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Introduction

How and where we grow in the next decade will impact the communities of Cape Cod for the next century. With 86% of the region's land already developed or protected, our ability to adapt to an ever-changing environmental and economic landscape is imperative. Cape Cod must face its challenges—including the need for diverse and affordable housing, wastewater infrastructure that requires billions of dollars to construct, traffic that continues to increase, canal bridges that are functionally obsolete, potential threats to drinking water quality, and a coastline that is rapidly eroding and significantly diminishing during every coastal storm—if the region is to continue to thrive.

Cape Cod is an intricate web of natural, built, and community systems and our seasonal economy presents both significant challenges and opportunities. With comprehensive regional planning Cape Cod will solidify its place as a leader in community resilience. By focusing new growth and redevelopment into existing centers of activity with thoughtful design through regional regulatory relief and incentives, we can realize increased density where it makes sense. We can create different sized housing units to accommodate more varied lifestyle needs and the Cape's wide-ranging demographic, as well as provide more access to affordable housing. With a smart approach to growth we can create more walkable communities, decrease infrastructure costs and generate more year-round and seasonal jobs. We can adapt to the ever-changing nature of retail and the need for higher paying wages and workforce housing to keep our younger professionals and families invested in calling Cape Cod home. We can attract public and private infrastructure investment that adds value to both the seasonal and year-round economies. Cape Cod has the ability to address its challenges and capitalize on opportunities to improve its future.

Using data and information to measure progress in meeting regional goals will provide Cape Cod communities with the ability to adapt. Meeting regional housing needs and promoting growth and development in locations with adequate transportation and wastewater infrastructure are priorities critical to the Cape economy. Making the Cape less vulnerable through policies and strategies that address our evolving shoreline and impacts from climate change and coastal storms is a priority. We must continue to seek and secure additional resources to lessen the financial burden of necessary infrastructure on our 15 Cape communities.

Together, as One Cape, we can build environmental and economic resilience, strengthen community relationships, and design regional policies and implementation plans to address

our greatest challenges. The 2018 Regional Policy Plan for Cape Cod provides a path forward for sustainable growth and development and streamlined regulation, it addresses critical housing needs and eases the local comprehensive planning process, and it provides a framework for coordinated regional capital planning. We must collaborate as a region to keep Cape Cod a special place for decades to come.

WHAT IS NEW IN THIS PLAN?

The following are brief descriptions of several new components of the 2018 Regional Policy Plan (RPP) update. Each of these components will play a key role in the Commission's regional planning and regulatory review over the next five years.

- Cape Cod Placetypes
- Identification of Activity Centers and Natural Areas
- Goal-Based Context-Sensitive Regulatory Review
- Emphasis on Coordinated Regional and Local Planning
 - Climate Change Planning
 - Regional Housing Strategy
 - Regional Capital Planning
 - Streamlined Local Comprehensive Planning
- Regional Performance Measures

CAPE COD PLACETYPES

This RPP identifies eight Placetypes found and desired on Cape Cod: Natural Areas, Rural Development Areas, Suburban Development Areas, Historic Areas, Maritime Areas, Community Activity Centers, Industrial Activity Centers, and Military and Transportation Areas. The framework of these Placetypes allows regional land use policies and regulations to better respond to and enhance local form and context and support development that complements its surroundings.

IDENTIFICATION OF ACTIVITY CENTERS AND NATURAL AREAS

This RPP identifies two types of regional activity centers: Community Activity Centers and Industrial Activity Centers. Community Activity Centers are areas with a concentration of business activity, community activity, and a compact built environment. Community Activity Centers may be suitable for additional multi-family housing and a mix of uses at a scale of growth and development desired by the community.

Industrial Activity Centers are areas containing industrial uses that are suitable for future industrial growth including but not limited to light manufacturing, warehousing and construction services, and emerging industry clusters, such as marine technology.

Both types of activity centers, provided sufficient infrastructure and local regulations exist, may be suitable for certain types of growth and economic development for Barnstable County.

While the 2018 RPP identifies these centers of activity at the regional scale based on existing characteristics, centers of activity also exist or could be envisioned at a neighborhood or local scale. For more information on the geodesign process used to identify activity centers, go to <http://ccc-plans.org/acs>.

This RPP also identifies Natural Areas, which contain the region's most important sensitive and vulnerable resources. This RPP encourages minimizing development and its impacts in these areas to protect the region's significant resources and to balance the anticipated redevelopment and growth in activity centers.

GOAL-BASED CONTEXT-SENSITIVE REGULATORY REVIEW

The identification of Cape Cod Placetypes creates a common understanding of the different character areas that are important to defining the Cape and allows for greater understanding of a potential development's context. The regulatory component of this RPP update includes goals and objectives that are applied to a project through the lens and vision of the Cape Cod Placetype in which a project is located.

EMPHASIS ON COORDINATED REGIONAL AND LOCAL PLANNING

Climate Change Planning

Climate change resiliency concepts are found throughout the RPP, incorporated into the growth policy, design, and resource protection policies, as well as in the related regional and local plans that help put these policies into action and support state and federal planning and resiliency goals. Specifically, this RPP will help reduce Cape Cod's vulnerability and improve resiliency in the face of climate change by promoting development outside of flood zones and vulnerable habitat areas and focusing development in activity centers with adequate wastewater, drinking water, and stormwater infrastructure; fostering walkable neighborhoods, bike-friendly roads, and transit systems; planning for resilient energy systems, reducing reliance on fossil fuels, and encouraging green building elements and renewable energy generation and storage.

Regional Housing Strategy

The June 30, 2017 “Regional Housing Market Analysis and 10-Year Forecast for Housing Supply and Demand” study for Barnstable County prepared by Crane Associates, Inc. and Economic & Policy Resources highlighted the need for a comprehensive regional housing strategy that supports development of affordable and varied housing options for Cape residents of all income levels and ages. Based on the results of this study, this RPP promotes housing production where it is most efficient in terms of land use and infrastructure and will not negatively impact the region’s crucial natural and cultural resources.

Regional Capital Planning

This RPP includes a framework for development of a Regional Capital Plan intended to characterize, quantify, plan, and advocate for regional infrastructure and facilities and the planning, forecasting, decision making and financial tools to support the region’s communities.

Streamlined Local Comprehensive Planning

Towns are encouraged to incorporate the regional goals and objectives of the RPP into local planning efforts. To encourage more towns to adopt or update their local comprehensive plans, the Commission will develop a template for what should be included in local comprehensive plans and technical guidance on the components of a local capital improvement plan. In addition, the Commission will continue developing web-based tools to help towns identify and better understand their community assets and opportunities. Commission staff will also assist towns in developing their local comprehensive plans to preserve or promote such assets and capitalize on their communities’ opportunities.

REGIONAL PERFORMANCE MEASURES

This RPP identifies regional performance measures intended to track the implementation and effects of the regional goals and objectives established by and through the RPP. The changes in these regional performance measures over time will help identify areas where progress has been made as well as areas in need of more work, which should be the focus for future Commission efforts.

1. The Cape Cod Region

Cape Cod is an iconic peninsula of 15 towns extending 60 miles into the Atlantic Ocean, and currently home to approximately 214,000 year-round residents. With over 500 miles of coastline and beaches, almost 1,000 freshwater ponds covering more than 17 square miles of the region, and more than 100,000 acres of habitat, wetlands, and protected open space, the natural beauty, environmental resources, and historic character of the region have made Cape Cod a globally-recognized visitor destination. Though each Cape town is unique, the Cape is often described as four sub-regions of towns with more similar characteristics—Upper, Mid, Lower, and Outer—further detailed in the following pages.

The Upper Cape sub-region consists of four towns: Bourne, Sandwich, Falmouth, and Mashpee. This sub-region of the Cape is closest to Boston and the rest of Massachusetts and contains the Cape Cod Canal and the Bourne and Sagamore bridges. Although seasonality permeates the entire Cape region, the Upper Cape communities tend to be less seasonal than the Lower and Outer Cape towns, with Bourne and Sandwich having the lowest proportions of seasonal housing in the region and the youngest populations. The Upper Cape tends to have higher median incomes than the other Cape towns, lower median home prices than the Lower and Outer Cape towns, and economies that are somewhat less focused on tourism. Woods Hole Oceanographic Institute, Marine Biological Laboratory, the National Oceanic and Atmospheric Administration, and associated spin-off businesses in Falmouth and Bourne make the Upper Cape a key area for oceanographic research and related industries. Also unique to this sub-region is Joint Base Cape Cod (shown in dark blue in the above graphic), which is approximately 22,000 acres in size, and includes land in parts of Bourne, Mashpee, and Sandwich and abuts the Town of Falmouth. The Upper Cape is relatively densely developed outside of Joint Base Cape Cod but does contain significant natural resources and open spaces.

Though the Mid Cape sub-region is comprised of only three towns—Barnstable, Yarmouth, and Dennis—it is home to almost 40% of the region's year-round population. In addition to the historic Cape villages and downtowns, the Mid Cape also has large areas of suburban development, particularly in Barnstable and along Route 28 in Yarmouth. Barnstable has one-third of all commercial building square footage in the region and Route 132 in Barnstable is the Cape's regional retail and commercial center, with a regional mall as well as several other larger, national retailers. The Town of Barnstable is the largest town on the Cape and has the largest population. Education and Health Services make up nearly one-third of all employment

in Barnstable, but moving west to east within the Mid Cape, the towns generally become more seasonal and tourism-oriented both in terms of housing units and employment opportunities.

The Lower Cape, consisting of the towns of Brewster, Harwich, Orleans, and Chatham, is where the typical development patterns of the region start to transition from denser suburban to somewhat more rural and include large tracts of open space such as Nickerson State Park and Punkhorn Parklands. Year-round populations and the number of housing units in this region are a fraction of the Upper and Mid Cape towns, though still higher than the Outer Cape towns. The Lower Cape communities tend to have older populations and higher median incomes than the Mid Cape towns. This sub-region is much more seasonal than the Upper and Mid Cape, though not as seasonal as the Outer Cape. Though this region tends to have higher median incomes than the Mid Cape, housing is also more expensive, with Chatham and Orleans having the highest median house prices in the region.

The four towns of Eastham, Wellfleet, Truro, and Provincetown make up the Outer Cape. These towns have significantly smaller year-round populations than the rest of the region—Truro's year-round population is only 1,738 people. These towns are much more rural in nature than the rest of the region. Part of what makes this sub-region unique and contributes to the rural and natural development patterns that typify these towns is the presence of the Cape Cod National Seashore (shown in dark green in the above graphic). This National Park contains more than 27,000 acres in the Outer Cape (as well as portions of Orleans and Chatham) and provides critical and stunning wildlife habitat, open space, and recreational opportunities, with limited development within its borders. In all towns within this region, housing units outnumber the year-round population because more than half of the housing stock is seasonal. This sub-region of the Cape experiences the most significant seasonal changes in population, housing, and the economy, and is very heavily focused on the tourism industry.

CAPE COD COMMISSION RESPONSIBILITIES

Unprecedented growth on Cape Cod in the 1980s prompted the Massachusetts General Court (the state legislature) to pass the Cape Cod Commission Act (Act) in 1989. The Act was signed into law by the Governor in January 1990 and ratified by a majority of Barnstable County voters in March 1990.

The Act established the Cape Cod Commission (Commission) as Barnstable County's regional planning and regulatory agency. Through the Act, the Commission is responsible for balancing the protection of the region's resources with appropriate development and economic

progress. Simply put, the mission of the Cape Cod Commission is to keep a special place special.

Section 1 of the Act identifies the values, purposes, and goals of the Commission as follows:

Section 1(a): The region commonly known as Cape Cod, comprised of Barnstable County, including all geographic areas to the jurisdictional limit of the commonwealth, possesses unique natural, coastal, scientific, historical, cultural, architectural, archaeological, recreational, and other values; there is a regional, state and national interest in protecting, preserving and enhancing these values; and these values are being threatened and may be irreparably damaged by uncoordinated or inappropriate uses of the region's land and other resources.

Section 1(c) of the Act identifies the purposes of the Cape Cod Commission, which are 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;
- 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.

Section 1(d) of the Act states that the Commission shall:

- Anticipate, guide and coordinate the rate and location of development with the capital facilities necessary to support such development;
- Review developments which will have impacts beyond their local community and determine the comparative benefits and detriments of those projects and their consistency with the regional policy plan and local comprehensive plans and goals;
- Identify and protect areas whose characteristics make them particularly vulnerable to adverse effects of development;

- Preserve the social diversity of Cape Cod by promoting fair affordable housing for low-income and moderate-income persons;
- Promote the expansion of employment opportunities; and,
- Implement a balanced and sustainable economic development strategy for Cape Cod capable of absorbing the effects of seasonal fluctuations in economic activity.

To carry out these broad purposes and goals, promote the public health, safety and general welfare, to maintain and enhance sound local and regional economies, and to ensure balanced economic development, Section 1(b) of the Act gives the Commission the authority to:

- Review and regulate Developments of Regional Impact (i.e., developments that will have impacts beyond their local community)
- Recommend for designation specific areas of Cape Cod as Districts of Critical Planning Concern
- Prepare and oversee the implementation of a regional land-use policy plan for all of Cape Cod.

Under the Act, the Regional Policy Plan is required to:

- Propose a growth policy for the region, contained in Section 3 of the plan
- Identify Barnstable County's critical resources and management needs, covered in Sections 4 and 5
- Develop regional goals for the next five years and beyond, covered in Section 6 of this plan
- Develop a policy for coordinating regional and local planning efforts, contained in Section 7 of this plan.

2. Evolution of the Regional Policy Plan

PREVIOUS VERSIONS OF THE RPP

The region's first Regional Policy Plan was adopted on September 6, 1991, just over one year after adoption of the Cape Cod Commission Act. The 1991 RPP adopted a Vision Statement that supported "protect[ing] the best of Cape Cod and repair[ing] the mistakes of the past." The plan contained goals, policies, and implementation strategies. These strategies consisted of Commission actions and recommended town actions and regulatory standards for 13 different issue areas. The 1991 RPP also included mapped and identified resources of regional importance, such as the Water Resources Classification Maps, and a strategy for coordination with other state, federal, and local partners. The 1991 plan proposed to map areas for designation as village, regional, and industrial growth centers for adoption through local comprehensive plans (LCPs). The 1991 RPP also mapped regulated and planning areas and adopted goals, minimum performance standards, and other development review policies for each issue area.

The 1996 and 2002 RPP updates followed a similar format to the 1991 plan. The 1996 update placed considerable emphasis on growth management tools and recommended analyzing the carrying capacity of Cape Cod's resources. Designation of growth centers remained in the plan for adoption in LCPs. The Outer Cape and Monomoy Capacity Studies, which analyzed transportation, water supply, and wastewater capacity in these two regions were a direct result of the 1996 plan and were prepared within the next few years. The 2002 plan also placed more emphasis on designation of Districts of Critical Planning Concern (DCPCs) for growth management purposes and to protect regional resources, resulting in several DCPC designations for those purposes.

In Spring 2006, the Barnstable County Commissioners appointed the 21st Century Task Force (Task Force) to evaluate the Commission's operations and make recommendations to improve the agency's effectiveness and relationships with towns. The 21st Century Task Force report included over 35 recommendations for improvements to the Commission's regulations. This effort resulted in a restructuring of the RPP to develop a more focused map-based approach to planning and regulation and included the adoption of the first Regional Land Use Vision Map (RLUVM). The RLUVM included five general categories of land use: Economic Centers, Industrial/Service Trade Areas, Villages, Resource Protection Areas, and Other. The Task Force

also recommended the Commission place more emphasis on planning and technical services for towns and to make the regulatory process more clear, predictable, flexible, and effective.

As a direct result of the Task Force recommendations, the Commission engaged in a collaborative process with Cape towns to adopt local Land Use Vision Maps (LUVMs) to incorporate into the RLUM. As a result of this process, eight of 15 towns adopted LUVMs that were incorporated into the 2009 RPP.

The 2009 RPP divided the plan into separate planning and regulatory sections and grouped issue areas into three categories: Growth Management Systems, Natural Systems, and Human/Built Systems. The 2009 RPP also expanded the practice of applying different standards in different geographic locations to issue areas in addition to water resources and reduced Development of Regional Impact (DRI) mitigation requirements in mapped Economic Centers for transportation, open space, and affordable housing to create incentives for development to locate in these areas.

RPP UPDATE PROCESS

In December 2014, the Commission held three sub-regional hearings to begin the RPP update process. These initial meetings provided an overview of the Cape's development history and its effects on the region's economy, culture, and environment. In addition, these meetings served as a forum for gathering public feedback on themes or lessons learned for incorporation and consideration in the updated RPP. These meetings were also used to recruit stakeholders to participate in several additional meetings to inform the RPP update, discussed in the following text.

Early Stakeholder Input

Recruited stakeholders, who represented a wide range of backgrounds, constituencies, and their interests and concerns, were grouped by sub-regional geographic area. Representatives were self-selected volunteers residing or working within the applicable sub-regional areas who were generally able to represent broader constituent and interest groups, for example, citizens, planners, municipal officials, environmental advocates, builders, attorneys, engineers, historic preservationists, or housing authorities. The Commission convened each of the three stakeholder working groups (Upper Cape, Mid Cape, and Lower/Outer Cape) six times over the course of nine months, from March through November 2015.

supplies on Cape Cod for their second home. However, few respondents use on-Cape financial or medical services and specialists because they are unnecessary while on the Cape and have established providers off-Cape.

PUBLIC COMMENT AND FEEDBACK ON DRAFT

A draft of this plan was released for a 60-day public comment period on September 21, 2018. During this comment period, three public hearings were held—one in Sandwich, one in Truro, and one in Yarmouth—and Commission staff attended nine Select Board and/or Planning Board meetings. Additionally, Commission staff met with staff from five towns, presented the draft plan to the Assembly of Delegates and the Cape Cod Selectmen and Councilors Association, and met with the Town Planners from across the Cape, in addition to 12 meetings with other stakeholders. During this time, stakeholders were encouraged to provide feedback on the draft plan at these meetings, as well as provide written comments. The public comment period ended on November 19, 2018 and more than 135 comments were received.

Comments generally fell into the following broad categories: balancing the economy and environment; the new framework for regulatory review; Placetypes; climate change mitigation; regional, sub-regional, and local characterizations; and plan process and general support. Additionally, there were issue-specific comments on capital facilities and infrastructure, community design, economy, energy, housing, ocean resources, solid waste, local comprehensive plans and capital plans, transportation, and water resources. The input from the initial stakeholder process and surveys helped identify key areas of concern such as affordable housing, preserving the area's natural resources, and protecting the regional character, and helped to shape a regional vision for the future of Cape Cod that balances protecting the critical regional resources with allowing for efficient growth in appropriate areas. Building upon the initial stakeholder process and surveys from 2014-2017, the feedback from the public comment process on the draft plan highlighted that climate change mitigation is one of the key issues facing the region, while also underscoring the need for affordable housing and the importance of balancing and linking the region's environment and economy to support vibrant communities into the future.

3. A Regional Vision for Cape Cod

The region's intrinsic wealth stems from its natural beauty, historic community character, and healthy coastal and freshwater environments. The features that make Cape Cod attractive are also the cause of the forces that threaten to overwhelm the environment and erode its character. The challenge Cape Cod continues to face is balancing the protection of the environment with supporting the residents, workers, and visitors with the necessary services and infrastructure to thrive over the long term. Where that balancing point lies may be a point of discussion, but the choices made must consider the threat of losing those unique Cape assets that cannot be replaced.

The vision for the future of Cape Cod is a region of vibrant, sustainable, and healthy communities, and protected natural and cultural resources. To advance this regional vision, the 2018 RPP includes a description of eight Placetypes, including identified Community Activity Centers, Industrial Activity Centers, and Natural Areas. The Commission will focus efforts to support vibrant downtowns and village centers by helping to plan for housing and economic opportunities to meet regional needs in the Community Activity Centers, and the Industrial Activity Centers will be targeted areas for future growth in existing and emerging industries. The Natural Areas will be the focus of the Commission's efforts to protect vulnerable resources and improve the Cape's resilience to severe storms and the effects of climate change.

GROWTH POLICY FOR BARNSTABLE COUNTY

Growth should be focused in centers of activity and areas supported by adequate infrastructure and guided away from areas that must be protected for ecological, historical or other reasons. Development should be responsive to context allowing for the restoration, preservation and protection of the Cape's unique resources while promoting economic and community resilience.

4. Cape Cod Systems

The Cape Cod Commission Act requires that the Regional Policy Plan identify Barnstable County's critical resources and management needs. Cape Cod is comprised of a suite of interrelated and interdependent systems: natural, built, and community. Natural systems are an integral part of life on Cape Cod, providing drinking water and supporting the habitats and landscapes that draw people to the region, guiding development patterns, and driving the region's economy. Built systems—the human-made physical elements of the region—allow for people to live, visit, and work on the Cape. Community systems are the social activities and qualities of the region, including the economy and cost of living, which depend on the health of both the natural and built systems. While maintaining a healthy balance among these systems has been an ongoing effort, climate change is anticipated to impact how each system functions, creating new challenges. The Growth Policy recognizes the importance and interdependence of these systems and the need to balance the impacts and functions of each to sustain the Cape over the long term. These natural, built, and community systems are described in this section.

NATURAL SYSTEMS

The region's natural systems are vital to the economy and way of life. The natural environment of Cape Cod includes the water and ecosystems upon which life depends and is prioritized by this plan for protection and restoration. The natural systems of the Cape center around water, water-dependent resources, and habitat. High quality natural systems are part of Cape Cod's attraction for residents and visitors, but they are also all susceptible to contamination from various land uses and activities and are increasingly vulnerable to changes in climate. In the future, it is anticipated the natural functions of these systems will be affected by increases in storm severity, intensity, and rainfall, as well as changes in temperature and periods of drought. Protection and restoration is a critical need.

Groundwater

Cape Cod groundwater is derived solely from precipitation and is stored in sandy glacial deposits that comprise Cape Cod's aquifer as the groundwater flows to the coast. The aquifer deposits are generally very permeable, making them ideal for development of high-yielding water supplies, but simultaneously vulnerable to contamination from land uses in their watersheds. Cape Cod's aquifer is bound by the water table, by a transition zone between fresh and salt water, and by bedrock beneath portions of the upper Cape. The water table

fluctuates in response to the seasonal loss of recharge due to evaporation and transpiration. About 10% of the total recharge to the aquifer is pumped for water supply. The amount of groundwater available for drinking water is limited to maintain the hydraulic balance of the aquifer's saltwater boundaries and sustain flow to the region's fresh waters and estuaries.

The Cape Cod Aquifer is comprised of six lenses of groundwater. The four Outer Cape lenses are buoyed above saline groundwater due to differences in fresh and salt water density. Each lens is separated by interlens discharge areas (e.g., estuaries). A lens is further divided into watersheds expressed by the water table (rather than topography) that are defined by their respective receiving surface waters or wells. These watershed areas contribute to municipal water wells, estuaries and embayments, fresh-water ponds and lakes, or open ocean.

The Cape Cod Aquifer is one of the most productive groundwater systems in New England and provides 100% of the Cape's drinking water. The aquifer is designated a Sole Source Aquifer under the Safe Drinking Water Act by the Environmental Protection Agency (EPA), a designation that requires Federally-funded projects to assess project impacts to the aquifer.

Marine Water

Ocean waters support rich marine life and complex ecosystems. Marine systems include open ocean, smaller segments such as Nantucket and Vineyard Sound, and estuaries and coastal embayments. Marine waters support important ecosystems such as primary shellfish habitat and spawning grounds for fish, as well as primary recreational areas for Cape Cod residents and visitors.

COASTAL WATERS

Nearly 80% of the region's land area drains to coastal embayments and estuaries. The remaining land discharges directly to open water such as the Cape Cod Canal, Nantucket Sound, Cape Cod Bay, and the Atlantic Ocean. Of the Cape's 101 watersheds, 53 watersheds drain to nutrient-sensitive coastal embayment and estuaries. Development contributes nitrogen to groundwater, either through wastewater or other sources such as fertilizer and stormwater runoff, and ultimately the nitrogen reaches the embayments. The increased availability of this nutrient results in excess algae and degradation of water quality, posing a primary threat to coastal habitat. The ability of most Cape Cod coastal embayments and estuaries to assimilate nitrogen has already been exceeded. These impacts are further discussed in the next section of the plan.

OFFSHORE MARINE WATERS

The oceanographic conditions around Cape Cod are varied. Vast quantities of sediments deposited during the late Pleistocene glaciation form the underpinnings of Cape Cod and the seafloor beneath its surrounding waters. Currents from the Gulf of Maine and the Gulf Stream affect sea temperature, with resulting biological differences around the region. The unique ocean environments support a host of species, including many rare or threatened fish, birds, reptiles, and marine mammals. Much of the marine waters around Cape Cod support the last population of the federally endangered North Atlantic Right whale. Cape Cod ocean waters continue to support fisheries that support recreational and commercial shellfishing and finfishing.

In addition to development on dry land, land under the ocean, seawater, and the space above the ocean surface are increasingly in demand for new marine uses. Changes to the Massachusetts Ocean Sanctuary Act in 2008 made renewable energy development, sand mining, and cable and pipeline installations possible in offshore locations, and other changes in state policies have created incentives for these development activities. The federal government's creation of offshore wind leasing areas in federal waters south of Martha's Vineyard and Nantucket means interconnection cables may cross through state and regional jurisdictional areas, making landfall on Cape Cod. To date, Massachusetts has permitted very limited ocean-based sand mining; with erosion rates and sea level rise increasing, demand for offshore sediments to nourish area beaches may also increase. While these water-dependent uses are important economically and for the region's energy and climate future, it is important to balance these interests with preservation of the critical marine ecosystems in these areas.

Freshwater Ponds and Lakes

The Cape's nearly 1,000 freshwater ponds are essentially "Windows on the Aquifer," manifestations of the water table where topographically low-lying areas extend below water level. Covering nearly 11,000 acres, Cape Cod's ponds are highly variable in size, ranging from less than an acre to 735 acres. The 21 largest ponds make up nearly half of the total Cape-wide pond acreage. Approximately 40% of the ponds are less than an acre, while 166 are designated as great ponds of 10 acres or more. As part of the regional aquifer system, ponds are directly linked to drinking water and coastal estuaries.

Freshwater ponds are particularly sensitive to additions of phosphorous, which is associated with development and land uses close to a pond (such as wastewater, fertilizer, and stormwater sources). Since 2001, many of Cape Cod's freshwater ponds and lakes have been

monitored through the Ponds and Lakes Stewardship Program. In 2003, the Cape Cod Pond and Lake Atlas was published, documenting the water quality for over 190 ponds. Many are impacted by development and land uses in their watersheds and accumulated organic matter at their bottom. Buffering pond shorelines from development is an effective strategy for protecting freshwater ponds and lakes by taking advantage of the soil's ability to adsorb and store phosphorus, thereby storing and delaying this nutrient from entering the pond.

Wetlands

The Cape's groundwater and stormwater runoff discharge to surface water in ponds, lakes, rivers and streams, coastal waters, and wetlands. These wetland resources support much of the plant and wildlife that makes the Cape such an environmentally rich and interesting place. In addition, wetlands play a vital role in regulating the environment by absorbing and filtering storm and flood waters, providing natural removal of nitrogen, recharging the aquifer, storing carbon in wetland peat and vegetation, and providing vital habitat.

Critical to protecting the nearly 30,000 acres of wetlands and their natural functions are healthy, naturally vegetated buffers. Buffers provide important habitat as well as assist in the management of pollutants, trapping or arresting nutrients and sediment before they can flow into wetlands and clog or impair them. Increasingly, wetland buffers preserved from development will help to store increased stormwater runoff as the climate changes and will allow wetlands to migrate as changes in groundwater height and increased precipitation events occur. Development pressures on wetlands are discussed in the next section of the plan.

Open Space

The open space of the Cape is critical to the health of the region's natural systems, economy, and population. Open space provides habitat for the region's diverse species and protection of the region's drinking water supply. Wooded open space provides a carbon sink for mitigating the impacts of climate change, both through the storage of carbon that would otherwise be lost to the atmosphere through development, and through the carbon-absorbing capacity of trees. Open space contributes significantly to the natural and rural character of the region and supports key industries. The beaches, farms, woodlands, and marshes of the Cape provide recreational outdoor activities that attract visitors and residents to the region and provide the necessary land and resources for the Cape's agricultural activities.

An analysis conducted using 2012 assessor's data showed that protected open space comprises approximately 40% of the Cape's more than 230,000 assessed acres. The protected land includes federal, state, and local holdings, which vary widely in their amounts by town. In total, Cape towns hold more than 30,000 acres of protected open space. In addition to government entities, private land trusts have been critical in protecting open space as well.

Nearly a third of the region's protected open space lies within the Cape Cod National Seashore. This area, established through the visionary efforts of citizens and the federal government in 1961, contains more than 27,000 acres of outstanding natural, scenic, and recreational resources across six Lower and Outer Cape towns. Three federally designated national wildlife refuges (NWR) also grace the Cape: Monomoy NWR in Chatham, and the Mashpee NWR and Great Thicket NWR both of which identify undeveloped lands in Falmouth and Mashpee for acquisition.

At approximately 22,000 acres, Joint Base Cape Cod (JBCC), formerly known as the Massachusetts Military Reservation (MMR), is one of the largest contiguous properties in state or federal ownership on Cape Cod. Camp Edwards is comprised of approximately 15,000 acres in the northern portion of the base. The cantonment area, which is substantially more developed with structures, roads and other infrastructure, is comprised of approximately 7,000 acres in the southern portion of the base. JBCC includes parts of the towns of Bourne, Mashpee, and Sandwich, and abuts the town of Falmouth. The northern 15,000 acres of Joint Base Cape Cod are protected by the Upper Cape Water Supply Reserve, established through a Memorandum of Agreement (MOA) and an Executive Order in 2001 and codification of the MOA into law in 2002 for the purposes of water supply protection, wildlife habitat, and open space consistent with compatible military training activities.

The Commonwealth of Massachusetts also holds large areas of protected open space on Cape Cod as well, 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.

Habitat

The entire Cape Cod peninsula is located within the southeastern Massachusetts pine barrens eco-region. Pine barrens are a globally rare habitat type comprised of a unique assemblage of plants and animals that thrive on the nutrient-poor soils and variable climate found on Cape Cod. Within the pine barrens eco-region, there are many and varied habitat types, including pitch pine-oak woodlands, transitional hardwood-pine forests, streams and rivers, ponds and

lakes, vernal pools, shrub and forested swamps, estuaries, salt marshes, dunes, beaches, grasslands, and others. This rich mosaic of habitat types supports 132 state listed rare plant and animal species, including Important Bird Areas, as well as hundreds more species that rely on Cape Cod habitats year-round or seasonally when migrating through or for breeding. When healthy naturally functioning habitats are protected from the impacts of development, humans benefit from the many ecosystem services that these habitats provide. Ecosystem services are functions that are intrinsic to a natural community, and which benefit humans through the services they provide, such as recreational access, filtering of nutrients or air quality, provision of food and other needed resources, and mitigating the threats from natural hazards.

For many years habitat loss due to development has been the primary threat to the region's habitats. While habitat fragmentation and loss through clearing or removal continues to be a significant threat, new threats such as climate change, invasive species, and the reduction of natural disturbances increasingly challenge the continued long-term health of native natural communities. Natural disturbances, such as wildfire or severe storms, are necessary to maintain the diversity of vegetation groupings that define the region's woodlands, heathlands, and coastal plain pond shores. Fire suppression, invasive species, and changing climate threaten the integrity of these habitats. The region's challenge is to find ways to protect remaining undeveloped lands, manage habitat to support diverse vegetation, and target invasive species incursions. Threats to habitat are discussed further in the next section of this plan.

BUILT SYSTEMS

The built environment—human-made infrastructure and resources—accommodates the people who choose to live and visit Cape Cod. Protecting and enhancing the built environment, including providing infrastructure that supports the region and vibrant activity centers, is vital to supporting the Cape's population. In many cases, infrastructure, such as wastewater treatment, is needed to improve and maintain the integrity of the region's natural environment. Built systems rely heavily on fossil fuels. Changes in climate require the region evaluate past development and consider changes needed to mitigate and accommodate the potential effects. The built environment must complement the regional character and be protective of the natural systems.

Development

Through most of the 1800s, development on Cape Cod concentrated around small village centers with little or no residential or commercial development in outlying areas. During the mid-1800s, much of the development occurred close to harbors and waterways in support of the regional maritime industries, defining the historic character and development pattern for villages still seen today. From the late 1800s through the early 1900s the Cape underwent a slow transformation from a subsistence farming and fishing way of life to a seaside resort destination attracting summer visitors and outside wealth.

The advent of rail travel, automobiles, and the adoption of the interstate highway system added to the accessibility and the popularity of Cape Cod. For the first half of the 1900s, the inland areas of Cape Cod remained largely undeveloped with most residential development concentrated near the coastline. Starting in the 1950s, the population began to rise more rapidly, and continued to grow even faster from the 1970s through the early 2000s, as Cape Cod became a desired location for retirees and second-home, “seasonal use” buyers. With this population increase, development increased and began to occupy much of the interior of the Cape as well.

Regulations, as well as market demand, influence the region’s past and present development patterns. Aspects of zoning regulation adopted on Cape Cod—such as large required minimum lot sizes and yard setbacks, and the rigid separation of residential and commercial uses—have had the effect of prohibiting the type of compact, mixed-use, and frequently desirable development representative of villages developed prior to the adoption of zoning. Though such zoning regulation resulted in less overall density of development on Cape Cod, the intensity of development has increased throughout the region, consuming more land on a per unit basis and replacing what was once undeveloped forest land. Though deforestation has happened on the Cape for centuries, early deforestation was for agrarian purposes that often left the land vacant with potential for forest regrowth. More recently, permanent structural development, such as houses and roads, is replacing forest land.

Drinking Water Supplies

Clean and reliable drinking water is essential to support the population of Cape Cod. Throughout the Cape, this need is met through a combination of public and private water supply infrastructure. Approximately 85% of Cape Cod is serviced with public water. The remaining 15% rely on private or privately owned small volume wells that serve the public in portions of East Sandwich, West Barnstable, Eastham, Wellfleet, and Truro. There are 18

separate water districts, municipal divisions and departments across Cape Cod (including the recently formed Eastham public water supply). All together there are 160 gravel pack municipal water supply wells (some capable of producing over 3 million gallons per day), one surface reservoir, and hundreds of private wells. The wells receive their water from recharge to distinct land areas referred to as wellhead protection areas and Zone IIs through the DEP Drinking Water Program. The wellhead protection areas have been adopted through local zoning and the Regional Policy Plan as groundwater protection overlays. The total land area of the Zone IIs on Cape Cod is 106 square miles.

Since 2000, public drinking water suppliers have pumped, on average, about 10.7 billion gallons of groundwater per year from Cape Cod's Sole Source Aquifer. Over the last decade, pumping has been fairly consistent, showing only slight variations. Temporal variations are more apparent at the local scale.

The quality of the Cape's drinking water is generally good. A maximum contaminant limit of 10 parts per million nitrogen is established for drinking water by the EPA and the Commonwealth of Massachusetts to protect public health. A 5 parts per million nitrogen loading goal was established as part of the 1978 Cape Cod Area Wide Water Quality Management Plan to ensure water supply wells on Cape Cod would not exceed the 10 parts per million public health standard. Cape Cod towns and the Massachusetts Department of Environmental Protection have adopted the regional goal of 5 parts per million as a planning and regulatory limit. While only a handful of public water supply wells have tested near 5 parts per million, a slight upward trend in nitrogen concentrations in the region's public water supplies is the result of development in wellhead protection areas.

Nitrogen can serve as an indicator of other contaminants, such as petroleum compounds, pharmaceuticals and personal care products and other contaminants of emerging concern (CECs). Emerging contaminants are not commonly monitored or regulated in the environment but may have negative impacts on ecological or human health. The EPA required testing for a select subset of emerging contaminants in public water supplies with over 10,000 connections. Several Cape Cod water suppliers participate voluntarily. Contaminants of emerging concern are being found in public and private water supplies under both the EPA's one-time Unregulated Contaminant Monitoring Rule program (UCMR) and sampling being conducted by the Silent Spring Institute. Septic systems are included as likely CEC sources. The UCMR Program reported occurrences of CECs in water samples collected from at least one withdrawal point for all 12 participating water suppliers. Subsequent sampling has detected 1-

4 dioxane and perfluoroalkyl substances above Massachusetts Drinking Water Guideline concentrations in four wellfields in the Hyannis and Mashpee supply districts.

The Silent Spring Institute tested for CECs in 20 private wells, 20 untreated public wells, and two public distribution systems. Of the 20 public wells, 15 wells and two distribution systems had detectable levels of at least one measured CEC. Of the 20 private wells, 17 had detectable levels of at least one measured CEC. Other private wells impacted by CECs have been identified by other investigators. For example, perfluoroalkyl-substances have been detected in private wells down-gradient of the Joint Base Cape Cod fire-training facility and areas used to discharge treated groundwater; and 1,4-dioxane was detected in private wells down-gradient of Eastham's capped landfill - an impetus for Eastham's new public water supply system. Joint Base Cape Cod is presently seeking funding to address contamination of private wells and a water supply in Mashpee attributed to use of firefighting foam at the base.

Where drinking water quality has been impaired by land uses, restoration is nearly impossible. Many public water supply wells are now treated for removal of natural elements, such as iron and manganese, or to neutralize bacteria in the special case of Long Pond in Falmouth, the Cape's only surface-water supply. Several municipal drinking water supply wells on Cape Cod are treated for a range of contaminants, including CECs and petroleum-based and other legacy contaminants from industrial uses. Several historic wells subject to contamination have been abandoned and replaced. Water supplies require continued vigilance and protection from upgradient development pressure to avoid the need for expensive treatment or replacement from a finite source.

The ongoing generation of hazardous wastes, and the transport, storage, and use of hazardous materials continues to be a concern. In addition, there continues to be a need to identify and protect suitable undeveloped land with potential for future water supply development.

Wastewater Management

Ensuring that development does not significantly degrade water quality on the Cape requires effective wastewater management. The Massachusetts Estuaries Project (MEP) identified wastewater as the primary source of nitrogen to the Cape's coastal embayments, with septic systems contributing 94% of wastewater nitrogen with the remainder from municipal or smaller private wastewater treatment facilities (WWTF). Ensuring the continued health and enjoyment of the Cape's water resources will require wastewater management to reduce nitrogen and restore water quality.

Several factors have led to the current distribution of wastewater infrastructure, where Title 5 septic systems are the predominant type of wastewater management on Cape Cod, and only 3% of the parcels or 15% of total wastewater flows on Cape Cod are handled with shared or centralized public or private wastewater treatment facilities. The generally permeable soils throughout the Cape region make on-site Title 5 systems highly effective for wastewater disposal, and relatively low density of development can make the cost of collecting and conveying wastewater to centralized treatment facilities expensive. Consequently, less than 4% of the state's population lives on Cape Cod yet the region is home to 20% of the standard Title 5 systems. Standard Title 5 systems, even when functioning correctly, are not designed to remove nitrogen and provide minimal nitrogen removal. The wide distribution of septic systems discharging high nitrogen wastewater accounts for nearly 80% of the controllable nitrogen load on Cape Cod.

Higher levels of nitrogen removal can be achieved at different infrastructure scales, including nitrogen removing septic systems on individual properties, cluster or satellite systems at the neighborhood or village level, and centralized wastewater treatment facilities. There are more than 123,000 standard Title 5 septic systems and more than 1,700 denitrifying septic systems installed on Cape Cod. Barnstable, Chatham, Falmouth, and Provincetown are the four Cape Cod communities with municipally owned and operated centralized wastewater treatment facilities; across Cape Cod there are 60 smaller, typically privately owned, wastewater treatment facilities. Portions of the Buzzards Bay section of Bourne utilize the Wareham Wastewater Treatment Facility.

On Cape Cod, wastewater at WWTFs is generally treated to 10 parts per million nitrogen. Over the last three decades effluent discharges are encouraged to be located outside of Zone II wellhead protection areas. Discharges in Zone II areas can only be considered if significant treatment levels are attained and remediation of existing drinking-water problems are included.

Centralized wastewater collection, treatment, and disposal systems can achieve high levels of nitrogen removal but require significant capital investment. Their high cost, and the ability or willingness of property owners and government to bear such cost, has impeded planning and implementation of more widespread centralized wastewater management systems on Cape Cod. With anywhere from 30-60% of the housing stock being seasonal across the Cape, wastewater treatment facilities must be designed and sized for a peak flow which occurs only four weeks a year—the last two weeks of July and the first two weeks of August (just like water supply infrastructure). The need to accommodate that short-term peak flow drives up the

costs of a system that could otherwise handle typical wastewater flows throughout the rest of the year. However, accommodating peak flow allows flexibility to handle flow, especially for the initial phases of a planned collection system. Finally, towns need to stimulate their tax base to fund wastewater system improvements, which is usually in the form of taxing new growth. At the same time, new growth often depends on whether there is sufficient shared or centralized wastewater infrastructure in place to handle such new growth. Though these systems are expensive, there are also direct and indirect costs (often unrecognized) to property owners and the region at large associated with owning and maintaining or replacing individual Title 5 septic systems. Continued growth and development on Cape Cod will need to rely on more shared or centralized wastewater treatment. Therefore, new development should be used as a financial and political catalyst for wastewater planning efforts.

Stormwater Management

Although much of the emphasis on controlling nitrogen loading to coastal embayments focuses on wastewater, stormwater runoff also contributes approximately 8% of the total controllable nitrogen load and impacts other water resources, including freshwater ponds. The same highly permeable soils that allow precipitation to recharge the Cape Cod aquifer also readily allow infiltration of runoff from roofs, parking lots, and roadways. These stormwater flows also recharge the aquifer but can contain toxic substances (such as petroleum products, pesticides, and heavy metals) as well as nutrients (nitrogen and phosphorus from fertilizers and animal waste). Management of stormwater should include managing its quantity (storing or infiltrating runoff to prevent ponding or flooding) and its quality (treating the runoff to remove suspended solids, nutrients, and toxic substances). Throughout Cape Cod varying levels of stormwater infrastructure exist; from gray infrastructure (systems of curbs, gutters, and conveyances to divert the flow of stormwater from buildings, streets, and parking areas) to green infrastructure or Low Impact Development (LID) structures that have been designed to mimic natural hydrologic processes and improve the quality of stormwater runoff while still allowing for aquifer recharge. Most towns on Cape Cod are now required under the EPA's MS4 program to inventory existing infrastructure and identify problems such as illicit discharges.

Recent history indicates that storm frequency and intensity are increasing. The quantity and quality of stormwater and the need for appropriate management strategies is anticipated to require more attention in the future.

Transportation Network

Numerous subsystems make up Cape Cod's transportation network including vehicular roadways, railways, public transportation, air travel, marine transportation, and pedestrian and bicyclist accommodations and networks. These systems are responsible for safely and effectively moving the people of the region and the goods they rely on. Additionally, these systems must serve not only the year-round population but must also effectively handle the movements of the more than doubled seasonal population, which requires building and maintaining a transportation system that functions under the strain of the peak season, without negatively impacting the character that defines this unique place.

Central to Cape Cod's transportation system is its over 3,800 miles of roadways, 80% of which are smaller, local roads. Route 6, Route 28, and Route 6A—the three major arteries of the Cape—only account for 6% of the region's roadways. The remaining 14% of roadways are medium-sized local or state roads. The roadways meet in 129 signalized intersections and 25 roundabouts and rotaries. Cape Cod has over 100 vehicular crossings over roadways, railways, and water bodies including the Bourne and Sagamore Bridges over the Cape Cod Canal. The Bourne and Sagamore Bridges are critical to the long-term viability of the region.

Rail service and infrastructure ultimately extended the entire length of Cape Cod, from Bourne to Provincetown, and points between, beginning in the mid-1800s through the first half of the 1900s. Today the extent and usage of rail is reduced to a single rail line, the Cape Cod Line, which travels through Bourne before branching off to termini in Hyannis, Yarmouth, and Joint Base Cape Cod. Together, these branches and the single line form a network of rail infrastructure for the freight services, scenic rail excursions, and CapeFlyer seasonal, weekend passenger service.

While personal vehicle travel is the predominant transportation mode on Cape Cod, the Cape also hosts a number of transit-dependent residents who do not have access to a private automobile. Data from the U.S. Census Bureau, 2011-2015 American Community Survey (ACS) 5-year Estimates indicates that 5.7% of Cape residents do not have access to a vehicle. These residents are dependent on public transport, bicycle or other modes of transportation. The Cape Cod Regional Transit Authority (CCRTA) provides public transit throughout the region and connects Cape Cod to neighboring communities and regions. The CCRTA offers several types of services, including fixed route service, flexible route service, and demand-response or paratransit service. Six of the CCRTA's fixed routes run year-round, primarily through the Upper, Mid, and Lower Cape regions. Demand-response service includes Dial-A-Ride Transportation (DART) and ADA Paratransit Service. The Greater Attleboro-Taunton Regional

Transit Authority (GATRA) also operates one line, the Onset-Wareham Link (OWL), with stops in Bourne. There are also several private bus companies connecting Cape Cod to other regional destinations such as Boston and New York City. Six airfields and airports also link Cape Cod residents and visitors to Boston, New York, and the islands of Martha's Vineyard and Nantucket.

Water also plays a large role in the transportation network of Cape Cod. Harbors and channels provide connections between marine transportation and land transportation routes and nine ferry routes connect Cape Cod to Martha's Vineyard, Nantucket, Boston, and Plymouth.

Destinations and pathways for bicyclists and pedestrians to use on Cape Cod are abundant, however, bicyclists and pedestrians face numerous challenges on Cape Cod roadways. Cape Cod has over 90 miles of multi-use paths, including the Cape Cod Rail Trail and Extension, Cape Cod Canal Bike Paths, Shining Sea Bike Path and Extension, and numerous paths in the Cape Cod National Seashore and Nickerson State Park. These pathways provide safe, separate accommodations for bicyclists and pedestrians, but frequently do not connect to one another, inhibiting bicyclists' and pedestrians' abilities to use them to travel throughout the region. A more comprehensive regional path network is envisioned with a spine that runs from one end of Cape Cod to the other with connections into villages and destinations in each of the communities. In addition to the separate paths, several bicycle routes exist, allowing bicyclists a wide network of travel across the region, but on roadways rather than dedicated paths separated from motor vehicle traffic.

Sidewalks provide not only pedestrian accommodations but encourage travelers to walk instead of drive, thereby supporting village centers and local businesses. However, significant gaps in the regional sidewalk network exist in many communities across Cape Cod. Furthermore, auto-oriented site design, including large parking lots without appropriate pedestrian accommodation, can make travel as a pedestrian challenging.

The mixture of narrow roadways, high seasonal and locational traffic volumes, and inconsistent pedestrian and bicyclist accommodations create a great deal of conflict between vehicles and people walking and biking.

Utilities

The Cape's population and economic and social activities depend on reliable and affordable access to electricity, natural gas, and telecommunications.

Eversource is the local distribution company and is responsible for distributing electricity to the region. The Cape Light Compact Joint Powers Entity (JPE) is the largest single energy supplier for residents and businesses on the Cape; however, electric customers may choose their competitive supplier. Electricity is primarily distributed through overhead wires.

Electricity supply to the Cape comes from many fuel sources. Massachusetts generates 68% of its electricity from natural gas, 10% from nuclear sources, and 0.3% from petroleum. The state generates 1,867 MW of electricity by solar photovoltaics, surpassing its goal of generating 1,600 MW by 2020. There are additional sources from other renewables and hydroelectric power.

Microgrids, which have the ability to disconnect from the traditional electric grid in order to operate autonomously, are not prevalent on Cape Cod; however, the Department of Defense operates a wind-powered microgrid at Joint Base Cape Cod and in 2019 another is anticipated at Dennis Yarmouth Regional High School.

Approximately 100,000 customers get natural gas from National Grid—the sole natural gas service provider on Cape Cod. Natural gas lines are not provided everywhere on Cape Cod, and there are no lines north of Eastham.

Education, government, healthcare, and other service and innovation sectors of the economy rely on effective and reliable access to broadband and telecommunications. Residential internet service is available virtually throughout the region and is primarily served by a single provider (Comcast). Depending on where a business is located, it may have a choice of internet service providers with OpenCape's continual expansion of its fiber optic internet services infrastructure. As more people choose to work from their homes, and more services such as doctor visits are conducted virtually, fast and reliable internet service will become even more important. Most of the region is served by multiple wireless communications providers, but there remain some places without service. Maintaining and enhancing the wireless communications infrastructure is increasingly critical to the region's need for emergency and non-emergency communications while also ensuring protection of the region's scenic and historic character.

COMMUNITY SYSTEMS

The Cape's community systems, which include the culture, people, and economic activity of the area, are critical for fostering and maintaining vibrant communities and social networks that serve and support the people who live, work, and play in the region. The community systems

are intricately tied to the environment. Impacts to natural systems, such as those related to climate change or water quality, will present challenges with respect to protecting cultural heritage, community character, and the economy.

Cultural Heritage

The Cape's rich cultural heritage and historic character stem from its Native American beginnings to its maritime industrial growth and success as a resort destination. The Cape Cod Commission Act recognizes the importance of the region's significant historical, cultural, archaeological, and architectural resources and charges the Commission with protecting them.

Many of the region's historic buildings have been protected with special designations. Thousands of the Cape's buildings are listed on the National Register of Historic Places, either individually or in one of the region's 45 National Register Historic Districts, and many more are within the Cape's 16 Local Historic Districts. These resources, including Cape Cod's rural areas and historic villages, are tangible connections to the region's agricultural heritage, maritime history, artist colonies, and unique past and play a key role in attracting and retaining residents and visitors to Cape Cod. Challenges faced in preserving these resources are discussed in the next section of this plan.

Responses to the 2014 homeowner survey highlighted the importance of these resources, with over 70% of respondents rating the historic character of the Cape as important or very important in their decision to live or own a home on the Cape. The survey also highlighted support for preserving this historical character: 81% of respondents would support requiring new buildings to conform with the traditional design and architectural character of Cape Cod and 56% would support preservation or restoration of historic buildings through dedicated sources of public funding such as local tax receipts.

People

The environmental and social challenges this region faces are largely due to rapid population growth beginning in earnest in the 1960s. By the 2000 Decennial Census, Cape Cod had grown over 400%, adding just over 175,000 year-round residents in five decades. Housing on the Cape went from being 60% seasonal in 1960 to 65% year-round in 2010; in total units the region went from just under 55,000 homes in 1960 to over 160,00 homes in 2010. During this same period, most towns invested in road improvements, schools, and public water to accommodate growth but fewer invested in wastewater treatment systems. Growth, due to

post-war zoning, took a suburban form, consuming much of the Cape's land and undermining the historic character that made the region such an appealing place to live and visit.

Cape Cod's population includes the Mashpee Wampanoag Tribe, which has inhabited present day Massachusetts for more than 12,000 years. According to their website, the Mashpee Wampanoag were re-acknowledged as a federally recognized tribe in 2007. In 2015, the federal government declared 150 acres of land in Mashpee as the Tribe's initial reservation, on which the Tribe can exercise its tribal sovereignty rights.

YEAR-ROUND RESIDENTS

Cape Cod's year-round population peaked at just over 228,000 residents around 2003 according to US Census Bureau population estimates. The 2010 Decennial Census showed a decline of about 10,000 to 12,000 people; estimates since that time have the population holding steady at about 214,000 year-round residents. Population projections vary greatly, but a recent study of housing supply and demand suggest that the resident population could grow by about 6,000 people by 2025; other population projections indicate a continued loss of population in the region.

Data from the US Census Bureau tells us that within the population of year-round residents, the Cape hosts various populations that should be considered in the Commission's planning efforts. Minority populations identified for their origin or language include about 8% of regional residents who speak a language other than English at home; most of those (70%) speak English as well. About 2% of the region's population (over 5 years of age) speak little or no English. The largest number of non-English speakers are Portuguese speaking (and this represents 1% of the county population). Eight percent (8%) of county residents self-identified as "Minority" in the 2010 US Census.

Migration has played a key role in the region's population changes. The region became popular for both retirees and younger families as it became more accessible and, at the time, affordable. Migration to the Cape continues today, but at a much slower rate than the 1980s and 1990s. Meanwhile, the natural growth rate, births over deaths, is currently negative and the resident population continues to age. While the median age of the population is getting older across the US, as a retirement community Cape Cod's median age (51 in 2016; ACS) is significantly higher than average. In 1990 most of the population (58%) was under the age of 45, but now about 60% of the population is over the age of 45, compared with about 40% nationwide. These age and growth trends are important elements for understanding the

region's past and how best to plan for its future, but resident population is only one piece of the puzzle.

SECOND-HOME OWNERS

Second-home owners have long been major players in the region's economy and housing market; this fact is unlikely to change in the future. The number of second homes on Cape Cod has grown more slowly than year-round homes, growing 73% since 1960 versus the nearly 400% increase in year-round homes during that same time. Going forward, however, the recent housing study projected that demand through 2025 for seasonal housing units will be more than double that of demand for primary residences. Seasonal units are non-uniformly distributed over the land; many are clustered along the coast and the greatest number are in the Mid-Cape, but in the Outer-Cape they represent over 50% of all the housing units.

According to a 2017 second-home owners survey carried out by the University of Massachusetts Donahue Institute (UMDI), the average Cape Cod second-home owner is 65 years-old, four years older than from the 2008 survey. The vast majority—80%—have a bachelor's degree and 70% have an annual income of \$100,000 or more. Most of the respondents live year-round in Massachusetts, with 1/3 of respondents calling the metropolitan Boston area home. Approximately a quarter of second-homes are rented either year-round or short-term.

July and August are when second homes are used the most, with much lower use in the winter months. However, nearly 20% of respondents anticipate moving to the Cape full-time in the next 20 years. Of those respondents, 40% state they plan to work part- or full-time on the Cape after relocating here.

VISITORS

Visitors are an important segment of the Cape community, coming mostly in the summer but also on weekends throughout the fall and spring. Data on rooms tax receipts, an indicator of visitor activity, suggest that visitors today are as numerous as at their peak in 1999. Like the seasonal population, visitors bring new resources to the region that serve to increase economic output and generate jobs and wages. They support local arts and culture and value the region's beaches and natural areas. Visitor patterns will change with national and international economic and political changes; typically, the Cape has weathered recessions well and been successful at attracting both international visitors and those from the larger northeast region to maintain steady levels across the decades.

Economy

The Cape Cod Commission Act calls for the Commission to implement a balanced and sustainable economic development strategy for Cape Cod capable of absorbing the effects of seasonal fluctuations in economic activity. The economy of Cape Cod reflects the region's population mix of full-time and seasonal residents, and visitors. It also reflects the age of the population, which tends to be older than communities off-Cape. As such, the dominant industries in the region are Accommodation & Food Service, Retail Trade, and Health Care; in terms of employment 17% of jobs are in Accommodations & Food Service, 16% are in retail trade, and 18% are in Health Care (US Bureau of Labor Statistics, 2017). Just under a quarter of jobs in the region are in emerging industry sectors including creative economy sectors, financial and information sectors, and professional services and technical service sectors. The region's marine assets, location, and the presence of Woods Hole Oceanographic Institute, the Marine Biological Laboratory, and the National Oceanic and Atmospheric Administration provide unique employment opportunities in the marine sciences and technology sector. Additionally, Cape Cod Community College, Bridgewater State College, and the Massachusetts Maritime Academy, and good K-12 schools, provide educational opportunities that contribute to the region's economy.

While employment growth has been steady, the average wages paid by Cape employers, when adjusted for inflation, have been largely stagnant and consistently below state and national averages since 1990. As a retirement community, over 43% of resident incomes come from non-wage income sources such as real estate, social security, and investments.

The Cape Cod economy is aptly characterized as a "Blue Economy" driven by the extensive shoreline and direct access to open water. Historically, the Cape's blue economy was based on extracting resources from the sea, such as fish, whales, salt, or shellfish. Some of these activities continue today along with new ventures around enjoying and understanding the region's blue resources. Tourism is a blue sector focused on bringing people here to directly enjoy the Cape's blue resources. Marine sciences is a blue sector focused on understanding marine resources, making new discoveries to help improve human wellbeing and protecting marine ecosystems. New economic sectors will continue to emerge that are directly dependent on marine resources and Cape Cod is in a strong position to embrace these new ventures and thus progress towards a balanced and sustainable economy. Seeing the region's economy through this Blue Economy lens reinforces understanding of the interdependencies of the economy and environment.

The marine environment, unique historic character of the region, and vibrant arts and culture scene attract both residents and visitors to the region. Most of the businesses on the Cape are small and independent, with fewer than 10 employees. Only 1% of the employers on Cape Cod have workforces greater than 100 employees. Because the tourism industry is most active in the summer months and many tourism-related businesses close during the winter, unemployment fluctuates drastically throughout the year, especially in Lower and Outer Cape towns. In the summer and fall, businesses typically import labor to fill seasonal jobs.

Cape Cod second-home owners actively support the Cape Cod community and economy. Nearly 75% of the 2017 Second Homeowner Survey respondents support arts, cultural, and other nonprofit organizations on the Cape through donations and purchases and about 70% reported attending or visiting museums, concerts, galleries, or theater productions. In addition to contributions to community organizations, second-home owners contribute to the local economy as nearly all respondents report purchasing groceries, hardware/building supplies, and garden supplies on Cape Cod for their second home. However, few respondents expressed the need to have used local financial or medical services and specialists while on the Cape and have already-established providers off-Cape.

Housing

Cape Cod's housing supply lacks diversity. Today, detached, single-family homes comprise more than 80% of the region's housing stock, compared with just over 50% for Massachusetts as a whole and 62% nationwide (ACS 2016 data). This means there are few housing options for those people who either cannot afford or do not want a detached single-family home. Given the high land value in the region, detached single-family homes are typically the most expensive housing option, driving up the cost of living in the region.

High demand for housing, by both year-round residents and second-home owners, and low average wages on Cape Cod results in a housing market that is unaffordable for many year-round residents. In all but one of the 15 towns on the Cape, the median home value exceeds the affordable home price for residents at or below 100% of the Median Household Income (MHI), and for seven of the eight Lower and Outer Cape towns, the median home value far exceeds the affordable home price for a household earning even 120% MHI.

The June 2017 Regional Housing Market Analysis finds that about 22,000 Barnstable County households that earn \$90,000 or less experience housing-cost stress, meaning they spend more than the recommended 30% of their income on housing costs. The lack of diverse housing options on the Cape, such as townhouses and apartments, also contributes

significantly to the high cost of housing. Younger families starting out lack housing options that are often a building block to long-term financial stability. Similarly, older individuals looking to downsize struggle to find suitable options and often stay in single-family homes that are large, further constraining the housing market.

Chapter 40B, also known as the Comprehensive Permit Law in Massachusetts, was enacted in 1969 to help address the shortage of affordable housing statewide by reducing unnecessary barriers created by local approval processes, local zoning, and other restrictions. The goal of Chapter 40B is to encourage the production of affordable housing in all cities and towns throughout the Commonwealth. The standard is for communities to provide a minimum of 10% of their housing inventory as affordable. Despite the enactment of Chapter 40B, on average, only 5.3% of the Cape's housing inventory is affordable.

Regional housing challenges are discussed further in the next section of this plan.

5. Key Challenges Facing the Region

As illustrated by the region's systems in the previous section, Cape Cod is a special place, but one that also faces significant challenges. Though in many cases the natural, built, and community systems augment one another and contribute to what makes the Cape a special place, they can also have conflicting needs or functions. At the regional scale, ensuring that the environment is protected will generally have positive effects on sustaining the economy since these areas of interest are so closely linked.

MORE DEVELOPMENT, FEWER NATURAL AREAS

Between 2001 and 2011, the Cape lost more than 2,300 acres of forest cover, with 70% of the loss replaced by development (buildings, driveways, parking lots, etc.). Losses vary in size from full lot clearing for individual development projects and subdivisions to more selective discrete tree removal on individual lots. Approximately 84% of the clearing is associated with residential use and development.

The broad loss of forest cover, and related forest fragmentation, negatively affects regional character as well as the natural functions tree cover provides such as wildlife habitat, carbon sequestration, nutrient uptake, and stormwater and flood water management and filtration. At the same time, with the increase in impervious surfaces occasioned by forest loss, stormwater run-off has increased and with it the need for natural systems to recharge such run-off.

Land use policy and regulation in the region, though intended to better protect the natural environment by reducing the overall density of development, has resulted in larger minimum required building lot sizes, and other lot requirements under prevailing policies and regulations have contributed to more impervious cover that is more spread out across the region.

DEVELOPMENT IMPACTS ON WATER QUALITY

Surface water quality in Cape Cod ponds has been significantly impacted by surrounding development. A comparison of 1948 and 2001 dissolved oxygen concentrations suggest that many of these pond ecosystems are not only impacted, but seriously impaired.

The fresh water ponds of Cape Cod provide a significant benefit in removing nitrogen as it moves through the watershed. Ponds provide natural attenuation of nitrogen in groundwater and are an important consideration in watershed planning, as they act as “nitrogen filters.” However, Cape Cod soils lack the geological buffering to neutralize acid rain and allow pollutants to drain rapidly into the aquifer. The anticipated increase in storm frequency and intensity due to climate change has the potential to exacerbate impacts.

The Cape Cod Aquifer is extremely susceptible to contamination from various land uses and activities. The aquifer has been seriously impacted in the past from military activities, gas stations, landfills, and development generally. The quality of Cape Cod’s community public drinking water supply is generally very good, but the cumulative impact of development has resulted in a trend toward degradation in areas that contribute to certain wells. The presence of contaminants of emerging concern also present a threat to drinking water.

EXCESS NITROGEN IN COASTAL WATERS

Nearly all development on Cape Cod continues to utilize on-site septic systems that release nitrogen to groundwater, which eventually travels to coastal embayments and results in degraded water quality. Cape Cod is home to 53 embayment watersheds with physical characteristics that make them susceptible to nitrogen impacts. Thirty-two of these watersheds cross town boundaries and 34 have been found to be impaired and require nitrogen reduction to meet water quality goals.

Nitrogen is impacting coastal water quality. About 80% of the nitrogen that enters Cape Cod’s watersheds is from septic systems. Excess nitrogen destroys animal habitat and results in fish kills and diminished shellfisheries. Climate change threatens to increase nitrogen loading to coastal waters and increases in temperature have the potential to increase the risk of algal blooms.

The Cape Cod seasonal economy relies on the water that surrounds the region and degraded water quality negatively impacts important economic drivers including coastal property values. Initial findings from a recent Cape Cod Commission study evaluating home prices in the Three Bays area in the Town of Barnstable indicate a 1% increase in nitrogen is associated with a decrease in single-family home sale prices in the range of 0.407% to 0.807% (average 0.61%), with a 95% confidence level.

Environmental quality (clean air and water) is a primary reason people bought a house on the Cape, according to the 2014 homeowner survey.

There have been significant efforts towards implementing solutions aimed at restoring the health of bays and estuaries since the approval of the Section 208 Area Wide Water Quality Management Plan Update in 2015. Communities are working across town boundaries to solve watershed-based problems and exploring the use of non-traditional technologies in areas where traditional collection and treatment is too expensive or not feasible.

Barriers to implementation of wastewater infrastructure and potential alternatives for restoring coastal water quality remain. Funding for infrastructure design and construction and comprehensive monitoring to support the use of non-traditional approaches is needed. The challenge moving forward is to create a regional strategy around capital infrastructure needs that can reduce costs for municipalities and ensure that the remaining burden is shared appropriately. The solution to the financial threat facing the region must be one that supports innovative ideas that communities have embraced through the 208 Plan Update and its process.

CLIMATE CHANGE

Cape Cod faces threats due to climate change. Flooding and erosion will be exacerbated by sea level rise and changing storm frequency and intensity. These threats can cause loss of life, damage buildings and infrastructure, impair coastal environments, and otherwise impact a community's economic, social, and environmental well-being. The 2018 Intergovernmental Panel on Climate Change Special Report projects continued sea level rise into the next century, with the rate of rise depending on how future greenhouse gas emissions are managed. Bringing emissions under control sooner than later will provide more time to plan for and respond to the Cape's changing shoreline. The report calls on the global community to act collectively to reduce emissions to achieve a net zero CO₂ emission rate as soon as possible in order to allow time for adaptation to the inevitable changes. While the problems posed by climate change appear unstoppable, there are actions the Cape community can take to reduce emissions and participate in the effort to slow the rate of change. Increasing the region's resilience to climatic changes and a rising sea level means thinking into the future and adjusting behaviors that put people and property at risk. Mitigating the causes of climate change and adapting to its effects on Cape Cod involves making policy decisions with both environmental and economic considerations.

It is likely that the region's vulnerability will increase in the future as sea levels continue to rise, climate change intensifies, and the region experiences an increase in storm activity and severity. Scientists anticipate that climate change will bring stronger storms with more

precipitation and the threat of more frequent and extensive flooding to the region. Storms have resulted in power outages, limiting access to necessary services, and increased storm activity is likely to further impact the region's power resources. In addition, temperatures are anticipated to rise, with related degradation of air quality, strain on local indigenous flora and fauna, increases in foreign pest migration, and more health-related problems, and significantly for Cape Cod, changes in sea surface temperature and the viability of the coastal environments for the region's native wildlife.

Sea level rise poses a major and particular threat to Cape Cod, which has 586 miles of vulnerable, tidal shoreline. Projected sea level rise will increase flooding, both elevating the height of storm and non-storm surges and flood levels, and exacerbating inundation and storm surge by sending floodwaters further inland, resulting in potential inoperable first response facilities, and substantial loss to property, economic prosperity, and habitat. In addition to structural and economic losses, sea level rise also threatens Cape Cod's groundwater with potential higher groundwater levels and, to a lesser effect, saltwater intrusion.

Even today, without the increased risk of climate change and sea level rise, flooding threatens more than 13,000 single-family homes—worth a combined \$9 billion—located within the FEMA special flood hazard areas.

Cape Cod's response to these threats must consider the region's vulnerabilities, priorities and opportunities. The extent of private property development and public assets located within coastal hazard areas poses the greatest challenge to sensitive but meaningful response to climate change. Additionally, in Massachusetts, private ownership of the shoreline to the mean low-water line affects potential responses to coastal impacts of climate change, including what adaptation strategies are feasible and who's responsible for paying for them. The regulatory environment, particularly along the shoreline, complicates the ability of communities to appropriately plan for and implement actions that benefit the whole community's interest.

PRESERVING HISTORIC RESOURCES

Even with the many National Register and Local Historic Districts, thousands of historically significant buildings on the Cape are not protected. More than 40% of the region's inventoried historic buildings over 100 years old have no protection from demolition or alteration of their character-defining features. Archaeological sites and historically open landscapes are similarly unprotected. Development pressures in waterfront areas and historic neighborhoods continue

to threaten these resources that embody the region's history and character. Demolition of these irreplaceable resources not only destroys the physical elements of the region's cultural heritage, but also negatively impacts community character and the economy, which are strongly tied to Cape Cod's unique architectural heritage.

Working with Cape towns and other organizations, the Commission seeks to improve and update historic inventories, better integrate cultural resource concerns into development reviews, and create new zoning that establishes incentives to re-use historic buildings to help protect the region's distinctive historic character and culture.

EXPENSIVE HOUSING, LIMITED OPTIONS

The Cape Cod housing market does not meet the region's diverse needs. Lower than average wages, higher than average costs, a lack of choice, limited supply, and the ever-present demand for seasonal and retiree housing by baby boomers makes housing for the current and future year-round population a high priority challenge.

To buy a median priced home on Cape Cod requires an income of at least \$75,000 a year. The median price for a home is over \$350,000 with most of the lower 50% of units closely clustered around the median. Rental housing is even more limited on Cape Cod given that many property owners can make more money renting their property for six weeks in the summer than renting it year-round, or they choose not to rent out their seasonal homes at all. The 2017 Regional Housing Market Analysis predicts that by 2025, close to half of the region's population will experience housing-cost stress, meaning they will spend more than the recommended 30% of their income on housing costs. Even those businesses with higher-paying jobs still struggle to fill professional positions in banking, engineering, and medicine because housing options on the Cape are significantly more expensive and limited than other regions.

While achieving the Commonwealth's 10% affordable goal remains an important standard for each Cape Cod community and for the region overall, Cape Cod's needs exceed 10%. To address housing needs moving forward, the region must recognize that the Cape Cod housing market is not simply fifteen separate economies but represents a single housing market, with sub-regional distinction. A regional strategy is needed to address the structural deficiencies in the regional market. As the "baby boomer" and general population ages, and as single-parent families and single-person households increase, two-person households over the age of 65 will dominate the Cape in the next 20 years. The decline in the average household size means that more housing units will be required to house the same number of people as 30 years ago.

Without increasing housing supply and choices, the Cape's housing affordability problem is likely to worsen.

PROVISION OF ADEQUATE INFRASTRUCTURE

The existing infrastructure fundamentally limits the region's ability to grow in a way that balances economic and social wellbeing with the protection of natural and cultural resources. The region's rural and suburban development patterns make providing adequate infrastructure more expensive on a per-unit or per-user basis as networks are typically more spread out, with fewer users able to utilize and pay for the same systems or materials. These development patterns also require greater development and disturbances of natural resources. However, directed, improved, and expanded transportation, water, wastewater, electric, and broadband infrastructure that mitigates and adapts to climate change will be necessary to support long-term regional economic stability. These regional networks must be resilient and provide last-mile connectivity, bringing the benefits of the regional investments to the people, businesses, and institutions that are the backbone of the economy.

Implementing these large-scale infrastructure improvements requires significant community dialog to determine the most effective, efficient solutions that are consistent with community values including its plan for growth, equity, cost sharing, climate change response, and environmental benefit. The environmental and public health imperatives requiring timely investment in water quality infrastructure across Cape Cod offer this region an opportunity to reset, change the paradigm, and to develop a coordinated plan to direct growth to areas that can support it.

LONG-TERM ECONOMIC STABILITY

Cape Cod's environment is its economy. The region's character and amenities attract a wide range of people who want to visit, live, or work on the Cape, including tourists, retirees, second-home owners, scientists, entrepreneurs, and artists. The Commission's regular surveys over the past 15 years consistently find that a clean, natural environment and Cape Cod's historic character are fundamental values.

Economic development for the region depends on a healthy natural environment, continued development of infrastructure to support the population and remediate the impact of 20th century growth patterns, resources to support an appropriately skilled labor pool, and effective and fair regulatory and land use policies.

Unlike business development, economic development focuses on the economic environment rather than on individual businesses. Economic development for the region should:

- protect and build on the region's competitive advantage, the unique natural environment, historic village character, harbors, and cultural heritage;
- use natural assets, capital facilities, infrastructure, and human capital and land use patterns efficiently;
- foster balance and diversity through a mixture of industries, businesses, workers, ownership types, and employment options;
- and expand opportunity and regional wealth by increasing exports, substituting imports locally, attracting capital, and fostering local ownership.

The long-term challenge is to maintain and improve the quality of the environment and mitigate climate change in the face of ongoing development pressure and environmental and social change to ensure a stable and robust economy into the future, thereby improving economic resilience. In the 2014 homeowners survey, nearly 83% of respondents listed the availability of jobs or economic opportunities as a serious or moderate problem in their community. The imbalance between wages and cost of living is a threat to the economy and social structure of the region.

6. Goals and Objectives

This RPP adopts 14 goals to guide and plan for the future of the region in a manner consistent with the vision and growth policy of this RPP. The goals and objectives derive from the values and purposes of the Cape Cod Commission Act, preserving and enhancing the region's assets.

Organized around the region's natural, built, and community systems, these goals and objectives form the structure upon which the region's planning work relies, serve as touchstones to guide implementation actions, and set the measures by which the regulatory review process takes place.

NATURAL SYSTEMS

To protect and restore the quality and function of the region's natural environment that provides the clean water and healthy ecosystems upon which life depends.

Water Resources

Goal: To maintain a sustainable supply of high quality untreated drinking water and protect, preserve, or restore the ecological integrity of Cape Cod's fresh and marine surface water resources.

Objectives:

- Protect and preserve groundwater quality
- Protect, preserve and restore fresh water resources
- Protect, preserve and restore marine water resources
- Manage and treat stormwater to protect and preserve water quality
- Manage groundwater withdrawals and discharges to maintain hydrologic balance and protect surface and groundwater resources

Ocean Resources

Goal: To protect, preserve, or restore the quality and natural values and functions of ocean resources.

Objectives:

- Locate development away from sensitive resource areas and habitats
- Preserve and protect ocean habitat and the species it supports
- Protect significant human use areas and vistas

Wetland Resources

Goal: To protect, preserve, or restore the quality and natural values and functions of inland and coastal wetlands and their buffers.

Objectives:

- Protect wetlands and their buffers from vegetation and grade changes
- Protect wetlands from changes in hydrology
- Protect wetlands from stormwater discharges
- Promote the restoration of degraded wetland resource areas

Wildlife and Plant Habitat

Goal: To protect, preserve, or restore wildlife and plant habitat to maintain the region's natural diversity.

Objectives:

- Maintain existing plant and wildlife populations and species diversity
- Restore degraded habitats through use of native plant communities
- Protect and preserve rare species habitat, vernal pools, 350-foot buffers to vernal pools
- Manage invasive species
- Promote best management practices to protect wildlife and plant habitat from the adverse impacts of development

Open Space

Goal: To conserve, preserve, or enhance a network of open space that contributes to the region's natural and community resources and systems.

Objectives:

- Protect and preserve natural, cultural, and recreational resources
- Maintain or increase the connectivity of open space

- Protect or provide open space appropriate to context

BUILT SYSTEMS

To protect and enhance the built environment and infrastructure necessary to support the region and healthy activity centers.

Community Design

Goal: To protect and enhance the unique character of the region's built and natural environment based on the local context.

Objectives:

- Promote context-sensitive building and site design
- Minimize the amount of newly disturbed land and impervious surfaces
- Avoid adverse visual impacts from infrastructure to scenic resources

Coastal Resiliency

Goal: To prevent or minimize human suffering and loss of life and property or environmental damage resulting from storms, flooding, erosion, and relative sea level rise.

Objectives:

- Minimize development in the floodplain
- Plan for sea level rise, erosion, and floods
- Reduce vulnerability of built environment to coastal hazards

Capital Facilities and Infrastructure

Goal: To guide the development of capital facilities and infrastructure necessary to meet the region's needs while protecting regional resources.

Objectives:

- Ensure capital facilities and infrastructure promote long-term sustainability and resiliency
- Coordinate the siting of capital facilities and infrastructure to enhance the efficient provision of services and facilities that respond to the needs of the region

Transportation

Goal: To provide and promote a safe, reliable, and multi-modal transportation system.

Objectives:

- Improve safety and eliminate hazards for all users of Cape Cod's transportation system
- Provide and promote a balanced and efficient transportation system that includes healthy transportation options and appropriate connections for all users
- Provide an efficient and reliable transportation system that will serve the current and future needs of the region and its people

Energy

Goal: To provide an adequate, reliable, and diverse supply of energy to serve the communities and economies of Cape Cod.

Objectives:

- Support renewable energy development that is context-sensitive
- Increase resiliency of energy generation and delivery
- Minimize energy consumption through planning and design (including energy efficiency and conservation measures)

Waste Management

Goal: To promote a sustainable solid waste management system for the region that protects public health, safety, and the environment and supports the economy.

Objectives:

- Reduce waste and waste disposal by promoting waste diversion and other Zero Waste initiatives
- Support an integrated solid waste management system

COMMUNITY SYSTEMS

To protect and enhance the linkages between society, the natural environment, and history vital to the way of life on Cape Cod by supporting development of amenities and life opportunities necessary to support vibrant and diverse communities.

Cultural Heritage

Goal: To protect and preserve the significant cultural, historic, and archaeological values and resources of Cape Cod.

Objectives:

- Protect and preserve forms, layouts, scale, massing, and key character defining features of historic resources, including traditional development patterns of villages and neighborhoods
- Protect and preserve archaeological resources and assets from alteration or relocation
- Preserve and enhance public access and rights to and along the shore
- Protect and preserve traditional agricultural and maritime development and uses

Economy

Goal: To promote a sustainable regional economy comprised of a broad range of businesses providing employment opportunities to a diverse workforce.

Objectives:

- Protect and build on the Cape's competitive advantages
- Use resources and infrastructure efficiently
- Foster a balanced and diverse mix of business and industry
- Encourage industries that provide living wage jobs to a diverse workforce
- Expand economic activity and regional wealth through exports, value added, import substitution, and local ownership

Housing

Goal: To promote the production of an adequate supply of ownership and rental housing that is safe, healthy, and attainable for people with different income levels and diverse needs.

Objectives:

- Promote an increase in housing diversity and choice
- Promote an increase in year-round housing supply
- Protect and improve existing housing stock
- Increase housing affordability

7. Coordinated Regional and Local Planning

Coordinated regional planning is at the core of the Cape Cod Commission's mission. The Commission's regional planning activities address resources and needs that transcend municipal or individual site boundaries. To achieve regional planning goals, the Commission and its staff identify special areas and resources that are particularly sensitive to development pressures and provide technical assistance on a wide range of topics to Cape communities. Additionally, the Commission provides resources to prepare and implement local plans in coordination with neighboring and oftentimes overlapping jurisdictions. While the Regional Policy Plan is comprehensive in its vision and growth policy for the region and serves as an overarching policy framework for the Commission's planning efforts, there are certain resources or issues facing the region, such as water quality, transportation, economic development, and climate resilience, that require more focused planning efforts beyond that provided through the Regional Policy Plan. These more specialized regional plans and programs work in conjunction with the RPP to accomplish local and regional goals.

TARGETED REGIONAL AND LOCAL PLANNING EFFORTS

Since the 2009 RPP update, Commission staff has been actively engaged with Cape communities on a wide range of issue-specific regional planning topics, including the Cape Cod Section 208 Area Wide Water Quality Management Plan, the Comprehensive Economic Development Strategy, the Regional Economic Strategy Executive Team program, the Regional Transportation Plan, the Cape Cod Ocean Management Plan, and coastal resilience planning. Following are brief descriptions of these planning activities and links to more information.

Cape Cod Section 208 Area Wide Water Quality Management Plan

The Cape Cod Section 208 Area Wide Water Quality Management Plan (208 Plan Update), certified and approved by the Governor of the Commonwealth of Massachusetts and the US Environmental Protection Agency (US EPA) in 2015, provides a path forward to define watershed-based solutions for the restoration of the waters that define Cape Cod. Watersheds, however, rarely follow political boundaries. As the regional planning agency, the

Commission was able to work across municipal boundaries and bring towns together to deal with this problem at the most effective and appropriate level—the watershed. The plan recommends actions to streamline the regulatory process, make complex information more transparent and available to citizens, abate nitrogen-induced costs already impacting the region, provide more support to local community water quality efforts, and eliminate unnecessary costs.

Developing a path forward to reduce nitrogen loading to Cape Cod waters was an appropriate next step in what has been a decades-long effort to identify watershed-wide sources of nitrogen and define associated water quality impacts on a watershed-by-watershed basis. Progress to address water quality impacts was challenging. Residents had been unwilling to fund expensive wastewater plans and state regulations were inflexible to accommodate less expensive or non-traditional approaches to reduce nitrogen.

The 208 Plan Update reflects a new approach with five basic principles:

1. The plan is watershed based.
2. The plan leverages existing local plans by making use of the enormous amount of data and input already collected by Towns as part of their comprehensive wastewater management planning to date.
3. All solutions are considered. Everything has to be on the table. The plan takes into account all potential technologies and strategies that could be successful on Cape Cod. It evaluates each individually and then looks for appropriate places for its use as part of watershed scenarios.
4. The purpose of the plan is to set the parameters for the discussion of solutions on a watershed basis, and not to suggest an optimal solution. The solution is ultimately determined by the watershed communities.
5. Cost must be considered as part of every watershed scenario and the impact on individual property owners must be a primary concern. If a solution isn't affordable or the community isn't able or willing to fund it, it isn't doable.

The key to successful implementation of the 208 Plan Update is providing a streamlined regulatory pathway for more efficiently and effectively achieving water quality goals through the development of targeted watershed management plans that address nutrient remediation through a variety of approaches. One aspect of the streamlined regulatory approach is the Commission's review of municipal water quality plans and projects, which are no longer reviewed as DRIs, but instead for consistency with the 208 Plan Update.

The full plan is available here: <http://ccc-plans.org/208>

Comprehensive Economic Development Strategy

In 2009, Cape Cod was designated an Economic Development District creating new regional opportunity for Federal Economic Development funding for projects and programs consistent with the Comprehensive Economic Development Strategy (CEDS) for Cape Cod. This important and valued designation followed an intense stakeholder driven regional planning effort to adopt a CEDS for Cape Cod, an economic blueprint for the region. The CEDS is an operational plan typically built on the policies and goals of the Regional Policy Plan thereby ensuring that the priorities, programs, and projects supported by the plan make advancements economically without undermining the region's most valuable and sensitive resources.

The CEDS planning effort on Cape Cod is led by the Barnstable County Economic Development Council and staffed by the Cape Cod Commission. The planning process and plan are informed by a comprehensive analysis of the region's economy, its strengths, opportunities, weaknesses, and threats. The result is an action plan and an evaluation process specifically designed to address priority issues through achievable projects and programs.

The CEDS is required by the US Economic Development Administration (EDA) to access funding for economic development planning and infrastructure construction. Together, the Cape Cod Commission and the Barnstable County Economic Development Council serve the governing board of the Cape Cod Economic Development District and jointly approve a CEDS 5-year plan, oversee implementation and approve annual reports documenting progress supporting the region's Economic Development Strategy.

Regional Economic Strategy Executive Team

The Commission established the Regional Economic Strategy Executive Team (RESET) program in 2009 as a multi-disciplinary comprehensive program providing direct municipal support and responding to community needs. RESET is a partnership with communities that leverages Commission resources and expertise to address challenges ranging from water quality and transportation infrastructure to zoning and building design to promote the town's economic and community potential.

RESET is an opportunity for a community to analyze a specific area using a team of Commission staff with policy, economic development, planning, regulatory, and technical expertise to provide specific, tangible deliverables—including site plans, research reports, land use plans, and recommended changes to bylaws—that are tailored to the needs of a specific town. RESET projects are directed by town staff and officials and the RESET program has been

utilized widely across Barnstable County. Projects have stimulated regional and local regulatory streamlining for developments with high-wage jobs with resulting job retention and growth, facilitated zoning changes promoting compact mixed-use development in village centers, promoted redevelopment of underperforming properties, and supported local and regional capital investment.

Regional Housing Needs Assessment

The Commission recognizes that a balanced housing market is a critical component of a strong and stable economy. The 2017 Regional Housing Market Analysis is the first regional benchmark analysis of Barnstable County's housing market. The study establishes a fact-based analysis of the current housing market and forecasts the housing supply and demand over the next ten years across all 15 municipalities and the four main sub-regions of Cape Cod (Upper, Mid, Lower, and Outer). The study identifies current and potential gaps between what households are willing and able to pay (demand) versus the supply of housing stock to meet demand.

The study involved the development of an economic and demographic forecast model specific to Barnstable County, which provides estimates for the population by age cohort, workforce and employment rates, household formation rates, household incomes, and housing unit supply for each municipality and for Barnstable County. From the 2015 baseline year, the study shows the greatest housing stress is currently felt by those earning 80% or less of Barnstable County's median income. In ten years, the stress on the lower end of earners increases and deserves continued attention. More striking, however, is how housing stress climbs through higher tiers of income. By 2025 the greatest increase in burdened households is with those earning 100% -120% of the projected median income.

This regional and sub-regional housing demand and supply forecast can help housing supply planning efforts to meet both existing and anticipated demographic, economic, and housing needs. With this improved and current data and forecasts, the Regional Housing Market Analysis provides the foundation for considering the housing market as a regional system, recognizing that the region will not meet its goals working as 15 independent communities but as a region with sub-regional strategies. The study provides a standardized assessment available on a town-by-town basis that will foster local housing goals and decisions that fit within a regional framework, as well as suggested regional strategies for addressing the County's housing needs.

The recommended regional strategies include:

- promoting increased diversity of housing options so that seniors and others looking to downsize have more options
- promoting increased diversity of multifamily housing to improve affordability
- conducting a detailed housing market preference study to further understand what Cape residents want in their housing stock
- promoting better housing design that is more efficient and complements the region's unique character
- developing strategies and policies to avoid displacement
- developing tools and strategies for seasonal housing
- developing regional and sub-regional housing supply goals

Looking ahead, it is anticipated that Cape Cod will experience a continued decline in household size driving demand for more diversity in housing units, an increase in housing stress to pay for housing by those earning higher than median wages, and an estimated net new demand for 2,715 year-round housing units. The existing inventory (supply) of homes will not meet the community and economic needs of the region in the future.

The regional housing market analysis laid the groundwork for a regional housing plan. The analysis provided a detailed explanation of the housing challenges and needs across the region. While it outlines next steps for addressing these challenges, it does not specify actions needed to accomplish these next steps. A regional housing plan will lay out specific actions and policies to implement at both the regional and local level to improve housing affordability and availability.

To address this regional challenge, the Commission could consider a planning goal to create a regulatory and investment framework supporting additional housing units in Community Activity Centers across Cape Cod. In Community Activity Centers, new housing could be created through infill and redevelopment to meet documented need for compact, year-round dwelling units varied in size. In some areas of the region, alternatives such as Accessory Dwelling Units and the conversion of seasonal cottage colonies to year-round homes will fulfill the need for year-round housing.

The Commission will work to address housing goals through the Goals and Objectives in this RPP update and through the review and approval of local comprehensive plans. In identified Community Activity Centers, the Commission will request a housing supply analysis, updated housing production plans when appropriate, and a plan for infrastructure investment and zoning reform to improve opportunities for diverse housing production. These planning

activities will support growth in Community Activity Centers in need of year-round population to support vibrant and diverse local economies.

In addition, there is a need for all segments of the community to support the creation of more affordable housing, particularly employers creating lower wage jobs that thereby increase pressure on the affordable housing market. The Commission recommends an evaluation of the region's employment and real estate market and the best practices for concurrency or nexus charges for affordable housing necessitated by the creation of new low-wage jobs.

Regional Transportation Plan

Another example of an area where the Commission can effectively bring together towns to address more detailed planning across municipal boundaries to further regional goals is transportation. The 2016 Cape Cod Regional Transportation Plan (RTP) was adopted by the Cape Cod Metropolitan Planning Organization, the regional governing body established by federal law to oversee regional transportation planning and recommend the distribution of transportation funds locally.

As a document that establishes the vision for the transportation system for the region, the RTP sets the framework for development of the transportation network on Cape Cod. This framework is built on a performance-based planning approach with a vision statement, goals, objectives, performance measures and targets, strategies, and policies.

The overarching vision of the RTP is as follows:

The Cape Cod Metropolitan Planning Organization envisions a transportation system that supports the environmental and economic vitality of the region through infrastructure investment that focuses on livability, sustainability, equity, and preservation of the character that makes our special place special.

The goals of the RTP expand on the vision statement in seven areas of emphasis: safety, environmental and economic vitality, livability and sustainability, multimodal options/healthy transportation, congestion reduction, system preservation, and freight mobility.

The performance measures and targets established in the RTP are quantifiable targets that the region will work to achieve over the coming years through implementation of a series of strategies and policies. Strategies to reach these targets include prioritizing projects that

“improve access to and within village centers.” This language was added to the 2016 RTP update to definitively link transportation and land use planning in the region.

The anticipated funding in the region over the next 25 years totals approximately \$1.1 billion. This total includes spending on transit, roadways, bridge, sidewalk, and multiuse path projects. The majority of projects funded through this plan have supported projects that improved access to the region’s activity centers.

The full plan is available at <http://ccc-plans.org/rtp>.

Climate Change Planning

Since the 2009 RPP update, the Commission has been actively engaged in several planning efforts to increase the region’s resilience to the effects of severe storms and climate change. Climate adaptation principles, policies, and actions in the 2018 RPP update reflect recommendations from the 2011 Massachusetts Climate Change Adaptation Report as well as input from stakeholders during the early RPP public outreach process. The 2018 RPP, by including actions related to climate change mitigation and adaptation as well as through the following work described, may position the agency to consider a broader climate adaptation plan in the future.

RESILIENT CAPE COD PROJECT

In 2015, the Cape Cod Commission and several partners were awarded a three-year grant from the National Oceanic and Atmospheric Administration (NOAA) to complete the Resilient Cape Cod planning project (<http://ccc-plans.org/resilientcapecod>). The purpose of the Resilient Cape Cod project is to investigate the environmental and socio-economic effects of local and regional coastal resiliency strategies, and to share this information broadly through stakeholder engagement, public outreach, and a local pilot project. The project team has compiled a database of adaptation strategies for Cape Cod coastal resource areas, produced an online storymap (<http://ccc-plans.org/coastalimpacts>) illustrating the challenges from coastal threats that Cape Cod faces, and is developing an online decision support tool to help facilitate local discussions about the tradeoffs associated with implementing different adaptation strategies. The work, including a series of stakeholder workshops held during the stormy winter of 2018, has highlighted and helped prioritize future actions that Cape communities should take to improve their readiness for and resilience to future storm and sea level rise threats.

Some of the needs identified for ongoing planning, education, and outreach include: improving broader public understanding of the threats to and vulnerabilities of Cape Cod, sharing information about possible actions that may be taken to improve coastal resiliency, streamlining regulation including taking a regional view to managing sediment, addressing public/private interests in the coast, and considering a coastal District of Critical Planning Concern designation.

MULTI-HAZARD MITIGATION PLANNING

The Commission has provided technical assistance to eight Cape communities to prepare multi-hazard mitigation plans. These plans, customized by each community to address local threats, are focused on addressing vulnerabilities to sea level rise, coastal storms, and erosion. Completed plans are submitted to the Massachusetts Emergency Management Agency and the Federal Emergency Management Agency for approval. Pending the availability of funds, MEMA conducts annual sub-grant programs for the Hazard Mitigation Grant Program; Flood Mitigation Assistance Grant; and the Pre-Disaster Mitigation Grant.

The federally-funded Hazard Mitigation Assistance programs provide significant opportunities for communities to reduce, minimize, or eliminate potential damages to property and infrastructure from natural hazard events. Funding for hazard mitigation plans and projects can reduce overall risks to the population, structures and infrastructure, while also reducing the reliance on taxpayer-funded federal disaster assistance for disaster recovery. Communities must have a FEMA-approved Local Natural Hazard Mitigation Plan in place prior to applying for funding (<http://ccc-plans.org/MA-HMAgrants>).

The Commission is committed to ongoing technical assistance to support Cape communities as they prepare and re-examine multi-hazard mitigation plans as they are updated every five years.

MUNICIPAL VULNERABILITY PREPAREDNESS PLANNING

The Municipal Vulnerability Preparedness grant program (MVP) provides support for cities and towns in Massachusetts to plan for resiliency and implement key climate change adaptation actions for resiliency. The state awards communities with funding to complete vulnerability assessments and develop action-oriented resiliency plans. Towns choose the provider of their choice from a list of certified providers. Communities who complete the MVP program become certified as an MVP community and are eligible for MVP Action grant funding and other opportunities (<http://ccc-plans.org/MA-MVP>).

The Commission is a certified provider and is available to assist communities in completing the assessment and resiliency plan using the Community Resilience Building Framework (<http://ccc-plans.org/MA-MVP-CRB>). As of 2018, nine Cape communities have become eligible to participate in the MVP program.

RENEWABLE ENERGY PLANNING AND DEVELOPMENT

Ten years ago, Massachusetts became one of the first states in the nation to move forward with a comprehensive regulatory program to address climate change upon passage of the Global Warming Solutions Act (<http://ccc-plans.org/MA-GWSA>).

The GWSA required the Executive Office of Energy and Environmental Affairs, in consultation with other state agencies and the public, to set greenhouse gas emission reduction goals for the Commonwealth to achieve reductions of between 10-25% below statewide 1990 GHG emission levels by 2020, and 80% below statewide GHG emission levels by 2050.

To help meet these greenhouse gas emission reduction goals, the Massachusetts Renewable Energy Portfolio Standard (RPS) was one of the first programs in the nation to require a certain percentage of the state's electricity come from renewable energy. The Massachusetts RPS requires retail electricity suppliers (both regulated distribution utilities providing basic service supply, and competitive suppliers) obtain a percentage of the electricity they serve to their customers from qualifying renewable energy facilities. Suppliers meet their annual RPS obligations by acquiring a sufficient quantity of RPS-qualified renewable energy certificates (RECs) that are created, traded, and tracked at the New England Power Pool Generation Information System. In order for retail electricity suppliers to meet their annual compliance obligations established by the RPS, they must purchase a number of RECs equal to the percentage of their retail sales for that particular compliance year (<http://ccc-plans.org/MA-RPS-summaries>). The Massachusetts Renewable Energy Portfolio Standard created a market for the development of renewable energy generation facilities, including solar photovoltaic, battery storage, wind energy, or other technologies to sell qualified RECs to retail electricity suppliers.

In 2016, Massachusetts further defined its commitment to renewable energy and greenhouse gas reductions through the passage of An Act Relative to Energy Diversity (<http://ccc-plans.org/MA-energy-diversity>), which sought to stabilize electric rates, ensure a diversified energy portfolio for the Commonwealth, and embrace technologies like offshore wind and energy storage.

The Commission has reviewed several renewable energy generation projects as Developments of Regional Impact since the creation of the Massachusetts Renewable Energy Portfolio Standard. However, most solar photovoltaic projects have been on greenfield sites with potential natural resources or water resource impacts. Siting of land-based wind energy conversion facilities on Cape Cod has also been challenging due to potential community character, noise and other environmental issues.

The best way to contribute to a fossil fuel-free electricity supply is to encourage more on-site renewable energy generation. To assist in the planning, siting, and design of on-site renewable energy facilities, the Commission will develop a technical bulletin for Developments of Regional Impact and/or use by municipal officials in local review including:

- siting and building design consideration to accommodate future solar installations;
- identification of potential grayfield sites such as parking lots that would be suitable for installation of solar photovoltaic panels;
- siting and design considerations for public electric vehicle charging stations and energy storage.

The Commission will consider requiring an energy audit for development and redevelopment reviewed as Developments of Regional Impact.

GREEN COMMUNITIES

The Green Communities Act (GCA) was a comprehensive reform of the Massachusetts energy marketplace that will improve the state's ability to meet the GWSA targets. The GCA promotes an expansion in energy efficiency, supports the development of renewable energy resources, creates a new greener state building code, removes barriers to renewable energy installations, stimulates technology innovation, and helps consumers reduce electric bills. It also created the Green Communities Program, providing Massachusetts cities and towns with energy efficiency and renewable energy funding opportunities (<http://ccc-plans.org/MA-green-communities>).

As of 2018, four Cape communities have become Green communities under the Green Communities Act and three towns are in the designation process. The Commission encourages Cape towns to become Green Communities and can assist in providing education for the development community about the state building code requirements.

Cape Cod Ocean Management Plan

The 2011 Cape Cod Ocean Management Plan (CCOMP) provides guidance on the use and protection of Cape Cod's ocean resources, again coordinating what happens at the local level with the regional interests and goals. The CCOMP establishes policy and provides technical support for review of the development activities allowed in the state's ocean waters. Revisions to the Massachusetts Ocean Sanctuaries Act in 2008 allowed for sand and gravel mining, and cable and pipeline installation in state waters. The Ocean Act also allowed for the installation of community wind turbines projects, consistent with the community's definition of "appropriate scale." The CCOMP provides Barnstable County's definition of appropriate scale for renewable energy projects in Cape Cod waters.

In order to ensure that ocean-based development is balanced with resource protection, the Commission led a District of Critical Planning Concern (DCPC) process to identify significant marine resources and engage the community in establishing appropriate policies for managing offshore development. The Cape Cod Commission assembled a Policy Committee consisting of elected officials representing each of the region's 15 towns. In addition, Technical Workgroups in the areas of natural resources, visual considerations and renewable energy were created to explore specific topics relevant to the CCOMP. A stakeholders group was invited to participate and comment on the work of the Policy Committee and Technical Workgroups throughout the planning process. Following 15 months of public meetings, workshops, and forums, the Policy Committee adopted specific recommendations directed at protecting resources and activities critical to Cape Cod. The Cape Cod Commission incorporated the Policy Committee recommendations into the CCOMP to guide future decisions about appropriate development activities in Cape Cod's ocean waters.

As a CCOMP action item, the Commission carried forward recommendations for revisions and additions to the RPP to address development in marine and coastal resource areas. The Assembly of Delegates adopted the recommended amendments to the RPP in 2012 creating a new marine resources section establishing review standards for sand and gravel mining and cable and pipeline installation. A future action item called for incorporating standards for offshore renewable energy development. This 2018 RPP addresses these limited allowable ocean activities through goals and objectives for ocean resource protection and capital infrastructure.

FRAMEWORKS FOR ENHANCED COORDINATION OF REGIONAL AND LOCAL PLANNING

Regional Capital Planning

As fifteen independent local governments and numerous sub-districts prepare capital infrastructure and facilities plans across the region, the Commission recognizes the opportunity for local and regional coordination and collaboration. Typically, the Capital Infrastructure Plan is a short-range plan (five to seven years) that lists specific capital projects and purchases needed by the town for which funding is needed. At the regional scale, a Regional Capital Plan's objective is to have towns include a broader, more policy-oriented capital infrastructure plan within their local comprehensive plans that is consistent with the RPP and the goals of the Regional Capital Plan. Regional capital planning must be consistent with protecting the region's natural and historic resources, and advancing a balanced economy, mixed housing options, and social diversity.

The Commission is charged under the Cape Cod Commission Act with anticipating, guiding and coordinating the rate and location of development with the capital facilities necessary to support development. To carry out this charge, the Commission will develop a regional framework to characterize, quantify, plan, and advocate for regional infrastructure and facilities and the planning, forecasting, decision making and financial tools to support Cape Cod communities.

With this framework, Cape Cod communities will realize long-term sustainable economic development through the strategic provision of high quality and safe infrastructure that advances social equity, economic and social diversity, disaster resiliency, and environmental health. The Regional Capital Plan will consider the following:

- **Long-Term Sustainability:** Locate infrastructure to effectively protect natural resources, strengthen activity centers and villages, discourage low density sprawling development, reduce disaster vulnerability, and preserve historic structures and pre-1950s development patterns.
- **Existing Needs First:** Build infrastructure to serve existing needs and mitigate impacts of current development as well as re-development and new development within identified activity centers.
- **Safety, Access, Equity & Quality:** Provide safe, accessible, high quality services, facilities, and infrastructure that meet the needs of all residents and property owners

- **Efficiency & Affordability:** Invest in, locate and use infrastructure efficiently to limit over building, reduce long-term costs, promote community interaction, and direct growth into activity centers.
- **Resilience:** Incorporate changing conditions and risks posed by deliberate attacks, accidents, or naturally occurring threats or incidents, into infrastructure planning and investments to reduce current and future loss of life, and the other costs of recovery, and to promote economic stability.

Streamlined Local Comprehensive Planning

In addition to coordinating issue-specific plans across the region, the Commission works to coordinate local comprehensive plans, which plan across multiple issue areas but focus within town boundaries, with the goals and vision of the RPP. The Act identifies the minimum criteria required for a local comprehensive plan (LCP) to be consistent with the Act. The two items specifically identified within Section 9 of the Act for LCP compliance are: (1) a plan for capital facilities which will be necessary to accommodate growth both in that municipality and throughout Barnstable County; and (2) a plan to provide for the development of low and moderate-income housing consistent with local needs. The Act further requires that the LCP, which must be adopted by Town Meeting or legislative body, be consistent with the Regional Policy Plan and goals of the Act.

Once an LCP has been adopted by the town, “within two years or further time as the Commission may allow” the town must ensure its development bylaws are consistent with its local comprehensive plan.

While most towns on Cape Cod have adopted local comprehensive plans in the past, some of these plans were not certified by the Commission as consistent with the Act and Regional Policy Plan. In addition, the majority of towns have not updated their LCPs on a regular basis to reflect new trends or issues that are important to the community or to reflect changes to regional goals. Through this 2018 RPP update and subsequent revisions to the LCP Regulations, the Cape Cod Commission is seeking to:

- Encourage more towns to adopt or update LCPs consistent with the Act
- Streamline the process for adoption and approval
- Accelerate and coordinate the planning process within Community and Industrial Activity Centers as well as other Placetypes
- Stimulate the production of more diverse housing types in activity centers

- Coordinate public infrastructure investment within activity centers
- Ensure local bylaws are consistent with the RPP and LCP for targeted areas

To help streamline the process for developing local comprehensive plans consistent with the Act and RPP, the Commission will develop a template for use by the towns in developing their local comprehensive plans. The Commission will also assist in developing local comprehensive plans when requested by the towns and continue to offer support for planning and technical assistance for activity center development as well as other Placetypes, including assistance with zoning changes needed to support mixed-use and residential development in selected areas.

The Commission is developing web-based tools that will help towns better understand their communities' assets and opportunities, including measures of activity center health, wealth, and economic resilience. These tools will help guide towns in developing a vision for communities in their local comprehensive plans.

Local Capital Facilities Planning

To ensure coordination of the RPP with local planning, the Commission will develop a template for the elements of a local capital facilities plan that will be a required element of a certified local comprehensive plan. The components of a local capital facilities plan may include the following:

- Identification of local infrastructure needs to support development/redevelopment in activity centers and/or other areas identified by the community;
- Ensure 208 Plan consistency through a targeted watershed plan to address nitrogen loads, including a timeframe for meeting the plan;
- Identification of transportation projects that support regional/local activity centers;
- Provision of adequate water supplies to support existing/future needs;
- Capital budget for local infrastructure needs and timeframe.

PLANNING TOOLS AVAILABLE THROUGH THE ACT

DCPCs as a Planning Tool

Section 10 of the Cape Cod Commission Act authorizes the Commission to propose the designation of certain areas which are of critical value to Barnstable County as Districts Of Critical Planning Concern (DCPC). The DCPC is a powerful planning tool that allows a town or a

group of towns, as well as the Commission to plan for and adopt special regulations designed to protect important resources and foster sustainable development without the pressure of pending development permits. Once nominated by the town, a limited moratorium allows uses/activities not detrimental to the purposes of the district to proceed while the town completes the planning and outreach and develops new regulations designed specifically for the district. The DCPC process also ensures substantial public input to ensure that the district boundaries, purposes and ultimately implementing regulations adequately reflect Towns' vision and goals.

If a DCPC is designated by the Assembly of Delegates, the town has 12 months (with the potential for a 3-month extension) to adopt implementing regulations for the district. Implementing regulations, adopted at Town Meeting, also eliminate grandfathering protection, which is particularly useful for an area the community would like to see redeveloped in a manner more consistent with local goals and community character. An example of this type of District designation is the Town of Eastham commercial area that was designated as an Economic or Development Resource District, Affordable housing, and Transportation Management District in 2017. The goals of this District were to promote sustainable economic development, affordable housing, and transportation management along a heavily traveled section of U.S. Route 6.

DCPCs can be designated for many different purposes tailored to the needs of the community, including:

- Water resource district
- Aquaculture resource district
- Agricultural resource district
- Wildlife, natural, scientific, or ecological resource district
- Economic or development resource district
- Affordable housing resource district
- Major public investment district
- Hazard district
- Waterfront management/watersheet zoning district
- Downtown commercial revitalization district
- Transportation management district

A total of ten (10) DCPCs have been designated for various purposes by the towns since the Act was adopted, including a town-wide DCPC in Barnstable for affordable housing and growth management.

The first Cape-wide DCPC to be designated was the Ocean Management Planning DCPC (<http://ccc-plans.org/OMP>) nominated by the Barnstable County Commissioners in December 2009. The County Commissioners made the nomination in anticipation of the final Massachusetts Ocean Management Plan (<http://ccc-plans.org/MA-OMP>) on December 31, 2009. The state created the Ocean Management Plan to coordinate and promote certain types of development within Massachusetts ocean waters. The second Cape-wide DCPC to be designated was the first one nominated by the Cape Cod Commission. The first DCPC proposed by the Commission was the Cape-wide Fertilizer DCPC in response to state legislation that would remove the ability of individual communities to regulate fertilizers. The DCPC designation gave Cape communities an opportunity to adopt local bylaws consistent with the implementing regulations; town participation was voluntary. A total of seven communities adopted local fertilizer bylaws under the DCPC, and Falmouth and Orleans received grandfathering protection for their nitrogen management bylaws.

For more information on DCPCs, go to: <http://ccc-plans.org/DCPC>

Development Agreements

A development agreement is a voluntary, binding contract between a public permitting authority or authorities, including the Commission, and a person who owns or controls property within the authority's jurisdiction, for the purpose of establishing the regulations and conditions that will govern proposed development on the property during the term of the agreement. Development agreements are specifically authorized under the Cape Cod Commission Act and Chapter D of the Commission's regulations, but not generally under Massachusetts zoning law and other state land use laws and regulations. Development agreements are well-suited to complex, long-term projects designed to be constructed in phases. Where the Commission determines that a project under its jurisdiction is appropriate for a development agreement, the development agreement review and approval process is in place of the DRI review and approval process.

Development agreements have several main purposes and distinct benefits to public authorities and developers. For the developer, a development agreement:

- provides a level of flexibility in permitting and developing a project;

- provides assurance that applicable development regulations will not change over the duration of the agreement; and,
- vests land use development rights applicable to a property for the duration of the agreement.

For public authorities, the development agreement process allows for a more comprehensive and holistic approach in reviewing the totality of a project, and for clearer expectations about provisions for infrastructure and mitigation associated with a project.

Growth Incentive Zones

To encourage concentrated growth in desirable and well-suited areas, towns may apply for designation of a Growth Incentive Zone (GIZ) as outlined in Chapter G of the Cape Cod Commission's regulations. The designation process requires a thorough analysis of the existing or planned infrastructure, bylaws, capital facilities for the proposed GIZ area and its suitability for increased development. A successful application process and resulting designation raises certain DRI review thresholds so that fewer development projects in the area require Cape Cod Commission review. This minimized review process may make the GIZ area more appealing to developers, promoting development where the Town desires and can efficiently support growth.

Municipal Revisions to Development of Regional Impact Thresholds

Chapter H (of the Code of Cape Cod Commission Regulations of General Application) allows the Commission or a town to propose revisions to certain of the mandatory DRI review thresholds of general applicability contained in Chapter A (Enabling Regulations Governing Review of Developments of Regional Impact). Revisions may be proposed within a range of building gross floor area and unit count parameters set out in Chapter H and may be established for discrete areas within larger areas mapped and designated by the Commission for such revisions (such as Economic Centers). Generally, the review thresholds that may be revised deal with mixed use, commercial or residential development. Review thresholds may be revised 'lower' so that the Commission has greater jurisdiction to review development in areas with an abundance of identified built or natural resources or may be revised 'higher' in developed areas where less Commission regulatory oversight is appropriate in terms of the potential for regionally significant impacts from development in such an area. The Commission ultimately must hold a hearing on and approve proposed revisions if they are to become effective. In proposals to revise DRI review thresholds under Chapter H, the Commission

reviews the built and natural resources, infrastructure, regulation and planning associated with an area proposed for DRI threshold revision.

To date, the Commission has approved one Chapter H designation for four areas on the Upper Cape (in Falmouth, Sandwich and Bourne) in order to further economic development in such areas and in the region. In these areas, net new building development up to 40,000 square feet gross floor area, which proposes research and development or light manufacturing use, is allowed without the requirement for DRI review.

8. Cape Cod Placetypes

While the RPP goals apply across the region, the region is comprised of many different and unique places. To recognize and support these unique areas, this RPP identifies areas with similar natural and built characteristics as distinct "Placetypes," which serve as a conceptual framework for regional planning and regulation. A character description for each Placetype is provided along with a vision for each area consistent with the region's growth policy. Additionally, each character description lists strategies for creating and enhancing the unique characteristics of these Placetypes.

NATURAL AREAS

Natural Areas are generally the region's least developed and most sensitive areas. These identified areas comprise natural shoreline, barrier beaches, banks, and dunes, areas with highest habitat value and natural landscapes, undeveloped lands in wellhead protection areas, buffers to wetlands and vernal pools, and undeveloped areas subject to flooding. The vision for Natural Areas is to minimize adverse development impacts to sensitive resource areas, to preserve lands that define Cape Cod's natural landscape and contribute to its scenic character, and to improve the Cape's resilience to severe storms and the effects of climate change. Natural Areas are lands with the highest significance for resource protection or conservation and are appropriate for permanent protection through acquisition and conservation restriction or for transfer of development rights to less vulnerable areas.

The Commission identified these areas by mapping BioMap2 Core Habitat and Critical Natural Landscapes, vernal pools and the 350-foot buffer of vernal pools, protected open space, wetlands and the 100-foot buffer to wetlands, undeveloped lands in wellhead protection areas, and undeveloped lands in FEMA flood zones.

Natural Areas Placetype Strategies:

- 1) Accommodate sea-level rise by allowing low-lying areas to absorb rising seas and wave action/tides from severe storms
- 2) Provide natural areas for plant and wildlife habitat
- 3) Retain natural cover and restore wooded areas
- 4) Integrate green infrastructure practices to accommodate sea-level rise and storm events
- 5) Provide areas for passive recreation such as walking and hiking

- 6) Limit development to protect natural resource functions and encourage removal of development where appropriate

RURAL DEVELOPMENT AREAS

Rural Development Areas are defined by a high percentage of open lands and sparse building development patterns that contribute to the unique rural and scenic character of the region. Rural Development Areas may include rural historic areas of the Outer Cape including the Cape Cod National Seashore and large agricultural areas in parts of Falmouth, larger lot residential development, lands in active agricultural production, significant tracts of wooded areas without identified special habitat, and cultural landscapes that help define the region's history. The vision for Rural Development Areas is to ensure that development is located, sited, and scaled appropriately to avoid impacts on scenic and/or cultural resources, and to help maintain the economic diversity that agriculture can provide for the region including opportunities for the continuation of traditional agricultural occupations, and for the availability of locally-grown food.

Rural Development Areas Placetype Strategies:

- 1) Preserve lands in agricultural production to encourage locally-grown food
- 2) Protect agricultural lands and natural cover to preserve existing natural functions
- 3) Ensure development respects the surrounding landscape by using existing topography to guide the development layout, cluster the development on the site, and preserve wooded buffers
- 4) Protect scenic and cultural landscapes and historic structures within these landscapes that contribute to the Cape's unique character and history
- 5) Provide connections to adjacent open space lands to create an open space network with opportunities for passive recreation such as walking and hiking

SUBURBAN DEVELOPMENT AREAS

Suburban Development Areas include residential neighborhoods built primarily between the 1950s and 1990s as well as automobile-oriented commercial and light industrial development established during the same time period. These areas are more densely developed than Rural Development Areas and may include curvilinear streets and cul-de-sacs, but generally lack an interconnected street network. Suburban Development Areas also have a patchwork of fragmented open space consisting of buffer strips or landscaped areas. Parking in commercial and industrial Suburban Development Areas is typically located in front of the site with

buildings that are highly visible from the roadway. The vision for these areas is to redevelop commercial and industrial Suburban Development Areas consistent with the community's vision to create more concentrated nodes of development, and to improve their design and function so that they are better integrated into surrounding neighborhoods. The vision for residential Suburban Development Areas is to cluster residential development to reduce the development footprint and provide high-quality open space.

Suburban Development Areas Placetype Strategies:

- 1) Encourage redevelopment of existing commercial suburban development with denser clusters of buildings surrounded by less developed areas
- 2) Integrate existing commercial development into surrounding areas with mixed-use and/or residential development providing greater housing opportunities and employment diversity
- 3) Create pedestrian and bicycle amenities within and between developments to improve safety for all users and reduce auto dependence
- 4) Improve the design and function of commercial and industrial areas through landscaping, stormwater treatment, and building layout/design
- 5) Encourage infill and cluster residential development to limit further suburban sprawl

HISTORIC AREAS

Historic Areas consist of concentrations of historic structures, including local and/or National Register districts located in a small-scale village setting. These areas are an important component of the region's history and Cape Cod character. The vision for Historic Areas is to protect historic resources and to support infill development that respects the form, scale, and character of existing historic areas.

Historic Areas Placetype Strategies:

- 1) Support infill development at appropriate scale and density to retain the vitality of these areas
- 2) Preserve the character and traditional function of historic areas
- 3) Encourage the re-use of historic structures to accommodate small businesses and/or greater diversity of residential opportunities

MARITIME AREAS

Maritime Areas are clusters of commercial and mixed-use development that contribute to Cape Cod's working waterfronts and harbors. These areas help to define Cape Cod's unique maritime history, are an important component of the Cape's economy, and provide recreational opportunities for both residents and visitors. Maritime areas will include both public and private harbors, marinas, and mooring fields and may extend to nearby commercial activity and historic maritime villages that contribute to the traditional character and economic success of the working waterfronts.

The vision for Maritime Areas is to support the fin- and shell-fishing industry as well as other commercial, recreational, educational, and research activities associated with the marine environment and to protect water dependent trades. Storm events and climate change, along with the use, scale and form of adjacent development pose challenges to maintaining valuable maritime infrastructure and activities, as well as their character.

Maritime Areas Placetype Strategies:

- 1) Encourage towns to develop and regularly update Harbor Plans
- 2) Identify harbor use policies that support traditional maritime activities while also accommodating other users, such as tourism, transportation, energy, and marine science focused operations
- 3) Preserve and/or expand public access to water/beaches
- 4) Preserve historic structures and overall scale and character

COMMUNITY ACTIVITY CENTERS

Community Activity Centers are areas with a concentration of business activity, community activity, and a compact built environment. Buildings are generally smaller in scale and connected by a network of streets, ways or alleys. Community Activity Centers are more walkable and densely developed than other Placetypes and often contain concentrations of historic buildings that contribute to the Cape's unique character. Mixed commercial and residential uses make it possible to live and work within the same walking distance. Smaller parks provide greenspace and recreation within Community Activity Centers, with ample access to transit, bike connections and sidewalks.

The vision for these areas is to accommodate mixed-use and multifamily residential development in a walkable, vibrant area, preserve historic buildings, and to provide diverse

services, shopping, recreation, civic spaces, housing, and job opportunities at a scale of growth and development desired by the community, with adequate infrastructure and pedestrian amenities to support development.

Community Activity Centers Placetype Strategies:

- 1) Encourage mixed-use commercial and residential development in a compact form to support a vibrant downtown area
- 2) Encourage development at a human scale that facilitates interaction and a sense of community
- 3) Develop infrastructure necessary to support greater density and mix of uses, including access to transit
- 4) Integrate pocket parks and create streetscapes that enhance the built environment and provide community gathering places

INDUSTRIAL ACTIVITY CENTERS

Industrial Activity Centers are lands containing industrial uses that are suitable for future industrial activity as well as emerging industries. Industrial Activity Centers are lands without significant resource constraints, are areas with access to major highway corridors, and are of an adequate size to support industrial uses. Industrial Activity Centers include some larger industrially-zoned areas, as well as existing areas designated under Chapter H of the Commission's regulations. These areas have a well-developed internal street network at a scale to accommodate larger vehicles and uses. The vision for Industrial Activity Centers is to support their development as significant employment centers with adequate infrastructure. Industrial land uses such as manufacturing, assembly, storage, processing and/or contracting in these areas is generally incompatible with residential development and should be appropriately separated and buffered from other uses.

Industrial Activity Centers Placetype Strategies:

- 1) Maintain adequate buffers between industrial development and surrounding uses
- 2) Provide employee services and facilities and access to transit
- 3) Develop incubator spaces for emerging industry clusters and entrepreneurs
- 4) Plan for renewable energy generation facilities

MILITARY AND TRANSPORTATION AREAS

Military and Transportation Areas consist of large land areas developed with and devoted to infrastructure such as airports, transfer stations, waste disposal facilities, and Joint Base Cape Cod. These areas have unique considerations such as access control, noise impacts, and flight path restrictions. The vision for these areas is to support comprehensive master planning with community input, encourage growth of industries appropriate to the diversification of the regional economy, and encourage partnerships for use of shared infrastructure.

Military and Transportation Areas Placetype Strategies:

- 1) Ensure transportation routes provide safe and adequate access to and from these facilities
- 2) Support opportunities for shared infrastructure
- 3) Support development of renewable energy generation where appropriate

While these Placetypes have been identified based on the presence of similar characteristics, there are different scales, sizes, and intensity of development within each. For example, a Community Activity Center located in one town will share characteristics with a Community Activity Center in another town, however, the character of two Community Activity Centers may be very different: one may be a historic village while another may feel more like a downtown area. While this plan identifies centers of activity at the regional scale based on existing characteristics, centers of activity also exist or could be envisioned at a neighborhood or local scale.

Additionally, the identification of the Community Activity Centers can help serve as an element or foundation for a community to plan for the area, but the identification of Community Activity Centers does not determine what the vision for the area is or should be. Specific visioning for these and other areas should be conducted by the communities, with help from the Commission if desired.

9. Regional Regulatory Review

The Cape Cod Commission Act (Act) charges the Cape Cod Commission with reviewing certain proposed developments which, because of their size or other characteristics, are presumed to have development effects beyond their local communities. These proposed developments are called Developments of Regional Impact (DRI). The DRI review requirements are set forth in Section 13(d) of the Act.

An important component of the Act's DRI review requirements is a review for consistency with the Regional Policy Plan in effect at the time a DRI is reviewed. The Commission regularly updates the RPP to establish a current and coherent set of regional planning policies, goals, and objectives to guide development throughout Barnstable County. The RPP is implemented in large part through the Commission's regulatory program.

This RPP focuses on the review of developments in relation to their surroundings, which are determined based on the Cape Cod Placetype within which the proposed project is located. Employing a context-sensitive review process will ensure that new development is harmonious with and enhances the unique character of the region and protection of its natural and cultural resources, which are critical to the regional economy and way of life.

THE ROLE OF THE GOALS AND OBJECTIVES OF THE RPP

This RPP has been drafted to align directly with the goals and purposes of the Act. Specifically, this RPP adopts fourteen (14) goals and corresponding objectives under each goal to guide and plan for the future of the region in a manner consistent with the vision and growth policy of the Commission.

Organized around the region's natural, built, and community systems, these goals and objectives form the structure upon which the region's planning work relies, guide implementation actions, and provide a framework by which the regulatory review process takes place.

The Goals and Objectives in Section 6 of this plan are the measures by which the Cape Cod Commission will make its determination whether a DRI is consistent with the RPP; for purposes of DRI and other regulatory reviews undertaken by the Commission, consistency with applicable goals and objectives constitutes consistency with the RPP.

The Commission determines the applicability and materiality of the RPP's goals and objectives to a project on a case by case basis. As the RPP has broad, general application to DRIs and other regulatory matters of regional significance, not every goal or objective may apply, be material, relevant or regionally significant, or apply in the same way or with the same focus or extent to every project or designation, given the specific facts and circumstances present in any given project.

THE ROLE OF TECHNICAL GUIDANCE IN REGULATORY REVIEW

Separate from, but in support of this RPP, the Commission has developed Technical Guidance. The Technical Guidance contains Placetype Maps, Technical Bulletins and references to resource areas mapped by federal, state and local governments. There is a Technical Bulletin for each of the fourteen goals of the RPP. The primary application of the Technical Guidance is during DRI or other regional regulatory review, and its primary purpose is to assist the Commission in its determination of whether a project is consistent with applicable RPP goals and objectives, and alternatively, to detail how an applicant could design and pursue its project to meet the applicable RPP goals and objectives. The Technical Bulletins detail methods by which the goals and objectives of the RPP may be met. Except where otherwise specified in the Technical Bulletin, the methods by which goals and objectives of the RPP are met are not prescriptive, but rather are examples of methods that further the goals and objectives of the RPP and assist in evidencing consistency with the RPP. Applicants may work with the Commission to develop alternative methods of evidencing RPP consistency. In some limited circumstances, there may be methods that are considered essential to achieving a particular goal and objective, and therefore required to be implemented; these are noted within the text of the applicable Technical Bulletin.

THE ROLE OF THE CAPE COD PLACETYPES IN REGULATORY REVIEW

Cape Cod Placetypes is an organizing principle that informs the Commission's regulatory review. The same Placetypes discussed in Section 8 of this plan, which frame the goals and objectives for land use form and function, are incorporated into the review of DRIs under the RPP. The Placetypes are determined in two ways; some are depicted on a map adopted by the Commission as part of the Technical Guidance for review of DRIs, and the remainder are determined using the character descriptions set forth in Section 8 of this plan and the

Technical Guidance. Placetype maps will be reviewed and updated as appropriate within 24-36 months after adoption of the RPP.

The Placetype for a given project is established at the outset of DRI review and provides the lens through which the Commission will review the project under the RPP. The applicability of goals and objectives may vary based on how projects are classified by Placetype. The means for achieving consistency with these goals and objectives may vary from site to site and project to project, typically depending on the relevant Placetype and whether certain sensitive resources are present on a given project site.

THE ROLE OF RESOURCE AREAS IN REGULATORY REVIEW

Also contained within the Technical Guidance are resource areas which illustrate resources such as Zone II water supply areas, rare species habitat, flood hazard zones, and wetland resource areas. These areas are identified throughout the Technical Guidance and are also used as a lens by which DRI review is conducted when identified. Placetypes and resource areas may be amended from time to time as new information becomes available.

RPP CONSISTENCY AND PROBABLE BENEFIT/DETRIMENT DETERMINATIONS

In order to grant DRI approval, the Act requires that the Commission find that the probable benefit of a proposed development is greater than its probable detriment. The Commission must also find that a proposed development is consistent with the RPP (among other stated requirements). This RPP update provides a goal-oriented approach to DRI regulatory review. It is intended that this approach will provide the Commission with more flexibility in determining whether proposed development is consistent with the RPP when considering the particular location, use and impacts associated with that development.

The Commission's review and analysis of a DRI under the RPP goals and objectives also inform its benefits/detriment analysis and determination. In considering the impacts of a development, the Commission will consider the various goals and objectives in the RPP applicable to a project in order to determine whether the project is consistent with the RPP, as the goals and objectives are not separate and independent from one another, but instead constitute a coherent, inter-related and integrated approach to planning for development in the region. Though the Commission's determination that a development is consistent with the

RPP does not in itself determine that the probable benefit of a development is greater than its probable detriment (or that the Commission has determined that there is any particular benefit or detriment associated with that development), the Commission may factor into its benefits/detriments determination those considerations identified through its RPP review and analysis, in addition to any other regional benefits, detriments, concerns or impacts within the broad purview of the Commission under the Act that are associated with the specific circumstances of the project.

This framework is intended to vertically align local and regional planning and regulatory efforts to maximize the region's ability to achieve common planning and development goals.

WAIVER AND FLEXIBILITY

When special circumstances warrant, and upon the request of the project applicant, the Commission may waive full and literal compliance or consistency with any specific RPP goal or objective applicable to a project, and otherwise allow a project to meet such goal or objective to the maximum extent feasible, provided the applicant demonstrates that:

- 1) such waiver will not result in substantial detriment to or substantial derogation from the purposes and values intended to be protected or promoted by such goal or objective, and
- 2) that the intent of the goal or objective will be met through some alternate approach, including appropriate mitigation; and
- 3) that the waiver is necessary to fulfill, protect or promote another compelling regional purpose, goal, objective or value from the Act or RPP that could not be achieved without such waiver.

In considering the grant of such waiver, the Commission may factor into its decision-making any hardship claimed and demonstrated by an applicant that would render such full and literal compliance or consistency impracticable. In determining such hardship, the Commission will consider, among other things:

- 1) whether that without the desired relief, full and literal enforcement would result in substantial hardship, financial or otherwise, to the project applicant;
- 2) the extent to which the claimed hardship is specific to the project, not generalized in nature, and the extent to which the hardship might be self-created; and
- 3) whether the requested waiver relates directly, and is the minimum relief necessary, to address the stated hardship.

REVIEW GOALS AND OBJECTIVES OF THE REGIONAL POLICY PLAN

Water Resources

Goal: To maintain a sustainable supply of high quality untreated drinking water and protect, preserve, or restore the ecological integrity of Cape Cod's fresh and marine surface water resources.

Objectives:

- Protect and preserve groundwater quality
- Protect, preserve and restore fresh water resources
- Protect, preserve and restore marine water resources
- Manage and treat stormwater to protect and preserve water quality
- Manage groundwater withdrawals and discharges to maintain hydrologic balance and protect surface and groundwater resources

Ocean Resources

Goal: To protect, preserve, or restore the quality and natural values and functions of ocean resources.

Objectives:

- Locate development away from sensitive resource areas and habitats
- Preserve and protect ocean habitat and the species it supports
- Protect significant human use areas and vistas

Wetland Resources

Goal: To protect, preserve, or restore the quality and natural values and functions of inland and coastal wetlands and their buffers.

Objectives:

- Protect wetlands and their buffers from vegetation and grade changes
- Protect wetlands from changes in hydrology
- Protect wetlands from stormwater discharges

- Promote the restoration of degraded wetland resource areas

Wildlife and Plant Habitat

Goal: To protect, preserve, or restore wildlife and plant habitat to maintain the region's natural diversity.

Objectives:

- Maintain existing plant and wildlife populations and species diversity
- Restore degraded habitats through use of native plant communities
- Protect and preserve rare species habitat, vernal pools, 350-foot buffers to vernal pools
- Manage invasive species
- Promote best management practices to protect wildlife and plant habitat from the adverse impacts of development

Open Space

Goal: To conserve, preserve, or enhance a network of open space that contributes to the region's natural and community resources and systems.

Objectives:

- Protect and preserve natural, cultural, and recreational resources
- Maintain or increase the connectivity of open space
- Protect or provide open space appropriate to context

Community Design

Goal: To protect and enhance the unique character of the region's built and natural environment based on the local context.

Objectives:

- Promote context-sensitive building and site design
- Minimize the amount of newly disturbed land and impervious surfaces
- Avoid adverse visual impacts from infrastructure to scenic resources

Coastal Resiliency

Goal: To prevent or minimize human suffering and loss of life and property or environmental damage resulting from storms, flooding, erosion, and relative sea level rise.

Objectives:

- Minimize development in the floodplain
- Plan for sea level rise, erosion, and floods
- Reduce vulnerability of built environment to coastal hazards

Capital Facilities and Infrastructure

Goal: To guide the development of capital facilities and infrastructure necessary to meet the region's needs while protecting regional resources.

Objectives:

- Ensure capital facilities and infrastructure promote long-term sustainability and resiliency
- Coordinate the siting of capital facilities and infrastructure to enhance the efficient provision of services and facilities that respond to the needs of the region

Transportation

Goal: To provide and promote a safe, reliable, and multi-modal transportation system.

Objectives:

- Improve safety and eliminate hazards for all users of Cape Cod's transportation system
- Provide and promote a balanced and efficient transportation system that includes healthy transportation options and appropriate connections for all users
- Provide an efficient and reliable transportation system that will serve the current and future needs of the region and its people

Energy

Goal: To provide an adequate, reliable, and diverse supply of energy to serve the communities and economies of Cape Cod.

Objectives:

- Support renewable energy development that is context-sensitive
- Increase resiliency of energy generation and delivery
- Minimize energy consumption through planning and design (including energy efficiency and conservation measures)

Waste Management

Goal: To promote a sustainable solid waste management system for the region that protects public health, safety, and the environment and supports the economy.

Objectives:

- Reduce waste and waste disposal by promoting waste diversion and other Zero Waste initiatives
- Support an integrated solid waste management system

Cultural Heritage

Goal: To protect and preserve the significant cultural, historic, and archaeological values and resources of Cape Cod.

Objectives:

- Protect and preserve forms, layouts, scale, massing, and key character defining features of historic resources, including traditional development patterns of villages and neighborhoods
- Protect and preserve archaeological resources and assets from alteration or relocation
- Preserve and enhance public access and rights to and along the shore
- Protect and preserve traditional agricultural and maritime development and uses

Economy

Goal: To promote a sustainable regional economy comprised of a broad range of businesses providing employment opportunities to a diverse workforce.

Objectives:

- Protect and build on the Cape's competitive advantages
- Use resources and infrastructure efficiently

- Foster a balanced and diverse mix of business and industry
- Encourage industries that provide living wage jobs to a diverse workforce
- Expand economic activity and regional wealth through exports, value added, import substitution, and local ownership

Housing

Goal: To promote the production of an adequate supply of ownership and rental housing that is safe, healthy, and attainable for people with different income levels and diverse needs.

Objectives:

- Promote an increase in housing diversity and choice
- Promote an increase in year-round housing supply
- Protect and improve existing housing stock
- Increase housing affordability

10. Regional Performance Measures

This RPP identifies performance measures to be tracked over time. Changes in these measures will help illustrate whether the region is moving toward the RPP's vision for the future as a region of vibrant, sustainable, and healthy communities, and protected natural and cultural resources.

While there are hundreds of different data points and measures that could show whether the region is making progress toward this vision, nine performance measures were chosen that measure progress across the systems that are critical to meeting the goals and the vision of this plan. The measures are often indicative of more than one facet of the region's systems and were chosen because measuring them is also achievable based on available data. Though ideally these measures will show positive progress over time, tracking them can also identify areas where additional resources are needed to make progress. The Commission will work to make this data accessible.

- Number of acres of protected BioMap2 Core habitat: Preserving the natural environment and habitats is essential to the region's environmental and economic resilience. An increase in the number of acres of protected BioMap2 Core habitat will show progress towards safeguarding the Cape's valuable natural environment.
- Nitrogen concentration in public drinking water wells: Clean drinking water is critical to any population's quality of life and well-being. Nitrogen is often used as an indicator of drinking water quality. The Commission's established nitrogen loading concentration of 5 parts per million is below the established federal maximum contaminant level of 10 parts per million to ensure the region's high-quality drinking water is maintained. A decrease in the concentration of nitrogen in public supply wells will show progress toward increasing protection of public health.
- Parcels connected to the sidewalk network: In order to achieve the vision of a region defined by vibrant and healthy communities, residents and visitors must be able to move through the area safely and efficiently and not solely using vehicles. Increasing the number of parcels connected to the sidewalk network, where appropriate, will indicate an increased ability for more people to travel around the region without getting in their cars, and getting people outside and walking around is also a key contributing factor to creating a vibrant community.

- Nitrogen concentrations in embayments: The health of marine water ecosystems depends on the quality of coastal waters; the Cape's economy is tied to its quality of life, and thus, to the quality of its coastal and other natural resources. Nitrogen travels through groundwater to coastal embayments and, in excess, results in degraded water quality. Decreased concentrations of nitrogen at monitoring stations in each of the region's coastal embayments is indicative of water quality improvement.
- Number of additional or updated historic structure inventory forms: The historic character of the Cape plays a huge role in attracting visitors and residents to the region, however many of these critical historic resources are unprotected. The first step towards protecting these historic resources is inventorying them, either for the first time or conducting more detailed inventories of previously inventoried structures. An increase in the number of historic resource inventories will show progress toward greater protection of these unique structures.
- Activity center evolution: The 2018 RPP utilized GIS analysis to identify existing centers of activity across the region. The Commission will review changes in the health, wealth, and economic resilience of existing centers of activity over time.
- Share of employment within high-wage industries: Year-round employment opportunities with good wages can be difficult to find on the Cape. This measure shows how many Cape Cod jobs are in high-wage industries. An increase in the employment opportunities in high-wage industries will show a shift away from an economy primarily focused on the tourism industry, with low-paying, seasonal jobs, and towards an economy that can support a more robust year-round population. An increase in the share of employment within high-wage industries will also reflect changes in the physical infrastructure and regulations necessary to support these companies.
- Housing diversity: Housing affordability is a large challenge to the year-round population and is compounded by the fact that over 80% of the Cape's housing stock is detached single-family homes. An increase in housing diversity in terms of housing type, size, and rental vs. ownership units, will show that there are more opportunities for people of different ages and economic backgrounds to live on the Cape.
- Changes in floodplain development: Climate change and sea level rise are threats posing a significant challenge for the Cape. A decrease in development within the floodplain, adapting development through new codes or regulations, or additional protected lands in strategic areas will help protect the environment and the population of the region and ensure its viability and sustainability for the next several decades.

Issue-specific plans adopted in conjunction with the RPP will also have a more comprehensive set of measures for achieving that plan's goals and objectives. For example, the Comprehensive Economic Development Strategy includes numerous additional performance measures focused on the health of the regional economy, while the Regional Transportation Plan update includes specific performance measures for meeting the goals of the RTP. Though separate from the RPP, these efforts align with and support the RPP goals.

11. Recommended Actions

Recommended actions in the 2018 RPP that the Commission commits to undertake over the next five years include both planning and regulatory efforts to address the major challenges identified in Section 5 of the Plan. These actions are organized around the Natural Systems, Built Systems, and Community Systems identified in Section 4 as well as other actions needed to align the Commission's planning and regulatory efforts. Many of these actions will require collaboration and partnerships at various levels of government and with non-governmental organizations, participation by committees and stakeholders that currently support the Commission's efforts, communication and coordination with private sector industries and businesses, and substantial public input in order to be achieved.

REGIONAL PLANNING ACTIONS

Natural Systems

IDENTIFY PRIORITY LANDS FOR FUTURE WATER SUPPLY DEVELOPMENT

Conduct a GIS-based analysis of lands suitable for the development of additional and/or replacement water supplies for Cape communities. Work with communities to establish areas of land for priority open space acquisition and protection for the purposes of water supply. In concert with identifying future needs and planning for future well development to replace existing wells, develop a water budget that focuses on identifying future needs to accommodate anticipated growth and includes strategies for reducing per capital water usage. Prepare a drinking water supply assessment for water quality including consideration of emerging contaminants.

SUPPORT WATER QUALITY PLANNING IN PRIORITY WATERSHEDS

Continue to support watershed planning and implementation in priority watersheds identified in the 208 Plan Update and subsequent implementation reports. Support should be provided in response to requests for Watershed Team technical assistance and through regional efforts that promote the analysis and integration of embayment water quality data and technology performance data into local decision-making processes.

UPDATE AND EXPAND UNDERSTANDING OF FRESH WATER RESOURCES DATA

Compile available fresh water resources water quality data into a regional database. Seek funding to update the Cape Cod Ponds and Lakes Atlas to reflect current water quality data collected by the Ponds and Lakes Stewardship Program.

Built Systems**DEVELOP A REGIONAL CAPITAL INFRASTRUCTURE PLAN TO SUPPORT SUSTAINABLE ECONOMIC DEVELOPMENT**

Prepare a Regional Capital Infrastructure Plan, in accordance with the RPP's Growth Policy, Regional Vision, and Goals and Objectives, that supports the human population and economies on Cape Cod.

UPDATE THE CAPE COD REGIONAL TRANSPORTATION PLAN

Complete the four-year update to the Cape Cod Regional Transportation Plan (RTP) to establish a framework that supports the Regional Growth Policy, Vision, and Goals and Objectives adopted in the 2018 RPP.

The RTP should strategically utilize available federal and state funds to provide a safe, reliable, and multimodal transportation system that effectively serves the region and its people. The RTP should prioritize investments that improve access to and mobility within compact, mixed-use activity centers including investments in public transportation.

Support communities in the implementation of Complete Streets projects and other projects that support the vision of the RTP.

CLIMATE CHANGE RESPONSE, READINESS, AND MITIGATION

Encourage and engage communities to better understand regional greenhouse gas emissions and identify opportunities for mitigation.

- Develop an estimated baseline of greenhouse gas emissions for the region using available models and data.
- Encourage more communities to seek Green Communities designation, which would facilitate greater funding opportunities for municipal energy efficiency and renewable

energy initiatives and participation in the Community Rating System to reduce insurance costs.

- Conduct GIS screening analysis of potential electric vehicle charging station locations.
- Conduct a GIS analysis to identify appropriate potential sites for development of utility scale solar photovoltaic arrays or energy storage facilities (with an emphasis on “grayfield” sites outside of densely populated areas) to encourage development of on-site renewable energy to offset line losses associated with electricity supplied from the utility grid.

CONTINUE COASTAL HAZARD MITIGATION AND CLIMATE ADAPTATION PLANNING

Support and engage communities in coastal hazard mitigation and climate adaptation planning to increase the region’s resilience to severe storm events and sea level rise consisting of the following efforts:

- Continue to develop and implement a coastal resilience scenario planning tool to assist communities in understanding the costs/benefits and ecosystem services provided by various coastal adaptation strategies;
- Continue to provide technical assistance to communities through the State’s Municipal Vulnerability Preparedness and Multi-Hazard Mitigation planning programs to identify coastal hazards, critical facilities and infrastructure, and mitigation and/or adaptation strategies;
- Consider use of planning and/or regulatory tools available through the Act and Commission regulations that could be implemented in the event of a disaster to relocate development outside of hazard areas;
- Provide design guidance on elevating structures and floodproofing/other techniques in flood hazard areas;
- Support analysis and planning at the regional and local level to advance and coordinate management of coastal resources that addresses the natural flow and function of sediment transport

Community Systems

DEVELOP A REGIONAL HOUSING PLAN

Develop a community housing plan for the purpose of addressing housing supply, affordability, and availability in the region. The regional housing plan should identify regional, sub-regional, and town-specific housing supply goals and appropriate areas for housing development, in

particular multi-unit development. The regional housing plan should also set out regional, sub-regional or town-specific policies, actions and strategies for furthering the goals of the plan, including how to foster infrastructure investment to support an increase in housing supply. As a component of the regional housing plan, examine the relationship between affordable housing needs generated by the creation of new, low-wage jobs.

UPDATE THE COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY

Complete the five-year update to the Cape Cod Comprehensive Economic Development Strategy (CEDS) to achieve the Regional Growth Policy, Vision, and Goals and Objectives adopted in the 2018 RPP. The CEDS should be developed through an intensive public engagement process and include a set of priority issues to address over the next five years. Specific priority projects and an implementation action plan should be adopted, along with a program for evaluating progress.

UPDATE LOCAL COMPREHENSIVE PLAN REGULATIONS

Encourage more towns to prepare or update local comprehensive plans that are consistent with the Act, Regional Growth Policy, Vision, and Goals and Objectives of the 2018 RPP. Streamline regulations governing the form, content, and review of local comprehensive plans while ensuring that minimum requirements under the Act are met. Continue to provide technical assistance to towns in preparing local comprehensive plans and assist towns in making changes to local development bylaws to ensure consistency with the local comprehensive plan. Provide a template on the required elements of a local comprehensive plan and local capital plan.

IMPROVE AND UPDATE HISTORIC INVENTORIES

Support the work of local historic committees to complete and/or update inventories of historic and cultural resources through GIS mapping and technical assistance, and work with Cape communities to adopt zoning changes that provide incentives to preserve and re-use historic structures.

CONTINUE TO DEVELOP LAND USE DECISION SUPPORT TOOLS

Building upon tools developed for and used in several major planning initiatives described in Section 7, such as the 208 Plan Update and the Resilient Cape Cod project, the Commission will continue to develop a suite of interactive land use decision support tools to assist local officials and stakeholders in visualizing the form and potential impacts of alternative

development scenarios on the environment. These tools could be used at a variety of scales ranging from an individual site or neighborhood to an entire community and could analyze a variety of resource impacts including wellhead protection, water use, impervious surfaces, or parking requirements generated by different development scenarios.

Current Decision Support Tools

GeoPlanner is an online tool that allows a user to “paint” different types of development on a particular area, allowing a comparison of the impacts from different land uses. This tool is particularly helpful early in the planning stages of a project or consideration of a potential zoning change on a particular area.

Using ArcGIS Pro, Impact 3D allows users to construct building massings with assigned land uses in a three-dimensional environment. Impact 3D helps visualize and compare the impacts of potential development scenarios with each other and on the existing environment.

Envision Tomorrow also utilizes GIS but operates in a two-dimensional environment to perform detailed calculations of the impacts of different types of development the user “paints” onto a certain area. Envision Tomorrow was used in the early stakeholder workshops on the RPP update and includes a feature that allows a user to estimate the feasibility of different development scenarios based on construction and other costs.

SPATIAL FISCAL IMPACT MODEL

The Commission is developing a spatial fiscal impact model that approximates the cost to a town of a certain type of development on a given parcel based on the parcel’s attributes, such as the land use and location. Using GIS, this model will allow the user to analyze the role of location in estimating the costs or revenues to a town from a development. The model may also be used to approximate the different fiscal impacts to the town for different development types at the same location. This can support better land use and development policies by highlighting the different impacts of various types of development, as well as help to identify where infrastructure improvements may be most effective.

ZONING ANALYSIS TOOL

The Commission currently has a three-town pilot project with OpenCounter, an intuitive web-based zoning tool designed to make local regulations accessible to the public.

OpenCounter reveals parcel-level zoning details, including existing uses, overlay and planned development districts. This helps applicants understand zoning challenges and opportunities

for projects before engaging with municipal staff. The three towns in the pilot program are Mashpee, Barnstable, and Yarmouth. These towns were chosen because they are contiguous, and each has a unique commercial base, population, and geographic size. Next steps after a successful pilot would be to bring on more interested communities and create a single portal.

By better understanding what people are trying to develop on the Cape, the Commission can help identify where changes in land use policies may be most effective in supporting market need and can guide development to appropriate locations.

COORDINATE ANNUAL REGIONAL PLANNING FORUM

Continue to coordinate and facilitate information sharing, education, and collaboration across the region by hosting the annual One Cape Summit. Originally launched in 2014 to chart progress on development of the Cape Cod 208 Plan Update, it has become a forum for community activists, industry practitioners, municipal staff and appointed board members, and local elected leaders to discuss regional issues related to the unique environment and economy of Cape Cod. In recent years, the Summit expanded to highlight the importance of environmental, community, and economic resilience. To support ongoing education for better collaboration on challenging issues, the Commission will continue to hold this event and will seek to bring in a range of local, regional, and national speakers on pressing topics impacting the region.

REGIONAL REGULATORY ACTIONS

In addition to the previous planning actions, the following are priority regional regulatory actions intended to align the Commission's regulatory program with the Growth Policy, Vision, and Goals and Objectives in the 2018 RPP.

CONSIDER DEVELOPMENT OF REGIONAL IMPACT THRESHOLD REVISIONS AND OTHER AMENDMENTS TO THE COMMISSION'S CODE OF REGULATIONS

- Consider potential changes to mandatory DRI review thresholds to encourage residential and mixed-use projects in Community Activity Centers, for research and development and light manufacturing in Industrial Activity Centers, and to support resource protection in Natural Areas.
- More generally, review and update the Commission's Chapter A/ DRI Enabling Regulations (including Section 3 containing the mandatory DRI review thresholds), where such Regulations have not recently been comprehensively reviewed for form or content. Such

review may include adoption of new or additional thresholds, or the removal or revision of certain existing thresholds.

- Amend Chapters in the Code of Regulations to conform to language and processes set out in the 2018 RPP.
- Amend Chapter D/ Development Agreement Regulations to better reflect Section 14 of the Cape Cod Commission Act.

REVISE REGIONAL DESIGN GUIDELINES

Expand upon Technical Bulletins 96-001 - Designing the Future to Honor the Past: Design Guidelines for Cape Cod, and the Addendum to Technical Bulletin 96-001 - Contextual Design on Cape Cod: Design Guidelines for Large-Scale Development to provide additional guidance to applicants on how to meet the Community Design Goals and Objectives in the 2018 RPP based on the Cape Cod Placetypes and to serve as model guidelines for local design review. Assist towns with the adoption of design guidelines, village center zoning, and/or form-based regulation as appropriate.

AMEND TECHNICAL BULLETINS TO BETTER RESPOND TO CLIMATE CHANGE

Amend energy, transportation, and other relevant technical bulletins to include methods that reflect the findings of the Climate Change Response, Readiness, and Mitigation action.