4/24/25 Climate Action Committee Minutes

Members and others attending: Lili Flanders, Chair of CAC; Mark Gebhardt, Vice Chair of CAC; Alex Limpaecher, member of CAC.

Assign Noteaker
Alex Limpaecher

Documents included in the meeting Packet

- Truro Climate Action Committee – Minutes Wednesday, April 9th
- Town of Truro, MA Boards, Committees, and Commissions Handbook

Approving Minutes

4/9/25 - Lili, Mark, Alex - approved
4/15/25 - Lili, Mark, Alex - approved

Future work for the CAC

- Lili: Summit and/or approve Climate Action Plan
- Alex: Communication on moving forward goals through community and networking
- Lili reported that Chris, while not present, suggested:
    - The Climate Action Committee will write the climate action plan after finishing the climate action plan. The energy committee and the bike committee contribute
    - Public visioning sessions
    - Working with other towns.

Updates on the Pre-town meeting, the Earth Day event, and the SB interview of applicants

Pre Town Meeting Report

- Chris presented, no questions on Solar

Earth Day

Earth Day went well.
Kristin Andres, from the Association to preserve Cape Cod; Laura Ludwig, from the Center for Coastal Studies; and students from Truro Central School hosted information tables.
Attendees worked on a bottle cap mosaic and designed and made pins to take home.

Select Board Interviews

Select board approved three new members to the climate action committee:

- Chip Connell, full member - 3 year term
- Paul Holt, full member - 2 year term
- Benoit Allbehaut, alternate member - 1 year term

Discuss the focus of outreach/education efforts before the annual town meeting.

- Pre-town meeting
- Newsletter (still to come)
- Library Night
- Lili will send an email to the climate email list
- Phone calls? Maybe for future initiatives
- Print out
    - We need 650
    - Alex will adjust the flyer to match the rules

Walsh "Liason"

Mark Gebhardt was named the unofficial Walsh liaison. To attend Walsch meetings and report back to the climate action committee.

The vote to approve was unanimous - Lili, Mark, and Alex.

Review sections of the Town of Truro Boards, Committees, and Commissions Handbook

- No deliberation over email (when a quorum is participating)
    - This only applies to members and not the Climate Action Coordinator or volunteers
    - You can discuss scheduling and procedure
- The minutes should list the document in the packet
- We only need to say Town Hall on agenda, not which room
- What we've been doing is acceptable in terms of Zoom usage

Library Sustainability Discussion

The library asked if we had any ideas for their "library of things" from a sustainability perspective. Having bicycles that could be borrowed was one suggestion.

Action Items to Meeting Notes

It was proposed to include action items discussed in the meeting agenda.

Lili

- ☐ Ask Chris about the lineup for the town meeting
- ☐ Budget
- ☐ Inform the Walsch Committee that we named an unofficial liaison to attend, to keep the group informed.
- ☐ Flyer printing
- ☐ Send email to the CAC list, include a letter about Solar and HRP

Alex

- ☐ Update Flyer
- ☐ Email flyer to moderator by Wednesday

Respectfully submitted by,

Alex Limpaecher

Climate Action Plan

Short version - Chris draft - May 2025

Strategies

Transportation - 45% emissions

1. Promote Alternatives to Personal Vehicle Travel
    - Active Travel
        - Better bike, ped infrastructure
        - E-bike incentives
    - Public Transit
        - Current service better utilitzed, public education, encouragement “take the bus day”
        - Bus shelters
        - Improved service - work with CCRTA, Peter Pan
    - Other
        - Carpooling
        - Carsharing
        - Microtransit
        - Remote work
        - Reduce need for travel, e.g. more services in Truro
        - Ferries, planes
2. Electric Vehicles
    - Charging Infrastructure
        - More public charging
        - More charging at Truro businesses
        - More residential charging, e.g. through building code / electrician incentives
        - Smart charging
        - Truro is EV vacation eco-tourism hotspot
    - Electric Vehicles
        - Public education about rebates, incentives, benefits
        - Electrify municipal fleet, inc. school buses, through capital planning, and grant applications
        - Electrify commercial vehicles, e.g. delivery trucks
        - More incentives, e.g. discounted beach stickers for EV? (equity concern)

Buildings - 31% emissions

1. Envelope Efficiency Improvements
    - Work with Mass Save / Cape Light Compact to increase retrofits
    -
2. Heat Pumps
    - Convert all fossil fuel and electric resistance heating to air or ground source heat pumps
3. Specialized Building Code

    - Ensure good education and enforcement
    - Keep up to date on updates and improvements

Energy

- Solar
    - Develop municipal solar (landfill, elsewhere)
    - Encourage residential solar
    - Encourage commercial solar
    - Solarize program (co-op approach buying solar at scale)
- Wind
    - Look into pros and cons of onshore wind on municipal sites
    - Feasibility / Truro impact of offshore wind

Other

- Library of Things
- Local food production
- Community garden / community orchard on Walsh property
- Improve waste management and recycling - community compost, reduction of waste in the first place - do waste audit, what are people throwing away?
- ?

Draft process

- CAC writes initial draft (already mostly done)
- Energy Committee and Bikes and Walkway Committee contribute to their relevant draft sections
- Compare with other Climate Action Plans, e.g. Massachusetts, Cape Cod Commission, Wampanoag, other Cape towns
- Work with town staff to make sure of a Whole Government Approach - possibly Climate Summit in autumn
- Hold public visioning session(s) to get public input and buy-in
- Work with other Outer Cape towns to see if there are places it makes sense to work together and align our goals
- Identify next few projects to come out of the Climate Action Plan that this committee can sink its teeth into

Truro Climate Action Plan [Draft]

Last Edited: 1/20/25

1. Introduction

Purpose and Scope

The **Truro Climate Action Plan** outlines strategies to address the impacts of climate change, enhance resilience, and ensure a sustainable future. Focused on Truro's unique coastal challenges, the plan targets reducing emissions, protecting natural resources, and fostering community engagement.

Vision Statement

Truro is committed to being a sustainable and resilient community. By working together, the community aims to safeguard its environment, economy, and way of life for future generations.

Background and Knowledge from Context

Truro faces urgent climate challenges, including rising sea levels, coastal erosion, and extreme weather. These threaten the town's ecosystems, infrastructure, and tourism-based economy. Proactive action is essential to reduce risks and build a resilient, sustainable future.

2. Climate Change Impacts on Truro, MA

Truro, MA, situated along the vulnerable Outer Cape Cod coastline, faces acute risks from climate change. The town's unique position, with its extensive sandy beaches, fragile dunes, and reliance on its natural environment for economic and social well-being, makes it particularly susceptible to the effects of rising sea levels, coastal erosion, and shifting climate patterns. These impacts threaten Truro's ecosystems, infrastructure, and way of life.

2.1 Coastal Risks in Truro

Truro stands on the frontlines of climate change, with its extensive coastline and critical infrastructure facing escalating risks from rising sea levels, intensified storms, and more frequent flooding events. Cape Cod is projected to experience sea level rise of **1.3 to 3.1 feet** by the middle of the century and **4.0 to 10.3 feet** by the end of the century, amplifying these

threats.[1] These changes jeopardize the town's natural beauty, its built environment, and the livelihoods of its residents.

Coastal Erosion and Risks

Truro's sandy shores and dunes, which serve as both natural barriers and key attractions for its tourism-driven economy, are particularly vulnerable to erosion. Rising sea levels are expected to accelerate this process, narrowing beaches and causing landward retreat of the shoreline. The potential loss of these iconic beaches could devastate the local economy, which heavily relies on tourism revenue. Property values and tax revenues may also suffer as erosion encroaches on homes and businesses near the coast.

Rising Sea Levels and Flooding

Draft Note: While this information is based on the Cape Cod Commission's website, please verify with internal staff to confirm the current accuracy and impact assessment. Particularly the statement on, Pump Station #6 and East Harbor Outfall pipe.

Tidal flooding and storm surges are becoming more frequent and severe, threatening both low-lying areas and critical infrastructure. Roads, homes, and essential facilities near the shoreline are increasingly at risk of inundation. Key examples include **Pump Station #6,** which faces storm surge threats at three feet of sea level rise and would be completely submerged at five feet, potentially leading to wastewater system failures and environmental contamination. Floodwaters can also carry debris and hazardous materials, causing physical damage to buildings and infrastructure while spreading contaminants that degrade soil and water quality, posing risks to both human health and ecosystems. **The East Harbor outfall pipe**, crucial for stormwater management, is similarly vulnerable at just one foot of sea level rise, risking disruptions that could exacerbate flooding in adjacent areas and further amplify environmental harm.[2]

Transportation Vulnerabilities

Draft Note: This information is drawn from the Cape Cod Commission's website. As there may have been changes to culvert infrastructure since publication, please verify with internal staff to confirm both the current conditions and the accuracy of this assessment. While specific vulnerability details may vary, the overall flooding assessment likely remains valid.

Culverts throughout Truro, essential for managing stormwater and tidal flows, face significant threats from rising water levels. Structures like the **Highhead Road Culvert**, **Castle Hill Road Culvert**, and the **Mill Pond and Eagle Creek Culverts**[3] are at risk as sea levels rise. These

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[1]https://www.capecodcommission.org/resource-library/file/?url=/dept/commission/team/climate/Shared%20Documents/Climate%20Action%20Plan/Cape-Cod-Climate-Action-Plan.pdf

[2] https://www.capecodcommission.org/our-work/sea-level-rise/

[3] https://www.capecodcommission.org/our-work/sea-level-rise/

culverts play a critical role in maintaining the stability of roadways, and their failure could result in severe flooding and road washouts, isolating portions of the community.

As part of the Outer Cape, Truro is particularly vulnerable to broader flooding impacts across the region. With Route 6 serving as the primary road providing access to and from the town, disruptions caused by culvert flooding could further isolate Truro. Route 6 culverts near **Long Nook Road** and **South Pamet Road** are vulnerable to storm surge after just one foot of sea level rise, highlighting this vulnerability. The situation is particularly concerning since the only alternative route, Old County Road between Truro and Wellfleet, already experiences flooding, leaving the town with severely limited access options during severe weather events.

Storm surges can already impact the **Orleans-Eastham Rotary on Route 6** with just two feet of sea level rise, disrupting this vital transportation link. Even more concerning, at six feet of sea level rise, the rotary would be permanently submerged, effectively turning the Outer Cape into an island.[45] This critical transportation link would be cut off, isolating the Outer Cape from the rest of Cape Cod. Limited connectivity threatens emergency response capabilities and restricts access to essential goods, services, and economic activities, compounding the risks posed by climate change. Such an event could occur even sooner during severe storm events, emphasizing the urgent need for regional coordination to address these vulnerabilities.

Economic Implications

Truro's economy relies heavily on its natural resources, particularly its beaches, harbor, and tourist attractions. As coastal erosion and flooding accelerate, the town faces mounting economic challenges. The loss of property tax revenue from eroded or inundated areas, combined with reduced tourism income, could significantly strain local budgets. The need for costly infrastructure repairs and retrofits will only compound these financial pressures.

Beyond beaches being eroded and flooding, The **Ballston Beach, Fisher Beach**, and **Ryder Beach** parking lots face flooding risks at one to three feet of sea level rise. These impacts will reduce accessibility and hurt the local economy. Several beach parking lots in the area would be fully submerged with five feet of sea level rise.

Pamet Harbor, a hub for local boating and recreation, is also threatened. With just three feet of sea level rise, its jetties, boat ramp, and parking lot are projected to be inundated. These disruptions could severely impact recreational and economic activities centered on the harbor, further straining Truro’s economy.

Risks to the Population

Truro’s population faces significant dangers from climate change, amplified by its geographic and demographic vulnerabilities. With only a single road (Route 6) connecting the town, extreme

[4] CapeCodCoast.org
[5] https://www.capecodtimes.com/story/news/2015/12/18/cape-cod-towns-struggle-to/32859731007/

weather events could isolate residents from essential resources, including emergency shelters and medical care. Truro's older population, many with mobility impairments or chronic medical needs, is especially at risk during storms and flooding.

The town lacks an emergency shelter or healthcare facility, so residents are reliant on shelters in Eastham or Provincetown, which may become inaccessible during major events. In addition to physical isolation, extreme weather events could disrupt electricity and communication networks, preventing residents from accessing vital services, emergency updates, and essential utilities. Chronic climate impacts, such as heat waves and air pollution, further threaten the town's most vulnerable residents, compounding these risks.

2.2 Other Climate Challenges

Beyond coastal impacts, Truro is also experiencing other risks related to climate change:

- **Shifting Precipitation Patterns:**
  Truro is expected to face more intense rainstorms in winter and spring, increasing the risk of inland flooding. Conversely, summer droughts may grow more frequent, straining water resources and affecting local agriculture and ecosystems.
- **Wildfire Risks:**
  Drier summers and longer droughts increase the likelihood of wildfires, particularly in Truro's wooded and undeveloped areas, which form a large part of the town's landscape.
- **Human Health Concerns**:
  Rising temperatures and changing ecosystems are likely to increase heat-related illnesses, mental health problems, and vector-borne diseases. Harmful algal blooms in surrounding water bodies may also pose risks to public health and recreation.

2.3 The Need for Urgent Action

The interconnectedness of these risks highlights the urgent need for Truro to take proactive steps to address the impacts of climate change. While adapting to these challenges will require investments, the costs of inaction will be far greater in terms of environmental degradation, economic loss, and reduced quality of life for residents. By protecting its coastal and inland environments, building resilience into its infrastructure, and fostering community awareness, Truro can position itself as a leader in climate action on Cape Cod.

Economic Implications for Truro, MA [6]

Climate change poses significant economic risks to Truro, MA, which is particularly vulnerable due to its reliance on its natural environment and coastal properties. Rising sea levels, coastal

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6 https://www.capecodcommission.org/resource-library/file?url=%2Fdept%2Fcommission%2Fteam%2FWebsite_Resources%2FCAP%2FEconomic+Impacts+of+Climate+Change+on+Cape+Cod+-+Technical+Report.pdf

erosion, and more frequent flooding threaten not only the town's built environment but also its economic foundation, including property values, tourism, and tax revenues.

Coastal Property Damages

The cumulative damage to Truro's properties from flooding and coastal erosion is projected to reach **$254.65 million** by 2100. Damage costs are expected to accelerate significantly over time:

- **2021 to 2030:** $7.67 million in damages, averaging $0.77 million annually.
- **2031 to 2050:** $21.78 million in damages, averaging $1.09 million annually.
- **2051 to 2100:** $225.2 million in damages, averaging $4.5 million annually.

These damages primarily reflect the loss of valuable coastal properties, increasing costs for property owners and local governments to repair or protect infrastructure.

Tax Revenue Loss [7]

Truro is projected to lose **$343.81 million** in total tax revenue by 2100, a direct consequence of property devaluation and flooding-related impacts:

- **2021 to 2030:** $9.83 million in lost tax revenue.
- **2031 to 2050:** $51.89 million in lost tax revenue.
- **2051 to 2100:** $282.08 million in lost tax revenue.

Lost revenue could severely limit Truro's ability to fund critical services, such as emergency response, infrastructure repairs, and climate adaptation projects.

Specific Economic Impacts

- **Isolated Homes:**
  Isolated homes flooded by floods will result in lost tax revenue of **$10.09 million** by 2100. These properties, disconnected from critical infrastructure, face heightened risks and may become uninhabitable over time.
- **Properties Near Flooded Roads:**
  Properties within a quarter-mile of flooded roads are expected to generate **$53.34 million** in lost tax revenue by 2100, as these areas become less accessible and desirable. This represents a significant economic impact on local mobility and property values.

Tourism and Climate Change in Truro, MA

Like the rest of Cape Cod, tourism is a vital economic driver for Truro. The town's reliance on its beaches and natural beauty makes it particularly susceptible to the impacts of climate change.

[7] Note, not sure if this includes tax revenue beyond housing damage.

While specific data for Truro is not always available, insights from Cape Cod as a whole provide a clear indication of the risks climate change poses to the town's tourism economy.

Beaches: A Critical Asset at Risk

Truro's beaches, part of the Cape Cod National Seashore, are among its most valuable tourism assets. Cape-wide data highlights the economic importance of these beaches, with their current annual recreational value estimated at over **$246.5 million** [8]. However, sea level rise and intensified storms are projected to cause significant beach narrowing, which could diminish the appeal and accessibility of Truro's shoreline.

The Cape Cod National Seashore is expected to suffer a loss of **$9.7 billion**[9] in recreational value between 2021 and 2100 due to sea level rise. While this figure encompasses all of Cape Cod, the implications for Truro are clear: narrower beaches and increased crowding could deter visitors, reducing the economic benefits of beach tourism.

Broader Economic Impacts on Truro's Tourism Economy

Tourism spending supports a wide range of businesses in Truro, from local shops and restaurants to accommodations and recreational services. A decline in beach visitation caused by climate change could lead to:

- **Decreased revenue for local businesses** that depend on seasonal visitors.
- **Lower property values** for waterfront and vacation homes, reducing tax revenue for the town.
- **Reduced job opportunities** in tourism-related industries, which are a cornerstone of Truro's economy.

Natural Ecosystems and Scenic Beauty

Beyond beaches, Truro's natural resources—including dunes, marshes, and coastal ecosystems—play a key role in attracting tourists. Cape-wide studies warn that climate change could degrade these ecosystems, reducing their appeal to visitors. For example:

- **Rising seas and storm surges** may damage Truro's marshlands, critical for wildlife viewing and outdoor recreation.
- **Loss of scenic beauty** due to erosion and habitat destruction could diminish Truro's reputation as a tranquil coastal destination.

Fishing and the Blue Economy

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[8] https://www.capecodcommission.org/resource-library/file/?url=/dept/commission/team/climate/Shared%20Documents/Climate%20Action%20Plan/Cape-Cod-Climate-Action-Plan.pdf

[9] Cape Code Climate Action Plan

Draft Note: We have Cape-wide economic numbers, but local data on Truro's connection to the 'blue economy' and related employment would make this section stronger if available. While specific local numbers would be ideal, the general point about protecting Cape Cod's fishing industry from collapse remains valid either way.

Truro's role in Cape Cod's blue economy, including fishing and shellfishing, is vulnerable to climate change impacts. Rising ocean temperatures, acidification, and extreme weather threaten key fisheries and shellfish populations, jeopardizing livelihoods. Cape-wide, fishing and aquaculture supported $14.9 million in wages and $34.2 million in regional GDP in 2017[10], underlining the potential economic loss if fisheries like Atlantic cod and American lobster decline. Sea level rise may further disrupt docks and coastal access, compounding these challenges. Adaptation efforts are crucial to safeguarding Truro's link to this vital economic sector.

Economic Takeaways

The economic costs of inaction are stark. Damages to property, infrastructure, and tax revenue represent substantial risks to Truro's financial stability. Proactive investment in coastal resilience, infrastructure upgrades, and sustainable economic diversification is essential to mitigate these long-term impacts and preserve Truro's economic viability.

3. Mitigation Strategies for Truro, MA

Truro's 2021 Greenhouse Gas (GHG) inventory provides valuable insights into the town's emissions profile, highlighting transportation, residential energy use, and electricity as the largest contributors. A smaller but important portion of emissions originates from municipal operations. Addressing these areas will help Truro achieve its climate goals.

Reduce Transportation Emissions (45% of Total Emissions)

Transportation accounts for 45% of Truro's greenhouse gas (GHG) emissions, making it the largest contributor. While much of the transition to electric vehicles will be driven by federal and state incentive programs and emission standards, Truro can play an important role through targeted municipal actions. The Town's most direct opportunity lies in transitioning its own municipal fleet to electric vehicles, while also helping residents and businesses make the switch by expanding local charging infrastructure, streamlining permitting processes, and raising awareness about available federal and state incentives. Through these efforts, Truro can help accelerate the adoption of electric vehicles while ensuring the community is prepared for an increasingly electric transportation future.

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10 https://www.capecodcommission.org/resource-library/file?url=%2Fdept%2Fcommission%2Fteam%2FWebsite_Resources%2FCAP%2FEconomic+Impacts+of+Climate+Change+on+Cape+Cod+-+Technical+Report.pdf

Benefits of EV Adoption

Electric vehicles (EVs) offer substantial environmental, economic, and public health benefits that align with Truro's climate action goals. These vehicles represent a crucial technology for reducing greenhouse gas emissions while providing practical advantages for residents.

Environmental Impact

The transition to electric vehicles significantly reduces greenhouse gas emissions compared to conventional gasoline-powered vehicles. As Massachusetts' electrical grid continues to incorporate more renewable energy sources, the environmental benefits of EVs will increase further. EVs also eliminate tailpipe emissions, directly improving local air quality and reducing the town's overall carbon footprint.[11]

Economic Benefits for Residents

While EVs may have higher upfront costs, they offer considerable long-term savings for Truro residents. The average Massachusetts driver can reduce monthly fuel costs from over $200 for gasoline to approximately $90 for electricity.[12] Maintenance costs are typically 20% lower than conventional vehicles due to fewer moving parts and simpler systems.[13] These savings make EVs an increasingly practical choice for Truro households.

Public Health Advantages

The elimination of tailpipe emissions from EVs leads to significant public health benefits through improved air quality. Research has shown that reduced pollution from vehicle electrification can prevent respiratory illnesses and other health conditions associated with vehicle emissions. These health benefits are particularly important for vulnerable populations, including children and elderly residents. The estimated cumulative health benefit for Barnstable County from switching to electric vehicles between 2021 and 2050 is projected to be $82 million through the reduction of air pollutants, demonstrating how the transition to EVs delivers both health and economic benefits to the community.[14]

Energy Independence

By reducing dependence on petroleum, EVs help insulate Truro residents from volatile fossil fuel prices. This transition supports greater energy independence at both the household and community level, while contributing to the region's economic resilience.[15]

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[11] Cape Cod Climate Action Plan
[12] Massachusetts Clean Energy and Climate Plan for 2025 and 2030
[13] Economic Impacts of Climate Change on Cape Cod - Technical Report.pdf
[14] Cape Cod Climate Action Plan
[15] Massachusetts Clean Energy and Climate Plan for 2025 and 2030

Future Cost Trends

The initial purchase price of EVs continues to decrease as technology advances and production scales up. Industry projections indicate that EVs will achieve price parity with conventional vehicles in the coming years, making them an increasingly accessible option for Truro residents. Combined with available federal and state incentives, the total cost of EV ownership is becoming more favorable for consumers. [16]

Promoting EV use among residents and visitors is a key strategy to reduce transportation emissions.

Citizen EV Adoption

Supporting residents and businesses in the transition to electric vehicles will be essential for reducing Truro's transportation emissions. The Town can help accelerate private EV adoption through public education and outreach, expanding charging infrastructure, streamlining permitting, and connecting residents with state and federal incentives.

Truro EV Goals

As of early 2025, Truro has made significant progress in electric vehicle (EV) adoption, with 99 electric vehicles (30 plug-in hybrid and 69 full electric) out of a total of 3,081 registered vehicles. This represents 3.2% of all vehicles in Truro, approaching but slightly below the 2025 target of 3.75% (115 vehicles).

Building on this foundation, Truro has established the following targets[17] for electric vehicle adoption:

- 115 EVs by 2025 (3.75% of total vehicles)
- 500 EVs by 2030 (~17% of total vehicles)
- 1,300 EVs by 2040 (~40% of total vehicles)
- Near complete adoption by 2050

These local targets align with Massachusetts' state goals of 200,000 EVs by 2025 and 900,000 EVs by 2030[18], as well as Barnstable County's target of 167,507 EVs by 2040.[19] The 2050 goal of near-complete adoption aligns with Massachusetts' regional decarbonization plan, which requires that emissions from light-duty transportation will need to be zero.[20]

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[16] Economic Impacts of Climate Change on Cape Cod - Technical Report.pdf
[17] Calculations can be found: https://docs.google.com/spreadsheets/d/1SUhBGCtlB8wClpSE3QROvoVgvoF4z8G0Bu_oB4wmbEw/edit?usp=sharing
[18] Massachusetts Clean Energy and Climate Plan for 2025 and 2030
[19] Economic Impacts of Climate Change on Cape Cod Techincal Report
[20] MASSACHUSETTS 2050 DECARBONIZATION ROADMAP

Public Charging Infrastructure

Draft Note: The Climate Action Committee drafted this initial section on charging stations. Since the Energy Committee is leading this initiative and has deeper expertise in this area, they're welcome to expand this section. Alternatively, CAC is happy to develop it further with input from their experience.

The Energy Committee is currently exploring and implementing charging solutions to support the growing number of EV users:

- **Install Charging Stations at Public Locations:**
  Charging stations at public buildings, such as the library are under active consideration to serve residents, visitors, and employees.
    - In 2021 Truro's first EV station was installed at Truro Town Hall.
    - These sites are being planned for future EV stations:
        - Truro Library
        - (Get the rest) Truro Central School
- **Collaborate with Local Businesses:**
  The Energy Committee is working with local businesses to identify opportunities to install EV chargers, creating a network of accessible charging options throughout Truro.
- Partner with state and federal programs to subsidize infrastructure costs.
    - EV Stations at the following Business are currently (find out details)
        - Truro Vineyards
        - …

Community Incentives and Education:

- Promote state rebates and tax credits for EV purchases.
- Educate residents on the cost savings and environmental benefits of switching to EVs.

Municipal Fleet Electrification[21]

Draft Note: This section was drafted by the Climate Action Committee based on the Truro Decarbonization Roadmap document. It should be reviewed/improved/improved by the Energy Committee as well as run by the DPW.

Truro's municipal fleet represents a significant opportunity for emissions reduction through strategic electrification. In FY22, the fleet generated 276.0 metric tons of carbon dioxide equivalent (MTCO2e) from gasoline and diesel fuel consumption. The fleet currently consists of 45 vehicles across three categories: 17 light-duty vehicles (38%), 11 medium-duty vehicles (24%), and 17 heavy-duty vehicles (38%).

[21] Truro Decarbonization Roadmap Document

To achieve substantial emissions reductions, Truro will need to transition to zero-emission vehicles (ZEVs) across all vehicle classes. Truro's decarbonization roadmap calls for replacing fossil fuel vehicles with ZEVs according to the following schedule:

- 2027: 10% ZEV adoption across light, medium, and heavy-duty categories
- 2030: 50% ZEV adoption across all categories
- 2040: 80% ZEV adoption across all categories
- 2050: Complete fleet electrification (100% ZEVs)

This phased approach allows Truro to begin with proven light-duty electric vehicles while taking advantage of rapidly advancing technology for medium and heavy-duty applications. The timeline aligns with expected improvements in vehicle availability, charging infrastructure, and decreasing costs of zero-emission technologies.

The transition to ZEVs will deliver multiple benefits beyond emissions reduction, including:

- Lower operating costs through reduced fuel and maintenance expenses
- Improved air quality for town workers and residents
- Enhanced reliability and performance of municipal vehicles
- Leadership by example in Truro's broader climate action efforts

To ensure successful implementation, the town will need to coordinate vehicle procurement with the installation of charging infrastructure, train maintenance staff on electric vehicle service, and carefully plan for vehicle deployment to maintain essential municipal services throughout the transition period.

Support for Regional Public Transit and Reducing Vehicle Miles Traveled

While Truro may not directly control public transit, supporting regional transit improvements can further reduce emissions.

- **Advocacy for Electrification:**
    - Collaborate with the Cape Cod Regional Transit Authority (CCRTA) to advocate for electric buses.
    - Support regional funding applications for infrastructure upgrades.
- **Encourage Public Transit Use:**
    - Promote awareness of existing transit options to reduce reliance on private vehicles.

Expanding Bicycle and Pedestrian Infrastructure

Draft Note: This section was drafted by the Climate Action Committee, but it would likely be greatly improved from input from the Bike and Walkways Committee.

Expanding bicycle and pedestrian networks in Truro would make it easier for residents to walk or bike to local businesses while reducing transportation-related carbon emissions. Adding bike lanes and well-maintained sidewalks would support public health through increased physical activity, enhance safety for pedestrians and cyclists, and create more opportunities for car-free trips. These improvements align with Cape Cod Regional Policy Plan and Regional Transportation Plan[22] while making Truro more accessible for everyone.

By prioritizing EV adoption, transitioning the municipal fleet, and advocating for regional transit improvements, Truro can make significant progress in reducing transportation emissions while supporting sustainable practices across the region.

Improve Building Usage of Energy (31% of Total Emissions)

Transition to Clean Residential Energy (25% of Total Emissions)

In Truro, residential heating with propane and heating oil contributes significantly to greenhouse gas emissions. Addressing this challenge involves focusing on energy efficiency, electrification, and renewable energy adoption while taking advantage of existing and future state and federal incentives:

- **Energy Efficiency Retrofits:**
  Encourage residents to upgrade insulation, install energy-efficient windows, and adopt modern HVAC systems. Programs like Mass Save offer rebates and no-cost energy assessments, making these improvements more accessible.
- **Electrify Heating Systems:**
  Promote the adoption of heat pumps for efficient year-round heating and cooling. Federal tax credits and upcoming rebates through the Inflation Reduction Act (IRA) can help offset installation costs.
- **Adopt Solar Energy:**
  Support the adoption of rooftop solar installations and participation in community solar projects. Federal incentives, such as the Residential Clean Energy Credit, make these renewable energy options more affordable for homeowners.

[22] Cape Code Climate Action Plan

- **Specialized Building Codes**

  Truro has already demonstrated strong climate leadership by adopting the Specialized Building Code at the 2023 Town Meeting, which took effect in January 2024. This forward-thinking decision brings multiple benefits to our community. Property owners enjoy lower operational costs through reduced energy usage, while also having access to valuable incentives for energy-efficient construction. Additionally, the adoption of progressive building codes supports Truro's eligibility for Green Community designation, which provides access to exclusive financial and technical resources for expanding clean energy adoption and reducing energy consumption. The code helps ensure all new buildings in Truro are built to high-efficiency standards that align with state greenhouse gas reduction targets. Beyond the financial advantages, this commitment to advanced building standards means improved air quality and health outcomes for residents through reduced pollution.[23] By embracing these sustainable construction practices, Truro has positioned itself at the forefront of climate action while supporting both environmental stewardship and economic benefits for our community.

By leveraging these existing and future programs, along with strengthened building codes, Truro can reduce residential emissions, improve energy efficiency, and support the transition to clean energy with minimal financial burden on its residents.

Clean Residential Energy Goals

Draft Note: CAC will be putting together goals based on the GHG Inventory and the Cape Cod and Mass goals.

Improve Municipal Operations Emissions (4% of total Emissions)

Draft Note: The 4% of total emissions needs to be double-checked, after the CAC redoes the GHG inventory.

Draft Note: CAC wrote this summarizing on the Truro Decarbonization Roadmap. CAC welcomes feedback and changes from the Energy Committee

This section summarizes the Truro Municipal Decarbonization Roadmap, which provides comprehensive details on the town's building decarbonization strategy. The strategy will significantly reduce greenhouse gas emissions while improving building performance and operational efficiency. Beyond the environmental benefits, the initiative will generate long-term cost savings and demonstrate the town's leadership in climate action to the broader community. For detailed implementation guidance and technical specifications, please refer to the complete Roadmap.

[23] Climate Action Fact Sheet-Net Zero New Non-Municipal Buildings

Current Status and Goals

Municipal buildings represent a significant portion of the town's operational carbon footprint. Through comprehensive analysis, eight key municipal facilities have been identified as accounting for 90.4% of building-related emissions. These facilities include Truro Central School, Public Safety PFR, Library, Town Hall, Community Center, Transfer Station, Beach Office, and Field House.

To address these emissions, the town has established ambitious yet achievable goals:

- Eliminate on-site fossil fuel use in municipal buildings by 2050
- Reduce overall energy use intensity (EUI) by 97% by 2050
- Implement clean energy strategies across all facilities

Implementation Strategy

The municipal building decarbonization strategy follows a systematic, phased approach that aligns with equipment replacement cycles and organizational capacity. The strategy encompasses multiple Energy Conservation Measures (ECMs):

1. Building Envelope Improvements
    a. Enhanced insulation systems
    b. Comprehensive weatherization
    c. High-performance window and door replacements
    d. Strategic air sealing
2. System Electrification
    a. Conversion to high-efficiency heat pump systems
    b. Electric water heating installation
    c. Modernization of HVAC controls and systems
3. Lighting and Controls
    a. LED lighting retrofits throughout facilities
    b. Installation of occupancy-based control systems
    c. Optimization of natural lighting
4. Renewable Energy Integration
    a. Rooftop solar PV installations where feasible
    b. Integration with grid decarbonization initiatives

Timeline and Prioritization

The implementation timeline is structured to maximize efficiency and manage resources effectively:

2027-2030 (Short-Term):

- Focus on right-sizing building energy use
- Begin systematic equipment replacement at end-of-life

- Prioritize high-impact facilities like Truro Central School and Town Hall
- Implement initial weatherization and insulation improvements

2030-2040 (Mid-Term):

- Complete HVAC and water heating electrification in primary facilities
- Expand renewable energy installations
- Implement comprehensive building envelope improvements

2040-2050 (Long-Term):

- Complete decarbonization of remaining facilities
- Optimize renewable energy systems
- Explore additional clean energy opportunities

Facility-Specific Strategies

Each major facility has a tailored approach based on its unique characteristics and needs:

Truro Central School:

- Priority facility due to highest emissions
- Complete envelope improvements and electrification by 2030
- Focus on educational opportunities through visible sustainability measures

Public Safety PFR:

- Weatherization improvements
- HVAC electrification by 2030
- Special consideration for operational reliability requirements

Town Hall and Library:

- Comprehensive insulation and weatherization
- Complete system electrification by 2030
- Integration of public-facing educational components

Community Center:

- Phased approach beginning with envelope improvements
- Strategic electrification of all systems
- Focus on demonstrating community benefits

New Building Development Standards

New municipal building development must align with the town's decarbonization goals by integrating efficiency and electrification requirements into planning, design, and procurement

processes. This includes incorporating passive design strategies, requiring all-electric systems, and implementing enhanced energy performance standards that exceed current building codes. This approach ensures new construction advances climate goals while avoiding future retrofits.

By focusing on municipal buildings, Truro can lead by example, demonstrating how energy efficiency and thoughtful retrofitting can significantly contribute to local emissions reduction goals while lowering operational costs and creating a more sustainable community.

- Events:
    - 2013 Municipal buildings excluding Truro Central School converted to LED lighting
    - 2018: Truro Central School converts to LED lighting

Improve Commercial Emissions (2% of Total Emissions)

Actions:

- 2022 - Climate Action Committee works with Cape Light Compact to sign up 17 Truro businesses for an energy audit

Lower Electricity Production Emissions (22% of Total Emissions)

Draft Note: The Energy Committee has put together a great presentation regarding electricity production and decarbonization that covers this topic. It will be integrated into this section after the select board meeting on 1/28/25

With the rise of electric vehicles (EVs) and electrified buildings that rely on electricity for HVAC and other needs, ensuring that Truro's electricity comes from renewable sources is essential. To support this transition, the town can focus on several key strategies:

Expand Solar Energy:

Promote the development of both public and private solar arrays to increase locally generated clean energy. Encourage residents, businesses, and municipal properties to invest in solar installations.

Public Solar Initiatives

- In 2010 6.8 kw Solar PV array installed on Central Elementary School
- There was another panel installed at some point. Get the details
- 2017 Truro invests in a solar farm in Canton that supplies 100% of municipal electricity

Private Solar

- Get the details on solar installed

Procure Green Energy:

Whenever possible, ensure that electricity used in Truro is sourced from renewable providers, leveraging programs that allow towns to opt into clean energy procurement.

Invest in Battery Storage and Microgrids:

Implement energy storage solutions and microgrids to enhance the reliability of renewable energy, reduce dependency on fossil fuels, and provide resilience during outages. These investments benefit both mitigation by reducing emissions and adaptation by improving energy security in extreme weather events.

By prioritizing renewable energy and modern energy infrastructure, Truro can ensure that its increasing electricity demand is met sustainably while supporting the town's climate goals.

Support Offshore Wind:

Truro can support state-wide offshore wind initiatives by educating residents on their benefits, including clean energy production, job creation, and reduced emissions. Hosting community forums and sharing factual information can address misconceptions and build local support, reducing opposition that might delay these critical projects. By fostering understanding, Truro can play a key role in advancing renewable energy solutions for the region.

Address Waste Emissions

Draft Note: This is somewhat of a placeholder section. This seems to be a relatively small source of emission, and it's worth asking how much more can do in this regard.

While waste emissions are a smaller contributor, reducing landfill use can make a difference:

- **Expand Recycling and Composting Programs:**
  - Promote waste diversion for residents and businesses.
- **Implement Zero-Waste Practices:**
  - Encourage reusable materials and minimize disposable items in town operations.
- Actions
  - 2019 Composting becomes available to residents at the Transfer Station

Natural Resources and Sequestration

Draft Note: This is a placeholder section.

6. Broader Initiatives

- **Land Use and Natural Carbon Sequestration:**
    - Protect forests, wetlands, and open spaces to absorb carbon emissions.
    - Restore degraded natural areas to enhance their sequestration capacity.
- **Education and Engagement:**
    - Conduct outreach programs to engage the community in sustainable practices.

4. Adaptation Strategies

Draft Note: This is a placeholder section

- MODEL BYLAW DEVELOPMENT - page 92 of cape cod action plan
- MULTI-HAZARD MITIGATION PLANNING - page 94 of cape cod action plan\
- MUNICIPAL VULNERABILITY - PREPAREDNESS PROGRAM - climate resiliency projects - page 94
- OUTER CAPE INTERMUNICIPAL SHORELINE FRAMEWORK - page 95
-

Possible Adaptations to Consider

Draft Note: *This is currently just a list of bullet pointed ideas primarily based on the Cape Cod Climate Action plan. Though it should also incorporate the work done on the MVP grant on resiliency hubs.*

Infrastructure Enhancements

- Assess and adapt vulnerable roadways by elevating, relocating, or abandoning low-lying road segments.
- Replace outdated culverts to improve tidal flow, reduce road flooding, and restore tidal marshes.
- Protect power lines and consider undergrounding in vulnerable areas to enhance resilience during storms.
- Develop solar microgrids with battery back-up, to improve energy resilience and independence.
- Expand and improve communication systems to maintain connectivity during emergencies.

Land Use Planning and Development

Daft Note: *The Planning Committee is working on these things, and they should be engaged on this. Should incorporate Model Floodplain Overlay District Zoning Bylaw.*

- Strategically relocate structures and infrastructure from high-risk coastal areas (managed retreat).
- Develop and enforce climate-resilient building codes, including floodproofing and elevation standards.
- Revise zoning regulations to limit development in floodplains and areas prone to coastal erosion.
- Draft and adopt floodplain bylaws to address development and redevelopment in vulnerable areas

Community Resilience and Preparedness

- Establish resilience hubs to provide essential services during emergencies.
- Strengthen emergency planning systems, including evacuation routes and communication protocols.

Vulnerablilities and actions

- Above ground Power lines
    - Underground them
- Low lying roads, particularly on Shore Road (hazardous materials)
    - Planning committee's bylaws
- Culverts floodable
    - Retrofit - could use some investigation
- Flooding that cuts off the Outer Cape
    - MVP grant - shelters and micro grids
    - What is being done about the section of route 6 roundabout
    - Truro low lying roads?
    - Evacuation plan?
- Brush fires
    - ?
- Heat waves
    - MVP grant shelters?
- Environmental flooding such as dunes and salt marshes?
- Communications?

Tapping into Larger Grant and Program Opportunities

Draft Note: This section is still a draft. Lacks specifics and information such as what Truro has already qualified for (such as Green communities).

For a small town like Truro, funding climate initiatives solely at the local level can be a significant challenge. To achieve sustainability goals, it is essential to tap into larger regional, state, and federal grant and program opportunities. These resources provide the financial support and technical assistance necessary to implement impactful projects that might otherwise be out of reach.

- **Leverage State Programs:**
  Programs such as **Green Communities** and the **Mass Save Program** offer grants and technical assistance to towns like Truro for energy efficiency upgrades, renewable energy adoption, and climate resilience projects. These programs can help fund initiatives such as solar installations, modernizing municipal buildings, and purchasing electric or fuel-efficient vehicles.
- **Access Federal Funding:**
  Federal resources like the **Inflation Reduction Act (IRA)** provide tax credits and rebates for heat pumps, solar energy, and battery storage, benefiting residents and municipal projects alike. Additionally, federal grants for renewable energy infrastructure and climate resilience can offset costs for major initiatives.
- **Collaborate Regionally:**
  Partnering with neighboring towns and regional organizations enables Truro to participate in larger-scale projects, such as offshore wind development or shared microgrids, which require significant investment but offer substantial benefits.
- **Explore Climate-Specific Grants:**
  Programs like the **Municipal Vulnerability Preparedness (MVP) Program** provide funding specifically for climate adaptation and resilience. Truro's participation in such initiatives can support projects that strengthen the town's ability to respond to climate impacts.

By tapping into these larger funding opportunities, Truro can implement critical projects to reduce emissions, improve energy efficiency, and enhance climate resilience without overburdening local resources. Collaboration with state and federal programs ensures that the town can achieve its sustainability goals effectively and affordably.

5. Community Engagement and Education

Draft Note: This is a placeholder section.

Recourse of note: See Cape Cod Communication Strategy

- **Public Awareness Campaigns**
  Host workshops on sustainable practices, such as energy efficiency and landscaping for resilience. Share trackable progress with the public.

- **Stakeholder Collaboration**
  Partner with local businesses, non-profits, and academic institutions to drive action.
- **Youth and School Programs**
  Integrate climate education into school curriculums and create youth-driven initiatives.

6. Monitoring and Evaluation

Draft Note: This is a placeholder section

- **Progress Tracking**
  Establish metrics for success (e.g., emissions reductions, homes retrofitted, wetlands restored).
- **Regular Reporting**
  Provide annual updates to the community.
  Adjust strategies as needed based on new data or community feedback.
- **Feedback Mechanisms**
  Create opportunities for residents to provide input on the plan's implementation and progress.

Appendix

Flood Dangers in Truro

	Type	Storm Surge	Sea Level Rise
Balston Beach overwash fanparking lot	Beach	1	
Fisher Beach Parking Lot	Beach	3	
Ryder Beach Parking Lot	Beach	3	
CCNS Head of the Meadow Parking Lot	Beach	4	5
Balston Beach Parking lot	Beach	4	
Corn Hill Beach Parking Lot	Beach	4	5
Highhead Road Culvert	Culvert	1	5
Route 6 culvert near long nook road	Culvert	1	
Culvert under Route 6 near South Pamet Road	Culvert	1	
Culvert on Castle Hilll Road Little Pamet	Culvert	3	5

Mill Pond Culvert	Culvert	3	5
Pamet Harbor Jetties South	Pamet		1
Pamet Harbor Jetties South	Pamet		1
Pamet Harbor Boat Ramp	Pamet		1
Pamet Harbor Pier	Pamet		1
Harbormaster office	Pamet		6
Pamet Parking Lot	Pamet		6
East Harbar Outfall Pipe			1
Pump Station # 6		3	5

https://www.capecodcommission.org/our-work/sea-level-rise/

- Pump Station #6 - Waste Water Pump Station - 3 feet
- East Harbor outfall pipe - 2 feet
- Culverts
    - Highhead Road Culvert - Bridge/Tidal Restriction | Highhead Road Culvert - 1 feet
    - culvert on Castle Hill Road, Little Pamet - 3 feet
    - Route 6 culvert near Long Nook Road - 1 feet
    - culvert under Route 6 near South Pamet Road - 1 feet
    - Mill Pond Culvert - 6 feet
    - Eagle Creek culvert - 6 feet
- Beach Parking Lot flooding
    - Ballston Beach Parking Lot - 2 feet
    - Fisher Beach Parking Lot - 3 feet
    - Ryder Beach - 3 feet
- Pamet Harbor
    - Pamet Harbor Jetties North/South - 2 feet
    - Pamet Harbor - 2 feet
    - Pamet Harbor Boat Ramp - 2 feet
    - Pamet Harbor Parking Lot - 6 feet

Change Log

1/18/25

Alex Limpaecher -

- I added the draft notes to make it clear which sections require more information, or where information needs to be verified.
- I expanded the EV section
    - Including the Municipal fleet section based on the Truro Decarbonization Roadmap.
    - And the private EV goals