer distinct benefits to the community, such as nonprofit service corporations, educational institutions, and health care facilities, can enhance the quality of life for the Cape's citizens while minimizing development-related impacts.

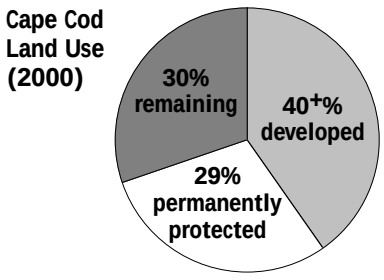
In summary, the goals and policies of the Regional Policy Plan are designed to provide both guidelines for evaluating Developments of Regional Impact and a framework for the development and implementation of Local Comprehensive Plans. The Minimum Performance Standards and Other Development Review Policies are designed to ensure that new growth complies with the broad principles outlined herein. The Implementation Actions articulate the research and actions needed to achieve an effective growth policy for the Cape. Barnstable County is committed to carrying out this program.

1. Issue Area: Land Use/Growth Management

This Regional Policy Plan sets forth a vision in which development is reshaped and redirected toward existing village centers and other developed areas.

"How much more growth can we sustain?" It is a question that many Cape Cod citizens ask themselves every day as they watch new houses emerge where woodlands once stood, as popular waterways begin to experience water quality problems, and roads become congested. The issue of "capacity," defined as the ability of the land and water to accommodate new population growth and development, guides the revision of this Regional Policy Plan (RPP). While many issues covered in the RPP address a range of concerns in our daily lives, capacity remains the most fundamental and pressing of our growth issues.

Capacity and land use are directly related. Land use plans, implemented through local zoning and other bylaws, establish the blueprint for growth and its associated impacts. It is these impacts, which can vary dramatically with the type, pattern, location, and amount of growth, that diminish the capacity we have available. For this reason, land use and growth management are inseparable from many of the other issues addressed in the Regional Policy Plan including transportation, water quality, open space and habitat protection, affordable housing, economic development, capital facilities, and others.



As of 2000, about 40% (102,099 acres) of the land on the Cape is developed. Another 29% (74,629 acres) is permanently protected. That leaves about 31%, or 76,973 acres—approximately one-third of the remaining land—available for development. While not all of this land is buildable because of the presence of wetlands, unsuitable topography, or other constraints, it is still subject to environmental impacts and habitat fragmentation from the development that could occur. During the 1990s, more than 15,000 acres of open land was converted to development. During the same period, the number of houses increased by approximately 17,000 and the population increased by roughly 35,000. The Cape is now home to more than 222,000 year-round citizens and more than 153,000 homes.

These trends are expected to continue during the coming decades. A "build-out" analysis conducted in 2000 by the Cape Cod Commission in partnership with the Massachusetts Executive Office of Environmental Affairs revealed that, with no additional growth management or land-protection efforts, the Cape could add 37,000 houses and at least 50,000 people. Moreover, at current growth rates, build-out will likely be reached within 30 years—well within the lifetime of many of the people reading this passage. Although this picture has improved somewhat—continued local land preservation efforts and the successful use of Districts of Critical Planning Concern (see Section III) have reduced the predicted build-out Capewide by several thousand homes—the remaining development potential still exceeds the capacity of

the Cape's infrastructure and natural systems. Much more needs to be done through planning, local regulation, and land protection to preserve some semblance of the quality of life that remains.

Although proper management of commercial development is a major challenge for the Cape, residential growth poses an even greater challenge. Most of this growth is occurring on geographically dispersed lots that use septic systems to dispose of wastewater and require the use of an automobile for virtually all trips. Our most serious problems—polluted groundwater and coastal embayments, traffic congestion, loss of open space and wildlife habitat—arise from residential development for both year-round and seasonal uses. Moreover, many of the vacation homes being built today will become the year-round homes of the future, as those who own them reach retirement age. This poses not only environmental but also human services challenges. For example, it is difficult and expensive to serve a geographically dispersed pattern of growth with transit services. As an increasing number of retirees move here, some may become unable to drive. Their isolation and lack of mobility may effectively deny them access to crucial services, not to mention social interactions with the community at large.

Fiscal costs are also associated with this growth. As more people move here, they demand year-round services. This means higher costs for schools, police and fire services, road construction and maintenance, and utilities. Most residential growth simply does not pay for its share of these services. A recent study of the costs of community services conducted by the Southern New England Forest Consortium revealed that it costs New England municipalities an average of $1.14 in services for each dollar of tax revenue collected from residential growth. If our pattern of growth continues to degrade environmental resources, some very expensive services, such as wastewater management systems, may be needed to fix the problems of the past. This can have serious financial impacts on other human services, such as the provision of health care, affordable housing, and other forms of public and private assistance.

The impacts from residential growth affect the character of our communities and the quality of our lives in many ways. For example, the singular approach to creating homes, namely, detached, single-family houses on large lots, may also be driving up the price of housing by providing only a single type of product marketed toward affluent customers. Without a range of housing choices (downtown apartments, townhouses, accessory units, affordable rentals) many families, single individuals, and elderly leave the Cape because they cannot find affordable housing.

Perhaps the most palpable impact we see is the change in the "look and feel" of Cape Cod. Traditional towns and villages compete with ever more suburban forms of strip development and housing subdivisions. Often referred to as "suburban sprawl," this type of development is wasteful, land-consumptive, and, to most, unattractive.

Moreover, sprawl stands in stark contrast to the pattern of village centered development that has characterized our compact, historic, pedestrian-friendly downtown areas for centuries. Surprisingly, it is our zoning bylaws—originally conceived as a means to manage growth—that have inadvertently

Typical grid development, Yarmouth. Credit: Kathy Sferra/CCC

Provincetown village. Credit: Kathy Sferra/CCC

contributed to sprawl by prohibiting more traditional forms of development.

This Regional Policy Plan sets forth a vision in which development is reshaped and redirected toward existing village centers and other developed areas. The challenge is to enhance existing downtowns and other areas where development already exists, to promote greater density and a mix of residential and commercial uses, and to ensure that all growth is properly served by infrastructure, especially wastewater treatment. Accordingly, development in outlying areas must be reduced in order to preserve open space, natural resources, and scenic landscapes.

In order to achieve this vision, the Plan outlines the standards by which towns should develop Local Comprehensive Plans. The Minimum Performance Standards of the RPP are designed to help local governments manage development that does not fall under the Commission's regulatory review.

The RPP also suggests changes to zoning and other local regulations to improve both the quality and pattern of development. For example, the RPP suggests the adoption of "cluster" or open space subdivision bylaws to protect open space on each development site; village-style development bylaws to promote the pedestrian-friendly features present in historic downtowns; and natural resource protection bylaws to require larger buffers around wetlands, vernal pools, and ponds, and to limit the clearing and grading of land.

As in the 1996 Regional Policy Plan, there is a process for designating Growth/Activity Centers of different scales. Developments of Regional Impact that locate in Growth/Activity Centers are accorded greater regulatory flexibility for water quality, traffic, and open space, thereby encouraging development in these areas. The three types of Growth/Activity Centers are:

- **Village Growth/Activity Centers** – Small pedestrian-oriented settlements that are suitable for a mix of residential and compatible small-scale commercial uses. Additional growth in these areas may be limited, although some intensification and reuse of existing structures is usually appropriate.

- **Regional Growth/Activity Centers** – Densely developed areas providing a wide range of commercial goods and services for the immediately surrounding area as well as for a larger region. These areas also have or support different types of residential uses and are usually served by urban-scale infrastructure, such as sewer.

- **Industrial Growth/Activity Centers** – Special districts designed to accommodate manufacturing, warehousing, transportation terminals, wholesale business, and related uses.

Towns must designate, revise or expand Growth/Activity Centers through their Local Comprehensive Plans.

The 2001 Regional Policy Plan provides additional incentives by allowing the designation of "Growth Incentive Zones." These are areas that are suitable for concentrated mixed-use development. Developments of Regional Impact in these areas qualify for even more flexible review than are accorded projects in certified Growth/Activity Centers. In essence, Growth Incentive Zones take the growth center concept to a higher level.

Growth Incentive Zones are designated through a process separate from that of certified Growth/Activity Centers and do not require that a town have a certified Local Comprehensive Plan. Existing Growth/Activity Centers could be proposed as, and would likely be good candidates for, Growth Incentive Zones.

Where undesirable or unattractive development already exists, the Plan identifies actions that can be taken to improve its quality and performance. The RPP also establishes strict standards for the permanent protection of open space in its review of Developments of Regional Impact, and suggests actions that towns can take to plan for and acquire land.

Whether one is advocating traditional villages, clustered subdivisions, or modern commercial centers, however, concentrated development will not be possible without the infrastructure needed to support higher on-site densities, particularly wastewater treatment systems. By proposing a Regional Infrastructure and Facilities Plan (described in more detail in the Capital Facilities and Infrastructure section), the RPP emphasizes the importance of sewers, clustered septic systems, and other technologies, especially those that reduce nitrogen, in order to make concentrated growth possible. The Plan also addresses unnecessary and wasteful infrastructure requirements, such as large setbacks or excessively wide roads, that can act as financial and regulatory barriers to better development.

Clearly, the suburban recipe for growth conceived in the 1950s and 1960s is inadequate to address the growth challenges of the 21st Century. This Regional Policy Plan attempts to balance the needs of communities with the capacity constraints of the Cape's ecosystem by promoting a more compact, less land-consumptive approach to growth. To the extent that we can emulate the traditional pattern of high-density, mixed-use villages that served Cape Cod so well for the first 350 years of its history, we will more effectively preserve the precious resources that remain and sustain in perpetuity the life and vitality of our communities.

Land Use/Growth Management

1.1 Goal:

To encourage growth and development consistent with the carrying capacity of Cape Cod's natural environment in order to maintain the Cape's economic health and quality of life through the enhancement of existing village and regional centers that provide a pedestrian-oriented and transit-accessible environment for living, working, and shopping for residents and visitors.

Minimum Performance Standards

1.1.1 New development shall be located and designed to promote redevelopment and infill within Growth/Activity Centers and Growth Incentive Zones, and, where appropriate, compact mixed-use residential/commercial areas.

1.1.2 Creation or extension of strip development shall not be permitted. Reuse, redevelopment, or infill within existing strip developments in a way that does not extend the linear nature of the development or increase traffic conflicts may be permitted.

1.1.3 All development and redevelopment in village centers, downtowns, Growth/Activity Centers, and Growth Incentive Zones shall be constructed with the minimum feasible setback from the street in conformity with the setback of adjacent structures in order to encourage village-style development and a more comfortable and secure pedestrian environment.

1.1.4 The building and layout of parking lots shall reinforce the character of existing buildings and traditional village streetscape patterns. Parking shall be located to the rear or the side of a building or commercial complex in order to promote traditional village design in commercial areas unless such location would have an adverse or detrimental impact on environmental or visual features on the site, or is infeasible. Parking structures shall be provided when appropriate to reduce the amount of paved parking areas supporting a proposed development, provided the structure meets the goals of the Commission's design manual, Designing the Future to Honor the Past: Design Guidelines for Cape Cod, Technical Bulletin 96-001. The use of shared parking, on-street parking, and community parking lots in village areas, Growth/Activity Centers, and Growth Incentive Zones shall be provided, where feasible, in order to reduce the amount of land devoted to parking.

Refer to Technical Bulletin 96-001.

Other Development Review Policies

1.1.5 Affordable housing should be provided as part of residential and commercial development. Particular attention should be given to locating affordable housing in or near Growth/Activity Centers and Growth Incentive Zones and convenient to transportation corridors.

1.1.6 Where appropriate, use of Transfer of Development Rights should be encouraged in order to concentrate development in Growth/Activity Centers and Growth Incentive Zones with adequate infrastructure and to preserve open space in outlying areas.

Land Use/Growth Management

1.2 Goal:

To protect open space and minimize environmental and community impacts of growth and to promote compact forms of residential and commercial development.

Minimum Performance Standards

1.2.1 All residential subdivisions of five or more lots shall cluster the proposed development unless inconsistent with local bylaws. Cluster plans shall use site designs that maximize contiguous open space, respect the natural topography and character of the site, and employ wastewater treatment alternatives to allow more compact development.

1.2.2 All commercial subdivisions of land shall cluster the proposed development unless inconsistent with local bylaws. Cluster plans shall use site designs that maximize contiguous open space, respect the natural topography and character of the site, and employ wastewater treatment alternatives to allow more compact development.

1.2.3 Development and redevelopment shall be directed away from Significant Natural Resource Areas as illustrated on the Cape Cod Significant Natural Resource Areas Map dated January 10, 2002, as amended.

Refer to Regional Policy Plan map.

Other Development Review Policies

1.2.4 The creation of affordable housing for both ownership and rental should be encouraged through infill, redevelopment or conversion of existing structures and sites, and the creation of accessory apartments. Adequate infrastructure should support these efforts in order to accommodate greater residential density.

1.2.5 Appropriate redevelopment and infill within Growth/Activity Centers and Growth Incentive Zones should be encouraged. The development of land in outlying areas should be reduced through downzoning, Transfer of Development Rights, open space purchases, or other techniques.

1.2.6 Efforts should be made to improve the appearance of existing strip development through frontage buildings, sign control, infill, relocation of parking, landscaping, and undergrounding of utilities, consistent with the recommendations of Designing the Future to Honor the Past: Design Guidelines for Cape Cod, Technical Bulletin 96-001.

Refer to Technical Bulletin 96-001.

1.2.7 For those areas determined by Local Comprehensive Plans or site assessments to be unsuitable for redevelopment where existing strip development exists, efforts should be made to remove such development, revegetate the site, and put in place permanent conservation restrictions for the purpose of reducing/mitigating the impacts of growth, removing traffic conflicts, reducing wastewater impacts, or restoring sensitive resource lands.

Land Use/Growth Management

1.3 Goal:

To preserve and enhance rural land uses, including agriculture, that are environmentally compatible with the Cape's natural resources in order to maintain opportunities to enjoy the traditional occupations, economic diversity, and scenic resources associated with rural lands.

Minimum Performance Standards

1.3.1 New development adjacent to rural landscapes and those lands in active agricultural production shall maintain or provide a thickly vegetated buffer of sufficient width to prevent conflicts between the development and existing uses.

1.3.2 Development unrelated to agricultural operations shall be designed so as to avoid or minimize development on lands capable of sustained agricultural production as evidenced by soils, recent agricultural use, and/or surrounding agricultural use.

Other Development Review Policies

1.3.3 Management practices such as those developed by the Cape Cod Cooperative Extension and the Soil Conservation Service should be encouraged to maintain the productivity of agricultural lands and minimize use of chemical fertilizers and pesticides that could adversely impact the environment.

Implementation

Joint Commission/Town Actions:

A. The Commission will assist towns in mapping natural and cultural resource constraints, existing development and infrastructure, and undeveloped land in order to identify appropriate areas for designation as village, regional, and industrial Growth/Activity Centers and Growth Incentive Zones. The towns, in consultation with the Commission and as consistent with their Local Comprehensive Plans, should work toward designating village and regional Growth/Activity Centers and Growth Incentive Zones for the purpose of concentrating growth that would otherwise occur in outlying areas. Growth/Activity Centers and Growth Incentive Zones should be supported by wastewater and other infrastructure that allows for higher densities, and should be coordinated with the Regional Infrastructure and Facilities (RIF) Plan to be developed by the Cape Cod Commission and the towns (see Chapter 4.4).

B. The towns and the Commission should undertake a major initiative to address the implementation of Local Comprehensive Plans through changes in zoning and other local regulations.

Commission Actions:


Chatham. Credit: John Lipman/CCC

A. The Commission will continue to use the Outer Cape and Monomoy capacity studies and the recently conducted Capewide buildout analysis to assist the towns in evaluating how much additional growth can be sustained.

B. The Commission will encourage intermunicipal management of resources of regional significance through coordination of Local Comprehensive Plans (LCPs) and the development of Districts of Critical Planning Concern (DCPCs).

C. The Commission will work with local educational institutions to establish an ongoing training and certification program on planning and land-use regulations for local boards and officials.

D. The Commission will provide technical assistance in identifying appropriate revisions to zoning bylaws and ordinances that promote village-style development.

E. The Commission will continue to seek amendment of state zoning and subdivision statutes to modify current provisions that allow "approval not required" divisions of land and grandfathering of existing zoning on lands for which only a preliminary subdivision plan has been submitted.

F. The Commission will continue to advocate its model Transfer of Development Rights bylaw and explore the feasibility of a Capewide Transfer of Development Rights program.

G. Cape Cod Cooperative Extension will work with the Cranberry Growers Association, Cape Cod Conservation District, the Commission and other organizations to encourage continued and expanded agricultural use of land on Cape Cod, where environmentally appropriate.

Recommended Town Actions:

A. Towns should develop cluster bylaws or ordinances consistent with the Commission's model bylaw/ordinance that require cluster development at the town's option. Towns should also adopt cluster provisions for commercial and industrial subdivisions.

B. Local zoning and regulations, including but not limited to lot sizes, parking requirements, undergrounding of utilities, setbacks, and road widths, should be revised to permit village-style and mixed residential/commercial uses. Such development should be located in areas served or planned for service by appropriate wastewater treatment systems and other infrastructure.

C. Local bylaws and regulations, including clustering, increased lot sizes, overlay districts, and other techniques are encouraged to foster preservation of all areas located outside of Growth/Activity Centers and Growth Incentive Zones.

D. Towns should consider making appropriate town-owned land available for agriculture, open space, and clustered affordable housing.

E. Towns should identify and designate areas where density bonuses may be appropriate and/or identify possible sending and receiving zones for a community Transfer of Development Rights program.

F. Towns should consider establishing, with limited exceptions, annual growth caps equal to a maximum of 50% of the annual average of building permits issued for that town during the decade of the 1990s. Allocation of available permits should give preference to the provision of affordable housing and individually owned single-family lots.

Mashpee Commons. Credit: MA Executive Office of Environmental Affairs

The Brewster Store. Credit: CCC file photo

Falmouth village green. Credit: CCC file photo

Melpet Farm, Dennis. Credit: Nancy Hossfeld/CCC

2. Natural Resources

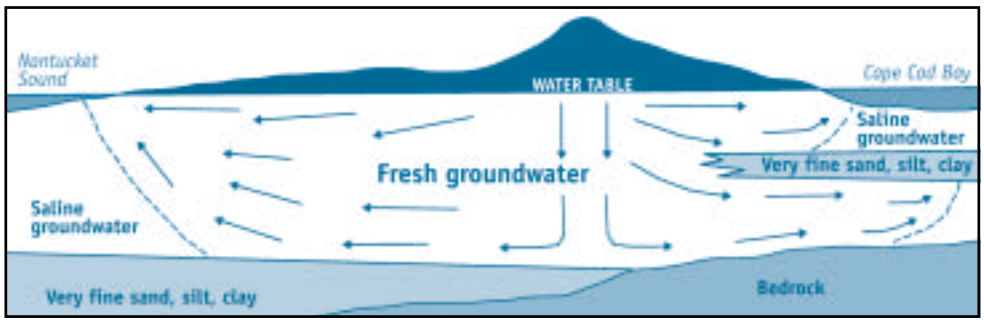
2.1 Issue Area: Water Resources

All of Cape Cod's water resources are linked together by groundwater. The quality and quantity of our groundwater is of critical importance, as it is the only source of drinking water for most of Cape Cod. Of equal concern are the health and quality of marine waters and freshwater bodies, which are connected to and dependent upon the groundwater for ecological health and sustenance. These resources provide significant economic and recreational opportunities and serve as a defining characteristic of Cape Cod.

Although the region has made progress over the past decade, Cape Cod continues to face challenges to the protection of its water resources:

- Cape Codders and visitors dispose their wastewater into Cape Cod's groundwater. Wastewater contains nitrogen and often other toxic chemicals that contaminate our water supplies. As the extent and intensity of land use increases and open space declines, available land for future water supplies disappears and preserving high-quality drinking water becomes increasingly difficult. Stormwater runoff and occasional hazardous materials spills are also sources of contamination. Cape Cod's aquifer requires a high degree of protection to assure water quality for the future.
- Excessive groundwater withdrawals for drinking water and irrigation can threaten the health and vitality of lakes, ponds, wetlands, and rivers by impacting water levels. These surface waters are essential habitats for wildlife, including many threatened and endangered species. Balancing drinking water needs with the ecological needs of nearby

Cross Section of the Sagamore Groundwater Lens



Source: Redrawn from US Geological Survey Hydrologic Atlas HA-692, 1986.

This Regional Policy Plan sets forth a vision of protecting and preserving a sustainable supply of high-quality untreated drinking water and preserving or restoring the ecology of marine waters and freshwater bodies.

resources through new commitments to water conservation is imperative.

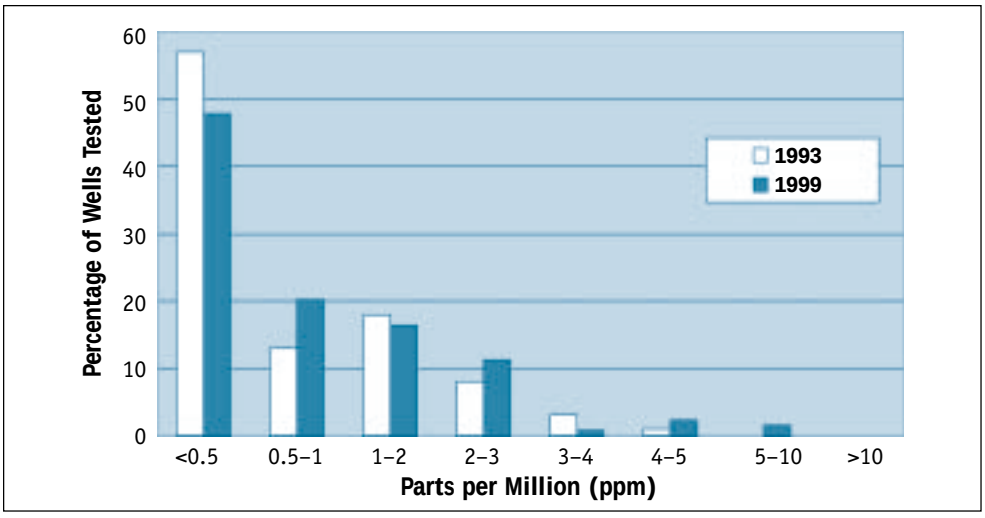
- Wastewater from increased population and development has also introduced excessive nutrients (such as nitrogen and phosphorus) into ponds, lakes, marshes, estuaries, bays, and marine waters. Excessive nutrients lead to nuisance algae and plant growth, increased bacterial activity, decreased water clarity, and, ultimately, losses in shellfish and fish habitat, and less aesthetically pleasing waters and loss of property value. Cape Cod needs comprehensive wastewater management solutions to ensure that our surface waters continue to be desirable places to boat, fish, and swim.

This Regional Policy Plan sets forth a vision of protecting and preserving a sustainable supply of high-quality untreated drinking water and preserving or restoring the ecology of marine waters and freshwater bodies. To achieve this vision, Cape Cod requires a comprehensive strategy that addresses wastewater and stormwater management, protection of existing and future public water supplies, and assessment and management of water quality in surface waters.

During the past two decades, a number of groundwater protection strategies that have focused primarily on drinking water quality have been implemented on Cape Cod. The Cape Cod Commission's predecessor agency, the Cape Cod Planning and Economic Development Commission, delineated the Zones of Contribution or Wellhead Protection Areas for all the public water supply wells on Cape Cod, developed model bylaws for regulating land uses within those zones, and adopted a 5-parts per million (ppm) nitrogen loading guideline to ensure that nitrogen concentrations in drinking water wells would not exceed the US Environmental Protection Agency drinking water standard of 10 ppm for nitrate-nitrogen. In addition, federal and state agencies have initiated projects and programs to improve the coordination of groundwater management at the federal, state, regional, and local levels.

This Regional Policy Plan continues to support the 5-ppm limit on nitrogen loading and upholds the comprehensive groundwater classification and protection

Nitrate Levels in Cape Cod Public Supply Wells



Source: Analysis of MA Department of Environmental Protection data by the Cape Cod Commission.

strategy introduced and strengthened in previous editions of the Plan. The strategy delineates recharge areas to drinking water supplies, coastal embayments, ponds, and lakes, identifies future public water supply areas, and outlines the activities necessary to manage and protect all these resources.

Groundwater contamination by chemicals is a gravely serious problem for Cape Cod's aquifer. Federal and state agencies continue to implement a major groundwater clean-up program at the Massachusetts Military Reservation, where plumes of contamination have tainted four public water supply wells and threatened additional pristine groundwater supplies, ponds, wetlands, and nearby marine waters. Federal, state, regional, and local efforts must continue to work toward a long-range water supply plan for the area. Similar instances of smaller-scale contamination are a concern for public water supply wells and private wells throughout Cape Cod. Cape Codders must also be vigilant about preventing chemical contamination of groundwater from hazardous wastes and materials.

Cape Cod's coastal waters and more than 400 freshwater ponds and lakes require protection from nutrient loading. Many of the region's embayments, subembayments, and ponds are already impaired or are threatened by excessive nutrients entering their watersheds from wastewater, stormwater runoff, and fertilizers. Nitrogen management and assessment activities are required in the Plan for developments within coastal watersheds, known as Marine Water Recharge Areas. The Plan also sets standards for limiting phosphorus loading to the watersheds of ponds and lakes, known as Fresh Water Recharge Areas. The Regional Policy Plan also encourages wastewater management plans and water-quality monitoring efforts by towns.

Much has been accomplished during the last several decades to better understand and protect Cape Cod's water resources. Providing appropriate wastewater treatment and infrastructure to protect these resources, however, remains one of the biggest challenges facing the region. During the next five years, the Commission will encourage the appropriate siting, development, and management of public and private sewage treatment facilities across the region. This Regional Policy Plan sets goals and standards to address these facilities, calls for towns to pursue comprehensive wastewater solutions, encourages the development of shared wastewater systems, and seeks rigorous reviews of the performance of alternative on-site septic systems.

The Commission also encourages better integration of regulatory tools, such as Title 5, state groundwater discharge and water withdrawal permits, state and federal reviews of proposed developments and municipal services, and Commission review of Developments of Regional Impact. In addition, the Commission will encourage better use of planning tools such as the implementation of Local Comprehensive Plans and the adoption of Districts of Critical Planning Concern to address management of drinking water, wastewater, and stormwater, protection of marine waters and freshwater quality, and recognition of the unique traits of Cape Cod's hydrology. These measures must reflect the interconnectedness of the Cape's water resources to best protect and maintain them.

The following standards and goals incorporate what has been learned and will help to ensure that Cape Cod's water resources meet the needs of this generation and generations to come.

Triangle Pond, Sandwich. Credit: Nancy Hossfeld/CCC

Water Resources

2.1.1 Goal:

To maintain the overall quality and quantity of Cape Cod's groundwater to ensure a sustainable supply of untreated high-quality drinking water and to preserve and restore the ecological integrity of marine and fresh surface waters.

Minimum Performance Standards

Classification System and Minimum Performance Standards: The Regional Policy Plan establishes a water resources classification system to manage and protect Cape Cod's water resources. The water resources classification system recognizes four primary water resource areas and their respective recharge areas: Wellhead Protection Areas, Fresh Water Recharge Areas, Marine Water Recharge Areas, and Potential Water Supply Areas. The classification system also recognizes areas where water quality may have been impaired from existing development or where water quality is unusually pristine. Where these areas overlap with any of the resource areas above, improvement or preservation of water quality is a major goal.

Refer to Technical Bulletin 91-001.

2.1.1.1 Except as otherwise specified in the classification system below, all development and redevelopment shall not exceed a 5-ppm nitrogen loading standard for impact on groundwater based on the methodology contained in Cape Cod Commission Nitrogen Loading Technical Bulletin 91-001.

2.1.1.2 All development and redevelopment shall comply with the Minimum Performance Standards outlined in the following water resources classification system. If a property is located where two classifications overlap, the more stringent standards shall apply. The water resources classification system is illustrated on the Cape Cod Water Resources Classification Maps I and II, dated January 10, 2002, as amended and described below:

Refer to Regional Policy Plan maps.

A. <u>Wellhead Protection Areas</u>: Consist of areas that contribute groundwater to existing public and community water supply wells. These areas shall be delineated by a consistent method and recognized by the Commission in conjunction with state standards for Zone IIs (as defined in 310 CMR 22.02).

A.1: The maximum loading standard for nitrogen impact on groundwater shall be 5 ppm for development and redevelopment unless a cumulative impact analysis indicates a more stringent loading standard is necessary.

A.2: Development and redevelopment that involves the use, treatment, generation, storage, or disposal of hazardous wastes or hazardous materials, with the exception of household quantities, shall not be permitted.

A.3: Public and private sewage or treatment facilities with Title 5 design flows greater than 10,000 gallons per day shall not be permitted in these areas, except as provided in subsection E.2 below and subject to Minimum Performance Standards 2.1.2.1 through 2.1.2.7.

A.4: Uses prohibited in Zone IIs by state regulations shall not be permitted in these areas.

A.5: Development and redevelopment shall adopt a turf and landscape management plan that incorporates water conservation measures and minimizes the amount of pesticides and chemical fertilizers through best management practices.

B. Fresh Water Recharge Areas: Consist of recharge areas to freshwater ponds as mapped by a standard hydrogeologic assessment or other method acceptable to the Commission.

B.1: In order to limit phosphorus inputs, no subsurface disposal systems shall be permitted within 300 feet of maximum high water of freshwater ponds, as determined by the high groundwater adjustment methodology in the Commission's Technical Bulletin 92-001, unless the applicant demonstrates by a groundwater study that groundwater from the site does not discharge into the pond or a tributary.

Refer to Technical Bulletin 92-001.

B.2: Development and redevelopment may be required to delineate the groundwater recharge areas to potentially affected freshwater ponds and conduct a phosphorous loading assessment in order to identify and mitigate the project's adverse impacts. For ponds where pond management strategies have not been developed or implemented, DRIs may be required to make a monetary contribution toward the development or implementation of appropriate assessment work or management strategies.

B.3: Public and private sewage treatment facilities may be used within Fresh Water Recharge Areas subject to subsection E.2 and Minimum Performance Standards 2.1.2.1 through 2.1.2.7 below.

C. Marine Water Recharge Areas: Consist of recharge areas to marine embayments as mapped by the Commission, on Cape Cod Water Resources Classification Map II dated January 10, 2002, as amended.

Refer to Regional Policy Plan map.

C.1: In watersheds where the critical nitrogen load has been determined, development and redevelopment shall not exceed the identified critical nitrogen loading standard for impact on marine ecosystems. In watersheds where the critical nitrogen load has not been determined, development and redevelopment shall be required to make a monetary contribution to determine the flushing rate of the embayment in order to calculate the critical nitrogen loading rate. DRIs may be required to make a monetary contribution toward the development or implementation of appropriate nitrogen management strategies.

Eelgrass. Credit: Ed Eichner/CCC

C.2: In watersheds where existing watershed development exceeds identified critical loading standards or where there are documented marine water quality problems in the associated embayment, including, but not limited to, those embayments shown on the Cape Cod Water Resources Classification Map II, development and redevelopment shall maintain or improve existing levels of nitrogen loading. This may be achieved by providing wastewater treatment for the development or redevelopment and additional treatment capacity for nearby land uses, installation of alternative denitrifying technologies for existing septic systems in the recharge area, and/or an equivalent contribution towards a municipal or watershed effort that achieves the intent of a "no net increase" policy.

C.3: In watersheds with Commission-approved watershed nutrient management plans, nitrogen loading from development and redevelopment shall attain the nitrogen loading limit specified by the plan, but in no case shall nitrogen loading exceed 5 ppm.

C.4: Public and private sewage treatment facilities may be used within Marine Water Recharge Areas subject to subsection E.2 and Minimum Performance Standards 2.1.2.1 through 2.1.2.7 below.

Landfill site. Credit: Greg Smith/CCC

D. Impaired Areas: Consist of areas where groundwater may have been degraded by point and nonpoint sources of pollution, including but not limited to areas with unsewered residential developments where lots, on average, are less than 20,000 square feet; landfills, septage, and wastewater treatment plant discharge sites; and high-density commercial and industrial areas and those downgradient areas where the groundwater may have been degraded by these sources. For the purpose of these standards, all certified Growth/Activity Centers and Growth Incentive Zones shall be classified as Impaired Areas.

D.1: Development and redevelopment shall generally meet a 5-ppm nitrogen loading standard for impact on groundwater, but the standard may be increased where it can be demonstrated to the Permitting Authority and the Commission that such increase will cause no adverse impact on ponds, wetlands, marine waters, public or private drinking water supply wells, and potential water supply wells as identified in Section F below.

E. Water Quality Improvement Areas: Consist of Impaired Areas that are located within Wellhead Protection Areas, Fresh Water Recharge Areas, and Marine Water Recharge Areas. In such areas, improvement of water quality is a major goal.

E.1: Development and redevelopment shall not exceed the nitrogen loading standards for Wellhead Protection Areas or an identified marine water quality standard as applicable. Where existing development within the watershed exceeds the identified loading standard or where there are documented marine water quality problems, there shall be, at a minimum, no net addition of nitrogen loading from development and redevelopment.

E.2: Use of public and private sewage treatment facilities shall be as follows: Within Water Quality Improvement Areas that are in Wellhead Protection Areas public and private sewage treatment facilities may be used to remediate existing problems; within Water Quality Improvement Areas that are in Fresh Water and/or Marine Water Recharge Areas, public and private sewage treatment facilities may be used in conjunction with any development or redevelopment. Sewage treatment facilities and their collection and discharge areas shall maintain the hydrologic balance of the aquifer and demonstrate that there are no negative ecological impacts to surface waters. All such facilities shall be subject to Minimum Performance Standards 2.1.2.1 through 2.1.2.7 below.

E.3: Development and redevelopment in Growth/Activity Centers and Growth Incentive Zones within Water Quality Improvement Areas that have been identified as requiring comprehensive wastewater treatment solutions may be required to provide a monetary contribution towards community wastewater facility planning or implementation efforts.

F. Potential Public Water Supply Areas: Consist of areas that have been identified by the Commission on the Cape Cod Water Resources Classification Map I dated January 10, 2002, as amended, and future well sites and their associated recharge areas that have been identified by towns, water districts, or private water companies. Potential Public Water Supply Areas may be removed from consideration provided that supporting information demonstrates to the Commission that they will not be considered as potential water supply areas.

Refer to Regional Policy Plan map.

F.1: No development shall be permitted within 400 feet of an identified future well site.

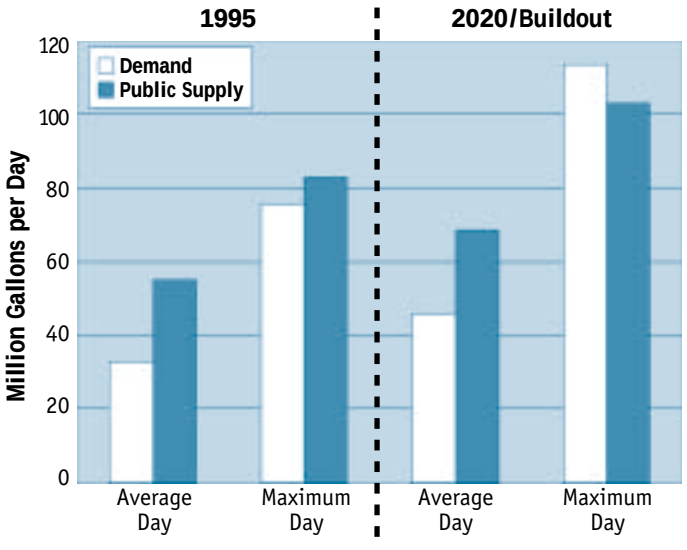
F.2: The maximum nitrogen loading standard for Potential Public Water Supply Areas shall be 1 ppm for development.

F.3: Within an identified Potential Public Water Supply Area, the same standards A.2 to A.5 apply as in Wellhead Protection Areas above.

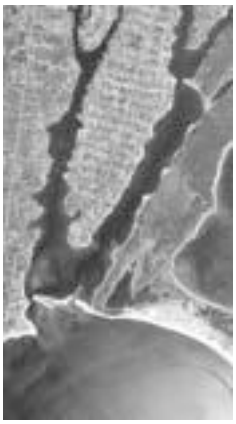
2.1.1.3 Development and redevelopment shall identify their proposed wells and existing private wells on abutting properties within 400 feet and assess the impact of the development on the water quality of these wells and

Capewide Public Water Supply vs. Demand, 1995 and Projected 2020/Buildout

	MILLION GALLONS PER DAY
1995:	
DEMAND	32.69 average 75.69 maximum
SUPPLY*	55.11 average 82.76 maximum
2020/BUILDOUT:	
DEMAND	45.90 average 113.55 maximum
SUPPLY*	68.59 average 103.00 maximum



*Supply figures represent municipal supplies only and do not include Otis wells or data for the towns of Eastham, Provincetown, Truro, and Wellfleet.
Sources: Sagamore Lens Groundwater Protection Project, Upper Cape Water Demand Study, Monomoy Capacity Study, and the Lower Cape Water Management Task Force Interim Report, 1995–2000.



Falmouth coastline. Credit: MA Executive Office of Environmental Affairs and MassGIS

all other existing wells that may potentially be affected by the proposed development. Septic systems and other sources of contamination shall be sited to avoid contamination of existing or proposed wells.

2.1.1.4 Conversion from seasonal to year-round uses in FEMA flood A-zones or within 100 feet of wetlands shall demonstrate that the project will not have adverse impacts on groundwater or adjacent surface waters and wetlands.

2.1.1.5 Developments of Regional Impact that withdraw more than 20,000 gallons of water per day shall demonstrate through a groundwater study that the project will not have adverse impacts on groundwater levels or adjacent surface waters and wetlands. The study shall include mapping of surface water morphology and comparison of existing and affected water-table fluctuations.

Other Development Review Policies

2.1.1.6 Water withdrawals and wastewater discharges should be managed so that they do not adversely affect surface water resources, wetlands, private wells, or the safe yield of the aquifer.

2.1.1.7 Development and redevelopment should use water-conservation technologies or other strategies to obtain a 40% reduction of water use.

2.1.1.8 Development and redevelopment should utilize alternatives to synthetic chemical fertilizers and pesticides in favor of organic and biological methods.

2.1.1.9 Development and redevelopment should increase aggregation and improve the level of treatment of existing wastewater flows.

2.1.1.10 Development and redevelopment should attain greater groundwater or surface water protection than provided for in the Minimum Performance Standards.

2.1.1.11 Development and redevelopment should attain zero discharge of wastewater through non-water-based waste treatment technologies or reuse of wastewater for irrigation.

2.1.1.12 Development and redevelopment should submit Chapter 21E site assessments or other water quality information indicating the condition of the site relative to hazardous waste.

2.1.1.13 Development in USGS-identified Potential Water Supply Areas should be avoided.

2.1.1.14 Development and redevelopment in Water Quality Improvement Areas subject to Marine Water Recharge Areas should seek to reduce nitrogen loading by providing for the removal of 2 kilograms of nitrogen for each kilogram added.

2.1.1.15 The development of public or community water supply systems should be encouraged for areas serviced by private wells in Impaired Areas.

Water Resources

2.1.2 Goal:

To encourage the use of public and private sewage treatment facilities in appropriate areas where they will provide environmental or other public benefits and where they can be adequately managed and maintained.

Minimum Performance Standards

2.1.2.1 Private treatment facilities may be constructed only if there are no feasible public treatment facility options available within three years of the proposed date of construction of a project.

2.1.2.2 All public and private sewage treatment facilities shall be designed to achieve tertiary treatment with denitrification that meets a maximum 5-ppm total nitrogen discharge standard either through advanced treatment to achieve 5 ppm in the effluent or 5 ppm in groundwater at the downgradient property boundary.

2.1.2.3 The construction of private sewage treatment facilities (PSTFs) shall not allow development to occur at a higher density than would be allowed by local zoning.

2.1.2.4 The construction of PSTFs shall be consistent with municipal capital facilities plans where they exist. Municipalities shall have the opportunity to assume ownership and maintenance responsibilities for such facilities where desired by the municipality.

2.1.2.5 PSTFs shall not be constructed in FEMA V-zones and floodways, Areas of Critical Environmental Concern (ACECs), wetlands and buffer areas, barrier beaches, coastal dunes, or critical wildlife habitats. PSTFs may be constructed in FEMA A-zones only to remediate water quality problems from existing development within such A-zones and consistent with Minimum Performance Standards 2.2.2.2 and 2.2.2.6, except as provided in Minimum Performance Standard 2.2.2.11.

2.1.2.6 The long-term ownership, operation, maintenance and replacement of PSTFs shall be secured as a condition of approval in accordance with Commission, state, and local guidelines.

2.1.2.7 Applications for approval of public and private sewage treatment facilities shall include a plan for sludge disposal.

Other Development Review Policies

2.1.2.8 When allowing additional development in areas where existing high-density development or large numbers of failing septic systems have led to public health or water quality problems, the Commission and/or towns may require PSTFs or DEP-approved alternative systems with enhanced nitrogen removal to be installed as a remedial measure.

Water Resources

2.1.3 Goal:

To protect the overall water quality of the aquifer and its resources by providing adequate stormwater management and treatment.

Minimum Performance Standards

2.1.3.1 New direct discharge of untreated stormwater, parking-lot runoff, and/or wastewater into marine and fresh surface water and natural wetlands shall not be permitted.

2.1.3.2 Stormwater shall be managed and infiltrated on site to minimize runoff and maximize water quality treatment. Stormwater treatment designs shall be based upon a 25-year 24-hour storm and attain 80% total suspended solids removal and at a minimum be consistent with Massachusetts Stormwater Policy Guidelines.

2.1.3.3 Development and redevelopment shall use best management practices such as vegetated swales and non-structured wetland detention basins for treatment prior to infiltration. Non-structured wetland detention basins and vegetated swales may be counted as open space within Wellhead Protection Areas.

2.1.3.4 Structured detention basins, infiltration basins and galleries may be used in Growth Incentive Zones provided that Minimum Performance Standards for stormwater are met.

A vegetated swale. Credit: Sharon Rooney/CCC

2.1.3.5 Infiltration basins or other stormwater leaching structures shall maintain a two-foot separation between maximum high water table and point of infiltration.

2.1.3.6 Development and redevelopment shall submit a stormwater maintenance and operation plan for approval by the Commission. The plan shall, at a minimum, include a schedule for inspection, monitoring, and maintenance and shall identify the party responsible for plan implementation.

A grassy swale. Credit: Sharon Rooney/CCC

2.1.3.7 In Wellhead Protection Areas, stormwater systems for land uses that have a high risk of contaminating groundwater, such as vehicle maintenance areas and loading docks, shall install a mechanical shut-off valve or other flow-arresting device between the catch basin or other stormwater-capture structure draining this area and the leaching structures.

Highlights of Water Resources Minimum Performance Standards*

Water Resources Classification System

Overall

- A maximum nitrogen load of 5 parts per million (ppm).
- Nitrogen loads greater than 5 ppm if there will be no adverse impacts on resources.

Drinking Water

- A maximum nitrogen load of 5 parts per million (ppm) unless a cumulative impact analysis indicates a more stringent standard is needed.
- Only household quantities of hazardous wastes or materials allowed in Wellhead Protection Areas.
- Zone II state regulations apply in Wellhead Protection Areas.
- A maximum nitrogen load of 1 ppm in Potential Public Water Supply Areas. No development is permitted within 400 feet of an identified future well site.
- Assessment of development impacts on nearby private wells required.

Coastal Embayments

- Must conform with critical nitrogen loads for marine ecosystems.
- No net increase in nitrogen loading where critical nitrogen loads have already been exceeded or where there are marine water quality problems.

Ponds

- No subsurface wastewater disposal systems within 300 feet of freshwater ponds.
- Delineation of groundwater recharge areas and assessment of phosphorous loading to potentially affected freshwater ponds.

Sewage Treatment Facility Standards

- Sewage treatment facilities limited to 10,000 gallon-per-day capacity in Wellhead Protection Areas unless remediating existing problems.
- Sewage treatment facilities must maintain the aquifer's hydrologic balance and prevent ecological impacts to surface waters.
- Development in Growth/Activity Centers and Growth Incentive Zones may be required to help pay for community wastewater facilities.
- Private sewage treatment facilities may be constructed only if no public facilities are available within three years.
- Sewage treatment facilities must have tertiary treatment with denitrification that meets 5-ppm total nitrogen concentration in the effluent or groundwater.
- Private sewage treatment facilities cannot enable growth more dense than local zoning allows.
- Private sewage treatment facilities must be consistent with municipal capital facilities plans.
- Sewage treatment facilities cannot be built in specified sensitive resource areas.
- Details regarding ownership, operation, maintenance, and replacement of private sewage treatment facilities are required.
- Sewage treatment facilities must include a plan for sludge disposal.

Stormwater Management Standards

- No new direct discharge of untreated stormwater into marine and fresh surface water and natural wetlands.
- Stormwater must be managed and infiltrated on site, attain an 80% TSS removal, and be consistent with state Stormwater Guidelines.
- Non-structural design components required, but structural components allowed in Growth Incentive Zones.
- Infiltration required to be at least two feet above high groundwater.
- Stormwater maintenance and operation plan required.
- Stormwater systems for land uses that have a high risk of contaminating groundwater must use emergency shut-off devices in Wellhead Protection Areas.

Natural Resources Standards

- Turf and landscape management plans required.
- Conversion from seasonal to year-round uses must protect sensitive resources.
- Developments that withdraw more than 20,000 gallons of water per day must protect groundwater levels and adjacent surface waters and wetlands.

**These highlights are offered as a simplified guide to—but are not a substitute for—the Minimum Performance Standards detailed on the preceding pages of the Water Resources section of the Regional Policy Plan.*

Implementation

Commission Actions:

A. The Commission will continue to review literature evaluating the impact of development on surface and groundwater quality and assist in the development of updated standards and management strategies as needed to protect water resource areas throughout Cape Cod.

B. The Commission will provide ongoing technical assistance to communities regarding designation of Zone IIs and water management permit issues for public water supply wells.

C. The Commission will continue to classify the region's marine surface waters, delineate recharge areas, determine flushing rates for marine embayments, evaluate land use to provide suggested management solutions, and assist the towns and the state in the development of appropriate management solutions.

D. The Commission will continue to maintain the regional network of groundwater observation wells from which estimates of groundwater levels are derived.

E. The Commission will aid communities with development of shared water supplies where appropriate and provide technical assistance to towns conducting wastewater facilities plans.

F. The Commission will evaluate the potential for nitrogen-reducing stormwater treatment systems.

G. The Commission will continue to coordinate water resource protection strategies with federal, state, county, and local programs and officials including but not limited to the following projects:

CCC displays at a pond-stewardship workshop. Credit: Nancy Hossfeld/CCC

1) The Commission will continue to participate in various Massachusetts Military Reservation technical advisory committees to expedite an appropriate and balanced clean-up of groundwater contamination and to develop an appropriate water resources management and protection strategy for the Upper Cape communities.

2) The Commission will coordinate with the Massachusetts Department of Environmental Management, the Massachusetts Department of Environmental Protection, The Nature Conservancy, and the Cape Cod National Seashore to develop criteria for determining permissible levels of groundwater withdrawal to avoid impacts on surface water ecosystems.

3) The Commission will participate in a regional study in cooperation with the US Geological Survey, the Massachusetts Department of Environmental

Protection, and University of Massachusetts-Dartmouth's School for Marine Science and Technology to evaluate recharge areas to wells, ponds, and coastal embayments.

4) The Commission will cooperate with nonprofit organizations, pond associations, the Barnstable County Department of Health and the Environment, the Massachusetts Department of Environmental Protection, University of Massachusetts-Dartmouth's School for Marine Science and Technology, and others to prioritize the region's freshwater ponds, delineate their recharge areas, encourage stewardship and develop protective strategies.

5) The Commission will work cooperatively with towns, the Massachusetts Department of Environmental Protection, the Barnstable County Department of Health and the Environment, and others to develop and implement wastewater management strategies including the application of Total Maximum Daily Loads.

6) The Commission will continue to work with the Massachusetts Department of Environmental Protection and the Barnstable County Department of Health and the Environment to assist towns in dealing effectively with multiple hazardous waste sites.

7) The Commission, working through the Cape Cod Groundwater Guardian Team, will continue to develop and provide educational information and participate in events to inform the public about Cape Cod's sole source aquifer and its water resources.

A water education festival organized by the Cape Cod Groundwater Guardian Team. Credit: Nancy Hossfeld/CCC

8) The Commission will continue to provide input to the state's various Title 5 working groups about the unique hydrogeologic conditions on Cape Cod and shall continue to provide assistance to local communities with the implementation of Title 5.

9) The Commission will cooperate with Soil Conservation Service, Department of Public Works, Cape Cod Cooperative Extension, and other appropriate agencies to encourage the use of alternatives to fertilizers, herbicides, pesticides, road salt, and other materials that could adversely impact surface and groundwater quality.

10) The Commission will work with the Barnstable County Department of Health and the Environment and the US Geological Survey to develop standards to protect against bacterial and viral contamination of ground and surface waters.

11) The Commission will continue to work with all involved entities to develop and implement wastewater management districts to address watershed-specific water quality problems.

12) The Commission will continue to maintain and publish an updated database of the region's public water quality and quantity of water pumped.

Recommended Town Actions:

A. Towns should develop water-conservation plans that encourage the installation and use of water-saving devices.

B. Towns should identify locations of private wells and septic systems, especially in densely developed areas, and undertake assessments to evaluate the need for sewers and/or public water.

C. Towns should work with the Commission to identify Impaired Areas and Water Quality Improvement Areas to prioritize wastewater treatment upgrades, including identification of appropriate parcels for aggregate treatment and/or discharge facilities for community wastewater treatment.

D. Towns should work with the Commission and others to identify wastewater infrastructure and legal and institutional needs to address the establishment of wastewater management districts.

E. Towns should establish or modify local water supply protection bylaws to prohibit hazardous land uses in Wellhead Protection Areas, limiting nitrogen loading to protect ground- and surface water quality, and protect and acquire future water supply areas.

F. Towns should develop stormwater design standards that encourage better treatment within Wellhead Protection Areas.

G. Towns should encourage and fund water quality monitoring programs, especially programs with citizens serving as water quality monitors.

H. Towns should establish bonus provisions to allow increased development density through their local bylaws/ordinances for development that provides a public benefit such as affordable housing substantially above the required 10% level, or treatment of amounts of sewage from existing non-sewered development.

Alum treatment of Ashumet Pond, Falmouth/Mashpee. Credit: Tom Cambareri/CCC

2.2 Issue Area: Coastal Resources

Coastal resources constitute the foundation of Cape Cod's environmental heritage. They have fueled the Cape's social, cultural, and economic engines from the days of blackfish, salt works, and shipwrights to today's emphasis on ownership of coastal real estate with water views.

Cape Cod's coastal resources are varied and their significance extends beyond the 586 miles of tidal shoreline that mark the interface of land and sea. Traditional planning efforts have separated land- and sea-based activities. We are increasingly aware, however, that these activities are inherently related. Projects such as the Massachusetts Water Resources Authority's ocean outfall pipe, which began discharging sewage effluent from the Boston area into Massachusetts and Cape Cod bays in 2000, require our attention and vigilance to ensure the health and vitality of the region's marine environment. The condition of our coastal embayments, the regulation of our fishery stocks, the health of our local fishing industry, the pressure to develop our coastline, and the commercial and recreational uses of our waterways remind us that this environment is fundamental to our quality of life.

This Regional Policy Plan sets forth a vision for balancing the use and protection of the land and water resources that constitute Cape Cod's coastline. The vision foresees the protection of public access and traditional maritime uses; improvement and protection of coastal water quality and shoreline habitat; limits on development in areas subject to flooding and coastal storm damage; and consideration of sea-level rise for all coastal planning and development activities.

Credit: Cape Cod Commercial Hook Fishermen's Association

Fishermen use Cape Cod's natural embayments as bases of operations to harvest fish from local waters and from grounds as far away as Georges Bank. A fragmented approach to fisheries regulation has dominated recent management decisions, and both the quantity of fish taken and the value of the reported catch of marketable species have fluctuated over time. In 1999 and 2000, the Cape's marine commercial fishery landings were $25.9 million and $30 million, respectively. The Cape's tidal areas, however, boast the largest traditional and cultivated shellfish industry of any coastal region in Massachusetts. The estimated economic value of cultured shellfish modestly increased in the last decade, from $1,083,455 in 1990 to $1,468,728 in 1999, and now appears stable. These statistics from the Commonwealth are garnered from voluntary reports by growers to the Massachusetts Division of Marine Fisheries, generally estimated to represent one half to one third of actual harvest.

This Regional Policy Plan sets forth a vision for balancing the use and protection of the land and water resources that constitute Cape Cod's coastline.

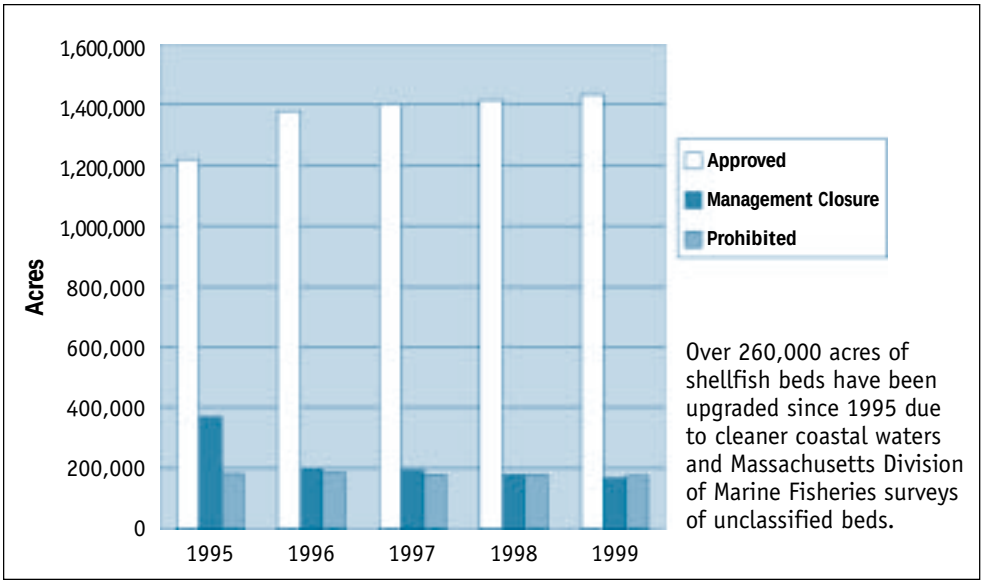
According to a 1995 Coast Alliance survey, however, coastal tourism in the northeast represents more than 40 times the economic value of all seafood caught in the region. This trend and the collapse of several major fisheries have changed the way the Cape's coastal harbors are managed and redeveloped. Restaurants, condominiums, and offices are replacing boatyards and marinas. Demand for moorings outstrips supply, and commercial dock space is being converted for recreational vessels. These conversions sacrifice the character of our historic maritime community and replace traditional working waterfronts.

Lucrative opportunities to develop coastal areas have also dramatically changed the scope and intensity of uses of the shoreline. Although the Commonwealth ensures the public's rights to fish, fowl, and navigate in tidelands, development has restricted or removed access to many of these areas. Private docks and piers have proliferated along embayments and shallow tidal creeks and rivers. Cumulatively, they clutter, fragment, and erode shores and banks, impede public access to public resources, diminish shellfish habitat, and encourage increased navigation of shallow and fragile waterways by larger and more powerful boats. Plans to dredge tidal estuaries and coastal ponds to greater widths and depths to accommodate larger craft diminish shellfish habitat and eel grass beds and increase the maintenance burden on public agencies.

To address these impacts, this Regional Policy Plan establishes standards to ensure that private development does not impede public access. It also provides a framework for managing the number and use of docks, piers, and boat slips in coastal and estuarine waterways.

Pollution of our coastal waters is another serious impact from increased development and population growth. Wastewater comprises between 50% and 70% of the nitrogen loading to coastal watersheds. Excess nitrogen in wastewater contributes to the loss of shellfish habitat, a diminished capacity to support

Status of Massachusetts Shellfish Beds since 1995



Source: "The State of Our Environment," MA Executive Office of Environmental Affairs, April 2000.

aquatic life, reduced species diversity, and foul odors. Excess nitrogen is the major contributing factor, for example, to the disappearance of eelgrass in Waquoit Bay in Falmouth and Mashpee. Eelgrass supports the habitat for juvenile fish and shellfish. Its disappearance has resulted in a decline in shellfish harvests, which are now at levels one tenth what they were in the 1970s.

Stormwater runoff also discharges excess nutrients and contaminants into coastal water bodies. Stormwater improvements have allowed shellfish beds to reopen and have contributed to water quality improvements in several towns. Much work remains to be done, however. Cape communities must continue to identify and seek funding for projects to upgrade existing stormwater system deficiencies and to remove artificial barriers to tidal flows.

Better management of boat wastes and debris can mitigate public health risks and may improve coastal water quality. Twelve Cape towns operate a total of 33 shoreside and floating pump-out facilities. In addition, Waquoit Bay, Wellfleet Harbor, and waters in Harwich, Chatham, Eastham, Orleans, Buzzards Bay, and Barnstable have been protected through recent federal designations as "No Discharge Areas" for boat wastes. Coastal managers, municipal officials, user groups, and residents should work to expand this protective network to encompass all Cape coastal waters. Although the contribution of marine waste to coastal contamination is not large, the designation of No Discharge Areas demonstrates a fundamental respect for our coastal resources and the people who use them.

To address these impacts on coastal water quality, this Regional Policy Plan prohibits new discharges of untreated stormwater, establishes standards for treating boat waste, and encourages wastewater assessments and management plans.

Storm drain. Credit: Steve Tucker/CCC

Another threat to coastal resources is uncontrolled and unplanned development of the shoreline and areas subject to erosion, flooding, and storm damage. In its 2000 national report, "Evaluation of Erosion Hazards," the Heinz Center for Sciences, Economics, and the Environment found that development density in coastal high-hazard areas had increased by more than 60% during the last 20 years. Similarly, the US Environmental Protection Agency's draft Clean Water Action Plan reports that the population of coastal counties in the US increased by 52% between 1970 and 1990. The Heinz Center also reported that one in four houses located within 500 feet of the US shoreline may be damaged or destroyed by coastal erosion within the next 60 years. Development in areas subject to coastal erosion and the effects of sea-level rise have contributed to soaring national disaster recovery costs. Total annual losses in 1970 stood at approximately $4.5 billion per year, and no single event had caused losses in excess of $1 billion before 1989. Today, natural hazards cause about $50 billion in damages annually, and Hurricane Andrew alone caused estimated insured losses of $15.5 billion. These national trends, development patterns, and threats have also emerged on Cape Cod.

Waterfront development in high-hazard areas such as the top of eroding coastal banks, on lands adjacent to wetlands, and on barrier beaches can

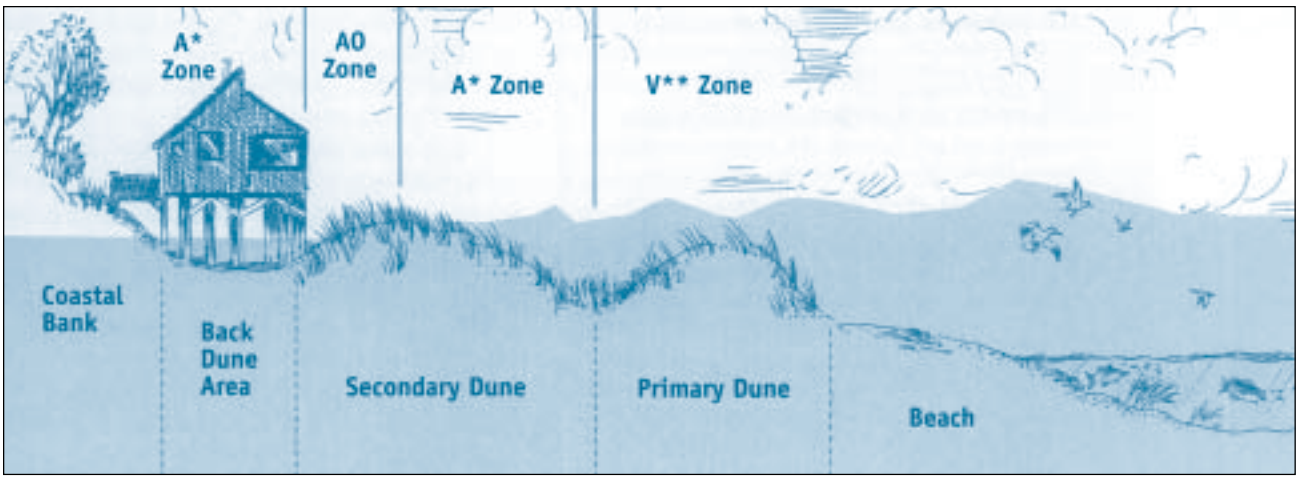
destabilize banks and dunes, accelerate problems with erosion and sedimentation, degrade critical habitat, and alter important characteristics of the Cape's scenic shoreline. Storms can cause hazardous flooding, wave impacts, and, in some cases, significant erosion and scouring. The topography and soil characteristics, vegetation, dynamism, and permeability of the land surface within Federal Emergency Management Agency (FEMA)-designated V-zones and AO-zones (described in the accompanying diagram and in the Definitions section of this document) are critical characteristics that determine how effectively an area dissipates wave energy and protects resources landward of these zones from storm damage and flooding.

When left undeveloped, coastal resources in V- and AO-zones are often able to compensate for rising sea level through natural processes. This adjustment or "migration" is suspended or impeded when roads, buildings, and coastal engineering structures (i.e., shoreline protection) are built in high-hazard areas. These impediments to natural processes alter wave effects, deflect wave energy onto adjacent properties or natural resources, and increase erosion and scouring. Dredging or removal of materials within V- and AO-zones increases the velocity and height of storm waves, thereby making wetlands and properties further inland vulnerable to storm effects.

To address these potential impacts, the Regional Policy Plan establishes minimum setbacks from sensitive resources such as coastal banks, dunes, marshes, and mean high water, and restricts new development from impeding the migration of coastal resources that tend to fluctuate naturally over time.

Damage to property and alterations of the coast by erosion and storm effects are exacerbated by poor land-use practices. Impacts are cumulative, and the effects of unplanned development may go unrecognized until substantial private and public investments are imperiled. The last storms to cause significant property damage on Cape Cod were in 1991 and 1992. Two of these three storms were "northeasters," and

Cross Section of Coastal Resource Areas and Flood Zones



Source: Illustration by Dan Dailey, courtesy MA Department of Environmental Protection.

their strength was estimated to be consistent with that of a "20-year" storm. Although the storms were of modest strength, they were costly in terms of damaged property, public infrastructure, and federal disaster assistance. Falmouth alone estimated that it sustained $3.5–4 million in damage to public facilities, more than two dozen homes, and 300 boats. In addition to the property damage, business losses, and loss of services, severe coastal erosion of beaches, dunes, and bluffs also occurred.

Damage from Hurricane Bob, 1991, in Falmouth. Credit: CCC file photos

The state's emergency regulations that govern repair and reconstruction of storm-damaged properties have improved; however, more work needs to be done to eliminate hazards. Each town has an evacuation plan, and local and state regulations limit some development in hazard areas. Many towns have not adopted formal reconstruction policies to improve practices and prevent repetitive losses from occurring. Towns should focus their efforts on developing flood-hazard management plans for future storm and flood events, including methods for damage assessments, reporting, and preparation for post-disaster mitigation with federal assistance funds. Towns should also consider acquiring vacant land in the floodplain and purchasing repetitive-loss properties. The Regional Policy Plan also has a role in minimizing hazards. Standards in the Plan restrict new development in flood-prone areas and require existing structures to be altered to better withstand storms and storm-related damage.

In addition to episodic damage caused by storms and hurricanes, the coastline is also experiencing the effects of sea-level rise as a result of global climate change and geologic processes. The climatologic record seems to demonstrate a trend toward higher global temperatures. New projections by the US Environmental Protection Agency indicate that a one-foot rise in sea level is likely to occur between 2025 and 2050, and a two- to four-foot rise in sea level is possible within the next 100 years. The Atlantic coast of the US is one of the regions most vulnerable to increased flooding and heightened storm effects. Existing land-use and building regulations are the minimum standards necessary to protect public safety, but they fail to address the effects of sea-level rise and associated coastal resource migration. For example, current law requires structures to be elevated to the 100-year flood elevation, which does not take sea-level rise into consideration. To protect coastal resources and safeguard investments in public infrastructure, more stringent standards must be applied to municipal planning and local and regional reviews of developments.

Damage from Hurricane Bob, 1991, in Provincetown. Credit: CCC file photo

Coastal Resources

2.2.1 Goal:

To protect public and traditional maritime interests in the coast and rights for fishing, fowling, and navigation, to preserve and manage coastal areas so as to safeguard and perpetuate their biological, economic, historic, maritime, and aesthetic values, and to preserve, enhance, and where appropriate, expand public access to the shoreline.

Minimum Performance Standards

2.2.1.1 Development and redevelopment along the coastline shall not interfere with existing public access and traditional public rights of way to and environmentally appropriate use of the shoreline.

2.2.1.2 Public access shall be provided at all publicly funded beach-nourishment sites where such access will not impair natural resources.

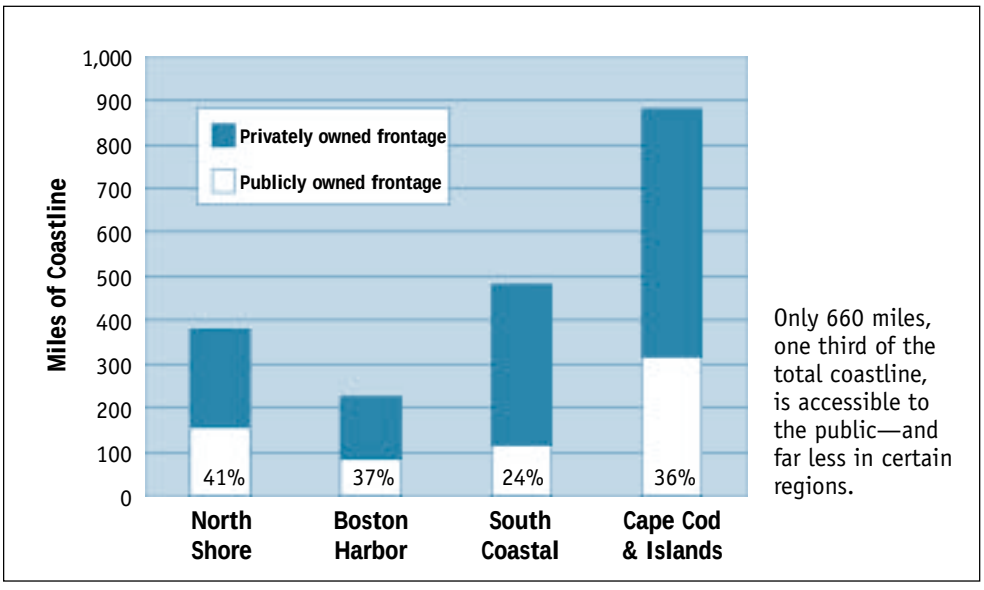
Other Development Review Policies

2.2.1.3 Marine infrastructure that supports fisheries or marine transportation should be preserved and protected from conversion to private or recreational uses.

2.2.1.4 Development and redevelopment should reflect the traditional maritime character and/or architecture typical of the area and should be designed to maintain and enhance views of the shoreline from public ways, waterways, access points, and existing development.

2.2.1.5 The construction of walkways, where environmentally acceptable, should be encouraged to enhance shoreline access for the public, including people with disabilities. Such activities should not degrade undisturbed resources or contribute to adverse impacts to habitat, aesthetics, or storm damage prevention.

Public Ownership of the Massachusetts Coast



Only 660 miles, one third of the total coastline, is accessible to the public—and far less in certain regions.

Source: "The State of Our Environment," MA Executive Office of Environmental Affairs, April 2000.

2.2.1.6 If an existing water-dependent facility is within 250 feet of the mean high water line or shoreward of the first public way, whichever is less, such use should not be changed to a non-water-dependent facility unless an overriding public benefit is provided to accommodate for the loss of the water-dependent use.

2.2.1.7 Development or redevelopment of water-dependent facilities should provide coastal access benefits to the general public. Such access should minimize interference with the water-dependent use.

2.2.1.8 Coastal engineering structures should be designed so as to allow the public to pass along the shore (either above or below the structure) in the exercise of its public trust rights to fishing, fowling, and navigation.

Coastal Resources

2.2.2 Goal:

To limit development in areas subject to coastal storm flow, particularly high-hazard areas, in order to minimize human casualties and property or environmental damage resulting from storms, flooding, erosion, and relative sea-level rise.

Minimum Performance Standards

2.2.2.1 Except as specified in Minimum Performance Standard 2.2.2.5, no development or redevelopment shall be permitted within FEMA flood V-zones. Existing structures may be reconstructed or renovated provided there is no increase in floor area or intensity of use. As an exception, where there is no feasible alternative, water-dependent structures and uses and maintenance of marine infrastructure may be permitted subject to the approval of all permitting authorities.

2.2.2.2 In order to accommodate possible relative sea-level rise and possible increased storm intensity, ensure human health and safety, and protect the integrity of coastal landforms and natural resources, all new buildings, including replacements, or substantial improvements to existing structures within FEMA A-zones shall be designed to accommodate the documented relative sea-level rise rate in Massachusetts of at least one foot per 100 years, except as provided in Minimum Performance Standard 2.2.2.13, and in V-zones shall be designed to accommodate a relative sea-level rise rate of two feet per 100 years.

2.2.2.3 Except as specified in Minimum Performance Standard 2.2.2.5, no new development or redevelopment shall be permitted on barrier beaches or coastal dunes as defined by the Wetlands Protection Act and associated regulations and policies. Existing structures may be reconstructed or renovated, provided there is no increase in floor area, footprint, or intensity of use, or conversion from seasonal to year-round use.

A. If the reconstruction/renovation is greater than 50% of the replacement value of a structure and is located within a V-zone, the lowest horizontal structural member shall be elevated at least two feet above the 100-year flood elevation.

If the structure is located in the A-zone, the lowest floor shall be elevated at least one foot above the 100-year flood elevation, except as provided in Minimum Performance Standard 2.2.2.13. On a barrier beach or coastal dune and in either the V- or A-zone, the structure shall be on open pilings to allow for storm flowage and beach and dune migration.

B. If the structure is on a barrier beach or dune and is outside the 100-year coastal floodplain and is proposed to be reconstructed/renovated greater than 50% of its replacement value before reconstruction and renovation, it shall be elevated at least two feet above grade on open pilings to allow dune migration.

Water-dependent public recreational facilities and marine infrastructure in these locations may be developed or renovated in accordance with Minimum Performance Standard 2.2.2.2 provided that it can be demonstrated that the proposed development will not compromise the integrity of coastal resources or contribute to the cumulative loss of public access to the coast or fish or shellfish habitat and preserves the aesthetic quality of the area in accordance with Minimum Performance Standard 2.2.1.3.

Eroding dune. Credit: Kathy Sferra/CCC

2.2.2.4 No new non-water-dependent development shall be permitted within 100 feet of the top of a coastal bank, dune crest, or beach. Redevelopment shall be designed to have no adverse effect on the height, stability, or the use of the bank or dune as a natural sediment source. In areas where banks or dunes are eroding, the setback for all new buildings and septic systems to the top of the coastal bank or dune crest shall be at least 30 times the average annual erosion rate of the bank or dune or 100 feet, whichever is greater. The annual rate of erosion shall be determined by averaging the erosion over the previous 30-year period at a minimum. In instances where shoreline erosion rates are indicative of bank/dune erosion rates, MCZM shoreline change maps may be used in determining the setback.

2.2.2.5 Where fire, storm, or similar disaster has caused damage to or loss of buildings in FEMA A- and V-zones, on barrier beaches, coastal banks, or coastal dunes of greater than 50% of their replacement value, all reconstruction shall be in compliance with current applicable regulations and shall be designed in accordance with Minimum Performance Standards 2.1.1.4, 2.2.2.2, 2.2.2.4, 2.2.3.1, and 2.2.3.2. Any reconstruction shall not enlarge or expand the use of an existing structure.

2.2.2.6 Except as provided in Minimum Performance Standard 2.2.2.13, no new public infrastructure or expansion of existing infrastructure shall be made in flood hazard zones (FEMA A- and V-zones) unless it is shown that there is an overriding public benefit provided, and provided that such infrastructure will not promote new growth and development in flood hazard areas.

2.2.2.7 Where land subject to coastal storm flow serves to control floods and prevent storm damage, no activity shall increase the existing site elevations

or the velocity of flood waters or increase flows due to a change in drainage or flowage characteristics on the subject site, adjacent properties, or any public or private way.

2.2.2.8 New development and redevelopment shall not impede the landward migration of resource areas within the 100-year floodplain, except for maintenance of existing public infrastructure. Relative sea-level rise and the landward migration of coastal resources in response to relative sea-level rise shall be incorporated into the design, construction, and location of structures and other activities proposed.

2.2.2.9 New structures, additions to existing structures, solid foundations, new or proposed expansions of roads, driveways, or parking lots, or impermeable paving of existing ways, new or proposed expansions of coastal engineering structures, and new septic systems shall be prohibited within the V-zone of a beach, dune, barrier beach, or coastal bank. Redevelopment of marine infrastructure shall include a monitoring and renourishment plan to replicate the form and function of pre-existing features to the greatest extent practicable.

2.2.2.10 Notwithstanding Minimum Performance Standards 2.2.2.6, 2.2.2.7, 2.2.2.8, 2.2.2.9, and 2.2.3.13, the following activities may be permitted provided the applicant demonstrates that best available measures are utilized to minimize adverse impacts on all critical characteristics of land subject to coastal storm flowage, and provided that all other performance standards for underlying resource areas are met: beach, dune, and bank nourishment and non-structural restoration projects, including temporary fencing and other devices composed of natural and biodegradable material to facilitate dune development and plantings compatible with natural vegetative cover; appropriately designed pedestrian walkways and elevated decks with appropriate orientation, height, and spacing between planks to allow sufficient sunlight penetration; maintenance and use of public boat launching facilities; maintenance required to preserve the aesthetics or structural integrity of marine infrastructure; projects that will restore, rehabilitate, or create salt marsh or freshwater wetlands; projects that are approved in writing or conducted by the Division of Marine Fisheries and that are specifically intended to increase the productivity of land containing shellfish, including appropriately sited and managed shellfish aquaculture projects, or to maintain or enhance marine fisheries, and projects that are approved in writing or conducted by the Division of Fisheries and Wildlife that are specifically intended to enhance or increase wildlife habitat.

Boardwalk over Mill Creek, Sandwich. Credit: CCC file photo

2.2.2.11 Monitoring and maintenance plans shall be required of all

A juvenile willet. Credit: Steve Tucker/CCC

projects proposing to place dredged material on public or private beaches for renourishment of eroding features. Vegetative stabilization shall be designed and maintained to ensure the longevity of the renourishment project, and shall be implemented as a component of the maintenance plan. The density of stabilizing vegetation may be reduced to preserve characteristics of nest sites and actual habitat of threatened and endangered species such as shorebirds and the diamondback terrapin.

2.2.2.12 Wherever feasible, dredge material shall be used for nourishment on public beaches subject to erosion. Such material shall be clean and compatible with existing strata. Where no feasible public site exists, dredge material may be used to enhance storm damage prevention for multiple private properties, provided that public access is afforded in accordance with Minimum Performance Standard 2.2.1.2.

2.2.2.13 In order to allow alternative means of reducing flood hazard risks in areas where there are serious concerns about protecting the character of historic villages, the following shall apply in Village Growth/Activity Centers or Growth Incentive Zones located in FEMA A-zones for which a Flood Hazard Mitigation Plan has been prepared and adopted by the town and has been found by the Cape Cod Commission to be consistent with state coastal policies and regulations. Notwithstanding Minimum Performance Standards 2.1.2.5, 2.2.2.2, 2.2.2.3 A, and 2.2.2.6, the following standards shall apply to such Village Growth/Activity Centers or Growth Incentive Zones located within FEMA A-zones:

A. Development and redevelopment shall be subject to the requirements of the adopted Flood Hazard Mitigation Plan and any related policies and regulations.

B. Public infrastructure and private sewage treatment facilities (PSTFs) may be constructed in FEMA A-zones (but not within a V- or an AO-zone) provided that these facilities are consistent with the Flood Hazard Mitigation Plan and the certified Local Comprehensive Plan; further provided that the infrastructure is itself flood-resistant; and provided that such infrastructure will not promote new growth and development outside such Growth/Activity Center or Growth Incentive Zone.

C. All new buildings or substantial improvements to existing structures in the FEMA A-zone shall comply with FEMA and State Building Code regulations for elevation and flood-proofing.

Other Development Review Policies

2.2.2.14 Vehicle, boat, and pedestrian traffic in critical wildlife and plant habitat areas as identified in Minimum Performance Standard 2.4.1.4 such as wetlands, dunes, shallow estuarine areas, and shorebird-breeding habitat and other sensitive resource areas should be minimized.

2.2.3 Goal:

To maintain and improve coastal water quality to allow shellfishing and/or swimming in all coastal waters as appropriate, and to protect coastal ecosystems that support protected species and shellfish and finfish habitat.

Minimum Performance Standards

2.2.3.1 New mounded septic systems shall be prohibited within FEMA V-zones except to upgrade existing failed systems where such systems pose a demonstrated threat to public health, water quality, or natural resources. Structural components of failed systems shall be removed from V-zones, unless such removal would cause irreversible adverse impacts to protected resources.

2.2.3.2 No new direct, untreated stormwater discharges shall be permitted into any coastal waters or wetlands, including discharges above or below the mean high water level. Existing stormwater discharges shall be corrected through treatment and redirection in accordance with applicable Minimum Performance Standards under Goal 2.1.3.

2.2.3.3 The design and construction of stormwater management systems proposed in V-zones shall incorporate the historic rate of relative sea-level rise in Massachusetts of two feet per 100 years to the maximum extent practicable. For systems proposed in A-zones, the historic rate of relative sea-level rise in Massachusetts of one foot per 100 years shall be incorporated into National Pollution Discharge Elimination System (NPDES) Phase II Plans (where required) and individual project design and construction.

2.2.3.4 In order to avoid additive losses of shellfish habitat and minimize cumulative impacts to wetlands and public access, construction of community docks and piers, rather than separate structures serving individual lots, shall be required. In significant shellfish habitat areas, as identified and documented by the Division of Marine Fisheries and/or local shellfish officials, the construction or expansion of docks and piers shall not be permitted. Previously licensed private docks and piers more than 50% damaged or destroyed by storms may be replaced in accordance with federal, state and local regulations, except in areas identified and documented as significant shellfish habitat.

2.2.3.5 New marinas of 10 or more slips, moorings, or active landward storage berths, and expansions of existing marinas by 10 or more slips, moorings, or berths shall provide or contribute to the provision of adequate boat sewage pump-out facilities in each harbor and shall provide restrooms for their patrons. Such marinas shall also provide or contribute to provision of adequate collection facilities for solid waste and waste oil for their patrons.

Boat slips in Buzzards Bay area. Credit: CCC file photo

2.2.3.6 New dredging shall be prohibited except when new dredging is necessary to accomplish a substantial public benefit and no feasible alternative exists.

2.2.3.7 Development shall have no significant direct or indirect adverse effects to eelgrass beds, unless there is no feasible alternative location or design for the project and the project is necessary to accomplish a public benefit.

2.2.3.8 Development and redevelopment shall be designed and constructed to minimize direct and secondary impacts to fish, shellfish, and crustaceans.

Scallop aquaculture project in Barnstable. Credit: AmeriCorps-Cape Cod

2.2.3.9 All projects proposed as maintenance dredging shall provide prior permitting authorities, permit numbers, dates of issuance and re-issuance, and documentation that clearly demonstrates the width, depth, and length of the previously permitted project.

2.2.3.10 Coastal aquaculture facilities shall be designed to have no significant adverse impacts to water quality or to the chemical composition and habitat value of marine sediment. New permanent or permanently anchored artificial structures designed to retain or support the propagation of fish or shellfish, other than marine infrastructure and other development permitted herein, shall not be permitted in the sub-tidal marine environment. Temporary structures permitted in writing by the Division of Marine Fisheries and specifically intended to increase the productivity of land containing shellfish or enhancing marine fisheries may be allowed, provided that there is no impact to public trust rights.

2.2.3.11 Undisturbed buffer areas of at least 100 feet in width surrounding coastal wetlands and/or landward of the mean high water mark of coastal water bodies shall be protected in accordance with Minimum Performance Standard 2.3.1.2.

Other Development Review Policies

2.2.3.12 Where appropriate, waterfront fueling facilities should be upgraded to ensure that best management practices are used to avoid adverse impacts to water quality.

2.2.3.13 Development and redevelopment in the marine environment should be designed to minimize subsurface noise impacts to fish and to protected species habitat.

Implementation


Sandy Neck Beach, Barnstable. Credit: Nancy Hossfeld/CCC

Commission Actions:

A. The Commission will continue to participate actively in the Massachusetts Bays, Buzzards Bay, Waquoit Bay National Estuarine Research Reserve, and other regional coastal research programs, to ensure that technical and scientific issues of importance to Cape Cod are addressed. The Commission will coordinate with the various agencies with jurisdiction in the coastal zone on matters related to these projects.

B. The Commission will work with the Massachusetts Bays National Estuary Program to advance mutual interests identified in the Comprehensive Conservation and Management Plan including public access, water quality, coastal habitat, and the environmental integrity and ecological health of Massachusetts and Cape Cod bays.

C. The Commission will provide technical assistance to towns in addressing public-access issues, user conflicts, flood hazard mitigation, sea-level rise and research, and monitoring their bylaws and Local Comprehensive Plans.

D. In order to ensure that communities have undertaken adequate planning measures to prepare for future disasters, the Commission will work with FEMA, MEMA, Woods Hole Oceanographic Institution Sea Grant Program, and the MCZM Program to pursue support for mitigation and flood hazard planning. The Commission will distribute educational materials and guidelines for pre-storm mitigation and post-storm construction activities, and encourage community awareness of and support for appropriate mitigation strategies.

E. Fish spawning and nursery areas, anadromous and catadromous runs, submerged aquatic vegetation, essential fish habitat, and shellfish habitat will be mapped to the greatest extent practicable and incorporated into the Commission's Geographic Information System (GIS). The Commission will work with the Division of Marine Fisheries and local agencies such as the Cape Cod Cooperative Extension to develop and maintain this information and its application to management challenges for Cape Cod waters.

F. The Commission will continue to work with Coastal Zone Management, Waquoit Bay National Estuarine Research Reserve, and other organizations such as the Woods Hole Oceanographic Institution to encourage cooperative research efforts and the inception of responsible management programs to deal with the impacts of recreational boating and the boating activity associated with docks and piers on coastal ponds and bays and shellfish habitat.

G. The Commission will continue to work with federal, state, and other authorities to ensure the protection of nearshore and offshore fishing grounds from adverse impacts from oil drilling and spillage; mining; septage, sewage and hazardous waste; dumping; dredge spoil disposal; and other offshore development. The Commission will also endeavor to support local fisheries and will work to preserve facilities and programs that support the most sustainable harvest techniques,

and will work with regional, state, and federal entities exploring the designation of marine protected areas in coastal waters.

Recommended Town Actions:

A. Towns should develop and implement harbor management plans and implement special purpose zoning to protect coastal resources and to minimize use conflicts pertaining to recreational or commercial uses of coastal and marine resources. Harbor plans and related management plans should be crafted with due regard for the town's ability to accomplish future maintenance and upkeep on coastal infrastructure and navigation improvements, should provide for the preservation of fisheries and traditional water-dependent uses, and should address capacity issues and siting and impacts of private docks and piers.

B. Towns should strengthen local bylaws and regulations beyond minimum state and federal standards to reduce the potential impacts to health, safety, and the economy resulting from coastal storms by adopting more rigorous construction standards and building regulations, by developing mechanisms to track incremental improvements to structures in high-hazard areas, and by exploring the use of "rolling easements" for new coastal development. (Rolling easements are a concept proposed in 1998 by the EPA. Under the concept, private landowners along rivers, estuaries, and the oceans could continue to use and develop their properties as long as they refrain from armoring the shoreline; they would receive payment up front in return for their commitment not to bulkhead their properties.)

C. Towns should require the use of "soft" solutions to coastal erosion (e.g., beach nourishment, beach-grass plantings, and related activities) to the greatest extent allowable by law, as an alternative to "hard" coastal engineering structures and should amend local bylaws and regulations to address this issue.

D. Towns should develop flood hazard management plans and identify necessary actions to accommodate storm events, sea-level rise, and the migration of dynamic coastal resources.

E. Towns should establish sufficient support services and statistical information to compile petitions to the EPA for the designation of federal "No Discharge Areas" for boats in conjunction with state and federal guidelines.

F. Towns should evaluate long-term dredging and dredge disposal needs and alternatives. Towns should explore the recovery of regenerative offshore sand deposits for sustainable beach renourishment and should identify potential confined aquatic disposal sites (if any) for unsuitable material in inactive areas.

G. Towns should work with their public works department and state agencies to develop plans to rectify identified tidal restrictions, to repair anadromous and catadromous fish runs, and to capitalize on opportunities to restore degraded coastal resources wherever possible during the course of infrastructure maintenance activities.

Credit: CCC file photo

2.3 Issue Area: Wetlands

One out of every four acres on Cape Cod is wetland. These areas include red maple swamps, Atlantic white cedar swamps, bogs, fresh and salt marshes, and wet meadows. These wetland resources are important to both the environment and economy of Cape Cod. They serve important natural functions including groundwater recharge and attenuation of pollutants. They protect water quality for shellfishing and provide wildlife and fisheries habitat. They serve as an attraction for residents and visitors seeking outdoor recreation opportunities including bird watching, fishing, and recreation. In addition, wetlands and their buffers often contain archaeological resources.

The Massachusetts Wetlands Protection Act provides some protection for wetlands by regulating any work within a coastal or inland wetland resource area and any work within a 100-foot buffer zone that is likely to affect a wetland. This state law is administered by local Conservation Commissions through a permitting process. Yet the Wetlands Protection Act standards were developed for the state as a whole and have a number of limitations that leave the Cape vulnerable to loss of important wetland resources. For example, the Act does not provide any protection for buffer areas surrounding wetlands. These buffers serve important functions including stormwater mitigation, sedimentation and erosion control, nutrient removal, and groundwater recharge. Buffer areas also provide critical habitat for wildlife species that depend on wetlands.

Nor does the Act protect all wetlands. It does not protect small, isolated wetlands and allows the filling of up to 5,000 square feet of wetlands if the wetlands are replicated on site, despite the fact that replication does not adequately replace the functions of natural wetlands. In some cases, town wetlands

Pickerelweed. Credit: Heather McElroy/CCC

Pitcher plant. Credit: Heather McElroy/CCC

This Regional Policy Plan sets forth a vision of protecting the attributes and function of all of the Cape's wetlands through standards that are more protective than state law requires.

bylaws have partially compensated for these deficiencies by expanding the definition of wetlands resources, requiring building and septic setbacks to protect buffer zones, and prohibiting or limiting wetland replication. There is, however, no regional consistency within these bylaws and variances are often granted. In addition, Conservation Commissions have expressed concern about the need for greater coordination among local boards, particularly with boards of health, on issues including the siting of wastewater disposal systems and redevelopment of areas with failing systems.

Estimates of the loss of historic wetland acreage on the Cape vary because there are no consistent comparative studies. Although it is unlikely that large-scale wetland alterations will occur in the future, the cumulative effects of hundreds of small projects individually deemed permissible by state law can be detrimental. As pressure grows to develop increasingly marginal land, adverse effects on wetlands and wildlife habitat and their associated natural functions are likely to increase.

In the 1995 Cape Cod Residents' Survey, 85% of those surveyed supported restricting new development in or near wetlands, ponds, floodplains, dunes, and critical habitat areas. Wetlands protection programs at both the state and federal levels are subject to modifications that are beyond the control of Cape residents. It is increasingly clear that if protection of the Cape's resources is desirable, it must be ensured through regional policies and local bylaws and regulations.

This Regional Policy Plan sets forth a vision of protecting the attributes and function of all of the Cape's wetlands through standards that are more protective than state law requires. The Plan uses as its guide studies indicating that buffers 100 to 300 feet wide are needed to protect surface water bodies from sedimentation and maintain wildlife habitat, and that even greater buffer widths (300 to 1,000 feet) are needed to remove 50 to 90 percent of anthropogenic nutrients. In addition, the Plan acknowledges the irreplaceable value of natural wetlands and prohibits any further wetland degradation. The Plan also promotes the restoration of previously degraded wetlands as a means to improving overall wetland performance.

Most Cape communities have passed local wetlands bylaws that regulate activities within wetlands or require setbacks for construction activities. Although these bylaws are generally more strict than the state Act, many still do not provide adequate protections, such as a minimum 100-foot undisturbed buffer. Greater regional consistency is needed to protect wetland resources. To that end, the Regional Policy Plan recommends stronger wetland buffer protections in both conservation regulations and zoning bylaws in order to promote a minimum 100-foot buffer requirement. The Plan also calls for development and adoption of a scientifically defensible methodology for

determining site-specific buffers to different kinds of resource areas where greater buffer widths might be needed.

Many of the Cape's wetlands occur as isolated kettle holes that do not meet the size thresholds for protection in the state Act. Therefore, the Regional Policy Plan protects all wetlands greater than 500 square feet whether they border water bodies or not.

Many developments have been designed to discharge stormwater directly to water bodies or to use wetlands for stormwater management and attenuation of pollutants, a practice that may result in degradation of the wetland and could adversely affect downstream waters. The Plan sets strict standards regarding the discharge of stormwater in or near wetlands.

Finally, the Regional Policy Plan includes recent efforts to promote the restoration of wetlands that have been degraded as a result of tidal restrictions or other impacts. The Cape Cod Commission is currently finishing a Capewide Atlas of Tidal Restrictions. Through surveys of the coastline using aerial photography, GIS data layers, and extensive fieldwork, the Commission is identifying all coastal wetlands on Cape Cod that are negatively affected by the reduction of tidal flow caused by infrastructure crossing tidal creeks, channels, and rivers. It is critical to retain and restore natural tidal flow not only for the overall health of the Cape's coastal wetlands but also to protect our built environment from unnecessary flooding caused by impeded drainage during and after coastal storms. The Commission hopes that this atlas will assist towns and state agencies to prioritize and target wetland remediation efforts, including removing restriction points during scheduled work on local roadways and bridges.

Wetlands

2.3.1 Goal:

To preserve and restore the quality and quantity of inland and coastal wetlands on Cape Cod.

Minimum Performance Standards

2.3.1.1 Wetland alteration shall not be permitted except as provided herein and in Minimum Performance Standard 2.3.1.3. As an exception, where there is no feasible alternative, water-dependent projects involving wetland alteration with appropriate mitigation may be permitted subject to the approval of all permitting authorities. Such permission may be granted subject to a finding that there is no feasible alternative location for the project and that any necessary alteration is the minimum necessary to accomplish the goals of the project. Appropriate mitigation shall not include wetland creation or replication.

2.3.1.2 Vegetated, undisturbed buffer areas of at least 100 feet in width shall be maintained and/or provided from the edge of coastal and inland wetlands including isolated wetlands, to protect their natural functions. This policy shall not be construed to preclude pedestrian access paths, vista pruning,

Wetland buffer. Credit: Don Keeran/Association to Preserve Cape Cod

or construction and maintenance of water-dependent structures within the buffer area, any of which may be permitted at the discretion of permitting authorities where there is no feasible alternative to their location. The Commission and local Conservation Commissions may require a larger buffer area where necessary to protect sensitive areas or where site conditions such as slopes or soils suggest that a larger buffer area is necessary to prevent any adverse impact to wetlands and associated wildlife habitat. Where a buffer area is already altered such that the required buffer cannot be provided without removal of structures and/or pavement, this requirement may be modified by the permitting authority, provided it makes the following findings: (1) that the proposed alteration will not increase adverse impacts on that specific portion of the buffer area or associated wetland, and (2) that there is no technically demonstrated feasible construction alternative.

2.3.1.3 Disturbance of wetlands and buffer areas for operation and maintenance of underground and overhead utility lines (electrical, communication, sewer, water, and gas lines) may occur. Installation of new utility lines through these areas may occur where the permitting authority finds that the proposed route is the best environmental alternative for locating such facilities. In all instances, disturbance of wetland and buffer areas shall be minimized and surface vegetation, topography, and water flow shall be restored substantially to the original condition.

2.3.1.4 Stormwater management plans for new development shall preclude direct discharge of untreated stormwater into natural wetlands and water bodies. New stormwater discharges shall be located a minimum of 100 feet from wetlands and water bodies.

Other Development Review Policies

2.3.1.5 Measures to restore altered or degraded inland and coastal wetlands, including nonstructural bank stabilization, revegetation, and restoration of tidal flushing should be encouraged; however, such areas should not be used as mitigation for wetland alteration projects (mitigation banking).

2.3.1.6 Construction of artificial wetlands for stormwater and wastewater management may be permitted in appropriate areas where there will be no adverse impact on natural wetlands, waterways, and groundwater.

2.3.1.7 For agricultural areas in wetlands and buffer areas, management practices that would improve water quality and conserve water as recommended by the Soil Conservation Service should be encouraged.

Implementation

Commission Actions:

A. The Commission will provide technical assistance to Conservation Commissions, Boards of Health, and Planning Boards in developing and modifying their local bylaws and ordinances to protect the Cape's unique resources and will develop a technical assistance program to assist Conservation Commissions with permit review.

B. The Commission will provide leadership in development and implementation of a site-specific buffer area methodology to assess additional buffer area requirements for sensitive wetlands and water bodies.

C. The Commission will support passage of state legislation to authorize conservation commissions to impose fees for the employment of outside consultants for project review, analysis, permit writing, and monitoring of development projects.

D. The Commission will continue to work with local, state, and federal agencies to encourage wetland restoration projects that further the goals of the Regional Policy Plan.

Recommended Town Actions:

A. Wetlands should be mapped by communities at a scale appropriate to local regulatory programs and should be identified and protected so as to maintain their ability to provide natural functions.

B. Towns should adopt local wetlands bylaws or ordinances that provide for the following: protection of vernal pools outside other resource areas as well as isolated wetlands, a policy of no alteration/replication of wetlands for both public and private applicants, expansion of jurisdiction beyond 100 feet where appropriate, improved enforcement authority, and the ability to hire consultants to review applications at the applicant's expense.

C. Conservation Commissions should work closely with Boards of Health and other relevant town boards to develop mutually acceptable policies for wetland boundary delineation and the siting of new subsurface disposal systems in relation to these areas as well as improving and retrofitting areas with failing systems.

D. Towns should develop and implement plans to address existing stormwater management problems where runoff and drainage systems are adversely affecting water quality in wetlands and water bodies.

E. Towns should seek ways to remediate tidal restrictions, including incorporating improvements to restricted areas into planned road and bridge work, and by seeking funding and partnering opportunities with the state and affected private entities.

2.4 Issue Area: Wildlife and Plant Habitat

This Regional Policy Plan sets forth a vision of protecting all remaining species habitats and promoting the restoration or improvement of areas that have been degraded.

Cape Cod hosts an unusually diverse mix of wildlife and plant communities, including many species that are rare or declining in number. Seventy-seven species of plants and wildlife on Cape Cod are listed by the State Natural Heritage and Endangered Species Program as endangered or threatened, and another 62 are "special concern" species that are declining or could easily become threatened. Additional species are on a "watch list" and could become listed in the future based on further review. Threatened and endangered species that are also on the U.S. Fish and Wildlife Service list of federal threatened and endangered species include the sandplain gerardia, northern right whale, piping plover, and roseate tern.

These species depend on undisturbed and healthy habitats for their survival. For example, the Cape's woodlands, composed primarily of a pitch pine/oak community, provide important upland wildlife and plant habitat. Poorly managed development can harm species by fragmenting large tracts of forest and severing wildlife corridors and other ecological connections. The Cape's wetlands, vernal pools, and ponds also provide vital habitat for a diversity of rare and endangered species. These areas can be damaged not only by impacts such as pollution and disturbance but also by groundwater withdrawals that can reduce water levels needed to support aquatic and shoreline species.

Loss of habitat represents the single greatest threat to biodiversity on Cape Cod. Between 1971 and 1990, 24% of the Cape's forest land was lost, reducing the total by approximately 35,458 acres. In the 10 years since 1990, approximately 15,000 additional upland acres have been developed, contributing to the fragmentation of the remaining upland ecosystems. Many examples also exist of ponds, wetlands, and vernal pools that have become severely stressed as a result of groundwater withdrawal or shoreline development.

This Regional Policy Plan sets forth a vision of protecting all remaining species habitats and promoting the restoration or improvement of areas that have been degraded. This must be accomplished through growth management approaches that reduce the amount of land converted to development and improve the design and performance of new development. It must also be accomplished through a renewed

Credit: Heather McElroy/CCC

commitment to protect the most ecologically sensitive undeveloped lands through land acquisition and other permanent conservation measures. Finally, efforts will need to be made to improve areas that have already been developed through restoration and better land stewardship.

Achieving this vision will require a more regular application of information about habitat protection as well as enhanced use of both state and local regulatory tools. In 1990 the Association for the Preservation of Cape Cod published a Critical Habitats Atlas that identifies important habitat areas on Cape Cod, including state-listed rare species, eight Areas of Critical Environmental Concern, and other unusual habitats such as sandplain grasslands, pine barrens, coastal plain pond shores, and quaking bogs. In 1998 the Compact of Cape Cod Conservation Trusts produced the Cape Cod Significant Habitat Map as part of a project for prioritizing conservation lands. These important sources of information must be better promoted as part of each town's regulatory and land acquisition decisions.

The Massachusetts Endangered Species Act, adopted in 1990, protects "significant habitat" areas for endangered and threatened species. Once areas are designated, any alteration of significant habitat requires a permit from the Division of Fisheries and Wildlife based on a finding that the proposed alteration will not reduce the viability of the significant habitat to support resident species. Despite its benefits, no significant habitat has been designated under this Act. Therefore, the Commission should work with towns to identify key areas for "significant habitat" designation.

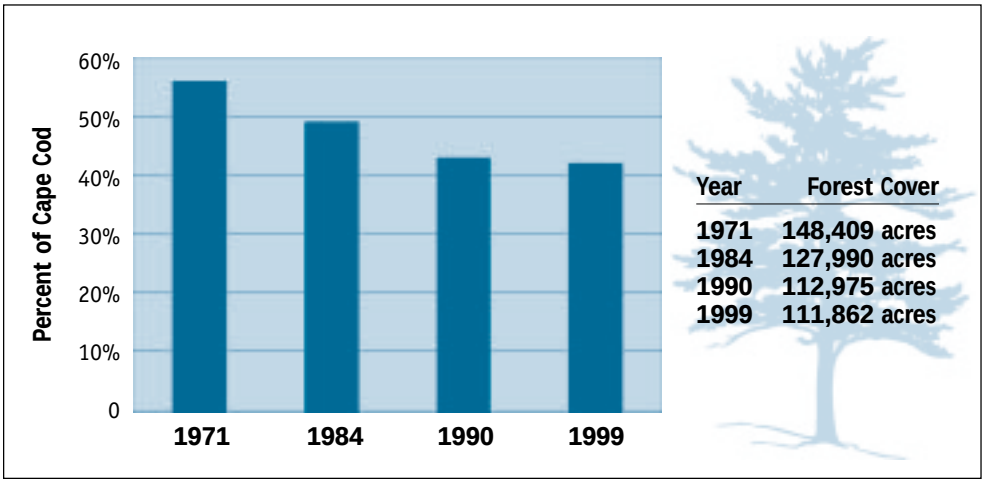
The Wetlands Protection Act is another valuable tool that provides protection for rare, state-listed wetland wildlife species whose habitat has been identified and mapped by the Massachusetts Division of Fisheries and Wildlife's Natural Heritage and Endangered Species Program. In these areas no short- or long-term adverse impacts from new development on the habitat of the rare species is permitted. A number of these areas have been mapped on Cape Cod.

The Act also establishes performance standards for wetland habitats. One shortcoming of the Act, however, is that the 100-foot buffer area around wetlands is not specifically protected, despite the fact that many wildlife species require a combination of wetland and adjacent upland habitat for foraging, breeding, and nesting. Therefore, this Regional Policy Plan encourages stronger local regulations, including zoning measures, to protect wetland buffers.

The Wetlands Protection Act does not provide adequate protection for vernal pools, which serve important natural functions for wildlife. Not only do vernal pools provide unique wildlife habitat, but also the upland habitat surrounding these pools is critical to the life cycle of the amphibians that rely on vernal pools for reproduction, such as wood frog and spotted salamander. Research suggests that amphibians migrate from vernal pools, depending on the species, median distances of 450 to 1,800 feet. There is virtually no protection for the vast number of vernal pools located outside the boundaries of wetland resource areas. Although the Massachusetts Natural Heritage and Endangered Species Program protects vernal pools that have been certified by the state, many more have not yet received certification and are thus at

Box turtle. Credit: CCC file photo

Cape Cod Forest Cover Continues to Decline



Source: MacConnell Land Use Data, 1971, 1984, 1990, 1999.

risk. The Regional Policy Plan encourages towns to identify additional vernal pools for state certification in order to better protect these critical resources. It also encourages larger setbacks to protect vernal pool buffers.

The Cape's lakes and ponds also provide critical habitat for fish, freshwater shellfish, invertebrates, and plants. The many coastal plain ponds on Cape Cod provide habitat for a wide variety of rare plants and are particularly sensitive to changes in water levels, nutrients, and human use. The Regional Policy Plan encourages local governments to take additional steps to reduce impacts such as sedimentation and runoff by requiring larger setbacks from pond shores and limiting clearing and grading during development.

In general, improving site design through development regulations can protect the most critical portions of any habitat area. The Regional Policy Plan includes a Capewide Significant Natural Resource Areas Map dated January 10, 2002, as amended, based on existing natural resources and protected open space that presently provides a system of wildlife habitats and corridors across the Cape. The maintenance of these corridors is a first step toward maintaining the viability of wildlife habitat. In addition, the Commission has mapped contiguous forested areas of 125 acres or more that are designated as areas that should be a high priority for protection in order to maintain healthy interior forest communities.

Finally, the Plan addresses the impacts of invasive plant species on wildlife habitats. Invasive plants outcompete native plant communities and threaten biodiversity. Loss of habitat from invasive plant species such as phragmites, bittersweet, and autumn olive ranks second only to loss of habitat from land development. New standards have been included to require invasive species management plans for large development projects.

Wildlife and Plant Habitat

2.4.1 Goal:

To prevent loss or degradation of critical wildlife and plant habitat, to minimize the impact of new development on wildlife and plant habitat and to maintain existing populations and species diversity.

Minimum Performance Standards

2.4.1.1 Applications for Developments of Regional Impact that propose to alter undeveloped areas shall contain a natural resources inventory. Such inventory shall identify the presence and location of wildlife and plant habitat, including vernal pools, and serve as a guide for the layout of the development. Developments shall be planned to minimize impacts to wildlife and plant habitat. Natural resources inventories shall be prepared in accordance with the Plant and Wildlife Habitat Assessment Guidelines, Technical Bulletin 92-002.

2.4.1.2 Clearing of vegetation and alteration of natural topography shall be minimized, with native vegetation planted as needed to enhance or restore wildlife habitat. Standing specimen trees shall be protected. The permitting authority may require designation of building envelopes (for structures, driveways, lawns, etc.), where appropriate, to limit removal of vegetation.

Refer to Technical Bulletin 92-002.

2.4.1.3 Fragmentation of wildlife and plant habitat shall be minimized by the establishment of greenways and wildlife corridors of sufficient width to protect not only edge species but also species that inhabit the interior forest, as well as by the protection of large unfragmented areas, and the use of open space or cluster development. Wildlife shall be provided with opportunities for passage under or across roads and through developments where such opportunities will maintain the integrity of wildlife corridors. Fencing shall not be constructed so as to interfere with identified wildlife migration corridors.

2.4.1.4 The Natural Heritage Program has agreed to review Developments of Regional Impact proposed within critical wildlife and plant habitat areas. These are habitat areas of rare (threatened or endangered) plant and wildlife species and species of special concern as generally identified and mapped by the Natural Heritage and Endangered Species Program and other critical habitat areas as identified and mapped by the Association for the Preservation of Cape Cod's Cape Cod Critical Habitats Atlas, or local authorities. Developments of Regional Impact that would adversely affect habitat of local populations of rare wildlife and plants shall not be permitted. Development may be permitted where the proponent can demonstrate that such development will not adversely affect such habitat. A wildlife and plant habitat management plan may be required as a condition of approval when development or redevelopment is permitted in critical wildlife and plant habitat areas.

2.4.1.5 Where a project site is located adjacent to a vernal pool (as defined herein) or within or adjacent to wetland-dependent rare species habitat, development shall be prohibited within a 350-foot undisturbed buffer around these wetland resources. New stormwater discharges shall be located a minimum of 100 feet from vernal pools.

2.4.1.6 Development on sites where a natural resources inventory identifies the presence of invasive plant species shall provide and implement a management and restoration plan detailing the management of, and where possible, the eradication of the invasive species present, and for revegetating the site with native species.

Other Development Review Policies

2.4.1.7 Measures to restore altered or degraded upland habitat areas should be encouraged where ecologically appropriate (e.g., sandplain grasslands, pine barrens, etc.).

Implementation

Commission Actions:

Osprey. Credit: Steve Tucker/CCC

A. The Commission will work with communities to identify and protect a continuous Capewide network of wildlife habitat areas and corridors of sufficient width and dimensions to be of value as wildlife habitat.

B. The Commission will adopt an invasive plant species list as Technical Bulletin 01-001.

C. The Cape Cod Commission will work with the Cape Cod Cooperative Extension and other agencies to help educate citizens about the threat of invasive species.

D. The Cape Cod Commission will work with towns to provide technical assistance for the management of invasive species.

E. The Commission will encourage the Division of Fisheries and Wildlife to expedite identification and designation of significant habitat areas on Cape Cod for protection as defined by the Massachusetts Endangered Species Act.

F. The Commission will continue to coordinate with the Massachusetts Natural Heritage and Endangered Species Program on review of projects affecting critical habitat areas.

Recommended Town Actions:

A. Vernal pools should be identified by local communities for certification by the state Natural Heritage and Endangered Species Program. Local schools should be encouraged to participate in this effort.

B. Critical plant and wildlife habitat areas should be identified in Local Comprehensive Plans, and towns should develop a review and regulatory process for activities that could adversely impact such habitat and/or seek their designation as significant habitat areas under the Massachusetts Endangered Species Act.

C. Towns should adopt bylaws/ordinances limiting land clearing and alteration of natural topography prior to development review.

2.5 Issue Area: Open Space Protection and Recreation

Cape Cod possesses a rich heritage of open space resources. Open space, and the rural character it imparts, is one of Cape Cod's most valuable assets. Beaches, farms, and woodlands contribute directly to key industries on Cape Cod, attracting tourists, providing areas for farming, cranberry growing, hunting, fishing, and swimming. Including federal, state, and local holdings, approximately 74,629 acres, or 29% of the land mass of Cape Cod, can be considered preserved open space as of 1999, although the percentage in each town varies widely.

Perhaps most notable is the Cape Cod National Seashore. This area, established through the visionary efforts of the federal government in 1961, contains more than 27,000 acres of outstanding natural, scenic and recreational resources in six Lower Cape towns. The Commonwealth of Massachusetts also holds large areas of protected open space on Cape Cod including Nickerson State Park in Brewster, Hawksnest State Park in Harwich, Crane Wildlife Management Area in Falmouth, the Hyannis Ponds in Barnstable, and numerous other smaller parks and preserves.

Despite the substantial land holdings of federal, state, and local governments, the region is nevertheless at great risk of losing the very attributes that draw millions of tourists to its resort communities. Much of the Cape's open, rural character comes not only from protected lands but also from the thousands of acres of unprotected open space that remains. These undeveloped lands are rapidly being replaced by development. More than 35,500 acres were developed on the Cape between 1971 and 1990, and more than 15,000 acres were developed in the last 10 years alone. During the 1990s, Barnstable County had the third highest population growth rate of all the counties in the Commonwealth.

In the 1995 Cape Cod Residents' Survey, 92% of the respondents indicated that the rural character of the Cape was an important factor in their decision to live here, and 87% cited the availability of open space. Eighty percent (80%) identified loss of open space as one of the most serious problems facing the Cape, and 67% said that the Cape Cod Commission should place a high priority on protecting open space and scenic landscapes. In addition, 66% said they would support regulations requiring developers of large projects to donate land to the local community for use as open space. The responses showed overwhelming support for acquisition of open space for water supply protection (81%), walking/bicycling trails (66%), passive recreation (64%), and reduction of local development potential (53%).

This Regional Policy Plan sets forth a vision of protecting one half of the remaining developable land as permanently protected open space in order to preserve the rural character, scenic amenities, and ecological integrity of the Cape. It is not merely the amount of open space but its integration into the fabric of the landscape and the

This Regional Policy Plan sets forth a vision of protecting one half of the remaining developable land as permanently protected open space to preserve the rural character, scenic amenities, and ecological integrity of the Cape.

lives of Cape residents that will define the Cape's future. There is a need to preserve large blocks of that which remains in order to provide a sense of solitude and beauty, rather than merely fragments of open space that serve as buffers between developments or as well-manicured recreational areas. The open space vision is more than just an acreage target; it is a future in which open space, largely in its natural form, remains the dominant feature of the landscape. Most importantly, the protection of open space will require a continued partnership between all levels of government and private organizations in order to bring the necessary financial resources to bear on this important issue.

To achieve this vision, the Regional Policy Plan outlines a number of regulatory standards and suggested actions. The Plan establishes stringent open space requirements for Developments of Regional Impact. Special attention is paid to those resource areas considered to be the most sensitive, such as wetlands, vernal pools, shorelines, and unfragmented forests.

Perhaps the most important recent step that has been taken to preserve open space was the adoption of the Cape Cod Land Bank in 1998. All towns on Cape Cod voted to adopt a 3% real estate property tax surcharge authorized by the Land Bank Act. All Cape communities have now established Land Bank committees to identify and negotiate open space purchases. That same year, Cape towns cumulatively authorized the expenditure of $20.1 million for the purchase of 797 acres, and in 2000 the towns authorized $18.2 million for 890 acres. Although the Land Bank has provided the means for securing a substantial amount of open space, it falls far short of what is needed to meet the open space goals

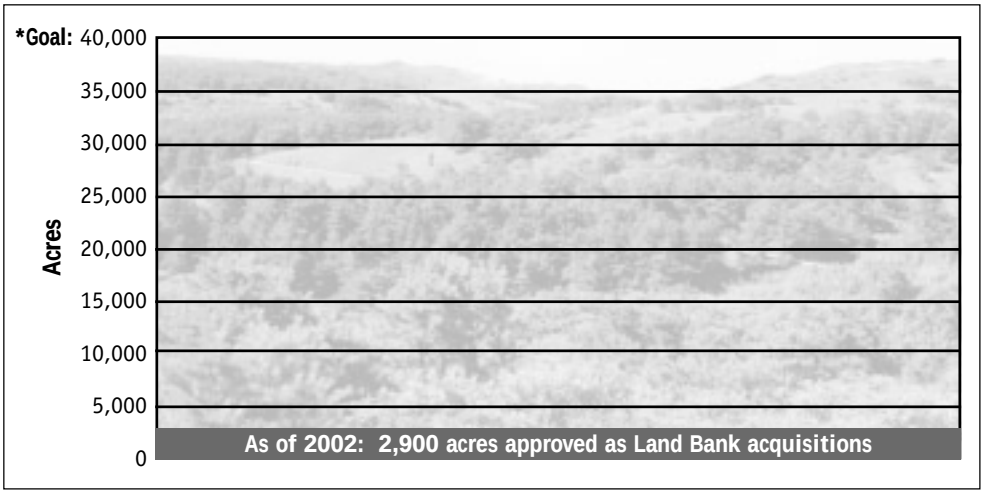
Credit: CCC file photo

of this Regional Policy Plan. Therefore, the RPP continues the Commission's commitment to assisting local Land Bank committees in their efforts to evaluate and purchase open space.

Even before the Land Bank, many towns on Cape Cod had established open space protection initiatives. Through the development of local open space plans, many Cape communities have sought to protect significant natural and fragile areas and outstanding water resources, including lakes, rivers, aquifers, shore lands, and wetlands. The RPP advocates the Commission's continued technical assistance in helping towns develop open space plans.

Private land trusts play a vital role in land protection as well. By 1988, land trusts had been established in all 15 towns on Cape Cod. By 2000, these trusts, most working with only volunteer resources, had protected 2,591 acres. Land trusts can also serve as valuable intermediaries in preserving lands through less expensive means than outright acquisition, such as donations or purchases of conservation restrictions. This underscores the importance of public-private partnerships for land protection. The RPP continues the Commission's efforts to preserve and protect open space by fostering public-private partnerships for land acquisition.

Total Acres Approved for Acquisition with Cape Cod Land Bank Funds, as of 2002



Background: Ballston Beach area, Truro. Credit: Heather McElroy/CCC

*Regional Policy Plan goal for open space protection, equivalent to 50% of the developable land remaining as of 1996.
Source: Cape Cod Commission analysis of town Land Bank records, 1998–2002.

Barnstable County has also played a major role in open space protection. In 1993, Barnstable County and the Cape Cod Commission began an initiative called Cape Cod Pathways, designed to create a Capewide network of walking trails linking all 15 towns on Cape Cod. This effort has provided a year-round recreational opportunity for residents and visitors and a focal point for regional land acquisition and trails planning. The project has received widespread support and endorsement from all 15 towns. Activities such as Walking Weekend and Cape Walk have been extremely successful in raising awareness and support for the Barnstable County Cape Cod Pathways project. The Pathways project has helped fund four trail guides in Brewster, Orleans, Falmouth, and Mashpee. This work will continue to serve as a means of acquiring key open space corridors and of emphasizing the importance of walking trails to community life.

In addition, many Cape communities have attempted to protect open space through zoning by requiring that new development set aside a certain percentage of open space within the developed parcel. Few towns, however, specify the exact nature of these reserved areas in their bylaws or have developed adequate design standards or layout requirements for the open space portion of the development. Consequently, the land that is most frequently set aside is of limited value for recreation or as wildlife habitat. The RPP identifies additional steps that towns can take to improve bylaws, such as those promoting cluster subdivisions with permanently protected open space.

Efforts must also be made to ensure that active and passive recreation are compatible with protection of the natural environment. Activities such as boating, fishing, swimming, walking, hiking, and bicycling are essential to connect citizens of and visitors to Cape Cod to the environment, which in turn generates strong support for the protection of open space. Yet these activities may also have unintended consequences for natural resources and habitats if not carefully managed. The 2000 Statewide Comprehensive Outdoor Recreation Plan (SCORP) prepared by the Massachusetts Executive Office of Environmental Affairs identified an

increased need on the Cape for recreation facilities including beaches and water-based recreational opportunities, protection of wildlife habitat, expansion of trail corridors, protection of scenic roadways, and provision of access for the disabled to recreational facilities. All of these recreational and access issues need to be revisited in order to ensure consistency with the SCORP so that recreational use remains compatible with resource protection.

Finally, more must be done to provide funding for open space, and this in turn calls for stronger partnerships between local, state, and federal governments. Effort should be made to petition the state for additional funding to counter the strong growth pressures and high real estate values on Cape Cod. This includes further funding for state parks and reserves as well as obtaining funding from the recently revived federal Land and Water Conservation Fund.

Open Space and Recreation

2.5.1 Goal:

To preserve and enhance the availability of open space on Cape Cod and provide wildlife habitat, recreation opportunities, and protect the natural resources, scenery, groundwater quality, air quality, and character of Cape Cod, Barnstable County shall strive to protect as open space at least 50% of the developable land remaining as of 1996.

Minimum Performance Standards

2.5.1.1 Development or redevelopment within Significant Natural Resource Areas, as illustrated on the Cape Cod Significant Natural Resource Areas Map dated January 10, 2002, as amended, shall be clustered away from sensitive resources and maintain a continuous corridor to preserve interior wildlife habitat. Where a property straddles the boundary of an area shown on this map, development shall be clustered outside the boundary. The primary function of these areas is the provision of groundwater recharge, wildlife habitat, open space, scenic roadways, appropriate recreational opportunities, and protection of the Cape's natural character.

2.5.1.2 Preserved open space within proposed developments shall be designed to be contiguous and interconnecting with adjacent open space, and shall be subject to permanent conservation restrictions. Towns may develop bonus provisions through their local bylaws to allow increased density for preservation of additional high quality open space. Additional guidance on dedication of open space for Developments of Regional Impact can be found in the Guidelines for Calculation and Provision of Open Space in Developments of Regional Impact, Technical Bulletin 94-001, as amended.

Refer to Regional Policy Plan maps.

Refer to Technical Bulletin 94-001.

2.5.1.3 Residential, commercial, and industrial development that qualifies as a Development of Regional Impact shall provide permanently restricted upland open space in accordance with the proportional calculation described below. Where appropriate, credit may be obtained for set aside of off-site open space or a contribution of funds may be made to the town, state, land trust, or the Compact of Cape Cod Conservation Trusts' Land Fund for open space acquisition at a per-point rate to be specified in the Guidelines for Calculation and

Provision of Open Space in Developments of Regional Impact, Technical Bulletin 94-001, as amended. Off-site open space shall be provided in the town where development is proposed, unless the Commission finds, in consultation with the relevant towns, that the provision of off-site open space in an adjacent community on Cape Cod is appropriate.

Refer to Technical Bulletin 94-001.

Open space shall be designed to protect those portions of the site with the highest natural resource values as identified by a natural resources inventory. Within open space areas, the maximum amount of natural vegetation shall be maintained. No credit may be obtained for land that is set aside as open space on a residential lot on which a dwelling exists or may be built, unless the lot is at least three acres in size. Where development consists of more than one type or is located in more than one area, open space totals shall be determined for each area and added together. No credit may be obtained for areas that have been dedicated as open space prior to the date of application. Where new development is proposed within Significant Natural Resource Areas, open space shall be provided within these areas. The requirements for Significant Natural Resource Areas shall apply to any certified Growth/Activity Centers or Growth Incentive Zones that are located within a Significant Natural Resource Area, with exceptions as noted in Minimum Performance Standard 2.5.1.7.

Proportional Calculation of Site Area (for New Development)

Location of Development	Proportion Required: Total Development Area to Total Open Space Provided
Development in Growth Incentive Zones	2:1
Development in Certified Growth/Activity Centers	3:2
Development in Significant Natural Resource Areas	1:2
Development in all other areas	1:1

For the purposes of calculating the open space requirement, the development area for a project is any upland area affected by "development" as defined in the Definitions section of this document, and as specified in Technical Bulletin 94-001, as amended.

Refer to Technical Bulletin 94-001.

2.5.1.4 Residential, commercial, and industrial redevelopment that qualifies as a Development of Regional Impact shall meet the open space requirements of MPS 2.5.1.3, except where the proportion of existing development to open space on the development parcel is less than that which is required, in which case the existing proportion shall be maintained. Redevelopment projects in Significant Natural Resource Areas shall provide no less than a 2:1 development to open space proportion either as on-site open space or an equivalent cash or off-site contribution, regardless of existing proportions, with exceptions as noted in Minimum Performance Standard 2.5.1.7.

2.5.1.5 In the design of developments, significant natural and fragile areas including critical wildlife and plant habitat; water resources such as lakes, rivers, aquifers, shore lands, and wetlands; historic, cultural, and archaeological areas; significant scenic roads and views; unfragmented forest (as mapped by the Cape Cod Commission); and significant landforms shall be protected.

2.5.1.6 Where development is proposed adjacent to land held for conservation and preservation purposes, the development shall be configured so as to prevent adverse impacts to these lands and in a manner that maximizes contiguous open space.

2.5.1.7 Notwithstanding Significant Natural Resource Area designation, where development is proposed in Growth Incentive Zones, the open space requirement shall be reduced to the proportion required for Growth Incentive Zones where a natural resources inventory demonstrates that there are no wetlands, surface water bodies, vernal pools, estimated rare species habitat, agricultural soils, priority natural communities, critical upland areas, public water supply Wellhead Protection Areas, or other unique or fragile habitat within 100 feet of the site boundary.

2.5.1.8 As an incentive toward reducing the generation of impervious areas, protecting open space, and maintaining or improving community character, projects meeting parking requirements under proposed buildings or as a multi-storied parking garage may reduce their open space requirement by an amount equivalent to one half the area of each floor of garaged parking provided. Open space credit may not be obtained for parking spaces provided in excess of the minimum number of spaces required by local zoning.

Other Development Review Policies

2.5.1.9 Wherever possible, off-site open space provided through Minimum Performance Standard 2.5.1.3 or 2.5.1.4 should be located within or contiguous to Cape Cod Significant Natural Resource Areas or in the areas identified in Minimum Performance Standard 2.5.1.5.

2.5.1.10 As an incentive for the increased protection of sensitive or significant natural resources, and at the discretion of the Commission, the open space requirement may be reduced by 10% where (1) all development provides a 350-foot undisturbed buffer from the mean annual high water line of a kettle pond where less than 50% of the existing shoreline frontage has been developed, or (2) all development provides a 200-foot undisturbed buffer from the mean annual high water line of a river, as determined by the local Conservation Commission consistent with the Rivers Protection Act (310 CMR 10.58), or (3) all development provides a 500-foot undisturbed buffer from a vernal pool, or (4) high quality, naturally vegetated open space is provided in a Significant Natural Resource Area contiguous to existing permanently protected open space and is made accessible to the public. A developed shoreline refers to structures, roads, driveways, parking areas, cultivated lawns, and other uses within 300 feet of the mean annual high water line that cause the relative long-term alteration of the shoreline. No more than 10% of the open space requirement may be reduced for any one project.

2.5.1.11 In public water supply Wellhead Protection Areas, stormwater management structures may be counted toward meeting the open space requirement where best management practices are used for stormwater infiltration (e.g., vegetated swales and non-structured wetland detention basins).

Open Space and Recreation

2.5.2 Goal:

To preserve and enhance opportunities for passive and active recreation in the natural environment to meet the needs of both residents and visitors.

Development Review Policies

2.5.2.1 Recreational needs as identified in the 2000 Statewide Comprehensive Outdoor Recreation Plan, Local Comprehensive Plans, and local and regional open space plans should be addressed in the development of projects on Cape Cod. Such needs include opportunities for wildlife study, expansion of trail corridors, protection of scenic roadways, development and expansion of access for the disabled, additional public beaches, and water-based recreational opportunities with associated parking facilities to the extent these minimize alteration of natural shorelines and do not harm wildlife habitat.

2.5.2.2 New development should provide suitable recreation and play areas to meet the needs of the residents of that development such as ball fields, playgrounds, basketball courts, or bicycle and walking paths.

Implementation

Commission Actions:

A. The Commission will continue to work cooperatively with towns, local land trusts, and state and federal agencies to protect significant natural and fragile areas and to develop a regional open space plan to protect high priority areas and build investment in the Cape's green infrastructure. High priority shall be given to the following areas:

1) Zones of contribution to public water supply wells;
2) Zones of contribution to nitrogen-sensitive marine embayments;
3) Future water supply areas;
4) Rare species habitat and other critical habitats;
5) Unfragmented forest habitat; and,
6) Missing links between open space areas identified on the Capewide Open Space/Greenbelt map and Cape Cod Pathways/Bikeways maps.

B. The Commission will continue to provide leadership on the Cape Cod Pathways and Cape Cod Bikeways initiatives and will work cooperatively with towns to map and designate routes for these two projects.

C. The Commission will work with communities to develop techniques for assessing the fiscal impacts of open space acquisition versus development, and to educate community leaders on the implications of such analyses.

D. The Commission will continue to provide technical support for the Cape Cod town Land Bank committees and to track acquisitions.

Refer to Technical Bulletin 94-001.

E. The Commission will update and revise Guidelines for Calculation and Provision of Open Space in Developments of Regional Impact, Technical Bulletin 94-001.

F. The Commission will investigate the feasibility of developing common signage for recreation facilities such as boat ramps, beaches, and foot and bike paths.

Recommended Town Actions:

A. Towns should actively seek to protect high priority areas that have been identified by the Commission and town boards as Significant Natural Resource Areas. Towns are encouraged to preserve the sensitive resources within greenbelt areas through local bylaws and regulations including mandatory clustering, increased lot sizes, and overlay districts.

B. Towns should work with local land conservation organizations to identify, acquire, and manage open space to meet projected community needs. Priority should be given to the protection of significant natural and fragile areas as described in Minimum Performance Standard 2.5.1.5.

C. Towns should maintain and protect public access for recreation to both freshwater and saltwater bodies.

D. Towns should aggressively seek to acquire tax title lands and hold them for community purposes such as open space, affordable housing, or municipal services. Properties of environmental significance such as wetlands and rare species habitat should be placed under the jurisdiction of the Conservation Commission or other appropriate board or nonprofit organization.

E. Towns should create local Pathways committees to work with the Commission to identify and designate suitable locations for walking paths that comprise the Cape Cod Pathways network.

"Undevelopment" along Route 28 in West Yarmouth. Credits: (above) - The Compact of Cape Cod Conservation Trusts; (right) - Heather McElroy/CCC

F. Towns should establish procedures for approval and assessment of conservation restrictions.

G. Towns should revisit their cluster or open space bylaws to remove provisions that mandate perimeter buffer strips and narrow access corridors, or that require universal lot access to the open space, as such requirements often have the effect of reducing the ecological integrity of the open space provided.

H. Where appropriate, towns should encourage landowners to restore blighted or abandoned areas to open space, whether as landscaped parks or natural areas.

2.6 Issue Area: Air Quality

Cape Cod generally enjoys good air quality. However, at several points during the last 10 years, the Cape has experienced problems with ozone levels that exceed public health standards during the summer months. Ground-level ozone or smog is formed when volatile organic compounds (VOC) and oxides of nitrogen (NOx)-primarily from motor vehicle fueling and tailpipe emissions, but also from the smokestacks of factories and power plants-combine in the presence of sunlight. Ozone occurs most frequently in the summer. It can affect people's health in a variety of ways: irritating the eyes, causing lung dysfunction, and making existing respiratory ailments worse.

The federal Clean Air Act established national ambient air quality standards for five priority air pollutants: sulfur dioxide, carbon monoxide, particulate matter of 10 microns or less, nitrogen dioxide, and ozone. Southeastern Massachusetts is classified as being in non-attainment for ozone and is required under the Clean Air Act to achieve the national ambient air quality standards for ozone.

In Massachusetts, the Department of Environmental Protection (DEP) is responsible for implementing the requirements of the Clean Air Act. DEP has developed a State Implementation Plan (SIP) to attain the national standards. The SIP includes a variety of measures designed to reduce emissions from stationary, mobile, and area sources. Examples include cutting back on VOC emissions from industrial sources; reducing the VOC content of certain products; requiring annual inspection and maintenance of cars and trucks and reducing excessive idling of engines; reducing vehicle miles traveled by encouraging employee ride sharing, improving mass transit systems, and adding more high-occupancy vehicle lanes to highways; and monitoring ambient air, estimating emissions, and testing the sources of those emissions.

DEP estimates that stationary point sources (such as industries and utilities) are not the major contributor of VOC emissions. Only 6% of VOC emissions come from these sources. Stationary area sources (such as residential heating systems, gasoline stations, auto body shops, and dry cleaners) contribute 45% of VOC emissions. On-road mobile sources (such as cars, trucks, and buses) contribute 26% and off-road mobile sources (such as boats, trains, recreational vehicles, and construction and lawn/garden equipment) contribute 22% of the VOC emission inventory.

While Cape Cod has very few stationary point sources of emissions, both stationary area sources and mobile

Sagamore Bridge traffic. Credit: Nancy Hossfeld/CCC

This Regional Policy Plan sets forth a vision for reducing air emissions by concentrating growth, protecting open space, and encouraging alternatives to private automobile travel.

sources are significant. Although new automobiles are getting cleaner, with increasing growth and development, the Cape can expect to experience worsening air quality. Each new home that is built on the Cape adds significantly to vehicle miles traveled on the roads and thus to air emissions. Each new home brings more population which in turn means more lawn mowers, more boats, and more recreational vehicles (such as all-terrain vehicles, snowmobiles, jet-skis). All of these things contribute to air pollution emissions.

The land use patterns of future development can make an important difference in air quality. Compact forms of development with mixed uses reduce the need for private automobile trips and make the use of alternate transportation modes such as transit, walking, and bicycling more viable. The Regional Policy Plan's policies of concentrating growth in Growth/Activity Centers and Growth Incentive Zones, protecting open space, and encouraging alternatives to private automobile travel all will help to reduce air emissions.

The Massachusetts Department of Environmental Protection is responsible for regulating emissions from stationary point sources. DEP also manages a number of other programs to reduce air emissions such as enhanced inspection and maintenance of motor vehicles, reformulated gasoline, vapor recovery at gasoline stations, architectural coating controls, auto body refinishing controls, and the federal Low-emission Vehicle (LEV) Program. The Cape Cod Commission's role in managing air quality should be focused on managing future land use and transportation so as to minimize air emissions.

Mirant/Canal Electric Plant. Credit: Kevin Galligan/Cape Light Compact

Air Quality

2.6.1 Goal:

To maintain and improve Cape Cod's air quality so as to ensure a safe, healthful, and attractive environment for present and future residents and visitors.

Minimum Performance Standards

2.6.1.1 Developments of Regional Impact shall be in compliance with the Massachusetts State Implementation Plan (SIP) and DEP's Air Pollution Control Regulations, 310 CMR 7.00.

Other Development Review Policies

2.6.1.2 Mixed-use development that results in a net decrease in automobile mileage and air emissions should be encouraged.

2.6.1.3 Drive-through services as part of development and redevelopment should be avoided in order to decrease emissions from engine idling.

2.6.1.4 Development and redevelopment should use energy-efficient means of construction, operation, and maintenance in order to reduce air emissions from stationary area sources.

Implementation

Commission Actions:

A. The Commission will continue to work with transportation agencies to promote alternative modes of travel on Cape Cod such as bicycling and pedestrian facilities, transit systems, air and water transportation, and ride-sharing programs in order to reduce air emissions.

B. The Commission will work with DEP to further understanding of air quality problems that affect Cape Cod and provide public education about ways that residents and businesses can improve air quality, such as proper vehicle maintenance, reducing the number of short automobile trips and engine idling, using efficient heating systems, reducing the use of gasoline-powered lawn and garden equipment, limiting wood and brush burning, and related actions.

Lawn/garden equipment affects air quality. Credit: Nancy Hossfeld/CCC

Recommended Town Actions:

A. Towns should examine existing land use patterns and through their Local Comprehensive Plans identify suitable locations for mixed-use development to reduce automobile travel and air emissions.

B. Towns should work with the Commission and DEP to provide public education about ways that residents and businesses can improve air quality, as outlined above.

3. Issue Area: Economic Development

This Regional Policy Plan sets forth a vision for promoting clean industries, year-round well paid jobs, and the telecommunications infrastructure; concentrating development in existing centers; and encouraging reuse and redevelopment.

Credit: Nancy Hossfeld/CCC

Cape Cod's prime economic asset is its world-renowned geographical setting. Its location, environment, and culture have led to the fastest growth in population and jobs in New England in recent decades. The Cape's seaside setting attracts tourists, retirees, and second-home owners and is a critical element in attracting new entrepreneurs to the region. For this reason, the economic opportunities and constraints of Cape Cod are inextricably tied to its location. A fundamental tenet of the Regional Policy Plan is to promote an economy that minimizes environmental impacts and enhances the natural, scenic, and cultural qualities of the region.

To benefit from tourism and seasonal residents, Cape Cod must continue to maintain its attractiveness and enhance its special regional character. Similarly, expanded cultural and educational facilities can improve the Cape's appeal and economic vitality. The retirement industry, which remains a strong economic sector, relies on the high quality of life that the region offers; to maintain its attraction, environmental protection, cultural and social offerings, health care, improved public transit options, and work opportunities for the retired population are critical. The technology sector pays well, is growing globally, and has minimal environmental impacts; this important sector of the Cape's present and future economy must be supported through skills-training programs, streamlined permitting, venture-capital programs, and business incubators. Telecommunications barriers must also be overcome and a reliable, high-speed, high-capacity support infrastructure must be pursued for companies to do business in the national and international marketplaces. Resource-based industries such as fishing, shellfishing, recreation, and heritage tourism must also continue to be supported.

Economic development strategies have changed markedly across the country in recent years. New enterprises and small businesses are important sources of new jobs, and encouraging the expansion of entrepreneurial businesses is critical. Communities no longer see aggressive business enticements and the lowering of business costs as the most effective ways to pursue economic development. They seek to grow the economy from within, building upon their comparative economic advantages. Increasingly, the major concerns of business are the skills of the work force, the quality of life in the community, improvements to public education, access to institutions of higher education, the availability of affordable housing, and the quality of the physical infrastructure. These concerns resonate for Cape Cod.

The economic development strategy expressed in previous editions of the Regional Policy Plan was to encourage the development of well-paying, year-round jobs while expanding the "shoulder" season (spring and fall) tourist economy to make the resort sector more viable. Progress has been made on both these fronts, and over the past decade,

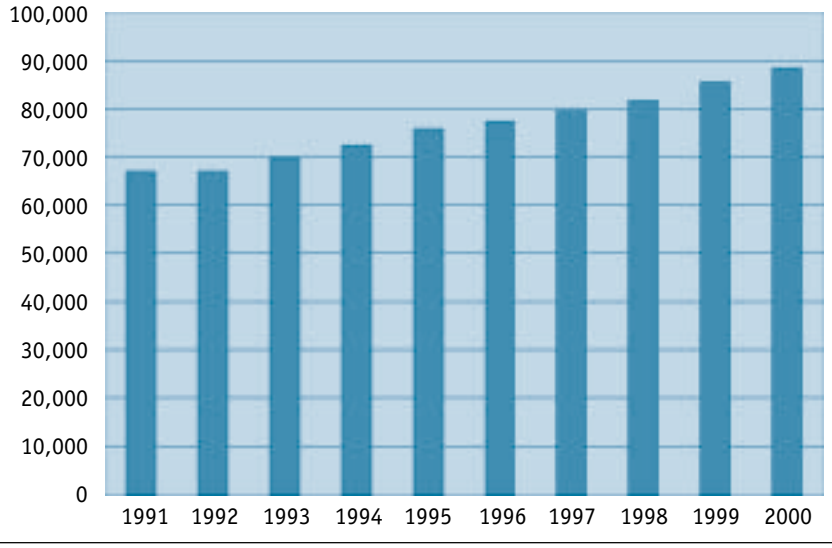
Cape Cod's economy has strengthened. Since 1991, the number of jobs on Cape Cod has grown from 66,952 to 88,583 in 2000, a 24.4% increase (note that this figure does not capture the above-average number of self-employed workers and consultants on Cape Cod). Remarkably, job creation outstripped population and housing growth by a significant margin. The greatest employment objective remains, however, the development of high-paying, year-round jobs.

According to a University of Massachusetts-Dartmouth study sponsored by the Cape Cod Commission ("Help! Wanted: Cape Cod Seasonal Workforce," 2000), the Cape's summer economy is dependent on approximately 25,000 seasonal workers in addition to the year-round workforce. Approximately 15,000 of the workers are Cape Cod high school and college students, retirees, and other adults while the remainder come from Bristol and Plymouth counties, out of state, and foreign countries. The number of seasonal workers has grown by 3,800 since 1990 and will probably continue to grow. More than 7,700 summer workers require seasonal housing. This heavy reliance on seasonal workers forces Cape Cod employers to consider where future workers will come from and where workers from off Cape will live.

The University of Massachusetts-Dartmouth study found that the majority of seasonal positions are lower-paying jobs in the hospitality and retail sectors. These data confirm findings of the 1999 Cape Cod Commission report, "Cape Cod and the Wage Gap," which described how the wages of retail and service workers average below those of other sectors. According to the Massachusetts Project for Family Self-Sufficiency ("The Self-Sufficiency Standard for Massachusetts," 1998), 29% of Cape Cod households do not earn enough to pay for housing, food, clothing, health care, child care, and transportation without public or private assistance. The project found that a Cape Cod family with two working adults, an infant, and a preschooler would need an annual income of $49,200 to pay for its basic necessities. This would entail each adult making $11.65

Average Employment in Barnstable County, 1991–2000

Year	Employment	% Change from Previous Year
1991	66,952	-4.8%
1992	67,045	0.1%
1993	69,702	4.0%
1994	72,371	3.8%
1995	75,773	4.7%
1996	77,332	2.1%
1997	79,803	3.2%
1998	81,769	2.5%
1999	85,512	4.6%
2000	88,583	3.6%



Source: Massachusetts Division of Employment and Training.

Credit: Nancy Hossfeld/CCC

per hour. The gap between a family's economic needs and the average wages is obvious in certain economic sectors.

Strategies must be pursued to deal with the problem of low-paying jobs. First, the Cape's economy needs to continue to create well-paying, year-round jobs. The best prospects are in the technology sector. Second, the Cape needs to address the issues that make it expensive for many workers to live on Cape Cod, including affordable housing, health care, child care, transportation, education, and job training.

For Barnstable County to mount an effective economic development effort, the Cape Cod Commission and Cape Cod Economic Development Council work to coordinate their programs. The two agencies pursue programs that complement each other in fostering a strong year-round economy that offers livable-wage jobs to Cape Codders. The Commission's Economic Development Program focuses on land use, infrastructure, and economic planning; economic research and information dissemination; heritage tourism; and energy planning. The Economic Development Council (CCEDC) focuses on a long-term approach that goes well beyond creating jobs. Its main theme is to optimize the Cape's use of human capital and to invest in education, training, and collaborative activities to broaden economic opportunity. The CCEDC engages in a variety of activities that include grants to nonprofit organizations and towns. The CCEDC also aims to increase economic opportunity for residents through support for K-12 education, promotion of education as an industry, implementation of skills-training programs for both youth and adults, and collaborative activities that can transform Cape Cod into a "learning community." Complementary activities in the areas of affordable housing, child care, and workforce development also receive strong support from the CCEDC.

The Cape Cod Economic Development Council has adopted the following program goals to pursue as part of its education/collaborative learning strategy:

1. Promote a technologically competent workforce through education and training.

2. Promote the establishment of a new four-year institution of higher learning.

3. Promote educational partnerships and new approaches to learning to benefit students enrolled in public schools. In particular, further the use of the Cape's natural, academic, and institutional resources for advancing the teaching of all subject areas, with a special emphasis on science, math, and art.

4. Promote increased public awareness of the Cape as a place for educational achievement.

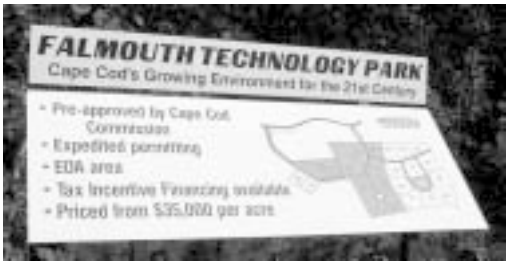
Many other organizations play important roles in economic development, including the Cape Cod Chamber of Commerce, town chambers of commerce, the Lower Cape Cod Community Development Corporation, the Cape Cod Technology Council, town planning and economic development commissions, the Cape and Islands Workforce Investment Board, the Cape Cod Community College, various economic organizations, and human service and health organizations. For effective economic development, it is important for these organizations to coordinate their efforts to identify and implement solutions to meet the needs of the region.

This Regional Policy Plan sets forth a vision for promoting clean industries and resource-based industries that minimize environmental impacts; expanding the non-resort economy to promote year-round jobs; expanding the technology sector and supply of highly paid, highly skilled jobs; promoting the region's telecommunications infrastructure to better serve high-tech, home, and small businesses; concentrating economic development in existing downtowns and village centers where infrastructure and transit can better serve growth; and encouraging the reuse and redevelopment of existing structures rather than building new ones.

With further population growth, the Cape will likely witness new job growth. From a planning perspective, Cape Codders must consider where the new jobs will be located; existing buildings and developed areas offer the greatest potential. The Cape enjoyed a 21.7% increase in jobs since 1990 without a commensurate increase in built space, thereby disproving a long-held assumption that job growth requires a commensurable growth in real estate development. Nonetheless, new building space will be needed on the Cape to accommodate economic development, particularly in the technology sector. To use land efficiently and in an environmentally sound way, new development should avoid sprawl by locating in areas that have adequate transportation, water supply, and wastewater treatment. Future commercial and industrial development should be targeted to certified Growth/Activity Centers and Growth Incentive Zones with appropriate infrastructure.

Many Cape Codders envision compact town centers that combine a mixture of uses: shopping, offices, housing, and entertainment, often with housing located above retail. By recreating the pattern of traditional town centers, the Cape can avoid wasteful sprawl and create friendlier places to live, work, and shop. Downtowns such as Hyannis, Falmouth, Chatham, Orleans, and Provincetown can be strengthened and villages such as Buzzards Bay and Dennisport can be revitalized. It is important to recognize, however, regional differences among the regions of Cape Cod when determining the types and scale of development. For example, residents on the Outer Cape continue to desire small, local businesses of a scale that is in keeping with the small-town character of the Outer Cape towns. It is also important to recognize the strengths of the various regions of the Cape, for example, the strong artist community on the Outer Cape and the technology-oriented businesses in Bourne.

Industrial parks will continue to serve as growth centers for some employment purposes. The Commission's "Industrial Land Inventory" shows that Cape Cod has over 1,400 acres of industrially zoned land. Space is becoming limited, however, at the major industrial/technology parks, which include Falmouth Technology Park, Mashpee Industrial Park, Independence Park in Hyannis, and Sandwich Industrial Park. Bourne, Dennis, and Orleans also have appreciable industrially zoned land. The Commission has encouraged development at the Falmouth and Mashpee parks with development agreements and has prescreened five other promising industrial areas, indicating the amount of industrial/office development that can be built and the permitting issues that would have to be addressed.



Credit: Nancy Hossfeld/CCC

Wellfleet Center. Credit: MA Executive Office of Environmental Affairs

As desirable industrial land on the Cape is developed, town growth centers of all types should be considered as possible sites for new office space. Many jobs do not require industrial facilities, which are most appropriate for factories and warehouses. A downtown setting, where workers can live and shop nearby, may be advantageous.

Given the increasing scarcity of developable commercial land, long-range economic development planning must go hand in hand with regional infrastructure planning. The growth center concept has not yet worked well to concentrate retail development in town centers. Larger retailers still seem to prefer undeveloped sites on commercial strips, possibly because they are widely available and easily fit the corporate development formula practiced elsewhere. Often, infrastructure, particularly for treating wastewater, also is limited in town centers.

This Regional Policy Plan creates incentives for businesses to locate in Growth/Activity Centers and Growth Incentive Zones by relaxing development standards for traffic generation, nitrogen loading, and open space set-asides. This Plan also establishes development review policies to encourage mixed-use (residential, professional, and commercial) development, pedestrian access, and connections to transit.

One of Cape Cod's chief economic development priorities is to promote more high-tech business. For Cape Cod to participate in the booming digital economy, it needs a widely deployed, high-speed, reliable telecommunications network. Until recently, Cape Cod's telecommunications network had fewer service options and higher costs than Greater Boston. To improve telecommunications services on Cape Cod, the Cape Cod Commission, Cape Cod Technology Council, Cape Cod Chamber of Commerce, and Massachusetts Technology Collaborative formed the "Cape Cod Connect" project to analyze Cape Cod's telecommunications needs and develop a strategy for meeting them. The goal of the Cape Cod Connect project has been to obtain reasonably priced data transmission services for every category of user in every Cape community.

The biggest gap in service has been for small businesses and residents. In a 2000 survey of Cape businesses prepared for Cape Cod Connect by the University of Massachusetts-Amherst, 74% of the respondents had 10 or fewer employees, and 91% had fewer than 35 employees. Of the businesses surveyed, 73% said that the Internet is "somewhat to extremely important" to their businesses. Forty-three percent (43%) said they were "very or somewhat unsatisfied" with the speed of their connection.

Cable television has made high-speed cable modem service available to residential users in 10 of the Cape's 15 towns. The introduction of cable modem service has spurred telecommunications providers to begin offering high-speed Internet access through Digital Subscriber Line (DSL) services over phone lines. Because DSL can only service

customers within 12,000 to 15,000 linear feet of a central office, only about 50% of the Cape's landmass can receive DSL. Telecommunications companies are researching technologies for providing DSL service to all customers. The Cape Cod Commission will work with the Cape Cod Technology Council's Infrastructure Committee on strategies for bringing high-bandwidth service to Cape Cod, a measure that would lower telecommunications costs, result in better service, and provide competitive advantages for businesses on Cape Cod. The RPP also contains recommendations that new construction include the installation of high-bandwidth fiber optics.

Other economic development issues are also addressed in the Regional Policy Plan. The Plan requires Developments of Regional Impact (DRIs) to provide information on economic and fiscal impacts, and it encourages activities that create "livable wage" jobs. Several economic development issues also deserve special mention:

• **Municipal Tax Base:** The constrained municipal tax base is an important economic issue. Municipal costs and tax rates are rising, and federal and state assistance is not keeping pace. Municipalities are anxious about future population growth, especially among school children, who will require greater municipal education expenditures. From a fiscal point of view, towns prefer commercial and industrial development to residential development to increase the tax base. The commercial/industrial contribution to the tax base ranges from 28% in Provincetown and 20% in Sandwich to 8% in Truro and 7% in Eastham. Zoning restrictions limit the prospect for increasing the percentage of commercial/industrial tax revenues in most towns. Towns that desire to increase the commercial tax base should seek opportunities for redevelopment of existing underutilized sites so as to minimize the impact of job growth on the environment and existing infrastructure.

• **Retailing:** Considerable discussion has focused on the impact of retail expansion on Cape Cod, especially by so-called "megastores," the large chain-store retailers. Some argue megastores are inappropriately scaled for the Cape, while others argue that such developments should be encouraged. Some residents are concerned about adverse effects on local businesses, as well as the stores' impacts on the environment, traffic congestion, and regional character. Many say that as long as any business does not harm the environment and does mitigate its impacts, it should be allowed on Cape Cod. Some believe that any company should be able to operate on the Cape regardless of its impact on other local businesses.

Retail sprawl in general is inefficient and unsustainable. The standardized architecture and corporate signage that accompany these megastore operations tend to detract from Cape Cod's unique regional character. An excess of retail can hurt smaller, locally owned businesses and create blight when existing retail buildings are vacated. In many cases, locally owned businesses should be regarded as more of a benefit to the regional economy than national chains because they tend to keep profits in the area and participate more actively in community life.

• **Gambling Casinos and Casino Boats:** Gambling casinos and casino boats are activities that could damage the regional economy by taking away business from retail, service, and entertainment establishments and by introducing social problems and environmental impacts. Casino gambling in other

communities has reduced the ability of those communities to attract and retain non-gambling businesses. Gambling activities also take a disproportionately high percentage of their income from lower-income people, cause social and governmental costs through crime and domestic neglect, and produce stresses on the environment and the limited transportation infrastructure. Gambling boats are especially problematic, as seen in the 2000 Provincetown experience, because they are not regulated by state law when operating beyond the three-mile federal limit. With no regulation, they are open to operational irregularities. The Barnstable County Assembly of Delegates approved a resolution in 1994 opposing the "initiation or expansion of legalized gambling in Massachusetts and most particularly in Barnstable County."

Economic Development

3.1 Goal:

To encourage businesses that are compatible with Cape Cod's environmental, cultural, and economic strengths in order to ensure balanced economic development.

Minimum Performance Standard

3.1.1 Commercial/Industrial Developments of Regional Impact applicants shall be responsible for providing economic data. The Commission will evaluate the economic impacts of proposed developments, taking into account net job creation, fiscal impact, employee benefits, housing needs, and services and/or products provided. The Commission will consider any negative or positive impacts that a project may have on the Cape Cod economy.

Other Development Review Policies

3.1.2 The Commission recognizes the important role of private enterprise in maintaining and enhancing sound local and regional economies, and in providing needed services to the Cape's population. Market forces should determine the nature of new businesses or business expansion on Cape Cod, provided that the environmental and planning standards of the Regional Policy Plan are adequately addressed.

3.1.3 The Commission should evaluate the economic impacts of proposed developments, taking into account net job creation and services and/or products provided. The Commission should take into account any negative impacts that a project would have on the Cape Cod economy and should encourage businesses that are locally owned and that employ Cape Cod residents.

3.1.4 Technology and office businesses should be encouraged to locate in Growth/Activity Centers and Growth Incentive Zones.

3.1.5 Economic activities that create livable-wage jobs, target opportunities in high-value knowledge-based sectors, or involve traditional resource-based or cultural sectors should be encouraged. Potentially desirable opportunities include

but are not limited to marine science, "clean" manufacturing, business services, environmentally oriented business, technology, telecommunications, shellfishing, aquaculture, finfishing, agriculture, health and elder care, social services, cultural activities, education, and enterprises that provide transportation solutions.

3.1.6 Development and redevelopment should encourage tourism and other activities that enhance the natural and cultural qualities of Cape Cod. Such activities include but are not limited to museums, art, theater, music, and natural recreation areas.

3.1.7 Development and redevelopment should encourage the development of local businesses that can be integrated into the community without adverse impacts on Cape Cod resources. Such activities include but are not limited to consulting, direct-mail business, home-based business, arts, and crafts.

3.1.8 Development and redevelopment should encourage the reuse and rehabilitation of existing buildings for residential, industrial, and commercial growth, consistent with preserving the Cape's natural environment and historic character.

3.1.9 Development and redevelopment that increases the availability of and access to health and community services in Barnstable County should be encouraged.

3.1.10 Gambling casinos or casino boats on Cape Cod should be discouraged because casinos produce stresses on the region's environment, the limited transportation infrastructure, and economy.

Economic Development

3.2 Goal:

To locate development so as to preserve the Cape's environment and cultural heritage, minimize adverse impacts, and enhance the quality of life.

Minimum Performance Standards

3.2.1 As specified in other sections of the Regional Policy Plan, the following incentives shall be provided to encourage development and redevelopment to locate in certified Growth/Activity Centers:

- **The nitrogen standard for groundwater may be increased to 10 ppm where such increase will cause no significant adverse impact on specific identified resources.**
- **DRIs located within Growth/Activity Centers shall be allowed to reduce their estimated trip generation by 10% for the purposes of calculating their mitigation requirements.**
- **Public and private sewage treatment facilities may be used.**
- **New development within certified Growth/Activity Centers is required to provide open space at a proportion of 3:2 development to open space**

Downtown Hyannis. Credit: MA Executive Office of Environmental Affairs

(see Minimum Performance Standard 2.5.1.3), less than that required in areas outside of certified Growth/Activity Centers.

3.2.2 If an applicant does not propose to locate in a Growth/Activity Center or Growth Incentive Zone, the applicant shall justify why an alternative site in a Growth/Activity Center or Growth Incentive Zone was not selected.

Other Development Review Policies

3.2.3 Development and redevelopment should be concentrated in certified Growth/Activity Centers and Growth Incentive Zones in order to use land more efficiently; create places more oriented to pedestrians, bicyclists, and public transit; preserve open space; maintain the Cape's attractiveness; and create a mix of residential, work, and shopping uses for residents and visitors. It will be considered a benefit if a business locates in a Growth/Activity Center or Growth Incentive Zone.

3.2.4 Village Growth/Activity Centers should be maintained and restored by concentrating small-scale retail, office, housing, and community activities in these areas.

3.2.5 Large-scale commercial activities should be concentrated in regional Growth/Activity Centers or Growth Incentive Zones where adequate infrastructure is available.

3.2.6 Manufacturing and warehousing business activities should be concentrated in industrial Growth/Activity Centers.

3.2.7 Redesign, revitalization, and infill of existing strip developments should be encouraged where adequate infrastructure is available.

3.2.8 Resource-based economically productive areas including agricultural land, harbors, fishing grounds, and recreational areas should be reserved specifically for those uses.

Chatham fish market. Credit: MA Executive Office of Environmental Affairs

Economic Development

3.3 Goal:

To encourage the creation and diversification of year-round employment opportunities.

Development Review Policies

3.3.1 Development and redevelopment projects should provide permanent, well-paying, year-round jobs, health, retirement and other benefits, employment training opportunities, and enhanced career-path opportunities for Cape Cod residents.

3.3.2 Development and redevelopment projects should be evaluated for net new jobs created, salary and benefit levels, occupational advancement opportunities for local workers, and the impact on existing businesses, traffic, natural resources, and affordable housing for employees. Minimum Performance Standard 5.3.1 of the Regional Policy Plan requires that nonresidential developments shall be evaluated as to the need for affordable housing created by the project. Any financial support for job training/education and/or affordable housing for workers will be considered a benefit.

3.3.3 Development and redevelopment projects should employ Cape Cod contractors and use local suppliers and workers. Project applicants should provide information describing the number of Cape Cod workers and contractors who worked on the project within three months from completion of the project.

3.3.4 Development and redevelopment projects should hire minority and women contractors listed with the State Office of Minority and Women's Business Assistance, and employ minorities, disabled, elderly, unemployed and underemployed persons in permanent positions. The employment of residents of Cape Cod in these positions will be considered a benefit.

Implementation

Regional/County Actions:

Coordination

A. The Cape Cod Commission's Economic Development program and the Cape Cod Economic Development Council (CCEDC) will coordinate their policies and activities to create a synergistic effort at improving the region's economy while addressing its unique challenges.

B. The Commission will work with local permitting agencies to coordinate and streamline the development review process to minimize delays.

Targeted Sectors

C. The Commission and Economic Development Council will work with local governments and business organizations to create strategies for developing the

following economic sectors, that have potential to expand Cape markets and create more year-round jobs: marine science, environmental research and technology, biotechnology, software, telecommunications, "clean" manufacturing, financial services, tourism, retirement, and health care and elder services. The CCEDC will give special attention to encouraging education as an industry.

Planning, Marketing, and Information Dissemination

D. The Commission will work with towns and local industrial park authorities to resolve environmental and planning issues in order to expedite the development and marketing of these parks. This could include industrial pre-screening, development agreements, or District of Critical Planning Concern designations to streamline the development review process. The Commission will maintain information concerning available developable property in industrial parks and other industrially zoned areas.

E. The Commission will support cultural and heritage activities such as the Heritage Discovery Network and Marine Heritage Program.

Maritime Days 2002 marina tour. Credit: Gay Wells/CCC

F. The Commission will continue to work with local chambers of commerce, tourist attractions, historians, environmentalists, public relations experts, and other knowledgeable individuals to strengthen the heritage tourism initiative and to publicize the environmental, historical, and cultural attractions of Cape Cod.

G. The Economic Development Council and the Commission will work with interested parties to promote Cape Cod as a retirement community.

H. The Commission will research and disseminate information concerning the telecommunications infrastructure and policy needs in order to make Cape Cod a competitive place for businesses and individuals.

I. The Commission will research and disseminate information concerning the economy and demographics of Cape Cod. These research activities will include interpreting data from the US Census, state and local agencies, private organizations, and businesses. Such materials will be made available to towns, business persons, the media, and interested individuals through periodic publications, such as "Cape Trends," and responses to individual inquiries.

Education and Technical Assistance

J. The Commission will work with towns, county government, businesses, and nonprofit organizations as a technical resource for economic development planning, including through Local Comprehensive Plans (LCP).

K. The Commission and Cape Cod Economic Development Council will sponsor conferences and workshops on the Cape Cod economy and strategies for improving it.

L. The Economic Development Council will support the efforts of the business sector and educational and training institutions to prepare local workers for and refer them to new job opportunities with special attention to disabled, elderly, minorities, and unemployed and under-employed persons. The Cape Cod Economic Development Council will pursue initiatives to develop a technologically literate workforce.

M. The Commission and Cape Cod Economic Development Council will support the development of expanded higher education, specifically a four-year college/ graduate school, and vocational programs on Cape Cod in order to enhance opportunities and upgrade job skills.

N. The Commission and the Cape Cod Economic Development Council will encourage the recruitment and training of underemployed residents who desire to work, such as retired persons, so as to reduce off-Cape recruitment.

Recommended Town Actions:

A. Town governments, in preparing Local Comprehensive Plans (LCPs), should meet with businesses and business organizations to ascertain economic development needs in the community.

B. Local Comprehensive Plans should identify Growth/Activity Centers in town as well as appropriate infrastructure needs. Towns should create regulations that provide incentives for businesses to locate in compact mixed-use centers.

C. Town governments should work with the private sector to identify and develop entrepreneurial and business activities compatible with towns' existing strengths and resources.

D. Town governments should consider offering incentives to promote desired economic development in their communities, including Economic Opportunity Areas and similar strategies.

E. Town governments should consider adopting impact fees for new development in relation to job training/education and affordable housing.

4. Community Facilities and Services

4.1 Issue Area: Transportation

This Regional Policy Plan sets forth a vision for balancing sensible road improvements, encouraging alternate modes of transportation, and promoting land preservation.

On many Cape Cod roads, the off-season traffic volumes of today are the same as the summer traffic volumes of about 20 years ago. Projections of traffic volumes indicate this trend will likely continue: Based on forecasts of traffic at "build out," the summer traffic volumes of today could be the winter traffic volumes of the future.

During the last 10 years, progress has been made in mitigating some of the impacts that might have occurred in the absence of regional planning. Generally, Cape Cod's roads and bridges, although stressed beyond traffic capacity at peak times, are in physically good condition. Roadway capacity has been or is being added in several locations, most notably Hadaway Road in Barnstable and the Route 6/Interchange 9 in Dennis. There is a far greater emphasis on providing and promoting bus service as a way to travel on and to or from the Cape, as demonstrated by construction of the Hyannis Intermodal Center. The Cape Cod Rail Trail was extended into Wellfleet several years ago, and the construction of the bicycle bridge links over Route 6 in Harwich and Orleans are proceeding. Ferry service to Provincetown has become more frequent. In the not-too-distant future, passenger rail connections to the mainland may once again be available.

Credit: MA Executive Office of Environmental Affairs

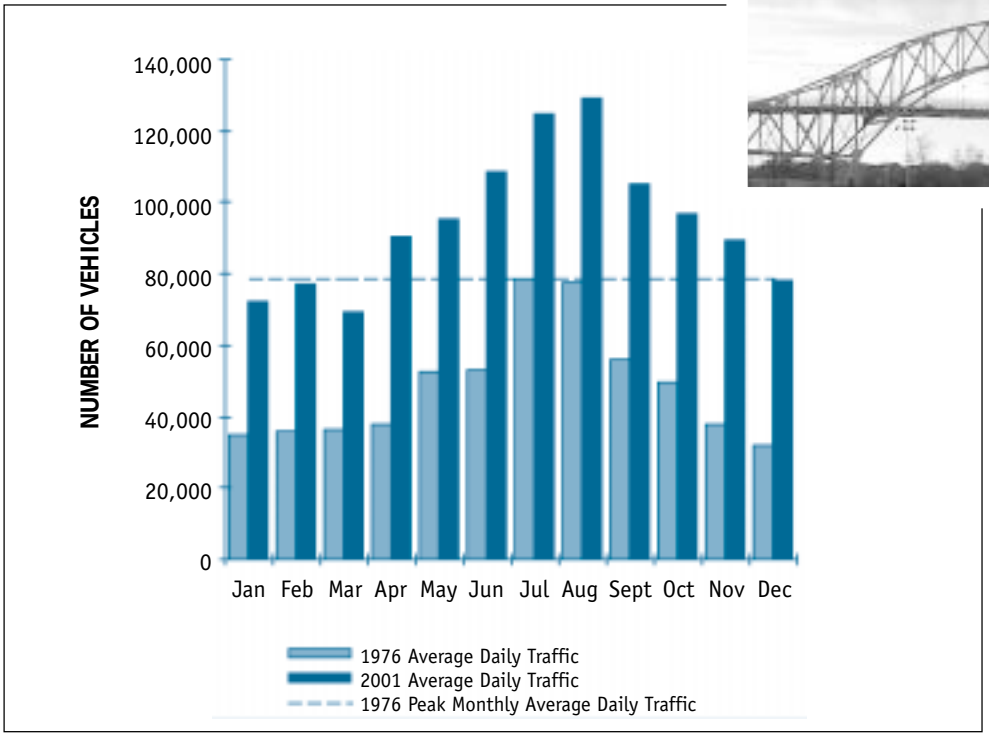
The Regional Policy Plan strives to strike a careful balance by addressing the need for sensible road improvements, encouraging alternate modes of transportation, and promoting land preservation. It also recognizes the unique role of the Canal area road system in providing vehicular access to and from the mainland for residents and visitors of Bourne as well as the other towns of Cape Cod. Finally, the Plan recognizes the impacts that a geographically dispersed pattern of growth can have on the provision of transit, which is key in ensuring that low-income and elderly individuals, who may not be able to drive, can access crucial public and private services.

This Plan also provides strong incentives to locate development and redevelopment within Growth Incentive Zones. This is central to the strategy of encouraging more concentrated development in downtowns and other areas that are served or can be served by bus service.

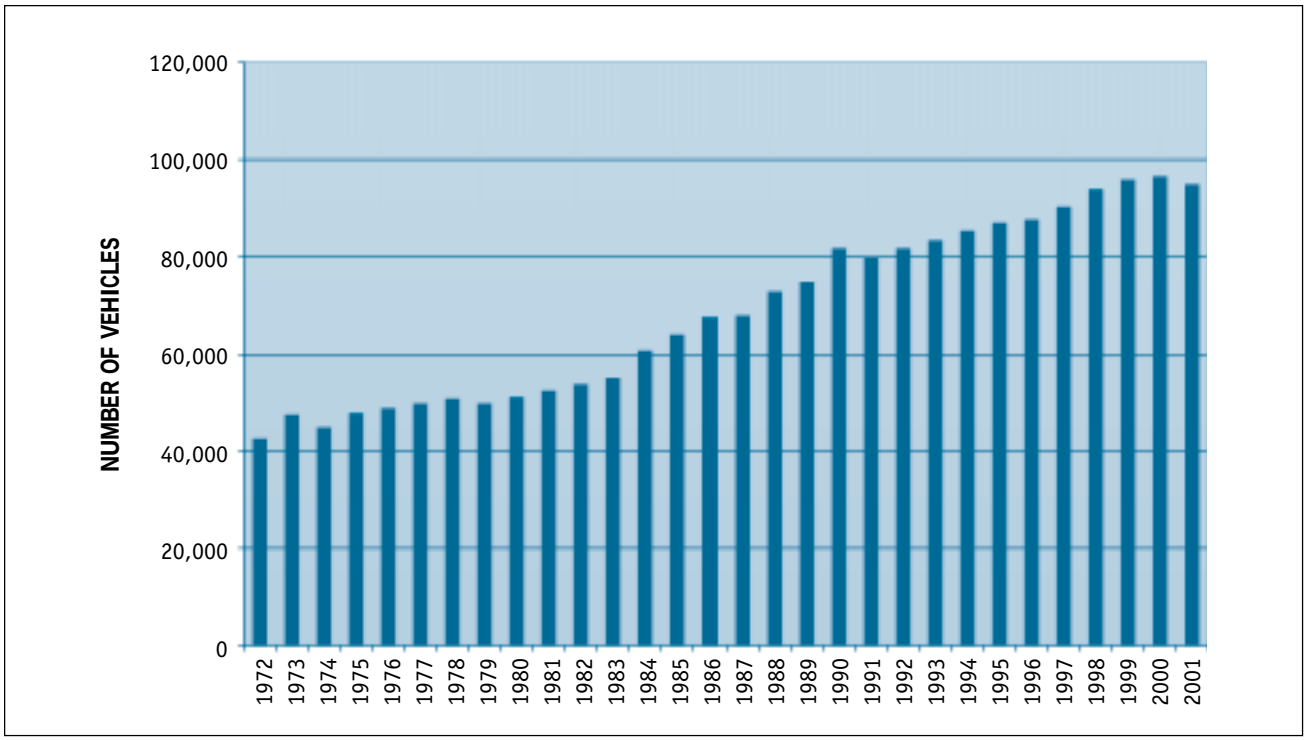
An objective of this RPP is to emphasize mitigation that reduces automobile travel by promoting alternate modes and reducing dependency on the automobile. It is necessary to

A 25-year Comparison of Average Daily Traffic Crossing the Sagamore and Bourne Bridges

Sagamore Bridge. Credit: Nancy Hossfeld/CCC



Average Daily Cape Cod Canal Crossings



Source: Compiled by the Cape Cod Commission from Massachusetts Highway Department traffic counts.

move away from strategies that often require mitigation not wanted by Cape Cod residents and visitors, such as wider roads and intersections. It is also necessary, however, to include checks and balances on travel times and safety. Finally, all projects that are reviewed as Developments of Regional Impact must recognize their impacts in the Cape Cod Canal area.

It is clear that we must take a multifaceted approach to meet existing and future travel demands. This must include increased capacity to move people and goods, sensible land use, and promoting alternative modes of transportation and efficient use of the Cape's transportation system.

Transportation

4.1.1 Goal:

To maintain an acceptable level of safety on all roads on Cape Cod for all users.

Minimum Performance Standards

4.1.1.1 Development and redevelopment shall not degrade safety for pedestrians, bicyclists, or motor vehicle operators or passengers.

4.1.1.2 Analysis of crashes and the potential safety impacts of development and redevelopment shall be required on all regional road links, at all intersections of regional roads, and at local road intersections with regional roads that are used by a project for access to the regional road network, where the project is expected to increase traffic by 25 or more trips during the project's average peak hour. Locations with an average of three or more crashes per year or a higher than average crash rate, as compared to the latest three years of local, regional, or state data, shall require measures to mitigate potential safety impacts of the development and redevelopment to comply with Minimum Performance Standard 4.1.1.1. All measures to mitigate safety impacts must be consistent with Goal 4.1.3 and its supporting Minimum Performance Standards.

4.1.1.3 All access and egress locations for development and redevelopment shall meet local, county, and/or state and federal access management bylaws, technical bulletins, standards, and/or policies for driveway spacing and separation from the nearest intersections. Development and redevelopment with frontage on more than one street shall be restricted to access and egress via the lower volume road when deemed appropriate by the Commission.

4.1.1.4 To reduce safety conflicts between local and through traffic, new development shall not be allowed direct access or egress onto Route 6 in Bourne (Scenic Highway), Eastham, Wellfleet, Truro, or Provincetown unless no alternative access or egress is available. Furthermore, redevelopment that utilizes existing access or egress onto any of these sections of Route 6 shall be allowed provided that there is no increase in expected daily or peak-hour traffic volumes utilizing those driveways during the summer. For uses abandoned for five (5)

years or less, the amount of traffic allowed shall be based on the estimated trip generation of the use prior to abandonment. No credit for prior traffic generation shall be allowed for uses abandoned for more than five (5) years.

4.1.1.5 Human-made objects such as signage, utility poles and boxes, and lighting to service development and redevelopment shall be located to minimize visual obstruction and possible safety conflicts, including glare or other distractions for drivers. New utility service and relocation of existing utility service shall be placed underground, where deemed feasible and appropriate by the Commission.

4.1.1.6 Site planning and access/egress for development and redevelopment shall minimize impacts on the adjacent road system and shall adequately and safely accommodate all users including pedestrians, bicyclists, and motorists. Development and redevelopment shall provide for pedestrian and bicyclist connections on the property of the applicant to allow for possible future connections with adjoining properties, where deemed appropriate by the Commission.

4.1.1.7 Acceptable sight distances shall be met and maintained at all access and/or egress locations for development and redevelopment regardless of project traffic volumes. At a minimum, these shall meet the stricter of the Massachusetts Highway Department and American Association of State Highway Transportation Officials' standards for safe-stopping sight distances.

4.1.1.8 Safety mitigation shall occur prior to occupancy of the development or redevelopment.

4.1.1.9 The width of driveway and/or curb-cut openings to serve development and redevelopment shall not exceed Massachusetts Highway Department design standards.

4.1.1.10 For the purposes of DRI review and analysis, trip-generation data sources other than those from national surveys shall be considered, and the most appropriate source(s) shall be utilized as determined by the Commission.

Other Development Review Policies

4.1.1.11 Development and redevelopment should avoid increasing through-vehicular traffic within residential neighborhoods.

4.1.1.12 Development and redevelopment should promote and assist in improving transportation safety on Cape Cod.

4.1.1.13 Elimination of existing curb cuts is encouraged.

Route 6, North Eastham. Credit: John Jannell/CCC

Transportation

4.1.2 Goal:

To reduce and/or offset the expected increase in motor vehicle trips on public roadways and to reduce dependency on automobiles.

Minimum Performance Standards

4.1.2.1 All development and redevelopment not located within Growth Incentive Zones shall implement adequate and acceptable measures to reduce and/or offset 25% of the expected increase in summer site traffic resulting from the development on a daily and project peak-hour basis. Employee carpooling, flexible work hours, and incentives for alternatives to automobile travel are strategies consistent with this standard. Trips generated from public transit buses and school buses shall not be included in trip generation for purposes of determining the trip-reduction requirement. Truck, tractor/trailer combination, and other non-automobile trips shall be considered as passenger car equivalents based on the ratio of two axles per vehicle. For example, a three-axle truck shall be considered 1.5 vehicles; a five-axle combination unit shall be considered 2.5 vehicles.

4.1.2.2 For development and redevelopment located within Growth Incentive Zones, the traffic reduction and/or offset requirements of MPS 4.1.2.1 shall be 12.5% of the expected increase in summer site traffic resulting from the development on a daily and project peak hour basis.

4.1.2.3 Development and redevelopment that allows for site traffic to travel conveniently and safely to adjacent properties without traveling on or crossing a public way or that allows for mixed-use development that minimizes dependence on automobile travel shall be allowed an appropriate reduction in estimated traffic increases on adjacent streets. The reduction in traffic increases on adjacent streets shall be supported by an analysis based upon Institute of Transportation Engineers' or another acceptable methodology.

Transit bus in Hyannis. Credit: Nancy Hossfeld/CCC

4.1.2.4 Development and redevelopment located directly adjacent to a road served by regularly scheduled fixed-route bus service shall be granted an appropriate trip-reduction credit provided that adequate amenities (such as a designated bus stop and/or shelter and employee/customer use incentives) are located on site. The trip-reduction credit shall be supported by an analysis based upon Institute of Transportation Engineers' or another acceptable methodology, but shall be at least 5% of the total expected increase in traffic for development and redevelopment located directly adjacent to existing year-round fixed-route bus service and at least 2.5% for development and redevelopment located directly adjacent to existing seasonal fixed-route bus service.

4.1.2.5 Development and redevelopment shall consider and accommodate the needs of bicyclists, pedestrians, and other non-automobile users in site planning and roadway and/or intersection changes. Where appropriate, historic footpaths shall be maintained and safe bicycle and walking links shall be created to establish an interconnected regional bicycle and walking path system. Where appropriate, bikeways and footpath connections between commercial and

residential neighborhoods and other compatible uses shall be provided to create a safe alternative to travel on or along major roads.


Credit: MA Executive Office of Environmental Affairs

4.1.2.6 The maximum parking allowed for development and redevelopment shall be no more than the minimum number of spaces required under zoning unless a greater number of spaces is justified by a parking analysis accepted by the Commission.

4.1.2.7 To meet the requirements of Goal 4.1.2 and the applicable minimum performance standards, Developments of Regional Impact may, at the applicant's option, utilize the following strategies to meet the portion of the trip-reduction requirements not otherwise met:

(a) the preservation of vacant developable land, in excess of other RPP open space requirements, as permanent open space. The land shall be located within the town(s) containing the DRI and held by the town's Conservation Commission or placed under a permanent conservation restriction and held by an appropriate conservation land trust. The trip-reduction credit shall be calculated by the Commission based on the amount of traffic that could reasonably be expected to be generated by development of the parcel based on size, location, zoning, accessibility, and land use.

(b) a payment of funds per expected summer-season daily trip to be reduced or offset. The funds shall be used to support alternatives to automobile travel in the town within which the project is located, including but not limited to traffic monitoring, planning, design, engineering, acquisition, implementation, marketing, and operation or the purchase of vacant land for protection of open space in excess of other RPP or municipal requirements. The amount of payment per daily trip to be reduced shall be calculated by the Commission based upon the estimated cost of funding for alternatives to automobile transportation or the estimated cost of vacant developable land within the town in which the project is located. The amount of payment shall also be commensurate with the number of vehicle trips to be reduced or offset.

(c) in-kind strategies consistent with MPS 4.1.2.1.

(d) any combination of (a), (b) and (c).

4.1.2.8 The Commission may allow a DRI to exceed the requirements of this section and receive a corresponding reduction in trip generation for the purpose of meeting Minimum Performance Standard 4.1.3.4.

Other Development Review Policies


Ferry in Hyannis Harbor. Credit: Nancy Hossfeld/CCC

4.1.2.9 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 both residents and visitors better, transit-service frequency should be increased and the routes expanded.

Chatham airport. Credit: MA Executive Office of Environmental Affairs

4.1.2.10 Cape Cod's current civilian airport capacity should be maintained as a vital economic and transportation resource. A buffer area should be maintained around regional and local airports to ensure future development is protected from noise, exhaust fumes and loss of life or property.

4.1.2.11 Development and redevelopment should make provisions for or contribute to information-based technologies in the region that assist travelers in making efficient travel decisions regarding travel mode and time of travel.

4.1.2.12 Development and redevelopment should adopt and implement strategies to encourage trip reduction through telecommuting and resources such as the Internet.

Freighter under the Cape Cod Canal railroad bridge. Credit: CCC file photo

4.1.2.13 Rail and marine freight shipment to and from Barnstable County should be encouraged as an alternative to truck freight shipments.

4.1.2.14 Freight shipments to Nantucket and Martha's Vineyard should utilize off-Cape ports except for freight originating on Cape Cod.

4.1.2.15 Strategically located parking garages that serve several developments should be considered within some Growth/Activity Centers and Growth Incentive Zones.

4.1.2.16 Development and redevelopment should share parking with adjacent uses.

4.1.2.17 Drive-through services as part of development and redevelopment should be avoided in order to decrease emissions from engine idling and possible conflicts with traffic.

Transportation

4.1.3 Goal:

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.

Refer to Regional Policy Plan map.

Minimum Performance Standards

4.1.3.1 The regional road system for Cape Cod shall include all roads with a functional classification higher than local roads, as adopted by the Cape Cod Metropolitan Planning Organization (CCMPO) and amended from time to time. The functional classification of highways, as adopted by the CCMPO, is adopted as an official part of this Regional Policy Plan.

4.1.3.2 Regardless of traffic volumes, Level of Service analysis shall be required at all access and/or egress points onto the regional road system for development and redevelopment. All new driveways providing access and/or egress onto the regional road system for development and redevelopment shall operate at Level of Service C or better during the project's summer peak hour for a minimum of five (5) years after project occupancy, except that Level of Service D shall be allowed for projects located within Growth Incentive Zones. For unsignalized driveways, the Level of Service standards shall be met for each turning or non-turning maneuver; for signalized driveways, the Level of Service standards shall apply to the overall intersection Level of Service.

4.1.3.3 For the purpose of meeting the requirements of Goal 4.1.3 and the supporting Minimum Performance Standards, DRIs located within Growth/ Activity Centers shall be allowed to reduce their estimated trip generation by 10%, and DRIs located within Growth Incentive Zones shall be allowed to reduce their estimated trip generation by 25%.

4.1.3.4 Developments of Regional Impact shall perform Level of Service analysis and provide for full mitigation of project impacts on all regional road links, at all intersections of regional roads, and at local road intersections with regional roads that are used by the project for access to the regional road network, including but not limited to bridges, intersections, rotaries, roundabouts, interchanges, and U-turns where traffic increases are expected from the project, after traffic adjustments in compliance with the Minimum Performance Standards supporting Goal 4.1.2. At all locations requiring analysis, mitigation shall be proposed and funded to maintain year-round and summer Level of Service at "no-build" conditions as measured by vehicle density, reserve capacity, volume-to-capacity ratio, seconds of delay, and travel times. In lieu of mitigation of traffic impacts concurrent with project development, the Commission, at its discretion, may allow a fair-share payment of funds to Barnstable County to meet the requirements of this Minimum Performance Standard. Transportation mitigation funds received from DRIs by Barnstable County shall be used to support regional transportation improvements consistent with the Regional Policy Plan. Furthermore, to maintain safe and adequate access across the Cape Cod Canal, a portion of any transportation mitigation funds received by Barnstable County from each DRI shall be allocated to supporting transportation improvements in the Canal region commensurate with expected new automobile crossings of the Cape Cod Canal resulting from the project.

4.1.3.5 With the exception of turn or flow restrictions created by the construction of roundabouts, turn restrictions at intersections or directional flow restrictions on regional road links shall not be allowed as project mitigation for development and redevelopment if such changes increase travel times and/or distances for vehicles not travelling to or from the project site.

Barnstable. Credit: Lev Malakhoff/CCC

4.1.3.6 All new traffic signals expected to be required by development and redevelopment shall be located only at the intersections of public roads unless there is no other feasible access or egress alternative.

4.1.3.7 Development and redevelopment shall not be allowed if the project is estimated to add new traffic such that within five (5) years after project completion generally accepted warrants (such as the American Association of State Highway Transportation Officials or Massachusetts Highway Department) for road and intersection widening or new traffic signals are expected to be met or exceeded at any location(s) within historic districts, on scenic roads, or if the road or intersection widening or new traffic signals are expected to impact natural resources or are inconsistent with community character.

4.1.3.8 All road and intersection widening and new traffic signals or modification of existing traffic signals required as part of development and redevelopment shall include appropriate bicycle and pedestrian accommodation.

4.1.3.9 Existing transportation rights-of-way shall be preserved for transportation uses. All development and redevelopment shall provide sufficient rights-of-way along the frontage of their properties to accommodate expected needs for bicycle and pedestrian accommodation and/or relocation of utilities.

4.1.3.10 All road and intersection widening proposed as part of development and redevelopment shall be limited to that which is necessary based on average year-round traffic conditions. Road and intersection widening necessary to accommodate summer travel demand shall not be allowed as part of development and redevelopment.

4.1.3.11 The capacity of limited-access highways on Cape Cod, including portions of Route 6, Route 3, and the Route 25 extension within Barnstable County shall be maintained but not increased. No additional travel lanes shall be allowed. Appropriate improvements to safety and traffic flow at the existing interchanges along limited-access highways shall be a permissible mitigation strategy.

4.1.3.12 All road and intersection widening proposed as part of development and redevelopment shall be consistent with local and regional plans, including but not limited to Local Comprehensive Plans, the Metropolitan Planning Organization's latest Regional Transportation Plan, and the Regional Infrastructure and Facilities Plan.

4.1.3.13 All road and intersection widening or new traffic signals proposed as part of development and redevelopment or used to support development of

theoretical mitigation plans must be consistent with community character and not degrade scenic or natural resources. Road and intersection widening and new traffic signals shall not be used as actual mitigation or to support theoretical mitigation in local or regional historic districts.

4.1.3.14 Where recommended by the Commission, all roadway widening, intersection signals, and other roadway capacity alterations proposed as mitigation by development and redevelopment to accommodate automobile travel shall include traffic recording devices to monitor traffic volumes, vehicle classification, and travel speeds continuously, and shall include devices to access the data remotely. Where necessary, a commitment of funds to support maintenance and operation of the devices may be required by the Commission.

4.1.3.15 New parking primarily to serve travel to Martha's Vineyard and Nantucket shall be consistent with the Regional Transportation Plan for Cape Cod as approved by the Cape Cod Metropolitan Planning Organization.

Other Development Review Policies

4.1.3.16 Transportation mitigation should be consistent with federal and state acts and plans, including the Transportation Equity Act for the 21st Century and successor transportation acts and amendments, the Clean Air Act Amendments of 1990, the Americans with Disabilities Act, and the Massachusetts State Implementation Plan.

4.1.3.17 Development and redevelopment, including transportation improvements, should replace existing overhead utility lines with underground service.

4.1.3.18 Visitors to Cape Cod should be encouraged to travel by bus, rail, plane, or ferry.

4.1.3.19 Visitors to Martha's Vineyard and Nantucket should be encouraged to use ports and parking outside of Barnstable County, excluding those visitors who are otherwise staying on Cape Cod.

Credit: Nancy Hossfeld/CCC

Implementation

Commission Actions:

A. The Commission will promote cooperation and service coordination among the various transportation agencies that have responsibility for the Cape's transportation system.

B. The Commission will continue to work as a member of Cape Cod's Metropolitan Planning Organization to utilize available programs to access state and federal funding for transportation projects as well as seek to identify and expand sources of funding for transportation projects that are consistent with the Regional Policy Plan.

C. The Commission will support, encourage, and seek to preserve the no-access policies of the Massachusetts Highway Department and the Federal Highway Administration for Route 6 between the Sagamore Bridge and Orleans Rotary, on Route 28 between Braeside Road in Falmouth and the Otis Rotary, and on the northbound lanes of Route 28/MacArthur Boulevard as well as other roads, in order to minimize traffic and safety conflicts between local and through-traffic on these roads.

D. The Commission will work with the towns and the state to improve access management and safety and to control vehicle speeds on Cape Cod roads.

E. The Commission will seek to enhance existing park-and-ride lots and to develop new ones in order to encourage the use of scheduled bus service for travel to off-Cape locations, and the Commission will seek to encourage visitors to travel to Cape Cod using bus, rail, or ferry services.

Credit: Nancy Hossfeld/CCC

F. The Commission will work with the appropriate agencies and organizations to develop real-time information systems to provide current and prospective travelers with information on current highway conditions, including congestion, accidents, weather, and travel delays. The Commission will seek to provide a central location accessible by telephone, fax, Internet, and mail for information on transit routes, schedules, fares, commuter lots, connections, and other relevant details.

G. The Commission will work to expand the viability of shuttle services, bicycling, and walking as modes of transportation.

H. The Commission will support efforts to expand shuttle services, carpooling, and flexible scheduling opportunities in the region.

Recommended Town Actions:

A. Towns should establish a traffic-impact assessment and mitigation program to identify and mitigate the impacts of new developments and redevelopment on the transportation system.

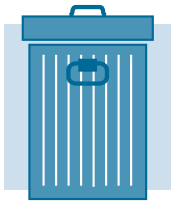
B. Towns should incorporate thresholds for review of traffic impacts of proposed projects within their zoning or site plan review bylaws.

C. Towns should adopt access-management guidelines.

D. Towns should evaluate parking requirements in an effort to minimize the number of required parking spaces and encourage shared parking.

E. Towns should develop impact fees for transportation improvements that are consistent with the Regional Policy Plan, the Local Comprehensive Plan, and the Regional Infrastructure and Facilities Plan.

F. Towns should adopt zoning bylaws and land use plans to ensure that the future transportation needs of the town are consistent with the existing or planned capacity of the transportation system.



4.2 Issue Area: Solid Waste Management

Like other regions of New England, Cape Cod faces the challenge of managing its solid and hazardous wastes in an environmentally sound manner. Environmental regulations require increasingly sophisticated waste management strategies and administrative arrangements to ensure compliance. Cape Cod citizens support efforts to protect the environment from the impacts of solid waste collection, transport, and disposal. As a result, communities are seeking economical and innovative ways to manage municipal solid waste properly. On Cape Cod, these trends are clearly demonstrated by:

- an emphasis on increasing the percentage of household waste that is recycled and on expanding markets for recyclables;
- a trend towards regionalization of waste management;
- waste-to-energy (WTE) facilities with advanced air-pollution control technologies; and,
- programs for the recycling and safe disposal of automotive wastes, paint wastes, batteries, mercury products, and other household hazardous wastes (HHW).

Municipal solid waste (MSW) includes garbage and refuse generated in homes, offices and industries, leaf and yard wastes, and construction and demolition (C&D) debris. This Regional Policy Plan sets forth a vision of managing solid wastes in a cost-effective and environmentally responsible way. This means first reducing, at the source of production or purchase, the total amount of solid waste created. For organic wastes such as food or yard waste, the Plan promotes composting. Collection and marketing of recyclables are regarded as an essential element in reducing the waste stream. Incineration and, finally, landfilling of wastes should be used only when all of the previously mentioned options have been exhausted. The highest priority should be for waste reduction and composting.

Waste reduction includes any effort that decreases the production of solid waste. Less waste means less hauling, less air and ground pollution, less use of fuel, and less use of scarce resources such as minerals, metals, timber, and oil. Actions that can result in less waste being generated include altering purchasing habits, improving manufacturing processes, redesigning packaging (which comprises one third of all waste), redesigning products to be recycled more fully and easily, and adopting variable rate fees thus providing generators with a direct economic incentive to conserve resources.

Every Cape Cod town is required to compost leaves and yard wastes, which make up approximately 5% of the Cape's solid waste stream by weight. Several private facilities compost or chip and recycle an undetermined quantity of organic material delivered to them by developers, landscapers, and property owners. Organic yard wastes represent

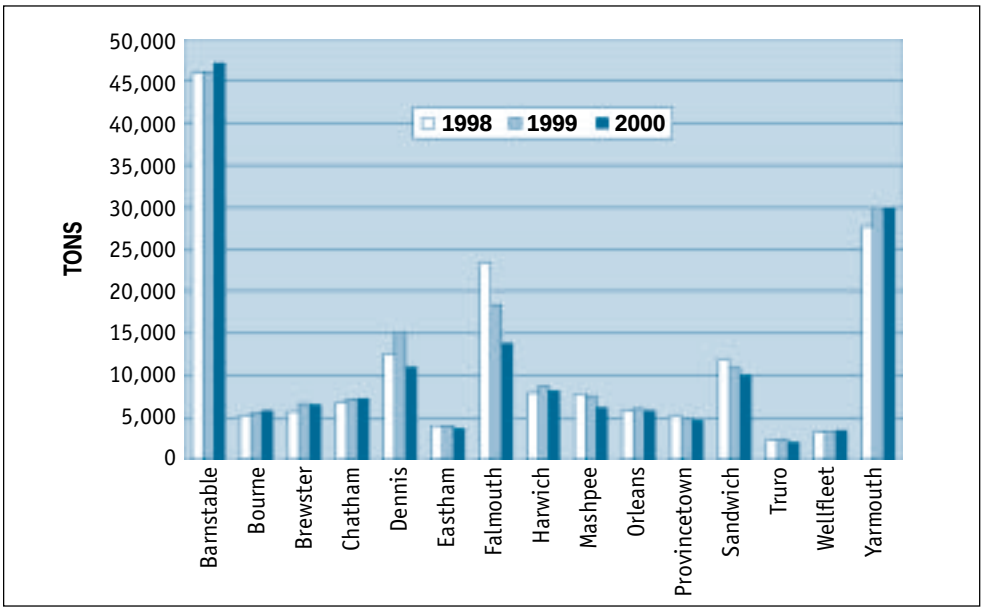
This Regional Policy Plan sets forth a vision of managing solid wastes in a cost-effective and environmentally responsible way.

18% of municipal solid waste generated nationally. Composting is a safe, efficient, and relatively inexpensive way to convert organic yard wastes into a beneficial product. The Regional Policy Plan recommends increased public education about home composting, and town composting programs could expand participation and benefit a town's recycling program.

Cape Cod residents strongly support recycling efforts. Every town on Cape Cod has a recycling program; six towns have mandatory recycling bylaws. In 2000, Cape Cod municipal recycling rates, which usually reflect only residential recycling, ranged from 15% to 50%, with the Capewide average being approximately 30%. A major impediment to increased recycling on Cape Cod is the inability or lack of opportunity for many tourists and vacationers to participate in local recycling programs. The Cape's population can swell to an estimated 500,000 during July and August. During a typical stay, visitors generate both solid waste and recyclables. Most visitors, however, do not have access to the local transfer station or do not know where the local facility is located. The shorter the visit, the less likely that the visitor will recycle. Also, those seasonal businesses that are only open for a few months may be less likely to have a recycling program. If a motel, cottage, or summer rental does not collect recyclables, it is unlikely that the material will be recycled. Therefore, the Plan recommends regional efforts to work with realtors, tourism businesses, and the chambers of commerce to encourage recycling by tourists and seasonal residents, with a goal of achieving a 40% recycling rate by 2010.

In 1985, 14 Cape Cod towns signed 20-year contracts with the SEMASS waste-to-energy (WTE) facility in Rochester, Massachusetts. Ten town transfer stations and two regional railhead stations have been constructed to deliver the municipal and commercial solid waste to SEMASS. Waste-to-energy facilities reduce by approximately 90% the volume of material that ultimately

Municipal Solid Waste Generated by Town



Source: SEMASS Waste-to-Energy Facility, 1998–2000.

must be sent to a landfill. These facilities also reduce the state's consumption of fossil fuels through the steam and/or electricity generated, which is sold by SEMASS to the power grid.

Participation in SEMASS does not solve any one town's solid waste problem. The current contract cannot be extended past 2015. Renegotiation at that time will likely result in significantly higher tip fees. Those towns with aggressive recycling and composting programs will fare better financially than towns without them. The Regional Policy Plan recommends strategies such as paying for waste thrown away ("Pay As You Throw" programs) as a means of encouraging composting, recycling, and other non-disposal options.

All municipal landfills have been closed on Cape Cod. The Town of Bourne operates the regional Integrated Solid Waste Management Facility (ISWMF), which is a municipally owned and operated bulk waste, C&D, and difficult-to-manage waste disposal facility. The types of waste being landfilled at the ISWMF consist primarily of construction and demolition material, mattresses, carpet, furniture, street sweepings, dead animals, and grit and screenings from wastewater treatment plants. In order to reduce the amount of waste generated and disposed, the Plan contains standards requiring development and redevelopment to provide a plan for the disposal of C&D debris and post-construction management plans to handle recycling and waste disposal.

SEMASS facility. Credit: American Ref-fuel Company of SEMASS

Solid waste planning on Cape Cod has been coordinated regionally by Barnstable County since 1969, although solid waste is still managed locally. Decision-making authority for the development and daily operation of waste-handling facilities remains with the 15 towns. Yet the management of solid waste is a broad and complex regional issue, and one that benefits from economies of scale and greater bargaining power when managed regionally, Therefore, it is essential to continue to build partnerships between all of the Cape's towns and Barnstable County to manage solid wastes in a safe, cost-effective manner.

Truro transfer station. Credit: Greg Smith/CCC

Solid Waste Management

4.2.1 Goal:

To manage solid waste using an integrated solid waste management system that includes waste reduction, recycling, composting, incineration, and landfilling, and to divert 40% of municipal solid waste from incinerator and landfill facilities through recycling and composting programs by 2005, and 60% by 2010.

Minimum Performance Standards

4.2.1.1 Development and redevelopment shall address both the construction and post-construction phases of development or redevelopment. A construction plan shall demonstrate how the applicant proposes to handle solid wastes, recyclables, and construction/demolition wastes.

4.2.1.2 If construction/demolition debris is to be generated as part of a proposed development or redevelopment, written notification shall be required for the following:

- **the types of material that will be generated;**
- **the manner by which recycled materials as part of the C&D waste stream will be separated and stored on site prior to disposal;**
- **the destination of all recycled materials separated out from the C&D waste stream; and,**
- **the manner by which both C&D and recycled materials will be delivered to markets.**

4.2.1.3 Suitable locations for the collection, storage, and removal of recyclable materials and related equipment shall be provided. A post-construction management plan shall demonstrate how an applicant proposes to handle the following:

- **recyclables and solid waste, including the manner by which they will be collected on site;**
- **for food-service businesses, the composting of food wastes;**
- **location and type of containers where the materials will be stored on site;**
- **how collection and holding facilities will be screened from abutting properties;**
- **the types of materials to be generated;**
- **the anticipated quantities of materials to be generated; and,**
- **destination of materials.**

Implementation

Commission Actions:

A. The Commission will assist towns in adopting full-cost accounting methods in solid waste management to demonstrate the financial benefits of adopting a Pay-As-You-Throw solid waste disposal program.

B. The Commission will publish an annual report of the quantities of solid waste that are recycled, composted, incinerated, and landfilled by each town, as

well as a report on recycling markets used by Cape Cod towns to assist them in locating the best markets.

C. The Commission will encourage government, businesses, institutions, and individuals to purchase goods made from recycled materials in order to increase the marketability of the recyclable materials they generate.

D. The Commission will work with realtors, chambers of commerce, and tourism-related businesses to encourage recycling by vacationers and seasonal residents.

E. The Commission will work with towns to explore regional alternatives for the recycling or disposal of non-recyclable and non-combustible wastes such as construction and demolition material.

F. The Commission will monitor SEMASS contractual issues that may impact Cape Cod.

G. The Commission will continue to assist in the development of state policies and regulations through participation in various Massachusetts Department of Environmental Protection (DEP) advisory committees.

H. The Commission will promote composting of yard wastes and household food wastes by homeowners, and will help disseminate information on composting in conjunction with the Cape Cod Cooperative Extension and DEP.

I. The Commission will research long-term alternatives to solid waste disposal, in light of the impending contract expiration with SEMASS in 2015 for solid waste incineration. Viable alternatives include the establishment of a Cape Waste Management District for the siting, design, and construction of a co-compost and recycling facility comparable to the Nantucket facility.

Recommended Town Actions:

A. Towns should adopt accounting methods that reflect all capital costs and operational expenses of municipal recycling and waste disposal services, and make it known to taxpayers the costs of these services.

B. Towns should develop an integrated system of waste management that involves recycling, composting, incineration, and landfilling for dealing with municipal solid waste, biosolids, and construction and demolition materials.

C. Towns should consider reducing or omitting sticker fees for residential recycling. Price differentials for recycling versus solid waste disposal could serve to increase recycling rates, as has been done in several Cape towns.

Dennis transfer station. Credit: Nancy Hossfeld/CCC

4.3 Issue Area: Hazardous Materials and Waste Management

This Regional Policy Plan sets forth a vision of reducing the generation, use, and improper disposal of hazardous materials and waste.

On Cape Cod, thousands of households and businesses dispose of small quantities of hazardous waste at SEMASS, or pour wastes down the drain to septic systems and sewage treatment plants. These activities result in tons of hazardous waste each year being disposed in ways that contaminate air, land, and drinking water supplies. Most hazardous waste continues to be generated unnecessarily due to carelessness, lack of information about alternatives, and inadequate employee training.

This Regional Policy Plan sets forth a vision of reducing the generation, use, and improper disposal of hazardous materials and waste. In particular, the Plan seeks to protect those areas that contribute to drinking water supplies by limiting the amount of hazardous materials that can be stored or used. The Plan also seeks to better educate consumers about their choices in buying, using, and disposing of hazardous materials.

Credit: Cape Cod Cooperative Extension

Cost-effective management of hazardous waste begins with educational programs aimed at minimizing generation. Barnstable County offers education and technical assistance to businesses and residents about how to manage hazardous waste through the Cape Cod Cooperative Extension, the Barnstable County Department of Health and the Environment, and the Commission. The Regional Policy Plan continues Barnstable County's commitment to hazardous materials and waste education.

In 1998, the DEP issued new regulations governing municipal waste combustion facilities, including the SEMASS plant in Rochester, MA. These regulations required each facility to prepare a Materials Separation Plan describing methods the facility would use to remove products containing mercury and other toxic components from the waste stream prior to incineration. The SEMASS Materials Separation Plan primarily assists municipalities in developing programs to manage mercury-containing wastes such as fluorescent bulbs. This assistance includes developing education and outreach programs for both the general public and for schools, providing storage sheds to municipalities to promote collection programs, and promoting and funding a mercury thermometer exchange.

Environmentally safe and cost-effective hazardous waste disposal programs for Cape residents include paint collection facilities at town transfer stations, municipal used-oil collection programs, and collection events for pesticides, solvents, and other hazardous wastes. The Regional Policy Plan commits to assisting Cape towns in planning, promoting, coordinating, and evaluating household hazardous waste collection programs.

Finally, the Commission's Development of Regional Impact review process

also plays an important role in minimizing the use or generation of hazardous materials or wastes, and in fostering proper management of both. This is accomplished through stringent Minimum Performance Standards regarding the use, treatment, generation, storage, or disposal of hazardous wastes or hazardous materials within Wellhead Protection Areas or Potential Public Water Supply Areas. The standards also require the preparation of an emergency response plan that identifies potential on-site threats from hazardous materials.

Household hazardous products collection. Credit: Marilyn Lopes/Cape Cod Cooperative Extension

2001 Household Hazardous Waste Collections

	Waste Collected (Gallons)	Household Participation Rate (based on 2000 US Census)	Total Cost†
Barnstable	5,600	5%	$20,900
Bourne	13,105*	5%	$9,034
Brewster	1,760	8%	$6,590
Chatham	1,350	6%	$5,583
Dennis	4,280	5% / 4%	$15,154
Eastham	800	4%	$2,623
Falmouth	*	4%	$15,207
Harwich	770	7%	$6,140
Mashpee	*	4%	$5,600
Orleans	935	5%	$4,505
Provincetown	3,755**	8%	$4,677
Sandwich	*	4%	$8,632
Truro	**	15%	$4,824
Wellfleet	**	8%	$4,229
Yarmouth	2,980	3% / 1%	$18,209
CAPEWIDE	35,335	Average: 5%	$131,907

NOTES:
*Combined total from joint collections (during multiple events) for the Upper Cape towns of Bourne, Falmouth, Mashpee, and Sandwich and Air Station Cape Cod (U.S. Coast Guard housing).
**Combined total from reciprocal collections for the towns of Provincetown, Truro, and Wellfleet.
† Costs for hazardous waste disposal only; does not include costs for advertising, traffic control, or trash disposal.
A slash (/) indicates information from more than one collection.
Source: Compiled by the Cape Cod Commission from data supplied by Cape Cod towns.

Hazardous Materials/Waste

4.3.1 Goal:

Hazardous wastes generated by Cape Cod households and businesses shall be disposed in an environmentally sound manner.

Minimum Performance Standards

4.3.1.1 Development and redevelopment shall make reasonable efforts to minimize their hazardous material use and/or waste generation through source reduction, reuse, material substitution, employee education, and recycling. Applicants shall submit a plan to demonstrate how their project will achieve conformance with this standard.

4.3.1.2 Development and redevelopment shall be in compliance with Massachusetts Hazardous Waste Regulations, 310 CMR 30.000. Applicants shall submit a plan to demonstrate how their project will achieve conformance with this standard.

4.3.1.3 Development and redevelopment that involves the use, treatment, generation, storage, or disposal of hazardous wastes or hazardous materials, with the exception of household quantities, shall not be allowed within Wellhead Protection Areas.

4.3.1.4 Development and redevelopment shall prepare an emergency response plan that identifies potential threats to employee safety and health and threats of environmental releases and describes ways to reduce those threats.

Other Development Review Policies

4.3.1.5 Development and redevelopment should incorporate into building designs toxicity-reduction and materials-substitution concepts, including the use of refurbished, salvaged, or recycled materials and low-toxicity or least-toxic building products. To be counted as a benefit, refurbished, salvaged, or recycled building materials should comprise at least 10% of the entire building, and applicants should submit a plan to demonstrate how their project will incorporate other toxicity-reduction or materials-substitution measures.

Implementation

Commission Actions:

A. The Commission will seek to educate and assist residents, businesses, institutions, and governments on source reduction of hazardous materials and wastes.

B. The Commission will continue to assist in the development of state policies and regulations through participation in various Department of Environmental Protection (DEP) advisory committees.

C. The Commission will assist towns with bidding, coordination, data collection, and development of educational materials for household hazardous waste collection programs.

D. The Commission will publish an annual report summarizing household hazardous waste collection events or other programs held by Cape Cod towns.

Recommended Town Actions:

A. Towns should adopt a toxic and hazardous materials bylaw or regulation, utilizing the Cape Cod Commission's model or similar regulations.

B. Towns should continue to hold periodic household hazardous waste collection events for solvents, pesticides, and other hazardous wastes, and establish other programs at transfer stations for paint wastes and oil.

C. Towns should develop and maintain an emergency response plan for spills of hazardous materials during transit.

Household hazardous products collections. Credit all photos: Marilyn Lopes/ Cape Cod Cooperative Extension

4.4 Issue Area: Capital Facilities and Infrastructure

This Regional Policy Plan sets forth a vision of planning for and providing local and regional infrastructure and facilities that will mitigate the environmental and economic impacts of growth.

Credit: CCC file photo

Capital improvements and infrastructure play a critical role in determining the rate, pattern, and location of development on Cape Cod. With population growth, new residents and businesses place increased demands on the community facilities and services that are needed to sustain residential, commercial, and industrial development and are provided by towns, special districts, private utility companies, regional agencies, and state and federal agencies. These facilities and services include water supply and distribution facilities, sewage collection and treatment facilities, streets and roads, communication facilities, utilities, and public facilities such as schools and fire stations.

In many areas of the Cape, infrastructure and public services are inadequate to handle existing, much less projected, development. Many roads operate at an unacceptable Level of Service even during the off season. Infrastructure limitations in village and town centers lead to land-consumptive, sprawling development outside these areas. Towns are increasingly unable to expand facilities and services to meet existing needs due to diminishing state and federal assistance and local fiscal constraints. This affects not only the ability of towns to manage the impacts of growth but also to meet the human service needs of citizens, who may experience increased barriers to accessing services as travel and mobility become more difficult. Few towns have a long-term (i.e., 20-year) Capital Improvements Plan, which addresses the expansion of infrastructure. If they do have such a plan, they have been unable to fund it. In addition, public investment in infrastructure and services often is not coordinated with existing land-use plans. For example, the placement of infrastructure such as sewers in low-lying coastal areas is often necessary to remediate existing water quality problems, but without more restrictive zoning, their installation may stimulate further development in inappropriate areas, thereby worsening the water quality problems the sewer was intended to fix.

Moreover, if towns are to be effective in concentrating growth in Growth/Activity Centers and Growth Incentive Zones, as the Plan envisions, suitable wastewater treatment must be available. Without highly effective and more centralized systems, such as sewers, towns will not be able to accommodate the higher density and mix of uses that define such centers. In other words, comprehensive wastewater facilities planning and land-use planning must go hand in hand in order for growth to be properly managed.

This Regional Policy Plan sets forth a vision of planning for and providing local and regional infrastructure and facilities that will mitigate the environmental and economic impacts of growth. It further envisions the accommodation of higher-density development in villages and downtowns and the location of new development in growth centers where it can be served by existing infrastructure.

Finally, the Plan acknowledges the relationship between community services and infrastructure, and highlights the need to ensure that critical services are considered as an integral component of municipal infrastructure plans.

To achieve this vision, the Regional Policy Plan establishes development review policies to encourage new development to provide infrastructure, to encourage businesses to locate in Growth/Activity Centers and Growth Incentive Zones, and to promote the redevelopment of existing structures.

The Regional Policy Plan also calls for a new initiative in which the Cape Cod Commission will collaborate with the 15 Cape towns to develop a 20-year Regional Infrastructure and Facilities (RIF) Plan. The RIF Plan will be a region-wide plan created in conjunction with the designation of Growth/Activity Centers and Growth Incentive Zones. The plan will:

- identify all existing infrastructure and facilities within towns;
- identify the location-specific needed infrastructure and facilities;
- establish priorities;
- identify potential funding mechanisms and sources; and
- facilitate the development of implementation plans.

The provision of infrastructure and capital facilities should allow for greater density in identified Growth/Activity Centers and Growth Incentive Zones while discouraging growth in outlying areas. The RIF Plan must be strongly coordinated with local and regional incentives to redirect growth to areas with existing or planned infrastructure. The plan will be updated with each five-year review and revision of the Regional Policy Plan.

The Cape Cod Commission and Barnstable County have a key role to play in planning for and funding public and private regional facilities. Regionally planned or funded infrastructure can be more cost-effective and can benefit towns that are financially constrained, while providing a more overarching framework for sustainable growth. Local opposition has sometimes made it difficult, however, to develop regionally needed facilities such as waste disposal facilities (sewage, septage, solid waste), special needs housing, hospitals, and correctional facilities. The Commission can help to coordinate the siting of such facilities through its planning activities with the towns and the development of the Regional Facilities and Infrastructure Plan.

At the town level, the Capital Facilities Element of the Local Comprehensive Plan establishes the policies that guide the provision of needed services. The purpose of the Capital Facilities Element is to establish where and when new infrastructure or capital facilities will be provided and how they will be financed. The Capital Improvements Plan provides the most specific details about infrastructure and associated costs. A detailed survey of existing facilities, how they were financed, and current Levels of Service (LOS) must also be established by the town to analyze impacts of future development properly. (For a complete list of information to be included in a Capital Facilities Element and a Capital Improvements Plan, see Local Comprehensive Plan Guidelines, Technical Bulletin 93-001.) The Capital Improvements Plans will be the basis from which the Regional Facilities and Infrastructure Plan will be developed.

Bourne landfill. Credit: MA Executive Office of Environmental Affairs

Refer to Technical Bulletin 93-001.

Both photos: Hyannis wastewater treatment facility. Credit: Ed Eichner/CCC

For those towns without a Capital Improvements Plan, the Commission will work directly with the towns to help develop one while creating the RIF Plan. Because the planning and provision of infrastructure is a long-term activity, the use of growth caps could be instituted in towns throughout the Cape to slow growth and allow time for planning, the accumulation of funds, and the provision of needed infrastructure in appropriate locations.

One opportunity for raising needed funds for infrastructure is provided in the Cape Cod Commission Act. The Act authorizes towns to charge "impact fees" once their Local Comprehensive Plans have been certified by the Cape Cod Commission. Impact fees are one-time assessments that may be levied by municipalities to pay the capital costs of new residential and commercial development. The fees help to fund the construction or expansion of municipal facilities and infrastructure needed to serve new development such as transportation, sewage treatment, water supplies, parks, police and fire facilities, affordable housing, libraries, and open space.

Impact fees are one of the tools for regulating and managing growth and are most useful for municipalities that are experiencing or anticipating growth. For impact fees to be effective, a town should have strong underlying zoning, land-use regulations, and environmental regulations that reflect the goals and policies in the town's Local Comprehensive Plan. Otherwise, the use of impact fees may lead to undesirable growth and sprawl by providing infrastructure capacity to inappropriate locations. The Cape Cod Commission will research and determine whether a regional impact-fees system would be of benefit to the towns and the region in providing much-needed capital facilities and infrastructure. (See the Commission's Impact Fees Guidance Document, regulations, and model bylaw/ordinance for more detailed information.)

As mentioned in the Economic Development section of the Plan, one of the Cape's chief economic development priorities is to promote more high-tech business and the communications infrastructure to support it. The Cape Cod Commission will work with the Cape Cod Technology Council's Infrastructure Committee on strategies for bringing a high-bandwidth service to Cape Cod, a measure that would lower telecommunications costs, result in better service,

and provide competitive advantages for businesses on Cape Cod. The RPP also contains recommendations that new construction include the installation of high-bandwidth fiber optics.

Another aspect of promoting high-tech business on Cape Cod involves improvements to wireless telecommunications facilities. While such improvements can have many economic benefits, they may also cause impacts to the Cape's scenic character if inappropriately designed and sited. Since 1996, the Commission's planning and regulatory program for wireless telecommunications has tried to balance the establishment of wireless technologies for Cape Codders with environmental concerns and scenic protection. Proposals for a number of wireless telecommunications facilities have gone through Commission review as Developments of Regional Impact. Those that were approved are now providing increased and improved wireless telecommunications services for Cape residents and businesses. Numerous other wireless facilities have been installed on existing buildings and structures, such as water towers. The Commission will continue its efforts to be well informed regarding new technologies as they emerge and will work to provide all state-of-the-art telecommunications services to the Cape in a manner that protects community character.

Credit: Nancy Hossfeld/CCC

Capital Facilities and Infrastructure

4.4.1 Goal:

To identify and provide state-of-the-art community and regional facilities that meet community and regional needs consistent with the goals and policies established in Local Comprehensive Plans, the Regional Policy Plan, and the Capewide Regional Infrastructure and Facilities Plan.

Minimum Performance Standards

4.4.1.1 Approval of development and redevelopment that increase the intensity of use shall be based on existing infrastructure and system capacity or on a development's ability to provide the infrastructure and services necessary to support it. The provision of infrastructure and services shall be consistent with the Minimum Performance Standards in the Regional Policy Plan and consistent with the town's Local Comprehensive Plan, Capital Improvements Plan, and the Regional Infrastructure and Facilities Plan. Outside of Growth/Activity Centers and Growth Incentive Zones installation by the developer of necessary infrastructure shall be timed to meet the need generated by the development. Within Growth/Activity Centers and Growth Incentive Zones, the developer may provide a contribution of funds toward the necessary improvements.

4.4.1.2 Development of new infrastructure shall occur only after an analysis of the impacts of this infrastructure with regard to land use, traffic, water quality, natural resources, affordable housing, community services, historic preservation, and community character as well as other applicable issue areas noted in the Regional Policy Plan and shall be consistent with the town's Local Comprehensive Plan and Capital Improvements Plan and with the Regional Infrastructure and Facilities Plan.

4.4.1.3 Privately provided infrastructure to service development and redevelopment shall be consistent with the Local Comprehensive Plans and the Regional Infrastructure and Facilities Plan and, when constructed off-site, shall receive formal approval from the town and other jurisdictional agencies, such as the Massachusetts Highway Department or the Department of Environmental Protection, prior to construction.

Other Development Review Policies

4.4.1.4 Public investments, including construction or expansion of infrastructure and facilities, including but not limited to municipal buildings, water supply and distribution, sewage collection and treatment, roads, telecommunications, and related facilities, should reinforce the traditional character and village development patterns of Cape Cod. This includes burial of electric and telecommunications utility lines.

4.4.1.5 Development and redevelopment should be encouraged to locate in Growth/Activity Centers and Growth Incentive Zones and areas where sufficient capacity exists with regard to transportation and water resources, and where adequate infrastructure already exists or is planned in the Local Comprehensive Plans and/or the Regional Infrastructure and Facilities Plan.

Capital Facilities and Infrastructure

4.4.2 Goal:

To encourage the provision of state-of-the-art and appropriately sited telecommunications infrastructure and facilities so as to promote economic development, telecommuting, and preservation of the quality of life and visual character of the Cape, and to make available high-speed telecommunications services to all communities and all classes of users.

Minimum Performance Standards

4.4.2.1 Wherever feasible, new wireless telecommunications facilities shall be required to locate on existing structures and/or co-locate with existing facilities in order to minimize their visual and environmental impacts. Construction of new telecommunications towers requires the commitment of two or more co-locators and shall be consistent with Wireless Technical Bulletin 97-001, as amended.

Other Development Review Policies

4.4.2.2 Development of new office and industrial buildings should include wiring to provide high-bandwidth fiber optics, for either present or future service capabilities. Redevelopment of existing office space and industrial buildings should provide a cost analysis for retrofitting to provide high-bandwidth fiber optics.

4.4.2.3 Redevelopment of existing office space and industrial buildings should be encouraged to provide installation of high-bandwidth fiber optics.

Implementation

Commission Actions:


New Hyannis Intermodal Transportation Center.
Credit: Nancy Hossfeld/CCC

A. The Commission will identify through the development of a Regional Infrastructure and Facilities Plan needed local and regional facilities and infrastructure, including but not limited to water supplies, septage disposal facilities, water and wastewater treatment plants, recycling facilities, hazardous waste collection facilities, landfills, waste transfer stations, a sludge treatment facility, mass transit facilities, telecommunications, health care facilities, community services, and special needs housing.

B. The Commission will work with the towns to develop policies, bylaws, and development regulations to provide incentives that encourage mixed-use development and the provision of infrastructure in Growth/Activity Centers and Growth Incentive Zones.

C. The Commission will research the possibility of developing a Capewide Impact Fee System for selected regional, system-wide facilities and/or infrastructure, or to meet a regional goal. Such facilities may include but are not limited to transportation projects, public transit, wastewater treatment facilities, and affordable housing.

D. The Commission will help communities with preparation of the Capital Facilities Element of their Local Comprehensive Plans.

E. The Commission will monitor the impacts of new telecommunications technologies on the economy, land use, and transportation infrastructure and make recommendations for utilizing telecommunications to develop the economy and improve communications options for businesses and individuals. The Commission will work on strategies to improve telecommunications bandwidth on Cape Cod.

Recommended Town Actions:

A. Towns should contribute to the development of the Regional Infrastructure and Facilities Plan and their own Local Comprehensive Plan by identifying and planning for the provision of appropriate infrastructure improvements where needed, such as public water supply and wastewater treatment facilities, in growth centers and business areas to support concentrated development. The towns should develop (or update) a Capital Improvements Plan (CIP) in conjunction with the above activities. Towns should provide incentives for locating development within designated Growth/Activity Centers and Growth Incentive Zones and should also limit infrastructure improvements in areas where development is not encouraged as established in their Local Comprehensive Plans.

Brewster Ladies Library. Credit: MA Executive Office of Environmental Affairs

B. Towns should review their zoning regulations and maps in order to plan for sufficient quantities of land in appropriate locations to serve community needs, including economic development, housing, water supply, police, fire, libraries, health and social services, waste disposal, education, community centers, telecommunications facilities, and recreation, as well as a fair share of necessary regional facilities. Specific sites for such purposes should be identified in local plans.

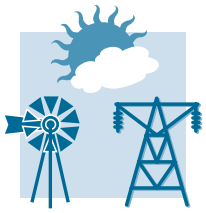
C. Towns should establish Levels of Service (LOS) for all public services, infrastructure, and facilities including, but not limited to, the following: roads, police and fire, emergency medical services, library, schools, open space, parks and recreation, solid waste disposal, and sewer and water lines. These should be included in the town's Local Comprehensive Plan and/or the Capital Improvements Plan to use as baseline data to assess impacts and changing conditions over time due to development.

D. Towns should adopt a growth cap, or other land use mechanism, to limit the rate of development over time in order to allow for planning, the accumulation of funds, and the provision of needed infrastructure.

E. Towns should adopt or revise (if needed) local bylaws and siting criteria to regulate wireless communications facilities, consistent with the Regional Policy Plan and the Local Comprehensive Plan.

Sandwich Health Center. Credit: Nancy Hossfeld/CCC

Both photos: Marstons Mills schools. Credit: Nancy Hossfeld/CCC



4.5 Issue Area: Energy

According to the Barnstable County Energy Management Plan of 1994, the average consumer on Cape Cod spends $475 more on energy annually than the average off-Cape Massachusetts consumer, even though usage is 11% less. The Cape's electric costs are the fifth highest in the nation, while its winter gas costs are third highest.

Such high energy costs harm both the overall economy of Cape Cod and individual consumers, especially lower-income families and retirees on fixed incomes. The Federal Department of Energy has estimated that existing conservation methods could reduce energy consumption by 33% to 50%. The Barnstable County Energy Management Plan found that saving as little as 10% of the dollars spent on energy would amount to an additional $43 million kept in the local economy.

Cape Cod can address its energy issues in two ways: (1) reduce the consumption of energy or utilize more efficient fuels, and (2) reduce the cost of energy from the provider. The Barnstable County Energy Management Plan, which was called for in the 1991 Regional Policy Plan, resulted in a number of recommendations. One such recommendation urged the establishment of a Barnstable County Energy Committee under the County Commissioners to promote energy conservation, renewable energy, and options for small consumers facing deregulation of the electric industry. Given the importance of these issues to Cape Cod, the County Energy Committee helped establish the Cape Light Compact in conjunction with the Barnstable County Commissioners and the Cape's towns.

The 15 Cape Cod towns and six Martha's Vineyard towns approved formation of the Compact. Its governing board is made up of representatives of each of these towns and the Barnstable County and Dukes County commissioners. The Cape Cod Commission has provided staff support to the Cape Light Compact and has sought to incorporate the Compact's findings into the Commission's work on economic development, housing, energy, and transportation. Since 1997, the Compact has become recognized as a national model for communities engaged in energy issues. Its work is being emulated in other states.

The Compact has been following through on tasks outlined in the 1996 RPP, which include: (1) reducing consumer electric costs through the Community Choice Power Supply Program and advocacy efforts with state agencies and the legislature; (2) energy efficiency efforts; and (3) a distributed generation (small-scale, local production of electricity) program that includes renewable energy. Some of the Compact's achievements in these areas include:

- negotiating the first major public-aggregation power-supply contract in the nation to provide energy savings to all consumers;
- preserving $25 million for the Cape and Martha's Vineyard in

Credit: Nancy Hossfeld/CCC

This Regional Policy Plan sets forth a vision, guided by the mission of the Cape Light Compact, to promote safe, clean, reliable, and affordable power for Cape Cod residents.

ComElectric's Asset Divestiture Case before the Department of Telecommunications and Energy;

- coordinating an effort among the towns to purchase streetlight equipment and natural gas for schools, and to implement an Energy Efficiency Plan (EEP) for Cape and Vineyard towns; and,
- developing a Distributed Generation Program to encourage small-scale power production, which could promote the use of renewable energy and alternative fuels.

This Regional Policy Plan sets forth a vision, guided by the mission of the Cape Light Compact, to promote safe, clean, reliable, and affordable power for Cape Cod residents. Specifically, the Commission and the Cape Light Compact will work to meet the Cape's energy needs through investments in energy efficiency, conservation, renewable energy sources, and distributed energy generation. The RPP also promotes more efficient patterns of land use that support the use of transit and other energy-efficient means of travel instead of the automobile.

The costs of energy are strongly related to energy efficiency. According to the Barnstable County Energy Management Plan, about 60% of the total Cape housing stock (81,000 units) does not meet current state and national energy code standards. About 26,000 units are owned or rented by low- or moderate-income residents, with many of the units heated by high-cost electricity. Low- and moderate-income households are disproportionately affected by high energy costs in that they have to spend higher proportions of their income on energy. Commercial, industrial, and municipal buildings,

Searsburg, VT. Credit: Martha Twombly/CCC

which consume approximately 24% of the Cape's total energy, are also in need of efficiency improvements. Federal home weatherization and fuel assistance programs, which have been effective in conserving energy and making fuel costs affordable to low-income families, have been cut substantially in the last decade. Therefore, Cape Cod needs to seek ways to promote energy conservation that utilizes existing institutions and does not require elaborate new initiatives. For instance, the Home Energy Loan Program was a model for using local banks to make energy conservation loans, although the program has been discontinued. Energy audits for residential and commercial buildings offered through existing utility and private programs need to be maintained. The Regional Policy Plan encourages such energy efficiency in development review policies relating to new construction by considering such measures a benefit during project review.

Using local renewable energy sources would also enable Cape Cod consumers to keep more money in the local economy. Among the many kinds of renewable energy resources that hold potential for energy generation are:

- **Wind Power:** The Outer Cape has some of the highest and steadiest

winds in the country. Wind-power generation also has become more cost-competitive with conventional forms of power generation.

- **Solar Power:** Solar energy is especially cost-efficient for water heating and passive-space heating. Photovoltaics, though not economical in many situations today, are expected to be significantly less expensive in the near future and will allow decentralized, small-scale electric generation at sites off the power grid.

- **Fuel Cells:** Another emerging technology for electrical generation is the fuel cell which, by processing hydrogen or natural gas, produces little or no pollution and is versatile enough to power a building, neighborhood, or town. It will be important for Cape towns to take advantage of these technologies as they come to market.

- **Geothermal Energy:** The use of geothermal heating and cooling systems are becoming economical for most commercial uses on Cape Cod. Geothermal technologies use the difference between the air temperature and the constant temperature beneath the ground to heat and cool buildings. This process uses far less electricity than conventional heating and cooling systems.

- **Wave Energy:** Energy harnessed from ocean waves may hold potential for Cape Cod. This technology generates electricity by converting wave energy to electricity. The generation modules can be mounted near shore in connection with existing coastal structures or can be installed further offshore. These technologies are presently in use at various installations throughout Europe.

Installation of a photovoltaic panel. Credit: Joan Muller

Renewable energy technologies also benefit the high technology industry, which demands a reliable and uninterrupted source of electricity. Renewable sources have the ability to buffer against fluctuations in supplies and prices that are increasingly symptomatic of the recent energy market. In addition, renewable energy technologies, if manufactured on Cape Cod, could also be a potentially valuable and clean industry for the regional economy. The Regional Policy Plan makes a number of recommendations at both the local and county level for pursuing renewable energy technologies.

One method of addressing both energy conservation and consumer cost issues is through distributed energy generation. Distributed generation produces electricity using modular technologies on a smaller scale. Power can be generated at the municipal level, giving the municipality more control over prices and saving transmission costs to ratepayers. Distributed generation makes renewable energy systems, such as fuel cells, wind power, and photovoltaics more cost competitive. As other parts of the United

States struggle with high energy prices associated with electric utility deregulation, distributed generation using renewable energy technologies appears to be the best way for Barnstable County to balance long-term price stability and adequate environmental protection. The RPP urges the Commission and the Cape Light Compact to work with local, state, and federal agencies to overcome regulatory and institutional barriers to distributed energy generation.

Transportation on Cape Cod accounts for approximately 32% of regional energy consumption. Cape Cod is highly reliant upon the automobile, which creates traffic congestion and air pollution as well as consuming energy. The RPP encourages alternate modes of transportation, including public transit, carpooling, bikes, and walking paths. It requires that new development establish bicycle and pedestrian paths and connections to transit as part of the development process. The RPP also encourages alternative automobile fuels, such as propane or Consolidated Natural Gas (CNG) that can save fleet users up to 40% of fuel costs and reduce air pollution at the same time. Super-oxygenated fuel additives such as ethanol and biodiesel can also significantly reduce air emissions.

Energy

4.5.1 Goal:

To encourage energy conservation and improved energy efficiency, stimulate investment in energy conservation, renewable energy resources, and distributed generation, and manage land uses to maximize energy efficiency.

Minimum Performance Standards

4.5.1.1 New development shall be required to lay new utility lines underground for aesthetic reasons, safety, maintenance of a high degree of power reliability, and facilitation of the development of walkways and bikeways.

4.5.1.2 Energy-saving transportation activities including carpooling, mass transit programs, bicycling, and walking shall be encouraged as an alternative to automobile trips. Where feasible, historic footpaths shall be maintained and safe bicycle and walking links shall be created to establish an interconnected regional transportation system. Where feasible, bikeways and footpath connections between commercial, and residential neighborhoods and between compatible uses shall be provided to create a safe alternative to travel on major roads.

Other Development Review Policies

4.5.1.3 Development and redevelopment should be designed to promote the efficient use of energy, including orienting structures to take advantage of solar gain and to maintain solar access for adjacent sites. Site design should protect and optimize the potential for the use of solar energy for heating and electricity.

4.5.1.4 Development and redevelopment should incorporate energy-efficiency measures that exceed state standards. Energy-efficient construction

techniques and materials to be encouraged would include but not be limited to:

- above-minimum R-values for insulation of walls, attics, and foundations;
- use of thermal-pane windows with low-emissivity coating with high R-values;
- annual fuel-usage efficiency ratings of at least 90% for all new heating systems; and,
- use of segregated or on-demand water heaters.

Implementation

Commission Actions:

A. The Commission will work with the Cape Light Compact and other organizations on their projects related to energy conservation and renewable energy. Commission staff, in particular, will provide assistance in researching various energy conservation and renewable energy issues. The Commission will provide assistance to the Cape Light Compact on its Community Choice Power Supply Program, Energy Efficiency Program, and Distributed Generation Program.

B. The Commission will promote the development of energy-efficient transportation alternatives.

C. The Commission will assist the Cape Light Compact, town governments, and other concerned organizations to promote energy-conservation measures in existing buildings.

D. The Commission will work with towns, utility companies, and private parties to develop long-term plans for relocating existing utility lines underground, prioritizing locations where such underground installation will improve power reliability and safety, enhance heritage preservation and community character, or restore scenic views.

E. The Commission will work with the Cape Light Compact and other concerned organizations on changes to government policies and codes to promote the installation of renewable and distributed generation technologies. The Commission will work with these groups on overcoming regulatory obstacles to installing renewable and distributed generation technologies. This will include working with the US Department of Energy, Massachusetts Department of Telecommunications and Energy, Massachusetts Division of Energy Resources, and local governments to remove barriers to renewable energy and distributed generation.

Cape Light Compact Actions:

A. The Cape Light Compact and other agencies will work with the Barnstable County Commissioners and the towns on seeking lower electric rates for consumers, businesses, and local government. This entails aggregating all consumers to achieve the lowest possible rates in the Community Choice Power Supply Program. The Compact will work with municipalities to ensure that energy conservation/demand-side

management and low-income assistance programs currently offered by utilities are maintained through deregulation.

B. The Cape Light Compact will encourage Cape Cod lenders to offer mortgages that promote energy efficiency.

C. The Cape Light Compact will encourage the use of financially feasible renewable energy sources of distributed generation, particularly wind power, solar, and fuel cells.

D. The Cape Light Compact and other organizations will research construction guidelines and incentives that improve on existing levels of conservation and renewable energy.

Recommended Town Actions:

A. Towns should incorporate energy conservation and renewable energy policies in their Local Comprehensive Plans.

B. Towns should work with the Cape Light Compact through each town's Compact representative on developing and promoting the Community Choice Power Supply Program, Energy Efficiency Program, and Distributed Generation program.

C. Towns should enforce energy conservation standards for development and redevelopment.

D. Towns should consider providing incentives for the use of energy-conserving building improvements and renewable energy devices in all existing and new buildings, if cost effectiveness over the improvements' expected lifetimes can be demonstrated.

Eastham Windmill. Credit: James C. O'Connell/CCC

E. Towns should make municipal buildings, facilities, and street lighting more energy efficient. A percentage of the net monetary savings from conservation at municipal buildings should be invested in further energy improvements.

F. Towns should consider utilizing clean alternative fuels, such as propane gas Consolidated Natural Gas (CNG), super-oxygenated fuel additives such as ethanol and biodiesel, and electricity, for all new fleet vehicles and shuttle buses.

G. Towns should work with the Commission, Cape Light Compact, and other organizations to educate citizens about renewable energy and distributed generation through public demonstration projects.

H. Towns should establish a priority list of overhead utility lines and associated structures that should be installed underground for reasons of safety, enhancement of community character, heritage preservation, or restoration of scenic views.

5. Issue Area: Affordable Housing

The affordable housing issue on Cape Cod has seen major changes since the 1996 Regional Policy Plan. There is growing awareness that the lack of affordable housing on the Cape affects many facets of life. More and more people are cognizant that an ever-growing segment of the seasonal and year-round population is vulnerable, and that we are threatened with the loss of the very fabric of our communities. This consciousness has translated into closer cooperation between the housing, economic, and environmental communities for the benefit of all.

The housing woes reported in the 1996 Regional Policy Plan have deepened and become more acute. The "affordability gap"—the difference between housing costs and the proportion of one's income that can be reasonably allocated to pay for housing—has become much more severe for renters and home buyers alike. The impacts of the Cape's second home market on local housing costs and the diminishing supply of reasonably priced units to rent or own is an even greater concern today than it was five years ago.

In the winter of 1999, the Commission released the Barnstable County Affordable Housing Needs Analysis. The analysis, prepared by the Lower Cape Cod Community Development Corporation, reported on the following:

- The estimated median rent was $1,050. A household at 80% of median income could afford a rent of no more than $707.
- Renters, along with families or elders earning less than 50% of median income, are particularly vulnerable to the hardships resulting from rising housing costs and the lack of affordable housing.
- The strong real estate market was being fueled mainly by the purchase of second homes, creating a dramatic impact on the diminishing supply of rental units.
- Approximately 46% of the Cape's year-round population could be classified as low income.

In the fall of 2000, the *Cape Cod Times* ran a week-long series documenting the nature and depth of the Cape's housing woes. The series upheld many of the findings of the Barnstable County Analysis. Called "Crisis at Our Doorstep," it reported the following:

- The median cost of housing on Cape Cod in 2000 was $182,000, up 62% since 1995.
- Seven out of 10 year-round residents could not afford the median cost of housing.
- More than 1,000 rental units have been lost since 1990, resulting in soaring rental prices.

This Regional Policy Plan sets forth a vision of providing ample affordable housing for both renters and homeowners in a manner that is consistent with other elements of the Regional Policy Plan and with good growth

Affordable rental cottages, Eastham. Credit: Ed Allard/CCC

This Regional Policy Plan sets forth a vision of providing ample affordable housing for both renters and homeowners in a manner consistent with Regional Policy Plan elements and good growth management principles.

management principles in general. This means locating growth in existing town centers or within preexisting structures or sites served by transit and wastewater infrastructure. This in turn reduces environmental impacts and consumption of open space while providing easy access to jobs and services in a way that lessens reliance on and costs associated with private automobiles. Affordable housing should also be built with the greatest possible level of energy efficiency so as to reduce the operational costs of maintaining a home. A mix of housing types, such as accessory units, apartment buildings, congregate housing, townhouses, single-family homes, and assisted-living residences should be provided to meet the diverse housing needs of the Cape's population.

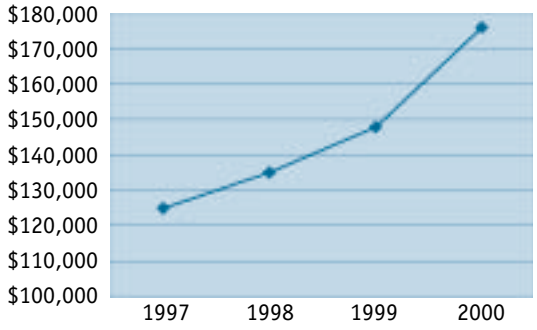
Achieving this vision will require a renewed effort on the part of the Commission, the towns, and all of the public and private interests on Cape Cod. In 2000, an affordable housing summit drew more than 350 people. The summit, cosponsored by the Cape Cod Chamber of Commerce, Association for the Preservation of Cape Cod, Housing Assistance Corporation, and Cape Cod Commission, provided an opportunity to build bridges between the housing, environmental, and business sectors, raise public awareness, and encourage action at local levels.

As a direct result of the housing summit, housing committees of one form or another have been established in almost all of the towns on Cape Cod. There has also been an increased level of cooperation between the housing and environmental communities, culminating in the creation of the Housing Land Trust for Cape Cod to acquire land for affordable housing.

Despite these efforts, the Cape's housing problems remain quite serious as the growth of expensive residential housing vastly outpaces the provision

Median Residential Sales Prices in Barnstable County, Massachusetts

Year	Median Sales Price
1997	$125,000
1998	$135,000
1999	$147,900
2000	$176,000



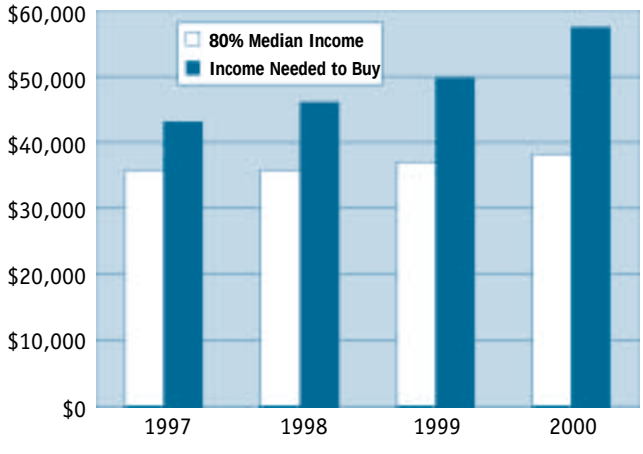
Source: Banker & Tradesman/Warren Information Services.

of affordable housing for residents. Moreover, the "suburban model" of zoning, which in many ways has contributed to the affordable housing crisis by propagating almost without exception single-family homes on large, isolated lots, is an expensive means of using scarce public funds, and is inappropriate for meeting the needs of those seeking affordable housing. In appropriate locations, zoning bylaws should be changed to promote affordable housing. Accessory apartment bylaws, multi-family zoning, special-permit bylaws that grant density bonuses, amnesty for illegal housing units, and linkage programs all have the potential to significantly increase affordable housing at the local level. The Regional Policy Plan encourages affordable housing in those areas suitable for higher-density mixed residential and commercial development, and provides guidance for changes in zoning to foster housing types for a range of incomes.

Of course, nearly all affordable housing development involving new construction requires some form of density relief. Consequently, such projects run the risk of coming into conflict with water quality resource issues. The

Housing Affordability Gap in Barnstable County, Massachusetts

Year	80% Median Income	Income Needed to Buy Median Priced Home
1997	$35,760	$43,120
1998	$35,760	$46,040
1999	$37,040	$49,640
2000	$38,160	$57,480



Source: U.S. Department of Housing and Urban Development.

CHIP's House II, affordable housing for head-injured persons, Centerville. Credit: Loretta Ruchinskas

Regional Policy Plan recommends using infill development or redevelopment of existing structures, especially where housing can be located on existing wastewater infrastructure. Other new affordable housing should use nitrogen-reducing "cluster" septic systems or other innovative technologies. While affordable housing developers have a role to play in finding such solutions, the thrust for this effort must come from the water quality experts at the county and town levels.

Creating affordable housing in Developments of Regional Impact has been a vital part of the Commission's regulatory process. The Regional Policy Plan has strengthened the requirement that all residential DRIs provide 10 percent of the units as affordable. The standards also require that affordable units or lots be provided by the developer rather than mitigated through cash payments. A study of the linkage between commercial development and affordable housing needs will also be conducted, and may lead to further recommendations regarding the provision of affordable housing as part of commercial projects.

Strategies are needed at the county and local levels to secure financial resources for affordable housing. Presently there is no dedicated source of funds for affordable housing similar to those generated for open space and economic development from the Cape Land Bank or Cape License Plate programs, respectively. Therefore, the Plan recommends continued use of Barnstable County surplus funds and pursuit of tools such as the state's Community Preservation Act to provide a stream of funding for affordable housing.

Towns can and must play a vital role as well. Local adoption of housing action plans is essential in order to define housing needs and identify needed resources. As developable land becomes increasingly scarce, towns should assess the suitability of remaining sites for affordable housing, particularly town-owned land. The Plan recommends that Barnstable County and Cape towns work together to set aside publicly owned land and buildings for affordable housing.

Finally, the Regional Policy Plan recommends continued education and outreach to inform the public about the need for affordable housing. During the past 11 years, the Commission has had a major impact on the Cape's overall capacity to address its affordable housing needs. It has achieved this by mustering financial resources, providing technical assistance, and maintaining a clear focus on the issue at both the regional and local levels. The Commission will continue to play a central role in meeting the challenges that lie ahead by providing both leadership and technical expertise. This RPP represents the foundation for how the Commission will meet those challenges and improve the overall quality of life for Cape Cod residents.

Minimum Performance Standards

5.1.1 Residential construction and redevelopment projects of 10 units or more shall provide at least 10% of the proposed units as affordable units. In lieu of providing such units on site, the applicant may satisfy these requirements by providing equivalent housing units off site through the purchase of existing units, redevelopment, new construction, or a contribution of land that can support the required number of affordable units.

5.1.2 Residential subdivision plans of 10 lots or more shall provide at least 10% of the proposed lots as affordable housing sites. In lieu of providing such lots on site, the applicant may develop, or contribute equivalent off-site lot(s) that can support the required number of affordable units. The applicant may also offer equivalent housing units off site through the purchase of existing units, redevelopment, or new construction.

5.1.3 Prior to final review by the Commission for DRIs, an applicant must demonstrate that off-site lots are buildable and/or units habitable. In the event that the off-site lots or units are determined to be unsuitable by Commission staff, an acceptable alternate contribution will be required.

5.1.4 For DRIs, the units or lots resulting from Minimum Performance Standards 5.1.1 and 5.1.2 shall be in the town where the DRI is located.

5.1.5 For DRIs, all affordable housing contributions shall be initiated upon the conveyance of any of the subdivision lots or the issuance of a building permit for any of the lots, whichever occurs first. The applicant shall notify the Commission prior to conveyance of any of the lots and/or application for a building permit for any of the lots.

5.1.6 For DRIs, development of on-site affordable housing shall take place at a rate and time frame to be determined by the Commission and shall be secured as a condition of approval.

5.1.7 Affordable housing units created by this section shall use deed restrictions that require the units to remain affordable in perpetuity.

5.1.8 On-site affordable housing units created by this section shall be integrated with the rest of the development and shall be compatible in design, appearance, construction, and quality of materials with other units. For DRIs, location of the affordable units and construction specifications are to be approved by the Commission prior to the start of construction.

5.1.9 The type (i.e., rental, homeownership), bedroom composition, and unit size of the affordable housing units resulting from Minimum Performance Standards 5.1.1 and 5.1.2 shall be subject to the area's priority housing needs as

Affordable Housing

5.1 Goal:

To promote the provision of fair, decent, safe, affordable housing for rental or purchase that meets the needs of present and future Cape Cod residents. At a minimum, each town shall seek to raise its affordable housing stock to 5% of all year-round units by 2005, 8% of all year-round units by 2010, and 10% of all year-round units by 2015.

determined by the Commission in coordination with the Five Year Consolidated Plan and Local Comprehensive Plans.

5.1.10 For DRIs, the applicant shall submit a marketing plan to the Commission, subject to its approval, that describes how the affordable units will be marketed to potential home buyers and/or renters. In the case of homeownership, the plan shall include a description of the lottery process utilized for selecting the home buyers.

5.1.11 For DRIs, prior to the occupancy of the affordable units, the applicant shall demonstrate that the occupants are income-eligible as determined by the Commission. The applicant shall be required to use the Commission's application package and format in determining income eligibility.

5.1.12 For the purposes of calculating the 10% affordable housing contribution, all numbers shall be rounded to the highest whole figure.

5.1.13 For DRIs, residential and/or commercial construction, redevelopment, or subdivision development projects resulting in the reduction of non-condemned residential units shall be prohibited, unless otherwise permitted by the Commission.

5.1.14 Residential construction, redevelopment, or subdivision development projects resulting in dislocation of existing residential occupants shall be subject to the provisions of the federal Uniform Relocation Act.

Other Development Review Policies

5.1.15 Affordable housing should be provided as part of residential and mixed-use residential and commercial development. Particular attention should be given to locating affordable housing in or near Growth/Activity Centers and Growth Incentive Zones and convenient to transportation corridors.

5.1.16 For DRIs, if it can be demonstrated to the satisfaction of the Commission that 50% of the proposed units in a residential Development of Regional Impact will be made available at an affordable price to households at 95% of the median income, the 10% affordable housing set-aside requirement may be reduced to 5%.

5.1.17 Guidelines contained in certified Local Comprehensive Plans to determine the local entity or organization that will receive the affordable housing contribution should be followed. In the absence of such a plan, the Commission may make this determination for DRIs.

5.1.18 Preference regarding off-site compliance with the affordable housing requirement should be first for the use of existing structures, second for the construction of new units, and third for land offerings.

Affordable Housing

5.2 Goal:

To promote equal opportunity in housing and give special consideration to meeting the housing needs of the most vulnerable segments of the Cape's population, including but not limited to very low income (50% of median income), low income (51% to 80% of median income), single heads of household, racial minorities, and others with special needs.

Minimum Performance Standards

5.2.1 In all of its actions the Commission and project proponents shall work to prevent discrimination in housing because of race, color, creed, religion, sex, national origin, primary language, age, political affiliation, disability, sexual orientation, or any other consideration prohibited by law, and shall not knowingly approve any development that so discriminates.

5.2.2 Residential construction and redevelopment projects shall provide at least 10% or one unit, whichever is greater, of the proposed units as legally handicapped accessible unit(s).

Other Development Review Policies

5.2.3 The use of the "visit-ability" program as a standard for increasing accessibility of residential units should be promoted as a means for ensuring simple access into any home and into the bathroom for occupants and visitors.

Affordable Housing

5.3 Goal:

To seek out, provide support for and encourage the development of innovative strategies designed to address the housing needs of Cape Cod residents, with particular attention to the needs of low- and moderate-income renters.

Minimum Performance Standards

5.3.1 For commercial DRIs, the applicant shall provide an analysis of affordable housing needs generated by the project.

5.3.2 New developments with a high need for seasonal workers shall make provisions for employee housing or assist in placing summer employees in housing designed specifically for summer use, such as cottages or accessory apartments.

Development Review Policies

5.3.3 Reuse of existing structures as a means for creating affordable housing should be supported and encouraged.

5.3.4 The development of assisted-living facilities, single-room occupancy, and other similar affordable housing types should be encouraged.

5.3.5 The use of HOME and Soft Second Loan Program funds should be encouraged.

Affordable Housing

5.4 Goal:

To develop and promote strategies, plans, policies, and actions that integrate the development of affordable housing with protection of the Cape's environment.

Development Review Policies

5.4.1 Use of alternative septic technologies and alternative construction techniques in conjunction with the development of affordable housing should be encouraged and expanded.

5.4.2 Cumulative-loading analyses or other similar strategies that identify areas where there is adequate nitrogen capacity for development of affordable housing should be promoted.

Lower Cape Cod CDC's Wellfleet Family Apartments. Credit: Paul Ruchinskas/CCC

Implementation

Commission Actions:

A. The Commission will promote local adoption of zoning and planning bylaws, Districts of Critical Planning Concern, growth management bylaws, and changes in tax assessment policies that foster the development of affordable housing.

B. The Commission will provide technical assistance to communities in developing their housing plans and meeting the ongoing certification requirements of the Governor's Executive Order 418, and will monitor each town's compliance with their comprehensive housing plan on an ongoing basis. Housing plans should target town-owned land for affordable housing.

C. The Commission will seek to have a rational nexus study conducted that examines the impact of nonresidential DRIs on affordable housing and establishes the basis for imposing an impact fee that mitigates these impacts. The Commission will seek to amend the RPP to permit adoption of such a fee as a Minimum Performance Standard.

D. The Commission will update its housing web page with the goal of having it become a more timely and substantive housing resource for the region. The page will include a best-practices component that describes effective, innovative affordable housing strategies.

E. The Commission will oversee the administration of the Barnstable County HOME Consortium and the Soft Second Loan Program (SSLP). This shall include administration of the HOME Program, submission of annual action plans, renewal of a cooperation agreement, update of the Consolidated Plan, and pursuit of additional funds for the SSLP.

F. The Commission will provide comments on Comprehensive Permits (Chapter 40B applications). Further, the Commission will convene information/training workshops from time to time regarding affordable housing issues.

G. The Commission's Housing Specialist will serve as the Commission's liaison to national, state, county, and local organizations that directly deal with the issue of affordable housing.

H. The County should continue to explore the use of surplus funds and regional bond funding to ensure an annual stream of funding for affordable housing.

Recommended Town Actions:

A. Towns should promote adoption of growth management bylaws that include provisions that are specifically related to affordable housing. Such provisions could include but not be limited to exempting affordable housing from growth caps, setting aside a specific number of building permits for affordable housing, and creating incentives for the development of affordable housing.

B. Towns should promote adoption of zoning changes that allow mixed-use development, use of Districts of Critical Planning Concern, and changes in tax-assessment policies that foster the development of affordable housing.

C. Towns should establish a local affordable housing committee, local housing partnership, or comparable body whose purpose would be to develop housing policy, review proposals, recommend actions, and maintain communication with the Commission.

D. Towns should develop a local housing needs assessment that will be updated every three years.

E. Towns should inventory public and private land suitable for the development of affordable housing and coordinate with local housing and Land Bank committees to develop opportunities for joint housing and conservation projects. Factors that could be considered in the selection of such sites by the town should include proximity to water supplies and sewer (where applicable), schools, services, proximity to existing developed areas, and environmental constraints. At a minimum, local housing and environmental advocates should be involved in the site selection process.

F. Towns should consider donating or leasing parcels of town-owned land for affordable housing.

Community Housing Resource's project at 32 Conwell Street, Provincetown. Credit: Paul Ruchinskas/CCC

6. Issue Area: Heritage Preservation/Community Character

This Regional Policy Plan sets forth a vision for protecting the character of historic villages, natural landscapes, historic buildings, and archaeological sites, and for fostering development consistent with surrounding neighborhoods and landscapes.

Cape Cod is treasured for the traditional historic character of its communities and landscapes and is well known for the preservation of its distinctive historic buildings and villages. Every year, however, the region's traditional small towns are eroded by development. New residential development replaces historic buildings and landscapes that reflect the Cape's history and culture. Commercial development in previously open agricultural and woodland areas draws activity away from traditional villages and erases the distinctive boundaries that once defined the Cape's village centers. As a result, the region is threatened with losing its "character."

With thousands of properties listed on the National Register of Historic Places, dozens of local historic districts, and numerous well-known, archaeologically sensitive areas, almost all Cape towns have dramatically increased their historic inventory information. The information, gathered by local historical commissions and other preservation organizations, serves as an educational resource for the community and as a basis for regulatory decisions by the Cape Cod Commission, the Massachusetts Historical Commission, and the towns themselves.

During the last decade, six Cape towns created new National Register Historic Districts, and one Cape town created a new local historic district. Individual historic properties in 10 Cape towns were placed on the National Register. But districts and individual properties on the National Register receive only limited protection from demolition and alteration under the Cape Cod Commission Act and state and federal historic preservation laws.

Local historic districts, by contrast, protect historic properties from most exterior alterations. They also protect the character of the entire district by requiring the review of new construction impacts. In this way, local historic districts play an important role in preserving the distinctive historic neighborhoods of the Cape. Historic district commissions, charged with reviewing development proposals within these districts, face increasing opposition, however, as more development is proposed, and they struggle to define acceptable ways to accommodate it.

The most effective local historic district commissions have professional staff and detailed guidelines to direct the review process. To be effective, these commissions also must work cooperatively with town planning departments and zoning enforcement officers to ensure consistency of their goals and regulations. Broad preservation efforts are achieved through zoning changes and regulations that specifically identify historic, cultural, and archaeological resources for consideration by town boards during development reviews. For example, the Town of Bourne recently adopted zoning that gives its planning board authority to protect inventoried historic and archaeological resources in the Bournedale area. In Barnstable

and Brewster, a local wetlands bylaw administered through the Conservation Commission provides protection for archaeological resources in wetland areas. Similar provisions should be considered by other Cape towns.

Demolition-delay bylaws, which provide an opportunity to consider alternatives to demolition of an historic property, have been effective in many cases, demonstrating how education can go a long way toward achieving historic preservation goals. Eleven Cape towns have passed demolition-delay bylaws. The most effective of these provides for at least a six-month delay, discourages demolition by neglect, and requires new development plans to be approved by all town boards before a demolition permit is issued. In highly desirable locations, however, the pressure to demolish historic properties continues to be high and will likely increase.

Many historic properties are not protected because they have not been inventoried, are not located within historic districts, and are not addressed through local bylaws and regulations. Other protection measures must be pursued, such as preservation restrictions and conservation restrictions, although by themselves they are not sufficient to protect the character of the region as a whole.

Preservation restrictions—deed restrictions that require preservation of a building's exterior features—have been useful in protecting important historic properties where other protections did not exist. Rarely used in the past, this tool appears to be gaining acceptance. Seven Cape towns placed preservation restrictions on 12 historic properties in the past decade. Some of these restrictions were required as a condition for receiving state funds for historic renovation work. Municipalities and property owners who wanted to ensure that the key historic structures they have struggled to preserve would be protected forever have also established other preservation restrictions.

Brewster. Credit: MA Executive Office of Environmental Affairs

Many distinctive "cultural" landscapes, which define the boundaries between village centers and reflect the region's agricultural heritage, have disappeared as new development has increased. Conservation restrictions can protect historic landscapes by preventing future development on properties. They have been effective in preserving both natural and cultural resource values and relieving some sprawling development patterns.

This Regional Policy Plan sets forth a vision for protecting the distinctive character of Cape Cod's historic villages

Dennis. Credit: MA Executive Office of Environmental Affairs

Falmouth village. Credit: Nancy Hossfeld/CCC

and natural landscapes and its historic buildings and archaeological sites. The vision also foresees new development and redevelopment that are consistent with the surrounding neighborhoods and landscapes of each community.

Achieving this vision requires the promotion of traditional patterns of growth within village centers and the protection of outlying open space. It also requires encouragement of the appropriate reuse of existing historic structures. Alterations should be accommodated in a manner consistent with the properties' essential historic elements and patterns of change over time. Allowing for appropriate changes to accommodate new uses and technologies will help promote the reuse of historic properties and ultimately encourage their preservation.

Cape Cod Commission review of historic properties has focused on allowing for "rehabilitation" as defined by the US Secretary of the Interior's Standards for Treatment of Historic Properties. So defined, rehabilitation is "the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values." Cape Cod Commission review should continue to focus on large-scale impacts to historic properties rather than smaller-scale alterations, which local historic districts typically address.

Current residential growth patterns, often referred to as sprawl, are most notable in that they conflict with the region's traditional dense village developments and undeveloped outlying areas. While cluster-development bylaws and changes in minimum lot sizes have been adopted in some Cape communities, additional incentives for traditional patterns of development are needed. The recent trend toward large residential buildings or "trophy homes" has increased the impact of new development on scenic vistas and village character, as many of these buildings have been located on key coastal properties, high elevations, or lots that are too small to accommodate such large structures adequately. Some towns have made changes to the allowable dimensional requirements as recommended in the Commission's model village bylaw to address this issue and others are considering similar actions.

Commercial growth changing the overall scale of buildings also threatens character in every Cape community. Existing zoning and parking requirements can make it hard to accommodate large buildings within historic village centers. The alternative locations—commercial strips—threaten a town's community character by drawing vitality away from historic centers and eliminating open areas that had previously provided rural relief between village centers. The design of these large commercial structures does not fit easily into traditional Cape Cod style buildings. Towns need to encourage designs that retain the Cape's distinctive character. The town of Yarmouth, for example,

recently created an overlay district along the Route 28 commercial corridor that allows relief from certain zoning requirements when a developer incorporates improved design features.

This Regional Policy Plan addresses the scale and design issues by establishing standards that limit the size of new buildings and require architectural standards consistent with community character. Encouraging appropriate redevelopment of commercial strip areas, however, will continue to be a major challenge.

Building design is not the only community character issue relevant to large commercial developments. Roadway changes, such as widening and adding turning lanes, to accommodate larger traffic volumes can significantly change the scale of the roadway and thus the community character, particularly in areas where narrow roadways and wooded buffers predominate. Roadway appurtenances such as signal mast arms, guardrails, and large drainage areas also have negative community character impacts, particularly within historic village centers.

This Regional Policy Plan addresses some of these issues by setting standards for lighting and signs and by requiring suitable landscaping for new development.

A specialized concern for the character of the Cape's communities is the impact of wireless telecommunications facilities, such as towers and antennas to support cell phones. Through its continuing work with the Lower Cape Wireless Working Group, the Cape Cod Commission has promoted better siting and design standards to limit the visual impacts of telecommunications facilities. Commission review standards identify appropriate sites for such facilities and require telecommunications providers to "co-locate" equipment (that is, share the facilities with other providers). The Commission's model bylaw and guidelines for wireless telecommunications facilities also creates incentives for providers to locate their facilities on existing structures rather than building new ones.

Cape Cod Mall, Hyannis. Credit: Nancy Hossfeld/CCC

With increased development pressures in recent years, more towns have considered zoning changes, new bylaws, and other efforts to guide growth and protect cultural resources. Many communities, however, are still reluctant to institute zoning changes, and towns continue to need help to enhance community character through local bylaws and regulations. Education about why zoning changes and other protections are warranted remains important, and the Cape Cod Commission will continue to assist towns in meeting their preservation, community character, and land use planning goals.


Chatham. Credit: MA Executive Office of Environmental Affairs

Heritage Preservation/Community Character

6.1 Goal:

To protect and preserve the important historic and cultural features of the Cape landscape and built environment that are critical components of Cape Cod's heritage and economy.

Minimum Performance Standards

6.1.1 An historic structure's key character-defining features, including the relationship to its site and setting, shall be preserved. Additions and alterations to historic structures shall be consistent with the building's architectural style and shall not diminish its historic and architectural significance. Removal or alteration of distinguishing original stylistic features or examples of skilled craftsmanship of historic or aesthetic significance shall be prohibited unless the Commission determines that such removal or alteration will not have a significant negative impact on the integrity of the historic property, surrounding historic district, or otherwise distinctive neighborhood.

6.1.2 The distinguishing original features of an historic or cultural landscape shall be preserved. New development adjacent to or within historic or cultural landscapes shall be located to retain the distinctive qualities of such landscapes and shall be designed to maintain the general scale and character-defining features of such landscapes.

6.1.3 Where development is proposed on or adjacent to known archaeological sites or sites with high archaeological sensitivity as identified by the Massachusetts Historical Commission or the Local Historical Commission during the review process, it shall be configured to maintain and/or enhance such resources where possible. A predevelopment investigation of such sites shall be required early in the site planning process to serve as a guide for layout of the development. Archaeological sites determined eligible for listing on the National Register of Historic Places shall be preserved and protected from disturbance.

In reviewing projects affecting historic resources, the Commission will refer to the Secretary of the Interior's Standards for Rehabilitation of Historic Properties and other current guidelines and bulletins prepared by the National Park Service Heritage Preservation Services Division. The Massachusetts Historical Commission (MHC) has agreed to review any projects that require a state or federal license, permit or funding, as defined by the National Historic Preservation Act, for their conformance with the Secretary of the Interior's Standards for Treatment of Historic Properties and for their effects on the historic significance of the property and any surrounding historic district. The MHC will also assist the Commission in reviewing other projects that will affect properties listed on the State or National Registers of Historic Places. A town's Local Historical Commission and, where appropriate, the Massachusetts Commission on Indian Affairs will also assist the Commission in reviewing projects that will affect properties with historic and archaeological significance.

Other Development Review Policies

6.1.4 Historic buildings that may be slated for demolition or relocation should be preserved on site and reused or incorporated into the overall design of the project.

6.1.5 The reuse of historic buildings in village centers is encouraged in order to preserve the distinctive characteristics of each Cape Cod village and to promote revitalization of these areas. Where reuse has been conclusively shown to be infeasible, these buildings should be replaced with structures of similar character, mass, proportion, and scale.

6.1.6 Cultural landscapes and archaeologically sensitive areas should be protected through conservation restrictions or preservation restrictions that ensure their long-term preservation.

Heritage Preservation/Community Character

6.2 Goal:

To encourage redevelopment of existing structures as an alternative to new construction, and to ensure that development and redevelopment respects the traditions and distinctive character of historic village centers and outlying rural areas consistent with "Designing the Future to Honor the Past, Design Guidelines for Cape Cod," Technical Bulletin 96-001, as amended.

Minimum Performance Standards

6.2.1 New development shall be located to preserve the distinctive boundary between village centers and less densely developed areas by focusing on redevelopment/reuse of existing structures or developed sites and on infill construction in designated Growth/Activity Centers and Growth Incentive Zones. Creation or extension of strip development shall not be permitted. Reuse, redevelopment, or infill within existing strip developments in a way that does not extend the linear nature of the development or increase traffic conflicts may be permitted.

6.2.2 New development proposed on local and regional roadways shall be sized such that it can be accommodated without significant changes to the existing character of the roadway. Any necessary structural improvements shall be consistent with the existing character of the roadway, unless the Commission and the community deem alternatives appropriate within the boundaries of Growth/Activity Centers and Growth Incentive Zones.

6.2.3 New development proposed adjacent to scenic roads shall be designed to preserve distinctive features of the scenic road including tree canopy, stone walls, winding road character, and scenic views, and to limit the visibility of new development. New development adjacent to or within scenic open vistas shall be clustered and designed to avoid adverse impact to scenic resources.

Refer to Technical Bulletin 96-001.

6.2.4 New development adjacent to or within historic districts, village centers, cultural landscapes, historic properties, or otherwise distinctive neighborhoods shall be designed to be consistent with the character of the area and to retain the distinctive features of the neighborhood. Elements of the distinctive area's character such as building mass, height, scale, roof shape, roof pitch, building materials, and proportions between doors and windows shall be maintained. Distinctive features of the area such as proximity to the street, views to historic structures, water and/or landscapes, and significant open spaces shall be preserved.

Sandwich Stop & Shop. Credit: Sharon Rooney/CCC

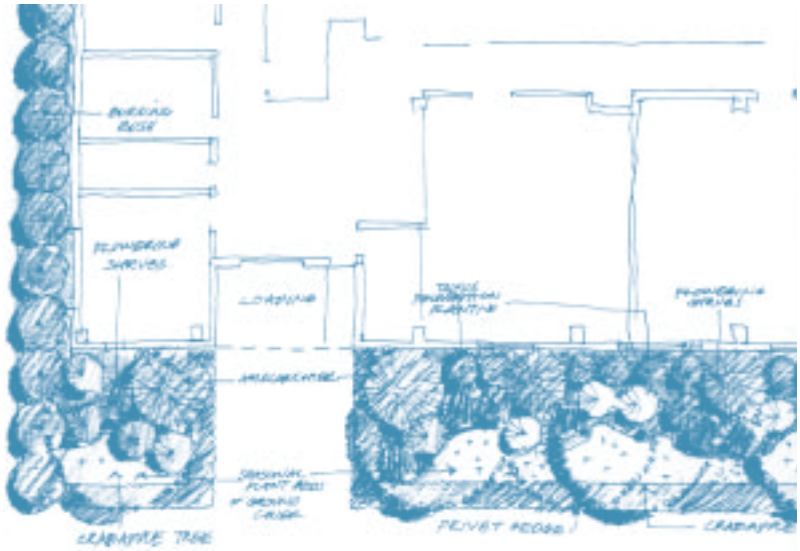
6.2.5 For all new development, no individual structure shall exceed a footprint of 15,000 square feet unless it is fully screened or located within a Growth Incentive Zone. For redevelopment projects, expansion of existing buildings up to an individual footprint up to 50,000 square feet shall be permitted without full screening if the expansion occurs on previously developed impervious or landscaped areas. Full screening may be achieved through the use of traditionally scaled frontage buildings or a vegetated buffer at least 200 feet in depth. The method of screening shall be consistent with the character of the surrounding area and preserve the distinction between village centers and outlying areas. In all cases, where an individual structure exceeds a building footprint of 10,000 square feet, the massing, façade, and roof configuration shall be varied in order to reduce the apparent mass of the building and shall include a minimum of 10 feet of set-back or projection in the façade footprint for every 50 feet of façade length.

6.2.6 In industrial parks or areas not visible from scenic or regional roadways or other distinctive areas noted above in 6.2.4, use of nontraditional materials and forms may be appropriate. In such areas, maintenance of adequate buffers on the subject property is required to ensure that the proposed development will not be visible from scenic or regional roadways such as Route 6A.

6.2.7 The building and layout of parking lots shall reinforce the character of existing buildings and traditional village streetscape patterns. Parking shall be located to the rear or the side of a building or commercial complex in order to promote traditional village design in commercial areas unless such location would have an adverse or detrimental impact on environmental or visual features on the site, or is infeasible. Parking structures shall be provided where feasible to reduce the amount of paved parking areas supporting a proposed development, provided the structure still meets the Design Manual goals. The use of shared parking, on-street parking, and community parking lots in Growth/Activity Centers and Growth Incentive Zones shall be provided, where feasible, in order to reduce the amount of land devoted to parking.

6.2.8 Redevelopment of existing strip development shall provide adequate buffers between parking areas and the street, and significant improvement to interior parking-lot landscaping, as well as façade improvements and frontage buildings, as necessary, to improve the visual character of the site.

6.2.9 All development shall implement a landscape plan that addresses the functional aspects of landscaping, such as drainage, erosion prevention, wildlife enhancement, screening and buffering, wind barriers, provision for shade, energy conservation, sound absorption, dust abatement, and reduction of glare. When vegetative buffers are necessary to prevent visual impacts from new development on scenic resources, maintenance of existing vegetation shall be required in the buffer area. A maintenance agreement or irrigation system, as appropriate, shall be provided by all development.



Credit: Marine Biological Laboratory, Woods Hole, MA

6.2.10 Exterior lighting in new development or redevelopment shall comply with standards including design, light source, total light cutoff, and foot-candle levels defined in the Exterior Lighting Design Standards, Technical Bulletin 95-001.

Refer to Technical Bulletin 95-001.

6.2.11 The installation of billboards, offsite advertising (excepting approved directional signs), and internally lit or flashing signs shall not be permitted.

6.2.12 All utilities for development including cable shall be placed underground except where the presence of natural features such as wetlands or archaeological resources prevent such placement.

Other Development Review Policies

6.2.13 The integrity of natural landforms and broad, open views of the landscape as seen from any public way or waterway should be maintained.

6.2.14 The planting of shade trees along roadways to improve the visual quality of the area is encouraged. Such trees should be tolerant of roadside conditions and a minimum of 3-inch caliper/diameter at breast height (4 feet above ground surface) at time of planting.

6.2.15 Distinguishing original features of a site such as trees of greater than 6-inch diameter at breast height, existing plantings, and topography should be preserved where possible. Plantings on the street-facing side of buildings, and

walkways within the development and linking to other buildings should be provided where appropriate.

6.2.16 In general, the size and color of all signs should be in scale and compatible with the surrounding buildings and street. When more than one sign is used, the graphics should be coordinated to present a unified image. Wooden signs, either painted or carved, are usually most appropriate.

6.2.17 All exterior lighting should be part of the architectural and landscape design concept. Fixtures, standards, and exposed accessories should be concealed or harmonious with other project design materials.

6.2.18 Undergrounding of overhead utility lines as part of any roadway improvement project is encouraged.

Implementation

Commission Actions:

A. The Commission will assist town boards and committees in protecting community character through new or revised zoning bylaws and regulations. Efforts will promote village-style development, limit strip development, foster redevelopment and infill construction, establish appropriate vegetated buffer standards, and encourage preservation and reuse of historic properties.

B. The Commission will inventory the region's distinctive cultural landscapes and sites of potential archaeological significance. The Commission will pursue preservation of significant resources through a variety of means such as land protection, preservation or conservation restrictions, regulatory changes, and educational efforts to increase public awareness.

Refer to Technical Bulletin 96-001.

C. The Commission will expand the existing design manual, Designing the Future to Honor the Past, to address moderate- to large-scale commercial projects and how they can be designed consistent with the region's traditional development patterns.

Route 6A in Dennis. Credit: CCC file photo

D. The Commission will work with towns and state agencies to develop guidelines for appropriate improvements to scenic and historic Cape Cod roadways.

E. The Commission will work with towns and utility companies to encourage placement of existing utility lines and associated structures underground in locations where these elements are deemed to detract from historic and cultural features, community character, and scenic views.

Recommended Town Actions:

A. Towns should revise zoning to encourage village-style development through setback, parking, building footprint, and incentives for redevelopment as discussed in the Commission's model village-development bylaw. Towns should also develop a design review process and local design guidelines for areas of distinctive development as discussed in the Commission's design manual, Designing the Future to Honor the Past.

Provincetown Heritage Museum. Credit: MA Executive Office of Environmental Affairs

B. Towns should continue to inventory their historic resources and, where appropriate, structures, landscapes, or sites of historic significance should be protected through means such as Local Historic Districts, nomination for listing on the National Register of Historic Places, demolition-delay bylaws, and subdivision regulations that provide for review of potential impacts to historic and archaeological resources.

C. Towns should identify scenic roadways and establish local bylaws or guidelines that preserve the character of these areas including:

- guidelines for clearing and planting to limit disturbance of natural resources;
- rules for placement of signs and utilities;
- plan review procedures for key locations;
- measures to preserve scenic views;
- restrictions on height of buildings;
- controls on removal or alteration of stone walls and other historic features;
- restrictions on the cutting of large trees (greater than 6 inches in diameter); and
- the institution of tree planting programs to replace trees in areas where older specimens have died.

D. Towns should reduce/institute more flexible parking requirements such as allowing shared parking lots, reducing the number of spaces required per development, requiring secure bicycle parking in shopping and business districts, allowing reserve parking strategies and, where safety permits, encouraging curbside parking in village centers in order to slow traffic and buffer pedestrians.

E. Towns should adopt a bylaw that limits land clearing and alteration of natural topography prior to development review, as discussed in the Commission's model land clearing, grading, and protection of specimen trees bylaw, and a local landscape ordinance that protects existing trees and requires landscaping and screening of new development from major roads.

F. Where feasible, towns should require the placement of new utility lines underground and actively encourage the undergrounding of existing lines and structures in locations where they detract from historic and cultural features, community character, and scenic views.

III. Resources of Regional Importance

Regional resources are those natural and human-made resources that are significant to more than one town or cross jurisdictional boundaries.

Background

Section 7(b)(1) of the Cape Cod Commission Act requires that the Regional Policy Plan identify Barnstable County's critical resources and management needs including its "natural, scientific, coastal, historical, recreational, cultural, architectural, aesthetic, and economic resources, groundwater and surface water supplies, available open space, and available regions for agricultural, aquacultural, and development activity." Regional resources for the purpose of the Plan are considered to be those resources that are significant to more than one town or cross jurisdictional boundaries. They include both natural and human-made resources, areas that have public value and that may be vulnerable to damage from uncontrolled or inappropriate development.

Key regional resources on Cape Cod include but are not limited to those listed below. Most of these areas have been mapped by the Commission on its computerized Geographic Information System.

Natural Resources

- Recharge areas to existing and future public water supply wells
- Recharge areas to coastal embayments
- Inland and coastal wetlands and their recharge areas
- Inland and coastal ponds
- Floodplains, beaches, banks, and dunes
- Shellfish and finfish habitat areas
- Rare plant and animal habitat and unusual biological habitats (e.g., sandplain grasslands, cedar swamps, etc.)
- Designated Areas of Critical Environmental Concern
- Federal, state, and regional parks and nature reserves (e.g., Cape Cod National Seashore, Nickerson State Park, Audubon sanctuaries)
- Town conservation lands
- Private open space

Credit: Kathy Sferra/CCC

Economic, Historic, and Cultural Resources

- Historic village centers
- Working waterfronts and harbor areas
- Active aquacultural and agricultural areas including cranberry bogs
- Regional business districts
- Affordable housing
- Properties listed or eligible for listing on the National or State Register of Historic Places
- Scenic landscapes
- Archaeological resource areas

Nobska Light, Woods Hole. Credit: Nancy Hossfeld/CCC

Key Regional Facilities

- Regional transportation corridors (roads, rail lines, bikeways)
- Major airports and ferry ports
- Landfills, transfer stations, recycling centers
- Public water supply and distribution systems
- Public wastewater and septage collection and treatment systems
- Regional health care facilities

Districts of Critical Planning Concern

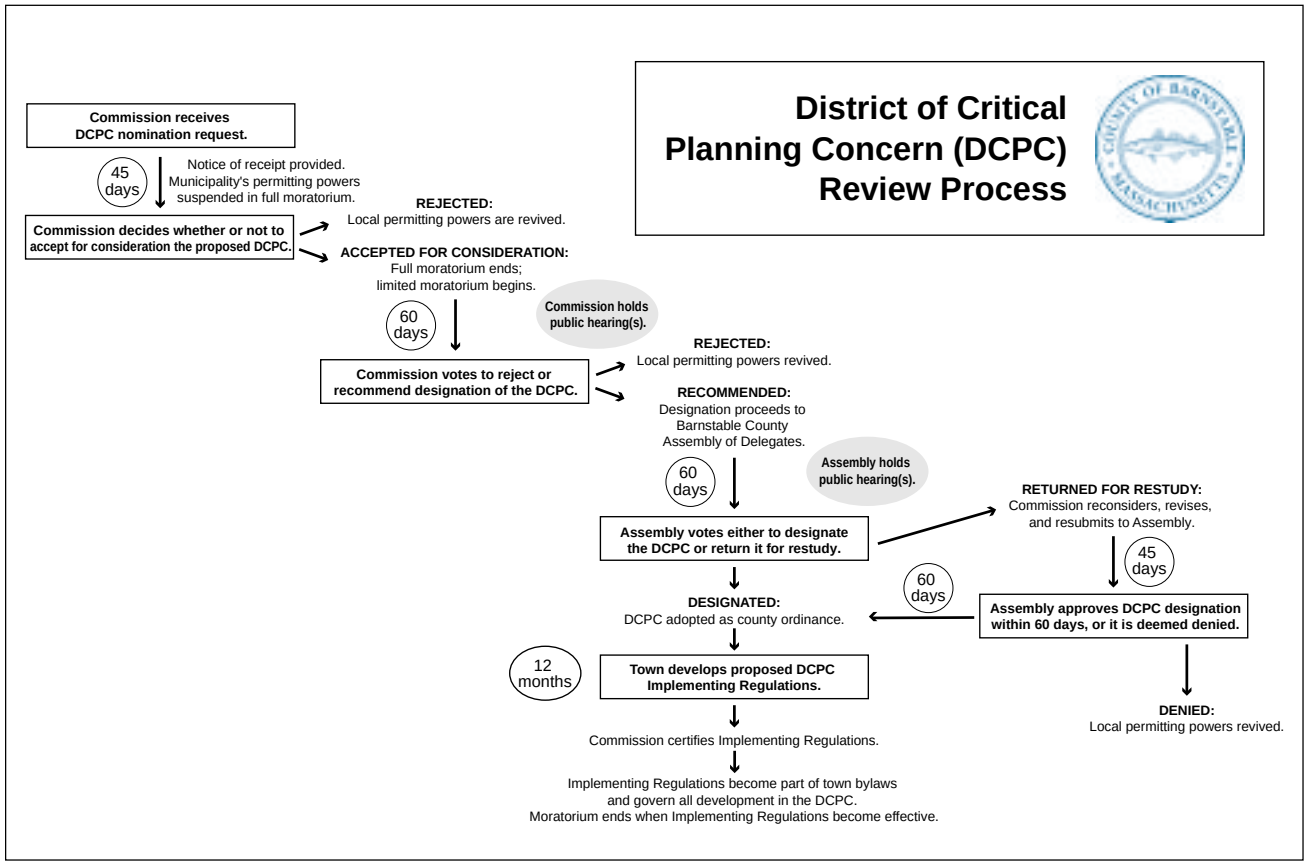
Sections 10 and 11 of the Act authorize the Commission to recommend to the Assembly of Delegates the designation of certain resources of regional importance to Barnstable County as Districts of Critical Planning Concern. These resources should be of critical value to the area and in need of protection from inappropriate development or poor management. According to the Act, a proposed district must possess "significant natural, coastal, scientific, cultural, architectural, archeological, historic, economic, or recreational resources or values of regional, statewide, or national significance." A proposed district may also include areas where sensitive ecological conditions preclude development or where a major capital public facility or area of public investment is proposed.

The District of Critical Planning Concern (DCPC) designation allows communities to protect a resource that has been identified in the Commission's Regional Policy Plan and/or a town's Local Comprehensive Plan as being critical to the ecology, economy, character, or viability of the region. The designation process encourages towns to work together to address problems or concerns that are crucial to the well being of all Cape residents such as the protection of clean drinking water or coastal embayments.

Most importantly, the DCPC designation is a powerful regulatory tool that can augment existing local bylaws and regulations in areas where these laws may be unable to prevent environmental degradation or may discourage sound economic development or construction of affordable housing. A designation allows for the creation and adoption of special rules and regulations to govern development within the district. Therefore, a nominated area should require a special regulatory or planning effort that cannot be addressed adequately through existing local or state regulations.

Once the Assembly of Delegates designates an area as a District of Critical Planning Concern and the town adopts the district's implementing regulations, projects within the district's boundaries are regulated under the new rules established to protect the resources within that district. Grandfathering protections afforded by MGL Chapter 40A do not apply. For example, implementing regulations designed to reduce density in order to protect critical environmental resources would supercede the protection of preexisting zoning conferred to property owners upon submission of a preliminary subdivision plan. This allows towns to put in place meaningful and effective safeguards to prevent inappropriate development. Once a district has been designated and implementing regulations adopted, town agencies oversee development and grant permits within the district.

Although a DCPC can be nominated by the Commission, County Commissioners, or Assembly of Delegates, all



of the nominations have so far come directly from the towns. In this sense, the Commission views the DCPC as a partnership with the towns to provide them with regulatory and planning tools that would not otherwise be available to them.

It is also important that affected property owners are invited to participate in the process. To that end, the DCPC process ensures that public hearings are held by both the Cape Cod Commission and the Assembly of Delegates before the DCPC is formally designated. Meetings and discussions at the local level, both before and during the designation process, are also encouraged.

Since the Cape Cod Commission was established, five DCPCs have been designated:

Black Beach/Great Sippewissett Marsh DCPC (West Falmouth): The Black Beach/Great Sippewissett Marsh DCPC was created to protect this sensitive marsh and barrier beach system. Designated by the Assembly of Delegates in January 1996, the district encompasses about 340 acres of marsh and barrier beach in West Falmouth. The town nominated the district to prevent flood damage, to improve water quality, to protect important plant and wildlife habitat, to manage stormwater runoff, to protect fin- and shellfish, and to minimize harmful effects of new development. The town developed regulations that included clearing and grading limitations, prohibition of wetland alteration, increased wetland buffers, improvements to septic systems and stormwater drainage, protections to V-zones, A-zones, and dunes, and other regulations.

Bournedale DCPC (Bourne): The Barnstable County Assembly of Delegates designated the Bournedale DCPC in December 1998. The district encompasses nearly 2,000 acres of land in the northeastern part of Bourne. The town nominated the district to protect drinking water quality, preserve an adequate water supply, assure an adequate and safe transportation network, preserve the area's unique historic resources and community character, and protect rare wildlife habitat and significant natural resources. The town approved implementing regulations that reduced development density, mandated cluster development, and reduced the amount of commercially zoned land.

Bournedale herring run. Credit: CCC file photo

Three Ponds DCPC (Sandwich): The Barnstable County Assembly of Delegates designated the Three Ponds DCPC in February 2000. The district encompasses nearly 700 acres of land and over 300 acres of surface waters, including Lawrence, Spectacle, and Triangle ponds, in the southeastern part of Sandwich. The town nominated the district to protect groundwater quality, surface water quality, natural resources, and wildlife habitat, to maintain the rural and scenic character and traditional camp use of the area, to review

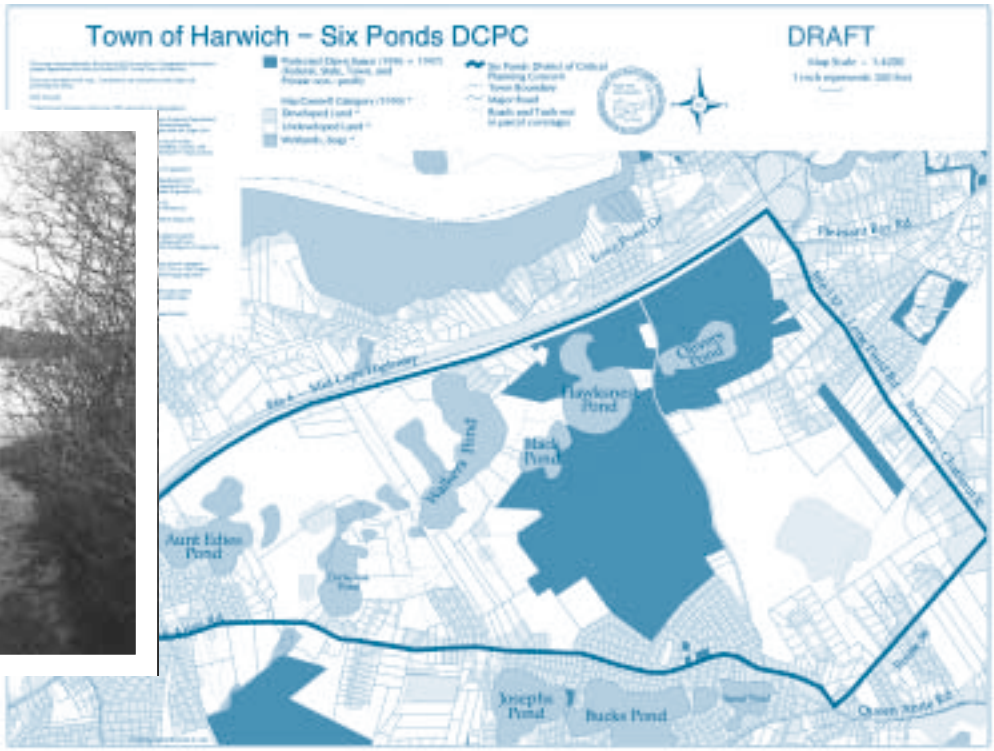
Black Beach, West Falmouth. Credit: Kathy Sferra/CCC

growth management tools, and to foster the permanent protection of open space and appropriate recreational facilities. The town approved implementing regulations that encourage cluster development and increase resource protection. Town meeting also voted to purchase a significant part of the area for conservation purposes.

Six Ponds DCPC (Harwich): The Barnstable County Assembly of Delegates designated the Six Ponds DCPC in May 2000. The district encompasses nearly 1,300 acres of land and water, including Aunt Edies, Black, Cornelius, Hawksnest, Olivers, and Walkers ponds, in the northeastern part of Harwich. The town nominated the district to protect water resources, natural resources, wildlife habitat, and open space/recreational opportunities, as well as to develop growth management strategies. The town approved implementing regulations to increase minimum lot sizes, reduce lot coverage, protect buffer areas along scenic road corridors, increase pond buffer areas, and promote flexible cluster developments.

Growth Management DCPC (Barnstable): The Barnstable County Assembly of Delegates designated the Barnstable DCPC and the Cape Cod Commission approved the town's implementing regulations for it in September 2001. Barnstable nominated all residential areas within the town as a growth management DCPC. The district's goals are to slow the rate of growth, increase the percentage of affordable housing, ensure that adequate infrastructure and municipal services keep pace with growth, and limit nutrient loading to groundwater and coastal embayments. The town implemented a growth cap to limit the rate of new residential construction, with provision of affordable housing.

Pond access in the Six Ponds DCPC, Harwich. Credit: CCC file photo



Credit: CCC GIS Office

Management of Critical Resources through Districts of Critical Planning Concern

The Commission has identified various types of districts that might be proposed as Districts of Critical Planning Concern. They include but are not limited to those listed below. The accompanying descriptions are intended to provide guidance for district nominations and should in no way limit their scope. In many situations, a significant resource area may qualify for designation as more than one type of district. For that reason, most existing DCPCs have multiple purposes and objectives that include elements of several of the types of districts listed below.

Water Resource District: This designation is appropriate for the protection of an aquifer, watershed, aquifer recharge zone, or surface water body that could be endangered by continued development. Studies or expert advice should indicate how special regulations could improve the quality or quantity of water. A town might seek to limit nitrogen loading within the recharge area of an existing or proposed public well to ensure a sustainable supply of high quality drinking water or to limit nitrogen and phosphorus loading to a freshwater pond to avoid eutrophication. Other potential regulations could include restrictions on toxic or hazardous materials discharge, stormwater regulations, limitations on lot coverage or the number of bedrooms allowed, or controls on conversion of seasonal residences to year-round occupancy.

Shellfish Resource District: This designation may be used to protect a water body that is particularly suited for production of shellfish or finfish and is either productive now but in danger of contamination, or can be made productive through good management. This could apply to areas with natural shellfish production or areas targeted for aquacultural production. As in a Water Resource District, the primary intention would be to limit the discharge of contaminants into those waters that provide good shellfish and finfish habitat. Potential regulations could include prohibitions on the discharge of untreated stormwater into coastal waters or wetlands, prohibition of construction or expansion of docks and piers within significant habitat areas, and restrictions on new dredging projects. Nearby marinas could be required to provide boat sewage pump-out facilities and collection facilities for waste oil.

Agricultural Resource District: This designation should include areas particularly suited now or in the future for agricultural production. If the district is not being farmed at the time of designation, it should be practical to convert it to agricultural uses due to soil and topography conditions and adequate available acreage. Potential regulations could include requiring best management practices to protect water quality. A buffer area might be required to separate agricultural and residential uses. Permanent title restrictions that would reduce property taxes might be placed on land within the district to promote agricultural use in perpetuity.

Wildlife, Natural, Scientific, or Ecological Resource District: This designation should include important and identifiable wildlife habitat areas and areas with natural or scientific value, such as rare plant and animal habitats, sandplain grasslands, vernal pools and quaking bogs, and unusual geological features. The purpose of this type of designation is to keep significant habitat areas intact. Potential regulations could include the prohibition of certain types of new development that would adversely affect threatened species and preparation of a wildlife management plan. In many cases, developments can be planned to minimize impacts on wildlife by locating structures away from sensitive areas and by minimizing the clearing of vegetation and alteration of natural topography.

Cultural, Historic, Architectural, or Archaeological Resource District: This designation is appropriate for the protection of a place, landscape, way, or view that is in some special way expressive of the character of Cape Cod or the traditions of its residents.

Burying Hill historical marker, Bournedale. Credit: CCC file photo

Designations should symbolize and support traditional activities, industries, and ways of life on Cape Cod, and should be considered for those areas that are of great aesthetic value to the region or are important historically such as a Native American settlement or quaint fishing village. This district may also be appropriate for the protection of regionally significant recreational areas including those used for hunting, fishing, and wildlife observation. Any such district should be marked by areas or resources considered irreplaceable. Potential regulations could require that new construction within an historic village, including signage and parking, be consistent with historic architectural styles and that archaeological sites are not to be adversely impacted. The alteration of ancient ways and cart paths and the removal of old stone walls or large trees might also be limited or prohibited.

Economic Development District: This designation is appropriate for enhancement of areas that have special potential for providing employment or housing for Cape Cod residents, or for accommodating necessary development that might be detrimental in other locations. The area should be suited for more intensive economic development and should have or provide the necessary infrastructure to mitigate growth-related impacts. These districts should promote economic activities appropriate for Cape Cod such as shell- or finfishing, aquaculture, marine science, cranberry farming, health services, tourism, clean manufacturing, computer software, education, eco-tourism, and cultural facilities. Potential regulations should preserve or enhance economic development potential and encourage the redesign, reutilization, and infill of existing strip commercial developments. Local zoning requirements might be altered to allow increased densities, a mix of uses, and more flexible dimensional requirements. The development review process could then be streamlined to encourage development consistent with the purposes of the district. Regulations might also require that certain design standards be upheld to enhance pedestrian amenities and landscaping.

Growth Management District: This designation can be used to address the rate, location, amount, pattern and type of growth desired. It can be used as a means of implementing a town's Local Comprehensive Plan by allowing towns to put in place necessary changes to local bylaws. Growth management districts can be used to increase the percentage of affordable housing, ensure that adequate infrastructure and municipal services keep pace with growth, and limit the impacts of growth on the environment.

Public Investment District: This designation could include areas that may now or in the future have a significant impact on major public investments such as airports, roads, schools, parks, beaches, preserves, public utilities, and medical facilities owned or operated by a federal, state, county, or municipal agency. It should be made clear how inappropriate development in the district would interfere with the use of the public investment or would impair the health, safety, and welfare of the public. Potential regulations could require a buffer zone between key public facilities, such as an airport, and surrounding areas. Regulations might also require buffers around public parklands in order to protect tourism value. Existing roadways could be made safer and roadway capacity better preserved through changes in local zoning to control access and traffic generation.

Hazard District: This designation should include areas that possess threats to public health, safety, and welfare due to natural or structural conditions that render them dangerous or unsuitable for development. Hazards may include things such as steep slopes, known potential for flooding, erosion or saltwater intrusion, areas that are extremely polluted, and any area where construction problems may arise due to existing natural conditions. In areas susceptible to flooding or wave action, new construction could be prohibited and the expansion or renovation of existing structures could be required to meet stringent construction standards. Construction could be prohibited along dunes or steep embankments where the threat of erosion is great. To reduce the risk of saltwater intrusion, limitations could be placed on new private wells within a specified distance of the shoreline.

Waterfront Management District: This designation could identify appropriate uses of harbor and waterfront resources, including maritime, fishing, and recreational uses of the shoreline and adjacent waters, and promote conservation. Potential regulations might restrict non-water-dependent uses within this area. In order to protect shellfish habitat, moorings, docks, and piers might be restricted and dredging allowed only to maintain existing channels. Boat sewage pump-out facilities, bilge waste, and waste oil collection areas could also be required. Maintenance of existing public access points for fishing or boat launching could be required as a condition of development approval.

Downtown Revitalization District: This designation could promote development in downtown areas with a goal of maintaining their economic vitality and reducing sprawl. These areas might be older, commercial "Main Streets" that have seen some decline in recent years. Regulations in this district could encourage rehabilitation by offering density bonuses and providing a streamlined development approval process. Mixed-use development could blend residential and commercial uses in multistory buildings to create a vibrant, active downtown. Regulations might also require, however, that new development should be sensitive to historic architectural styles and patterns of development. New buildings and redevelopment could be encouraged to build close to the sidewalk and provide pedestrian amenities such as benches, landscaping, and street-tree plantings. Parking could be encouraged on the street and to the rear of the buildings rather than in unattractive lots in the front.

Transportation Management District: This designation would regulate development in order to facilitate public transportation and/or traffic flow and safety. Any measures taken within this district should be consistent with the Cape's historic, scenic, and natural resources. Potential regulations could require all new development along an existing roadway to contribute funds towards traffic improvements in order to maintain a desired Level of Service within the district. New developments might be required to provide bus stops at frequent intervals in order to accommodate public transit or to make provisions for bike lanes and paths. In order to minimize curb cuts and pavement coverage, adjacent commercial uses might be required to share parking and access points. Along scenic and environmentally sensitive roadways, major widening or the removal of trees, vegetation, or scenic features might be prohibited.

Mixed-Income Housing District: This designation could include areas suited for the provision of decent, affordable housing of all types for low- and moderate-income Cape Cod residents. A variety of issues should be considered such as proximity to social services and commercial centers, availability of utilities and town infrastructure, appropriate wastewater treatment, and environmental impacts. Potential regulations might encourage the creation of accessory apartments. Town-owned land might exist within the district that could be donated for the development of affordable units. Local zoning might be amended to allow higher density in appropriate locations. Incentives, such as density relief or exemption from other zoning requirements, could be provided for developers of market-rate housing who place affordable deed restrictions on some proportion of their units. When market rate and affordable housing are developed within the same project, integration of landscape and architectural details might be required. Deed restrictions that require units to remain affordable in perpetuity and procedures governing their operation and management might also be required.

IV. Regional Coordination with Other Planning Efforts

A variety of coordinating efforts will need to be undertaken both formally and informally to carry out the purposes of the Regional Policy Plan.

Section 7(b)(4) of the Cape Cod Commission Act states that the Regional Policy Plan shall include a section that contains "a policy for coordinating regional and local planning efforts, including coordinating planning activities of private parties and local, state or federal governmental authorities." A review of the goals and policies and implementation actions contained in the Regional Policy Plan makes it clear that a variety of coordinating efforts will need to be undertaken both formally and informally to carry out the purposes of the Plan. Many of these activities are already planned or under way through public and private sector programs. The Cape Cod Commission should not duplicate existing efforts but should supplement these efforts and provide technical assistance where appropriate.

The contents of this Coordination section have evolved as various drafts of the Commission's Regional Policy Plan were reviewed by local, county, state, and federal agencies. During this period the Commission has attempted to incorporate into the Plan a discussion of coordinating efforts that would be undertaken to further the goals and policies of the Regional Policy Plan. The Regional Policy Plan is not a static document, and cooperation among all levels of government will be a significant factor in the Commission's planning and regulatory program and in future refinement and implementation of the Regional Policy Plan.

Meeting of Cape and Islands' planning commissions. Credit: Nancy Hossfeld/CCC

Local Authorities

The Cape Cod Commission Act provides for establishment of Local Planning Committees to develop Local Comprehensive Plans for each town in consultation with the Cape Cod Commission. Each community on the Cape has established such a Committee and these committees have been meeting regularly. In some towns the Planning Board was appointed as the Local Planning Committee; in others a separate committee was created composed of representatives of various town boards within the community, including Conservation Commissions, Boards of Health, and Historic Commissions. Regardless

of the formal composition of the Local Planning Committees, it is clear that preparation of Local Comprehensive Plans requires the participation of all relevant town boards. The Commission encourages Local Planning Committees to seek the broadest possible input from within their communities in developing local plans. The Commission has provided substantial financial and technical assistance to towns to help them develop Local Comprehensive Plans. In addition, the Commission intends to work directly with town boards and staff to implement portions of the Regional Policy Plan and assist local planning efforts by providing data on regional trends and other technical information. Such boards and staff include but are not limited to Boards of Selectmen and Town Administrators, Planning Boards and Town Planners, Conservation Commissions and Conservation Administrators, Boards of Health and Health Agents, Housing Partnerships and Housing Committees, Historic Commissions and Historic District Commissions (including the Old King's Highway Regional Historic District Commission), Recreation Commissions, Water and Sewer Commissions, Natural Resource Departments and Shellfish Officers, Public Works Directors and Town Engineers, Solid Waste Advisory Committees, Harbormasters, and Building Inspectors.

In addition to the planning efforts of Local Planning Committees, the Commission will coordinate with local boards on review of Developments of Regional Impact. Commission decisions shall be consistent with local bylaws and regulations as required by the Cape Cod Commission Act. However, the Commission may impose more stringent conditions on development than would be required by local review. In certain cases, the Commission may recommend during its review of a project that a town consider waiving one or more of its local standards in the interest of attaining the intent of the Cape Cod Commission Act. Such waivers are not mandatory, but they can be considered by the town during its local review process.

County Authorities


Barnstable County Superior Court House. Credit: CCC file photo

In 1988 Barnstable County adopted a home rule charter that established an executive branch of county government, the County Commissioners, and a legislative branch, the Assembly of Delegates. The Cape Cod Commission Act specifies the formal roles that the County Commissioners and Assembly of Delegates play in reviewing and approving certain Commission decisions and regulations.

The Act specifies that a member of the County Commissioners must serve as a member of the Commission. In addition, the County Commissioners appoint two additional members of the Commission: a Native American representative and one minority member. The County Commissioners also appoint the Commission's staff. The Assembly of Delegates approves some of the Commission's regulations by ordinance, including regulations on designation of Districts of Critical Planning Concern, review of Developments of Regional Impacts, and imposition of impact fees. The Act also requires that the Assembly of Delegates adopts the Commission's Regional Policy Plan by ordinance and establishes a procedure for review and amendment of the Regional Policy Plan at intervals not to exceed five years. The Assembly must also review and designate by ordinance all Districts of Critical Planning Concern.

In addition to the roles specified by the Act, the Commission will work with the County Commissioners and the Assembly of Delegates on projects of regional interest to further the goals and policies in the Regional Policy Plan. The Commission also plans to work with the other departments within Barnstable County government including the Department of Health and the Environment, Cape Cod Cooperative Extension, and the Cape Cod Economic Development Council on a number of activities.

The Barnstable County Department of Health and the Environment, like the Commission's Water Resources Office, has been actively involved with the protection of Cape Cod's water resources. The department assists local health departments throughout the county and conducts laboratory analysis, monitoring and research projects on a number of subjects including septic systems, landfills, safe use of hazardous materials, underground storage tanks, and shellfish contamination. The Cape Cod Cooperative Extension plays a vital role in educational programs for residents of Barnstable County in areas such as agriculture, septic system maintenance, recycling, natural resources, and the safe use of fertilizers and pesticides. Where Commission research or planning activities are proposed in these subject areas they will be coordinated with the applicable county department so as to use their expertise and not duplicate efforts already under way. Educational efforts should be sponsored by Cooperative Extension in cooperation with other appropriate departments and agencies.

Barnstable County Water Quality Laboratory. Credit: Nancy Hossfeld/CCC

There are a number of proposed areas of coordination between the Commission, Department of Health and the Environment, and Cape Cod Cooperative Extension. For example:

- The Commission will work with the Department of Health and the Environment to encourage the development of alternative approaches to wastewater management as facilities planning, in order to encourage more compact patterns of growth with better quality wastewater treatment;
- The Commission will work with the Department of Health and the Environment to help it identify unregistered underground storage tanks and will support the county's ongoing tracking program for underground storage tanks;
- The Commission will work with the Department of Health and the Environment to encourage town adoption of a model toxic and hazardous materials bylaw/health regulation developed by the department and the Cape Cod Commission;
- The Commission will work with Cape Cod Cooperative Extension to encourage the use of alternatives and best management practices for fertilizers, pesticides, road salt, hazardous household chemicals, and other materials that could adversely affect surface and groundwater quality; and
- The Commission will work with both Cape Cod Cooperative Extension and the Department of Health and the Environment to provide technical assistance to towns on alternate methods of stormwater management.

In addition, the Cape Cod Economic Development Council (CCEDC) has an important role to play in promoting development initiatives that are compatible with the Cape's environment and character. The actions described in the Economic Development section of the Regional Policy Plan outline the respective roles of the Commission and the CCEDC in economic development.

Other Regional Authorities

The Cape Cod Commission has several advisory committees that were established to provide specialized expertise in a variety of policy areas. These include the Joint Transportation Committee, Solid Waste Advisory Committee, and Coastal Resources Committee. The Commission will continue to work closely with these advisory committees to carry out the policies and implementation actions in the Regional Policy Plan.

The Coastal Resources Committee (CRC) is advisory to both the County Commissioners and the Cape Cod Commission. The CRC provides a forum for the public and government agencies to discuss coastal and marine issues of local and regional concern. Where appropriate, the CRC makes recommendations for actions to the county. In addition, the CRC serves as an advisory committee to the Massachusetts Coastal Zone Management Program and the Massachusetts Bays Program, providing advice on local and regional issues of concern to both for program implementation.

MA Water Resources Authority's Boston Harbor sewage treatment facility. Credit: Steve Tucker/CCC

The Commission has established two issue specific advisory committees, that it will continue to work with. The Barnstable County Science Advisory Panel, composed of interdisciplinary scientists, assists the county in its review and evaluation of the Massachusetts Water Resources Authority's Deer Island wastewater treatment facilities.

The Barnstable County Scientific Advisory Panel on the Massachusetts Military Reservation, established in response to an Assembly of Delegates ordinance, is composed of 11 interdisciplinary scientists appointed by the County Commissioners, in addition to eight scientists from the US Environmental Protection Agency. This panel was established to assist the county in evaluating the information to date regarding the cleanup of the Massachusetts Military Reservation, and to provide advice on the relative environmental risk of the plumes and the

CCRTA information display. Credit: Nancy Hossfeld/CCC

remediation plan, to the Upper Cape's fresh and saltwater ecosystems.

The Cape Cod Regional Transit Authority (CCRTA) provides regional coordination for the Cape's public transportation systems. The Commission will work with the Regional Transit Authority to encourage the development of public transportation alternatives such as bus routes, rail, and shuttle van services. In addition, the Commission will work with the CCRTA and other appropriate state agencies and private parties to identify locations for future park-and-ride lots, and to encourage the provision of bicycle storage facilities at such locations.

The Commission will coordinate with the Wood Hole, Martha's Vineyard, & Nantucket Steamship Authority to encourage joint solutions on issues of mutual concern relating to ferry transportation between the Cape and Islands.

Although the Cape Cod Commission Act does not specifically enumerate health and human services as an interest to be furthered by the Act, the Commission recognizes the importance of health and human services to the Cape's economy and to the well-being of the Cape's residents. The Commission will work with the Barnstable County Health and Human Services Advisory Council and the county's Human Services Coordinator to incorporate information on health and human service needs and resources into the Commission's library of economic and demographic data. The Commission will also consult with the council regarding the impact of proposed policies and development on the health and human service needs of Barnstable County residents.

State Authorities

Governor's Committee

The Cape Cod Commission Act created a Governor's Committee composed of the Secretaries of the Executive Offices of Environmental Affairs, Transportation and Construction, Economic Affairs, Labor, and Communities and Development, and any other state official designated as a member by the Governor. Through the Governor's Committee a vehicle is also created for coordination with the various state agencies that are situated within these Executive Offices such as the Department of Environmental Management; Department of Environmental Protection; Department of Fish, Wildlife and Environmental Law Enforcement; Department of Food and Agriculture; Massachusetts Highway Department; Water Resources Commission; and others. The purpose of the Governor's Committee is to coordinate state agency planning with the duties, responsibilities, plans, and policies of the Cape Cod Commission. The Act required that the Commission meet quarterly with the Governor's Committee during its first two years and annually thereafter. The Act also authorizes joint planning programs between the Commission and state agencies. The Commission will work with the Governor's Committee to incorporate new state initiatives and policies into the Commission's policies and programs as well as to discuss modifications to existing state policy that would further the goals of the Regional Policy Plan.

State Agencies

The Commission recognizes that there are a host of existing state regulations and programs that relate to

Commission efforts, particularly review of Developments of Regional Impact. These include Chapter 91 regulations on waterways and waterfront development, the Wetlands Protection Act, Massachusetts Environmental Policy Act, Ocean Sanctuaries Act, Title 5, Highway Access Permits, Groundwater Discharge Permits and Chapter 40B. It is not the intent of the Commission to undertake the review required by these laws and regulations. Such review is best undertaken by the appropriate state and local agencies. The Commission will make decisions that are consistent with the requirements of these programs and will seek to include conditions on projects that further their regulatory goals. However, in keeping with the intent of the Cape Cod Commission Act, the Commission's decisions and project conditions may be more stringent than would be required by the state.

The Commission will also actively work to streamline existing permitting processes where such reviews overlap with the Commission's review. For example, during the Commission's first year of operation it established a joint review process with the Executive Office of Environmental Affairs for projects subject to review under the Massachusetts Environmental Policy Act (MEPA) and the Cape Cod Commission Act. This process helps to coordinate review of such projects among local, regional, and state authorities. The Commission has also prepared memoranda of understanding with numerous towns to help coordinate regional and local reviews of proposed developments.

In addition to state regulatory programs, existing state agency policies exert a significant influence on Cape Cod. As far as possible, it would be desirable if future state agency policies and actions reflect the character and sensitive nature of Cape Cod. The Cape Cod Commission has undertaken and will continue planning activities in conjunction with a number of state agencies in a wide variety of subject areas. Many of these activities are discussed in the implementation section of the Regional Policy Plan. For example:

- The Commission works with the Massachusetts Historical Commission and local historic commissions to identify important archaeological sites in order to protect their integrity;
- The Commission coordinates with the Executive Office of Communities and Development to encourage participation by communities in their local initiative housing program;
- The Commission works with the Department of Environmental Protection and local communities to implement programs for composting, recycling, landfill assessment, and hazardous waste reduction and disposal;
- The Commission works with the Division of Marine Fisheries and local authorities to map coastal habitats, including fish runs, fish spawning and nursery areas, submerged aquatic vegetation, and shellfish habitat; and
- The Commission coordinates with the Department of Environmental Management on issues relating to management planning at state parks on Cape Cod.

State Legislature

During the process of developing and using the Regional Policy Plan, the Commission identified several areas

where modifications to existing state law or new legislation may be desirable to further the goals of the Regional Policy Plan. For example:

- The Commission has and will support changes in the Title 5 regulations to permit the use of alternative on-site wastewater treatment technologies that reduce nitrogen loading;
- The Commission will continue to support modification of current zoning and subdivision laws to address problems associated with "approval not required" subdivisions and grandfathering; and
- The Commission has supported legislation to permanently preserve 15,000 acres of the Massachusetts Military Reservation for the protection of groundwater.

Coastal Zone Management Program

The Massachusetts Coastal Zone Management Office (MCZM) coordinates development of state policies regarding protection, development, and revitalization of Massachusetts coastal zone resources and works with appropriate state agencies to implement these policies. MCZM also provides technical assistance to towns on management of coastal resources, including the development of harbor plans. Since the "coastal zone" encompasses all of Cape Cod, MCZM staff played an integral role in shaping the portions of the Regional Policy Plan that address coastal issues to ensure that its goals and policies are consistent with the state's program.

The Coastal Zone Management Office has no direct regulatory role and does not administer state regulatory programs. The Office does, however, conduct a federal consistency review on all direct federal actions that affect the Massachusetts coastal zone, require a federal permit, or are federally funded, and determines whether such activities are consistent with the state's coastal policies. The Cape Cod Commission Act requires that the Coastal Zone Management Office refer such consistency certifications for proposed federal activities in Barnstable County to the Commission for review of consistency with the Regional Policy Plan and Local Comprehensive Plans. The Commission must notify MCZM of any objections to a consistency certification where it finds proposed activities are inconsistent with these plans. Conflicts between MCZM and the Commission are to be resolved by the Secretary of the Executive Office of Environmental Affairs.

The Coastal Zone Management Office may adopt appropriate portions of the Regional Policy Plan, including specific goals and policies, into the state's Coastal Zone Management Program. If this occurs, these policies would also apply to MCZM's federal consistency review discussed above thus requiring federal activities in Barnstable County to be consistent with the Regional Policy Plan.

In addition to this formal consistency review process, the Commission will continue to work closely with the Coastal Zone Management Office on planning issues that affect coastal resources, including development of local harbor management plans. For example, the Commission will work with MCZM to develop educational campaigns concerning coastal hazards, sea-level rise, and coastal construction practices. Since regional MCZM staff work out of Barnstable

County offices, numerous opportunities exist for direct coordination between the two agencies.

Federal Authorities

National Park Service (Cape Cod National Seashore)

Located in six towns on the Outer Cape, Cape Cod National Seashore (CCNS) is a patchwork of public and private lands with numerous public and private inholdings, including town-owned land. The purposes of the Seashore are to protect outstanding natural, cultural, scientific, scenic, and recreational resources; to ensure current and future generations opportunities to enjoy these resources; and to advance an understanding of and appreciation for the interrelationship between humankind and the environment.

Many of these communities that include the Seashore have traffic and other problems that are created, at least in part, by the presence of the National Seashore. Although the towns in which the Seashore lies have zoning districts designed to promote compatible uses on lands within the Seashore, the level of protection provided by these zoning districts may be inadequate. The Park Service's Statement for Management, prepared in 1990, lists a number of major issues facing the park. In the area of land use, many of these issues are related to the six towns and include:

- future use of undeveloped town-owned lands within the Seashore boundaries;
- need for boundary revisions or adjustments;
- lack of joint Seashore-municipal agreements for septage, solid and hazardous waste disposal; and
- the need for planning coordination between the Seashore and the local towns.

The need for joint planning between the National Park Service and communities is clearly pointed out by a number of major issues including the transfer of the North Truro Air Force Base to the Seashore, the Truro Radar Dome replacement, the Provincetown Airport improvements, Hatches Harbor restoration, and water supply management on the Outer Cape. The National Park Service's "1988 Management Policies" explicitly direct the Service to engage in "Cooperative regional planning...to integrate parks into their regional environments and to address adjacent land use issues that influence park resources." In addition, the Service is directed to "encourage compatible land uses and to mitigate potential adverse effects on park values by actively participating in planning and regulatory processes of neighboring jurisdictions, other federal, state, and local agencies, and Native American authorities."

The National Park Service has cooperated with the Commission on several important projects in recent years including development of the Seashore's General Management Plan, the work of the Lower Cape Water Management Task Force (an effort to investigate future water supply options), the Lower Cape Wireless Working Group (an effort to coordinate planning for the siting of wireless telecommunications facilities), the Outer Cape Capacity Study, Cape Cod Pathways and related trail planning

Nauset Light, Eastham. Credit: MA Executive Office of Environmental Affairs

efforts, relocation of Nauset Light, extension of the Cape Cod Rail Trail, and the negotiation of rules for off-road vehicles within the Seashore. The Cape Cod Commission should continue to play a coordinating role in addressing the mutual concerns of the National Park Service and the towns. The Commission would welcome the participation of CCNS as an ex-officio member of the Commission.

Other opportunities to improve and coordinate management under the Cape Cod Commission Act could include stricter DRI review standards for projects on lands in and around the Seashore or designation of critical lands within or adjacent to the park as a District of Critical Planning Concern. In addition, towns should reexamine their zoning bylaws and regulations for their consistency in protecting Seashore resources. A final opportunity for coordination would be the adoption of the Regional Policy Plan by the Coastal Zone Management Program, thereby requiring the Service's actions to be consistent with the Plan. This would encompass activities undertaken by the National Park Service wherever such consistency can be achieved without compromising the Park Service's mission.

Department of Defense – Massachusetts Military Reservation

The Massachusetts Military Reservation (MMR) is located within the towns of Sandwich, Bourne, Falmouth, and Mashpee and has a significant economic impact on Cape Cod. The Cape Cod Commission has worked for many years on the cleanup and restoration of contaminated groundwater on the base. Barnstable County also appointed a Scientific Advisory Committee to provide additional expertise on the review of clean-up options. The Cape Cod Commission will continue to play a significant role in facilitating appropriate remediation. Any groundwater remediation plan is likely to have a significant regional impact and will be of interest to the Commission. The Commission will also continue to monitor other regional issues related to the MMR, including air quality, noise generation, and siting and use of regional facilities, including those for water supply purposes.

Other Federal Agencies

A number of federal agencies administer land on Cape Cod or have programs and policies that affect the Cape. In general, either through voluntary efforts or required consistency through the Coastal Zone Management program, federal actions taken on Cape Cod should be consistent with the Regional Policy Plan unless specific statutory mandates make such consistency impossible. These include actions taken by federal agencies such as the Fish and Wildlife Service, Federal Emergency Management Agency, Federal Aviation Administration, the Department of Housing and Urban Development, Army Corps of Engineers, Department of Commerce, Small Business Administration, Environmental Protection Agency, Census Bureau, Federal Highway Administration, and Federal Transit Administration.

The Commission will continue to coordinate with these and other federal agencies on cooperative planning and research efforts and will undertake new initiatives as necessary. Many of these activities are discussed in more

detail in the Implementation section of the Regional Policy Plan.

Private Parties

The Commission will coordinate with the various educational and research institutions and organizations on Cape Cod to develop information and educational opportunities to further the policies and programs in the Regional Policy Plan. These include the Cape Cod Community College, the Woods Hole Oceanographic Institution, the Marine Biological Laboratory, the Woods Hole Research Center, the Cape Cod Museum of Natural History, the Center for Coastal Studies, the Cape Cod Center for Sustainability, and the Thornton Burgess Society. The Commission will work with the Cape Cod Environmental Education Resource Center to encourage incorporation of waste minimization and recycling in primary and secondary educational curricula in Cape Cod schools.

The Commission will work with nonprofit, civic, and professional organizations on Cape Cod including the League of Women Voters, Association for the Preservation of Cape Cod, Cape Cod Homebuilders Association, Cape and Islands Board of Realtors, Barnstable County Bar Association, Cape and Islands Recreation Association, surveyors, and others to inform them about the Regional Policy Plan and respond to their comments and concerns about implementation of the policies in the Plan.

The Commission will continue to coordinate with various conservation organizations and agencies on open space preservation issues, including the Massachusetts Audubon Society, The Nature Conservancy, the Trust for Public Land, the Trustees of Reservations, The Compact of Cape Cod Conservation Trusts, the Conservation Fund, the National Park Service, and state environmental agencies. In particular, the Commission will support the Cape Cod Pathways project.

The Commission will work with various minority groups on Cape Cod, including those of Asian, Pacific Island, Black, Cape Verdean, Hispanic, and Native American ancestry and their community associations to address their comments and concerns about implementation of the Regional Policy Plan.

The Commission will work with the Cape Cod Economic Development Council, the Cape Cod Technology Council, the Cape Cod Chamber of Commerce, town chambers of commerce, the Association for the Preservation of Cape Cod's Business Roundtable, and others to identify and implement programs to improve the Cape Cod economy. One objective of the Regional Policy Plan is to promote projects that confer distinct benefits to the community, such as nonprofit service corporations, educational institutions, and health care facilities, so long as such projects pose no danger to public health or the environment.

The Commission will work cooperatively with local land trusts and The Compact of Cape Cod Conservation Trusts to protect significant natural and fragile areas on the Cape. The Commission will also work with the HOME Consortium, the Housing Land Trust of Cape Cod, and private, nonprofit housing trusts to support their efforts to develop affordable housing on Cape Cod.

Appendix: Regional Policy Plan Maps

Produced by the Cape Cod Commission Geographic Information System (GIS)

- Cape Cod Water Resources Classification Map I
- Cape Cod Water Resources Classification Map II: Marine Water Recharge Areas
- Cape Cod Significant Natural Resource Areas Map
- Functional Classification of Cape Cod Roadways

Notes:

• Color versions of each map (dimensions: approx. 8.5 inches by 11 inches) are available as downloadable JPEG- and PDF-formatted files on the Web at: www.capecodcommission.org/RPP

• Commercially printed and folded color versions of each map (dimensions: approx. 2 feet by 3 feet) are available from the Cape Cod Commission.

• Color ink-jet printouts (dimensions: approx. 3 feet by 4 feet) are also available for purchase at $25 each, plus postage if shipped.

• The Cape Cod Commission also produces and maintains geographic data on many other aspects of Cape Cod land use.

Map Notes

Cape Cod Water Resources Classification Map I

Explanation and Data Sources:

Primary Resource Areas: Include potential public water supply areas, identified wellhead protection areas, identified freshwater recharge areas, and marine water recharge areas (MWRAs). The MWRAs are depicted on Cape Cod Water Resources Map II.

Water Quality Impaired Areas: Include unsewered residential lots less than 20,000 square feet, marinas, landfills, septage and wastewater treatment plant discharge sites, commercial and industrial areas. (See MacConnell land use.)

Water Quality Improvement Areas: Overlap of Primary Resource Areas and Water Quality Impaired Areas.

Identified Wellhead Protection Areas: (Zones of Contribution) 1:25,000, CCC Water Resources Department updates to 2001, which include various private consulting firms and DEP.

(*) Freshwater Recharge Areas: Areas shown are those identified TO DATE by CCC Water Resources staff and private consultants, 2001.

Potential Public Water Supply Areas: From the "Priority Land Acquisition Assessment Project," June 1999; from the Lower Cape Water Management Task Force, 1998; from various other CCC Water Resources Office projects; and from USGS GIS analysis "Water Resources Investigations Report 94-4156, 1994," Harris and Steves.

Small Volume Wells: Property locations with small volume wells were matched with digitized parcel locations in order to determine geographic locations of wells shown here. Wells include public water supplies registered with DEP and unregistered water supplies which are likely to serve 25 or more persons per day for more than 60 days per year. (CCC Small Volume Well Inventory and Prioritization Project, DEP FY92 604(b) grant, 1996)

Marine Water Recharge Areas: The MWRAs are depicted on Cape Cod Water Resources Map II.

Landfills, public supply wells: (digital) U.S. Geological Survey, CCAMP 1988, with updates by CCC to September 2001 from town water departments.

Plumes: Various scales, Various private consulting firms, HAZWRAP, Jacobs Engineering, CCC Water Resources Staff, to August 2001.

MacConnell land use: (digital) 1999, source of the categories: medium and high density residential, multi-family residential, commercial, industrial, transportation, waste disposal, and marina; from aerial photo interpretation (1:25,000 scale). Digitized by the Resource Mapping - Land Information Systems Dept. of Forestry and Wildlife Management, University of Massachusetts, Amherst in cooperation with the EOEA MassGIS project and the Cape Cod Commission. Further explanation of the land use categories may be found in the publication "Remote Sensing 20 Years Change in Barnstable, Dukes, and Nantucket Counties, Massachusetts, 1951–1971" W. P. MacConnell, University of Massachusetts.

Non-digital data were automated by the Cape Cod Commission GIS staff using the ARC/INFO GIS software.

Cape Cod Water Resources Classification Map II

Data Sources:

Marine Water Recharge Areas: Delineated by CCC Water Resources Office under the Cape Cod Coastal Embayment Project. (See Technical Memorandum: Nitrogen Sensitivity and Prioritization of Cape Cod Embayments, August, 1996 for more details.)

The Cape Cod Coastal Embayment project was partially financed with federal funds from the Environmental Protection Agency to the Department of Environmental Protection (FY93 319 Project 93-10).

Non-digital data were automated by the Cape Cod Commission GIS staff using the ARC/INFO GIS software.

Cape Cod Significant Natural Resources Map

Data Sources:

Habitat Information: Combination of Mass. NHESP and APCC: Critical Upland Areas, Vernal Pools, Rare Wetland Wildlife Habitat, Priority Sites for Rare Species and Natural Communities: 1:25,000 (NHESP data are from 1999–2001) USGS Quadrangles in the "Cape Cod Critical Habitats Atlas," Association for the Preservation of Cape Cod, 1990, with assistance from the Mass. Natural Heritage and Endangered Species Program. (Selected habitat areas of state listed rare plants and animals. Not for use with the Wetlands Protection Act.)

Identified Wellhead Protection Areas: (Zones of Contribution) 1:25,000, CCC Water Resources Department updates to 2001, which include various private consulting firms and DEP.

Potential Public Water Supply Tracts: From the "Priority Land Acquisition Assessment Project" (PLAAP), June 1999, CCC Water Resources Office. This was the follow-up investigation of USGS's "Water Resources Investigations Report" of 1994. Also from the Lower Cape Water Management Task Force, 1998.

Unfragmented Forest Habitat: 1:25,000, 1999 MacConnell (*) Forest category greater than 125 acres.

Wetlands: 1:5,000, 1999 DEP Wetlands Conservancy Program.

* MacConnell land use: (digital) 1999. MacConnell land use is from aerial photo interpretation (1:25,000 scale). Digitized by the Resource Mapping - Land Information Systems Department of Forestry and Wildlife Management, University of Massachusetts, Amherst in cooperation with the EOEA MassGIS project and the Cape Cod Commission. Further explanation of the land use categories may be found in the publication "Remote Sensing 20 Years Change in Barnstable, Dukes, and Nantucket Counties, Massachusetts, 1951–1971" W. P. MacConnell, University of Massachusetts.

Non-digital data were automated by the Cape Cod Commission GIS staff using the ARC/INFO GIS software.

Functional Classification of Cape Cod Roadways Map

Data Sources:

Functional Classification: Roads selected and identified by the Bureau of Transportation Planning and Development for the Massachusetts Highway Department Year-end 2000 Road Inventory. Updated by CCC transportation staff, 2001, to improve geographic accuracy.

Federal Aid Urban Area: From attribute data in the Massachusetts Highway Department Year-end 2000 Road Inventory.

Military Reservation, Federal Aid Urban Area, digitized by CCC, 2001.

All Maps

These maps were produced by the Cape Cod Commission's Geographic Information System department for the Regional Policy Plan update, submitted January 10, 2002, effective April 29, 2002, with any amendments listed. Corrections are welcome at the Cape Cod Commission office.

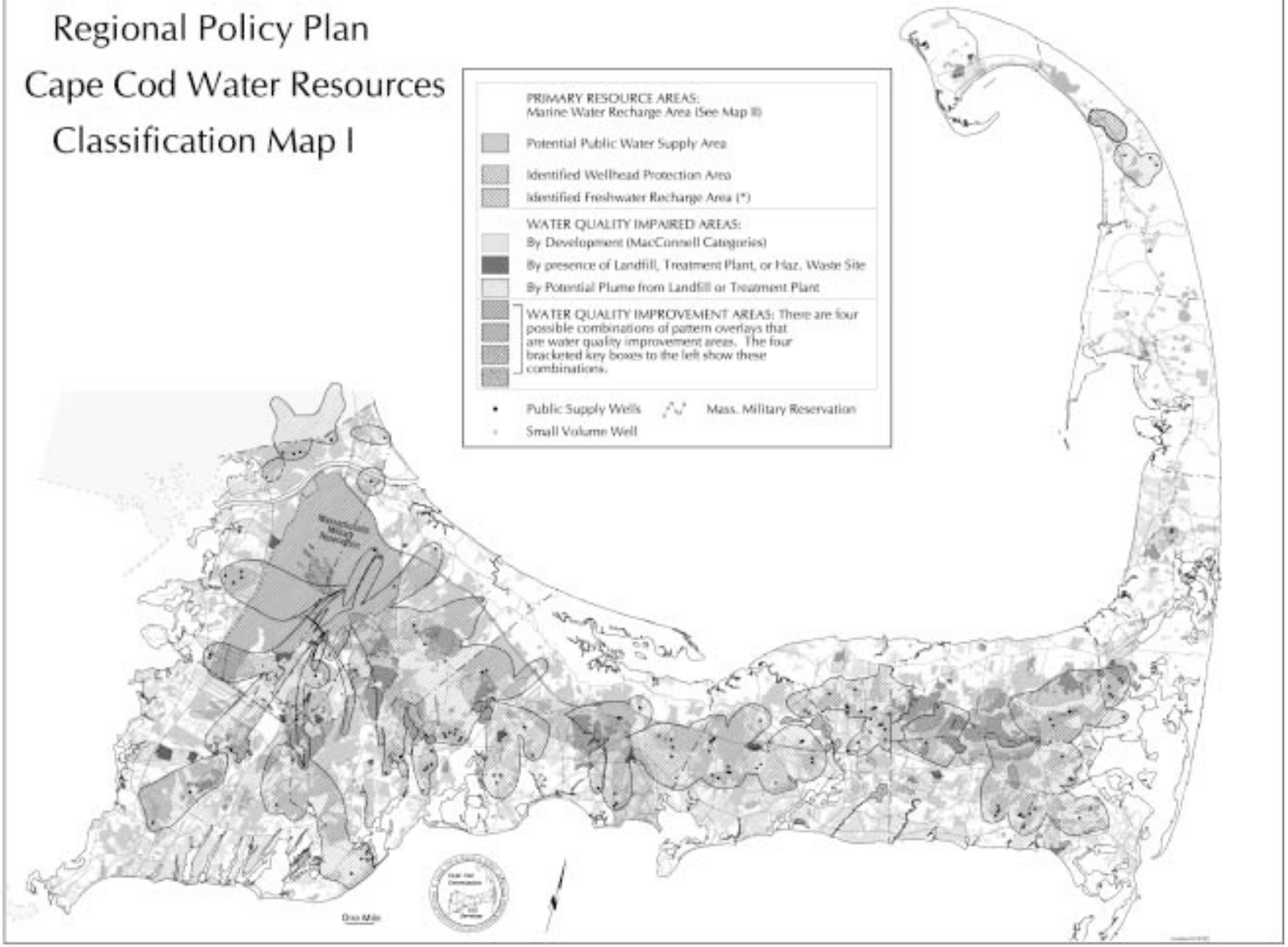
Basemap features: MassGIS, (digital), 1988, from 1:25,000 scale USGS Quadrangle Sheets; late 1970s and earlier 1:100,000 scale maps. Includes ponds, roads, coastline, town boundaries.

These maps are illustrative and all depicted boundaries are approximate. They are intended for planning purposes only—not site specific purposes.

Regional Policy Plan

Cape Cod Water Resources

Classification Map I

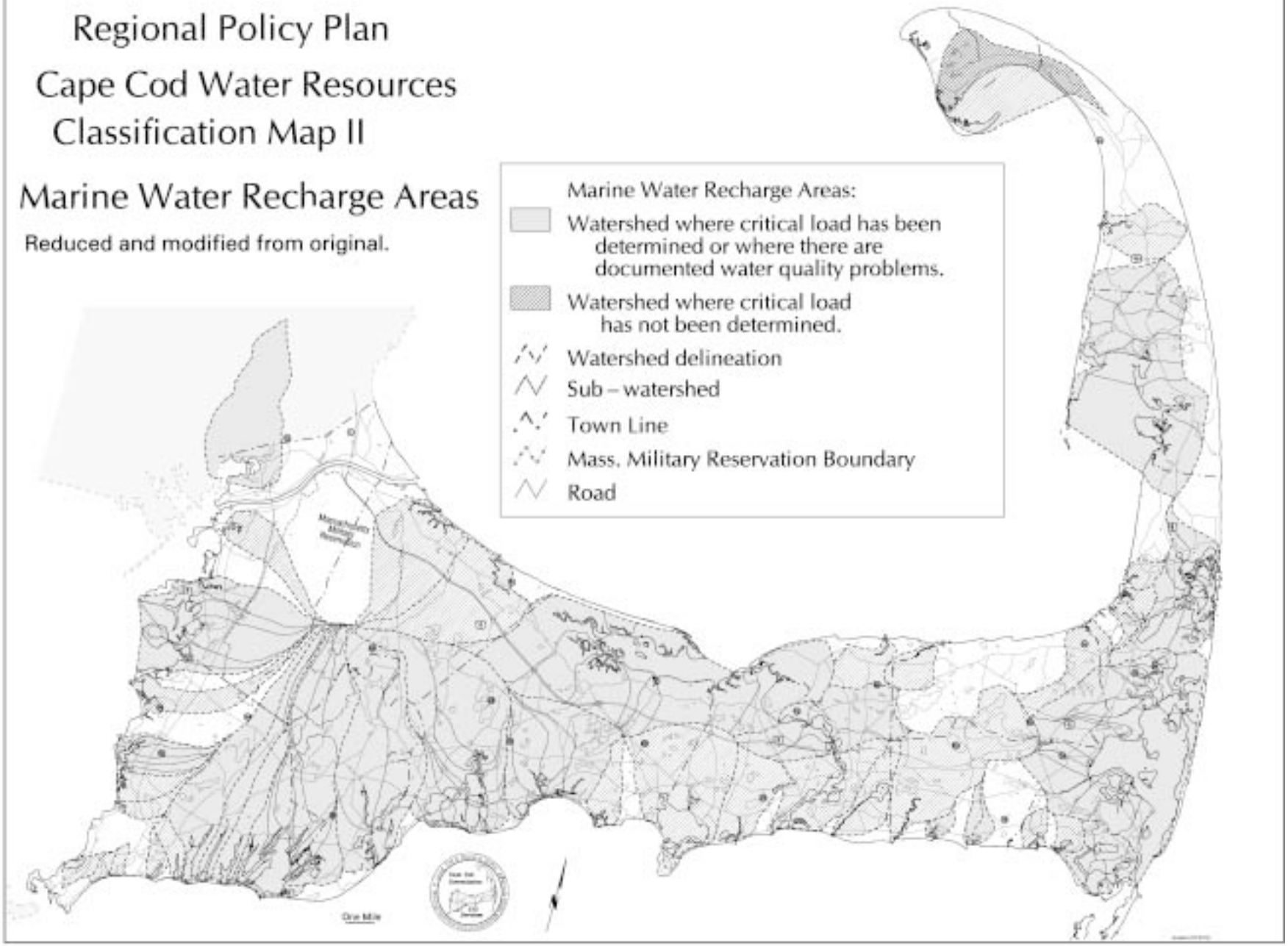


Regional Policy Plan

Cape Cod Water Resources Classification Map II

Marine Water Recharge Areas

Reduced and modified from original.



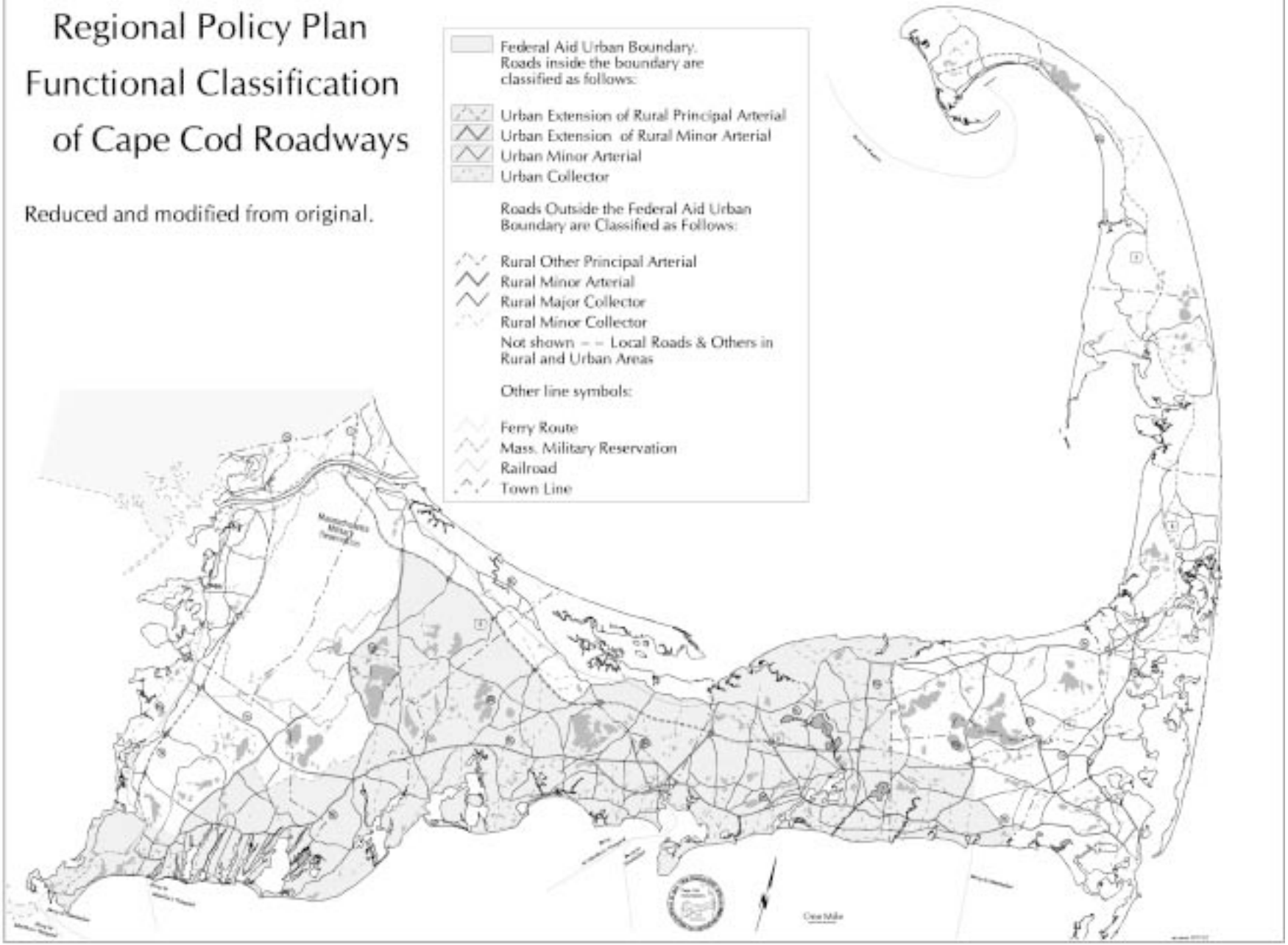
Regional Policy Plan

Cape Cod Significant Natural Resources Map

Reduced and modified from original.

Regional Policy Plan
Functional Classification of Cape Cod Roadways

Reduced and modified from original.



Technical Bulletins Available from the Cape Cod Commission

Printed copies of these documents are available from the Cape Cod Commission. Most are also available as downloadable PDF-formatted files on the Web at: www.capecodcommission.org/regulatory

- **Technical Bulletin 91-001** – Nitrogen Loading
- **Technical Bulletin 92-001** – Estimation of High Groundwater Levels for Construction and Land Use Planning
- **Technical Bulletin 92-002** – Development of Regional Impact Guidelines for Natural Resources Inventory (Plant and Wildlife Habitat Assessment)
- **Technical Bulletin 93-001** – Local Comprehensive Plan Guidelines
- **Technical Bulletin 94-001** – Guidelines for Calculation and Provision of Open Space in Developments of Regional Impact
- **Technical Bulletin 95-001** – Development of Regional Impact Standards and Submittal Requirements for Exterior Lighting Design
- **Technical Bulletin 96-001** – Designing the Future to Honor the Past: Design Guidelines for Cape Cod
- **Technical Bulletin 96-002** – Guidelines for Referral of Historic Structures to the Cape Cod Commission
- **Technical Bulletin 96-003** – Guidelines for Traffic Impact Assessment
- **Technical Bulletin 97-001** – Guidelines for DRI Review of Wireless Communication Towers

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Cape Cod Regional Policy Plan

Barnstable County • Massachusetts

Effective April 29, 2002