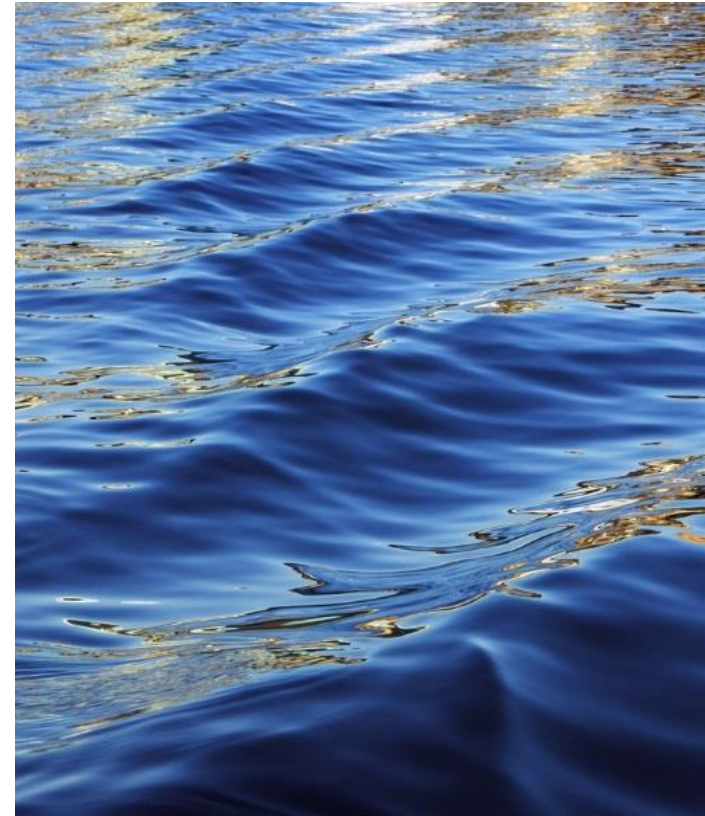




The NetZero Plan for Ashland

Updates on planning



Executive summary

- The town of Ashland adopted a resolution to achieve NetZero emissions by 2040, in Fall 2019, at which point the sustainability committee was tasked with creating a plan to achieve this goal
- Our first step was to complete a green house gas inventory for the town, findings were presented to the Select Board in July 2020
- The committee has leveraged the findings of the green house gas inventory to research strategies most likely to help us achieve the 2040 goal
- These strategies have now been drafted into a plan that identifies recommendations, key stakeholders and a time horizon for implementation
- Engagement of key stakeholders is a critical success factor to the adoption and implementation of the plan
- The committee recognizes that some of these strategies require action at the state level

The GHG survey in 2020 helped inform this plan



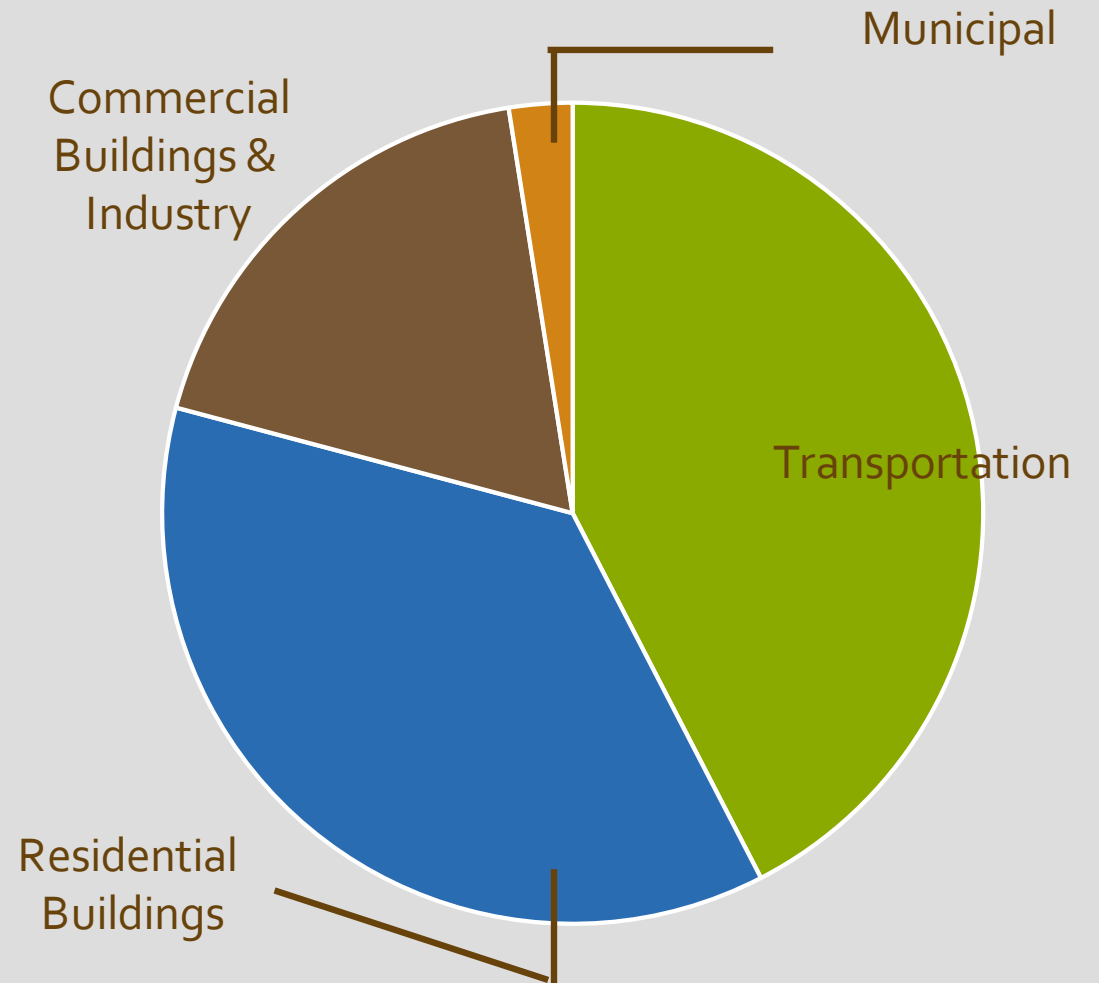
155,000
Metric Tons of
CO₂e*
town wide in 2017



9
Metric Tons of
CO₂e*
per person

*Carbon dioxide equivalent

Emissions by sector



We need to take actions in 5 key areas to meet our goals

Achieve Net Zero emissions by
2040 in an equitable manner

Education

Understand and set baselines.
We cannot solve what we don't
understand or measure

Adaptation

Shift the status quo through
adjustments to attitudes and
behaviors

Investment

Municipal and personal
capital investments to
change the playing field.

Transformation

Long term and strategic
planning and investment.



Our energy supply



**Our homes and
buildings**



**How we get
around**



**Smart zoning &
planning**



Environment

We have identified specific strategies in each area

		Today	2030	2040
Our Energy Supply	Pursue 100% carbon free electricity in our aggregation			
	Eliminate the dependence on fossil fuel based energy			
	Maximize the potential for producing green energy locally			
Our Homes and Buildings	Require large buildings to report and reduce energy use			
	Create programs to help owners reduce energy use			
	Require electrification of new buildings			
	Support electrification of existing buildings			
	Adopt net zero building policies and codes			
	Municipal buildings should lead by example			

We have identified specific strategies in each area

		Today	2030	2040
How We Get Around	Maximize walking, biking and public transportation options			
	Advance zero emissions vehicle infrastructure			
	Target 100% conversion to electric for new vehicles			
	Lead by example in the municipal fleet			
Smart Zoning and Permitting	Change zoning to make it easier to install clean energy			
	Advocate for and adopt state level net zero codes			
	Enact green zoning bylaws and strategic town planning			
Environment	Adopt a zero waste mindset			
	Preserve and protect natural resources			
	Invest in equitable climate resilient projects			

A personal checklist for reducing your carbon foot print



On the road and in the sky

- Drive Less. Transportation is now the top source for emissions.
- Try taking the train, bus or better yet bike.
- Consider switching to an EV.
- Consider taking fewer flights.



On your plate

- Eat less meat: Meat has 100 x the impact of plant based foods.
- Try to eat local and in season.
- Waste less. Over 40% of our food is disposed off.
- Avoid single use plastics.
- Sign up for curb side composting.



In your home

- Complete an energy audit, and act on the recommendations.
- Consider installing solar for your electricity needs.
- Turn down the heat.
- Switch to sustainable sources of heating and cooling.

What you buy

- Recycle and Upcycle.
- Avoid fast fashion.
- Vote with your dollars, and shop sustainably.
- Avoid the packaging and take a re-usable bag to the store.



What you do

- Understand the science, and talk to your friends and family.
- Advocate for sustainable policies at the municipal and state level.
- Support local sustainability groups.
- Vote.

Detailed planning recommendations



The following sections provide detailed recommendations, intended for offline review for each of the 5 key areas

- **Our Energy Supply**
- **Our homes and buildings**
- **How we get around**
- **Smart zoning and permitting**
- **Environment**

For these recommendations, we have also identified **key stakeholders** and the rough **timeline** by which these recommendations will need to be achieved if we are to meet our goal of achieving NetZero emissions by 2040, while still being careful not to leave our social justice communities behind.

Most of these recommendations will push us out of our comfort zone, but with the latest IPCC report showing that global temperatures have **already risen by 1.09°C**, we have to take the lead and bridge the gap to start mitigating our contribution to climate change.

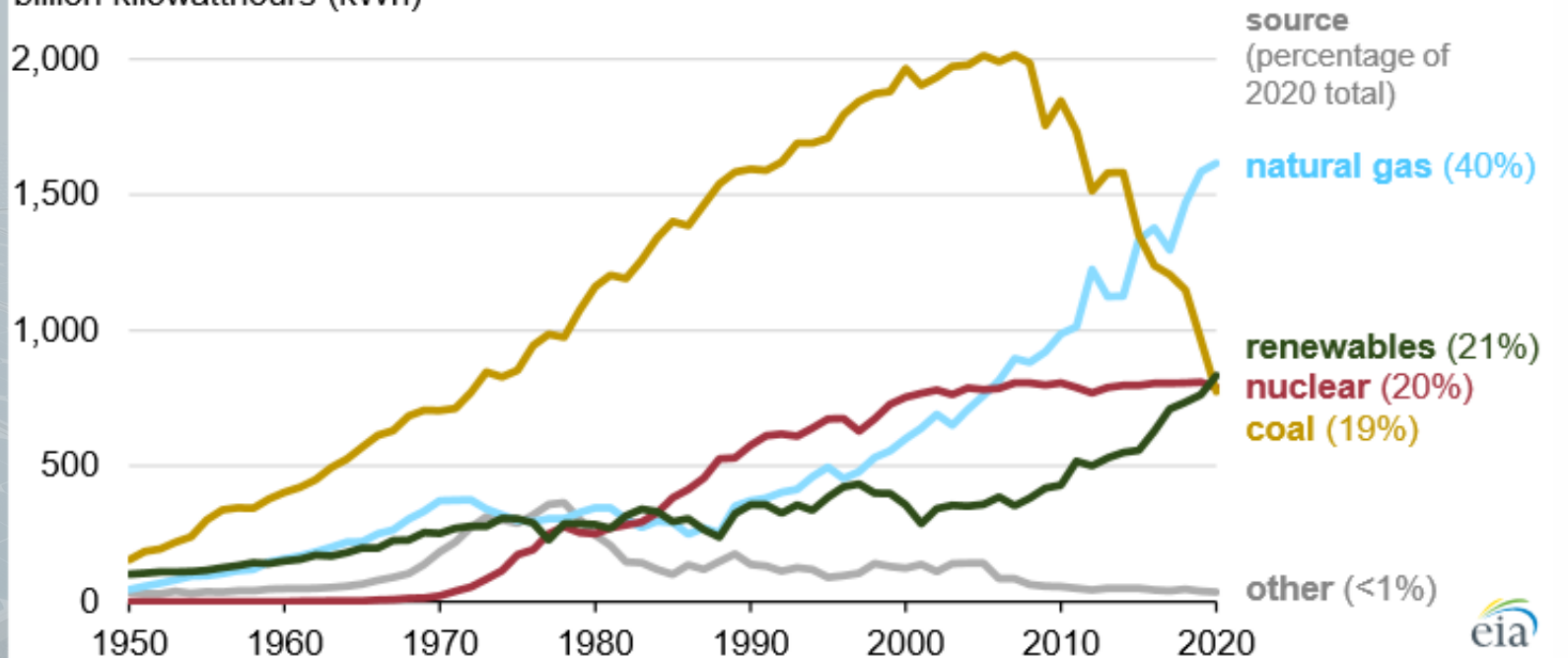
Our Energy Supply



Decarbonization requires us to shift away from fossil fuel based energy sources, and that in turn makes **electrification** the cornerstone strategy of our NetZero plan.

While natural gas still accounts for over 40% of US electricity generation. The good news is that in 2020 renewables have now become the 2nd most prevalent US electricity source.

Annual U.S. electricity generation from all sectors (1950–2020)
billion kilowatthours (kWh)



Our Energy Supply

	Today	2030	2040
<p>Pursue 100% carbon free electricity in our aggregation</p> <p>Municipal aggregation gives us the ability to change where we get our electricity from without requiring individuals to make large investments. Clean energy technologies typically restricted to single family home owners are not a barrier. Ashland is to be commended for basing aggregation on 100% renewable energy.</p> <p>However the Committee believes, along with others concerned with decarbonization, that we need to transition to Class 1 sources, which are subject to stricter standards including that the renewable energy is generated in New England.</p>	<p>Key Stakeholders</p> <p>Town Manager and Select Board</p>		
<p>Eliminate the dependence on fossil fuel based energy</p> <p>Decarbonized electricity is only effective at removing greenhouse gases if we also transition away from fossil fuel based energy, including for heating, cooling & transport. Technologies like ground source and air source heat pumps make this transition feasible with a number of incentives available at both the state and federal level.</p> <ul style="list-style-type: none"> • Support and expand initiatives like the Metrowest Clean Energy Challenge • Develop requirements for all new building to use only electricity for heating and cooling. • Municipal leadership by ensuring any public sector construction and buildings are NetZero. • New zoning regulations that incentivize electrification of all new buildings <p>We will however have to consider how we assure participation opportunities for social justice communities and landlords.</p>	<p>Key Stakeholders</p> <p>Town staff, Select Board, Finance Committee, Sustainability Committee, Sustainability Coordinator, Planning Board</p>		
<p>Produce more green energy locally</p> <p>Solar panels are our primary opportunity to produce energy in Ashland. Federal and state incentives make rooftop solar a good investment. Beyond solar challenges we recommend:</p> <ul style="list-style-type: none"> • Remove obstacles to solar energy development • Pursue and acquire a gold level SolSmart designation • Explore opportunities to solarize condo complexes in bulk. <p>Incentives for social justice communities and multi-unit buildings are available.</p>	<p>Key Stakeholders</p> <p>Town Manager, Select Board, Town Staff, Finance Committee, Planning Board, Sustainability Coordinator, Sustainability Committee</p>		

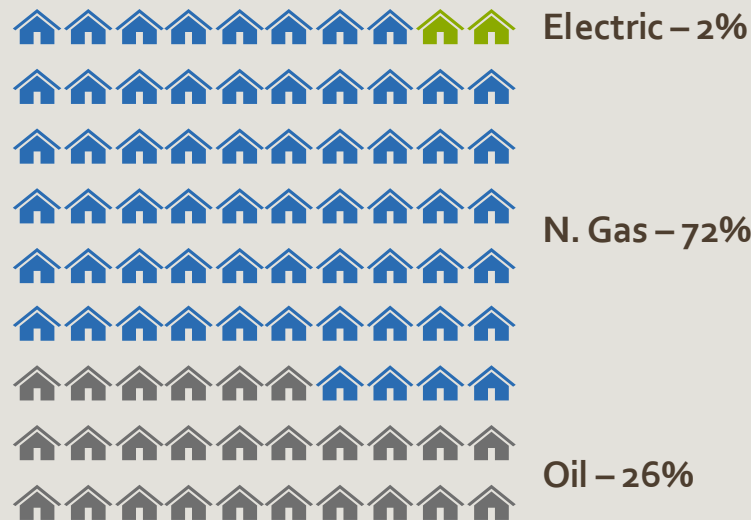
Our Home and Buildings



Homes and commercial buildings are the largest source of emissions in Ashland. We need to fundamentally transition the ways that we heat and cool our buildings while making them significantly more energy efficient.

While retrofitting older building requires investments that may be out of reach of a number of our residents, transitioning to net zero buildings will generate multiple benefits in addition to emissions reductions - improved health outcomes, greater resilience in the face of extreme weather and reduced energy costs.

Primary Residential Heating Source



Square Footage



37 Years
Median age of buildings

Our Home and Buildings

		Today	2030	2040
<p>Require large buildings to report and reduce energy use Generating energy consumption baseline is key to bringing awareness and understanding of energy use to property owners and businesses. Once a baseline is established, the exposed inefficiencies with heating, cooling and other operations can be addressed.</p> <ul style="list-style-type: none"> • Have all large building track energy usage • Collect reports and analyze data • Use this information to identify areas needing the most improvement 	<p>Key Stakeholders Town Manager, Select Board, Planning Board, Building Owners, Town Building inspector, Sustainability Committee, Sustainability Coordinator</p>			
<p>Create programs to help owners reduce energy use The Town of Ashland will need to guide the local businesses and residents to resources/programs that can make it easier for us to achieve our Net Zero goals.</p> <ul style="list-style-type: none"> • Advocate for participation in Mass Save for homeowners and commercial properties. • Keep the community up to date on current and upcoming state and federal clean energy programs, such as MA commercial PACE law. • Collaborate with local vendors (such as HVAC contractors, solar contractors) to create improved costs for upgraded energy efficient systems. The Mass Solar Heat and Energy Challenge is an example of this. 	<p>Key Stakeholders Building Owners, Sustainability Committee, Sustainability Coordinator</p>			
<p>Electrify new and existing buildings. The electrification of space and water heating, cooking, and other end uses is a key strategy for reducing emissions. The current policy options for requiring electrification at the local level are limited, however we can promote electrification through a combination of education, incentives and dis-incentives. The Mass Solar Heat and energy challenge, and our previous solar challenge are both examples of programs that combine education and town brokered incentives that make electrification more accessible to residents.</p> <ul style="list-style-type: none"> • Make policy and building code changes, to ensure new buildings are as energy efficient as possible • Show the benefits of Electrification of Municipal buildings (and other projects) 	<p>Key Stakeholders Town Manager, Select Board, Developers, Building Owners, Planning Board, Finance Committee, Sustainability Committee, Sustainability Coordinator</p>			

Our Home and Buildings

	Today	2030	2040
<p>Advocate for and Adopt net zero building policies and codes</p> <p>A net zero stretch code allows communities to ensure that new construction and major renovations will be built to net zero standards and helps ensure that buildings are not locked into high emissions for years into the future.</p> <ul style="list-style-type: none"> • Support legislation that establishes a net zero stretch code in Massachusetts. • Advocate for the adoption of the net zero stretch code by the Board of Building Regulations and Standards (BBRS). • Adopt the net zero stretch energy code when available. 	<p>Key Stakeholders</p> <p>Town Manager, Select Board, Developers, Building Owners, Planning Board, Sustainability Committee, Sustainability Coordinator</p>		
<p>Municipal buildings should lead by example</p> <p>While a small source of emissions community-wide, municipal buildings still present an important opportunity to reduce emissions and demonstrate the feasibility and appeal of net zero buildings to the broader community.</p> <ul style="list-style-type: none"> • Develop and adopt a policy that requires higher levels of energy efficiency and renewable energy generation, includes net zero standards for new construction, and sets broader sustainability metrics for public projects. • Include provisions in the policy that expand to include major renovations in the near term and, when feasible in MA, private buildings 	<p>Key Stakeholders</p> <p>Town Manager, Select Board, Finance Committee, Sustainability Committee, Sustainability Coordinator</p>		

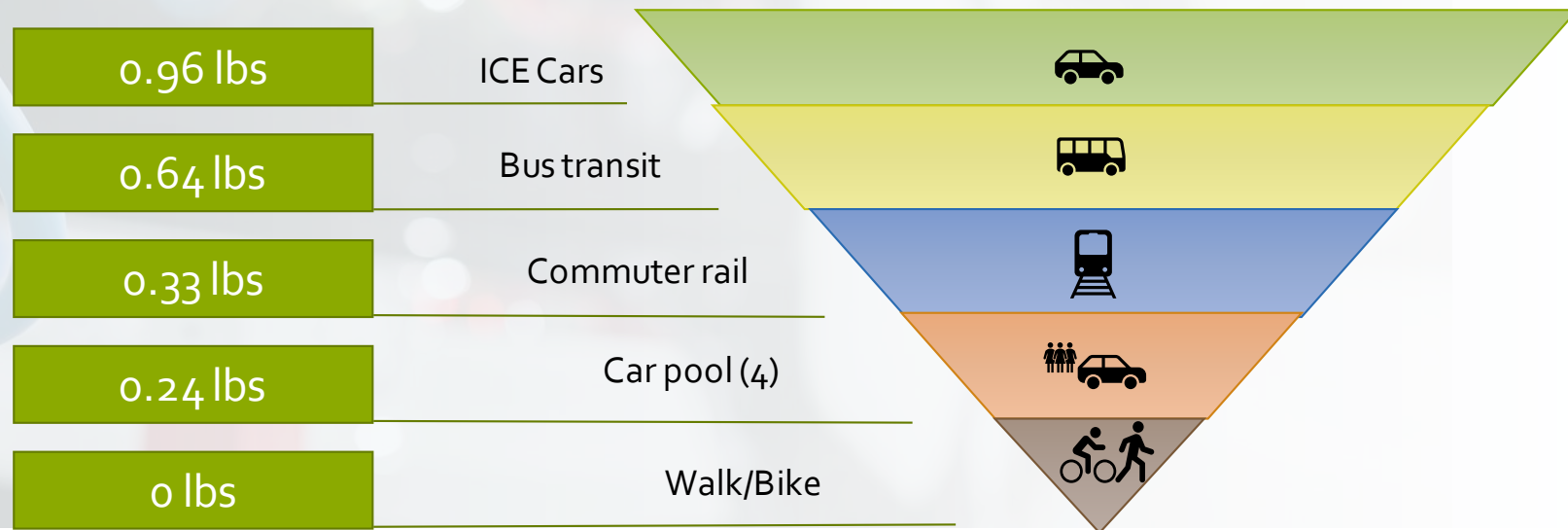
How we get around



Transportation accounts for more than 30% of our total emissions, with a vast majority coming from gasoline-fueled resident cars. Electrification and creating viable choices towards walking, biking, and public transportation are going to be key contributors to reducing emissions in this area.

Beyond education and support, Ashland will have to actively incorporate zero emissions mobility options in our strategic and municipal plans, increase access to EV charging stations (expand charging in public lots, and mandate charging in condos/apartment lots, commercial charging), and influence regional and state organizations to expand access to public transportation.

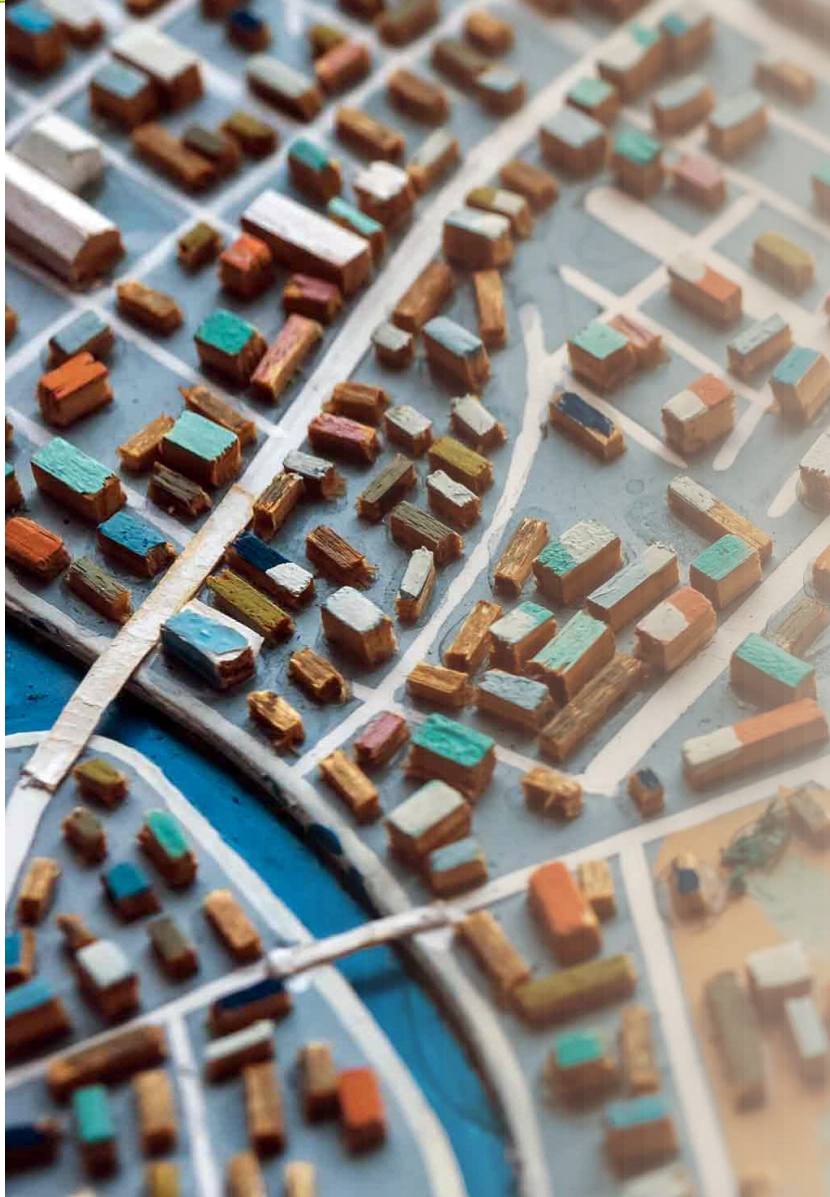
CO₂e Emissions per passenger mile



How we get around

	Today	2030	2040	
<p>Support walking, biking and public transportation</p> <ul style="list-style-type: none"> • Pursue expanded bus transit system and ridership to minimize individual transport emissions • Advocate for expanded rail service and access on MBTA commuter line across all days • Expand affordable housing near public transportation access points for equity considerations • Adopt a Complete Streets policy as part of the Downtown revitalization project • Create a walkable and bikeable community through a safe and interconnected pedestrian and bicycle infrastructure. • Pursue health-oriented programs such as bike sharing to further community well-being • Implement climate-smart parking policies, including landscape requirements, shared parking, and space considerations 	<p>Key Stakeholders</p> <p>Select board, Town manager and staff, Planning board, planning department, Finance, committee sustainability coordinator, building developers</p>			
<p>Advance zero emissions vehicle infrastructure</p> <ul style="list-style-type: none"> • Expand public charging stations, including downtown and community-gathering areas • Adopt variable pricing for reasons of sustainability and equity • Seek outside funding opportunities via incentives and grants for EV charging stations • Implement EV and parking policies, ensuring equal access and space efficiency • Build in EV space requirements for all business/condo units of a certain size 				
<p>Expand use of electric vehicles</p> <ul style="list-style-type: none"> • Implement an EV car sharing program, available for all residents • Partner with community leads and businesses for EV car sharing and/or shuttle services • Adopt an EV mindset through ongoing education and awareness of necessity, benefits, and opportunities • Build new relationships with transportation network companies to further both usage and visibility of EVs 				
<p>Lead by example in the municipal fleet</p> <ul style="list-style-type: none"> • Adopt and implement a zero-emission municipal fleet policy. • Require a transition to electric school buses as part of any new bussing contract • Amplify and reinforce example to all generations through education and social sharing 				

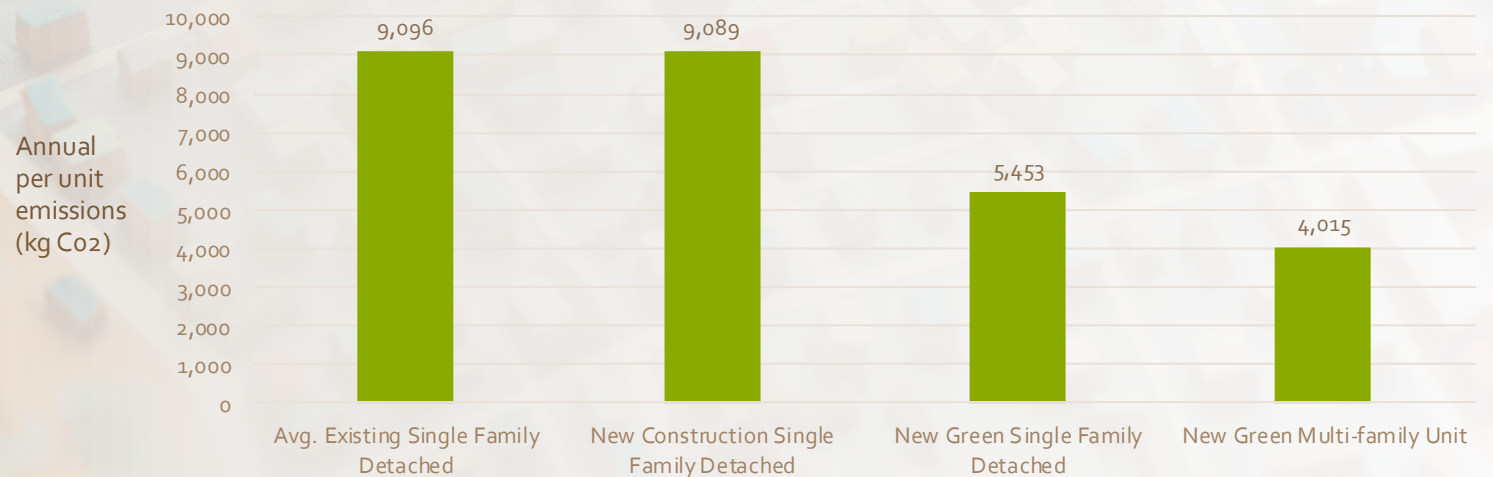
Smart Zoning and Planning



As cities and towns plan for and implement climate-smart strategies and measures to advance toward net zero, local levers – such as zoning and strategic planning – play a crucial role

Strategies in this section can include green overlay districts, provisions to meet climate-smart performance standards; allowances to enable more robust building envelopes and clean heating and cooling systems; optimize rooftop square footage to reduce heat loads, absorb storm water, or generate solar heating or electricity; and much more.

Average Greenhouse Gas Emissions by Building Type in New England



Source: Green Zoning: Creating Sustainable Communities Through Incentive Zoning

Smart Zoning and Permitting

Adopt sustainable requirements and incentives for new buildings during site permitting:

- Incentives may include: Density Bonuses, Expedited permitting, Reduced parking requirements
- Provisions may include: Performance standards, Electrification measures, On/Off site renewable energy procurement, Energy storage, EV charging, Electrification in affordable housing units, Passive solar siting, Tree coverage

Revise zoning bylaws to align with net zero goal and climate resiliency

- Remove barriers to installing clean technology (heat pumps, energy storage, rooftop and ground mounted solar, etc.)
- Remove barriers to energy efficiency upgrades such as additional exterior insulation or vestibules
- Update regulations to provide by-right permitting for Level I and II EV charging stations and establish EV parking space requirements for new construction.
- Consider Green Overlay Districts as a tool to incentivize smart development

Collaborate regionally and advocate at the state and national level

- Coordinate with other towns on sustainable zoning best practices
- Advocate for Net Zero stretch building code and other building performance measures at the state and federal level (these may precede certain zoning requirements at the local level in time)

Equity considerations: Consider the short and long-term impacts of any modifications on affordable housing by looking at up front costs and ongoing expenses for residents.

Key Stakeholders

Planning board, planning department, sustainability coordinator, building developers

Today

2030

2040



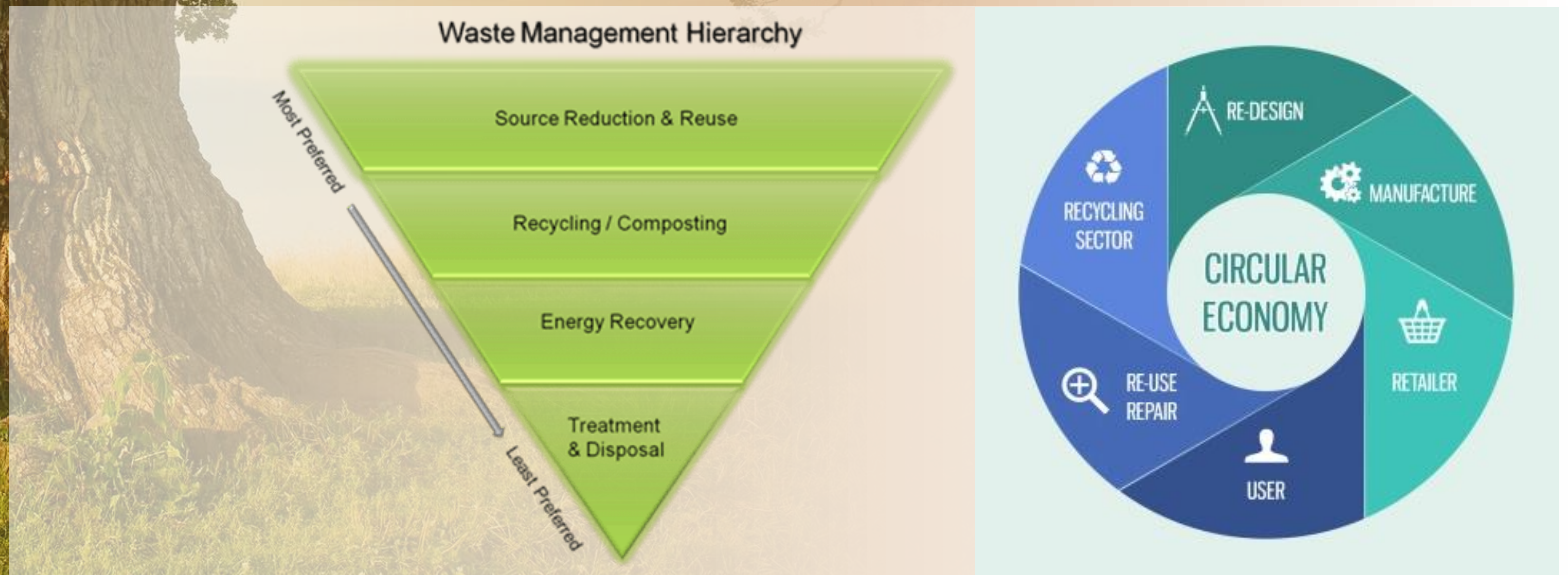
Environment





Our built and natural systems work together to provide resilience to climate change and expand social and environmental benefits to all.

Trees absorb CO₂ and are the best sink for carbon. This is the only way we sequester carbon. Trees also regulate stormwater and reduce flooding and decrease energy needs, thereby lessening contributions to and destructive impacts of climate change.

Strategies in this section focus on waste reduction, preserving our tree canopy, and adopting climate resilient policies that preserve and benefit from our natural resources.



Environment

	Today	2030	2040
<p>Adopt a Zero waste mindset The way we produce, consume, and dispose of goods and food in the U.S. accounts for 42% of our nation’s greenhouse gas emissions¹. Therefore, a primary consideration is to promote waste reduction via these principles and actions:</p> <ul style="list-style-type: none"> • Reduce purchases, reuse as much as possible, repair when necessary, and recycle as a last resort (when possible). • Advocate for legislation to support reuse and repair of products and to mandate Extended Producer Responsibility (EPR) for plastics, packaging, and product stewardship • Expand curbside or home composting; continue PAYT and improve by replacing plastic bags with reusable containers 	<p>Key Stakeholders Town Manager and Select Board Ashland residents, businesses, and institutions Sustainability Committee and Coordinator</p> 		
<p>Preserve and protect natural resources including open space, wooded areas, and water resources</p> <ul style="list-style-type: none"> • Revise zoning bylaws and enact green zoning bylaws to align with net zero goal and climate resiliency • Adopt a tree protection bylaw • Hire a certified arborist as tree warden 	<p>Town Manager Select Board Town staff</p> 		
<p>Invest in climate resilient projects</p> <ul style="list-style-type: none"> • Advocate and support Green infrastructure, including the Green Streets Program, and Low Impact Development • Outreach to support environment awareness and best practices • Promote landscaping with native plants while reducing lawns 	<p>Planning Department and Planning Board Zoning Board Sustainability Committee</p> 		

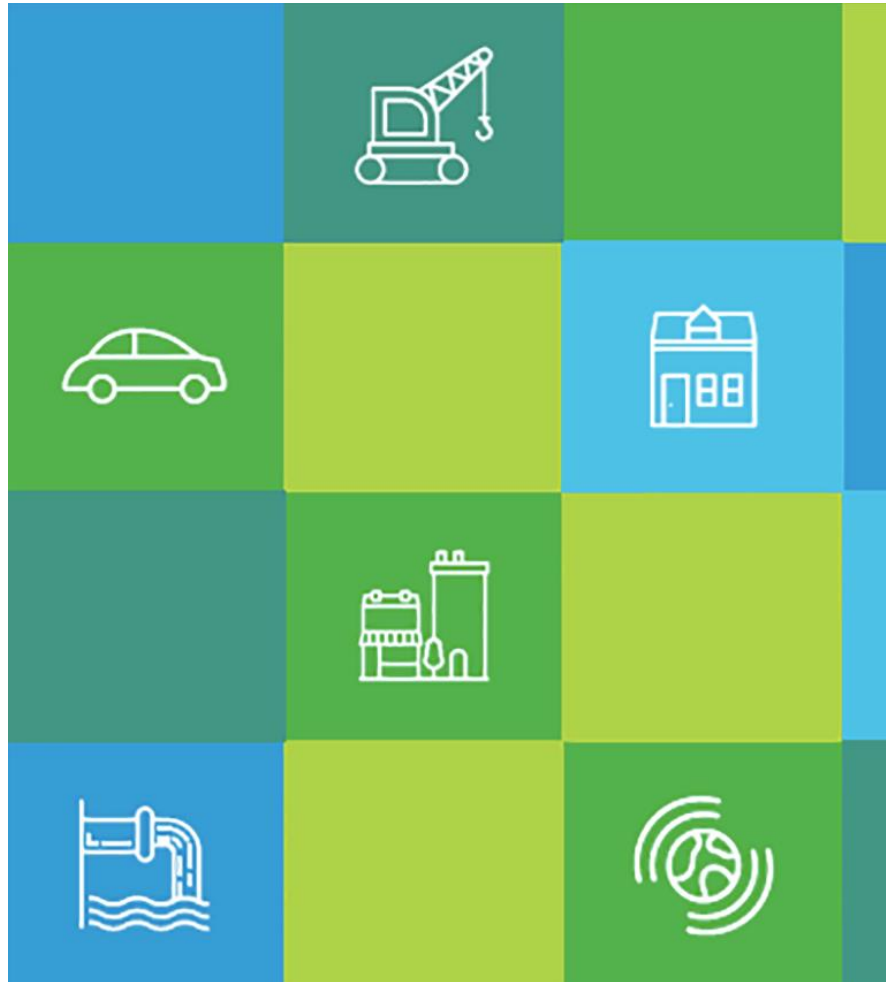
¹ <https://www.epa.gov/sites/production/files/2016-08/documents/ghg-land-materials-management.pdf>



Appendix



MAPC Communities Green House Gas inventory tool



- Massachusetts-specific approach to calculating GHG emissions from the primary local sources of emissions within cities and towns.
- All GHG emissions that contribute to a municipality's carbon footprint are categorized into three sectors:
 - Stationary Energy
 - Transportation, and
 - Waste
- Utilizes accessible datasets to simplify and streamline the GHG inventory process
 - The data relates back to 2017 as a base year.
- The completed inventory is directionally accurate as there were some gaps in available data for Ashland
- We cannot account for the positive impact of our green spaces

APPENDIX: Green Streets Program



- Create a Green street certification to recognize sustainable neighborhoods
- The street or group of neighbors certified as a green street
 - Based on number of residents who complete a home audit
 - Adopt a renewable source of energy
 - Could be supported through yard signs
- Benefits
 - Builds community engagement
 - Raises awareness of sustainable practices
 - Raises the profile of Net Zero

APPENDIX: Low Impact Development: Core Requirements

- Conserve natural areas wherever possible
 - Don't pave over the whole site if you don't need to
- Minimize the development impact on hydrology
- Maintain runoff rate and duration from the site
 - Don't let the water leave the site
- Scatter integrated management practices (IMPs) throughout the site
 - IMPs are decentralized, microscale controls that infiltrate, store, evaporate, and/or detain runoff close to the source
- Implement pollution prevention, proper maintenance, and public education programs

APPENDIX: Trees/Forest Benefits vis a vis Climate Change

- Trees absorb CO₂ and store carbon while releasing oxygen back into the air.
- Trees serve to manage stormwater runoff and filter pollutants, improving air and water quality.
- Trees can reduce air temperature up to 10°F by shading our homes and streets.
- Trees placed strategically around buildings can cut summer air conditioning needs by up to 50 percent.
- By reducing the energy demand for cooling our houses, we reduce carbon dioxide and other pollution emissions from power plants.
- Shade from trees slows water evaporation from thirsty lawns thereby saving water supplies.

A Resolution calling for Swift, Just Building Decarbonization

- **We are** calling for the Commonwealth to address building decarbonization in line with the State's own legally binding requirement for 85% emission reduction by 2050, while clarifying the rules to allow Ashland to be able to take additional appropriate municipal action.
 - **We are** focusing on new construction, rather than retrofitting existing homes with expensive heat pump solutions.
 - **We are not** asking for a ban on fossil fuels **and this is not** a petition for home rule
-
- The only viable path to achieving our NetZero goals is through wide spread electrification
 - 75% of Building in Massachusetts are powered by fossil fuels
 - There are economically viable economically viable options for electrification of new construction already on the market, addressing this up front, both avoids stuck stock and expensive retrofits in the future.
 - The Commonwealths legal structure makes it very difficult for local authorities to take actions on their own.
 - The impact of any required action on economical and social justice communities **cannot** be addressed only at the municipal level, coordinated action will result in better health and economic outcomes.
 - The resolution was drafted in collaboration with the Rocky Mountain Institute, who has been working on a decarbonization strategy with several of our sister towns.

Lowered housing cost, improved quality and reduced emissions

1

Reducing energy loads with safe high performing energy envelopes and improving indoor air quality by controlling air movement through sealing, compartmentalization and mechanical ventilation

2

Installing highly efficient all electric equipment and appliances like heating and cooling equipment, hot water heaters, stoves, electric dryers and ensuring adequate electric service

3

Using demand controls, onsite renewable energy and storage to manage the amount and timing of electric energy consumptions

