

SUSTAINABLE CONCORD

Revolutionary

Resilient

Ready



CLIMATE ACTION AND RESILIENCE PLAN

JUNE 2020

TABLE OF CONTENTS

Letter from Town Manager	4
Letter from Director of Sustainability	5
Acknowledgments	6
Introduction	8
Plan at a Glance	11
Climate Action in Concord	13
Greenhouse Gas Emissions	14
Climate Impacts	16
Developing the Plan	18
Plan Advisors	18
Plan Approach	18
Engaging Our Community	19
Plan Elements	20
Built Environment	20
Energy	22
Mobility	24
Natural Resources	26
Preparedness	28
Implementation Plan	30
Leadership on Climate Action	30
Next Steps	33
Action Implementation Blueprints	34
Endnotes	78
Appendices	79
A: GHG Inventory Report	
B: GHG Reduction (Wedge) Analysis	
C: Survey Summary Reports	
D: Business Resilience Workshop Summary & Best Practices Guide	

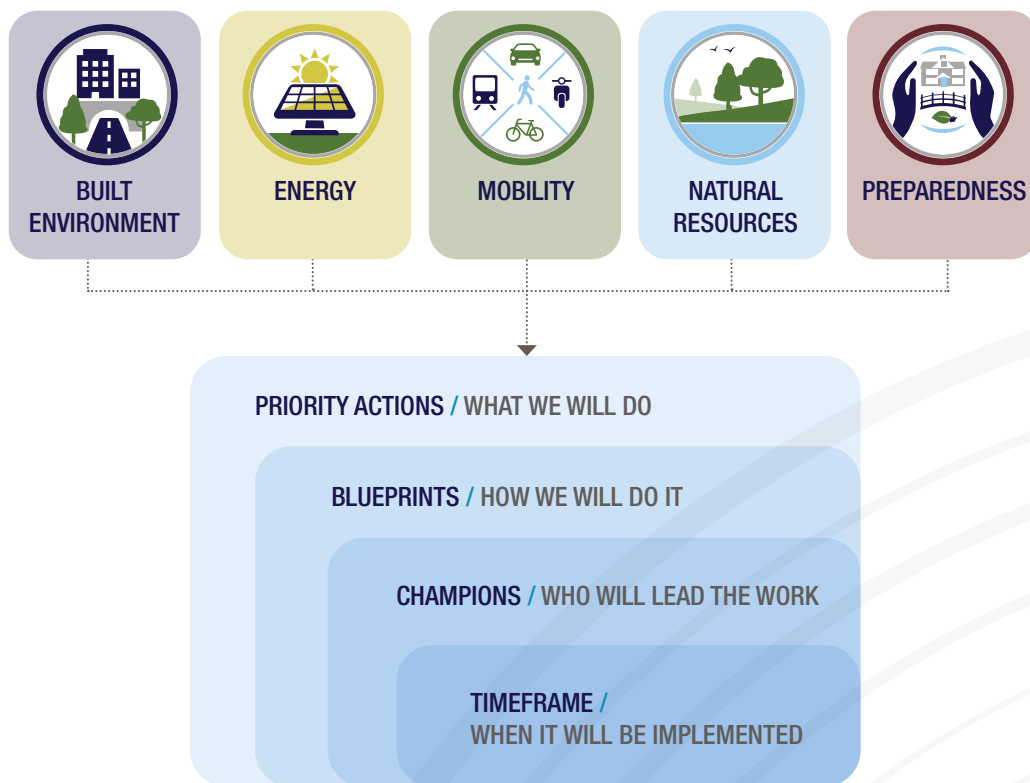
How to Navigate this Plan

Sustainable Concord is the roadmap for how Concord will take action in the next 5 years to make progress toward our climate goals.

It is a commitment to take 22 climate actions and includes detailed implementation blueprints. This makes for a dense document. This section serves to help you navigate the Plan.

Plan Elements

The Plan is organized into five plan elements, key areas to addressing climate change. Each plan element has a goal, priority actions, and indicators of success.



Priority Actions

The priority actions are the **“what”** we are going to do in Concord to take action on climate. There are 22 priority actions organized into 5 plan elements.

Blueprints

The implementation blueprints are the **“how”** we are going to do it. The blueprints outline key steps, timeframes, and partners.

Champions

The blueprints indicate champions for each priority action, the **“who”** is leading the work to ensure it gets done.

Timeframe

The entire plan is designed to be initiated in the next 5 years. The blueprints indicate the **“when”** in the expected timeframe for each implementation step. While there will certainly be more to do, these priority actions are the most important to make significant progress toward our goals.

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Letter from Town Manager



It is no secret that what draws residents, businesses, and visitors alike to the Town of Concord is our historic character and natural resources. Concord is known for its revolutionary, literary, abolitionist, and agricultural history. Concord has a long tradition of protecting and enjoying the natural environment that is the bedrock of its commitment to sustainability.

Climate change is one of the most pressing challenges of our time. In Concord, climate action is about preserving historical gems like the North Bridge and the Orchard House and protecting our precious natural resources, while bolstering our community's ability to take collective action to reduce our impact on climate change.

True to Concord, we developed our first Climate Action and Resilience Plan as a community by bringing together past planning efforts, committee members, staff experts, and data-driven best practices. The approach we take in this Plan is the same we have taken for generations, one that is bold, revolutionary, and rising to the scale of the challenge!

As we release this Plan, we are in the midst of the COVID-19 pandemic and seeing first-hand the impacts that a sudden global threat has on our economy, our children's education, and our daily lives that brings focus to the existential threat of climate change. We are also seeing our community's ability to come together. I am confident that we can bring that spirit to make Concord a model of local action on resilience and sustainability.

This Plan is the result of countless hours of work by Town staff and many dedicated volunteers to whom we owe a debt of gratitude. I am proud to join them in asserting Concord's commitment to take action on climate change and eager to work with all of you to implement this Plan to bend the curve on greenhouse gas emissions and ensure we are resilient to a changing climate.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen Crane". The signature is fluid and cursive, written on a light-colored background.

Stephen Crane
Concord Town Manager

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Letter from Director of Sustainability



Climate change is one of the most pressing challenges of our time. It also presents an opportunity for collaboration and innovation across sectors, regions, and boundaries of all types. That is why I have personally committed my career to sustainability. I am constantly impressed by Concord's unwavering commitment to taking climate action and honored to be part of developing this Climate Action and Resilience Plan.

There is no doubt that we have entered a critical decade for bending the curve on greenhouse gas emissions to avoid the worst impacts of climate change. This Climate Action and Resilience Plan builds on Concord's legacy of environmental protection, sustainability, and resilience. It outlines the most important next steps to make progress toward our climate goals.

Tackling climate change will require mitigating our impact and improving our ability to adapt to a changing climate. That's why this Plan outlines a vision and strategies for both.

It won't be easy, but we're in it together. In the first half of 2020, we have really learned what being in it together means. We began developing this Plan in 2019 and I think most of us could not have imagined that we would be completing it at home through virtual meetings.

But we adapt. We held our first public meetings online. We celebrated the 50th anniversary of Earth Day with virtual gatherings. We used social media to connect and engage. We saw hopeful photos of dramatically reduced air pollution and a vision for what could be if we burn fewer fossil fuels.

The COVID-19 pandemic has emphasized the importance of social resilience, something that will be equally important in tackling climate change. It has changed the way we work, the way we connect, and the way we gather. But it has not changed our vision for a sustainable and resilient Concord.

I thank the Concord community for its enduring commitment to climate action and look forward to working with you all to implement our Climate Action and Resilience Plan.

Sincerely,

A handwritten signature in black ink that reads "Kate Hanley". The signature is written in a cursive, flowing style.

Kate Hanley
Director of Sustainability

Acknowledgments

Sustainable Concord was developed through a collaborative process between municipal staff and the community with support from our consultant team courtesy of a generous grant from the Massachusetts Executive Office of Energy and Environmental Affairs Municipal Vulnerability Preparedness (MVP) Program.

Municipal Advisors

Alan Cathcart

Director of Public Works

David Wood

Concord Light Director

Delia Kaye

Natural Resources Director

Erin Stevens

Public Information and
Communications Manager

Jan Aceti

Energy Conservation
Coordinator, CMLP

Joseph O'Connor

Chief of Police

Kate Hanley

Sustainability Director

Kate Hodges

Deputy Town Manager

Laura Scott

Power Supply & Rates Administrator,
CMLP

Laurie Hunter

Superintendent of Schools

Marcia Rasmussen

Director of Planning and Land Management

Melissa Simoncini

Sr. Environmental & Regulatory
Coordinator, Water/Sewer

Ryan Orr

Facilities Director

Stephen Crane

Town Manager

Susan Rask

Public Health Director

Tom Judge

Concord Fire Chief

Climate Action Advisory Board

Brian Foulds, Chair

Jane Hotchkiss, Select Board Liaison

Ruthy Bennett

John Bolduc

Brian Crouse

Courtney Eaton

Pam Hill

Warren Leon

Michael McAteer

Peter Nichol

Jake Swenson

Consultant Team







Introduction

The climate crisis requires revolutionary thinking and action. In Concord, we know a thing or two about that.

Sustainable Concord is a roadmap to meet the commitments the Concord community made at 2017 and 2018 Annual Town Meetings to reduce GHG emissions 80% by 2050 in alignment with the Paris Climate Accord and the 2008 Massachusetts Global Warming Solutions Act and to prioritize climate resilience goals and initiatives.

Sustainable

A sustainable Concord is a community that reduces our contribution to climate change by eliminating greenhouse gas emissions and preserves a high quality of life for future generations.

Resilient

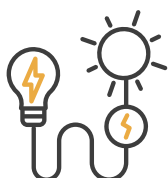
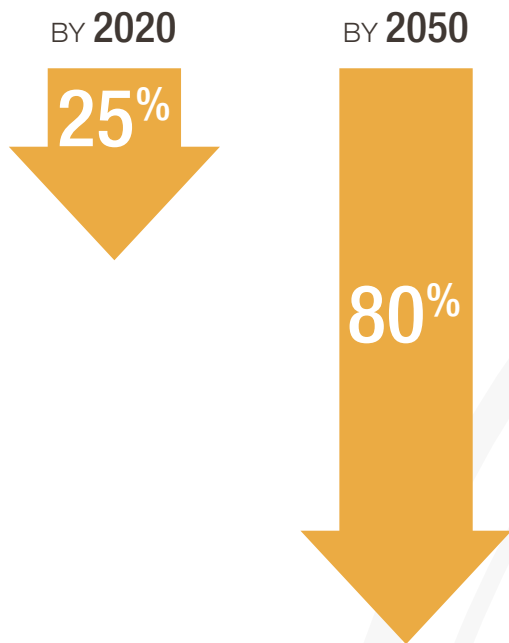
A resilient Concord is one that is prepared to minimize the impacts of climate change



Sustainable Concord has been intentionally and strategically designed to prioritize actionable solutions for both reducing greenhouse gas emissions (mitigation) while improving our community's resilience (adaptation) to the impacts of climate change.

Concord's Climate Goals

Reduction in town-wide GHG emissions from 2008 baseline



100%
carbon-free electricity source by 2030



Empowering Future Climate Leaders

Empowering Concord youth to take climate action in their hands, a group of Concord High School students were trained as part of Concord's first ever Sustainable Concord street team. Street Team members were tasked with engaging community members of diverse backgrounds and asking people for their input on Sustainable Concord. Seven students were up to the challenge, and their work on the street team helped to strengthen community feedback and initiated a dialogue about climate change among our youth.

Concord's Commitment

The Plan continues work that has already been done and outlines 22 priority actions that can be taken over the next five years to ensure Concord is on a path to a sustainable future. Reaching Concord's goals will be an iterative and collaborative process which will require action across all sectors of the community. This Plan is an important step in the journey of turning climate commitments into climate action.

The Town recognizes that truly effective climate leadership will require the integration of sustainability into daily operations, decision-making, and planning of our municipality. The Town government is committed to taking the lead on implementation of this Plan and integration of sustainability throughout and will focus on three specific areas to achieve this:



Governance

Integrate sustainability goals, metrics, and evaluation criteria into Town planning, including staff and department evaluations and budgeting.



Education

Work with educators, parents, students, the School Department, and the State to bring climate education curricula into schools and student activities.



Social Resilience

Prepare businesses and residents for the impacts of climate change through education and climate preparedness planning.

Plan at a Glance



BUILT ENVIRONMENT

Goal: Concord's buildings and solid waste system minimize GHG emissions and are resilient to a changing climate.

- Increase electrification and improve energy efficiency of residential buildings.
- Improve energy performance of commercial buildings.
- Set progressive sustainability standards for new municipal buildings and schools and develop a phased plan for deep energy retrofits to existing town buildings.
- Establish policies and incentives for new development to achieve high standards for sustainability and resilient design.
- Create opportunities town wide to increase the waste diversion rate by 30%.



ENERGY

Goal: Concord's electricity is 100% carbon-free, reliable, and affordable.

- Redesign electricity rates to support energy conservation, peak load management, electrification, and renewable energy generation.
- Provide incentives for businesses and homeowners to invest in renewable energy.
- Shift CMLP's electricity supply to 100% carbon-free sources by 2030.
- Deploy utility-scale energy storage.



MOBILITY

Goal: Everyone has access to zero-carbon transportation options to commute and get around Concord.

- Increase use of public transportation and other low-carbon and no-carbon transportation options.
- Accelerate adoption of electric vehicles.
- Implement a long-term plan to electrify school and municipal vehicle fleets.
- Improve availability, accessibility, and connections between bicycling and walking paths and sidewalks.



NATURAL RESOURCES

Goal: Concord's natural resources are enhanced and supported to provide resilience benefits to the community and to maximize biodiversity and carbon sequestration.

- Develop forest management plan to enhance health of Concord's forests.
- Increase indoor and outdoor water conservation.
- Work with homeowners to promote sustainable landscaping practices.
- Assess the vulnerability of natural resources most at risk to projected climate changes.
- Assess and improve Concord's tree canopy.



PREPAREDNESS

Goal: Concord's critical infrastructure is designed to reduce emissions and be prepared for projected climate impacts.

- Develop an integrated water resource management plan.
- Conduct a threat assessment for Concord's critical infrastructure.
- Update stormwater regulations and create a stormwater utility.
- Increase the use of green infrastructure and low impact development.



2011

Concord Select Board adopts **4 Sustainability Principles**

- 1 Reduce dependence upon fossil fuels, underground metals, and minerals;
- 2 Reduce dependence upon synthetic chemicals and other manufactured substances;
- 3 Reduce encroachment upon nature; and
- 4 Meet human needs fairly and efficiently; and to ask the Town Manager and Department Heads to report on methods and successes in implementing sustainable principles and balancing reductions in order to meet human needs fairly and efficiently.

2012

Concord hosts a Solar Fair and bans single-use plastic water bottles

2013

Concord is designated a Green Community by the Massachusetts Department of Energy Resources

2014

Concord hosts a Solar Challenge resulting in over 150 homes installing solar panels and passes a Resolution on Fossil Fuel Divestment at Town Meeting

2015

Concord passes a ban on plastic bags





2016

Concord receives its first electric school bus and 141 homes participate in a residential weatherization campaign called Green Your Heat

2017

Cooler Concord Fair draws 1,000 residents to learn about ways to cut carbon at home and Concord passes Article 51 at Town Meeting committing to GHG reduction goals

2018

Concord collaborates with neighbors on HeatSmart campaign resulting in over 40 homes installing climate-friendly heat pumps and passes Article 23 at Town Meeting committing to climate resilience goals

2019

Concord hosts a Sustainable Landscaping Fair drawing 150+ residents and the Bruce Freeman Rail Trail opens

2020

Concord launches "Your Sustainable Home Now!" resource for residents to take action at home

Climate Action in Concord

The Town of Concord has a history of forward-thinking action on climate and sustainability that serves as a valuable foundation for its continued leadership.

Concord's history of climate action is thanks to the efforts of community volunteers, who devote considerable time, energy, and talent towards making Concord a more sustainable community and a great place to live. These volunteer groups include many Town committees, such as the **Comprehensive Sustainability and Energy Committee (CSEC)**, and grassroots groups such as the **Concord Climate Action Network (ConcordCAN!)**, **Mothers Out Front**, the **League of Women Voters**, **Carbon-Free Concord**, and citizen petitioners for the Town Meeting resolutions adopted. Concord is proud to have a strong community volunteer base, which will continue to be important in carrying out many of the actions and steps in this Climate Action and Resilience Plan.



Greenhouse Gas Emissions

Climate change is one of the most serious challenges of our time. To address Concord's contribution to climate change, we must reduce greenhouse gas emissions (GHG). Concord has set a goal of reducing GHG emissions 80% by 2050.

To ensure Concord meets the established GHG reduction targets, we must be clear on where we currently stand and what opportunities exist to reduce emissions. Concord conducted a baseline (2008) and an updated (2016) GHG inventory to understand how much the community is emitting and from what sectors and fuels. The two inventory years allow us to see trends and the impact of the actions during that 8 year period from 2008 to 2016. The GHG inventories follow international protocols for GHG accounting at the municipal and community levels and include the emissions that come from:



The burning of fossil fuels (oil and natural gas) to power, heat, and cool our buildings



Gasoline and diesel to drive our vehicles



Methane that is created from waste decomposing in the landfill



Treating our wastewater



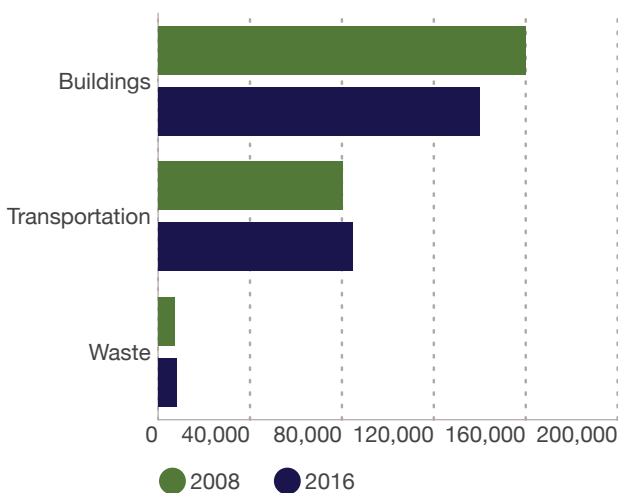
Pumping water to our homes and businesses

Concord's GHG emissions totaled:²

246,890 MTCO₂e in 2008

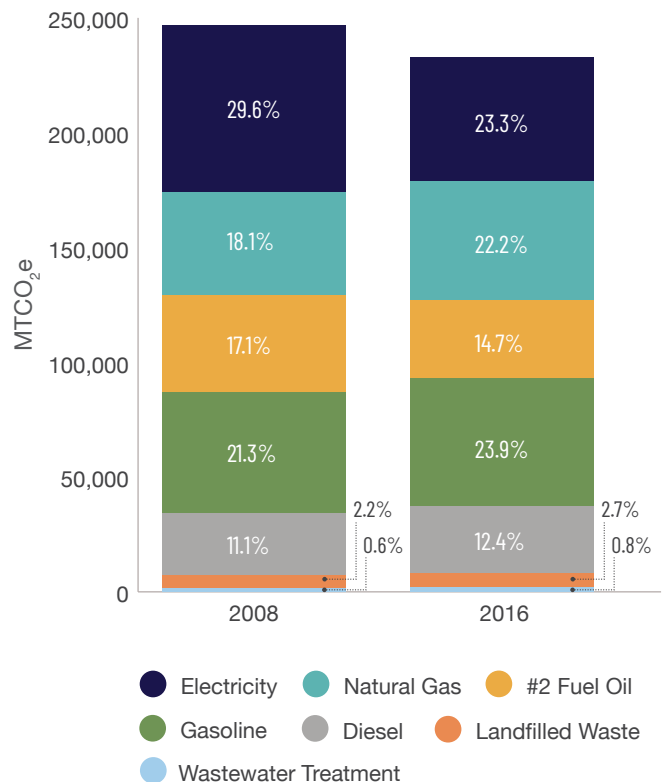
232,951 MTCO₂e in 2016

Emissions by Sector¹



source: Concord Community GHG Emissions (MTCO₂e) by Sector Over Time

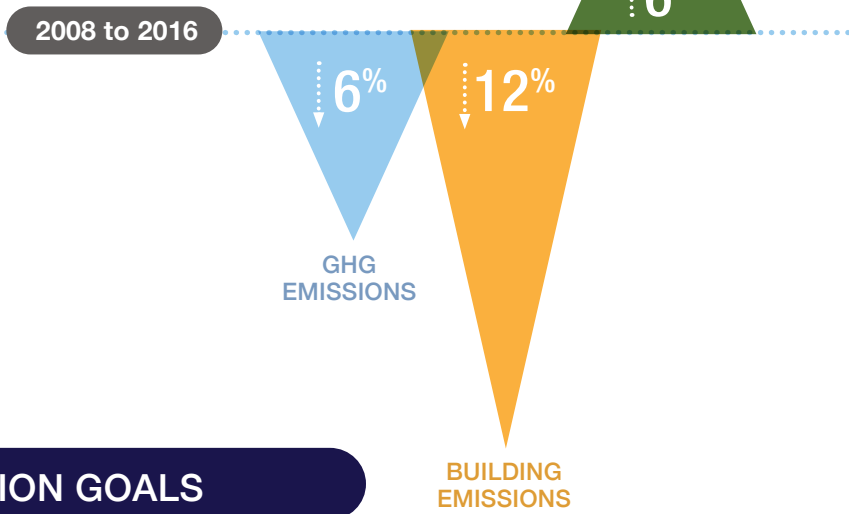
Concord's GHG Emissions By Source in MTCO₂e



GHG emissions from 2008 to 2016 are trending in the right direction – down – but Concord will have to take more significant action- and fast- to meet the 80% by 2050 reduction goal.

Total GHG emissions decreased 6% from 2008 to 2016 driven largely by an increase in renewable energy, a decrease in electricity use by the commercial sector, and more efficient energy use in homes.⁵

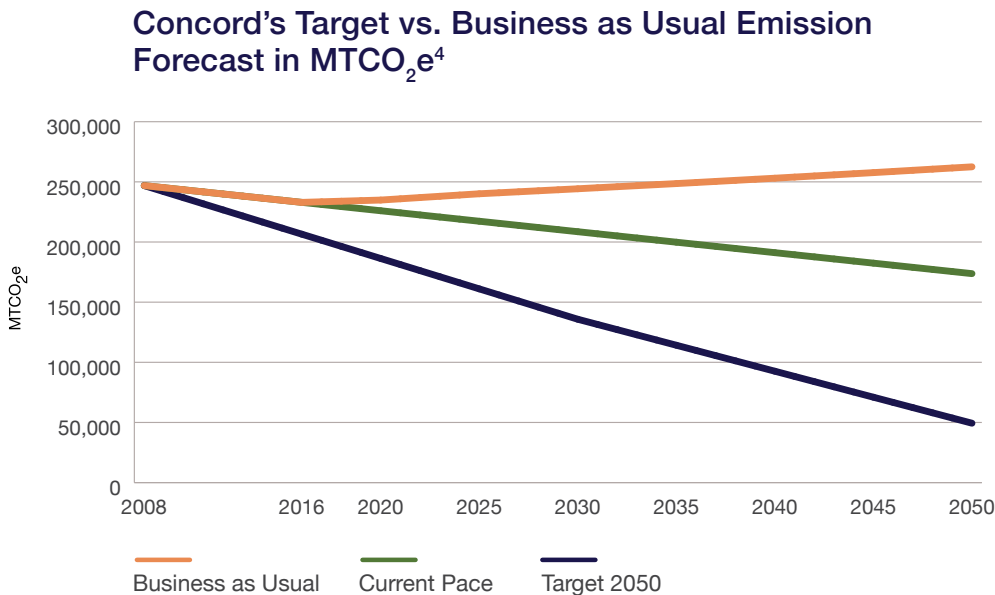
While total emissions decreased, **emissions from buildings dropped by 12% while emissions from transportation grew 6%.**⁶



PATH TO MEET OUR GHG REDUCTION GOALS

262,488 MTCO₂e is the forecasted 2050 emissions under the business as usual scenario.

49,378 MTCO₂e is the Town's target for 2050 emissions



In order to achieve Concord's goals the rate of emissions reductions will need to more than double.

1% actual annual reduction between 2008 and 2016

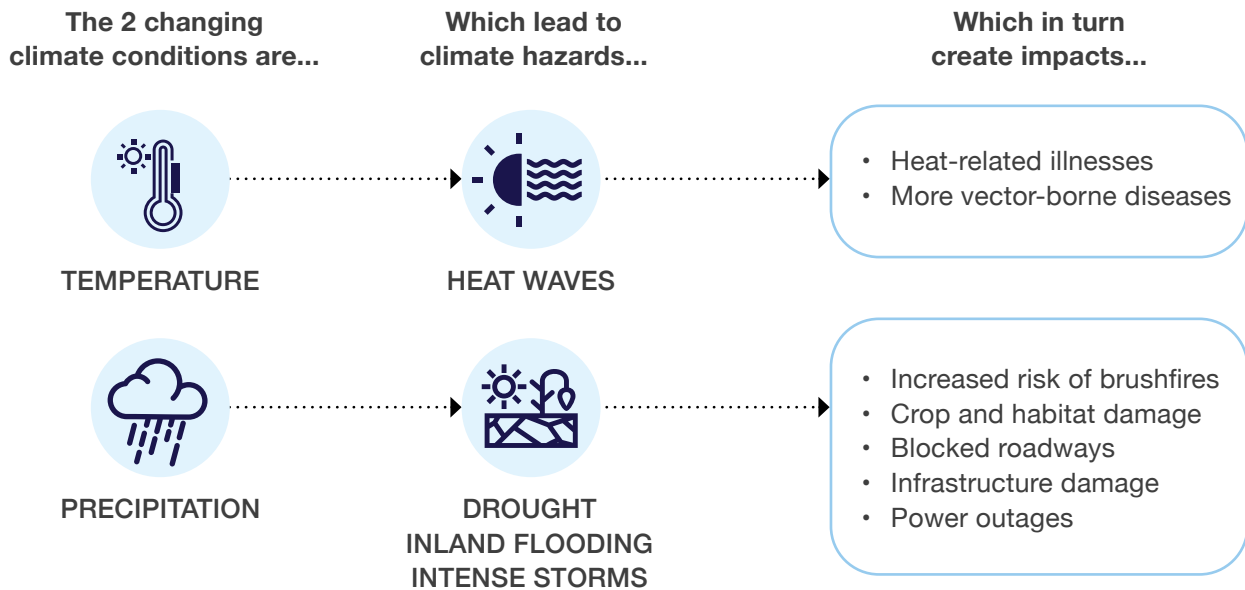
2.5% average annual emissions reduction needed to achieve **80% goal by 2050**

The Intergovernmental Panel on Climate Change (IPCC) says that a 45% reduction in global emissions by 2030 is required to avoid the worst impacts of climate change. Reductions become harder and harder to achieve and Concord may also have to overcome potential increases to emissions due to population and employment growth.³

3.5% average annual emissions reduction needed to achieve **45% reduction by 2030**, as recommended by the IPCC

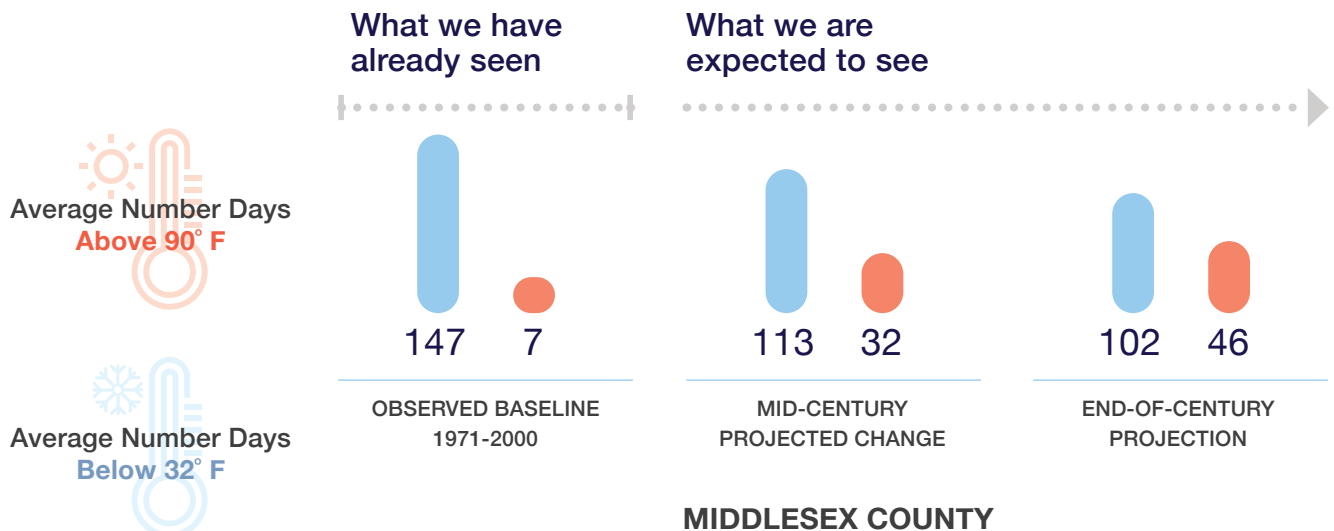
Climate Impacts

No matter how successful Concord is in reducing emissions, the community will also need to adapt to a changing climate. Decades of increasing global emissions have made climate impacts inevitable. Concord is already experiencing climate change in the form of increased flooding, droughts, heat, and intense storms, and can expect more.



Annual temperatures are rising and the frequency of extreme heat is increasing. This changes how we will experience every season here in Concord. Heat waves increase risk of heat-related deaths and illnesses and stress infrastructure. Higher average temperatures have significant impacts on ecosystems, biodiversity, and crop production, as well as increase likelihood of infectious diseases spread by insects like EEE (eastern equine encephalitis) as experienced in summer 2019. Increased heat can also result in more demand for energy required to maintain livable and comfortable temperatures in homes, schools, and workplaces, increasing costs and emissions.

TEMPERATURE⁷



PRECIPITATION

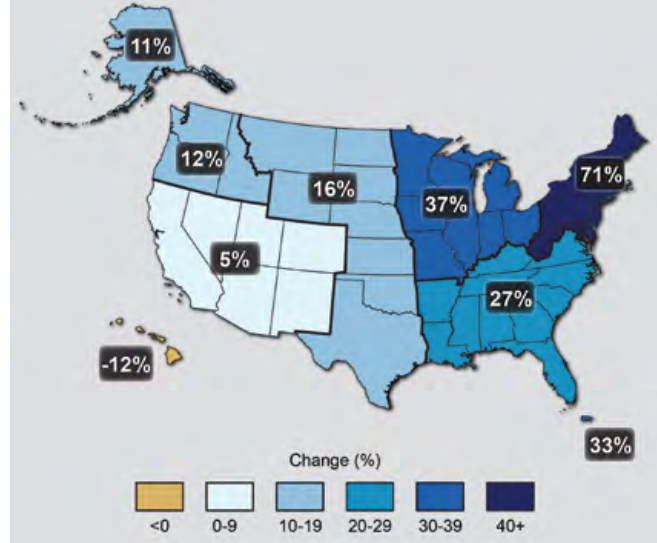
Concord will experience more **intense storms** with stronger winds, persistent winter cold spells, and heavier, moisture-filled snow. Downed trees and snow-packed or icy roads disrupt emergency management systems, delay commutes, damage private property, and slow the movement of goods, which hinders our local economy.

New England's most powerful storms now produce 71% more precipitation during their lifecycles than in 1958.⁸

An increase in intense rainfall events can overwhelm riverbanks and stormwater drainage systems causing flash **flooding** and damage to property and infrastructure. Powerful precipitation runoff can also impact the health of water systems and stress infrastructure like culverts and stormwater treatment. Runoff can result in greater nutrient loading in rivers and ponds, which when combined with warmer waterbody temperatures can cause algal blooms and fish kills.

Even though more annual precipitation is projected overall, it is anticipated to fall in fewer extreme events in the winter and spring rather than in smaller more regular events throughout the year resulting in increased potential for **drought** during the periods with no rainfall. Drought can stress the water supply and impact ecosystems and crop production altering the soil moisture and water depth that plants and animals rely on to flourish.

Climate projections tell us that changing temperatures and precipitation patterns have the potential for dramatic impacts on our community's natural resources, infrastructure, critical facilities, economy, and social services. The community can prepare for a changing climate by integrating climate projections across town planning and implementing actions that bolster resilience. Climate projections are uncertain so strategies should also be flexible and adaptable.

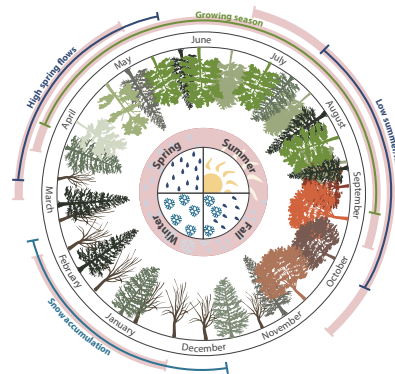


Observed increase in very heavy precipitation* from 1958 to 2012. (*the top 1% of storm totals)⁹



48 weeks

the longest duration of drought in MA since 2000 (June 2016–May 2017)¹⁰



Northeast and Midwest Seasonal Patterns¹¹

Shifted season projected from increasing temperatures and precipitation changes.

In 2018, Concord convened a group of stakeholders to participate in a community resilience planning workshop. Community members applied their expertise and experience to climate data and **identified three priority actions for community resilience.**

- ✓ Promote and highlight low impact development and green infrastructure
- ✓ Develop an integrated resource management plan for the town
- ✓ Prioritize an action plan for police/fire/DPW facilities located in the floodplain

Developing the Plan

Plan Advisors

Sustainable Concord was developed through a collaborative Town-wide effort that included Town staff, committee members, residents, businesses, volunteers, and members of the community.

Two groups served as primary advisors to the development of the Plan, the Climate Action Advisory Board and a municipal advisory team. Ten advisory group meetings were held from September 2019 through May 2020. Advisors also provided extensive input on draft documents and Plan materials.



Climate Action Advisory Board – Tasked with providing strategic direction on how Concord can achieve its mitigation and adaptation goals, Concord’s Climate Action Advisory Board includes members of the community with expertise in climate, energy, sustainability, and adaptation.



Municipal Team – The municipal advisory team includes municipal staff experts from departments and divisions including school department, water and sewer division, facilities management, public works, fire, police, natural resources, electric utility, communications, planning, and town management.

Plan Approach

The Plan drew upon previous planning efforts and reports as well as regional studies. We cast a wide net to collect potential climate actions including:

- Town and regional plans and reports
- High impact best practices from other communities
- Input from Plan advisors
- Ideas and insight from the community

With a long list of potential actions, the Plan advisors relied on four guiding principles to prioritize climate actions. The guiding principles represent Concord’s values and climate goals. Actions that had the potential for the highest impact in these areas became priority actions for this Climate Action and Resilience Plan.



EQUITY

Ensuring equitable access to services and opportunities



CULTURAL AND HISTORICAL CHARACTER

Preserving the history and culture that defines us



RESILIENCE

Improving everyone’s ability to adapt and thrive in the face of change



GHG REDUCTIONS

Reducing community-wide greenhouse gas emissions

Engaging Our Community

EVENT HIGHLIGHT

Concord Open House

Over 100 Concord residents, from youth to seniors, joined a December 2019 Open House at Concord-Carlisle High School. Participants shared their feedback on how to make Concord more resilient and sustainable and rotated between interactive stations. Town staff and volunteers tabled to share sustainability tips and resources.



100+
attendees at
community open
house

20+
social media
posts

**Have an idea
for climate
action?**



1
business resilience
open house

15
responses to
business
resilience
survey

3
presentations
at community
events

20+
ideas submitted
via online form

128
responses to 2
online surveys

8
one-on-one
stakeholder
interviews



Built Environment

GOAL: Concord’s buildings and solid waste system minimize GHG emissions and are resilient to a changing climate.

Climate Considerations

Buildings contribute 60% of community-wide GHG emissions. The way we operate our buildings and surrounding infrastructure also generates waste that contributes to a smaller, but not insignificant, portion of emissions. We can reduce emissions from the built environment by retrofitting existing buildings to be more energy-efficient and ensuring that new buildings are built to high efficiency standards that rely increasingly on renewable energy sources.



The improvements made to Orchard House are an example of how even historic buildings can implement energy and water saving projects. Orchard House has implemented geothermal pumps, LED lights, low-flow toilets, and paperless ticketing.

As our electricity sources shift to renewable sources, and our Concord Municipal Light Plant aims for 100% carbon-free electricity, it is also critical that our buildings are built or retrofitted for electric heating and cooling systems that can take advantage of the clean energy source.

Additionally, sustainable and efficient buildings are typically healthier and more resilient buildings. As Concord also prepares for the impacts of climate change, buildings that are designed for more passive heating and cooling and can generate on-site energy will be best equipped to withstand increasing pressures on the electric grid and more extreme weather impacts.



Actions to-date

- ✓ Concord adopted Massachusetts Stretch Energy Code
- ✓ Working toward a net zero energy design for new Concord Middle School
- ✓ CMLP provides rebates for efficient lighting, heat pumps, solar, and electric vehicles
- ✓ Participation in MassCEC HeatSmart program accelerated adoption of and raised awareness of climate benefits of air source and ground source heat pumps
- ✓ Emissions from buildings decreased 12% between 2008 and 2016
- ✓ A designated Green Community since 2013 and reduced energy consumption in municipal buildings by 13%
- ✓ Municipal buildings converted to efficient LED lighting
- ✓ Concord Public Works composts yard waste
- ✓ Concord has banned water bottles, plastic bags and polystyrene



Priority Actions

Concord had previously conducted an analysis of the GHG reduction potential of various strategies (see Appendix B). Based on that analysis, the installation of 3,000 air source heat pumps in Concord (a more efficient heating method that does not rely on natural gas or heating oil) could reduce total community wide emissions by approximately 4%. Additionally, more energy efficient buildings could reduce emissions by another 4.6%; both of these strategies' reduction potential being further amplified by a shift to carbon-free electricity. The prioritized actions in the table below will support Concord's efforts in realizing these, and potentially greater, GHG reduction benefits.

Prioritized Actions	GHG Reduction	Resilience
Increase electrification and improve energy efficiency of residential buildings.	⤴	⤴
Improve energy performance of commercial buildings.	⤴	⤴
Set progressive sustainability standards for new municipal buildings and schools and develop a phased plan for deep energy retrofits to existing town buildings.	⤴	⤴
Establish policies and incentives for new development to achieve high standards for sustainability and resilient design.	⤴	⤴
Create opportunities town wide to increase the waste diversion rate by 30%.	⤴	⤴

Contribution to Guiding Principles: Very Positive = ⤴ Positive = ⤴

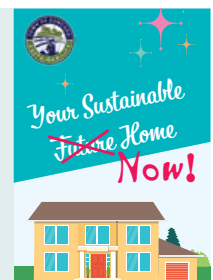
Indicators of Success

Our homes and buildings are the number one source of emissions in Concord. While we have made progress in this area, we still have much to do. Transforming our building sector to be all electric and include renewable energy is the key to success. Also, improvements in our waste diversion efforts will provide numerous community benefits, along with additional GHG reductions. We can use the indicators below to track our progress.

Indicator	Baseline Data	Baseline Year	2030 Target
Greenhouse gas emissions from the building sector ¹²	159,779 MTCO ₂ e 140,072 MTCO ₂ e	2008 2016	74,564 MTCO ₂ e
Energy use intensity (EUI) of residential/commercial sector ¹³	0.23 MMBtu/sq ft (commercial sector) 0.08 MMBtu/sq ft (residential sector)	2016	0.20 MMBtu/sq ft commercial 0.069 MMBtu/sq ft residential
Number of all-electric residential buildings ¹⁴	136 Residential	2017	1,650
Residential waste diversion rate ¹⁵	40% (residential)	2016	65%

Concord Best Practice: Your Sustainable Home Now!

CSEC and the Town have created a resource for making your home more sustainable NOW! The brochure available at www.concordma.gov/yoursustainablehome provides great tips on how to cut costs, waste, and emissions in your home today.





Energy

GOAL: Concord's electricity is 100% carbon-free, reliable, and affordable.

Climate Considerations

Electricity contributes 23% of 2016 community-wide greenhouse gas emissions. Concord Municipal Light Plant's (CMLP) purchase of renewable and carbon-free sources of electricity can significantly reduce emissions from the electricity sector and community-wide. Concord can also continue to install solar arrays in town to provide local, renewable, and distributed energy. Combined with energy storage options, local renewable energy sources also provide increased reliability in the case of extreme storms.



Actions to-date

- ✓ 54% of Concord's electricity was carbon-free in 2018
- ✓ Concord Municipal Light Plant (CMLP) ranked highly on climate scorecard from Massachusetts Climate Action Network
- ✓ CMLP offers rebates on energy efficient lighting, heat pumps, PV systems, home weatherization, and electric vehicle charging
- ✓ The Town has 5 large arrays in town, totaling 7.57 MW
- ✓ Over 350 homes and businesses have rooftop solar arrays totaling over 3.5 MW



Priority Actions

Based on an analysis of GHG reduction potential from various strategies (see Appendix B), shifting to zero carbon electricity has the potential to reduce community wide GHG emissions by nearly 23%, a reduction potential that could be further amplified with increased building electrification discussed in the Built Environment section. The prioritized actions in the table below will support Concord’s efforts in realizing these, and potentially greater, GHG reduction benefits.

Prioritized Actions	GHG Reduction	Resilience
Redesign electricity rates to support energy conservation, peak load management, electrification, and renewable energy generation.	⬆️	⊖
Provide incentives for businesses/homeowners to invest in renewable energy.	⬆️	⊖
Shift CMLP’s electricity supply to 100% carbon-free sources by 2030.	⬆️	⊖
Deploy utility-scale energy storage.	⬆️	⬆️

Contribution to Guiding Principles: Very Positive = ⬆️ Positive = ⬆️ Neutral = ⊖

Indicators of Success

How we generate electricity is a huge determinant in Concord’s ability to meet its climate action and resilience goals. With a municipal utility, we have an opportunity to accelerate the adoption of non-fossil fuel electricity generation and these indicators will help keep us on track. We can use the indicators below to track our progress.

Indicator	Baseline Data	Baseline Year	2030 Target
GHG Emissions from electricity generation ¹⁶	54,234 MTCO ₂ e	2016	0
Percent carbon-free electricity ¹⁷	54%	2018	100%
Total MW capacity of residential renewable generation installations in Concord ¹⁸	3.5 MW	2020	5.44 MW
Number of homes with rooftop solar ¹⁹	358	2020	558
Number of homes with battery storage ²⁰	9	2020	109
Total MW capacity of solar generation on town property ²¹	7.57 MW	2020	20 MW
Total MWh capacity of battery storage on town property ²²	0	2020	60MWh

Over 350 Concord homes and businesses have rooftop solar arrays totaling over 3.5 MW. Concord Municipal Light Plant offers generous rebates that allow for dozens of new local installations each year.





Mobility

GOAL: Everyone has access to zero carbon transportation options to commute and get around Concord.

Climate Considerations

Almost 40% of Concord's greenhouse gas emissions are the result of transportation, mostly from vehicles driven by Concord residents and businesses. Concord can reduce emissions from transportation by driving less, using shared and public transit, biking, walking, and driving electric vehicles.

Improving active and shared transit options improves equitable access to town centers and resources in Concord and in the region. Switching to an electric vehicle reduces total cost of ownership, impacts to local air quality, and GHG emissions.

Providing a mix of low-carbon vehicle and active transportation options also makes us more resilient to changes in fuel prices and provides alternative mobility options if economic, health, or climate impacts limit certain transportation options.

Driving electric today in Concord reduces emissions by over 50%! The Town is leading the charge by adding 4 new plug-in vehicles to the municipal fleet and converting 3 vehicles to hybrids in the last 2 years.



Actions to-date

- ✓ 400+ electric vehicles registered in Concord
- ✓ 5 electric vehicles in municipal fleet and 1 electric school bus
- ✓ 9 public electric vehicle charging stations
- ✓ One of the nation's first electric school buses deployed and still in operation in Concord
- ✓ Concord Public Works and Concord Municipal Light Plant using a fleet fuel management system to monitor fuel consumption, vehicle efficiency, and vehicle maintenance
- ✓ Complete Streets policy to increase safety and accessibility of streets to multimodal transportation options

Priority Actions

Based on an analysis of GHG reduction potential from various strategies (see Appendix B), improving vehicle efficiency and increasing adoption of electric vehicles can reduce community wide GHG emissions by 6-12%. The prioritized actions in the table below will support Concord's efforts in realizing these, and potentially greater, GHG reduction benefits.

Prioritized Actions	GHG Reduction	Resilience
Increase use of public transportation and other low-carbon and no-carbon transportation options.	⤴	⤴
Accelerate adoption of electric vehicles.	⤴	⤴
Implement a long-term plan to electrify school and municipal vehicle fleets.	⤴	⤴
Improve availability, accessibility, and connections between bicycling and walking paths and sidewalks.	⤴	⤴

Contribution to Guiding Principles: Very Positive = ⤴ Positive = ⤴

Indicators of Success

How we get around is the second highest source of emissions and represents a great opportunity for climate action. Our individual options and decisions on how we commute to work and get around town impact that. For those that can avoid driving alone to work, we encourage you to do so. For those that cannot, the shift to an electric vehicle will be essential for Concord to meet its GHG reduction targets. We can use the indicators below to track our progress.

Indicator	Baseline Data	Baseline Year	2030 Target
Greenhouse gas emissions from the transportation sector ²³	84,754 MTCO ₂ e	2016	46,500 MTCO ₂ E
Number of registered electric vehicles (BEV & PHEV) ²⁴	425	2020	7,920
Percent of commuters who take public transit to work ²⁵	8%	2016	16%
Percent of commuters who walk to work ²⁶	5%	2016	10%
Percent of commuters who bike to work ²⁷	0.6%	2016	2%
Percent of commuters who drive alone to work ²⁸	70%	2016	50%
Community vehicle miles traveled (VMT) ²⁹	141,321,246	2016	100,943,747

Concord Best Practice: Electric Vehicle Ride & Drive Event

A November 2019 electric vehicle ride and drive event drew hundreds of residents interested in driving electric. Over 130 test drives were taken that day!





Natural Resources

GOAL: Concord's natural resources are enhanced and supported to provide resilience benefits to the community and to maximize biodiversity and carbon sequestration.

Climate Considerations

Concord's natural resources are a critical part of the town character and provide resilience benefits including stormwater mitigation, reduced heat island effect, and improved water quality. Additionally, trees, wetlands, and other vegetation help to absorb and sequester carbon and improve air quality.



Tree canopy includes trees in our “urban” environment, including trees along the street and on public and private property.

Climate change will impact local wildlife, forests, tree canopy, wetlands, and water supply. Protecting and enhancing the ability of natural resources to adapt will help to maintain town character and make Concord more resilient to climate impacts like extreme heat and changing precipitation patterns. Protecting waterways from pollution in stormwater runoff and conserving water also means less energy required to treat and transport that water.

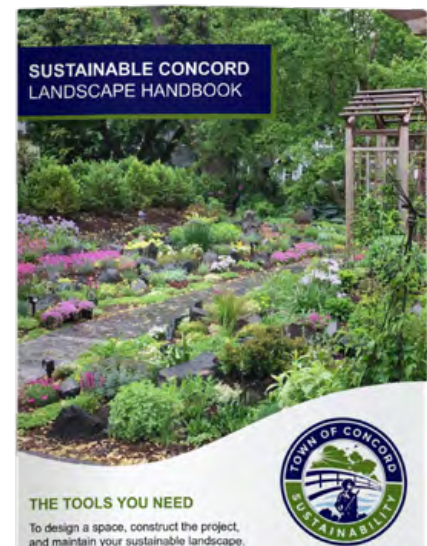
Forests include trees in densely forested areas on conservation land and land managed by land trusts.



Concord Best Practice: Sustainable Landscape Handbook

In 2019, the Town of Concord worked with experts to develop a user-friendly sustainable landscape handbook to help community members create, install, and care for landscape in a more sustainable way. The way in which we manage our landscape impacts our water supply, water quality, biodiversity, energy consumption, and soil health. Sustainable landscaping is a win-win solution for our community and our natural resources because it:

- Increases biodiversity
- Reduces demand on our limited water supply
- Improves water quality
- Mitigates flash flooding
- Increases resiliency to drought
- Reduces energy consumption and maintenance needs
- Enhances ground water recharge and reduced runoff during storms



[Get the guide online](#)

Priority Actions

Those actions that can directly enhance resilience while also reducing GHG emissions are particularly valuable to Concord's climate action efforts. The prioritized actions in the table below will support Concord's efforts in realizing these, and potentially greater, GHG reduction benefits.

Prioritized Actions	GHG Reduction	Resilience
Develop forest management plan to enhance health of Concord's forests.	⬆️	⬆️⬆️
Increase indoor and outdoor water conservation.	⬆️	⬆️
Work with homeowners to promote sustainable landscaping practices.	⬆️	⬆️
Assess the vulnerability of natural resources most at risk to projected climate changes.	⬆️	⬆️⬆️
Assess and improve Concord's tree canopy.	⬆️	⬆️⬆️

Contribution to Guiding Principles: Very Positive = ⬆️⬆️ Positive = ⬆️

Indicators of Success

Concord is unique in already having a healthy and robust tree canopy, so much of the effort in this area will be to protect these existing natural assets and slowly expand them over time. Successful implementation of the priority actions will help to realize these targets. Residential water consumption is another area that needs to be addressed, Concord uses more than 10% more water per person per day than the Middlesex County average. While our proposed target may appear to be a small decrease, it represents an annual savings of nearly 10 million gallons of water. We can use the indicators below to track our progress.

Indicator	Baseline Data	Baseline Year	2030 Target
Residential per capita water consumption (gpd) ³⁰	66.5	2020	65
Percent tree canopy coverage ³¹	58%	2016	60%
Percent of public tree planting sites occupied ³²	90%	2017	95%
Forest Management Plan created	No	2020	Yes



Actions to-date

- ✔️ 30% of Concord's open space is protected from development
- ✔️ Five wildlife underpasses exist along Route 2
- ✔️ Concord Public Works provides water conservation audits and rebates for homeowners
- ✔️ Town TreeKeeper map displays inventory and health of street trees
- ✔️ Natural Resources Division hosts monthly "Conservation Coffees"
- ✔️ 2019 Sustainable Landscaping Fair hosted by CSEC drew 150+ attendees
- ✔️ Concord's Sustainable Landscaping Handbook released in 2019
- ✔️ Tree Preservation Bylaw passed at 2017 Town Meeting



Preparedness

GOAL: Concord's critical infrastructure is designed to reduce emissions and be prepared for projected climate impacts.

Climate Considerations

Concord has already experienced impacts associated with climate change, such as high heat days, extreme storms and flooding. While our vast natural resources help minimize how these impacts affect us, we still need to ensure Concord's electricity, water, sewer, stormwater systems, and emergency facilities are resilient and can continue to provide valuable services to the community.



Potential Design Strategies

Concord worked with consultant team member, ONE Architecture, to understand the climate risks to Concord's town centers. Local businesses were surveyed and interviewed about risks and concerns related to climate change. The result is a best practice guide of recommendations for protecting commercial buildings, including historic structures. Sample actions are listed below. The full report can be found in Appendix D.

- Floodproof basements and relocate important building systems above ground level
- Install reflective surfaces or green roofs to mitigate heat island effect
- Implement green infrastructure such as bioswales and rain gardens to mitigate stormwater and flooding

Concord Best Practice: Green Infrastructure

Rain gardens like the one at Junction Park in Concord collect rainwater and allow it to infiltrate into the ground instead of running off the surface.



Priority Actions

Those actions that can directly enhance resilience while also reducing GHG emissions are particularly valuable to Concord’s climate action efforts. The prioritized actions in the table below will support Concord’s efforts in realizing these, and potentially greater, GHG reduction benefits.

Prioritized Actions	GHG Reduction	Resilience
Develop an integrated water resource management plan.	⊖	⊕
Conduct a threat assessment for Concord's critical infrastructure.	⊖	⊕
Update stormwater regulations and create a stormwater utility.	⊖	⊕
Increase the use of green infrastructure and low impact development.	⊕	⊕

Contribution to Guiding Principles: Very Positive = ⊕ Positive = ⊖ Neutral = ⊖

Indicators of Success

While Concord’s abundance of natural areas has helped us be resilient to some extent, we do need to continue to enhance that resilience by assessing our infrastructure and natural systems’ abilities to adapt to further changes that are consequences of a changing climate. We can use the indicators below to track our progress.

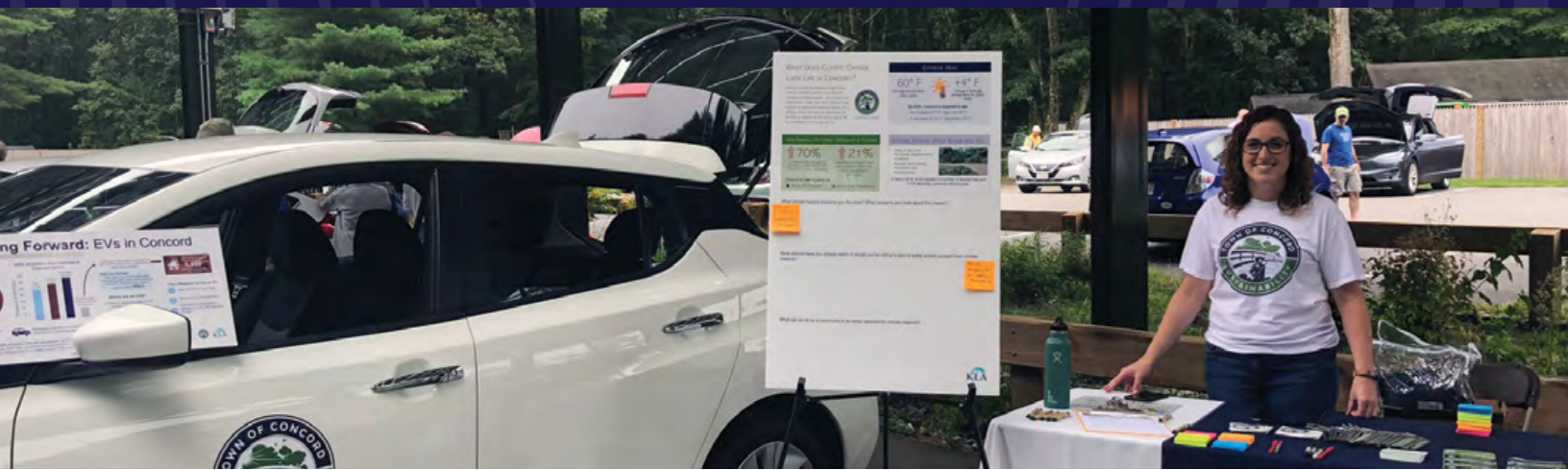
Indicator	Baseline Data	Baseline Year	2030 Target
Percent pervious surface ³³	90.7%	2016	92%
Completed Water Resource Management Plan	No	2020	Yes
Created stormwater utility	No	2020	Yes
Conduct Vulnerability Assessment of Critical Infrastructure	No	2020	Yes



Actions to-date

- ✓ Directly engaged nearly 500 people in the Municipal Vulnerability Preparedness Program
- ✓ Identified critical infrastructure in floodplains
- ✓ Water and Sewer Division manages and monitors water quality
- ✓ Integrate green infrastructure into municipal projects through elements such as rain gardens

Implementation Plan: Leadership on Climate Action



The Town recognizes that truly effective climate leadership will require that sustainability is integrated into daily operations, decision-making, and planning. It calls for a culture of climate change awareness and understanding.

For these reasons, Concord has identified 3 cross-cutting priorities for leadership:



Governance

Integrate sustainability goals, metrics, and evaluation criteria into Town planning, including staff and department evaluations and budgeting.



Education

Work with educators, parents, students, the School Department, and the State to bring climate education curricula into schools and student activities.



Social Resilience

Prepare businesses, residents, and agriculture for the impacts of climate change through education and climate preparedness planning.

Governance

Integrate sustainability goals, metrics, and evaluation criteria into Town planning, including staff and department evaluations and budgeting.

Under leadership of the Town Manager's Office and the Sustainability Division, the Town will review and update existing administrative policies related to purchasing and procurement to include sustainability and climate resilience considerations. Similarly, they will undertake a review of the Town's capital planning process to establish a decision-making framework, building off this Plan's guiding principles and evaluation framework, that considers sustainability and resiliency standards and guidelines. This could result in development of a sustainability and resiliency checklist for capital projects. Comprehensive economic analysis will require considering avoided costs and valuing resilience and public health benefits to climate action. The Town will also need to put in place standard educational and awareness-raising elements into its staff onboarding and ongoing training for existing staff.



Action to-date

- New hires are briefed on sustainability goals and practices
- Fuel efficient vehicle policy prioritizes fuel efficiency and requires sustainability approval
- Town House staff are composting food waste



Climate Action Advisory Board Meeting

Education

Work with educators, parents, students, the School Department, and the State to bring climate education curricula into schools and student activities.

A resilient future depends on its future workforce and community leaders understanding climate change and the role that we each have to play in mitigating our contributions and preparing ourselves which allows Concord to thrive for decades to come. That understanding must begin in our education system. The Town will work collaboratively with the education community to further integrate sustainability into lessons and curriculum planning. Volunteers and Town staff will continue to integrate sustainability topics into extracurricular activities and provide climate-related volunteer opportunities, service learning, and internships/apprenticeships.

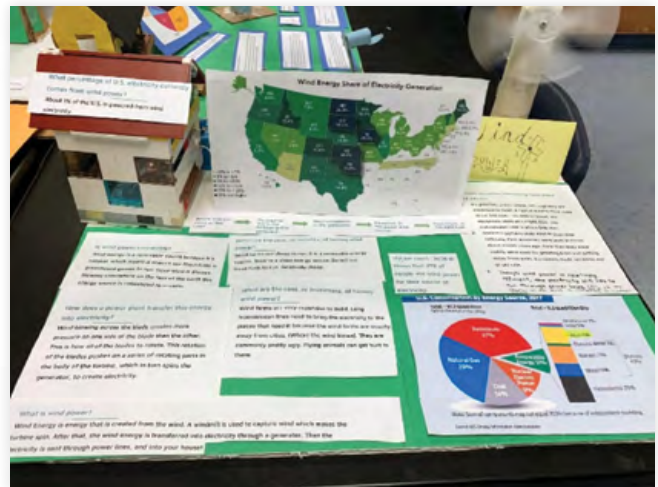


Action to-date

Concord students learn about sustainability through their built environment, classroom and school operational practices, and in lessons in grades K-12.

- Outdoor classrooms and gardens
- Classroom recycling and waste reduction
- Composting in cafeterias
- Reusable trays and utensils in dining halls

Beginning in Fall 2020 all 9th grade students will take a newly designed earth science course focused on sustainability called Planet Earth.



(L) Students designing a device to keep garbage out of the oceans and (R) 7th grade “Energy Shack” project where students research energy sources and build working models

Implementation Plan: Leadership on Climate Action



Social Resilience

Prepare businesses and residents for the impacts of climate change through education and climate preparedness planning.

The COVID-19 pandemic and subsequent impacts to our community have emphasized the importance of preparedness. Whether it is a global pandemic, extreme heat emergencies, or a storm event, the Concord community must prepare itself for natural, infrastructural, social, and economic impacts. Equity is an especially important consideration in planning for resilience as climate shocks often more significantly impact our most vulnerable. This begins with education and proceeds with taking actions to better prepare ourselves. Concord will need to work with businesses, farmers, and residents to share information on climate risks and best practices for enhancing our resiliency, such as:

- Investing in upgrades to buildings and infrastructure to protect from flooding and storm impacts
- Upgrading and backing up energy systems to reduce downtime
- Encouraging businesses to have emergency response and communications plans in place
- Collaborating with local farmers to prepare for changing climate conditions
- Preparing your home and family for emergencies – have preparedness kits, and essential supplies.

Implementation Plan: Next Steps

Climate change is a complex problem with many solutions. In developing this plan, the community and advisory groups identified many ideas, actions, and programs that could be studied further, included in plan updates, and/or explored and advanced by groups in partnership with the Town. We continue to welcome ideas for climate action. Community members can submit ideas at concordma.gov/sustainability.

Climate change is a global issue and cannot be solved by Concord alone, so Concord will continue to advocate for state policies that align with the town's commitments to climate action.

Implementation

The previous pages lay out the urgency to take action on climate and the 22 priority actions that Concord is committed to taking over the next 5 years. The implementation blueprints that follow outline how Concord will move these priorities forward.

A blueprint for each action indicates a champion who will lead the work, implementation steps with timeframes and key partners, as well as details about tradeoffs, equity considerations, potential financing mechanisms, tracking success, and engaging the community.

Accountability

The Sustainability Division, within the Town Manager's Office, will be responsible for overseeing implementation of the plan. This plan will not live on a shelf, but in Concord's day-to-day actions. The Town will report on progress and make updates including:

- Annual report on implementation status of 22 actions (Sustainability Division)
- Annual update to metrics (Sustainability Division and municipal advisory team)
- Annual review by the Climate Action Advisory Board
- 5-year full plan review and update

Immediate Next Steps

The Climate Action and Resilience Plan lays out Concord's priorities for climate action over the next 5 years. The advisory groups identified immediate next steps that will be necessary in the next 6-12 months to move the plan forward from vision to implementation:

- Further understand the recommended priority actions' implementation costs, economic benefits, and possible financing mechanisms
- Further understand the potential emissions reductions of the different priority actions
- Identify the actions that deserve the greatest near-term attention in terms of time and financial resources
- Further review and update of 2030 targets
- Community engagement plan to raise awareness and inspire individual action on climate



Action Implementation Blueprints



ACTION NAME

Increase electrification and improve energy efficiency of residential buildings.

DESCRIPTION OF ACTION

Residential buildings contribute 30% of GHG emissions in Concord. Reducing emissions by improving energy efficiency and electrifying heating and cooling in homes will be critical to achieving GHG goals. Efficient homes are also more resilient to extreme weather and a changing climate.

Programs, financial incentives, and education campaigns will enable residents to improve the energy efficiency in their homes and transition to electric heat pumps for heating and cooling.

CHAMPION

Concord Municipal Light Plant (CMLP) and Sustainability Division

IMPLEMENTATION STEPS

PLANNING CONSIDERATIONS

TIME FRAME

KEY PARTNERS

1. Explore and provide streamlined pathways for residents to go from audit to action, such as:

- a. Providing and following up on home energy assessments
- b. Heating/Cooling Coaching services
- c. Energy advisor services to assist residents in following through on home energy assessments
- d. Lists of participating contractors familiar with Concord programs and incentives
- e. Facilitating creative financing mechanisms such as on-bill financing, revolving loan funds, third-party financing, zero-interest loans, etc.

2021-2025

- Comprehensive Sustainability and Energy Committee (CSEC)
- CMLP
- CAAB
- Residents
- Multifamily property owners
- Financial institutions
- Built environment professionals
- Energy New England
- Mass Save
- HeatSmart Alliance

2. Promote and provide education on home energy assessments, home energy efficiency improvements, and electrification through activities, such as:

- a. "Your Sustainable Home Now!" materials designed by CSEC for residents
- b. Materials designed for new residents
- c. Up-to-date and interactive resources on the Town website
- d. Mailed materials
- e. Video testimonials, interviews, and presentations
- f. Tabling at local events
- g. Hosting events designed for homeowners, multifamily property residents or owners, and/or energy professionals
- h. Partnering with schools

2021-2025

- CSEC
- Sustainability Division
- CMLP
- CAAB
- Residents
- Multifamily property owners
- Built environment professionals
- Community organizations (congregations, schools, grassroots)
- Schools

3. Explore potential for time of sale energy assessment requirement and report out on pros/cons, costs/benefits, and recommendation to implement in Concord.

- a. Understand experiences of communities piloting policies
- b. Engage with external stakeholder groups on pros/cons and costs to implement
- c. Engage with state to evaluate potential for state-wide policy

2022-2025

- CAAB
- Sustainability Division
- CMLP
- Residents

Increase electrification and improve energy efficiency of residential buildings.



FINANCING RESOURCES AND MECHANISMS

Residential incentives and rebates:

- [Mass Save](#)
- [CMLP Rebates](#)
- [MassCEC](#)
- [Mass Solar Loan](#)
- [Performance Contracting](#) with an Energy Services Company (ESCO) – [performance contracting](#) will be a viable option for multifamily properties and can be configured for both owner- and tenant-paid utility models.
- [Database of State Incentives for Renewables & Efficiency \(DSIRE\)](#)

TRADEOFFS (CHALLENGES/BARRIERS)

- Upfront technology costs may be significant, even after incentives.
- Homeowners may not be incentivized to make upgrades if the payback is longer than their intended ownership timeline.
- Technology knowledge, particularly with air source heat pumps and advanced building envelope improvements may be limited.
- The process of selecting among multiple heat pump equipment, envelop improvement, and installer options can be confusing and complex.

EQUITY CONSIDERATIONS

- Continue to provide enhanced incentives for low- and moderate-income residents.
- Ensure that educational materials and programs are designed to not only include homeowners, but also renters, multifamily dwelling residents, etc.
- Split incentive issues may arise where commercial and multifamily property owners are not incentivized to upgrade buildings where tenants pay utilities.

TRACKING SUCCESS

Outputs:

- Increase in local knowledge of building energy efficiency and electric heating and cooling technologies, reduction in energy use intensity of existing buildings.
- Increased adoption of heat pumps and building envelope improvements.

Outcomes:

- Reduced GHG emissions from residential buildings
- Reduced energy use intensity (EUI) in buildings
- Improved indoor environmental quality
- Enhanced energy resilience

ENGAGING THE COMMUNITY

- Success in this action will depend on a broad and effective community engagement approach. This will involve multiple stakeholders including town departments, schools, community groups, and volunteers. It will require reaching new audiences. Community engagement should also be coordinated with engagement on other climate and sustainability topics.
- The Comprehensive Sustainability and Energy Committee (CSEC)'s charge is to engage the community on sustainability initiatives. They have had great success in promoting heat pumps, sustainable landscaping, weatherization, and other sustainability measures. They will be an important stakeholder in engaging the community.

Action Implementation Blueprints



ACTION NAME

Improve energy performance of commercial buildings.

DESCRIPTION OF ACTION

Commercial buildings contribute 30% of Concord’s GHG emissions. Significant reductions in emissions from existing buildings will be critical to achieving GHG goals. Educational and pilot programs, incentives, and policy mechanisms will help to improve energy performance in commercial buildings through efficiency, renewable energy generation, energy storage, electrification, and demand response to achieve high-performance building standards in existing buildings.

CHAMPION

CMLP and Sustainability Division

IMPLEMENTATION STEPS

PLANNING CONSIDERATIONS

TIME FRAME

KEY PARTNERS

1. Research, design, and develop pilot program for energy performance disclosure for existing commercial buildings.
 - a. Look at barriers, such as cost, to commercial energy audits and implementing recommendations.
 - b. Evaluate existing data on commercial building energy consumption and request additional data from commercial building owners.
 - c. Engage stakeholders and develop pilot commercial energy disclosure program with performance goals and participation targets.
 - d. Launch pilot program and provide resources and support to pilot participants on how to improve energy performance energy consumption.
 - e. Evaluate results of pilot program.

2021-2023

- CMLP
- CAAB
- CSEC
- Property owners
- Commercial tenants
- Energy services professionals
- Builders and contractors
- Town Building & Inspections Department
- Mass Save
- [MA Zero Net Energy Buildings Task Force](#)

2. Coordinate education, outreach and technical resources for commercial property owners and tenants, which could include:
 - a. Business sustainability roundtables
 - b. Frequent communications about incentives available
 - c. Presentations from energy professionals
 - d. Online platform for sharing of best practices
 - e. Green business certification or award program

2021-2025

- Sustainability Division
- CMLP
- Mass Save
- Local business groups
- Property owners
- Commercial tenants
- Energy services professionals
- Builders and contractors
- DPLM

3. Evaluate policy options for commercial buildings, including:
 - a. Expand pilot program for disclosure
 - b. Report back to community on recommended policy or policies
 - c. Draft policy documents and develop stakeholder engagement plan

2023-2025

- Property owners
- CAAB
- Commercial tenants
- Energy services professionals
- Builders and contractors
- Building Department
- CMLP

Improve energy performance of commercial buildings.



FINANCING RESOURCES AND MECHANISMS

- [CMLP/National Grid – commercial energy audit incentives](#)
- [Mass Save](#)
- [PACE financing](#)
- [SMART](#)
- [MassCEC](#)
- [CMLP](#)
- [Performance Contracting](#) with an Energy Services Company (ESCO)
- [MA Office of Technical Assistance and Technology](#) - provides free, confidential, onsite technical assistance to Massachusetts manufacturers, businesses, and institutions

TRADEOFFS (CHALLENGES/BARRIERS)

- Costs of energy assessments and upfront costs for energy efficiency improvements
- Will require engaging multiple stakeholders

EQUITY CONSIDERATIONS

- Split incentive issues may arise where commercial and multifamily property owners are not incentivized to upgrade buildings where tenants pay utilities

TRACKING SUCCESS

Outputs:

- Increase in local knowledge of ZNE and renewable energy technologies and practices, reduction in energy use intensity of new buildings
- Strengthened relationships with commercial property owners

Outcomes:

- Reduced GHG emissions
- Reduced energy demand
- Improved indoor environmental quality
- Enhanced energy resilience

ENGAGING THE COMMUNITY

- Success in this action will depend on effectively engaging the business community. Working with business groups will be important as well as working with the private schools. Community engagement should also be coordinated with engagement on other climate and sustainability topics.
- The Comprehensive Sustainability and Energy Committee (CSEC)'s charge is to engage the community on sustainability initiatives. Their success in engaging residents could be leveraged to engage businesses.

Action Implementation Blueprints



ACTION NAME

Set progressive sustainability standards for new municipal buildings and schools and develop a phased plan for deep energy retrofits to existing town buildings.

DESCRIPTION OF ACTION

Concord can lead by example by reducing emissions from municipal buildings. Policies and planning will enable new municipal and school buildings to achieve high sustainability standards including net zero energy, all-electric, and resilient design. A zero net energy building is an energy-efficient building that generates as much renewable energy as it uses annually. Developing a plan to complete deep energy retrofits including electrification and renewable energy to existing municipal and school buildings will put Concord on track to achieve 50% emissions reduction in the municipal sector by 2040.

CHAMPION

Sustainability Division, Facilities Division, and Schools

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
<p>1. Update Town's Municipal Energy Reduction Plan</p> <ol style="list-style-type: none"> Gather town staff to create a task force responsible for facilitating energy performance improvements to existing buildings. Perform portfolio wide energy efficiency assessment/audit, including inventory of equipment and building envelope status. Update the municipal energy reduction plan required by Green Communities using the updated building energy audits and energy analysis. Municipal energy reduction plan should indicate top priorities for energy reduction with priority on electrification. 	2020-2022	<ul style="list-style-type: none"> Town Facilities Division Sustainability Division School administration Senior Management Team Energy services consultants Mass Save and National Grid CMLP DOER-Green Communities
<p>2. Make public pledge to lead by example and achieve high sustainability standards in all new construction of town facilities, including zero net energy (ZNE).</p> <ol style="list-style-type: none"> Agree on standards for new construction. Set date for when requirements go into effect. Consider setting standards for major renovation. 	2021-2024	<ul style="list-style-type: none"> Climate Action Advisory Board CSEC Town Manager Select Board
<p>3. Use Municipal Energy Reduction plan to develop capital improvement plan for town facilities.</p> <ol style="list-style-type: none"> Evaluate costs for energy efficiency and electrification improvements. Work with a phased approach, as funds become available and needs are addressed in order of priority (energy use reduced per dollar spent). Develop sustainability checklist for all capital planning projects to integrate sustainability. Develop plan for solar PV and storage (as appropriate) for existing municipal buildings and facilities. 	2020-2024	<ul style="list-style-type: none"> Building operators Energy manager School administration Finance committee CMLP

Set progressive sustainability standards for new municipal buildings and schools and develop a phased plan for deep energy retrofits to existing town buildings.



FINANCING RESOURCES AND MECHANISMS

- [MAPC Technical Support](#)
- [MA DOER Green Communities Grants](#)
- [Mass Save](#) and National Grid rebates
- CMLP rebates and incentives for electric measures
- [Performance Contracting](#) with an Energy Services Company (ESCO)

TRADEOFFS (CHALLENGES/BARRIERS)

- For existing buildings, up-front costs may be significant for retrofits
- Some town facilities are historic and/or in historic districts
- Grants available but have specific timelines for implementation and cost share
- Procurement process requires low bidder

EQUITY CONSIDERATIONS

- Town may use phased approach and take advantage of grants and incentives to ensure best use of taxpayer funds.

TRACKING SUCCESS

- Outputs:
 - Updated Municipal Energy Reduction Plan
 - ZNE policy for new buildings
- Outcomes:
 - Reduced GHG emissions
 - Reduced energy use intensity (EUI) of buildings
 - Improved indoor environmental quality
 - More resilient community

ENGAGING THE COMMUNITY

- Town can lead by example and share successes in energy reduction with community.
- Community groups and committees should be engaged to help bolster public support for setting a municipal target. In particular, CSEC who has experience working on municipal energy efficiency projects through Green Communities.

Action Implementation Blueprints



ACTION NAME

Establish policies and incentives for new development to achieve high standards for sustainability and resilient design.

DESCRIPTION OF ACTION

Buildings in total contribute the majority of Concord's GHG emissions. Policy mechanisms, incentives, and resources will help to achieve sustainability and resilient design standards in new construction and development.

CHAMPION

Climate Action Advisory Board (CAAB) and Sustainability Division

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
<p>1. Engage stakeholders and conduct research to understand options for local policy mechanisms available to Town to influence new development, such as updating current bylaws or developing new ordinances.</p> <p>a. Engage with state agencies and legislators to stay up-to-date on progress at state-level for building code and other policies designed for new buildings, and understand opportunities to advocate for progressive policies.</p> <p>b. Engage with builders and developers to understand barriers to designing and building net zero, resilient, energy efficient homes.</p> <p>c. Highlight examples of new construction that demonstrates high standards for sustainability and resilient design.</p> <p>d. Leverage existing expertise from building sustainability entities such as Passive House Institute US and National Renewable Energy Laboratory.</p>	<p>2020-2022</p>	<ul style="list-style-type: none"> • CAAB • Sustainability Division • Department of Planning and Land Management • CSEC • Planning Board • Zoning Board of Appeals • Building and Inspections • State agencies • New Buildings Institute • Institute for Market Transformation • Northeast Sustainable Energy Association (NESEA) • Community organizations
<p>2. Recommend preferred policy options, draft policies, engage stakeholders, and adopt policies. Implement town-wide outreach and awareness campaign, including industry training and education, collaborating with regionally where possible.</p>	<p>2021-2025</p>	<ul style="list-style-type: none"> • CAAB • CSEC • DPLM • Developers • Property owners • Architects • Planning Board • Zoning Board of Appeals • Building and Inspections • Regional partners
<p>3. Develop options for new construction incentives such as technical support or permitting incentives.</p>	<p>2021-2025</p>	<ul style="list-style-type: none"> • CSEC • CAAB • Developers • Property owners • Financing entities • Regional partners
<p>4. Advocate at state-level for improvements to state building code and/or other policies that will allow Town to have more influence over standards of new construction.</p>	<p>2021-2025+</p>	<ul style="list-style-type: none"> • Sustainability Division • CAAB • CSEC • Select Board • Town Manager • Community groups • Regional groups

Establish policies and incentives for new development to achieve high standards for sustainability and resilient design.



FINANCING RESOURCES AND MECHANISMS

- State grants may be available to help draft policies
- CMLP rebates and incentives for electric measures
- Performance Contracting with an Energy Services Company (ESCO)

TRADEOFFS (CHALLENGES/BARRIERS)

- Developers and others may raise concerns about feasibility and costs.
- Siloed stakeholders – partitions exist between renewable energy, storage, demand response, and construction.
- Technology costs – stakeholders may raise objections and concerns about upfront costs.
- Also, may need to introduce internal carbon pricing to more accurately value emission reduction benefits.

EQUITY CONSIDERATIONS

- Highly energy efficient buildings benefit occupants because they are more affordable to operate, comfortable, have better indoor air quality, and are more resilient. Provides new opportunities for job/skills training and workforce development.
- Increases the value of homes and commercial buildings.

TRACKING SUCCESS

Outputs:

- Financial incentive mechanisms
- Education and awareness program
- New policies

Outcomes:

- Reduced GHG emissions
- Enhanced building resiliency
- Increased renewable energy generation/capacity
- Reduced energy use intensity (EUI) in new buildings

ENGAGING THE COMMUNITY

- Town can lead by example by developing new town buildings with high sustainability and resilient design standards.
- Engaging the building community and understanding concerns and barriers will be critical to success.
- Community groups and committees should be engaged to help bolster public support for new policies.

Action Implementation Blueprints



ACTION NAME

Create opportunities town wide to increase the waste diversion rate by 30%.

DESCRIPTION OF ACTION	Waste from Concord residents and businesses contribute to community-wide GHG emissions. Develop programs to reduce waste produced, including hard-to-recycle items, and increase waste diverted via reuse, recycling, organics collection/composting methods.	
CHAMPION	Concord Public Works	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Inventory Concord’s current waste stream and current hauling practices, research best practices research on waste diversion program, and develop plan to increase waste diversion by 30%.	2020-2022	<ul style="list-style-type: none"> • Public Works • MA Department of Environmental Protection • Sustainability Division
2. Develop pilot programs for <ol style="list-style-type: none"> a. Curbside organics collection b. Solid waste reduction incentives c. Hard-to-recycle items d. Development and support of a circular economy 	2022-2024	<ul style="list-style-type: none"> • Public Works • Sustainability Division • Waste Hauler • Natural Resources Division • Department of Planning and Land Management
3. Procure vendors and new materials, prepare infrastructure and apply for request permits for organics collection and handling and subsequent composting processes.	2022-2024	<ul style="list-style-type: none"> • Public Works • Natural Resources Division • Department of Planning and Land Management • Curbside Composting Vendors
4. Launch educational and promotional materials to community for pilot programs.	2022-2024	<ul style="list-style-type: none"> • Public Works • MA Department of Environmental Protection • Sustainability Division • Concord Free Public Library • Concord Public Schools • Select Board • CSEC • REUSIT
5. Revise programs and launch community-wide.	2022-2025	<ul style="list-style-type: none"> • Concord Public Works • Sustainability Division • Select Board

Create opportunities town wide to increase the waste diversion rate by 30%.



FINANCING RESOURCES AND MECHANISMS	
<ul style="list-style-type: none"> • Sustainable Materials Recovery Program (SMRP) Municipal Grant • MassDEP Compost Bin Distribution Program 	
TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> • Increased programmatic costs but tradeoff is long-term waste disposal savings • Need to implement new processes, such as to rollout organic materials collections 	<ul style="list-style-type: none"> • Provide educational materials in a variety of formats (e.g. audio, visual) to ensure all Concord residents are engaged. • Ensure program designed to provide value to all residents.
TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> • Improved handling of hard-to-recycle items • Increased community education on waste diversion strategies and opportunities • Organics collection program • Increased reuse programs and events <p>Outcomes:</p> <ul style="list-style-type: none"> • Reduction in tons of solid waste disposed • Tons of organic waste diverted from waste stream • Reduction in % of organic waste as percentage of solid waste disposal • Tons of recyclable materials diverted from waste stream • Reduction in % of recyclable materials as percentage of solid waste disposal • # of residents participating in organics collection 	<ul style="list-style-type: none"> • Distribute free community compost • Promote DropOff SwapOff programs as a sustainable and affordable way to obtain items of interest. • Work with local restaurants and grocery stores to donate prepared foods and ingredients to local pantries.

Action Implementation Blueprints

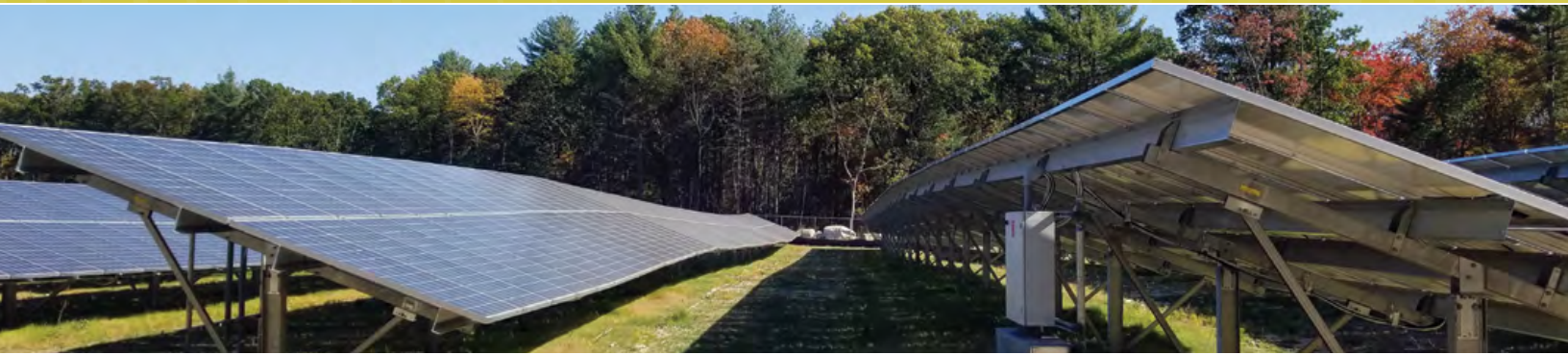


ACTION NAME

Redesign electricity rates to support energy conservation, peak load management, electrification, and renewable energy generation.

DESCRIPTION OF ACTION	Concord Municipal Light Plant (CMLP) plans to deploy smart meters for all customers. Smart meters will allow CMLP to implement Time of Use (TOU) rates better align customer, utility, and grid expenses. TOU rates provide peak load savings, benefits to the grid, allowing customers to best utilize solar + energy storage and providing environmental benefits.	
CHAMPION	CMLP	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Model how time-of-use (TOU) rates would affect peak load management, renewable energy generation, energy conservation, and electrification efforts. Analysis of existing rates and modeling of new TOU rates should be performed collectively to ensure the outcome reaches the right balance between customer value and utility goals.	2020-2021	<ul style="list-style-type: none"> • CMLP • Concord Municipal Light Board • Sustainability Division
2. Deploy smart meters to all CMLP customers with advanced metering infrastructure to provide communication network and data management system.	2022-2025	<ul style="list-style-type: none"> • CMLP
3. Pilot TOU rates across rate classes and with a variety of customer types and then deploy TOU rates community-wide.	2022-2025	<ul style="list-style-type: none"> • CMLP • Concord Municipal Light Board
4. Design and implement marketing/awareness campaign to educate CMLP customers on the benefits of the rate re-design and the installation of smart meters.	2021-2025	<ul style="list-style-type: none"> • CMLP • Concord Municipal Light Board • Sustainability Division • CSEC

Redesign electricity rates to support energy conservation, peak load management, electrification, and renewable energy generation.



FINANCING RESOURCES AND MECHANISMS

- CMLP
- 2017 Town Meeting Article 26 – Smart Meter Improvements

TRADEOFFS (CHALLENGES/BARRIERS)

- Deployment of smart meters is a large project and may require a phased approach
- Rate changes require careful analysis and approval
- Smart meters must be deployed before TOU rates can be widely adopted
- Transitioning to TOU rates will require extensive community engagement and education

EQUITY CONSIDERATIONS

- TOU rates will be designed to reduce customer costs.
- As customers understand their energy use, they can change their behavior for additional cost and carbon benefits. Smart thermostats that sync with the smart meter can help give customers a real-time understanding of their usage.
- The Town could consider discounts or no-cost smart thermostats for low-income customers.

TRACKING SUCCESS

Outputs:

- Operational plan to deploy smart meters
- Timeline for rolling out TOU rates

Outcomes:

- Potential reduction in energy consumption if TOU paired with monitoring and appliance control technologies
- Reduction in peak demand
- Enhanced energy resilience

ENGAGING THE COMMUNITY

- TOU implementation will have an effect on all CMLP customers and the marketing and awareness campaign will be a critical step in gaining acceptance from all Town of Concord residents.
- Town committees and community groups with sustainability missions can help to build community support.

Action Implementation Blueprints



ACTION NAME

Provide incentives for businesses and homeowners to invest in renewable energy.

DESCRIPTION OF ACTION	CMLP will provide rebates and incentives for solar. CMLP and the Town will also explore creative financing options that would encourage investments by residents and businesses in renewable energy and battery technology.	
CHAMPION	CMLP and Sustainability Division	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Maintain, promote, and enhance solar incentive programs for residential and commercial customers to ensure continued adoption of renewable energy in town.	2020-2025	<ul style="list-style-type: none"> • CMLP • Concord Municipal Light Board • CSEC
2. Create Property Assessed Clean Energy (PACE) financing program. PACE programs allow building owners to finance energy efficiency, renewable energy, and water efficiency projects through property tax assessments. Commercial PACE is available to Massachusetts municipalities and can be enacted by the Select Board.	2020-2021	<ul style="list-style-type: none"> • Sustainability Division • Assessor's Office • Select Board • Town Manager • CMLP
3. Explore potential for offering incentives for customer-sited energy storage projects.	2022-2025	<ul style="list-style-type: none"> • CMLP • Sustainability Division • MA DOER • Information Technology
4. Explore potential for on-bill financing, revolving loan funds, and other financing options for renewable energy and battery storage, as well as energy efficiency improvements for residential and commercial customers.	2022-2025	<ul style="list-style-type: none"> • CMLP • Sustainability Division

Provide incentives for businesses and homeowners to invest in renewable energy.



FINANCING RESOURCES AND MECHANISMS

- CMLP ratepayers
- State incentives
- DOER
- MassDevelopment

TRADEOFFS (CHALLENGES/BARRIERS)

- State solar rebate programs change every few years.
- Determination of how to structure financing to cover upfront cost of renewables and energy storage.
- For energy storage and PACE programs, it is critical to ensure proper consumer protection rules are in place.

EQUITY CONSIDERATIONS

- The solar and energy storage incentive programs should have a specific carveout for low-income or disadvantaged customers that provides higher incentives (up to 100% incentives in some cases).
- PACE and on-bill financing program should reduce or eliminate any fees or interest rates to low-income or disadvantaged customers.

TRACKING SUCCESS

Outputs:

- Solar incentive programs
- PACE program
- Design for other financing options

Outcomes:

- Net energy bill savings to customers
- Reduced GHG emissions
- Increased renewable energy generation in town
- Increased energy storage

ENGAGING THE COMMUNITY

- Marketing, education, and outreach plan will be critical to this effort and getting customers to take advantage of incentives.
- Establishing a comprehensive website with information and social media campaign.
- Town committees and community groups with sustainability missions can help to build community support.

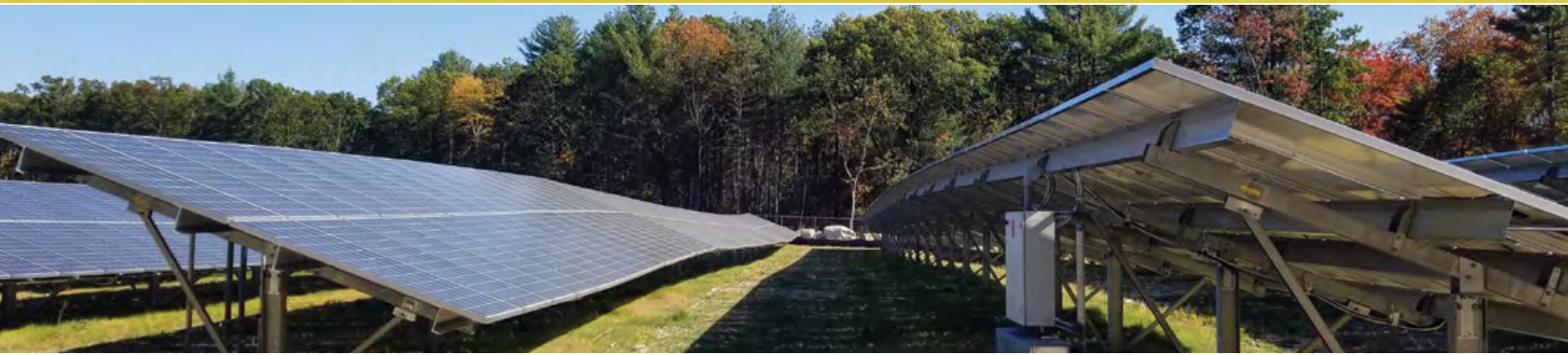
Action Implementation Blueprints



ACTION NAME

Shift CMLP’s electricity supply to 100% carbon-free sources by 2030.

DESCRIPTION OF ACTION	<p>Decarbonizing the electricity supply is the most impactful strategy for reducing town-wide carbon emissions, reducing emissions almost 25% by 2030. Carbon-free electricity also creates deeper carbon reductions through electrifying buildings and transportation.</p> <p>CMLP will provide carbon-free electricity by contracting for renewable energy generation through Power Purchase Agreements (PPAs) and by purchasing Renewable Energy Certificates (RECs).</p>	
CHAMPION	CMLP	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Continue with the plan adopted by the Concord Municipal Light Board to prioritize owning renewable energy generation and also purchase and retire Class I RECs to increase the percentage of carbon-free electricity provided to Concord Light customers with a target of 100% by 2030.	2020-2030	<ul style="list-style-type: none"> • CMLP • Concord Municipal Light Board
2. Educate CLMP customers on the 100% carbon-free electricity by 2030 goal and its associated financial, climate and resiliency benefits. Share with community the percentage of renewable and carbon-free electricity purchases annually and show progress toward 2030 goal. Highlight in-town renewable energy projects and regional projects supported by CMLP’s purchases.	2020-2030	<ul style="list-style-type: none"> • CMLP • Sustainability Division • CSEC • CAAB • Community groups



FINANCING RESOURCES AND MECHANISMS	
<ul style="list-style-type: none"> • CMLP ratepayers • Town budget and staff time 	
TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> • Electricity rates will increase to support renewable energy. 	<ul style="list-style-type: none"> • Town could consider implications and potential alleviation of impact of 'REC purchase' line on low-income ratepayer's electric bills.
TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> • Retirement of RECs • Reporting on progress toward 100% carbon-free electricity goal <p>Outcomes:</p> <ul style="list-style-type: none"> • GHG emissions reduction (23% community-wide by 2030) • Additional GHG reductions for electrification strategies 	<ul style="list-style-type: none"> • Progress toward the 2030 goal can be a source of excitement and pride for Concord residents that their community is achieving deep decarbonization and actively addressing the climate crisis. • Town committees and community groups with sustainability missions can help to build community support.

Action Implementation Blueprints



ACTION NAME

Deploy utility-scale energy storage.

DESCRIPTION OF ACTION	Energy storage is an essential technology for better integrating renewables to support grid optimization, increase system reliability, reduce peak demand period supply, transmission and capacity costs, increase control over how and when CMLP purchases power from ISO-NE, and accelerate the pathway to a decarbonized electricity grid. This action is to evaluate opportunities to contract and install utility-scale energy storage in Concord.	
CHAMPION	CMLP	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Evaluate options for the installation of a utility-scale energy storage battery system. Evaluation considerations to include: <ol style="list-style-type: none"> a. Technology options b. Ownership vs. lease or PPA models c. Additional financing options and grant availability d. Renewables integration potential e. Cost-benefit analysis for CMLP and ratepayers, including potential stacked value streams (e.g. upcoming MA Clean Peak Standard credits) f. Siting considerations (optimum substation location; proximity to existing and potential solar sites) g. Potential to support building and transportation electrification h. Potential for key town facility microgrid integration i. Resiliency benefits 	2021-2022	<ul style="list-style-type: none"> • CMLP • Concord Municipal Light Board
2. Leverage results of META grant report to evaluate installing distributed battery storage systems at critical municipal buildings and the potential to deploy energy storage systems in a virtual power plant (VPP).	2021-2023	<ul style="list-style-type: none"> • CMLP • Sustainability Division • Facilities Division • MA DOER
3. Engage vendors and install utility-scale energy storage system. Monitor and manage equipment performance, and adjust software algorithms, as needed, to optimize battery discharge, especially during peak demand periods to maximize financial benefits. Evaluate technical and economic performance of energy storage system. Deploying energy storage will enable Town to install additional in-town solar arrays on town property as recommended in 2010 Utility-scale Solar Strategy to develop 25MW of CMLP operated solar generation capacity.	2022-2024	<ul style="list-style-type: none"> • CMLP
4. Explore potential for offering incentives for customer-sited energy storage projects, an Energize promotion campaign for residential and commercial battery storage, and a VPP pilot.	2022-2024	<ul style="list-style-type: none"> • CMLP • Sustainability Division • Solar customers

Deploy utility-scale energy storage.



FINANCING RESOURCES AND MECHANISMS

- CMLP ratepayers DOER
- MassCEC
- MVP Grant Program
- Green Communities
- Energy storage project developers
- U.S. DOE Energy Storage Project Developers
- 2010 Town Meeting Article 64 Authorization of Long-Term Lease for Solar Energy
- 2015 Town Meeting Article 36 Authorize Long-Term Lease for Municipal Building Rooftop and Ground Mounted Solar Energy

TRADEOFFS (CHALLENGES/BARRIERS)

- High upfront technology ownership costs (approximate 7-year payback, without grants or subsidies), however costs continue to decline dramatically.
- Infrastructure upgrades may be required to accommodate energy storage.

EQUITY CONSIDERATIONS

- A larger share of the electricity cost savings resulting from the energy storage project could be apportioned to low-to-moderate income (LMI) residents.

TRACKING SUCCESS

Outputs:

- Utility scale battery storage feasibility study
- Utility-scale storage solicitation
- Utility-scale storage installation

Outcomes:

- Reduced electricity costs
- Lowered peak demand
- Reduced GHG emissions
- Increased renewable energy generation capacity
- Increased flexibility, reliability and resiliency of the electricity grid

ENGAGING THE COMMUNITY

- Initiate a community-wide outreach effort to educate town residents and businesses on the benefits of energy storage. Will be especially important if rate payers must bear any additional costs.

Action Implementation Blueprints



ACTION NAME

Increase use of public transportation and other low-carbon and no-carbon transportation options.

DESCRIPTION OF ACTION

Transportation contributes almost 40% of Concord's GHG emissions.

Concord is home to two stations on the commuter rail and a commuter bus. By improving access to public transit through efforts like providing first-mile/last-mile transit options (from residents' homes to the stations or from the stations to work), we can increase use of public transportation.

Increased ridership of public transportation and use of other low-carbon transportation options will reduce vehicle miles traveled (VMT) and GHG emissions from Concord drivers.

CHAMPION

Sustainability Division, Dept. of Planning and Land Management, Concord Public Works

IMPLEMENTATION STEPS

PLANNING CONSIDERATIONS

TIME FRAME

KEY PARTNERS

1. Identify stakeholder groups, gathering baseline data and barriers to use of public transit and shared transit for commuting, visitors, and in-town mobility.
 - a. Interview current transit riders on the challenges they face in their journey to and from transit.
 - b. Continue to participate in MBTA meetings and advocate for increased service.
 - c. Understand opportunities for regional collaboration
 - d. Evaluate barriers and opportunities for parking solutions at commuter rail stations.

2020-2022

- MBTA
- Concord Public Works
- DPLM
- MAPC
- Concord commuters
- Yankee Line buses rider
- Crosstown Connect riders
- CSEC

2. Pilot operating a local bus to connect town centers with train stations for Concord workers and residents with workforce transportation grant.

2020-2021

- DPLM

3. Collaborate with neighboring communities to pilot transportation for visitors between tourist sites and town centers.

2020-2022

- DPLM
- Trails Committee
- Tourism and Visitor Services
- Minute Man National Historical Park
- Neighboring towns

4. Develop and launch communications plan for encouraging public transit or other shared transit options by visitors and residents.
 - a. Share information on Yankee bus service, commuter rail, and ride-share opportunities on town website and communications platforms.
 - b. Create self-guided 'trail maps' for accessing historic sites by bike or other sustainable transport. Work with businesses and restaurants to offer perks to participating visitors.
 - c. Share interviews with active public transit riders.

2021-2023

- National Parks Service
- Tourism and Visitor Services
- Public Information Office
- Minuteman Media Network

5. Develop a plan for improved accessibility of MBTA transit stops by low/no carbon modes by inventorying safe walking and biking routes, secure bike parking, protected bike lanes, charging for e-bikes, pick-up/drop-off locations.

2023-2024

- MBTA
- Concord Public Works
- Concord Recreation
- Parking Clerk
- Human Services

6. Establish a central transportation planning function within Town government tasked with transportation demand management, encouraging low-carbon transportation options, and developing a long-term transportation plan.

2024-2025

- DPLM
- Town Manager

Increase use of public transportation and other low-carbon and no-carbon transportation options.



FINANCING RESOURCES AND MECHANISMS

- Town budget may fund staff time. If a transportation function is established within town, that function should be responsible for implementing this action.
- The first few steps could be completed as part of a UNH Sustainability Institute Fellowship.
- Complete Streets
- TCI
- MAPC or MAGIC
- Regional or public-private partnerships

TRADEOFFS (CHALLENGES/BARRIERS)

- MBTA Ridership also heavily influenced by fares and system reliability
- Cycling between historic sites for visitors may be limited to advanced riders on roads without cycling lanes

EQUITY CONSIDERATIONS

- Ensure new in-town transportation routes and stops are designed to provide equitable access to residents, visitors, and workers.

TRACKING SUCCESS

Outputs:

- New outreach materials and resources
- New facilities (bike parking, established routes, etc) in and around MBTA Stops
- New transportation modes (buses) and routes for getting around town and the region

Outcomes:

- Reduced GHG emissions from transportation sector
- Improved air quality
- Higher ridership to/from Concord MBTA stops
- High utilization of new facilities
- Higher visitation of historic sites by car-free families

ENGAGING THE COMMUNITY

- Collaborate with tourism and visitor services to help potential tourists plan for a car-free visit.
- Install posters at the MBTA train stops.
- Talk with business owners about employee transportation needs and survey employees.
- Survey residents about how they get around town, get to work, and how they might change habits with additional transportation options.

Action Implementation Blueprints



ACTION NAME

Accelerate adoption of electric vehicles.

DESCRIPTION OF ACTION

Transportation contributes almost 40% of Concord’s GHG emissions. Electric vehicles reduce emissions by more than 50% and produce no tailpipe emissions. As the electricity supply is decarbonized, the emissions reductions from driving electric are even greater.

This action is to accelerate transportation electrification by supporting the deployment of Electric Vehicle Supply Equipment (EVSE), providing incentives for EV adoption, and educational programming.

CHAMPION

Concord Municipal Light Plant (CMLP), Sustainability Division, and EV Working Group

IMPLEMENTATION STEPS

PLANNING CONSIDERATIONS

TIME FRAME

KEY PARTNERS

1. Analyze existing public deployments of EVSE infrastructure and identify gaps in level 2 EVSE coverage, need for level 3 EVSE and number of stations needed to support a strong adoption rate.
 - a. Consider need for additional public charging stations and consider EV charging infrastructure integration with Complete Streets upgrades.
 - b. Collaborate with Multi-Dwelling Units (MDUs) and business community to host charging stations with peak demand controls.
 - c. Continue rebates for single family home EVSE installations.

2020-2022

- CMLP
- EV Working Group
- Property Owners
- Commercial Tenants
- Public Works
- Multi-Dwelling Units

2. Continue to provide and explore new incentives for EV charging.
 - a. Ensure that as time-of-use electric rates are designed they make EV ownership attractive, and incentivize EV charging at optimal times for CMLP operations.
 - b. Maintain EV Miles (off-peak charging incentive) program until new TOU rates are established.
 - c. Explore incentives for residents and businesses to install installation of smart charging (or V2G) infrastructure that can respond to utility signals.

2020-2025

- CMLP
- Municipal Light Board
- Town Manager
- Property owners
- Commercial tenants
- Homeowners

3. Provide and/or make available financial incentives to residents and businesses to purchase new and used electric vehicles.

2020-2025

- CMLP
- Municipal Light Board
- Green Energy Consumer’s Alliance
- State MOR-EV program

4. Engage community on the benefits of driving electric vehicles with a wide variety of online, community, and EV sector engagement. For example, town website, EV help line, tabling at local events and, an annual ride and drive.

2020-2025

- CSEC
- EV Working Group
- Clean Energy Stakeholders
- Residents
- Car Dealers
- CMLP
- Energy New England

Accelerate adoption of electric vehicles.



FINANCING RESOURCES AND MECHANISMS

- CMLP
- U.S. Department of Energy and Massachusetts Offers Rebates for Electric Vehicles (MOR-EV) program

TRADEOFFS (CHALLENGES/BARRIERS)

- Wide-spread adoption will require planning to manage electricity load.
- Public perception barriers to EV adoption, include perceived upfront cost, range anxiety, lack of familiarity with EV performance and with vehicle options on the market.

EQUITY CONSIDERATIONS

- Ensure that EV infrastructure is deployed throughout the community
- Purchasing new vehicles may be out of reach for some residents. Make residents aware of the growing used EV market and potentially offer incentives for used EV purchases

TRACKING SUCCESS

Outputs:

- EV charging incentive programs
- EV education online activities
- EV awareness events

Outcomes:

- Increased deployments of EV charging infrastructure
- Increased adoption of electric vehicles as a % of registered vehicles
- Charging profile that benefits CMLP
- Reduced GHG emissions from the transportation sector
- Improved air quality

ENGAGING THE COMMUNITY

- Infrastructure deployment helps to serve existing EV drivers as well as raise awareness among future EV purchasers.
- EV displays at a range of community events help to reach new audiences.
- Ride & Drive Events the provide test drive opportunities help to increase adoption rate.
- Online engagement and resources for EV promotion including website, webinars, social media, etc. raise community awareness and demonstrate town support for electric vehicles.
- Town committees and community groups with sustainability missions can help to build community support.

Action Implementation Blueprints



ACTION NAME

Implement a long-term plan to electrify school and municipal vehicle fleets.

DESCRIPTION OF ACTION	The town can lead by example in reducing emissions from the transportation sector by electrifying its municipal and school fleets. Electric vehicles reduce GHG emissions at least 50%, with a greater impact as our electricity supply becomes cleaner.	
	CHAMPION	Sustainability Division, Department Heads, Concord-Carlisle Regional School District Transportation Office
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Conduct a fleet baseline by reviewing the existing vehicles, identifying mileage, fuel use, duty cycle and age. Review any past projects involving vehicle electrification for any best practices, such as the 2016 electric school bus pilot program with Concord Public Schools and funding from MassCEC.	2020-2021	<ul style="list-style-type: none"> • Sustainability Division • Town Departments • School District
2. Update Town Vehicle Policy to be an electric-first policy.	2020-2021	<ul style="list-style-type: none"> • Select Board & Town Manager • Planning Board • Public Works • Fire-Rescue • Police • Schools • Finance
3. Use fleet analysis to develop a vehicle transition plan. <ol style="list-style-type: none"> Develop a prioritized list of vehicles for replacement. Identify electric vehicle options that meet needs of current fleet vehicles. Identify other opportunities for efficiencies by adjusting routes or operational practices. Identify procurement implications, including vehicle costs, procurement method, and infrastructure requirement. 	2021-2022	<ul style="list-style-type: none"> • Sustainability Division • Town Departments • School District
4. Identify priority locations (e.g. Schools, Municipal Buildings, Community Centers) for charging infrastructure. <ol style="list-style-type: none"> Conduct an electrical assessment of the sites to see if any infrastructure upgrades will be required to meet current and future charging demands, considering the addition of new fleet EVs. Determine the type of charging station that will be required to meet charging demand (Level 1, Level 2, or DCFC). Special consideration should be given to the fact that school buses have larger batteries than a typical EV and therefore will require higher charging capacities. 	2021-2025	<ul style="list-style-type: none"> • Town Departments • School District • CMLP Engineering • Concord Public Works • Town Facilities Division • School Facilities Team • Information Technology
5. Conduct a Vehicle-to-Grid (V2G) pilot with the school bus fleet and/or the town Nissan LEAFs.	2021-2023	<ul style="list-style-type: none"> • CMLP Engineering • Information Technology

Implement a long-term plan to electrify school and municipal vehicle fleets.



IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
<p>6. Track annual mileage and electricity consumption.</p> <ul style="list-style-type: none"> a. Ensure vehicles are being used in the most efficient way possible. b. Facilitate staff training on electric vehicle best practices. c. Schools operating electric buses should optimize their routes to maximize the number of students while minimizing miles driven to most efficiently optimize their bus fleet. 	2022+	<ul style="list-style-type: none"> • Town Departments • School District

FINANCING RESOURCES AND MECHANISMS
<ul style="list-style-type: none"> • VW Settlement Funds • DOER Green Communities • MA Clean Cities • MassEVIP Fleet Incentives • Public-Private Partnerships • Public Access and Workplace Charging Incentives

TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> • Vehicles with low annual mileage may have limited opportunity for operating cost savings. • Medium/Heavy duty electric vehicles options are limited and have high incremental costs. • Site upgrades may be required for charging infrastructure to be installed. 	<ul style="list-style-type: none"> • School buses give all students the chance to experience riding in an electric vehicle. • Work with a phased approach and maximize grant funding to make best use of taxpayer funds. • EVs provide public health benefits through improved air quality and improved resiliency.

TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> • Increased % of EVs in town fleet • Increased # of e-miles driven <p>Outcomes:</p> <ul style="list-style-type: none"> • Reduced GHG emissions from transportation sector • Reduced maintenance costs • Savings in Total Cost of Ownership • Improved air quality 	<ul style="list-style-type: none"> • Town and School District leading by example will complement town goal to accelerate adoption of EVs among residents and businesses. • Vehicles can be put on display at community events, parades, farmers markets, etc. to educate members of the community.

Action Implementation Blueprints



ACTION NAME

Improve availability, accessibility, and connections between bicycling and walking paths and sidewalks.

DESCRIPTION OF ACTION

By improving access to and making biking and walking as safe, convenient, and carbon-free mobility options, Concord residents will be more likely to shift from driving to active transportation. The Town can continue to prioritize sustainable infrastructure projects in the right-of-way (such as dedicated/protected bike lanes, road marking, safe sidewalks, pedestrian bridges, etc.) and take advantage of opportunities to improve availability of and connections between key bicycling and walking paths and sidewalks.

CHAMPION

Concord Public Works, Department of Planning and Land Management (DPLM)

IMPLEMENTATION STEPS

PLANNING CONSIDERATIONS

TIME FRAME

KEY PARTNERS

1. Review Complete Streets Priority List and begin implementing projects that improve availability of and access to active transportation in public right-of-way, with focus on:

- a. Considering all users (pedestrians, cyclists, transit riders, and drivers) in project design
- b. Encourage multimodal transportation analysis instead of traffic analysis
- c. Implement demonstration projects

2020-2022

- Concord Public Works
- Sustainability Division
- Department of Planning and Land Management
- Residents of Concord and neighboring towns
- Bruce Freeman Rail Trail Committee
- Concord bike groups

2. Evaluate existing regulations and bylaws for opportunities to integrate consideration of bike/pedestrian connections in new or redevelopment projects, public right-of-way projects, and capital projects.

2021-2023

- Sustainability Division
- Department of Planning and Land Management
- Concord Public Works

3. Explore potential funding and regional collaboration opportunities to facilitate feasibility study of multimodal transportation network, corridors, origin/destination study to find where bike/pedestrian transportation gaps exist. Identify opportunities to create improved connections between existing bike and walking trails based on destinations and frequently traveled routes.

2021-2025

- Trails Committee
- Bruce Freeman Rail Trail Committee
- DPLM
- Natural Resources Division
- MAPC/Minuteman Advisory Group on Interlocal Coordination (MAGIC)
- Complete Streets

4. Evaluate opportunities to create a more bike-friendly community, such as:

- a. Safe Routes to School Program
- b. Education and awareness on safe cycling
- c. Enhance maps, way-finding, and marking
- d. Consider bike parking options in new projects and at existing locations
- e. Continue and expand bike sharing program

2021-2023

- Sustainability Division
- Concord bike groups
- Concord Recreation
- Schools
- Trails Committee
- Bruce Freeman Rail Trail Committee
- DPLM
- Natural Resources Division

Improve availability, accessibility, and connections between bicycling and walking paths and sidewalks.



FINANCING RESOURCES AND MECHANISMS

- MVP Action Grants
- Metropolitan Area Planning Council (MAPC) technical assistance
- MassDOT and DHCD Grants
- Private Sector Grants to 'Non-Profit' Bicycling Advocacy Group

TRADEOFFS (CHALLENGES/BARRIERS)

- In fully built out areas, adding additional transportation infrastructure (i.e. sidewalks, protected bike lanes) may require major restructuring within the right-of-way.
- Walking/biking needs are highly local.
- Limited funding.
- Abutters to under-utilized existing easements and rights-of-way may object to opening these areas to the public.

EQUITY CONSIDERATIONS

- Engage the community often to ensure projects enhance safety and have broad community support
- Evaluate existing infrastructure based on ADA accessibility and ensure all future projects require ADA accessibility

TRACKING SUCCESS

Outputs:

- Increase in miles of sidewalks/walking paths
- Increase in miles of bike lanes/paths
- Increased connectivity of existing walking and biking corridors

Outcomes:

- Decrease in % of trips made by car
- Decrease greenhouse gas emissions from the transportation sector
- Improved air quality
- More reliable (resilient) mobility options

ENGAGING THE COMMUNITY

- Utilize public surveys to understand the transportation needs of the broader public
- Take a regional approach—include members of other towns in the conversation and take advantage of regional planning agencies
- Follow any project installation with community education on opting out of driving and safe walking/biking practices

Action Implementation Blueprints



ACTION NAME

Develop forest management plan to enhance health of Concord’s forests.

DESCRIPTION OF ACTION	Climate change poses threats to public and private forest resources. This action is to develop a management plan for forests on Town conservation land, water supply lands, and forests managed by land trusts and other forest managers.		
CHAMPION	Natural Resources Division		
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	TIME FRAME	KEY PARTNERS	
1. Convene land managers to identify common goals and scope of forest management plan. Review existing studies/tree inventories of forest lands and data available to assess health, species and age structure.	2021-2022	<ul style="list-style-type: none"> • Natural Resources Division • Local Land Trusts • CPW - Water/Sewer Division 	
2. Develop scope for plan that incorporates current and future threats including shifts in the ranges of significant tree species expected with a changing climate.	2021-2022	<ul style="list-style-type: none"> • Natural Resources Division • Local Land Trusts • UMass Extension • The Nature Conservancy 	
3. Develop a plan that establishes decision criteria for management activities that may evolve with a changing climate and creates actionable recommendations for all landowners in Concord.	2022-2024	<ul style="list-style-type: none"> • Natural Resources Division • Local Land Trust 	
4. Implement priority actions identified in the planning process.	2022-2030	<ul style="list-style-type: none"> • Natural Resources Division • Local Land Trusts 	

Develop forest management plan to enhance health of Concord's forests.



FINANCING RESOURCES AND MECHANISMS

- Grants from programs such as LWCF, EOEAA, MAPC, or MVP Action Grants
- CPA grants
- Partnerships with land trusts and regional organizations
- Regional partnerships

TRADEOFFS (CHALLENGES/BARRIERS)

- Climate projections are uncertain
- Will need to anticipate how plant communities will change and adapt
- Coordination required with adjacent landowners
- Balancing needs of forest users with ecological functions
- Forest management plan is a large undertaking and will require dedicated resources

EQUITY CONSIDERATIONS

- Ensure opportunities for diverse groups to engage with the plan development.
- Continue to ensure appropriate access to open land in Concord by all.

TRACKING SUCCESS

Outputs:

- Understanding extent of local forests, their health and threats, and carbon sequestration potential
- Plan of actionable management solutions
- Ongoing meeting and coordination among conservation landowners / managers

Outcomes:

- Improvement Across USDA [Forest Health Indicators](#)
 - Vegetation Diversity & Structure
 - Tree Damage & Mortality
 - Crown Condition
 - Soil Conditions and woody debris
 - Lichen communities
- Carbon sequestration
- Reduced heat island

ENGAGING THE COMMUNITY

- Inform community of the value of forests and why forest health is important.
- Develop a brand identity for the plan and include this identity on signage or other materials posted where forest management activities are taking place.
- Use QR Codes or similar means to connect activities in the field with information and other resources to learn more and contribute to the goals of the plan.

Action Implementation Blueprints



ACTION NAME

Increase indoor and outdoor water conservation.

DESCRIPTION OF ACTION	Water supply and quality are threatened by the impacts of climate change. Concord will provide education, policies, and incentives to increase water efficiency and minimize the use of drinking water for outdoor water use.	
CHAMPION	Concord Public Works - Water and Sewer Division	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Conduct Concord water use analysis to assess baseline.	2020-2021	<ul style="list-style-type: none"> • Public Works' Water and Sewer Division • Concord Municipal Utilities
2. Develop program to encourage residents to complete water efficiency audits and/or upgrade water fixtures and appliances to high efficiency models. Launch new water efficiency and water conservation campaigns for residents on ways to reduce water use at home.	2020-2021	<ul style="list-style-type: none"> • Sustainability • Public Works' Water and Sewer Division • Neighborhood associations • Community organizations • Schools • Massachusetts Department of Environmental Protection (toolkits) • Concord Municipal Utilities (bill inserts)
3. Develop program to encourage rainwater harvesting for irrigation use.	2021-2022	<ul style="list-style-type: none"> • Public Works • Building Department • Sustainability
4. Develop policy and plan to retrofit existing Town buildings with low-flow faucet fixtures and metering and require all new municipal construction to incorporate as standard.	2021-2023	<ul style="list-style-type: none"> • Building and Inspections • Public Works' Water and Sewer Division • Planning • Facilities Division

Increase indoor and outdoor water conservation.



FINANCING RESOURCES AND MECHANISMS	
<ul style="list-style-type: none"> • MVP Action Grants • Regional partnerships 	
TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> • Costs associated with upgrading water fixtures • New systems may require maintenance and upkeep • Town Bylaw/Policy adoption • State Plumbing Code 	<ul style="list-style-type: none"> • Ensure educational materials/outreach are available on multiple platforms including print, online, TV, etc.
TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> • Water conservation programs • Water audit results • Educational materials <p>Outcomes:</p> <ul style="list-style-type: none"> • Reduced water consumption • Increased resilience to drought conditions 	<ul style="list-style-type: none"> • Engage residents on savings benefits as well as positive impacts on local water resources. • Hold fixture swap days, where still-working fixtures (e.g., models swapped out by upgrades) can be utilized by residents in need of replacements.

Action Implementation Blueprints



ACTION NAME

Work with homeowners to promote sustainable landscaping practices.

DESCRIPTION OF ACTION	<p>Sustainable landscaping improves our resilience to climate change and reduces GHG emissions by reducing demand on water supply, enhancing ground water recharge, reducing runoff during storms, protecting biodiversity, mitigating flash flooding, increasing resilience to drought, enhancing potential for carbon sequestration, and reducing energy demand for maintenance and water supply.</p> <p>Concord will promote sustainable landscaping practices through education, partnerships with garden clubs and other local groups, collaborations with contractors, and resources such as equipment and seed libraries.</p>	
CHAMPION	Natural Resources Division, Concord Public Works, Sustainability Division	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Develop and execute communications plan to promote Concord's Sustainable Landscaping Handbook.	2020-2021	<ul style="list-style-type: none"> • Sustainability Division • Concord Public Works • Natural Resources Division • Public Information Office • CSEC
2. Develop a list of best management practices and programs for landscape, nursery, and garden center retailers that align with Sustainable Landscaping Guide goals. Incorporate guidance/framework in Subdivision Rules and Regulations.	2020-2021	<ul style="list-style-type: none"> • Concord Public Works • Agriculture Committee • Natural Resources Commission • Pollinator Health Advisory Committee • Planning Department
3. Survey area landscaping and gardening providers about sustainable practices. Create ongoing mechanism for businesses to report practices and mechanism for sharing with residents.	2020-2021	<ul style="list-style-type: none"> • Public Works • Local businesses • Plant societies (Mass Horticultural Society)
4. Develop incentive-based program for Town, residential, and commercial sustainable landscaping. Explore possible incentives for electric lawn care equipment.	2021-2022	<ul style="list-style-type: none"> • Public Works • Natural Resources • Neighborhood associations
5. Establish a tool share and seed exchange facility at an accessible location.	2021-2022	<ul style="list-style-type: none"> • Natural Resources Division • Concord Public Works • Garden Clubs • Library

Work with homeowners to promote sustainable landscaping practices.



IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
6. Develop ongoing training and education program for landscapers and residents.	2022-2024	<ul style="list-style-type: none"> • Public Works • Garden Clubs
7. Develop and update outreach mechanism (website, newsletter) to connect residents with information about businesses using sustainable practices, resources available via the tool library, and relevant events.	2020-2021	<ul style="list-style-type: none"> • Public Information Office • Minuteman Media Network

FINANCING RESOURCES AND MECHANISMS
<ul style="list-style-type: none"> • Business partnerships • MAPC • MVP Action Grants • Summer internship programs like UNH Sustainability Institute • Other external grants

TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> • Maintaining updated business information over time • Establishing liability protection for tool library • Staff availability • Regulatory Enforcement 	<ul style="list-style-type: none"> • Collaborate and communicate with small businesses • Ensure materials are available in multiple formats and platforms (print, online, TV) • Ensure tool library is accessible nights and weekends

TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> • Resources for residents to choose businesses that align with their values • Accessible tools and plant materials for all residents to contribute directly to sustainable landscapes <p>Outcomes:</p> <ul style="list-style-type: none"> • Improved health/abundance of pollinators • Reduced chemical burden to land and waterways • Reduced noise and air pollution from fossil fueled equipment • Reduced potable water used on landscapes • Increased resilience to drought • Enhanced biodiversity • Reduced burden on public water supplies 	<ul style="list-style-type: none"> • Engage the community, particularly youth and seniors, in community sustainable gardening days. • Work with partners to showcase best practices and help residents find businesses. • Have representatives attend area industry events and reach out to plant society organizations to identify partners. • Provide opportunities for practitioners to share back success stories via social media with a common brand or hashtag. • Town committees and community groups with sustainability missions can help to build community support.



ACTION NAME

Assess the vulnerability of natural resources most at risk to projected climate changes.

DESCRIPTION OF ACTION	<p>Concord's natural resources are threatened by a changing climate (increase in temperatures and seasonal pattern changes, change in precipitation patterns, riverine flooding, and drought). This action is to conduct a vulnerability assessment of natural resources most at risk from impacts of climate change. This study will assess the current conditions of habitats, landscapes, wetlands, forests, fields, and water resources on Town conservation and water supply lands at risk of climate change, identify vulnerable areas, species, habitats, ecosystem process, ecosystem services, and identify best practices.</p>	
CHAMPION	Natural Resources Division	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Review existing assessments and analysis. Prepare detailed list of assets and resources – according to climate change vulnerability assessment (CCVA) tool box and methods 2014 , prepare sets of maps, prioritize assets and develop matrix of typologies.	2021-2022	<ul style="list-style-type: none"> • Natural Resources Division • CPW – Water/Sewer Division • Sustainability Division • Planning Division
2. Establish a regional working group to coordinate water shed level natural resources and other cross municipal habitats.	2021-2023	<ul style="list-style-type: none"> • Natural Resources Division • Metrowest Conservation Alliance • MA Association of Conservation Commissions • MA Society of Municipal Conservation Professionals • Mass Division of Fisheries and Wildlife • State agencies
3. Engage stakeholders including property owners and state and local agencies. This group will participate in the long term monitoring process and development of strategies.	2021-2023	<ul style="list-style-type: none"> • Natural Resources Division • Metrowest Conservation Alliance • MA Association of Conservation Commissions • MA Society of Municipal Conservation Professionals
4. Based on the prepared list of resource types – prepare a supporting program for long term monitoring. Standards on the ground monitoring with Landsat/drown mapping and other technological solutions.	2023-2025	<ul style="list-style-type: none"> • Natural Resources Division • Example for satellite monitoring – Green City Watch or Sensible City Lab MIT
5. Best practices, recommendations, and pilot projects. Review Town ordinances and policies, develop recommendations for revisions to enhance resilience and preserve natural resources.	2023-2025	<ul style="list-style-type: none"> • Natural Resources Division • Sustainability Division • CPW – Water/Sewer Division • Planning Division



FINANCING RESOURCES AND MECHANISMS	
<ul style="list-style-type: none"> MVP Action Grants Regional partnerships 	
TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> Monitoring and identifying natural resources conditions is time and labor intensive. Coordination with multiple agencies, stakeholders, and institutions will be necessary. Active protection and conservation of resources will require land acquisition and development rights and restrictions. The scale of these natural resources extends beyond municipal boundaries and will require coordination with state agencies and abutting municipalities. 	<ul style="list-style-type: none"> Allocate resources to education and engagement of multiple stakeholders with emphasis on a diversity of voices and perspectives. Prioritize long term and capacity building programs to develop stewardship. Ensure equitable access to natural resources and open space.
TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> List of vulnerable natural resources with prioritization for solutions Methodology for monitoring and long-term analysis Recommendations for policy and regulations <p>Outcomes:</p> <ul style="list-style-type: none"> Preservation of natural resources Health benefits of exposure to green space Increased and connected wildlife habitat Increased biodiversity Improved water quality and stormwater management 	<ul style="list-style-type: none"> Engage the community – schools, seniors, volunteer groups, faith organizations, etc. to participate and/or sponsor tours and monitoring days.

Action Implementation Blueprints



ACTION NAME

Assess and improve Concord's tree canopy.

DESCRIPTION OF ACTION	Concord's tree canopy is core to the Town's character and provides climate mitigation, resilience and health benefits. This action will evaluate and develop a plan to ensure Concord's tree canopy (public and private street and setback trees) is resilient to the projected impacts of climate change and develop a management plan that considers location, tree type, long-term growth, care and maintenance.	
CHAMPION	Concord Public Works and Natural Resources Division	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Engage town stakeholders to understand baseline data and identify additional stakeholders. Develop scope for tree canopy management plan and appropriate board, committee, or town department to charge with implementation. Plan should consider: <ol style="list-style-type: none"> a. Annual public tree removal tracking; private tree census. b. Establish a Town goal for tree canopy of minimally no net loss of trees, but preferably restoration to a defined level of diversity. c. Establish town policies for equal replacement for public tree removals. d. Establish incentives for public tree planting on private land. e. Conduct a health impact assessment to guide tree and canopy placement. 	2020-2022	<ul style="list-style-type: none"> • Concord Public Works • Natural Resources Division • Sustainability Division • Planning Division
2. Evaluate the costs and benefits of applying to be an Arbor Day Tree City USA. Revise current Town codes with program requirements (e.g. establishing a tree board, adopting a tree care ordinance, instituting an arbor day observance and establishing public funding source for tree planting of \$2/capita ~\$34k/year).	2020-2022	<ul style="list-style-type: none"> • CPW – Park and Tree Division • Planning Division • Natural Resources Division • Arbor Day Foundation • Sustainability Division
3. Develop community awareness and educational materials about "Trees of Concord."	2021-2022	<ul style="list-style-type: none"> • CPW – Park and Tree Division • Natural Resources Division • Sustainability Division • Planning Division • Public Information Office
4. Formalize a tree canopy management plan and embed within an existing town department, committee or board with authority and charge to restore and preserve Concord's tree canopy.	2022-2024	<ul style="list-style-type: none"> • CPW – Park and Tree Division • Natural Resources Division • Sustainability Division • Planning Division



FINANCING RESOURCES AND MECHANISMS

- Arbor Day Foundation
- MA Urban and Community Forestry Challenge Grants
- MVP Action Grants

TRADEOFFS (CHALLENGES/BARRIERS)

- Need to consider tree maintenance in coordination with utilities and public works.
- Need to plan for long-term tree growth and impacts on city infrastructure (e.g. sidewalks and underground utilities).

EQUITY CONSIDERATIONS

- Ensure equitable distribution of street tree and tree canopy placement across the entire Town.
- Prioritize programs and improvements based first on areas with higher instances of urban heat island or temperature fluctuations.

TRACKING SUCCESS

Outputs:

- Updates to Treekeeper software
- Tree canopy management plan
- Community outreach materials on value of trees
- Increase in % of tree canopy coverage (including private property).
- Increase in # of public trees planted annually
- Increase # of private tree incentives utilized annually

Outcomes:

- Improved air quality and decreased respiratory health impacts.
- Health benefits of exposure to green space.
- Increased wildlife and biodiversity support.
- Improved water quality and stormwater management.

ENGAGING THE COMMUNITY

- Engage street teams to survey tree canopy sites.
- Town committees and community groups with sustainability missions can help to build community support.
- Engage the community – schools, seniors, volunteer groups, faith organizations, etc. to participate and/or sponsor planting days.
- Implement Adopt-A-Tree programs with local organizations.

Action Implementation Blueprints



ACTION NAME

Develop an integrated water resource management plan.

DESCRIPTION OF ACTION

Concord will develop an integrated water resource management plan to ensure that water systems are resilient to climate change and positively contribute to the health of the public and the environment.

Concord can be a model community by planning and implementing systems that go beyond basic requirements for handling stormwater, groundwater, drinking water, and surface water.

CHAMPION

Concord Public Works

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Develop a scope of work for an integrated water resource management plan including: <ol style="list-style-type: none"> A framework for diverse stakeholder involvement Assessment of critical infrastructure as well as system interrelationships between drinking water, wastewater, stormwater, and their relationships to groundwater and surface water Implementation strategies 	2020-2021	<ul style="list-style-type: none"> Concord Public Works Natural Resources Commission and/or Division Planning Division Sustainability Division
2. Develop integrated water resources management plan including <ol style="list-style-type: none"> Stakeholder engagement Assessment of baseline Recommended policy, regulatory, and programs to achieve resilient water management systems 	2020-2022	<ul style="list-style-type: none"> Concord Public Works Natural Resources Commission and/or Division Planning Division Sustainability Division Community stakeholders
3. Launch community education program on integrated water resource management.	2021-2022	<ul style="list-style-type: none"> Concord Public Works Natural Resources Commission and/or Division Sustainability Division
4. Develop regulatory and economic strategy to optimize water quality and quantity interests (flow, and load).	2021-2022	<ul style="list-style-type: none"> Concord Public Works Natural Resources Commission

Develop an integrated water resource management plan.



FINANCING RESOURCES AND MECHANISMS	
<ul style="list-style-type: none"> • MVP Action Grants • Concord Public Works Water & Sewer Enterprise budgets • Stormwater utility 	
TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> • Regulatory barriers including acceptance by state and federal agencies and changing regulatory requirements. • Many stakeholders requiring collaboration/consensus relating to cost benefit and schedule. 	<ul style="list-style-type: none"> • Allows for a more equitable cost distribution across drinking water, wastewater, and stormwater rate payers. • Ensures long-term access to quality water, protection of local water resources for all Concord residents.
TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> • Defined scope of service for resilient water management plan. • Baseline assessment of all current water systems and their interrelationships. • Development of programs to achieve resilient water management systems. <p>Outcomes:</p> <ul style="list-style-type: none"> • Reduced water consumption • Improved water quality • Reduced impact on natural water resources • Increased resilience to flooding and drought conditions 	<ul style="list-style-type: none"> • Engage residents early in the planning process to gather feedback and share information about the environmental, economic, and health benefits of integrated water resource management. • Concord’s approach to integrating climate projections into water management can be a source of pride for Concord and a model for other communities. • Engagement can highlight anticipated benefits to residents, businesses and developers.

Action Implementation Blueprints



ACTION NAME

Conduct a threat assessment for Concord’s critical infrastructure.

DESCRIPTION OF ACTION	Concord’s hard infrastructure (e.g. roads, utilities) and critical facilities (town buildings, emergency shelters, hospitals and healthcare, etc.) are vulnerable to extreme weather events and changes to average temperature and precipitation. This action is to conduct a threat assessment and security plan for Concord’s infrastructure and critical facilities. It will assess the vulnerability and identify security and resilience strategies to ensure the continued safety of Concord residents and businesses.	
CHAMPION	Concord Emergency Planning Committee	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Reconvene Concord Emergency Planning Committee and set expectations and goals for group moving forward.	2022-2023	<ul style="list-style-type: none"> • Fire department • Concord Emergency Planning Committee • All Town departments • Health Division • Planning Division • Public and private schools • Emerson Hospital • NE Deaconess
2. Review existing reports and plans, including the Hazard Mitigation Plan and Municipal Vulnerability Preparedness program assessments. Identify gaps and opportunities related to threat assessment and security.	2023-2024	<ul style="list-style-type: none"> • Concord Emergency Planning Committee • Sustainability Division • Planning Division
3. Conduct more detailed assessments as needed to understand direct impact/hazard potential, utilizing site inspections, GIS analysis, flood modeling, etc. Integrate climate projections data into planning process.	2023-2024	<ul style="list-style-type: none"> • Concord Emergency Planning Committee • Public Works • IT/GIS • Consultants • Sustainability Division • Public Health
4. Develop and launch updated emergency management and security plan and implementation strategies based on completed threat assessment.	2024-2025	<ul style="list-style-type: none"> • Concord Emergency Planning Committee • Sustainability Division • All Town departments

Conduct a threat assessment for Concord's critical infrastructure.



FINANCING RESOURCES AND MECHANISMS	
<ul style="list-style-type: none"> • MVP Action Grants • MEMA Emergency Management Grant Programs 	
TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> • Challenging to make assessments or cost of technical assessments and stay current with infrastructure and security demands. • Communicating the right level of information to the public. • Ability to be proactive vs. reactive during events in order to minimize community and infrastructure impact. • Need to take action to mitigate risk during extreme weather events. 	<ul style="list-style-type: none"> • Ensure vulnerable populations are considered in analysis, including seniors, youth, and non-native English speakers.
TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> • Convening emergency operations center group meetings • Full department participation • Annual table-top exercises • Report on vulnerability assessment • Alignment of goals and coordination of efforts across Town departments <p>Outcomes:</p> <ul style="list-style-type: none"> • Improved social resilience • Improved community resilience 	<ul style="list-style-type: none"> • Consider establishing neighborhood networks and reviving the Community Emergency Response Team (CERT). • Focus on opportunities to engage and empower the senior community, such as through events and visits. • Inform and educate all committees and boards on the planning process via newsletters, annual reports, and town manager reports.

Action Implementation Blueprints



ACTION NAME

Update stormwater regulations and create a stormwater utility.

DESCRIPTION OF ACTION

Concord will evaluate the opportunity to create a stormwater utility to ensure the proper management and maintenance of the Town's stormwater system. In conjunction with information from Concord's 2019 5-Year Stormwater Management Plan, this action will assess stormwater needs, permit requirements, and weather/flooding trends to inform updates to current stormwater regulations.

CHAMPION

Concord Public Works

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Conduct an inventory and assessment of current stormwater infrastructure, regulations, and future needs.	2020-2021	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division • Planning • Buildings and Inspections • GIS expertise • Consultant
2. Research stormwater regulation and best practices from progressive towns and cities and evaluate state recommendations.	2020-2021	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division • Massachusetts Statewide Stormwater Coalition • Charles River Watershed Climate Compact • EPA Green Infrastructure Modeling Toolkit • Consultant
3. Update stormwater regulations based on assessment.	2021-2022	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division • Public Works Commission • Planning • Select Board
4. Conduct analysis of appropriate stormwater utility fee.	2021-2022	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division • Public Works Commission • Planning • Select Board
5. Hold public meetings regarding creation of a stormwater enterprise.	2021-2022	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division • Public Works Commission • Select Board • Finance Committee • Town Meeting
6. Rollout updated stormwater regulations and have hearing on stormwater utility fee.	2021-2022	<ul style="list-style-type: none"> • Concord Public Works • Public Works Commission • Concord Municipal Utilities
7. Distribute educational material to residents regarding residential stormwater runoff and solutions.	2021-2022	<ul style="list-style-type: none"> • Concord Municipal Utilities • Concord Public Works' Engineering



FINANCING RESOURCES AND MECHANISMS	
<ul style="list-style-type: none"> • EPA Urban Small Waters Grants Program • NFWF/Wells Fargo Resilient Communities Grant Program • Massachusetts stormwater project funding programs 	
TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> • New utility fees to property owners based on impact vs general fund support. • Will require community outreach to communicate the benefits. 	<ul style="list-style-type: none"> • This action is designed to provide greater equity in establishing a stormwater service fee based on private property impacts. • Ensure analysis of stormwater utility considers resident household income and small business impacts.
TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> • Stormwater analysis report • Updated stormwater regulations • New stormwater utility <p>Outcomes:</p> <ul style="list-style-type: none"> • Improved water quality • Improved public health & safety • Reduction in property damage attributed to flooding • Increased wildlife/biodiversity 	<ul style="list-style-type: none"> • Engage with residents and businesses located in areas prone to stormwater damage/management issues. • Engage with residents and local community organizations regarding improvement to environmental protection and wildlife/biodiversity protection.

Action Implementation Blueprints



ACTION NAME

Increase the use of green infrastructure and low impact development.

DESCRIPTION OF ACTION	Green infrastructure and low impact development in new construction, existing buildings, and residential spaces help to manage stormwater runoff, provide green space for recreation, integrate nature-based solutions, and improve resilience to climate change. This action is to identify and implement policies to increase the use of green infrastructure and low impact development in Concord.	
CHAMPION	Department of Land Use Management & Concord Public Works	
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS	
	TIME FRAME	KEY PARTNERS
1. Research best practices and code examples in green infrastructure and low impact development (e.g. bioswales, green roofs, lot surface permeability).	2020-2021	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division • Planning • Natural Resources • Sustainability
2. Conduct town wide assessment of high-benefit areas for green infrastructure installations.	2020-2021	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division IT/GIS Division • Planning • Buildings and Inspections • External consultant
3. Determine desired planning and code requirements based on project type, size, and cost thresholds and present draft policy recommendations to the Town.	2021-2023	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division • Planning • Buildings and Inspections • Select Board • Consultant
4. Finalize and launch town planning/code requirements for green infrastructure and low impact development in new construction, retrofits, and residential areas.	2021-2023	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division Planning • Buildings and Inspections • Local architecture and construction businesses • Neighborhood associations
5. Develop and distribute educational materials and design guidelines for residential and commercial spaces.	2021-2023	<ul style="list-style-type: none"> • Concord Public Works' Engineering Division • Planning • Natural Resources • Sustainability • Neighborhood associations • Local architecture and construction businesses • Community based organizations



FINANCING RESOURCES AND MECHANISMS	
<ul style="list-style-type: none"> • EPA Urban Small Waters Grants Program • NFWF/Wells Fargo Resilient Communities Grant Program • Massachusetts stormwater project funding programs 	
TRADEOFFS (CHALLENGES/BARRIERS)	EQUITY CONSIDERATIONS
<ul style="list-style-type: none"> • Increased capital costs • Variability of site-specific hydrogeology • Increased Operation/Maintenance needs • Stormwater regulations • Contractors with expertise in green alternatives for residential locations 	<ul style="list-style-type: none"> • Prioritize implementation of green infrastructure projects in areas of highest impact first. • Consider program that allows for off-site equivalencies.
TRACKING SUCCESS	ENGAGING THE COMMUNITY
<p>Outputs:</p> <ul style="list-style-type: none"> • List of identified priority locations for green infrastructure projects • Implementation of new town codes and regulations • Educational materials and design guidelines for implementation <p>Outcomes:</p> <ul style="list-style-type: none"> • Improved water quality • Improved air quality • Habitat for wildlife/biodiversity • Reduction in localized temperature extremes 	<ul style="list-style-type: none"> • Coordinate with homeowners associations • Provide trainings to residents, building contractors and landscape contractors • Plan community volunteer days to help implement green infrastructure techniques

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Appendices

A: GHG Inventory Report

B: GHG Reduction (Wedge) Analysis

C: Survey Summary Reports

D: Business Resilience Workshop
Summary & Best Practices Guide



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