SUSTAINABLE NEEDHAM
A CLEAN FUTURE TOGETHER

Sustainable Needham

Climate Action Roadmap

Prepared by the Climate Action Planning Committee of Needham

Acknowledgments

Needham Climate Action Planning Committee (CAPC)

Stephen Frail, Chair
Nick Hill, Vice Chair
Rachel Bright
Marianne Cooley, Needham Select Board
Artie Crocker, Needham Planning Board
Paul Dellaripa
Natasha Espada, Needham Planning Board
Joe Higgins
Kevin Keane, Needham Select Board

Town Staff Support for the CAPC

Cecilia Simchak, Assistant Director of Finance, Town of Needham
Kathryn Copely, Administrative Specialist of Design and Construction, Town of Needham
Hank Haff, Director, Building Design & Construction, Town of Needham

CAPC Interns, 2022 & 2023:

Andy Atallah, Resident, Student, Middlebury College
Rachel Alpert-Winna, Student, Emory University
Joseph Sten, Resident, Student, Boston University

Working Groups

Clean Energy Supply

Liz Gregg, Mothers Out Front, Needham
Nick Hill, Needham CAPC
George Kent, Resident
Carys Lustig, Director of Public Works, Town of Needham
Eileen Mullen, Green Needham
Mathew Tuttleman, Resident
Donna Vello, Green Needham

Climate Smart Zoning & Planning

Natasha Espada, Needham CAPC
Jacob Knowles, BR+A Consulting Engineers
Andrea Love, Payette
Oscar Mertz, Resident
Lee Newman, Director of Planning & Community Development, Town of Needham
David Roche, Former Building Commissioner, Town of Needham
Justin Savignano, Assistant Town Engineer, Town of Needham

Governance

Peter Atallah, Resident
Rachel Bright, Needham CAPC
Cyndi Gonzalez, Former Chief Information Officer, Town of Needham
Amy Haelsen, Director of Communications & Community Engagement, Town of Needham
Moe Handel, Former Member of Needham Select Board
Karen Price, League of Women Voters of Needham
Cecilia Simchak

Natural Resources/Zero Waste

Deb Anderson, Director of Conservation, Town of Needham
Maureen Commane, Green Needham
Artie Crocker, Needham CAPC
Clayton Hutchinsen, Conservation Specialist, Town of Needham
Joe Leghorn, Needham Community Farm
Ally Littlefield, Public Health Division, Town of Needham
Christine Mittaz, Student, Needham High School
Ed Olsen, Superintendent of Parks & Forestry, Town of Needham
Mike Retzky, Superintendent of Water, Sewer and Drains, Town of Needham
Eleanor Rosellini, Green Needham
Isabell Wells, Resident

Net Zero Buildings

Lynn Deninger, CannonDesign
Barry Dulong, Director, Building Maintenance, Town of Needham
Reg Foster, Chair, Needham Housing Authority
Tali Golan, Sherman, Trip Advisor
Hank Haff
Joe Higgins, Needham CAPC
Matthew Mayerhofer, Trip Advisor
Shannon Nelligan, Assistant Director of Building Maintenance, Town of Needham
Bill Paulsen, Realtor, Rotarian
Ed Quinlan, Green Needham

Zero Emissions Transportation

Carol Brown, Congregational Church of Needham
Paul Dellaripa, Needham CAPC
Jackie DeWolfe, Resident
Michael Greis, Green Needham
Robbie Havdala, Needham Public Schools
JP Mittaz, Green Energy Consumers Alliance
Nick Morris-Kliment, Christ Episcopal Church
John Regan, Fleet Supervisor, Town of Needham

Sustainable Needham Advisory Group Members

Georgina Arrieta-Ruetenik, Resident
Kim Hewitt, Former Director, Needham Free Public Library
Peter Atallah
Keith LaFace, Resident
Hans Bhatra, Needham High School Environmental Club
Andrea Longo Carter, Needham School Committee
Kathleen Ward Brown, Needham Board of Health
Carys Lustig
Alexandra Clee, Assistant Town Planner, Town of Needham
Louise Miller, Needham Finance Committee
Hannah Corrigan, Assistant Director Parks & Recreation, Town of Needham
Lee Newman
Paul Corwin, Resident
Bill Paulsen
Rob Dangel, Resident
Robert Petitt, Trustees of the Needham Free Public Library
Matthew DeMarrais, Superintendent, Recycling & Solid Waste, Town of Needham
Karen Price
Jackie DeWolfe
John Regan
Reg Foster
Kate Robey, Needham Center at the Heights
Dave Greenstein, Resident
Claire Rodgers, Associate Energy Engineer, Olin College
Amy Haelsen
Eleanor Rosellini
Hank Haff
Justin Savignano
Moe Handel
Mathew Tuttelman

Consultant

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Letter from the Select Board

SELECT BOARD

Marianne Cooley, Chair

Kevin Keane, Vice Chair

Marcus Nelson

Heidi Frail

Cathy Dowd

The fight to save our planet is on, and Needham is committed to doing our part.

To paraphrase President John F. Kennedy, "The problems of mankind...can be solved by mankind." And so in this spirit, we look to science and good environmental stewardship to move Needham towards a carbon-free future. This roadmap is part of that effort.

Over the past decade, the Town of Needham has made significant investments in improving the energy efficiency of Town buildings, increasing the availability of solar-powered electricity, and switching street lights to more efficient LED lights.

Since Needham embarked upon its efficiency efforts, the urgency of reducing greenhouse gas emissions has increased significantly. Climate change is here. We have all seen it in the form of more frequent intense storms, extended heat waves, wind events, droughts, and damage to utilities and infrastructure, trees, and our own gardens.

Recognizing the importance of tackling climate change, the Massachusetts Legislature passed the 2022 Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, committing the state with all its communities to achieving Net Zero greenhouse gas emissions by 2050, with interim targets in 2030 and 2040. Further, the Town has responded to an October 2021 Needham Town Meeting resolution asking the Select Board to act now to reduce the greenhouse gas emissions across the municipal, business, and residential sectors of Needham.

During the Summer 2021 Select Board goal setting process, the board chartered the Climate Action Planning Committee (CAPC) to advise the Select Board on prioritizing climate actions, and the CAPC has done so. We are pleased to report that current CAPC recommendations are being implemented: Municipal Electrical Aggregation, adopting the State's Specialized Energy Code, hiring a Sustainability Manager, understanding Needham's greenhouse gas profile, and generating this Climate Action Roadmap.

We thank the Climate Action Planning Committee and everyone who participated in creating this Climate Action Roadmap, and we are committed to supporting the implementation work that lies ahead.

Letter from the Climate Action Planning Committee

CLIMATE ACTION PLANNING COMMITTEE

Stephen Frail, Chair

Nick Hill, Vice Chair

Rachel Bright

Marianne Cooley

Artie Crocker

Paul Dellaripa

Natasha Espada

Joe Higgins

Kevin Keane

We are pleased to present the Town of Needham's Climate Action Roadmap, a comprehensive plan that outlines our commitment to achieving Net Zero greenhouse gas (GHG) emissions by 2050, as mandated by the Commonwealth of Massachusetts and directed by the Needham Select Board.

The Sustainable Needham Climate Action Roadmap represents a collective response to the urgent challenges of climate change. It is the result of extensive research, community engagement, and collaboration with various stakeholders. Our goal is to secure a sustainable and resilient future for our town while reducing our carbon footprint and mitigating the impacts of climate change.

This roadmap outlines specific targets, milestones, and actionable strategies across all sectors of our community. It covers essential areas such as energy efficiency, renewable energy, transportation, waste management, land use, and community engagement. The roadmap emphasizes the importance of collaboration, innovation, and inclusivity in achieving our shared goals.

Throughout the planning process, we have considered the unique characteristics of Needham, including its demographics, infrastructure, and local resources. We have also acted upon the valuable feedback and input received from residents, businesses, and community organizations.

By implementing the strategies outlined in this roadmap, Needham will not only reduce GHG emissions but also create opportunities for economic growth, improve public health, and enhance the overall quality of life in Needham. The roadmap emphasizes the role that each of us plays in achieving our Net Zero goals.

We are excited about the transformative potential of this roadmap and look forward to working closely with the entire community. Together, we can make a significant difference and leave a lasting legacy for future generations.

Thank you for your dedication to the well-being of our town and your commitment to climate action. We invite you to review the complete Sustainable Needham Climate Action Roadmap for detailed strategies and implementation steps. We are confident that, with your involvement, Needham will emerge as a leader in sustainability and inspire other communities to follow suit.

What We Have Accomplished

2011

Public Services Administrative Building is built and uses geothermal energy

2014

First Solarize Needham yields 99 new solar PV installations on homes

2016

Solar array installed at Needham Recycling and Transfer Station, producing 25% of the Town's electricity

2019

Solarize Needham Plus generates 52 new solar PV installations

2020

Needham adopts Stretch Energy Code and becomes a Green Community

2020

Sunita L. Williams Elementary School opens with a roof-mounted 155 kW solar array earning LEED Silver rating

2021

Mitchell & Newman Elementary Schools, Pollard Middle School undergo lighting upgrades projected to save 142,056 kWh annually

2021

LED Streetlight Project completed, saving 21,637 kWh annually

2021

Needham Town Meeting passes resolution to declare a Climate and Ecological Emergency

2022

Climate Action Plan Committee is chartered by the Select Board

2023

Needham Town Meeting passes the Specialized Energy Code

What We Will Do Next

2023

Needham hires its first Sustainability Manager

ACTIONS

In the coming years, Needham is committed to taking the following actions.

2030

Needham will aim to electrify 20% of residential and 25% of commercial buildings

2040

Needham will strive to electrify 80% of passenger vehicles

2050

Needham will aim to achieve net zero emissions across our entire community

SUSTAINABLE NEEDHAM
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A Clean Future Together

Needham is a place where civic engagement thrives, we embrace the role of responsible stewards, and we set high expectations for all of us to meet together. We take pride in the strategic and prudent decisions that have shaped our community, and **Sustainable Needham**—Needham's first Climate Action Roadmap—is our commitment to embracing smart choices today for a safer, cleaner future together.

Through **Sustainable Needham**, we are involving our entire community in making smarter decisions about how we get around town, heat and cool our buildings, source our electricity, and more. We will rely on the collective participation of residents, businesses, civic organizations, and the municipality itself to get the job done. Ultimately, we will draw on best practices to make the investments and create the opportunities needed to safeguard our health and safety and that of our future generations.

The goals, strategies, and actions in this Roadmap are organized into

SIX KEY FOCUS AREAS

CLEAN ENERGY

GOVERNANCE

NATURAL RESOURCES & WASTE

NET ZERO BUILDINGS

RESILIENCE & PUBLIC HEALTH

TRANSPORTATION

Why We Are Taking Action

Residents of Needham are already experiencing the impacts of climate change such as extreme heat, intense storms, and destructive flooding. If we do not prepare for climate change, residents will face a range of consequences from increasing costs to repair infrastructure to severe public health impacts. We must take action now for the following reasons:

Save money and conserve resources as the cost of taking action now is far less than the cost of climate change later.

Preserve Needham's history, culture, and quality of life because residents deserve a healthy and safe place to live.

Prepare for current and future climate impacts that are becoming more frequent and intense.

Since 1980, the US has experienced over 370 major climate-related disasters with a combined total of over $2.6 trillion in damages and over 15,000 fatalities.[1] As the costs of failing to reduce climate change become more apparent, the value of avoided Greenhouse Gas (GHG) emissions becomes clearer too. The Social Cost of Carbon (SCC)[2] quantifies reduced emissions in terms of avoided damage. Governments and major companies are using the SCC to guide decision-making. Our analysis assumes $190 per ton in alignment with EPA's calculated 2023 value for the SCC. By utilizing the SCC to calculate the cost of our GHG emissions, we can better understand the economic impacts of decisions that would increase or decrease our emissions.

The Roadmap's three guiding principles represent Needham's values and goals for implementation:

REDUCE GHG EMISSIONS

Prioritizing the reduction of Needham's greenhouse gas emissions to address climate change.

EQUITY AND INCLUSION

Addressing challenges that disproportionately affect underserved communities and prioritizing opportunities that benefit them.

RESILIENCE

Strengthening Needham's ability to adapt to climate impacts through a robust social network, reduced economic stressors, and direct investment in ecological systems.

Main Climate Hazards

Climate Change in Needham

We know climate change is here. We've already experienced its impacts in the form of localized flooding, more intense storms, droughts, and oppressive heat waves. It takes a toll on our infrastructure, energy bills, health, taxes, and property. While climate change will be experienced by everyone, the impacts will not be equal. Low-income families, people with pre-existing health conditions or disabilities, seniors, and youth are particularly vulnerable. But we've got what it takes to be resilient—to act now so that Needham emerges stronger tomorrow.

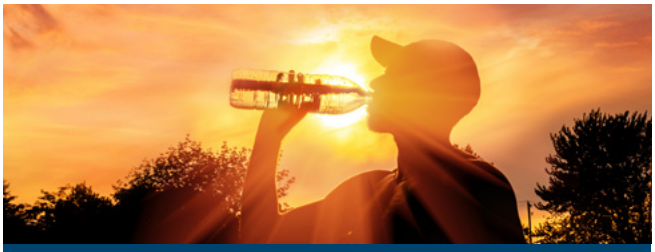
INTENSE STORMS

70% INCREASE
in the amount of precipitation falling in heavy rain events between 1958 and 2010 in the Northeast.[3]

9.9%
increase in total precipitation by 2050.[4]

IMPACTS

- Downed trees
- Power outages
- Property damage



HEAT WAVES

5.5
Average number of days above 90 degrees F from 2016-2021.[5]

21
Projected number of days above 90° F by 2050.[6]

IMPACTS

- Heat-related illness and death
- Higher energy demand
- Increased risk of vector borne disease
- Strain on electricity grid
- Increased risk of fires

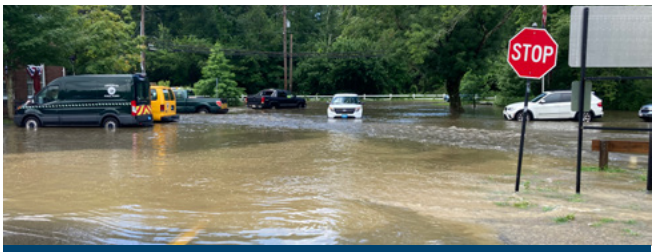
DROUGHT

22 WEEKS
with moderate to severe drought in Norfolk County in 2022.[7]

UP TO A 10 DAY
increase in annual maximum number of consecutive dry days expected by 2100 in Massachusetts.[8]

IMPACTS

- Stress on wildlife
- Diminished water supply
- Damage to local farm crops
- Increased food insecurity



FLOODING

220 HOMES AND BUSINESSES
were impacted by the August 8, 2023 flooding event.[9]

25%
increase in annual days with total precipitation > 1 inch by 2050.[10]

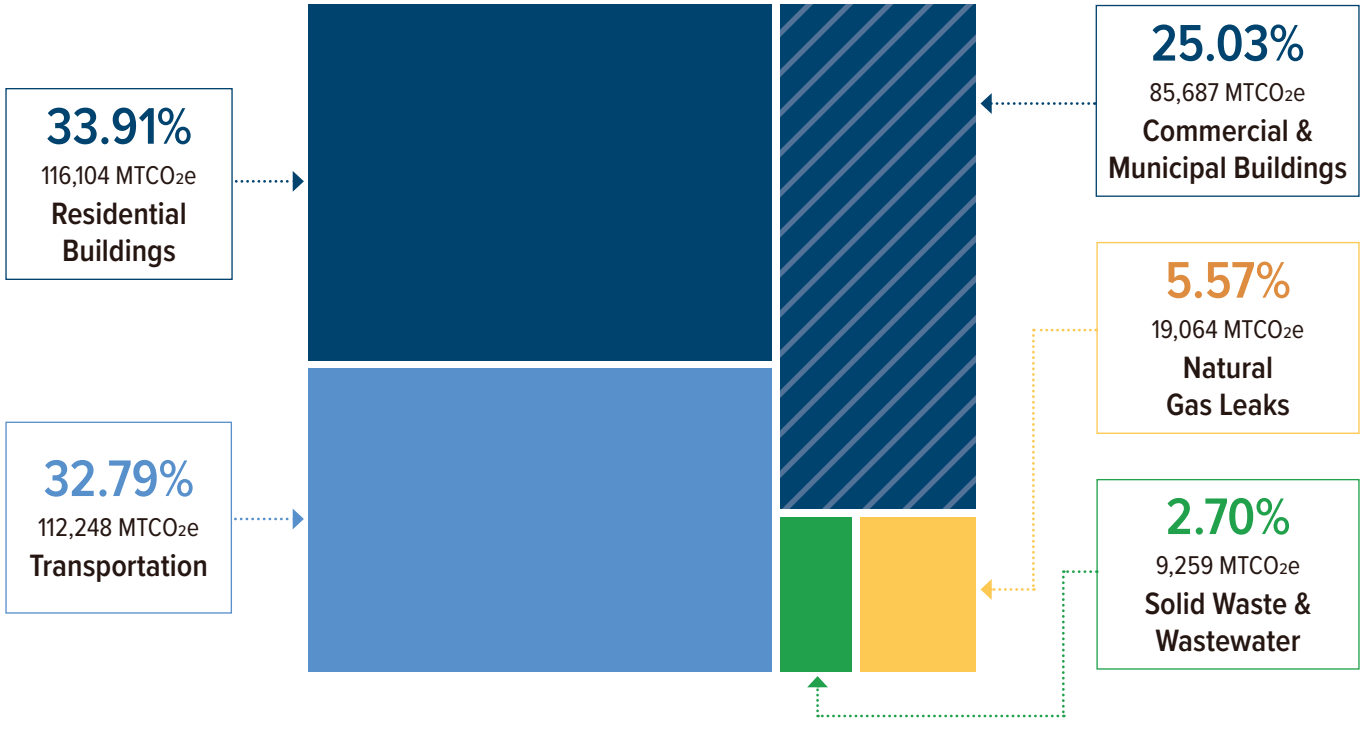
IMPACTS

- Damage to critical facilities, infrastructure, homes, and businesses
- Costs to taxpayers
- Risk to humans and wildlife
- Pollution from stormwater runoff

Assessing Our Contribution

The key to addressing climate change in Needham is reducing our greenhouse gas (GHG) emissions. GHGs are the planet-warming product of burning fossil fuels like natural gas and oil to power our homes, businesses, and vehicles. Emissions are also produced when trash and food waste are incinerated or decompose in a landfill. To create an actionable and data-driven climate action plan, we need to identify and understand the sources of GHG emissions in Needham. A community wide GHG inventory with a 2021 baseline year identifies the largest sectors and sources of emissions. The inventory provides a foundation to develop high-impact strategies and actions for **Sustainable Needham**.

In 2021, Needham generated 342,362 metrics tons of carbon dioxide equivalent ($MTCO_2e$) community-wide, including the public and private sectors. Energy used to power buildings accounts for the majority of our emissions (65%). These emissions are related to lighting, heating and cooling, and powering the appliances and devices we use. The second largest source of GHG emissions was the transportation sector (33%), primarily from private passenger vehicles with small additions from commercial vehicles and public transit. Municipal operations, including energy consumed by Town-owned buildings, facilities, and vehicles, account for less than 3% of Needham's total GHG emissions. As a result, the high-impact strategies laid out in this Climate Action Roadmap specifically target community-wide actions.



Needham's 2021 GHG Emissions by Sector = TOTAL 342,362 $MTCO_2e$

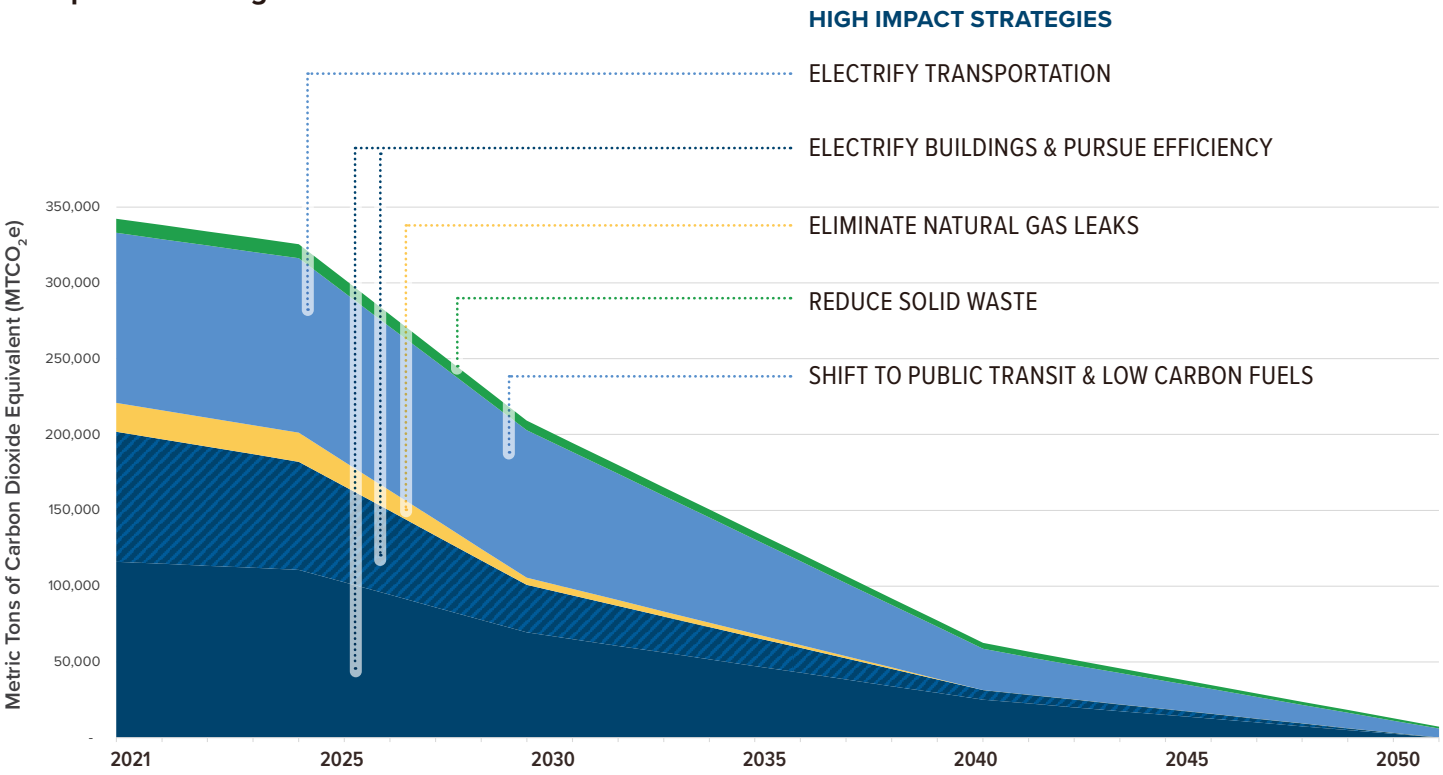
Pathways to Reducing Emissions

Reducing our direct GHG emissions is the primary way that we can reduce our contribution to climate change.

Achieving Net Zero by 2050

Reducing our GHG emissions is the primary way we can reduce our contribution to climate change. We can directly affect our sources of emissions by changing what types of energy we use, how efficiently we use it, and how much waste we generate. The strategies outlined in this Climate Action Roadmap are designed to help us reach our climate goals. The chart below models the opportunity for GHG reductions in our community through 2050. The different bands in the graph correspond to the remaining emissions after Needham's high-impact strategies are implemented. To achieve these reductions, an additional overarching strategy to purchase 100% of our electricity from new renewable energy resources is required—aligning with Massachusett's Renewable Energy Portfolio Standard (REPS) and related investments in solar and off-shore wind projects. This will ensure we maximize GHG reductions as we transition our homes, businesses, and vehicles to operate using electricity.

Impact of Strategies



GHG Emissions by Sector

- Residential Buildings
- Commercial Buildings
- Transportation
- Natural Gas Leaks
- Solid Waste & Wastewater

High Impact Strategies

ELECTRIFY TRANSPORTATION

GHGS REDUCED: 120,000 $MTCO_2e$

SOCIAL COST OF CARBON AVOIDED: $22.8M

Transportation represents the second largest source of GHG emissions. To tackle emissions from the transportation sector, we will need to transition a significant number of both passenger and commercial vehicles to EVs; these milestones are in alignment with the MA Decarbonization Roadmap and the 2025-2030 Climate and Clean Energy Implementation Plan.

ELECTRIFY BUILDINGS & PURSUE EFFICIENCY

GHGS REDUCED: 111,400 $MTCO_2e$

SOCIAL COST OF CARBON AVOIDED: $21.2M

Energy use in buildings accounts for almost two-thirds of Needham's GHG emissions. To rapidly reduce emissions, we must eliminate the direct use of fossil fuels for heating, cooking, and other uses in both new and existing buildings. All electrification efforts should be accompanied by high efficiency retrofits to minimize the demand for new renewable energy.

ELIMINATE NATURAL GAS LEAKS

GHGS REDUCED: 19,100 $MTCO_2e$

SOCIAL COST OF CARBON AVOIDED: $3.6M

Natural gas leaks in buildings, which account for 5% of Needham's emissions, can be a significant contributor to climate change, as it is a source of methane (CH_4). Methane is a potent greenhouse gas with a global warming potential (GWP) that is over 25 times greater than carbon dioxide (CO_2).

REDUCE SOLID WASTE

GHGS REDUCED: 8,200 $MTCO_2e$

SOCIAL COST OF CARBON AVOIDED: $1.6M

Between now and 2050, we need to steadily increase diversion rates to ultimately reach 90% (which is the threshold for "zero waste"). This means diverting organic waste (e.g., food waste) to compost, reducing our use of plastics and other non-recyclable materials, and preventing as much waste as possible from being incinerated.

SHIFT TO PUBLIC TRANSIT & LOW CARBON FUELS

GHGS REDUCED: 3,000 $MTCO_2e$

SOCIAL COST OF CARBON AVOIDED: $570K

Increased use of public transportation can decrease vehicle miles traveled and will further reduce emissions from transportation. With the uptake in transit-oriented development, Needham is moving towards more sustainable options. As heavy-duty trucks lag in EV transition due to market and technology limitations, state and federal standards to reduce these residual emissions in the short-term.

Decarbonizing Our Electricity Supply

How "clean" our electricity is will be determined by which resources we use to generate it. The greater the percentage of clean energy sources, the less carbon is emitted to serve our needs. Purchasing 100% of our electricity from new renewable sources will ensure significant GHG reductions as we transition our buildings and vehicles away from fossil fuels. The High Impact Strategies listed above assume that the carbon intensity of our electricity will be zero in 2050.

Action Plan Summary

The **Sustainable Needham** planning process identified goals, strategies, and actions under each focus area that will reduce our contribution to climate change and prepare our community for climate impacts.

CLEAN ENERGY

Goal EN.1 Needham achieves 100% renewable energy by 2050.	
EN.1.1	**Provide residential and commercial customers with electricity options that are clean, local, and competitively priced.**
⚙ EN.1.1.A	Design and implement a Municipal Electricity Aggregation program to drive the development of local renewable capacity and community solar.
EN.1.1.B	Create and implement an outreach campaign to educate residents about the Municipal Electricity Aggregation program and encourage residents to opt up to the greenest option.
EN.1.2	**Accelerate local renewable energy installation.**
⚙ EN.1.2.A	Identify sites to install solar plus storage on public property.
✱ EN.1.2.B	Re-establish a solarize campaign and expand it to include storage and other complimentary technologies.
⚙ EN.1.2.C	Update zoning and permitting bylaws to encourage the installation of solar PV, particularly over parking lots and commercial buildings.
Goal EN.2 Needham has a resilient energy infrastructure and supply.	
EN.2.1	**Collaborate with local and regional entities to drive the transition to clean, renewable energy.**
EN.2.1.A	Formalize a collaboration with Eversource to address gas leaks, plan for infrastructure upgrades, and invest in electrification.
EN.2.2	**Strengthen and expand back-up power infrastructure.**
EN.2.2.A	Explore opportunities for microgrids to improve energy reliability and resilience in the face of climate impacts.
⚙ EN.2.2.B	Identify candidate sites and assess the feasibility of network geothermal systems and the expansion of energy storage capacity for critical facilities.

NET ZERO BUILDINGS

Goal BU.1 Buildings in Needham are designed, constructed, and maintained to be energy efficient and minimize greenhouse gas emissions.	
BU.1.1	**Implement high-efficiency and carbon neutrality standards for new construction and significant renovations.**
✔ BU.1.1.A	Adopt Specialized Energy Code (“Net-Zero”) for all new construction including municipal buildings, residential, and commercial developments.
✱ BU.1.1.B	Enable Commercial Property Assessed Clean Energy (PACE) by opting into MassDevelopment Program and develop supporting programs to drive participation.
BU.1.1.C	Require municipal building construction and renovations to calculate embodied carbon and life cycle costs and encourage reductions where feasible.
⚙ BU.1.1.D	Partner with Needham Housing Authority to identify funding opportunities for sustainability upgrades in existing affordable housing units.
BU.1.2	**Pursue deep energy efficiency through retrofits and electrification in existing buildings.**
⚙ BU.1.2.A	Pursue upgrades to existing municipal facilities to achieve net zero energy performance and publish energy use data to increase transparency.
✱ BU.1.2.B	Develop educational materials and conduct a targeted outreach campaign around MassSave incentives to residential and commercial property owners.
BU.1.2.C	Establish a local energy coaching program where trained coaches can engage directly with residents and businesses on electrification and efficiency upgrades.

✔ Complete ⚙ In Process ✱ High Priority

TRANSPORTATION

Goal TR.1	**Needham accelerates the transition to electric vehicles.**
TR.1.1	**Promote and encourage EV adoption among Needham residents.**
✱ TR.1.1.A	Install EV charging stations in priority parking locations such as apartment buildings, municipal buildings, and local businesses.
TR.1.1.B	Create a public awareness campaign for electric vehicles, available charging stations, and existing incentives for EVs.
TR.1.2	**Transition all municipal vehicles to electric models by 2030.**
✱ TR.1.2.A	Create and adopt an EV-first policy that requires Town-owned and leased vehicles to adopt readily available EV technology at time of replacement, where feasible.
Goal TR.2	**Needham has low-carbon mobility options accessible to all.**
TR.2.1	**Decrease single occupancy vehicle trips.**
✱ TR.2.1.A	Create a bike network plan and launch an outreach campaign to educate residents about active mobility options for local trips.
TR.2.1.B	Invest in high-comfort bicycle and pedestrian infrastructure and expand bike lane connectivity.
TR.2.1.C	Identify opportunities and work with community partners and neighboring towns to connect the Needham Rail Trail to other local trails and commercial points of interest.
TR.2.1.D	Update zoning by-laws to reduce minimum parking requirements in an effort to reduce vehicle trips and increase safety for pedestrian and bicycle traffic.
TR.2.2	**Increase public transit ridership and reduce transit-related emissions through operational improvements and electrification.**
TR.2.2.A	Support electrification of transit vehicles through installation of level 3 chargers at strategic locations throughout town.
TR.2.2.B	Collaborate with MBTA to improve operations including route efficiency, expanded service, last-mile options, improved affordability, and electrifying railway.
⚙ TR.2.2.C	Revise local zoning requirements to ensure compliance with MBTA Communities zoning law.

NATURAL RESOURCES & WASTE

Goal NA.1	**Public and private landscapes are designed to be climate resilient, manage stormwater, maximize tree canopy, and promote community resilience and carbon sequestration.**
NA.1.1	**Protect and enhance tree canopy and open space.**
✱ NA.1.1.A	Develop and enact a Tree Preservation Bylaw covering the removal and restoration of trees on private land.
NA.1.1.B	Identify private parcels of land with a high natural resource or recreation value and pursue local, state, and federal funding to acquire and preserve them as open space.
⚙ NA.1.1.C	Conduct a baseline tree inventory to map and track tree canopy and identify heat islands and other areas to enhance the canopy.
NA.1.2	**Implement sustainable landscaping practices and green infrastructure on private and public lands.**
NA.1.2.A	Create a municipal planting policy that prioritizes adaptive and native species and supports pollinators and other wildlife.
NA.1.2.B	Incentivize developers to obtain UMASS Clean Energy Extension Pollinator-Friendly Certification for medium- and large-scale solar installations.

✔ Complete ⚙ In Process ✱ High Priority

Action Plan Summary

The **Sustainable Needham** planning process identified goals, strategies, and actions under each focus area that will reduce our contribution to climate change and prepare our community for climate impacts.

NATURAL RESOURCES & WASTE

NA.1.2.C	Accelerate the uptake of sustainable landscaping practices through rebates, incentives, and education.
NA.1.2.D	Develop and enact an ordinance to phase out the use of gas-powered lawn equipment on public and private property.
Goal NA.2	**Needham manages waste responsibly and reduces waste where possible.**
NA.2.1	**Reduce consumption and maximize reuse.**
NA.2.1.A	Develop and implement a public outreach campaign to educate residents about how to reduce waste to meet the goals of the state's Solid Waste Master Plan.
NA.2.1.B	Expand existing plastic bag ordinance to target other types of single-use plastics and packaging.
⚙ NA.2.1.C	Partner with local organizations, businesses, and the library to expand and increase use of mini "Re-Use-It Swap Shops" and lending libraries in multiple locations across the community.
NA.2.2	**Increase diversion to recycling and composting.**
NA.2.2.A	Allocate additional resources and infrastructure for Needham's Community Food Waste Recycling Program.
NA.2.2.B	Maintain and publicize online resources to help community members recycle or donate textiles, mattresses, hazardous materials, and other hard-to-recycle items.
✱ NA.2.2.C	Audit the waste stream in municipal facilities and schools from purchasing to disposal and develop and implement plans to reduce waste.

GOVERNANCE

Goal GO.1	**Needham has a culture of climate action through enhanced education and leadership.**
GO.1.1	**Increase the Town's organizational capacity to implement the Climate Action Roadmap.**
GO.1.1.A	Educate municipal departments, Town Boards, Committees, and Town Meeting about the *Climate Action Roadmap* objectives and its applicability to operations and procedures.
✱ GO.1.1.B	Report implementation progress of the *Climate Action Roadmap* to Town Boards, Committees, Town Meeting, and the general public on an annual basis and update the GHG inventory and Roadmap every 5 years.
✔ GO.1.1.C	Hire a Sustainability Manager to oversee the implementation of the Climate Action Roadmap and reevaluate capacity needs every five years.
GO.1.2	**Enhance climate literacy and leadership among Needham's residents and businesses.**
GO.1.2.A	Establish a comprehensive Climate Communications Strategy to engage community members and organizations in the implementation of climate actions and continuous evolution of the Climate Action Roadmap.
GO.1.2.B	Develop and promote a green business designation program that highlights simple cost-saving sustainability measures for local businesses.
Goal GO.2	**Needham's municipal operations reflect sustainability and resiliency principles.**
GO.2.1	**Incorporate climate change into Town projects, programs, and plans.**
GO.2.1.A	Integrate the Social Cost of Carbon into the Town's financial analyses to ensure Town projects, programs, and policies align with Climate Action Roadmap principles and goals.
GO.2.1.B	Require Capital Improvement Plans to align with the Town's climate goals.
GO.2.1.C	Integrate sustainability requirements and standards into Town procurement policies where feasible.

✔ Complete ⚙ In Process ✱ High Priority

RESILIENCE & PUBLIC HEALTH

Goal RE.1 Needham's infrastructure and services are equipped to respond to climate hazards.	
RE.1.1	**Implement climate-smart zoning practices to enhance resilience and address threats.**
RE.1.1.A	Conduct a targeted outreach campaign to homeowners, renters, and prospective buyers about local flood, stormwater, and other climate change driven risks and protection best practices.
RE.1.1.B	Update Flood Plain maps to incorporate climate projections including sea level rise.
RE.1.1.C	Update zoning bylaws to require occupiable spaces and critical building systems to incorporate flood protection measures and prevent stormwater runoff from damaging neighboring properties.
RE.1.2	**Enhance the resilience of Town infrastructure and services.**
⚙ RE.1.2.A	Elevate or protect vulnerable utilities or infrastructure above projected flood levels.
RE.1.2.B	Strengthen existing emergency response plans to include strategies and procedures to address the impacts of climate change.
RE.1.2.C	Implement cooling strategies at existing Town-owned property.
Goal RE.2 People in our community are prepared to recover quickly from short-term shocks and long-term stressors.	
RE.2.1	**Strengthen communication and education to increase emergency preparedness of residents.**
RE.2.1.A	Assess and improve accessibility of climate and emergency preparedness educational resources to ensure they reach everyone, especially vulnerable populations.
RE.2.1.B	Create a promotional plan to increase the number of people signed up to receive emergency alerts through AlertNeedham.
RE.2.1.C	Establish partnerships with community-serving facilities to distribute emergency preparedness information and serve as hubs during climate emergencies.
RE.2.1.D	Develop and disseminate climate resilience toolkits for small businesses, community groups, houses of worship, and other organizations.

✔ Complete ⚙ In Process ✱ High Priority

WHAT'S INCLUDED

- ☑ Local renewable generation
- ☑ Energy supply
- ☑ Resilience retrofits
- ☑ Grid resilience

Clean Energy

Maximizing new renewable energy and storage capacity within the local built environment.

BY THE NUMBERS

In recent years, there has been an increase in solar production in Needham as more and more property owners are choosing to install solar systems on their homes and businesses. Needham aims to encourage more solar installation with the adoption of the Specialized Energy Code.

84%

increase in solar system installations in Needham from 367 in 2016 to 674 in 2021.[13]

62%

increase in local solar production in Needham from 7,986 MWh in 2016 to 12,911 MWh in 2021.[14]

122,000 MWh

of local renewable energy could be produced if rooftop solar systems were installed on all existing buildings with conditions suitable for solar. This would supply 30% of the building electricity demand in 2050 under our Pathways to Reducing Emissions scenario.[15]

TRACKING PROGRESS

The following metrics will help Needham monitor progress toward our goals for Clean Energy.

METRIC	BASELINE YEAR	2030 TARGET	2040 TARGET	2050 TARGET
Solar Capacity (MW)	11 MW (2021)[11]	27 MW	54 MW	108 MW
Solar Potential Reached	10% (2021)[12]	25%	50%	100%
Percent of households enrolled in Municipal Electricity Aggregation greenest option	New Metric	50%	100%	100%

TAKE ACTION

Thinking of installing solar or battery storage at your home or business? Ask a Green Needham expert any questions you may have about the process.

LEARN MORE

WHAT'S INCLUDED

- [x] Climate literacy
- [x] Climate communications
- [x] Procurement policies
- [x] Green businesses

Governance

Ensuring the Town's ability to implement the Climate Action Roadmap and improving climate literacy through community outreach.

BY THE NUMBERS

Throughout the process of developing this Climate Action Roadmap, Needham conducted a survey to receive feedback from community members and key stakeholders. The survey received 334 responses and the overwhelming majority agreed that Needham should take action on climate.

87%
of survey responders are worried about global warming.

82%
of survey responders agree that Needham should do more to reduce its impact on the environment.

85%
of survey responders agree that the residents and businesses of Needham should do more to reduce their impact on the environment.[16]

TRACKING PROGRESS

In order to measure progress toward implementing the Climate Action Roadmap, the Town of Needham will track the following metrics:

- Implementation progress of Climate Action Roadmap actions
- Number of citizens reached through climate educational programming and events

TAKE ACTION

Stay updated on what the Town is doing by signing up for the Town's weekly e-newsletter, The News you Need(ham).

LEARN MORE

WHAT'S INCLUDED

- ☑ Recycling and composting
- ☑ Reduced consumption
- ☑ Sustainable landscaping practices
- ☑ Parks, open spaces, tree canopy

Natural Resources & Waste

Maximize carbon reduction through natural resources protection and responsible waste management.

BY THE NUMBERS

Trees are vital for helping absorb and reduce Needham GHGs, making the preservation and expansion of tree canopy a high priority. Additionally, while Needham is already above the national average in residential diversion rates, continuing to divert waste from landfills through increasing recycling and composting rates will help reduce emissions.

4,114
acres of tree cover.*

*MassGIS (2016). Landcover.

Stores **469,168** $MTCO_2e$, equivalent to over **59,000** homes' energy use for one year

Sequesters **18,681** $MTCO_2e$ per year

39% of residential waste is diverted from landfills*

*MassDEP (2021). Municipal Solid Waste & Recycling Survey.

National average household diversion rate is **32%**

TRACKING PROGRESS

The following metrics will help Needham monitor progress toward our goals for Natural Resources & Waste.

METRIC	BASELINE YEAR	2030 TARGET	2040 TARGET	2050 TARGET
Percent of tree canopy coverage	48% (2016)[17]	49%[18]	50%	Maintain at 50%
Percent of land covered by impervious surfaces	30% (2019)	29%	27%	25%
Residential waste diversion rate	39% (2021)[19]	50%	60%	90%

TAKE ACTION

Reduce the amount of food waste you send to the landfill by participating in the Town of Needham's composting program or hiring a composting company to collect it.

LEARN MORE

WHAT'S INCLUDED

- [x] Energy efficiency
- [x] Electrification
- [x] Existing buildings
- [x] New construction

Net Zero Buildings

Improving building energy performance through high-efficiency and carbon neutral standards.

BY THE NUMBERS

Only a small percentage of households in Needham are heated with electricity. There is significant opportunity in Needham to retrofit and electrify homes and buildings. As the electricity grid continues to get cleaner, electrifying buildings is a critical step to reducing our contribution to climate change.

46%
of residential housing structures are heated with oil*

53%
of residential housing structures are heated with natural gas

only 2%
of housing structures are heated with electricity

*Assessor's Database

TRACKING PROGRESS

The following metrics will help Needham monitor progress toward our goals for Net Zero Buildings.

METRIC	BASELINE YEAR	2030 TARGET	2040 TARGET	2050 TARGET
Percent of residential buildings electrified	2% (2023)[20]	20%	50%	100%
Percent of commercial buildings electrified	1% (2023)	25%	75%	100%

TAKE ACTION

Lower your energy costs and improve the comfort of your home by taking advantage of rebates and incentives offered by Mass Save to insulate and switch to heating and cooling heat pumps.

LEARN MORE

WHAT'S INCLUDED

- ☑ Reduced flood risk
- ☑ Infrastructure resilience
- ☑ Emergency preparedness
- ☑ Access to resources and services

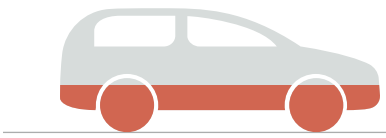
Resilience and Public Health

Preparing for climate hazards through enhanced resilience infrastructure and emergency services.

BY THE NUMBERS

Needham has already been experiencing increased levels of flooding during intense rainfall events. For example, on August 8, 2023, Needham experienced a 1 in 1,000-year storm with some areas receiving over 6 inches of rain per hour, leaving drivers stranded and public transit disrupted. As projected flood risk continues to increase, strengthening infrastructure and protecting critical assets will improve resilience for the Needham community.

1,368 out of 8,799
residential properties have a moderate flood risk over the next 30 years*



61 out of 204
miles of roads have a moderate flood risk over the next 30 years

82 out of 314
commercial properties have a moderate flood risk over the next 30 years

*Flood Factor. Flood Risk Overview: Needham.

TRACKING PROGRESS

The following metrics will help Needham monitor progress toward our goals for Resilience and Public Health.

METRIC	BASELINE YEAR	2030 TARGET	2040 TARGET	2050 TARGET
Percent of homes with moderate flood risk	16% (2023)[21]	11%	6%	0%
Heat-related ER visits in Norfolk County	51 (2020)[22]	35	20	0
Percent of Needham residents signed up for Needham's Rave911 mobile alerts	13% (2023)[23]	45%	60%	70%

TAKE ACTION

To prepare for emergencies, sign up to receive alerts through Needham's Rave911 System and report floods and other hazards that you experience through SeeClickFix.

Rave911 System
LEARN MORE

SeeClickFix
LEARN MORE

WHAT'S INCLUDED

- ☑ Public transportation
- ☑ Parking
- ☑ Low-carbon mobility (e.g., walking, biking)
- ☑ Electric vehicles and charging

Transportation

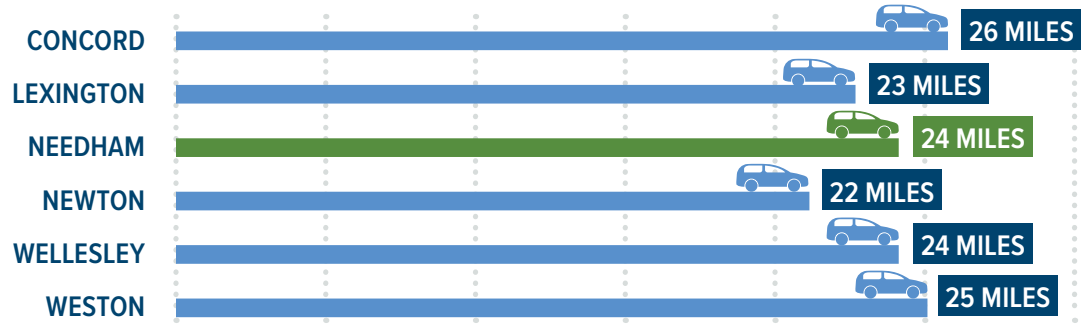
Accelerating the transition to electric vehicles and enhancing low-carbon mobility alternatives.

BY THE NUMBERS

Transportation contributes one-third of Needham's GHG emissions, most of which come from private vehicles driven by residents and businesses. We can significantly reduce GHGs by shifting to public transit and transitioning to electric vehicles (EVs). Fortunately, Needham has already seen an increase in EV adoption with fully electric and hybrid EVs making up 10% of passenger vehicles.

How does Needham Compare to Other Communities?

PASSENGER VEHICLE MILES TRAVELED (VMT) PER PERSON PER DAY



Data Source: Massachusetts Vehicle Census (2022)

TRACKING PROGRESS

The following metrics will help Needham monitor progress toward our goals for Transportation.

METRIC	BASELINE YEAR	2030 TARGET	2040 TARGET	2050 TARGET
Share of Passenger Vehicles 100% Electric	2% (2023)[24]	19%	80%	100%
Increase in Daily Transit Riders	# of MBTA Riders: ~1,440 (2023)[25]	+268	+535	+669
Percentage of residents within .25 mile of high comfort bicycle network	<1% (2023)[26]	30%	80%	100%

TAKE ACTION

Massachusetts offers rebates for the purchase or lease of new and used electric vehicles, as well as the installation of home EV chargers. See if you qualify.

LEARN MORE

Endnotes

1 U.S. Billion-Dollar Weather and Climate Disasters, NOAA National Centers for Environmental Information (2023).

2 The Social Cost of Carbon, United States Environmental Protection Agency (2023).

3 Climate Change Impacts in the United States: The Third National Climate Assessment, Ch 16: Northeast (2014).

4 Climate Explorer, NEMAC (2023).

5 National Environmental Public Health Tracking Network, CDC (2023).

6 Climate Change Projections Dashboard, Resilient MA (2023).

7 US Drought Monitor, Norfolk County (2023).

8 Climate Action Tool, UMass Amherst (2017).

9 Town of Needham Data (2023).

10 Climate Resilience Mapping for Adaptation, NOAA (2023).

11 Production Tracking System (PTS) Solar Photovoltaic Report, MassCEC (2022).

12 Google Project Sunroof, Data Explorer (2019).

13 Production Tracking System (PTS) Solar Photovoltaic Report, MassCEC (2022).

14 Production Tracking System (PTS) Solar Photovoltaic Report, MassCEC (2022).

15 Google Project Sunroof, Data Explorer (2019).

16 Community Survey, Town of Needham (2023).

17 Neighborhoods at Risk, U.S. Climate Resilience Toolkit (2023).

18 Tree Equity Score, American Forests (2023).

19 Municipal Solid Waste & Recycling Survey Responses, MassDEP (2021).

20 Assessor's Database, Town of Needham (2023).

21 Flood Factor, Needham (2023).

22 National Environmental Public Health Tracking Network, CDC (2023).

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24 Massachusetts Vehicle Census, MassDOT (2023).

25 MBTA Commuter Rail Ridership, MassDOT MBTA Open Data Portal (2023).

26 Town of Needham Data (2023)

SUSTAINABLE NEEDHAM

A CLEAN FUTURE TOGETHER

Have questions? email us at:

climate@needhamma.gov

Sign up for Needham's newsletter