

REPORT OF THE CLIMATE ACTION COMMITTEE

The Climate Action Committee (CAC) was originally established by Town Meeting as the Sustainable Energy Committee (SEC) in 2010. The CAC is composed of seven appointed members, with staggered terms of three years. The Select Board, Municipal Light Plant (MLP), and School Committee each appoint a representative, and the Select Board appoints the remaining four members from among residents or others with relevant interests and expertise.

During 2021, the primary activity of the CAC was to develop the Town's Climate Action Plan, which was completed in February 2022.

A brief timeline of the committee's work:

- **2010:** ATM establishes the SEC to lead efforts to accomplish the goal adopted at the 2009 Annual Town Meeting to reduce town-wide greenhouse gas (GHG) emissions 10 percent below 2007 levels by 2013, to monitor and report progress toward that goal, and to propose further goals for emissions reductions to Town Meeting.
- **2014:** The 2009 goal is reached, and ATM adopts the SEC proposal to establish a new goal to reduce town-wide emissions 25 percent below 2007 levels by 2020.
- **2020:** The town achieves the 25% emissions reduction goal due to a variety of factors including greening of the electricity grid, the transition away from the use of fuel oil to heat buildings, improved energy efficiency and waste reduction, and pandemic-related changes in building and vehicle use. At Special Town Meeting in Fall 2020, the Town adopts a resolution proposed by the Select Board to address the serious impact of climate change urging that all boards, committees, and departments proactively consider actions to reduce greenhouse gas emissions associated with Town-supported projects and programs and to coordinate with the SEC to develop and implement a comprehensive climate action plan for the Town.
- **2021:** Annual Town Meeting adopts new GHG emissions goals to reduce town wide GHG emissions 50 percent below 2007 levels by 2030, 75 percent below 2007 levels by 2040 and to net zero emissions by 2050 (Article 24). These goals align with the emissions goals set by the Commonwealth of Massachusetts, which has also adopted a 2050 net zero carbon emissions goal. ATM also approved a name change from the SEC to the Climate Action Committee (CAC).

MEASUREMENT OF 2021 EMISSIONS AND TRENDS

Inventory Methodology Update

As part of the Climate Action Plan process, Climate Action staff worked with an expert consultant to update the methodology Wellesley uses to estimate town-wide greenhouse gas emissions. Below is a list of major methodological changes reflected in the 2021 inventory results.

- **New GHG electricity emissions factors** to replace regional electricity emissions factors with factors reflecting Wellesley Municipal Light Plant electricity purchases. The new factors are based on Massachusetts Department of Environmental Protection data and methods for calculating electric utility-specific emissions factors.
- **Revised on-road vehicle emissions calculation** to reflect best practices. The revised methodology:
 - Includes half of Route 9 vehicle miles traveled (VMT) and excludes Route 128 VMT.

- Avoids double counting emissions from the municipal fleet and Metro West transit.
- Adjusts for reduced vehicle use during the pandemic.
- **New Global Warming Potential (GWP) factors** to align with the State GHG inventory. The GWP factors are from the Intergovernmental Panel on Climate Change's (IPCC's) Fourth Assessment.
- **Revised college sector emissions**, which now include emissions from MassBay Community College. MassBay emissions previously appeared as part of commercial sector emissions.
- **A new Municipal Services emissions category** which includes emissions from water treatment and distribution, wastewater pumping, Recycling and Disposal Facility (RDF) solid waste processing, streetlights, field and municipal parking lot lighting, traffic lights, and public electric vehicle charging. The municipal and school buildings category previously included these emissions.
- **Additions to waste-related emissions** including emissions from:
 - Solid waste from the three colleges in Wellesley;
 - Residential and commercial waste picked up by private haulers; and
 - Source-separated food waste processing.

Measurement of Emissions 2020-2021

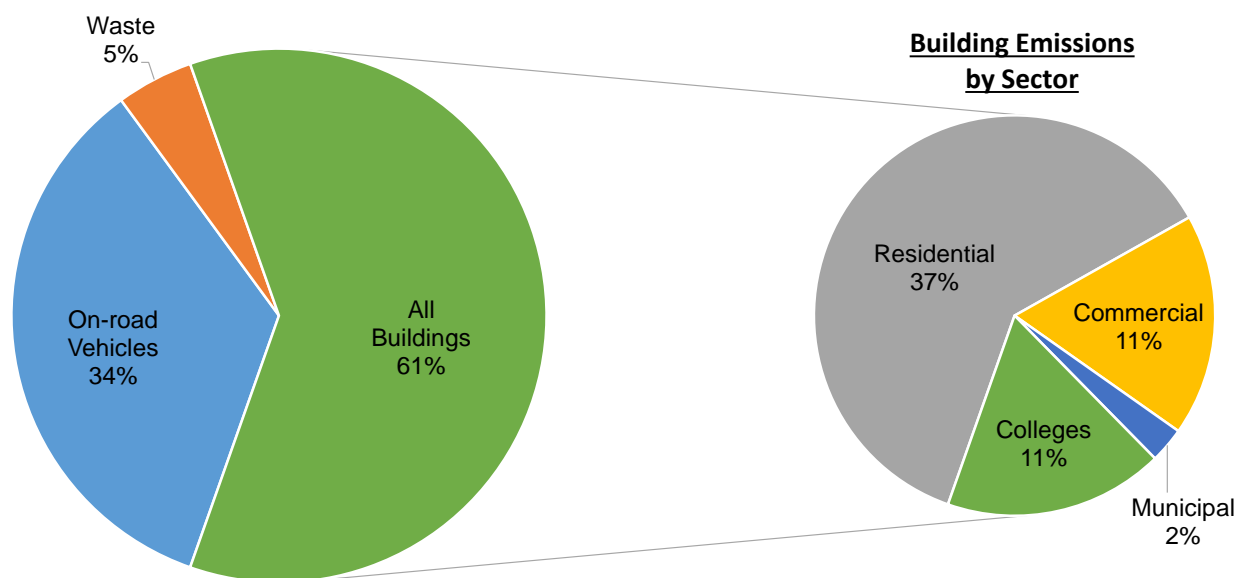
As shown in the table below, Wellesley's total 2021 GHG emissions decreased 2% from 2020 levels. As in 2020, significant emissions reductions in 2021 can be attributed to ongoing pandemic-related changes in activity patterns, increasing carbon-free electricity purchases by the MLP, as well as mild weather during the 2021 heating season.

Preliminary Greenhouse Gas Emissions (CO ₂ e) in metric tons [*]							
	Share of Total 2021 Emissions	2021 Emissions	2020 Emissions	2020 - 2021 Percent Change	2019 Emissions	2007 Emissions	2007 - 2021 Percent Change
Buildings	60.7%	131,560	134,575	-2.2%	167,060	255,993	-48.6%
Residential	37.3%	80,835	83,026	-2.6%	96,551	138,172	-41.5%
Commercial	10.9%	23,623	24,790	-4.7%	33,872	61,412	-61.5%
College	10.8%	23,335	23,274	0.3%	32,111	48,755	-52.1%
Municipal & School	1.7%	3,767	3,486	8.1%	4,525	7,654	-50.8%
On-road Vehicles	34.5%	74,805	74,805	0.0%	95,229	48,913	52.9%
Municipal Services*	0.2%	374	471	-20.4%	663	2,316	-83.8%
Waste	4.7%	10,085	11,469	-12.1%	11,324	8,912	13.2%
Total Emissions	100.0%	216,824	221,320	-2.0%	274,277	316,135	-31.4%

*Municipal services include water treatment, RDF waste processing, public electric vehicle charging, as well as street, traffic, field, and municipal parking lot lights.

*GHG estimates are based on actual municipal and college energy use data, actual electric and natural gas use by households and businesses, estimates for heating oil consumption and on-road vehicle VMT, a mix of actual and estimated waste data, fuel efficiency of on-road vehicles, and conversion factors that translate energy use into GHG emissions. Gas leaks (discussed below) are not currently included in the inventory. The methodology is guided by the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions established in October 2012. Town-wide emissions are calculated using ICLEI – Local Governments for Sustainability software.

Contribution to 2021 Total GHG Emissions (MTCO₂e)



Municipal services, not shown above, contributed 0.2% of total GHG emissions in 2021.

Building emissions in college and municipal sectors increased between 2020 and 2021 while building emissions in residential and commercial sectors decreased. In 2021, energy use in Town buildings, public schools, and college buildings rose toward pre-pandemic levels. However, an increase in MLP's carbon-free electricity purchases by 10% over 2020 levels helped to mitigate emissions growth resulting from greater electricity use. While GHG emissions decreased for both residential and commercial buildings, these emissions reductions are more closely correlated to cleaner electricity than to the 1% reduction in energy consumption observed in both sectors.

On-road vehicle emissions were calculated to be the same on average in 2020 and 2021. Typically, Wellesley traffic counts averaged over past years are used to calculate GHG emissions from gasoline and diesel powered on-road vehicles. Given the lack of 2021 traffic data, this method was insufficient to capture pandemic-related changes in the town's traffic patterns over the last two years. Therefore, statewide 2020 and 2021 data showing average reductions in vehicle-miles traveled were used to conservatively estimate the pandemic's effect on vehicle miles traveled in Wellesley in 2020. Although vehicle activity was exceptionally low mid-March through mid-May 2020, state data show an annual average reduction of 20% below pre-pandemic levels for both 2020 and 2021.¹

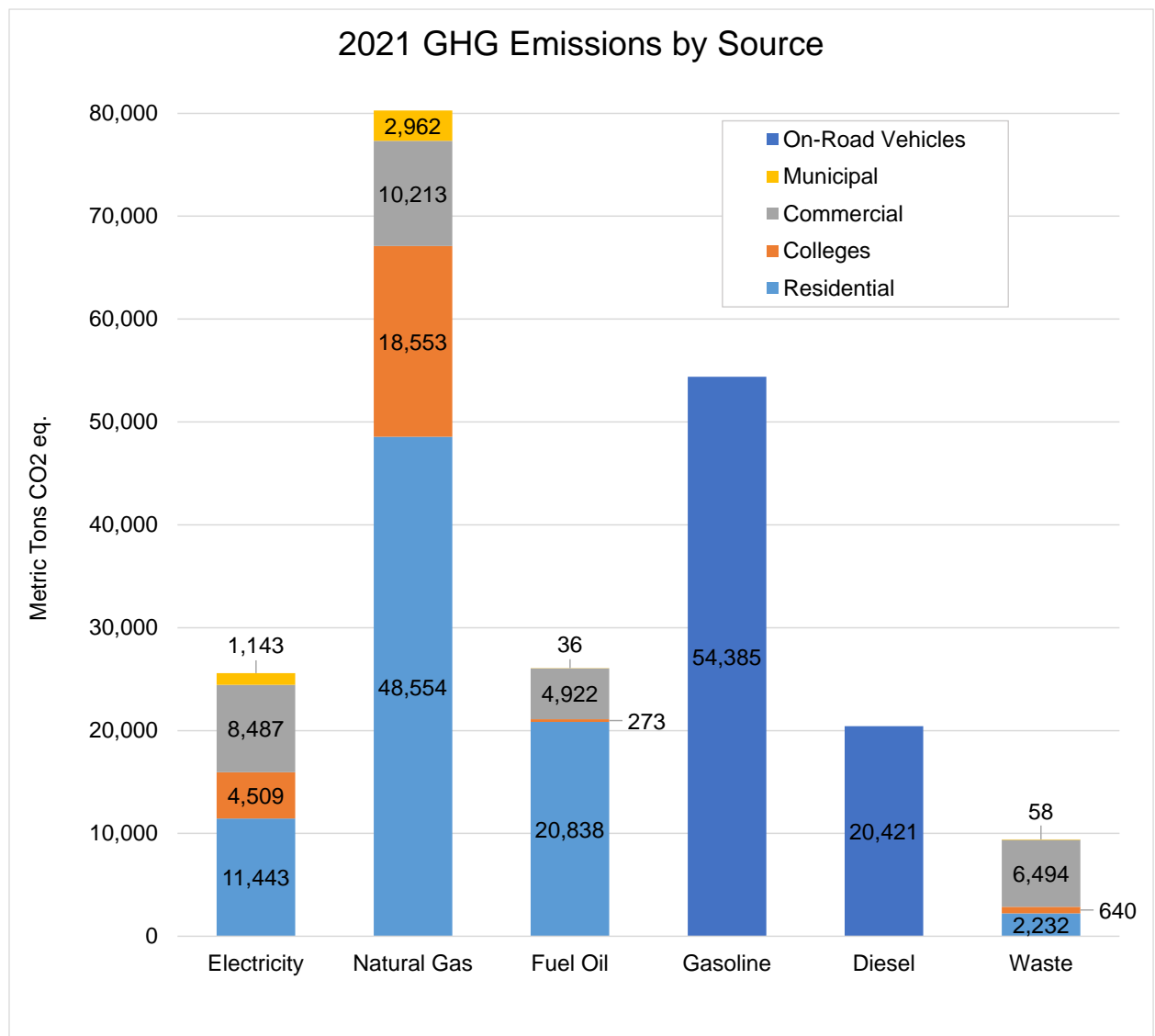
Municipal services emissions decreased in 2021 compared to 2020 due to lower energy use by the Department of Public Works for water treatment as the Morses Pond Water Treatment Plant was taken offline in May 2021.

Waste sector emissions declined 12% from 2020 levels, mirroring a similar reduction in the tonnage of landfill-bound waste processed by Wellesley's Recycling and Disposal Facility (RDF), with materials discarded by the residential and commercial sectors falling by 3% and 15%, respectively. Waste is a small sector and tends to fluctuate with the economy, building demolition

¹ <https://mobility-massdot.hub.arcgis.com/#traffic>

waste, and fees for waste disposal in Wellesley and the surrounding area. Municipal waste increased 13% as staffing levels in Town buildings rose compared to 2020.

Gas Leaks are not currently accounted for in the GHG inventory results. According to 2020 analyses from the Home Energy Efficiency Team ([HEET](#)), Wellesley has 250 unrepaired gas leaks emitting an estimated 91 metric tons of methane annually, equaling 7,858 metric tons of carbon dioxide equivalents (MTCO₂ eq.). Annual gas leak emissions exceed emissions from municipal/school buildings and services.



2007-2021 Emissions Trends

As of 2019, Wellesley reduced its overall GHG emissions by 13% below 2007 levels and was not on track to meet its goal of reducing emissions 25% by 2020. This shortfall was due primarily to the large and growing impact of the transportation sector. However, significantly lower energy consumption, warmer than average winters, and large increases in MLP purchases of carbon-free electricity in 2020 and 2021 resulted in emissions reductions of approximately 30% below 2007 levels for both years. As the pandemic continued in 2021, on-road vehicle activity and commercial building energy consumption remained low, and the MLP increased carbon-free electricity purchases by 9% compared to 2020. While future on-road vehicle emissions are expected to rebound to some degree, building sector emissions reductions should persist. Long-term trends that have contributed to GHG emissions reductions since 2007 appear below.

- **Decarbonization of the electricity grid:** Over the last 14 years, Wellesley MLP's electricity sources shifted from coal and oil to natural gas and included more clean energy, lowering the emissions per unit of electricity by 75%.
- **Transition from heating with fuel oil to natural gas:** Many homes, businesses and college buildings switched from heating with fuel oil to natural gas, which releases fewer GHG emissions per unit of energy.
- **Energy Efficiency:** Electricity consumption between 2007 and 2021 fell by 1.8% despite a roughly 7% increase in Wellesley's population. New, more efficient heating and cooling systems, appliances, and lighting in Wellesley homes and businesses lowered energy use and resulting emissions. The MLP's light-emitting diode (LED) streetlight retrofit project and the Facilities Management Department's LED retrofits, recommissioning and other energy conservation measures contributed to a decline in energy use. Changes in the building code and building practices have also improved energy efficiency and lowered building emissions. These improvements helped to keep electricity consumption level.
- **Changes at Wellesley College:** Wellesley College decreased its natural gas use and emissions by sourcing electricity from Wellesley's Municipal Light Plant instead of generating it on-site.
- **Transportation:** Increased fuel efficiency in vehicles was not sufficient to offset the increasing number of vehicle miles traveled between 2007 and 2019.

Note that 2021 GHG inventory results are marked as preliminary since emissions factors for the electricity grid are updated annually with a two-year lag. GHG inventory results for 2019 have been updated with the recently released 2019 factor. The CAC will finalize the 2021 results in 2023 and publish them in the Report to ATM 2024.

COMMITTEE ACTIVITIES IN 2021 AND EARLY 2022

In addition to tracking and analyzing GHG emissions, as described above, the CAC led and contributed to several initiatives, detailed below, aimed at reducing the Town's carbon footprint.

Climate Action Plan

The Committee completed a Climate Action Plan (Plan or CAP) which serves as a comprehensive road map for achieving the GHG emissions goals adopted by ATM 2021. The CAC worked with at least twelve departments, boards, and committees to plan and execute the Climate Action Plan. In Spring 2020, the Committee hired a consultant and recruited over 70 community-wide stakeholders to participate in working groups focused on governance, energy, buildings, mobility, waste, and natural resources. The CAC also carried out several CAP community outreach efforts including a climate action survey, nearly 40 public presentations, and a first-ever Building Energy

Roundtable for commercial property owners. The Committee published the Climate Action Plan and an eight-page summary in February 2022. The Committee is now focused on many facets of implementation.

Green Communities

In partnership with FMD, MLP, and the Police Department, the CAC coordinated a Green Communities grant for \$137,920 supporting the following projects:

- Interior LED retrofit in the High School auditorium and gymnasium;
- Exterior LED retrofit in municipal parking lots; and
- Two hybrid police cruisers.

The high school lighting project was completed in Fall 2020. The parking lot LED retrofit and hybrid cruiser purchase were complete in 2021.

In February 2022, the Department of Energy Resources awarded Wellesley a Green Communities grant totaling \$200,000 to contribute to the following projects:

- Air-source heat pumps at Wellesley Avenue water treatment plant (WTP);
- Air-source heat pumps at Morses Pond WTP;
- Air-source heat pumps at Longfellow WTP;
- LED lighting in the DPW's Water and Sewer garage; and
- Two additional hybrid electric police cruisers.

CAC staff coordinated the 2021 grant application in collaboration with DPW and the Police Department. Since 2018, Wellesley earned over \$475,000 in Green Communities grant funding. All Green Communities projects reduce the Town's operating costs.

Sustainable Zoning

The CAC participated in a Sustainable Zoning Working Group to propose sustainability additions to the Zoning Bylaw.

Gas Leaks

Members of the CAC continue to participate in the Multi-Town Gas Leaks Initiative which brings together cities and towns in National Grid territory to work with the utility to accelerate progress on gas leaks. Gas leaks are made up of methane which is 86 times more potent as a greenhouse gas than carbon dioxide. The GHG inventory section above contains an estimate of gas leak emissions in Wellesley for 2021. The Climate Action Plan includes goals, strategies, and actions to address the impact of gas leaks on Wellesley's carbon footprint, public health, and ecosystems.

Working with the Municipal Light Plant

The CAC assists the Municipal Light Plant's WE CARE Program, Incentive Design Working Group, and incentive programs such as the Clean Comfort Air-source heat pump initiative, residential solar rebate project, and electric vehicle off-peak charging program.

Town-wide Mobility Working Group

The CAC participates in the Town-wide Mobility Working Group and contributes to development of the Town's Sustainable Mobility Plan.

WasteWise Wellesley

The Climate Action Committee contributes to WasteWise Wellesley and the 3R (Reduce, Reuse, Recycle) Working Group which includes the CAC, DPW and the Natural Resources Commission working to reduce waste and positively impact sustainable materials management in Wellesley. Initiatives include zero waste and recyclable of the month programs, food rescue and food waste diversion programs, and community and business outreach and education.

Green Collaborative

To connect over 30 environmentally interested groups across Town, the CAC facilitates Wellesley's "Green Collaborative," which hosts speakers and lively discussions on sustainability topics. In 2021, the Green Collaborative hosted webinars on Air-Source Heat Pumps and the Climate Action Plan.

Proposed Staffing Changes

The CAC Operating Budget request seeks a 16 hour/week increase in the Climate Action Analyst's position to support Climate Action Plan implementation. The CAC's Capital Budget request seeks \$50,000 for a CAP implementation pilot program. This program will involve:

- Consultant assistance with strategy, resources, and content for climate action-related community education and engagement; and
- Technical assistance directly to community members interested in pursuing sustainability transitions such as building retrofits, electric vehicle purchases, and sustainable waste management.

Conclusion

Wellesley's Climate Action Plan outlines an ambitious roadmap for reducing greenhouse gas emissions and building resilience to climate change impacts. Successful CAP implementation requires strong Town leadership and participation of Town departments, boards, and committees, and of residents, businesses, and institutions across Wellesley.

CLIMATE ACTION COMMITTEE

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