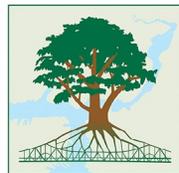


North Suffolk **Zero Carbon Action Plan**



**NORTH
SUFFOLK
OFFICE of
RESILIENCE &
SUSTAINABILITY**



Celebrating **25** Years
of Fighting for Social and
Environmental Justice!
GreenRoots



Acknowledgements

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Introduction Letter

The North Suffolk region, composed of the municipalities of Chelsea, Revere and Winthrop, has a rich history as a key coastal corridor in the Greater Boston area. Our region has experienced increased development and socio-demographic diversity, with a 17% increase in population, 95% increase in non-white residents, and 78% of the population living within state-designated Environmental Justice areas over the past 10 years.^A With climate change emerging as a key challenge to our wellbeing, the municipalities joined to create the North Suffolk Office of Resilience & Sustainability in 2021, to address limited staffing capacity and to achieve greater sustainability and resilience.

Climate change is happening and impacting our communities: sea-level rise and stronger storms expose people, buildings, and infrastructure to increased flooding. As temperatures rise, extreme heat will become an even greater public health concern for our community. To mitigate the worsening effects of climate change, the Commonwealth of Massachusetts adopted the Climate Roadmap Law (Acts of 2021, Ch. 8), requiring greenhouse gas emissions reductions to reach net-zero by 2050. Due to the proximity of Boston Logan Airport and current land uses within the region, improving air quality has been a major objective from the community, and directly overlaps with the reduction of GHG emissions in the region.

The North Suffolk Office of Resilience & Sustainability is thrilled to present the Zero Carbon Action Plan, a key roadmap to align local policies and strategies with broader objectives from the Climate Roadmap Law and improve public health outcomes. Community engagement and collaboration has been a cornerstone of our approach to creating this plan, including equity as an important factor in deciding how to pursue the zero carbon by 2050 goal. The insights, concerns, and aspirations from residents, community-based organizations and businesses have shaped the strategies and actions outlined within this document.

The Zero Carbon Action Plan will serve as a clear guide for municipal staff and policymakers to achieve our ambitious net-zero emissions objective, while fostering a sense of collective responsibility to undertake these steps.



Ibrahim López-Hernández
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A. Period between 2010 Census and 2020 Census.

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Section One: Introduction

About the Plan

The North Suffolk region, comprised of the City of Chelsea, City of Revere, and Town of Winthrop, has come together to develop a region-wide plan to address carbon pollution and create a more sustainable and livable future. In 2020, the three municipalities formed the **North Suffolk Office of Resilience and Sustainability (NSORS)**¹ to support climate and sustainability efforts across the communities.

In 2021, NSORS received a grant from the state to support the development of the first North Suffolk Zero Carbon Action Plan (ZCAP). With this funding, NSORS worked with the Metropolitan Area Planning Council (MAPC) and GreenRoots to engage local community members, community groups and non-profits, and municipal staff to develop the ZCAP. The resulting regional climate action plan aims to reduce carbon pollution, improve community health, and mitigate the impacts of climate change. The strategies and actions included in the plan focus on local and regional actions that can be taken to decrease greenhouse gas (GHG) emissions across all three communities including:

- Reducing emissions from transportation
- Making our communities more walkable and bikeable
- Increasing local solar power and other clean energy sources
- Reducing energy costs and use for community members
- Pursuing land use, zoning, and policy changes
- Making our homes and businesses more energy efficient and sustainable
- Using strategies to remove carbon from the atmosphere, like tree planting

This local and regional effort aligns with the Commonwealth of Massachusetts' net zero by 2050 commitment, with a key interim goal of reducing emissions by 50% by 2030. Municipalities have a critical role to play in rapidly driving down emissions while ensuring that solutions meet community needs, are equitable, and advance local public health priorities.

About the North Suffolk Region

The North Suffolk region is unique — it is home to some of the densest communities in the Commonwealth and over 85% of residents live within a census block classified by the state as Environmental Justice (EJ) area.² Situated immediately north of the City of Boston, on the Mystic River and Boston Harbor, it is home to some of the region's critical infrastructure including port activities and shipping, transportation, and support services for Logan Airport. Its proximity to Boston, access to transit, and density of housing has made it a prime location for commuters and residential neighborhoods, and pursuing additional transit-oriented development is key to reducing carbon emissions. However, the high levels of passenger vehicles, freight, port, and air traffic have led to disproportionate amounts of air pollution and these same communities face a disproportionate number of environmental burdens and related infrastructure including fuel tanks and road salt storage.

- **Chelsea:** Located across the Mystic River from the City of Boston, it is home to 40,000 residents across 2.21 square miles, making it the second most densely populated city in Massachusetts. Chelsea is a diverse community, with a rich history of immigrants and more than 60% of the population identities as Latino or Hispanic. 73.14% of households are renters.
- **Revere:** A coastal city located 5 miles from downtown Boston, it is home to 54,000 residents across 10 square miles. Revere has a history of being a working-class, blue-collar community, and home to several immigrant and multicultural communities including Spanish, Brazilian Portuguese, and Arabic speaking communities. 50.49% of households are renters and there is a rapidly growing multifamily residential housing market.
- **Winthrop:** A coastal town situated on a peninsula at the north entrance of Boston Harbor, is home to 19,000 residents across 1.6 square miles. It is connected to Revere by two roadways and includes ferry service for commuters. 55.84% of households are owner-occupied and 83% identify as white and 13% identify as Latino or Hispanic.

Existing Climate Leadership

The municipalities in North Suffolk have been leaders on advancing sustainability and climate priorities within their communities. As members of the Metro Mayors Coalition, the three communities made a regional commitment to address climate impacts and preparedness in 2015, and in 2016 made a commitment to become a net zero region by 2050 and take local action.³

All three municipalities are designated Green Communities, which included adoption of the Stretch Energy Code, Municipal Fleet Vehicles Policy, and zoning for solar energy.⁴ As part of the program, all three communities have implemented measures to reduce energy usage in municipal buildings, schools, and municipally owned vehicles.

In 2017, Chelsea and Winthrop were designated SolSmart communities by the United States Department of Energy (DOE) for efforts to streamline and reduce costs for solar in their communities. Revere has also lowered energy costs for the city and low-income residents through participation in community shared solar which is projected to save the city \$4.5 million dollars in energy costs over the 20-year contract.⁵ Revere has also worked with performance contractor, Ameresco, to make energy efficiency upgrades in its school buildings. Most recently, the region has participated in the Mass Save Community First Partnership together, a program which provides education, outreach, and assistance to low- and moderate-income residents to access energy efficiency programs available through the utility.⁶ The ZCAP builds upon the success of existing programs and leadership from municipal governments that continue to reduce carbon emissions, save on energy costs, and advance sustainability.

Environmental Justice and Equity

The three North Suffolk communities have Environmental Justice (EJ) populations and 85% of the region lives in a designated EJ census block. The Commonwealth of Massachusetts defines EJ as *“the principle that all people have a right to be protected from environmental hazards and to live in and enjoy a clean and healthful environment. EJ is the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits.”*¹

Massachusetts uses three demographic criteria: low-income, minority, and English isolation to designate a community as an EJ community:

- “(i) the annual median household income is not more than 65 percent of the statewide annual median household income;
- (ii) minorities comprise 40 percent or more of the population;
- (iii) 25 percent or more of households lack English language proficiency; or
- (iv) minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.”²

EJ communities are more often impacted by pollution and climate change because of the historical disinvestment and disenfranchisement in public processes and decision making that has caused certain neighborhoods and communities to be overburdened by polluting industries. Policies such as redlining have also contributed to the lack of green space and low housing quality in predominantly Black, Indigenous, People of Color (BIPOC) and low-income communities. These frontline communities are often disproportionately impacted by extreme weather events, which are increasing due to climate change.

All block groups in Revere and Chelsea have EJ populations that meet one or more of the following EJ criteria: minority, minority and income, minority and English isolation, and income and English isolation. About half of the block groups in Winthrop consist of EJ populations that meet the following criteria: minority, income.

In addition to EJ demographics, there are other factors that can contribute to climate vulnerability, including age and ability. In the North Suffolk region, 13% of residents live with a disability and seniors (age 65+) make up 9.7% of Chelsea’s, 13.7% of Revere’s and 19.9% of Winthrop’s total population.

Sources:

1. [Updated Massachusetts 2020 Environmental Justice Populations \(arcgis.com\)](#)
2. ACS 2016-2020 data

What is “Zero Carbon”?

We all use energy to heat and cool our homes, power our electronics, and drive our cars. Many of these energy sources use fossil fuels, which release GHG emissions like carbon dioxide (CO₂) into the air. This form of climate pollution heats up the atmosphere and impacts our communities and the globe – and leads to more heat waves, changes in rainfall, more severe storms, and frequent and severe flooding.

“Zero Carbon” is the approach taken in this plan to equitably drive down GHG emissions, also called carbon pollution, through energy efficiency, clean energy, and greening transportation. This aligns with the state goal to reach net zero emissions by 2050, to prevent the worst impacts of climate change.

There are many corollary or co-benefits to the carbon reduction strategies in the ZCAP including:

- Saving on energy costs and reducing energy usage
- Making our communities safer and easier for walking and biking
- Improving the quality of the air we breathe by reducing dirty fossil fuels, which in turn improves people’s health and wellbeing
- Reducing pollution in our waterways
- Stabilizing energy prices and ending reliance on fossil fuels
- Creating more good local green jobs in the clean energy and related sectors

In addition to reducing carbon emissions, the strategies in the plan have been created to increase equity, improve access, and reduce barriers to the adoption of clean energy technologies by residents.

Community Engagement

The North Suffolk Zero Carbon Action Plan (ZCAP) was informed by residents in the three municipalities, Chelsea, Revere, and Winthrop, who provided input and feedback throughout the planning process. GreenRoots, a community-based nonprofit working for environmental justice in Chelsea and East Boston, was a key partner in the engagement process, leading outreach, and engagement in Chelsea by building on their existing work in the community.



The initial phase of public engagement in Fall 2022 focused on developing a shared vision for a cleaner and healthier future for the region. Each municipality hosted either a virtual or in-person public forum to begin engagement, share about the ZCAP, and hear from community members and residents. About 40 residents participated across the three forums. Community members were asked to submit a “postcard from the future” to share their visions for 2050. Throughout the fall and winter, MAPC and GreenRoots hosted an Engagement Roadshow in which the project team presented at events and meetings hosted by local community-based organizations, non-profits, and community centers, reaching more than 70 residents.

The Visioning Forums for Revere and Winthrop were virtual, and the Chelsea Forum was held in-person at GreenRoots’ offices in October 2023 — photo of the gathering above.

Community Engagement Roadshow

- October 2022: **Bike Winthrop Halloween Ride**
- November 2022: **North Suffolk Public Health Collaborative Meeting**
- December 2022: **Winthrop Senior Center Focus Group**
- January 2023: **Alliance for Health and the Environment Meeting** (included Revere and Winthrop residents)
- February 2023: **Environmental Justice Fair hosted by GreenRoots ECO youth group** (Chelsea residents)



Participants at the Bike Winthrop Halloween Ride provided input to the ZCAP through a post-it note activity by responding to the prompt: *“What changes can Winthrop make to reduce air pollution?”*

During winter to spring of 2023, a second phase of engagement occurred, through which the project team received feedback on the plan’s draft recommendations. In March 2023, members of the public from across the North Suffolk region were invited to an interactive virtual forum to discuss the draft focus areas and actions, including in-depth breakout groups on different focus areas. After the forum, attended by over 30 residents, a community-wide survey was sent out to participants, reaching over 100 residents across the region.

In summer 2023, the final draft of the plan was shared back with community members through a Digital Dashboard on the NSORS website and an “Information Residency” in which boards summarizing the final draft plan contents were displayed in locations across each of the municipalities.

Throughout the community engagement process, in-person events were more successful at reaching residents in the North Suffolk region than virtual. While Zoom interpretation was provided in Spanish, Portuguese, and Arabic in the virtual forums, the online events were not well-attended by non-English speakers, possibly due to internet access. Partnerships with GreenRoots, as well as other local community-based organizations, and a commitment to language access were helpful in reaching groups like people of color and immigrants.

Section Two: Current Carbon Emissions

North Suffolk's GHG Emissions Baseline

Many of the energy sources we use to heat and cool our homes and businesses, power our lights and electronics, and drive our cars use fossil fuels like natural gas, coal, oil, and gasoline. The burning of fossil fuels release GHGs such as carbon dioxide, methane, and other gases into the air. In essence, GHGs trap heat within the Earth's atmosphere causing the planet to warm. While some GHGs, like water vapor, are natural and keep the planet at a livable temperature, human generated GHGs have already caused the planet to warm by 2 degrees Fahrenheit.⁷ The impacts of climate change are devastating, including more extreme heat, changes in rain patterns (including periods of drought and floods), more extreme storms, and flooding due to sea level rise.⁸

The North Suffolk GHG Inventory developed for the ZCAP quantifies the emissions coming from within the three municipalities in a baseline year of 2017. The GHG Inventory catalogues emissions, measured in Metric Tons of Carbon Dioxide Equivalent (MTCO_{2e}), across different sectors including stationary, transportation, and waste emissions.⁹ The inventory also includes emissions from municipal services and activities.

Stationary Emissions Sources:

- **Residential:** Energy use in residential buildings and losses from distribution systems.
- **Commercial, Industrial, and Manufacturing:** Energy use in commercial, government, institutional, manufacturing and industrial facilities, and losses from distribution systems.
- **Construction and Landscaping:** Energy use from construction and landscaping equipment and activities.
- **Energy Industries:** Stationary combustion of fuel in various equipment (e.g., boilers and generators).

Transportation Emissions Sources:

- **On-road vehicles:** All trips taken by passenger and commercial vehicles registered in a community. Includes emissions from buses and trackless trolleys solely within a community's boundary.
- **Railways:** Emissions from public, light, and heavy rail solely within community boundary.

Waste Emissions Sources:

- **Solid Waste:** Municipal solid waste disposed in/by landfills, incineration, composting, and anaerobic digestion.
- **Wastewater:** Process and fugitive emissions from treating wastewater.

Municipal Emission Sources:

- **Public Buildings:** School buildings, city-owned buildings like City Hall, Libraries, Senior Center.
- **Fleet Vehicles:** cars, trucks, and municipally owned equipment used by the Department of Public Works, Emergency Services, and other municipal services.

The GHG Inventory was used to identify the largest sources of emissions within each of the three municipalities, as well as the region. This data informed the focus areas, strategies and actions laid out in the ZCAP. Future GHG Inventories can be compared against the 2017 baseline year to measure the success of these strategies and actions.

In 2017, residential buildings and passenger vehicles in the entire region were responsible for 60.5% of emissions, while C&I (Commercial and Institutional) Buildings & Manufacturing Industries were responsible for 29.5% of emissions and municipal and public services were responsible for 4.5% of emissions. The stationary energy section was where most of emissions were generated in 2017 (66.8%), followed by transportation (32.6%), and waste (0.6%).

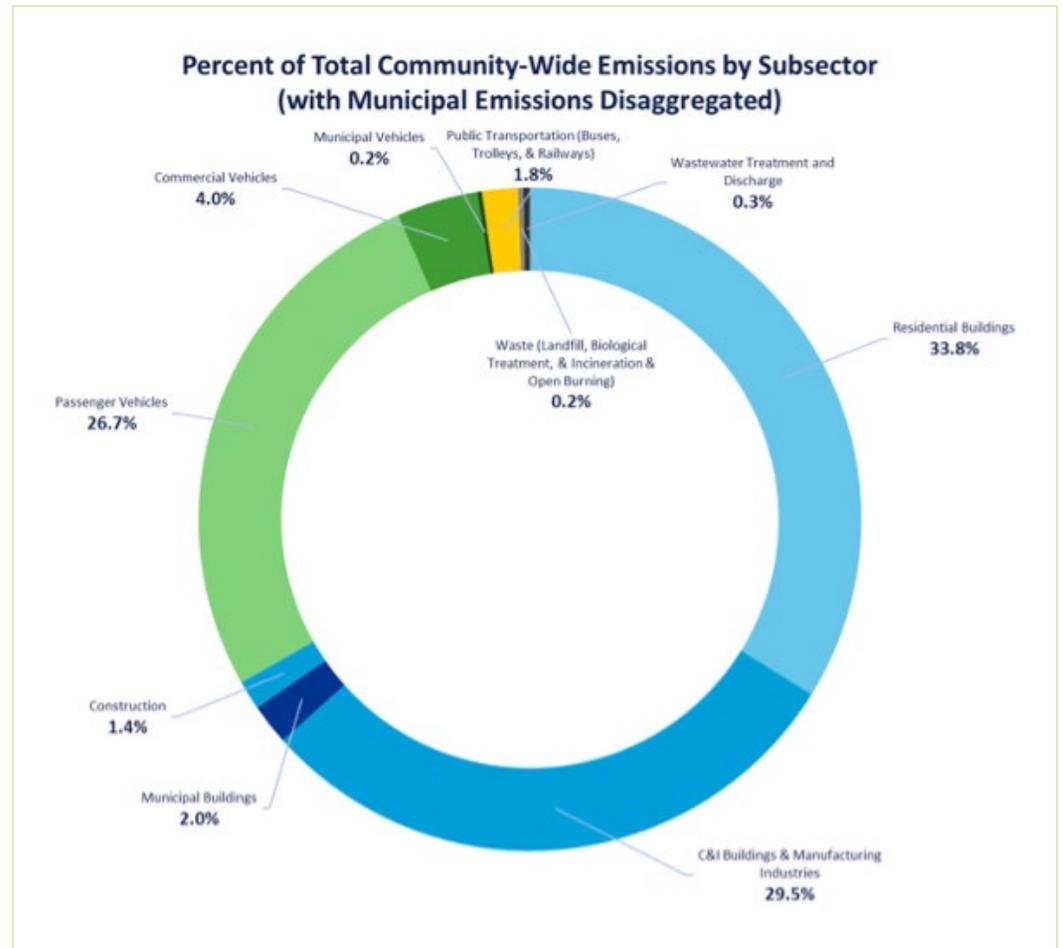


Figure 1. North Suffolk Community-Wide Emissions by Subsector across the three communities with municipal emissions disaggregated (left) and a breakdown of North Suffolk’s Community-Wide Emissions by Sector (right). All units are in metric tons of carbon dioxide equivalent (MTCO_{2e}).

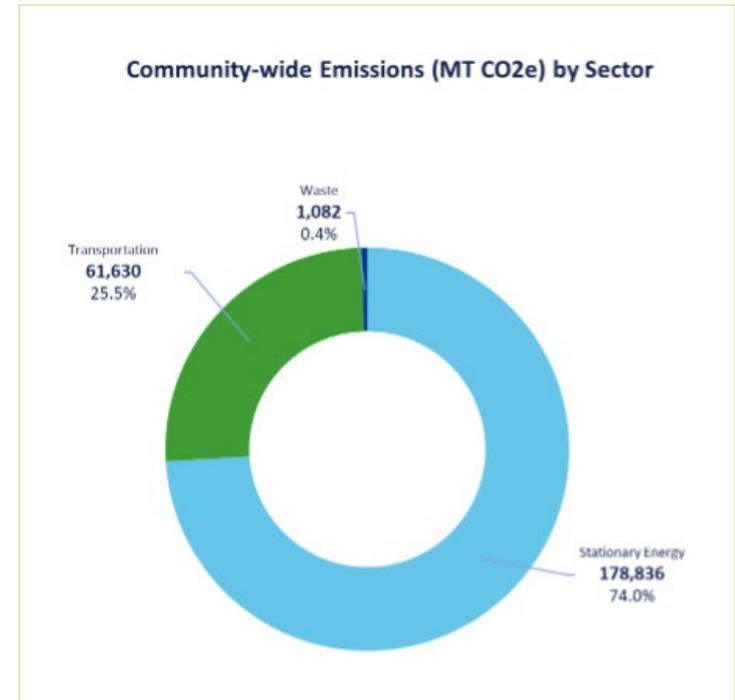
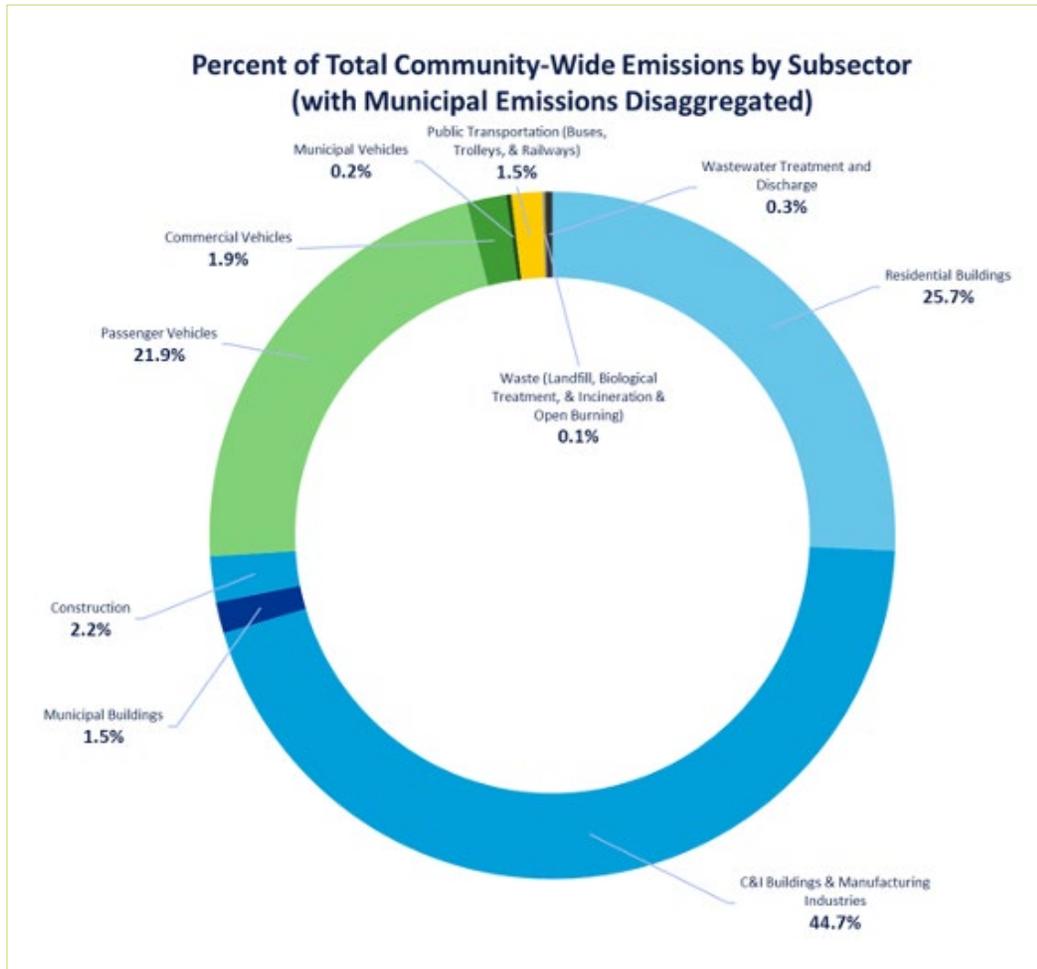


Figure 2. Chelsea's Community-Wide Emissions by Subsector with municipal emissions disaggregated (left) and a breakdown of Chelsea's Community-Wide Emissions by Sector (right). All units are in metric tons of carbon dioxide equivalent (MTCO2e).

In 2017, C&I Buildings & Manufacturing Industries were responsible for 44.7% of emissions in Chelsea, while municipal and public services were responsible for 3.6% of emissions, and residential buildings and passenger vehicles were responsible for 47.6%. Reflections of Chelsea being heavily industrialized can be seen in the emissions data. Stationary energy was where most of emissions were generated in 2017 (74%), followed by transportation (25.5%), and waste (0.4%).

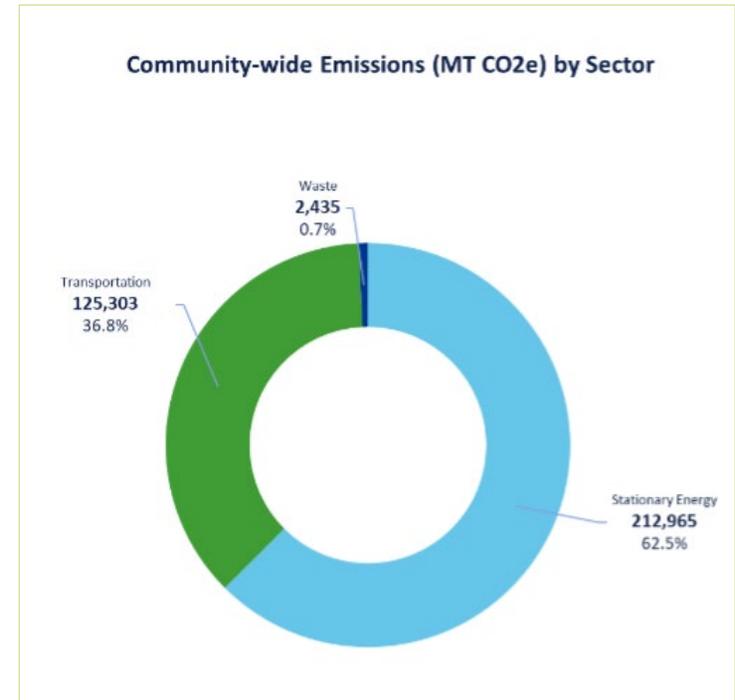
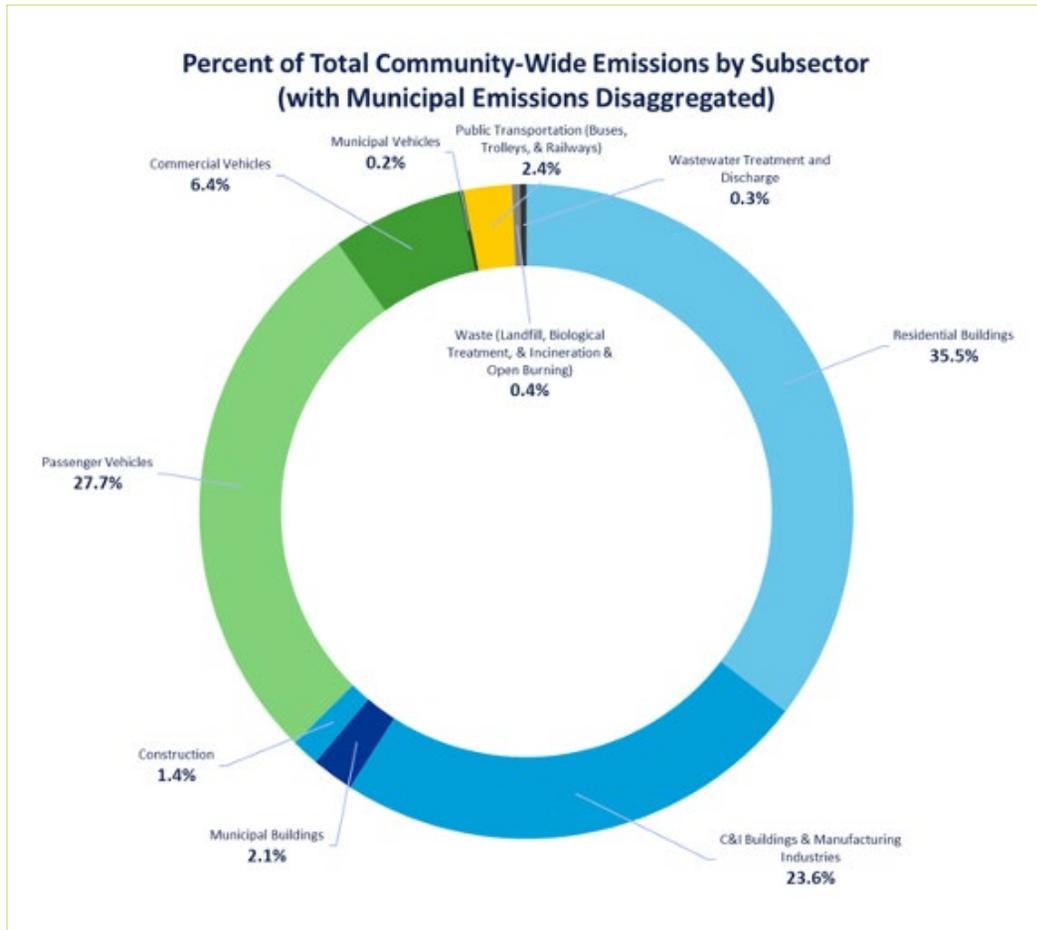


Figure 3. Revere's Community-Wide Emissions by Subsector with municipal emissions disaggregated (left) and a breakdown of Revere's Community-Wide Emissions by Sector (right). All units are in metric tons of carbon dioxide equivalent (MTCO2e).

In 2017, residential buildings and passenger vehicles were responsible for 63.2% of emissions, while C&I Buildings & Manufacturing Industries were responsible for 23.6% of emissions and municipal and public services were responsible for 5.4% of emissions. Stationary energy section was where most of emissions were generated in 2017 (62.5%), followed by transportation (36.8%), and waste (0.7%).

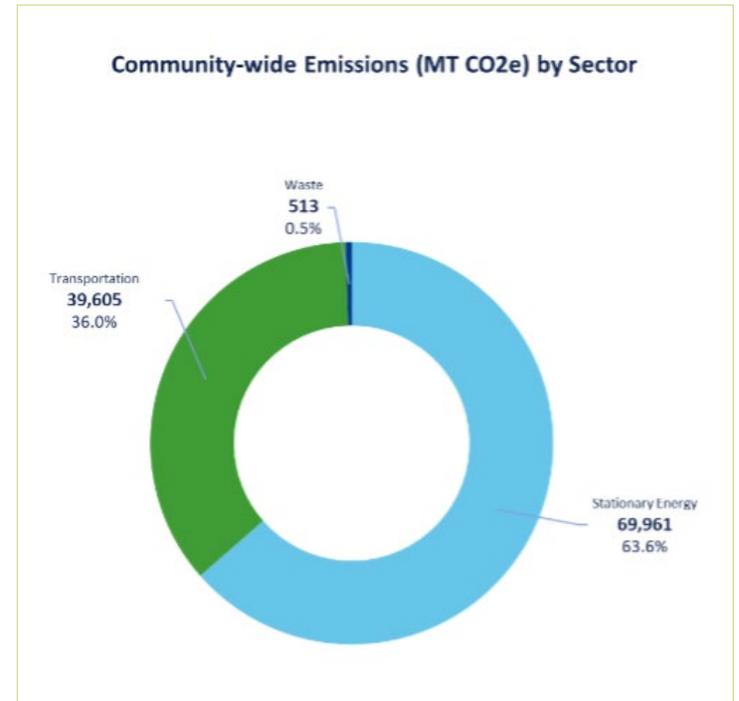
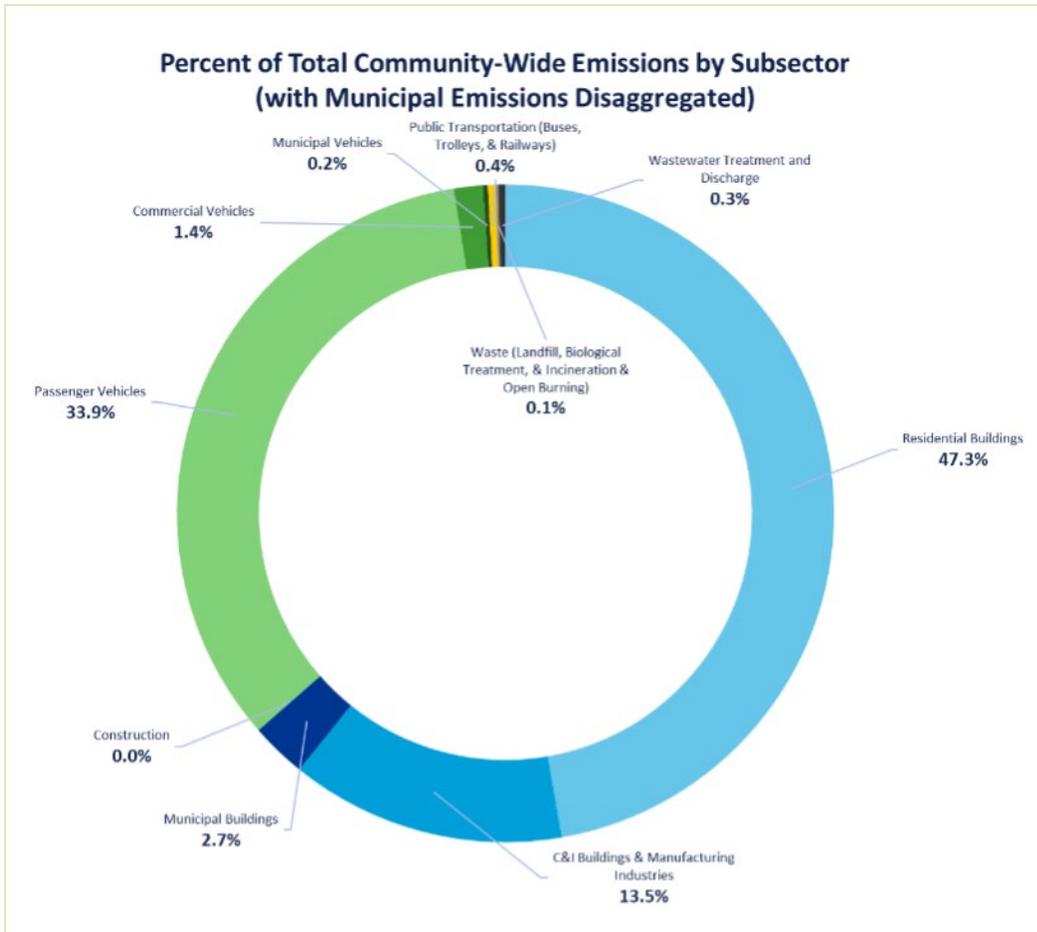


Figure 4. Winthrop's Community-Wide Emissions by Subsector with municipal emissions disaggregated (left) and a breakdown of Winthrop's Community-Wide Emissions by Sector (right). All units are in metric tons of carbon dioxide equivalent (MTCO2e).

In 2017, residential buildings and passenger vehicles were responsible for 81.2% of emissions, while C&I Buildings & Manufacturing Industries were responsible for 13.5% of emissions and municipal and public services were responsible for 3.7% of emissions. The stationary energy section was where most of emissions were generated in 2017 (63.6%), followed by transportation (36.0%), and waste (0.5%).

When analyzing the sources of emissions, residential buildings and passenger vehicle emissions are the primary contributors to community-wide emissions. In Revere, 63.2% of emissions are from the residential sector, while in Winthrop 81.2% are from residential sector. While Chelsea's residential sector comprised 47.6% of total emissions, it is only slightly more than the Commercial and Industrial sector which is responsible for 44.7% of the emissions.

Winthrop Top Source of Emissions:

Residential Buildings 47.3%

Revere Top Sources of Emissions:

Residential Buildings 35.5%

Chelsea Top Source of Emissions:

C&I Buildings 44.7%

Environmental Justice Snapshot

As seen through the data, almost half of Chelsea's emissions come from the Commercial, Industrial and Manufacturing sector (44.7%), which is a significant land use in the city. Historically and presently, Chelsea has been a critical area for regional infrastructure and industry, including those related to port activities, the airport, and the region's energy systems.¹⁰ This includes jet fuel tanks, natural gas terminals, and road salt for the entire region. Hosting this infrastructure makes Chelsea one of the most environmentally overburdened cities in Massachusetts¹¹ in terms of exposure to hazardous sites and industries which harm air and water quality and the health of residents.

At the same time, advocates and community members in Chelsea have been fighting for a long time to increase green space and open space, clean up and protect waterways and marshes in the community, and improve access to the waterfront.

The ZCAP provides an opportunity to align climate pollution reduction goals with other priorities for the city and community, including cleaning up and reducing air and water pollution, improving green space and open space, improving public health, and increasing resilience to climate impacts.

Section Three: Zero Carbon Action Plan: Getting to Zero

The following section provides a framework for local and regional action over the next five to ten years to make significant cuts in carbon pollution and set the region on a path towards net zero by 2050. This framework includes six Focus Areas, that align with different sectors and were chosen based on emissions reduction potential and the opportunity to advance range of co-benefits. The focus areas and strategies were developed in collaboration with municipal stakeholders with feedback and input from members. Each of the Focus Areas outline key strategies and actions that can be taken at either the municipal or regional level, including opportunities for advocacy through state action.

Focus Areas:

1. **Buildings and Energy**
2. **Mobility and Transportation**
3. **Waste**
4. **Municipal – Lead by Example**
5. **Open Space and Environment**
6. **Collaborative Governance**

At the end of each Focus Area, the plan includes a high-level analysis of GHG reduction potential, co-benefits, and equity considerations for the grouping of strategies. It also includes information for implementation, including timeframe, costs, lead implementers and partners, and potential sources for funding and financing.

Focus Area 1: Buildings and Energy (BE)

Background: In the North Suffolk region, buildings made up 64.7% of total GHG emissions in 2017. 33.8% of those emissions came from homes and 29.5% from commercial, institutional, and industrial buildings and manufacturing industries, and 1.4% from new construction activities.

Emissions from the buildings sector primarily come from heating and cooling buildings, hot water heating, energy used for cooking, and electricity usage. In Massachusetts, the average energy burden, the percentage of income a household spends on energy, is 3%,¹² while low-income residents in North Suffolk have higher energy burdens of 8 to 10%. Strategies in this section are aimed at reducing GHG emissions through energy efficiency and weatherization, clean energy installations, while reducing energy costs and helping to make energy affordable for residents.

Goal: The goal of the Buildings and Energy focus area is to reduce carbon pollution from energy generation and usage in homes and commercial, institutional, and industrial buildings through weatherization and energy efficiency, electrifying heating, and cooling systems, and switching to carbon-free energy sources like solar, wind, and renewable thermal.

BE Strategy 1.

Update zoning, land use planning, and permitting processes to reduce emissions in new construction and renovations.

1.1 Review and update local zoning code to remove barriers to renewable energy technology, such as rooftop solar, battery storage, renewable thermal, and electric vehicle supply equipment (EVSE).

1.2 Regularly train permitting and inspections staff on best practices for energy efficient and sustainable buildings in line with the new Stretch Energy Code.

1.3 Establish sustainable voluntary building design guidelines and required permitting checklists for developers and contractors and provide training for planning and special permit review boards. Design guidelines may include recommendations for supporting active transportation and electric vehicles, and the reduction of parking where appropriate.

1.4 Establish a municipal level working group to explore and develop local strategies to prevent displacement and increase affordable housing that aligns with climate goals. Share emerging and best practices regionally.

1.5 Advance Smart Growth principles and best practices through zoning and other land use policies to reduce emissions and decrease costs of housing, including increasing density and housing near accessible public transit, establishing parking maximums, and reviewing parking requirements for multi-family housing developments near transit.¹³

BE Strategy 2.

Improve energy efficiency of existing buildings, increase access to clean energy, and reduce energy utility costs for residents and businesses.

2.1 Adopt Municipal Aggregation (MA) also known as Community Choice Aggregation, a program that allows a municipality to procure a competitive energy supply on behalf of its residents and can allow residents to receive a higher percentage of clean energy supply than the utility provides, often at lower prices. MA can often help stabilize electricity prices and participants may see cost savings. Electricity service is still provided and billed by the utility, and the only thing that changes for the customer is the energy supplier portion of the bill.

2.2 Provide consumer protection and educational resources on predatory third-party competitive suppliers, including those offering clean energy options. This can include posting information on municipal websites and partnering with trusted messengers. Educational resources should be made available in multiple languages.¹⁴

2.3 Advocate and collaborate with the state and CAP agency to conduct and improve outreach on current energy bill assistance and weatherization programs for low- and moderate-income households and renters. Outreach should include accessible, multi-lingual communications and bilingual service providers to work directly with community members.

2.4 Lead a regional Solarize Plus program that uses collective procurement to drive down prices and streamline installation to increase the number of residents and businesses installing rooftop solar, air source heat pumps, accessing community shared solar, and other clean energy technologies.

2.5 Led or support local energy projects including microgrids, district energy, and community solar which can provide multiple benefits to residents. Design program structures so low- and moderate-income (LMI) residents benefit from these programs, including maximizing incentives, reducing barriers to entry, and allocating a LMI carve-out in the program.

BE Strategy 3.

Explore and enable funding and financing for renewable energy, energy efficiency, and electrification of existing buildings.

3.1 Work regionally to educate property owners about existing S=state and federal incentives, grants, and rebates for energy efficiency and electrification, particularly those that will soon be available via the Inflation Reduction Act and the Bipartisan Infrastructure Law.

3.2 Enable and educate property owners about Property Accessed Clean Energy (PACE) and Commercial-PACE financing, which provides upfront financing for energy improvements that are then paid off through an assessment on the property tax.

3.3 Advocate for increased State funding and financing options for deep energy retrofits and electrification of existing buildings with opportunities targeting low-moderate income customers and landlords.

Buildings and Energy Focus Area Key Considerations:

GHG Reduction Potential: High

Co-Benefits: Reduce energy usage and save on energy costs, improve indoor air quality, and health of buildings.

Equity: Community members are concerned about displacement, particularly those who are renting, low-income, or fixed income, due to increased costs in housing and utilities. While the costs associated with developing highly efficient buildings are decreasing, it's critical that increased costs are not passed onto residents, in the case of renovations or new construction. Increasing energy efficiency in rental units is particularly challenging because of "split incentives"- landlords may not be interested in making improvements because they do not receive the financial benefits of reducing energy costs of their renters. Additionally, many low-income and people of color have been left out of benefitting from clean energy and solar installations. Programs must consider both how to ensure equitable outreach and how to address structural issues that prevent people from participating in these programs.

Lead Implementers and Partners: North Suffolk Office of Resilience and Sustainability, Planning and Economic Development, Housing, Mass Save, Utilities, Public Health, Community Action Programs Inter-City, Inc. (CAPIC), Mayors Office, Tax Assessors

Funding/Financing Options: Mass Clean Energy Center, Mass Save, Federal Investment Tax Credit (ITC) and Direct Pay, State SMART incentives, Executive Office of Energy and Environmental Affairs Planning Assistance Grants, Mass Save Programs and Community First Partnership, Mass Clean Energy Center, Department of Energy Sol Smart

Focus Area 2. Mobility and Transportation (MT)

Background: In North Suffolk in 2017, the transportation sector contributed 30.7%¹⁵ of emissions from personal vehicles driven, public transportation, shipping, and other on-road vehicles.¹⁶ Conventional gasoline or diesel-powered vehicles also contribute to air pollution in the region, as well as traffic congestion. According to the state's asthma plan, 10.3% of adults and 9.5% of children in MA currently live with asthma (higher than the national average). Additionally, in MA there are racial and ethnic disparities in health outcomes associated with asthma. Black and Hispanic people have rates of hospitalization and emergency department visits three to four times higher than White and Asian people.¹⁷ The City of Chelsea has been selected as one of eleven "communities of focus" statewide due to high rates of hospitalization and emergency department visit rates in the state's Strategic Plan for Asthma.¹⁸ Strategies in this section focus on reducing carbon emissions from vehicles and provide an opportunity to lower other types of air pollutants associated with transportation.

Goal: The goal of the Mobility and Transportation focus areas is to reduce carbon emissions and other air pollutants from transportation by lowering single-occupancy passenger vehicles, increasing access to public transportation, and improving safe routes for walking and biking, and transitioning to electric vehicles (EVs) from gasoline fueled vehicles.

MT Strategy 1.

Lower single occupant vehicles and vehicle miles traveled (VMT) by investing in and improving access to public transportation and active transportation such as walking and bicycling.

1.1 Advocate and collaborate with the MBTA and State on identifying and implementing community transit service needs, bus stop upgrades, bus rapid transit, and electrification of the regional transit system.

1.2 Work with MBTA to identify funding sources and implement free fares on key bus routes to increase access and affordability of public transit.

1.3 Develop neighborhood-scale and community-wide projects to improve safety, access, and convenience for pedestrians walking and bicycling. Prioritize safe routes for children, seniors, and people with disabilities to key spaces including schools, community centers, parks, and shopping.

MT Strategy 2. Transition vehicles to all-electric by supporting electric vehicles (EVs) access and affordability, and ensuring robust, regional charging infrastructure.

2.1 Develop a regional EV strategic plan that addresses placement of public charging stations, payment structures, funding and purchasing models, and ensures community engagement and equitable access in the plan. Analyze barriers and identify solutions for increasing LMI access to EVs including affordability, access to on-street and public charging stations, and rate structures.

MT Strategy 3. Continue to collaborate with public health and other sectors to address air pollution issues from the transportation sector.

3.1 Form a regional working group to explore and establish a regional Air Pollution Control Commission for North Suffolk. Coordinate with Massachusetts Department of Environmental Protection (MassDEP), Mass Department of Transportation (Mass DOT), Mass Port, and Boston Air Pollution Control Commission on region-wide sources and solutions to air pollution.

3.2 Coordinate with the North Suffolk Public Health Collaborative to install additional air quality monitors to provide consistent, publicly available air pollution data across the region. Monitor air quality in key areas including freight, transportation, airport, water transportation routes, as well as stationary sources like the Saugus Win waste-to-energy generator. Explore public sector funding, as well as partnerships with academic institutions for this work.

Mobility and Transportation Focus Area Key Considerations:

GHG Reduction Potential: High

Co-Benefits: Air quality and public health improvements.

Equity: The North Suffolk region experiences a disproportionate amount of air pollution due to high levels of traffic, roads, airport, port activity, and other industrial uses. At the same time, residents struggle to have access to alternative modes of transportation including safe routes for walking and biking, accessible public transportation, and access to EVs. While EVs will be part of the solution, affordability and access considerations will be key to ensuring equity within transportation and mobility.

Lead Implementers and Partners: Transportation, Mass Bay Transportation Authority, Mass Port, Mass Department of Environmental Protection, Mass Department of Transportation, MAPC, Central Transportation Planning Staff (CTPS), Municipal Public Health, Boston University, Mass in Motion.

Funding/Financing Options: State and Federal funding, capital improvement budget, Efficiency in Regionalization Grant, Climate Pollution Reduction Grant, EECBG grants, Department of Transportation Grants.

Focus Area 3: Waste (W)

Background: Processing and disposing of waste in the region in 2017 contributed to .2% of the total region wide GHG emissions and wastewater treatment contributed to .3% of total emissions based on the waste data.^B While waste is a small percentage of overall emissions, processing solid waste emits other harmful pollutants such as nitrous oxide (NO_x), Carbon Monoxide (CO), Methane, particulate matter and fly ash, heavy metals, PFAS, and dioxins into local air and waterways. These pollutants impact both human health and environmental health. Due to limited land fill capacity, Massachusetts burns more household waste per capita than any other state and has the third highest number of waste incinerators, one of which is located across the border from Revere in Saugus.¹⁹ Massachusetts' DEP 2030 Solid Waste Master Plan sets a goal of reducing waste by 30% by 2030 and 90% by 2050.²⁰ Municipalities can do their part to help meet these goals in their own operations and community-wide waste management services.

Goal: The goal of the Waste focus area is to reduce carbon emissions and other pollutants from how waste is processed and disposed of, including reducing waste, increasing recycling, increasing material reuse, and composting natural materials like food waste and yard waste.

W Strategy 1. Reduce waste through increasing material reuse, and removing recyclables, natural materials, and toxic materials from the waste stream.

1.1 Conduct a waste audit to better understand waste composition and conduct a feasibility assessment for municipal composting programs which would help reduce the number of natural materials, such as food and yard waste, which end up in landfills or incinerators. Explore regionalization of composting services and other waste services and pilot composting within public schools.

1.2 Advocate for a State "Extended Producer Responsibility" (EPR) policy to ensure that producers/product manufacturers are also responsible for minimizing waste in their products and packaging processes. Advocate for policies that reduce single-use packaging.

1.3 Expand and improve outreach and education on existing recycling programs, including "pink bag" recycling programs for textiles. Identify opportunities for regionalization and shared services for waste management in North Suffolk.

B. The GHG Inventory does not include a consumption-based inventory which would likely place waste management at a much higher priority level.

W Strategy 2. Lower emissions from waste-to-energy sites in MA.

2.1 Advocate for State policy and adoption of technologies that require significant reduction of greenhouse gas (GHG) emissions and toxic pollutants at waste-to-energy incinerators. Work with local community groups and academic partners to elevate awareness and advocate for additional air quality monitoring and access to public information on existing pollution from Saugus Win plan.²¹

Waste Focus Areas Key Considerations:

GHG Reduction Potential: Medium

Co-Benefits: Addressing waste can provide multiple co-benefits including reducing air pollution, water pollution, and increasing opportunities for a regenerative economy.

Equity: Community members are concerned about the impacts on air and water quality as a result of solid waste disposal and waste-to-energy incineration. In Massachusetts, 6 out of 7 waste incinerators are located within 3-miles of an EJ community.²²

Lead Implementers and Partners: Community-based organizations, BU School of Public Health and other universities, Metro Mayors Coalition, Mass DEP, Recycle Smart MA program,

Funding/Financing Options: Efficiency in Regionalization Grant, Mass DEP Sustainable Materials Recovery Program

Focus Area 4: Municipal- Lead by Example (M)

Background: In 2017, municipal buildings and vehicles contributed 2.2% of total GHG emissions in North Suffolk (2.9% in Winthrop, 2.3% in Revere, and 1.7% in Chelsea). While this is a relatively small percentage of overall emissions, municipal governments have direct control over their buildings, schools, fleet vehicles, open space, and other municipal operations. This provides each municipality with an opportunity to lead by example, as well as pilot innovative solutions that can be scaled up in other sectors. All three municipalities have previously committed to reducing energy use from municipal operations by at least 20% when being designated a Green Community.²³ Through this program, each municipality has already begun to implement energy conservation measures in municipal buildings.

Goal: The goals of the Municipal- Lead by Example focus areas is to reduce carbon pollution from municipal buildings, public schools, fleet vehicles, and other municipal operations.

M Strategy 1. Reduce emissions from municipal buildings, public schools, and other municipal operations.

1.1 Adopt a municipal policy to ensure that new municipal facilities, including schools, are net-zero buildings or meet the highest energy efficiency standards possible.

1.2 Conduct or update a site suitability assessment to maximize the installation of renewable energy on city/ town-owned property including rooftop solar and solar parking canopies where appropriate. Consider pairing battery storage for peak demand management and resilience benefits.

1.3 Implement demand management programs in municipal buildings, that make behavioral and systems changes to reduce electricity and energy usage during the summer in order to save on energy costs and reduce emissions.

1.4 Develop an electrification master plan to transition municipal buildings and schools off fossil fuels like natural gas and oil for heating and cooling needs. Seek State and Federal grants for school building retrofits.

M Strategy 2. Reduce emissions from municipal fleet and school buses.

2.1 Update municipal fleet policy that commits to transitioning vehicles to electric or electric hybrid.

2.2 Assess the feasibility of transitioning school buses to be all electric, including exploring regional procurement models, Federal and State funding opportunities, and working with third-party vendors to electrify by a certain benchmark.

M Strategy 3. Support and invest in local and regional workforce development for the clean energy economy.

3.1 Collaborate with local community-based organizations, schools/institutions, and government agencies around workforce development opportunities in the clean energy, energy efficiency, and climate fields particularly for those historically left out of the clean energy economy, including women, people of color, immigrants, and those with limited English proficiency (LEP). This includes diversifying trades that serve the clean energy economy, such as construction, contractors, and electricians.

3.2 Adopt municipal procurement guidelines to encourage hiring of local Women and Minority Owned Businesses (WMOB) in energy and climate-related procurements, including local hiring requirements where possible.

Municipal Lead by Example Focus Area Key Considerations:

GHG Reduction Potential: Low

Co-Benefits: Educational opportunities for students and youth, local job creation, economic development

Equity: With direct control, municipal led actions can advance equity including through community engagement and procurement of contractors.

Lead Implementers and Partners: NSORS, Mayors Office, Planning Department, Department of Public Works, School Department. Community colleges, technical schools, colleges and universities, local non-profits (Browning the Green Space, Neighborhood Developers, Women Encouraging Empowerment)

Funding/Financing Options: DOER Green Communities Program, Massachusetts School Board Authority, budget, private capital/financing, federal economic development funds, Mass Clean Energy Center.

Focus Area 5: Open Space and Environment (OSE)

Background: The operation and maintenance of open space and recreation accounts for a small percentage of emissions in municipal operations, but public and private open space, green space and environment provides many benefits and services. The urban forest and street trees can provide necessary shading and reduce neighborhood temperatures leading to lower requirements for air conditioning, natural spaces like wetlands and marshes can act as carbon sinks, and safe pathways/routes can encourage people to get out of their cars and walk or bike to work and school. In the 2019 North Suffolk Community Health Needs Assessment, 47% of respondents listed environmental health as a top concern.²⁴

Goal: The goal of the Open Space and Environment focus is to use the natural environment, open space, and green infrastructure to reduce emissions and provide additional co-benefits such as access to open space and green space, recreation, improvements to air quality, water quality, and resilience to extreme weather events. Increase access to and quality of open space and green space, and improve the urban forest for all residents, particularly in Environmental Justice communities and neighborhoods.

OSE Strategy 1. Reduce urban heat islands through investments in green infrastructure, urban forest, and other techniques.

1.1 Adopt municipal policies and implement projects to reduce urban heat island impacts at the neighborhood and local scale including cool roofs/eco-roofs, de-paving parking, and shade structures in priority areas.

1.2 Increase urban tree canopy by planting and maintaining street trees/urban forest. Explore regional procurement and shared services models for maintaining trees. Provide paid stipends to community members to water street trees.

OSE Strategy 2. Increase access to parks and open space.

2.1 Identify and implement opportunities for pocket parks, community gardens, or other sustainable community assets.

2.2 Ensure that equitable access is a priority in updates to the Open Space and Recreation Plans (OSRP) including a 10-mins walk commitment, safety of getting to the park, and accessibility for all ages and people with disabilities. Integrate climate priorities into open space planning and programs.

Open Space and Environment Focus Area Key Considerations:

GHG Reduction Potential: Medium

Co-Benefits: local job creation, economic development, retain and filter stormwater runoff, reduce air pollution, provide shading and cooling, additional space for recreation and community gatherings.

Equity: Environmental justice communities have had less access to quality open space and green space, as well as fewer street trees in their neighborhoods. The strategies listed above provide steps to ensure more equitable access. Programs like providing stipends or paying jobs to residents to help water and maintain street trees can promote local job creation.

Lead Implementers: Planning Department, Parks and Recreation, Public Health, Department of Public Works

Key Partners: Local community-based organizations and non-profits, Department of Conservation and Recreation, Mass in Motion

Funding/Financing Options: State and Federal funding, capital budget, private foundation funding

Focus Area 6: Collaborative Governance and Community Engagement (CGCE)

Background: The North Suffolk region, comprised of three municipalities, is a diverse area where many people live, work, and play. Given the diversity of local community and stakeholders, it's important to center community perspectives and voices in climate action planning and implementation. Collaborative governance is defined as an intentional pairing and partnership between government and non-government stakeholders. This model strives to build understanding, trust, and consensus when making decisions.

Goal: The goal of the Collaborative Governance and Community Engagement focus area is to ensure that the people and communities most impacted by climate change and carbon pollution are collaborative partners in developing solutions and centered in decision-making.

CGCE Strategy 1. Implement the Zero Carbon Action Plan through a collaborative governance model.

1.1 Establish a regional community advisory board/Taskforce that has dedicated members representing the EJ community.

1.2 Provide stipends for community leaders and volunteers that engage in the Taskforce. Consider and budget for equitable engagement at public forums including transportation needs, time of meetings, translation and interpretation, and childcare to support community participation particularly for in-person events.

1.3 Ensure that materials on climate change are translated into multiple languages and are available to a wide diversity of groups, especially those most impacted by climate change.

1.4 Develop guidelines and templates for community benefits agreements (CBAs) for large developments and energy infrastructure, with considerations for GHG emissions, clean energy benefits, and climate benefits.

1.5 Establish a Climate Ambassadors or Community Corps program that pays residents to conduct outreach, education, and establish relationships on climate and sustainability related issues.

CGCE Strategy 2. Strengthen and maintain regional partnerships within and beyond North Suffolk.

2.1 Coordinate with the North Suffolk Public Health Collaborative on issues related to environmental and public health, including air pollution, water pollution, waste (trash), and vermin. This would involve additional support for the implementation of the 3-year Community Health Improvement Plan(s) (CHIP).²⁵

2.2 Continue to engage and collaborate with regional coalitions and partners, including the Metro Mayors Coalition Climate Taskforce and the Resilient Mystic Collaborative.

Collaborative Governance and Community Engagement Focus Area Key Considerations

GHG Reduction Potential: Low, these strategies enable other strategies.

Co-Benefits: Increase social cohesion, participation and resilience, engage youth and those who may typically be left out of the planning process.

Equity: The region includes neighborhoods identified as environmental justice communities, including people of color, low-income individuals, and those for whom English is not a first language or have language isolation. These communities are often disproportionately impacted by the legacy of polluting industries and infrastructure, such as placement of highways, and may experience the worst impacts of climate change (flooding, extreme heat, etc.).

Lead Implementers and Partners: NSORS and Planning,

Key Partners: Public Health, Senior Services, Family Services, Library, community-based organizations and non-profits

Funding/Financing Options: These items should be scoped into State and Federal grants where applicable.

Section Four: Implementation

The next five to seven years are a critical moment for our communities, region, and State to drastically cut carbon emissions to meet the net zero by 2050 goals and prevent the worst impacts of climate change. Additionally, the Federal Inflation Reduction Action (IRA) and Infrastructure Investment and Jobs Act (IIJA) have allocated billions of dollars to advance the clean energy sector and to address the impacts of climate change- representing the largest investment of its kind into the sector. The focus areas, strategies and actions laid out in the North Suffolk Zero Carbon Action Plan lay the foundation for the region to meet this transformational moment. In these three communities, the investments in clean energy and climate can be leveraged to advance racial and economic equity and to improve the quality of life for all residents. This section builds upon the actions in Collaborative Governance and Community Engagement and provides actionable next steps for implementing and managing the plan.

Management

The North Suffolk Office of Resilience and Sustainability will continue to facilitate a multi-municipal advisory committee to prioritize and implement key actions from the plan. NSORS will provide support for formal adoption of the plan by the three municipalities.

- Coordinate monthly Municipal Advisory Committee meetings. Initially meetings will occur monthly to keep up the momentum from the planning process and may shift to every other month or once a quarter thereafter. This is also an opportunity to align the ZCAP with municipal departmental goals and other City priorities.
- Launch a regional Climate Community Advisory Board or Taskforce that brings together residents and community members from across the three municipalities to guide and implement the ZCAP. Ensure representation on the board from environmental justice communities and pursue stipends for participation and/or other actions to reduce barriers to participation.
- Report to municipal staff and relevant boards on progress towards goals at least twice a year through a meeting presentation. You may consider pairing this with an annual report from the Green Communities program and/or the annual NSORS reporting mechanisms already in place in order to streamline reporting.
- Update online dashboard quarterly with project status updates and funding secured.

Identify Funding and Resources

- Align priority actions with available resources including municipal budget and state, federal, and foundation grants. NSORS may also consider opportunities for financing of energy efficient and clean energy projects, as well as state and federal incentives.
- Work regionally with the Metro Mayors Coalition Climate Taskforce and MAPC to identify and track potential sources of Federal and State funding.

Current funding opportunities

State Grants

- Department of Energy Resources (DOER)
 - Green Communities municipal grants, REPA, and META
- Mass Clean Energy Center (Mass CEC)
 - Empowered Grants (Spring and Fall)
- Office of Energy and Environmental Affairs
 - Municipal Vulnerability Preparedness (MVP) Action Grants (spring, resilience focused but some project types that have co-benefits of mitigation and resilience are considered)
 - EEA Planning Assistance Grants (spring)
- Efficiency in Regionalization Grant (ERG) (fall)

Federal Grants

- MAPC Federal Funding Opportunities Center
[Federal Funding Opportunities Center – MAPC](#)
- National League of Cities
[Federal Funding Sources for Municipal Sustainability and Climate Action – National League of Cities \(nlc.org\)](#)

Public Engagement and Education

In addition to the actions laid out in the Collaborative Governance and Community Engagement focus area, a key part of implementing the plan will be to engage residents, businesses, and other community members in the process.

- Continue to build on the success of outreach and education through the Mass Save First Partnership and other similar community outreach programs.
- Create and update a dedicated NSORS website and online presence with relevant information, data, and resources for the public on energy and climate topics.
- Ensure that all public-facing materials are disseminated in the major languages spoken in the region.

GHG Inventory and Plan

- Revisit and update the ZCAP every five years- Progress on the Zero Carbon Action Plan and updates on priority strategies should be updated every five years. This should happen in conjunction with the Municipal Advisory Committee and Community Taskforce.
- Update the GHG inventory every 3 years or as data is available- The regional GHG inventory will be a core tool for benchmarking progress towards its emission reduction goals. The Cities and Town will update their GHG inventory as new data sets are made available, using MAPC's Community Greenhouse Gas Inventory Tool. The 2017 GHG inventory developed as a part of this planning process will be used as the baseline to measure progress against.

Key Terms

Air Pollution: Small particulates, dust, gases, and aerosols that are released into the atmosphere that reduce air quality and have negative effects on human health and the environment. Air pollution can get inside our lungs and sometimes even our bloodstream. This is linked to many health issues, including asthma, heart attacks, and lung disease.

Carbon Emissions: Carbon dioxide (CO₂) is a greenhouse gas that's emitted when fossil fuels, such as coal, natural gas, methane, oil, and gasoline, are burned in vehicles, during the generation of electricity and heating, and for industrial processes (such as in factories).

Carbon Neutral Policy: A policy goal to reduce greenhouse gas (GHG) emissions through energy efficiency and clean energy, and the remaining emissions are balanced by carbon "offsets," strategies that remove carbon from the atmosphere or keep carbon in the ground.

Clean Energy: Sources of electricity, heating, and cooling derived from non-fossil fuel based technologies including solar photovoltaics (PV), solar hot water, wind, geothermal, air source heat pumps, as well as other emerging technologies such as waste energy recovery. These sources are also known as renewable energy, because they are not from limited resources like coal, gas, and oil.

Clean Heating/Cooling: Sources of energy that provide heating in the winter and/or cooling in the summer from renewable energy sources and not the burning of fossil fuels. Some examples include air source heat pumps, geothermal, and waste heat recovery.

Climate Adaptation: Making changes to the built infrastructure (such as buildings and homes) or the natural environment (such as parks and open space) to best prepare them for the impacts of climate change, including flooding, drought, extreme heat, and extreme storms.

Climate Change: Describes the long-term changes in average weather patterns, temperatures, and precipitation across the world due to the warming of the earth's atmosphere. Scientific consensus shows that current climate change is caused by human activity, specifically the burning of fossil fuels that release greenhouse gases into the atmosphere causing global temperatures to increase. While global average temperatures are rising, the local impact to weather may include both increases and decreases in temperature, changes in precipitation (rain and snow), increased risk of severe weather events, sea level rise, and other changes. Climate change impacts the world around us including shifts in agricultural and growing seasons, pollen and air quality, insect borne diseases, pests, and other impacts to the environment.

Climate Mitigation: The strategies to slow down and reduce the severity of climate change impacts by reducing the amount of greenhouse gases emitted into the air.

Climate Preparedness: Preparing for the impacts of climate change, including emergency planning and community services.

Community Choice Aggregation (CCA) or Green Municipal Aggregation: Also known as municipal electricity aggregation, allows town and city governments to use bulk purchasing power (where they pay a lower price for the service in exchange for purchasing a larger quantity of the service) to negotiate contracts for electricity supply on behalf of the residents and small businesses in the community that are on the basic electricity service. The contracts often include a higher percentage of renewable energy than standard electricity mix.

Community Shared Solar: A program that allows multiple electric energy customers to subscribe, participate, or purchase a portion of a solar energy project located somewhere else in their community (for example, a field with solar panels). Participants receive a credit on their utility bill for their portion of clean energy produced. This is an option for those who cannot install solar panels on their own property for any reason and renters.

Decarbonization: Reducing the use of carbon-emitting energy sources, usually in the energy, buildings, and transportation sectors.

Electric vehicle (EV): A vehicle, such as a car or truck, that is powered fully or mostly by electricity instead of gasoline.

Electricity Grid: described the full system including power plants that generate electricity, and the transmission and distribution lines that transmit electricity to power homes and businesses that use it.

Electrification: Converting a machine or system to use electricity instead of burning natural gas, oil, or other fuels. The benefit of electrification is that the energy source can come from renewable sources such as solar PV or wind.

Energy Burden: "Energy burden is defined as the percentage of a household's income spent on home energy bills. In Massachusetts, the average energy burden is about three percent. However, the average energy burden for low-income populations is about 10 percent, and, in certain neighborhoods, energy burden is as high as 31 percent. This means that some low-income families are spending close to a third of their income on energy bills alone, sometimes forcing them to choose between paying their utility bills and spending money on essentials like food, rent, or medicine."

Energy Insecurity: People who are unable to pay for basic energy needs such as heating, cooling, and lighting in their homes live in a state of energy insecurity. This is often the case when a household has a very high energy burden and may be at risk of having utilities shut off due to non-payment.

Environmental Justice: "The principle that all people have a right to be protected from environmental hazards and to live in and enjoy a clean and healthful environment regardless of race, color, national origin, income, or English language proficiency."

Equity: Equity is the goal and principle that everyone deserves access to resources and opportunities to thrive. Equity is not simply equal access, but rather equity recognizes that existing systems (racism, classism, sexism etc...) mean that people need different things to have the same opportunities and benefits, and protection from harm.

Fossil Fuels: Carbon based fuels that are mined or drilled from the earth such as coal, oil, natural gas/methane gas, gasoline. When processed and burned, fossil fuels emit greenhouse gases and other harmful pollutants.

Greenhouse Gases (GHG): When we burn fossil fuels like gasoline, diesel, and natural gas, gases such as carbon dioxide (CO₂), methane, and water vapor are released into the atmosphere. These gases trap heat around the earth which changes our worldwide climate. This is referred to as the greenhouse gas effect.

Greenhouse Gas Inventory: A greenhouse gas (GHG) inventory accounts for the emissions within a geographic boundary in a specific year (City, Region, State). GHG emissions can be accounted for through different methods, the most common of which is to look at emissions that result from activities occurring within the city or town boundary. GHG emissions are expressed in Metric Tons Equivalent of Carbon, even though there are many types of GHGs.

Sustainability: Means meeting the needs of today without compromising the needs of future generations. Including social, economic and environmental needs. In addition to issues around climate and energy, sustainability often includes things like waste, recycling, composting, and addressing environmental pollution.

Weatherization: The process of sealing up air leaks and adding insulation to homes and buildings to better save energy, money, and improve quality of the building.

Endnotes

- 1 Climate Resilience and Sustainability. [Welcome to City of Chelsea, MA \(chelseama.gov\)](https://chelseama.gov)
- 2 2019 American Communities Survey
- 3 Metro Mayors Climate Preparedness Taskforce. [Metro Mayors Climate Preparedness Taskforce – MAPC](#)
- 4 Green Communities Designation [download \(mass.gov\)](#)
- 5 [Go Green Save Green - City of Revere, Massachusetts](#) Both the City and residents participate in this community shared solar project.
- 6 [Community First Partnership \(masssave.com\)](https://masssave.com)
- 7 NOAA Climate Change: Global Temperature. 2023. [Climate Change: Global Temperature | NOAA Climate.gov](#)
- 8 Massachusetts Climate Change Assessment. 2022. [Massachusetts Climate Change Assessment | Mass.gov](#)
- 9 The inventory tool used for this plan is not able to capture sources of renewable energy in the community. The inventory also does not include the emissions of aviation and marine transport in the region. [Community GHG Inventory Resources – MAPC.](#)
- 10 WBUR. The Injustice of Climate Change. 2019. [The Injustice Of Climate Change | Cognoscenti \(wbur.org\)](#)
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- 14 MA Attorney General's Office. Competitive Electric Supply. [Competitive Electric Supply | Mass.gov](#)
- 15 Not including municipal fleet vehicles.
- 16 Note that this data does not include water-based transportation such as ferries.
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