CAPE COD
CLIMATE INITIATIVE

Cape Cod Climate Action Plan Goals, Strategies, Actions and Steps

DRAFT V2

The Cape Cod Climate Action Plan will include goals, strategies, actions, and steps to be taken in implementing the plan. The following draft is based on literature review, stakeholder input, and efforts of the Cape Cod Climate Change Collaborative (which are denoted with *).

Potential Actors are identified in red square brackets after individual steps.

Housing and Development

1. GOAL: REDUCE GHG EMISSIONS FROM THE BUILT ENVIRONMENT

1.1. Strategy: Strive towards Net Zero Energy Buildings; reduce energy consumption in non-residential structures

ACTION	STEPS
1.1.1. Ensure new commercial, industrial, and publicly funded construction is built to maximize energy efficiency*	■ All Cape communities adopt the Mass stretch building code; includes 3-year updates consistent with requirements of the Green Communities Act *[towns, Cape CANs]* ■ Building energy efficiency bylaws/ordinances to establish bench marking and energy audits for new buildings *[towns]* ■ Institute a renewable fuel standard for heating systems, *[state]* ■ Require that new buildings are EV and PV ready *[state]* ■ Establish new procurement rules for new construction to specify low energy demand and solar readiness *[towns, county]*
1.1.2. Retrofit existing commercial, industrial, municipal and other public buildings*	■ Subsidize energy efficient equipment; includes deep retrofits of HVAC and retro-commissioning, moisture management, appliances *[CLC, others]* ■ Promote smart temperature controls in all municipal (commercial, industrial) buildings* ■ Encourage solar or other renewable energy generation on commercial and industrial buildings ■ Promote decarbonization of industrial processes ■ Encourage towns to develop solar PV projects on town buildings and town-owned land *[CVEC, towns, CANs]* ■ Subsidize energy conservation measures; reducing air leaks, adding insulation, switching to efficient lighting and appliances *[CLC, state]* ■ Strive to "Lead by example" in publicly funded buildings; include education on tradeoffs for costs v. savings *[state, towns, county]* ■ Encourage energy conservation through cool roofs (light, reflective materials), green (vegetated) roofs, and sub-metering (metering by building unit) *[towns, state]* ■ Require progressively tighter GHG emissions standards for heating systems *[state]* ■ Increase building efficiency through weatherization, insulation, and air control (blower door tests) *[CLC]*
1.1.3. Expand solar incentive programs such as *Solarize Our Town* to all Cape communities*	■ Engage Boards of Selectmen and Barnstable Town Council *[Cape CANs]*

Housing and Development

1. GOAL: REDUCE GHG EMISSIONS FROM THE BUILT ENVIRONMENT

1.2. Strategy: Strive towards Net Zero Energy Buildings; reduce energy consumption in residential buildings

ACTION	STEPS
1.2.1. Retrofit existing residential buildings/houses*	■ Promote incentives, rebates, and MassSave to weatherize and improve energy efficiency of residential buildings ■ Incentivize replacement of oil, propane, and gas energy systems with electric heat pumps powered by green energy ■ Address unique considerations of historic homes, including the ability to electrify and weatherize ■ Address community character concerns associated with renewable energy installations, including engaging historic commissions
1.2.2. Support energy and efficiency data collection for homebuyers	■ Promote climate-friendly building products *[businesses]* ■ Encourage benchmark standards that require certain building performance ■ Require reporting of retrofits and renewable energy installations for homebuyer information ■ Consider means to include home energy scorecards in building transactions
1.2.3. Ensure new residential construction is built to maximize efficiency	■ Advance the design of new homes; promote Passive House principles ■ Support training of architects, contractors, builders, building code enforcement officials ■ Support Cape communities in adopting the Mass stretch building code; includes 3-yr updates consistent with requirements of the Green Communities Act *[Cape CANs]*

1.3. Strategy: Promote efficient land use policies and development patterns that protect the nature and character of the region

ACTION	STEPS
1.3.1. Encourage a mix of land uses where possible	■ Encourage zoning that allows commercial and residential uses in the same area ■ Encourage zoning that promotes compact multifamily development in walkable areas ■ Educate the community about new zoning
1.3.2. Promote infill and adaptive reuse	■ Develop new zoning, transfer of development rights bylaws for new construction, redevelopment and the existing built environment ■ Provide density bonuses or increased coverage for developments that are redeveloping or infilling
1.3.3. Focus growth in Activity Centers	■ Utilize zoning tools, such as form-based code, to promote infill and development in Community Activity Centers, where infrastructure already exists, but outside of Special Flood Hazard Areas ■ Encourage trails around development

Housing and Development

1. GOAL: REDUCE GHG EMISSIONS FROM THE BUILT ENVIRONMENT	
	■ Adopt zoning that minimizes impervious surfaces, allows multi-story buildings, and allows for more natural area for carbon sequestration

2. GOAL: REDUCE GHG EMISSIONS FROM WASTE MANAGEMENT SYSTEMS	
2.1. Strategy: Increase diversion of waste from landfills in the short-term; eliminate sending waste to landfills in the long-term	
ACTION	**STEPS**
2.1.1. Promote building materials reuse	■ Promote the reuse of building materials and organizations whose function is collection and reuse of these materials
2.1.2. Promote preservation of historic structures	*None yet identified*
2.1.3. Promote composting	*None yet identified*
2.1.4. Reduce plastic consumption	*None yet identified*
2.1.5. Enhance recycling programs	■ Educate and/or enforce recycling bylaws ■ Create partnerships between non-profits and municipalities to advance recycling (e.g., Take Care Cape Cod) ■ Pay as you throw programs
2.1.6. Explore regional waste management and collection agreements	*None yet identified*
2.2. Strategy: Reduce landfill emissions	
ACTION	**STEPS**
2.2.1. Capture methane	■ Reduce the regulatory barriers to capturing and converting methane to energy

2. GOAL: REDUCE GHG EMISSIONS FROM WASTE MANAGEMENT SYSTEMS

2.3. Strategy: Improve efficiency of wastewater treatment systems

ACTION	STEPS
2.3.1. Develop, approve, and fund wastewater treatment plans; collaborate with neighboring communities when appropriate	■ Continue to work on priority watershed planning as identified in the Cape Cod Section 208 Area Wide Water Quality Management Plan.
2.3.2. Improve operational efficiencies of wastewater treatment facilities	■ Utilize U.S. Dept. of Energy's Sustainable Wastewater Infrastructure of the Future (SWIFt) Initiative to improve WWTF energy use; toolkit available
2.3.3. Observe good maintenance practices of plants	*None yet identified*

3. GOAL: IMPROVE AND ADVANCE THE RESILIENCE OF THE BUILT ENVIRONMENT

3.1. Strategy: Address vulnerabilities in public infrastructure

ACTION	STEPS
3.1.1. Explore remedies to state regulatory barriers that delay or prevent solutions to resiliency problems	■ Communicate with state agency staff, legislative delegation about regulatory barriers *[CCC, state]*
3.1.2. Assess and correct vulnerabilities in utility infrastructure	■ Address threats to the electricity distribution network from wildfire, storms, and flooding *[utility]* ■ Locate utility lines underground *[utility]* ■ Address threats to wastewater collection facilities from flooding *[towns]*
3.1.3. Conduct vulnerability assessments of municipal facilities and carry out recommendations	■ Assess community shelters and critical facilities *[towns]* ■ Conduct Stormtide pathways analyses where not yet complete (Nantucket Sound shoreline and Buzzards Bay) *[Center for Coastal Studies, Cape Cod Cooperative Extension]* ■ Develop guidance on planning for long-range sea level rise scenarios ■ Support communities in updating their hazard mitigation plans *[CCC, state]* ■ Map or update mapping of municipal assets

3. GOAL: IMPROVE AND ADVANCE THE RESILIENCE OF THE BUILT ENVIRONMENT

3.2. Strategy: Identify a uniform approach to managing development in coastal resource areas region-wide

ACTION	STEPS
3.2.1. Adopt uniform regulations region-wide to limit new development and redevelopment in the floodplain and vulnerable areas	■ Identify best practices for conservation commissions to address properties vulnerable to erosion and/or flooding ■ Explore methods to reduce new development in flood hazard areas ■ Identify means to protect public access to the coast as vulnerable areas become increasingly accessible only to those with means ■ Draft and adopt floodplain bylaws to address development and redevelopment in vulnerable areas
3.2.2. Develop regional sediment management plans	■ Consider nature-based alternatives to address the sediment transport dynamics at vulnerable locations *[county, Center for Coastal Studies, MCZM, engineering consultants]*
3.2.3. Look at remedies to the challenges of private property ownership in coastal hazard areas	■ Investigate legal remedies to coastal private property ownership/management, *[county, state]* ■ Protect properties using green or nature-based solutions, or buy-out and "undevelop" with willing owners *[towns, state]*
3.2.4. Consider a coastal District of Critical Planning Concern	■ Explore local interest in and support for uniform coastal development regulations *[CCC, towns]*

3.3. Strategy: Retrofit buildings located within climate hazard areas

ACTION	STEPS
3.3.1. Elevate buildings	*None identified yet*
3.3.2. Floodproof or retrofit buildings to withstand flooding	*None identified yet*
3.3.3. Support on-site renewable energy generation	*None identified yet*

3. GOAL: IMPROVE AND ADVANCE THE RESILIENCE OF THE BUILT ENVIRONMENT

3.4. Strategy: Address vulnerabilities in the road network

ACTION	STEPS
3.4.1. Improve stormwater management through culvert retrofits and other stormwater best management practices	■ Update stormwater management design protocols (design for increased rainfall) *[DEP]* ■ Coordinate with MassDOT on State highway and roadway projects, resolve areas of overlapping authority *[CCC, towns, MassDOT]*
3.4.2. Assess low-lying and key roads and take appropriate action	■ Protect coastal land, elevate roads, utilize green solutions, or relocate ■ Consider regional access routes and impacts from storms (including utility lines over regional roadways such as the Mid-Cape Highway)

3.5. Strategy: Relocate vulnerable buildings and structures

ACTION	STEPS
3.5.1. Move buildings and infrastructure out of the floodplain	■ Identify buildings in the most vulnerable locations *[County, towns]* ■ Identify locations for relocation *[County, towns]* ■ Establish a buy-out program for vulnerable properties *[state, towns]* ■ Relocate and repurpose structures in vulnerable areas

3.6. Strategy: Ensure regional policies promote long-term infrastructure resiliency

ACTION	STEPS
3.6.1. Adopt policies that ensure that new infrastructure is designed to address climate change threats	*None yet identified*

Energy

1. GOAL: INCREASE THE PRODUCTION AND USE OF CLEAN ENERGY

1.1. Strategy: Generate and increase the use of safe, reliable, and clean energy

ACTION	STEPS
1.1.1. Facilitate renewable energy investment*	■ Encourage community partners to finance and install renewable systems on private facilities ■ Train workers in solar installations and servicing, *[tech schools, Community College]*
1.1.2. Use clean energy sources in municipal operations*	■ Support investment in electric municipal vehicles, *[towns]* ■ Incorporate the use of solar/renewable energy into bylaws for town projects ■ Support development of emergency generators that use renewable fuels and on-site storage in case of emergencies ■ Encourage municipalities to purchase more renewable energy
1.1.3. Encourage renewable energy installations that limit new clearing and loss of sequestered carbon*	■ Support new renewable energy projects, appropriately sited *[CCC, towns]* ■ Develop and adopt model solar bylaws and review existing bylaws for effectiveness *[county, towns]* ■ Create incentives to generate local/onsite renewable energy
1.1.4. Decarbonize industrial processes	■ Ensure use of scrubbers at industrial facilities
1.1.5. Identify safe affordable renewable energy sources	■ Continue to support bulk clean power purchase agreements ■ Establish energy financing districts; offer renewable energy system financing to small commercial properties ■ Increase the mix of renewable energy options in the power supply ■ Renewable biomethane ■ Investigate potential for combined heat and power generating facilities ■ Hydroelectric power; tidal power ■ Capture methane from municipal solid waste landfills ■ Incorporate geothermal heating and cooling pumps ■ Explore potential to mine plastic from the landfills to turn into diesel fuel ■ Investigate ability to repurpose and/or recycle renewable energy components at end-of-life
1.1.6. Explore potential offshore wind tech jobs, operations center on-Cape	■ Need for workers to service more easterly offshore wind lease areas, with access from Cape Cod

Energy

1. GOAL: INCREASE THE PRODUCTION AND USE OF CLEAN ENERGY

1.2. Strategy: Modernize and optimize the grid

ACTION	STEPS
1.2.1. Support expansion of electric vehicle (EV) charging network*	■ Develop options for fully charged EV auto rental service* ■ Develop / support programs to reward tourists for utilizing local EV rentals* ■ Develop criteria for the placement of charging stations and the level of charging and identify locations for new or expanded EV charging infrastructure, including buses ■ Electrify all appropriate municipal vehicles, including emergency response vehicles, heavy equipment
1.2.2. Support development of storage capability/battery technology*	■ Promote customer adoption of small-scale storage* ■ Establish and ensure that best practices are followed for installation ■ Support efforts to demonstrate warranty battery safety and educate planning/permitting agencies* ■ Work to ensure that the electric distribution company, Eversource, allows private installation and ownership of battery storage* ■ Encourage towns and other municipal organizations to develop storage to pair with their existing solar in order to levelize their electric usage* ■ Utilize EV rental depot for battery storage deployment at utility scaling* ■ Work with utilities on hosting capacity of feeders ■ Promote time-of-use rates, with equity considerations
1.2.3. Understand potential demand and capacity needs, plan for grid upgrades, and work toward grid decentralization	■ Identify potential offshore energy landfalls *[CCC, MCZM]* ■ Understand potential electricity demand with electrification of overall energy demand *[CLC, state]* ■ Understand capacity of existing transmission corridors, substations *[CLC, CCC, state]* ■ Understand net-metering and municipal generation capacity limits; explore remedies *[CLC, CCC, utility]* ■ Promote decentralized micro-grids, ■ Analyze the solar canopy installation potential of each town ■ Promote the use of electric equipment for homeowners (e.g. electric lawn mowers)
1.2.4. Work toward managing electricity demand	■ Educate public about peak demand times ■ Educate public about conservation, and utilizing technology to reduce demand (e.g., smart thermostats) ■ Promote peak load reductions *[CLC, state, utility]*

Energy

1. GOAL: INCREASE THE PRODUCTION AND USE OF CLEAN ENERGY

1.3. Strategy: Identify and utilize carbon offsets

ACTION	STEPS
1.3.1. Identify and calculate GHG emissions that are permanently reduced, avoided, or removed (sequestered) from the atmosphere	■ Calculate offsets from forests (Cape Cod woodland types), freshwater wetlands and salt marshes

1.4. Strategy: Achieve Green Communities designation in all Cape towns

ACTION	STEPS
1.4.1. Support efforts to pass bylaws and adopt stretch code	• Educate communities and decision makers; attend community meetings and hearings

Transportation

1. GOAL: REDUCE EMISSIONS FROM THE TRANSPORTATION SECTOR

1.1. Strategy: Reduce vehicle miles traveled

ACTION	STEPS
1.1.1. Improve broadband access across Cape Cod	*None identified yet [Open Cape]*
1.1.2. Support work from home policies	*None identified yet [private sector, towns, CCC]*
1.1.3. Support virtual civic and business meetings	▪ Incentivize businesses and towns to hold meetings virtually *[towns, CCC]* ▪ Support legislation to waive requirement for in-person majority present for committee and board meetings
1.1.4. Support idling policies	▪ Enforce state idling laws *[towns]* ▪ Provide outreach and awareness on the effects of idling *[towns, CCC]*
1.1.5. Explore pricing mechanisms that incentivize GHG reduction strategies and fund other strategies	*None identified yet [CCC]*

1.2. Strategy: Enhance public transportation, bicycling, walking, and shared transportation options*

ACTION	STEPS
1.2.1. Encourage carpooling and ridesharing*	*None identified yet*
1.2.2. Expansion and improvements of park and ride facilities	*None identified yet [state, CCC, towns]*
1.2.3. Improved coordination between modes	*None identified yet [CCRTA, other transit providers, CCC]*
1.2.4. Reduce parking standards/requirements	*None identified yet [towns]*
1.2.5. Improve and expand the public transit network	■ Promote existing services *[CCRTA, CCC, towns]* ■ Expanding routes *[CCRTA]* ■ Expanding service days/hours *[CCRTA]*

1. GOAL: REDUCE EMISSIONS FROM THE TRANSPORTATION SECTOR	
	■ Increase frequency on busy routes *[CCRTA]* ■ Improve predictability/reliability *[CCRTA]* ■ Provide free or greatly subsidized transit service to encourage increased use *[CCRTA, state, towns, CCC]* ■ Encourage use of electric vehicles for ride share ■ Encourage the use of cleaner fuels for fleet vehicle including school buses *[towns]*
1.2.6. Expand passenger rail service	■ Expanded passenger rail service *[CCRTA, CCC]* ■ Consider local/light rail service (intra-Cape) *[CCRTA, CCC]*
1.2.7. Expand and improve the bicyclist and pedestrian network as alternate transportation modes	■ Encourage adoption of Complete Streets policies *[towns]* ■ Retrofit existing roads to accommodate non-motorists *[state, towns]* ■ Educate public about sharing roads for multiple transportation modes *[CCC, towns, state]* ■ Support bicycle share and rental programs ■ Expand bicycle infrastructure (including bicycle rack, fix-its station, lighting, and safe connections) *[CCC, towns, state]* ■ Encourage responsible use of electric bicycles *[CCC, towns, state, CCNS]* ■ Support safe routes to schools efforts *[CCC, towns, state]*
1.2.8. Consider new water transportation options	*None identified yet*
1.3. Strategy: Accelerate the electrification of the transportation system*	
ACTION	**STEPS**
1.3.1. Support investments in EV infrastructure and programs that incentivize EV adoption, for Cape residents and visitors*	■ Identify opportunities for and support the development of additional public EV charging stations *[CVEC, CCC, towns, state]* ■ Update zoning to encourage EV spaces and charging stations in new/redevelopment *[towns]* ■ Develop programs to reward utilizing local EV rentals *[private sector, chambers of commerce]* ■ Support renewable energy production/battery storage/charging at transportation terminals and parking lots where people park for extended periods *[CCC, towns, state]* ■ Explore barriers to expanded battery storage ■ Promote electrification of municipal fleets *[CCC, towns]* ■ Support financing options for EV purchases/EV infrastructure ■ Support car shows promoting EVs and education and outreach to promote EV usage *[dealerships, CCC, towns, state]*

1. GOAL: REDUCE EMISSIONS FROM THE TRANSPORTATION SECTOR

	■ Work with private auto companies and dealerships to promote EVs *[dealerships, CCC, towns, state]* ■ Consider adaptability to future technologies (ex. hydrogen power)
1.3.2. Electrify public transit vehicles*	■ Conduct an electric bus feasibility study *[CCRTA, other agencies with buses, CCC]* ■ Advance electric bus pilot programs *[CCRTA, other agencies with buses]* ■ Where feasible, support the purchase of electric buses *[CCRTA, other agencies with buses]*
1.3.3. Electrify vehicle fleets (municipal vehicles, school buses, police vehicles, delivery vehicles, etc.)*	■ Conduct feasibility study of the conversion potential of vehicle fleets *[CCC, towns, state]* ■ Prioritize fleets for conversion *[CCC, towns, state]* ■ Support towns in the conversion of municipal vehicle fleets *[CCC, towns, state]*
1.3.4. Electrify ocean-based transport (personal watercraft, commercial fleets, improve dockside infrastructure, etc.)*	■ Dockside EV infrastructure ■ Support incentives for electric watercraft

1.4. Strategy: Make efficiency improvements to the transportation system

ACTION	STEPS
1.4.1. Address inefficient traffic signals, upgrades	■ Retime signal and, where appropriate, install adaptive signals *[towns, state]* ■ Consider replacing with roundabout *[towns, state]* ■ LED upgrades *[towns, state]*
1.4.2. Address bottleneck locations (congested roadways and intersections)	■ Identify and implement solutions for bottleneck locations identified in the Cape Cod Congestion Management Plan *[CCC, towns, state]*
1.4.3. Support idling policies	■ Enforce state idling laws, Towns ■ Provide outreach and awareness on the effects of idling, Towns, CCC
1.4.4. Improve the efficiency of freight movement (including waste) by all modes (on-road, rail, and waterborne)	■ Incentivize freight movement by the mode with the lowest emissions generation ■ Consider incentives for deliveries made by EVs

1.5. Strategy: Encourage more efficient land use patterns

ACTION	STEPS
See Housing & Development Strategy 1.3	
1.5.1. Promote Transit Oriented Development (TOD)	■ Encourage smart growth and smart development ■ Expand rail service ■ Prioritize bicycle and pedestrian improvements that provide connections to TOD

2. GOAL: IMPROVE THE RESILIENCE OF THE TRANSPORTATION SYSTEM TO THE IMPACTS OF CLIMATE CHANGE

2.1. Strategy: Adapt critical transportation infrastructure for climate change impacts

ACTION	STEPS
2.1.1. Low-lying roads – elevate, relocate, or abandon	*None identified yet*
2.1.2. Identify and address deficient culverts and bridges	*None identified yet*
2.1.3. Evacuation routes/potentially disconnected area	*None identified yet*

2.2. Strategy: Design transportation infrastructure for future conditions

ACTION	STEPS
2.2.1. Redesign for future precipitation/storm patterns	*None identified yet*
2.2.2. Planning for the impact of increased temperature/heat events	*None identified yet*

1. GOAL: SUPPORT AND PROMOTE PROTECTION, CONSERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

1.1. Strategy: Reduce emissions by increasing protected open space, parks, and tree canopy

ACTION	STEPS
1.1.1. Maintain and increase parks and open spaces	■ Work with towns and land trusts to increase protected open space with public access wherever appropriate ■ Develop new sources of funding for open space and park land acquisitions and maintenance *[state]* ■ Identify new ways to protect open space (ex. regulations or TDR incentives) *[CCC, state]* ■ Identify/map remaining areas available for protection and prioritize what is to be protected; Inventory/map areas that have been protected, what is available for protection, where open space is missing *[CCC, APCC, land trusts]* ■ Quantify the tree canopy in residential areas and identify strategies to preserve that existing tree canopy ■ Provide education on the importance/benefits of the tree canopy ■ Create regulations for limiting new clearing and grading *[CCC, towns]* ■ Educate the public about the benefits of open space
1.1.2. Urban reforestation - Plant trees or increase urban tree canopy	■ Identify shade-starved areas and support tree planting programs ■ Plant trees strategically to provide building shading or cooling benefits ■ Create parks and green spaces on abandoned or underutilized spaces ■ Work with towns and land trusts to increase parks in activity centers ■ Work with towns and non-profits to increase tree canopy in activity centers ■ Incorporate trees into design of LID or stormwater runoff projects
1.1.3. Reforestation of disturbed areas	■ Identify disturbed areas suitable for reforestation and support tree-planting programs

1. GOAL: SUPPORT AND PROMOTE PROTECTION, CONSERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

1.2. Strategy: Avoid new conversion of land uses*

ACTION	STEPS
1.2.1. Avoid conversion of natural areas to prevent development sprawl	■ Investigate adoption of TDR bylaws, other changes to zoning to enable this vision *[CCC, towns]* ■ Promote compact mixed-use development downtown and in activity centers (where infrastructure can support it) *[CCC, towns]* ■ Create incentives to build and infill in activity centers and away from natural areas *[CCC, towns]* ■ Invest in infill development, support local and regional policies that make redevelopment more affordable than new development ■ Encourage solar development on rooftops, parking lots, and already disturbed lands *[CCC, towns]* ■ Demonstrate benefits of maintaining tree cover for nitrogen uptake and managing coastal water quality (N loading calculations) *[researchers]* ■ Identify the types of forests cleared, and for what purpose; develop policies to disincentivize tree clearing *[researchers, CCC]* ■ Create tree ordinances or bylaws that restrict the removal of specimen trees or trees over a certain size (suggested 3-inch DBH) *[CCC, towns]* ■ Use subdivision regulations to limit maximum building area *[towns]*

1.3. Strategy: Maintain ecosystem diversity, including conservation of the natural communities within the Pine Barrens ecoregion

ACTION	STEPS
1.3.1. Limit ecosystem stressors by reducing threats such as habitat conversion and fragmentation (i.e. development), invasive species, and airborne and waterborne pollutants	■ Prevent the introduction and establishment of invasive species and control existing damaging invasive species ■ Increase monitoring for invasive species (especially at pathways for infestation - trailheads, roads) ■ Control invasive species through physical or chemical treatments ■ Clean equipment prior to activities to avoid introduction of species to a new environment ■ Education on invasive species identification and notification protocols
1.3.2. Protect ecosystems of sufficient size	■ Expand the boundaries of existing open space *[towns, conservation trusts]* ■ Identify opportunities to acquire/protect lands adjacent to existing open space *[CCC, towns, conservation trusts]*

1. GOAL: SUPPORT AND PROMOTE PROTECTION, CONSERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS	
1.3.3 Protect ecosystems across a range of environmental settings	■ Inventory natural communities to identify those important for protection and restoration *[APCC, NHESP, researchers]*
1.3.4. Protect multiple example ecosystems to capture redundancy	■ Inventory existing and potential protected open space to identify natural communities protected and those requiring additional examples protected *[CCC, researchers]*
1.3.5. Maintain large-scale ecosystem processes and prevent habitat isolation	*None identified yet*
1.3.6. Embrace adaptive management to allow for the changing characteristics of natural communities	■ Preserve options for habitat adaptation and migration in a changing climate *[researchers]* ■ Understand the processes that contribute to a habitat's natural adaptation ■ Expect and plan for species losses and gains (i.e. changes in species assemblages) ■ Favor or restore native species that are expected to be adapted to future conditions; incorporate anticipated vegetation changes into restoration practices ■ Establish or encourage new mixes of native species that may be a suitable combination under future conditions ■ Manage for species with wide moisture and temperature tolerances ■ Require prompt revegetation of sites following severe disturbance *[CCC, towns]* ■ Allow for areas of natural regeneration to test for future-adapted species ■ Promote improved, better integrated, and increasingly coordinated monitoring systems to detect, track, and attribute species and habitat shifts to climate change over spatiotemporal scale
1.3.7. Use nature-based adaptation solutions	■ Consider soft engineering approaches as alternatives to hard engineering solutions during project planning, design, site plan review, and permitting *[engineers, towns]*
1.3.8. Develop a unified vision or regional plan for collaborative conservation of natural resources	■ Use State Wildlife Action Plan, BioMap2, Pine Barrens Green Infrastructure Map, and Mass Wildlife Climate Action Tool as resources for protection and restoration
1.3.9. Remove/reduce environmental review/permitting barriers to restoration projects	■ Review/revise state and local regulations *[state]* ■ Coordinate funding ■ Increase technical support ■ Expand public outreach and education

1. GOAL: SUPPORT AND PROMOTE PROTECTION, CONSERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

1.4. Strategy: Support and promote protection, preservation, and restoration of wetlands and riparian areas

ACTION	STEPS
1.4.1. Protect, restore, and enhance riparian areas (river and associated wetland buffers)	■ Restore native communities and ecosystem components (e.g. natural groundcover, litter layer, coarse woody debris) in riparian areas ■ Plant/restore a diversity of tree and plant species ■ Educate property owners on importance of natural buffers, native species ■ Reclaim developed sites and restore or reforest riparian areas
1.4.2. Protect, restore, and enhance freshwater wetlands, including ponds and lakes	■ Update Ponds and Lakes Atlas *[CCC]* ■ Widen existing buffers to wetlands *[towns]* ■ Protect/restore vegetation around ponds ■ Avoid chemical/fertilizer use around waterbodies ■ Avoid/reduce sources of land-based pollutant and nutrient loads
1.4.3. Protect, restore, and enhance salt marshes	■ Prioritize protection of salt marshes over restoration ■ Identify salt marshes that have greatest landward migration potential, and those that do not due to human infrastructure. Facilitate salt marsh migration ■ Expand Pleasant Bay Alliance study of which salt marshes across the Cape are most likely to benefit from a resiliency program (using LIDAR) *[Pleasant Bay Alliance, CCC, Cooperative Extension]* ■ Promote better surface water management to reduce runoff and degradation to help marshes and coastal habitats ■ Identify locations where culverts can be improved to allow for better tidal flushing ■ Develop coastal zoning regulations that provide room for marshes to retreat *[CCC, towns]* ■ Promote living shorelines where erosion control is needed to allow for salt marsh migration and disincentivize coastal armoring ■ Provide education about living shorelines and alternatives to coastal armoring ■ Mitigation banking to provide funding for green infrastructure (e.g. Chatham) ■ Marsh resilience toolkits for the Northeast ■ Identify or score salt marshes based on overall resilience (not just ability to migrate) ■ Educate the public about the importance of salt marshes for fisheries ■ Promote shoreline management strategies to sustain natural coastal resource processes

1. GOAL: SUPPORT AND PROMOTE PROTECTION, CONSERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

1.4.4. Support ongoing cranberry cultivation through industry transition, including retirement and restoration	■ Identify bogs with wetland restoration potential and with high upland habitat connectivity value ■ Reduce or eliminate agricultural drainage improvements near wetlands

1.5. Strategy: Support and promote protection, preservation, and restoration of habitat connectivity

ACTION	STEPS
1.5.1. Construct, retrofit, or replace crossing structures for wildlife passage	■ Identify key sites for connectivity improvements *[NR departments]* ■ Plan, design and build for future conditions
1.5.2. Reduce landscape fragmentation and maintain/create habitat corridors	■ Identify opportunities to connect existing open space parcels and acquire/protect these connections ■ Promote communication between towns and land trusts to work towards common goals ■ Provide tools to identify where lands should be preserved to reduce fragmentation (ex. BioMap2) ■ Identify funding sources for land preservation to reduce habitat fragmentation

1.6. Strategy: Protect water quality and quantity

ACTION	STEPS
1.6.1. Restore natural hydrology	■ Remove remnant hydrological modifications ■ Identify funding opportunities for stream and river restorations ■ Streamline permitting to support restoration projects
1.6.2. Incorporate natural or low impact development into designs	■ Direct runoff into green infrastructure or natural features that can appropriately manage runoff ■ Monitor drainage systems to ensure they are working as designed *[towns, others]* ■ Use low impact designs such as permeable paving ■ Manage and treat stormwater on-site using natural vegetation
1.6.3. Protect drinking water supply	■ Protect/acquire lands in Zone IIs ■ Limit development activities in Zone IIs *[CCC, towns]*
1.6.4. Plan for and design "shovel-ready" projects that achieve restoration and water quality goals	■ Align planning, design, permitting, and construction of water quality restoration projects

2. GOAL: INCREASE CARBON SEQUESTRATION IN THE NATURAL ENVIRONMENT

2.1. Strategy: Increase carbon storage and sequestration in soils

ACTION	STEPS
2.1.1. Improve soil management techniques in both agriculture and landscaping	■ Minimize soil disturbance by avoiding or reducing grading for development or tillage for planting, weed control, or other purposes ■ Wherever possible, avoid/reduce fertilizer and pesticide use ■ When needed, use fertilizers, pesticides and other soil amendments more efficiently ■ Use compost ■ Use soil cover (mulch, cover crop) to conserve soil moisture and reduce soil temperatures ■ Reduce topsoil erosion ■ Education and outreach to homeowners and landscapers to reduce land management practices/landscaping, or use alternative, natural techniques and alternatives to fertilizers ■ Promote the use of native species to restore natural soil processes and biology

2.2. Strategy: Enhance carbon storage/sequestration in forests

ACTION	STEPS
2.2.1. Protect and restore trees and forests	■ Maintain vegetation or revegetate disturbed areas with native species ■ Retain large diameter trees, protect specimen trees ■ Identify areas with high carbon stocks and prioritize protection of these ■ Support use of carbon credits to increase woodland protection
2.2.2. Keep natural lands intact*	■ Set high fees for conversion of intact landscapes ■ Protect forested land through deed/conservation restrictions ■ Prioritize large, unfragmented forest patches for avoidance of disturbance or protection ■ Identify and reforest lands that have been deforested ■ Consider undevelopment where appropriate
2.2.3. Support forest management to protect healthy forests and reduce wildfire threat and severity	■ Forest thinning ■ Establish and maintain fuel breaks ■ Prescribed fires

2. GOAL: INCREASE CARBON SEQUESTRATION IN THE NATURAL ENVIRONMENT

2.3. Strategy: Increase carbon storage in blue carbon ecosystems

ACTION	STEPS
2.3.1. Protect/restore wetlands (in particular salt marshes) and preserve wetland functions	■ Identify means for calculating the carbon sequestration value of the Cape's salt marshes and other wetlands *[CCC]* ■ Provide public education on the importance of salt marshes and how those ecosystems work, including ways property owners can help protect and restore salt marshes on their property ■ Inventory salt marsh locations and identify their specific threats (ex. sea level rise, storm impacts) ■ Support Conservation Commissions in incorporating climate change into wetlands bylaws and regulations
2.3.2. Make room for salt marsh migration (landward)	■ Provide public education on the need for space to allow for salt marsh migration ■ Conduct cost/benefit analysis of thin layer deposition to support salt marsh resilience
2.3.3. Consider seaweed aquaculture as a decarbonization method	*None identified yet*

3. GOAL: PROTECT THE ABILITY OF WORKING LANDS AND WATERS TO PROVIDE ESSENTIAL SOCIAL AND ECONOMIC SERVICES WHILE PROTECTING THE ENVIRONMENT

3.1. Strategy: Support sustainable and resilient working lands

ACTION	STEPS
3.1.1. Increase agriculture activities	■ Incentivize local food production ■ Address Community Supported Agriculture (CSAs) disappearing - labor challenges ■ Update farmland current use taxation program (Ch61A) to further support agricultural activities *[state]* ■ Support local food production through infrastructure and policy (e.g. right to farm bylaws) ■ Identify areas/parcels with prime agriculture soil and encourage/zone it for agriculture *[CCC, towns]*
3.1.2. Protect water quality and quantity from agricultural activities	■ Reassess nutrient applications and ensure that use of organic materials, fertilizers, amendments, and all sources of nutrients is matched to changing climate conditions *[DAR, NRCS]* ■ Reassess pesticide risk and ensure that all pesticide applications consider changing climate conditions *[DAR, NRCS]* ■ Avoid/reduce irrigation or increase irrigation efficiencies

3. GOAL: PROTECT THE ABILITY OF WORKING LANDS AND WATERS TO PROVIDE ESSENTIAL SOCIAL AND ECONOMIC SERVICES WHILE PROTECTING THE ENVIRONMENT	
3.1.3. Reduce crop stressors	■ Enhance use of integrated pest management *[CCC, towns]* ■ Use of varieties and species resistant to heat, drought, flash floods, pests, and diseases *[DAR, NRCS]* ■ Altering crop rotations ■ Monitor for and eradicate noxious weeds
3.1.4. Reduce risks from warmer and drier conditions by adjusting agricultural practices	■ Adjust timing of planting and other operations to account for longer growing season and altered conditions *[DAR, NRCS]*
3.1.5. Manage farms and fields as part of a larger ecosystem, promoting biological diversity through the landscape	■ Maintain or restore natural ecosystems ■ Promote biological diversity across the landscape ■ Enhance landscape connectivity
3.1.6. Alter agriculture management to accommodate expected future conditions	■ Diversification - add additional farming activities or new commodities ■ Switch to commodities expected to be better suited to future conditions (e.g. new cultivars/species that match a changing climate, more water-efficient crops) ■ Upgrade to more energy efficient equipment and/or integrate on-farm renewable energy generation
3.2. Strategy: Support the fishing industry through transitions created by climate change	
ACTION	**STEPS**
3.2.1. Increase the public's demand for "emerging" seafood varieties (e.g. dogfish, shellfish varieties)	■ Assist with marketing and educating the public on alternative seafood products (e.g. dogfish, shellfish varieties)
3.2.2. Expand research, data access, and forecasting of fisheries trends	■ Support research into local ocean acidification trends *[federal, state, researchers]* ■ Keep tabs on ocean acidification and impacts on shellfish *[researchers]* ■ Increase data access to support long-range planning and capital projects
3.2.3. Restore native shellfishing areas	■ Identify suitable shellfish restoration sites; coordinate with water quality management needs
3.2.4. Protect harbor and fishing access infrastructure	■ Adopt zoning to protect maritime access and industries

3. GOAL: PROTECT THE ABILITY OF WORKING LANDS AND WATERS TO PROVIDE ESSENTIAL SOCIAL AND ECONOMIC SERVICES WHILE PROTECTING THE ENVIRONMENT

3.3. Strategy: Promote local and regional recognition of the importance of natural resources and working lands to mitigate the impacts of climate change

ACTION	STEPS
3.3.1. Adopt municipal statements or policies about the contribution of natural resources and working lands to mitigate the effects and causes of climate change	*None identified yet*

Community

1. GOAL: IMPROVE BROAD PUBLIC KNOWLEDGE AND UNDERSTANDING OF CLIMATE CHANGE IMPACTS AND PROGRAMS

1.1. Strategy: Increase education and communications about climate change mitigation and adaptation options

ACTION	STEPS
1.1.1. Identify the legal framework that towns and other actors must work within (consider how to reach vulnerable populations)	■ Identify how information flows through neighborhoods, how to reach vulnerable populations
1.1.2. Provide guidance for communities to help prioritize actions to reduce greenhouse gas emissions	*None identified yet*
1.1.3. Develop curriculum and hands-on programming for students of all ages to become informed about climate change and the actions available to address it*	■ Engage students and faculty (high school and college) in the development of curriculum, including department of education to change curriculum ■ Widely distribute the Climate Action Plan in print and other media; including town halls, libraries, bookstores, Chambers of Commerce, etc.
1.1.4. Identify individual actions or lifestyle choices that individuals can take; provide that information as guidance	■ Utilize the Climate Action Networks to distribute information, *[CANs]* ■ Vendor fairs, lectures, peer influence (climate influencers) ■ Provide information about the impact that eating a plant-based diet can have on personal greenhouse gas emissions ■ Identify and distribute a GHG calculator to assess emissions associated with personal travel, consumption choices, etc.

1.2. Strategy: Expand efforts to engage diverse communities

ACTION	STEPS
1.2.1. Initiate direct outreach to wider and more diverse communities through attendance at events/meetings/forums	■ Work with County partners to engage broader community *[Human Rights Commission, Health and Human Services, Food Banks]* ■ Develop educational materials about cost savings through energy conservation and efficiency measures, and means to achieve these improvements *[Climate Collaborative]*

2. GOAL: ACCELERATE ADOPTION OF EMISSIONS REDUCTION STRATEGIES AND ACTIONS ACROSS REGIONAL AND LOCAL GOVERNMENTS

2.1. Strategy: Where suitable, identify and adopt regional goals and policies that help advance mitigation strategies and actions

ACTION	STEPS
2.1.1. Adopt amendments to the Regional Policy Plan (RPP) and supporting regulations to advance the Commonwealth's greenhouse gas reduction goals	■ Adopt a goal in the Regional Policy Plan (RPP) to advance the Commonwealth's greenhouse gas reduction goals *[CCC]* ■ Adopt a new performance measure in the RPP that tracks progress on greenhouse gas emissions *[CCC]* ■ Adopt objectives in the RPP to promote low carbon transportation alternatives, low carbon technologies for building heating and cooling, to promote carbon sequestration through land use practices, and to promote low carbon energy generation *[CCC]* ■ Amend existing technical guidance to advance net or near zero construction methods and elements, including solar considerations* *[CCC]* ■ Develop technical guidance to support the new RPP goal and objectives, including technical guidance on Net or Near- Zero construction; alternate fuel sources and HVAC systems; Electric vehicles including transit; bike and pedestrian networks; means for preventing the reduction of, and promoting new carbon sequestration *[CCC]*

2.2. Strategy: Increase capacity within municipal staffs; provide outside technical assistance

ACTION	STEPS
2.2.1. Increase technical assistance capacity within regional organizations to support local governments (develop model bylaws, regulations, and policies)	■ Develop model bylaws, regulations, and policies to assist local governments
2.2.2. Improve communication between municipalities	*None identified yet*
2.2.3. Assess social infrastructure needs	■ Support and train response personnel in needs of the elderly
2.2.4. Create and fund new staff positions within municipal government to advance climate change actions	*None identified yet*

2.2.5. Provide grant-writing assistance	*None identified yet*

3. GOAL: INCREASE DATA COLLECTION AND ACCESS

3.1. Strategy: Identify more granular, town-specific data of GHG emissions

ACTION	STEPS
3.1.1. Request legislative change to mandate provision of fuel use data at municipal level	*None identified yet*

4. GOAL: ENSURE THE HEALTH, SAFETY, AND EQUITABILITY OF MITIGATION AND ADAPTATION SOLUTIONS

4.1. Strategy: Assess opportunities for green economy to create jobs with livable wages

ACTION	STEPS
None identified yet	*None identified yet*

4.2. Strategy: Expand access to energy conserving and efficient building systems and technologies

ACTION	STEPS
4.2.1. Expand access to energy efficient and affordable housing	■ Identify funding for home energy retrofits for low and moderate income households
4.2.2. Expand access to renewable sources of energy supply for low and moderate income households	■ Identify funding to subsidize access to green energy through renewable power purchases ■ Identify opportunities to build community solar programs

5. GOAL: ESTABLISH STRATEGIC PARTNERSHIPS TO ADVANCE SHARED GOALS

5.1. Strategy: Foster collaborations between levels of government

ACTION	STEPS
5.1.1. Look at opportunities to combine projects among different government agencies, such as road retrofits with new utility installations (e.g., wastewater when addressing sea level rise or flooding)	*None identified yet*

5.1.2. Easily and regularly share information and best practices	*None identified yet*

5.2. Strategy: Foster collaborations between the public and private sectors*

ACTION	STEPS
5.2.1. Identify opportunities for strategic partnerships to advance common goals or objectives	*None identified yet*