City of White Plains

Baseline Year 2019

Inventory of Government Operations Greenhouse Gas Emissions

Credits and Acknowledgements

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Executive Summary

The City of White Plains recognizes that greenhouse gas (GHG) emissions are catalyzing climate change, the consequences of which pose risks to the future health, wellbeing, and prosperity of our community. This recognition is reflected within our One White Plains Draft Comprehensive Plan and addressed in the greenWP section of the plan.

The City of White Plains has already taken a leadership role, both locally and regionally, to mitigate impacts on the climate. The Mayor, Common Council, City departments, and the Sustainable White Plains Committee have all prioritized sustainability initiatives, which have led to significant strides in recent years:

- The City is a municipal member of the New York State Energy Improvement Corporation (EIC). EIC is a non-profit organization and local development corporation that is focused on helping property owners reduce energy waste, save money, and improve the quality of their buildings through clean energy projects involving energy efficiency and renewable energy.
- White Plains was designated as a NYSERDA Clean Energy Community in 2017. Actions taken by the City to qualify for this program include implementing a Clean Fleets Policy, conducting community campaigns on energy efficiency, conducting Energy Code Enforcement Training for City staff, implementing Property Assessed Clean Energy (PACE) financing, and adopting the Unified Solar Permit.
- The White Plains Community Solar Project, started in 2019, is a groundbreaking project that sets the standard for municipal solar initiatives in New York. The project received the 2021 Mayors Climate Protection Award.
- As of April 2023, the City was officially certified as a Bronze Level Climate Smart Community, recognizing the many significant climate smart actions that White Plains has accomplished.
- In April 2023, Governor Hochul announced that White Plains was one of the first three communities to become a member of the Green Purchasing Communities Program, a first in the nation program that makes it easy for local governments to ensure that the products they are purchasing have a lower environmental impact.

This report provides estimates of greenhouse gas emissions resulting from activities within the City's government operations. A greenhouse gas (GHG) emissions inventory is one of the most important steps in the local climate action process. This local government operations GHG inventory is an accounting, analysis, and report of the GHG emissions resulting from the day-to-day operations of the City. It summarizes the GHG emissions from the consumption of energy and materials in government buildings, from wastewater, from municipal vehicle fleets, from government-owned outdoor lighting, and from other sources.

Key Findings

Figure 1, below, shows local government operations emissions.

The Buildings and Facilities sector and the Vehicle Fleet sectors each account for 38% of these emissions. The next largest contributor is the employee commute at 19%. Together these three sectors account for 95% of all GHG due to government operations. Actions to reduce emissions from these sectors will be a key part of any future climate action plan developed by the City of White Plains.

The two remaining sectors accounted for a much smaller percentage of emissions: streetlights and traffic signals (4%) and wastewater treatment facilities (1%).

The Inventory Results section of this report provides a detailed profile of emissions sources within the City of White Plains, information that is key to guiding local reduction efforts. These data will also provide a baseline against which the city will be able to compare future performance and demonstrate progress in reducing emissions.

Omissions and Explanations
We have not included emissions associated with refrigerants because the refrigerant used for the City's ice rink is ammonia, which has a global warming potential of zero.

We did not include Solid Waste because it was determined that it is likely to be a very small contributor to GHG emissions. White Plains does have a closed landfill (Gedney Way). It is relatively small and the majority of its fill is ash. It is not included in the EPA's Flight Tool.

The City does not have direct data on waste from government employees, so the only option was to potentially scale from the City's community solid waste data, which is lower-quality data (for instance, it includes all the Westchester County employees working in White Plains). When scaled, the tonnage was relatively small.

The city does not have wastewater pumps. This inventory includes the city's pump stations that pump water to pressure basins.

CO2e By Category

- Water & Wastewater Treatment Facilities
- Street Lights & Traffic Signals
- Employee Commute
- Vehicle Fleet
- Buildings & Facilities
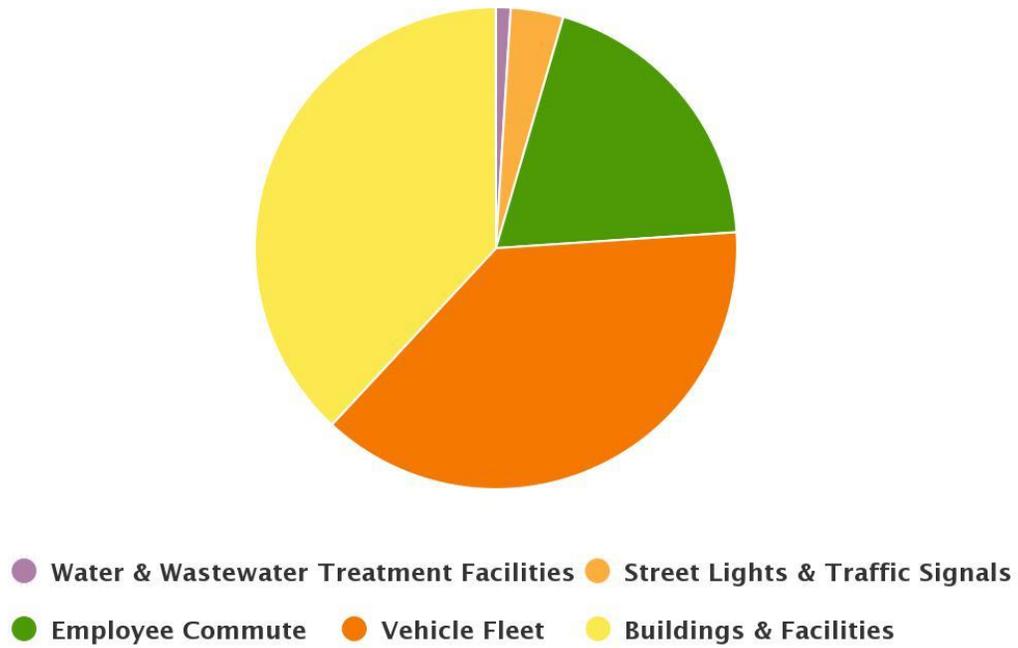
Total of 7,068 Metric Tons of CO2e

Figure 1: Government Operations Emissions by Sector

Introduction to Climate Change

Naturally occurring gases dispersed in the atmosphere determine the Earth's climate by trapping solar radiation. This phenomenon is known as the greenhouse effect. Evidence shows that human activities are increasing the concentration of greenhouse gases and changing the global climate. The most significant contributor is the burning of fossil fuels for transportation, electricity generation and other purposes, which introduces large amounts of carbon dioxide and other greenhouse gases into the atmosphere. Collectively, these gases intensify the natural greenhouse effect, causing global average surface and lower atmospheric temperatures to rise, threatening the safety, quality of life, and economic prosperity of global communities.

Although the natural greenhouse effect is needed to keep the earth warm, a human enhanced greenhouse effect with the rapid accumulation of GHG in the atmosphere leads to too much heat and radiation being trapped. The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report confirms that human activities have unequivocally caused an increase in carbon emissions[1]. Many regions are already experiencing consequences of global climate change. Creating measures to mitigate and adapt to climate change is a main focus of the greenWP element of the One White Plains Draft Comprehensive Plan.

Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. (high confidence) Warming from anthropogenic emissions from the pre-industrial period to the present will persist for centuries to millennia and will continue to cause further long-term changes in the climate system, such as sea level rise, with associated impacts (high confidence), but these emissions alone are unlikely to cause global warming of 1.5°C (medium confidence). Climate-related risks for natural and human systems are higher for global warming of 1.5°C than at present, but lower than at 2°C (high confidence). These risks depend on the magnitude and rate of warming, geographic location, levels of development and vulnerability, and on the choices and implementation of adaptation and mitigation options (high confidence)[2].

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[1]IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [MassonDelmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press.

[2]IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp.

According to the most recent National Climate Assessment by the U.S. Global Change Research Program, the northeast U.S. will experience impacts from seasonal changes and hazards occurring at unprecedented magnitudes. The seasonal climate, natural systems, and accessibility of certain types of recreation are threatened by declining snow and ice, rising sea levels and rising temperatures.

Residents in urban areas face multiple climate hazards, including temperature extremes, episodes of poor air quality (some caused by smoke from wildfires), recurrent waterfront and coastal flooding, and intense precipitation events that can lead to increased flooding on urban streams. These physical changes may lead to evacuated and displaced populations and damaged infrastructure. Sustaining communities may require significant investment and planning to provide emergency response efforts, a long-term commitment to rebuilding and adaptation, and support for relocation.

Some communities such as low/moderate income households, elderly, disabled, language-isolated, and recent immigrants, may be more vulnerable due to a limited ability to prepare for and cope with extreme weather and climate events. It is critically important to specifically plan for climate change effects on these communities, as they often get hit the hardest when it comes to natural hazards. Equity and inclusion are priorities for the City of White Plains, and are reflected in the greenWP element of our One White Plains Draft Comprehensive Plan.

In recent years, storm damage has impacted our area, with flooding causing major damage to infrastructure, businesses, and residential properties.

Businesses along Mamaroneck Avenue in the village of Mamaroneck have faced numerous challenges due to flood-water damage after recent storms.
Photos courtesy of westchestermagazine.com and Town of Mamaroneck

Many communities in the United States have started to take responsibility for addressing climate change at the local level. Reducing fossil fuel use in the community can have many benefits in addition to reducing greenhouse gas emissions. More efficient use of energy decreases utility and transportation costs for residents and businesses. Retrofitting homes and businesses to be more efficient creates local jobs. In addition, when residents save on energy costs, they may be more likely to spend money at local businesses and add to the local economy. Reducing fossil fuel use improves air quality, and increasing opportunities for walking and bicycling improves residents' health.

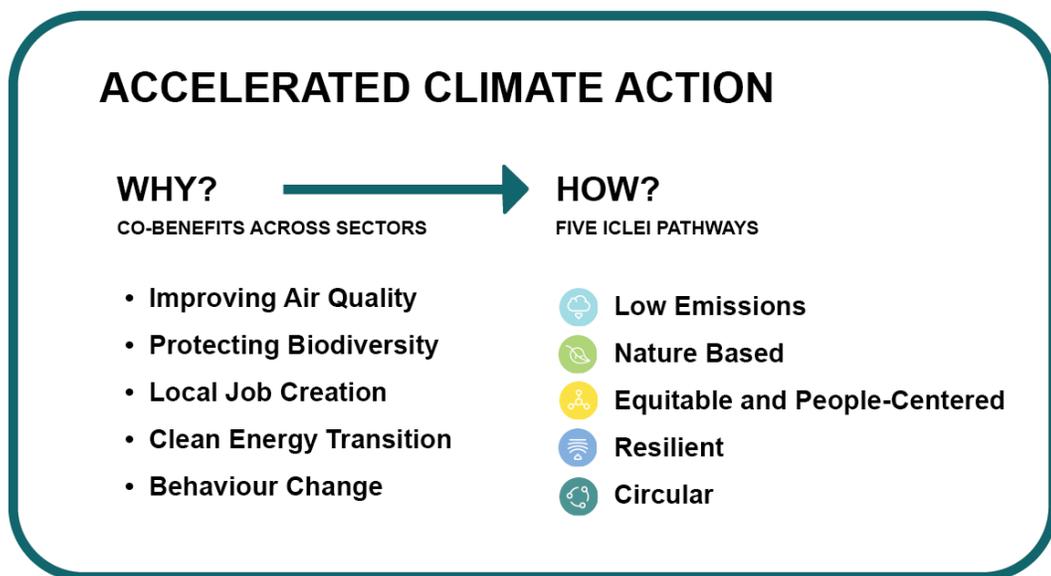# Greenhouse Gas Inventory as a Step Toward Carbon Neutrality

Cities, towns and counties are well placed to define coherent and inclusive plans that incorporate climate change adaptation, resilience and mitigation. Existing targets and plans established by NY State, the Federal Government and non-governmental organizations with expertise in climate change can be used to help create an outline for how to achieve net-zero emissions within a given time frame.

Creating a roadmap for climate neutrality requires the City of White Plains to identify priority sectors for action, while considering climate justice, inclusiveness, local job creation and other benefits of sustainable development.

To complete this inventory, the City of White Plains utilized tools and guidelines from ICLEI - Local Governments for Sustainability (ICLEI), which provides authoritative direction for greenhouse gas emissions accounting and defines climate neutrality as follows:

> The targeted reduction of greenhouse gas (GHG) emissions and GHG avoidance in government operations and across the community in all sectors to an absolute net-zero emission level at the latest by 2050. In parallel to this, it is critical to adapt to climate change and enhance climate resilience across all sectors, in all systems and processes.

To achieve ambitious emissions reduction, and move toward climate neutrality, the City of White Plains will need to set a clear goal and act thoughtfully following a holistic and integrated approach. Climate action is an opportunity for our community to experience a wide range of co-benefits, such as creating socio-economic opportunities, reducing poverty and inequality, and improving the health of people and nature.

ACCELERATED CLIMATE ACTION

WHY?
CO-BENEFITS ACROSS SECTORS

HOW?
FIVE ICLEI PATHWAYS

- **Improving Air Quality**
- **Protecting Biodiversity**
- **Local Job Creation**
- **Clean Energy Transition**
- **Behaviour Change**

- **Low Emissions**
- **Nature Based**
- **Equitable and People-Centered**
- **Resilient**
- **Circular**

ICLEI Climate Mitigation Milestones

In response to accelerating climate change, many communities in the United States are taking responsibility for addressing emissions at the local level. Since many of the major sources of greenhouse gas emissions are directly or indirectly controlled through local policies, local governments have a strong role to play in reducing greenhouse gas emissions within their boundaries, as well as influencing regional emissions through partnerships and advocacy. Through proactive measures around land use patterns, transportation demand management, energy efficiency, green building, waste diversion, and more, local governments can dramatically reduce emissions in their communities.

ICLEI provides a framework and methodology for local governments to identify and reduce greenhouse gas emissions, organized along Five Milestones, also shown in Figure 2:

1. Conduct a LOCAL GOVERNMENT OPERATIONS (LGO) inventory and forecast of local government greenhouse gas emissions;
2. Establish a greenhouse gas emissions target;
3. Develop an LGO climate action plan for achieving the emissions reduction target;
4. Implement the climate action plan; and
5. Monitor and report on progress.

This report represents the completion of ICLEI's Climate Mitigation Milestone One and provides a foundation for future work to reduce greenhouse gas emissions in the City of White Plains.

Figure 2: ICLEI Climate Mitigation Milestones

Inventory Methodology

Understanding a Greenhouse Gas Emissions Inventory

The first step toward achieving tangible greenhouse gas emission reductions requires identifying baseline emissions levels and sources and activities generating emissions in the community. This report presents emissions from operations of the City of White Plains government. The government operations inventory is mostly a subset of the community inventory, as shown in Figure 3. For example, data on commercial energy use by the community includes energy consumed by municipal buildings, and community vehicle-miles-traveled estimates include miles driven by municipal fleet vehicles.

As local governments continue to join the climate protection movement, the need for a standardized approach to quantify GHG emissions has proven essential. This inventory uses the approach and methods provided by the

Figure 3: Relationship of Community and Government Operations Inventories

U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions (Community Protocol) and the Local Government Operations Protocol for Accounting and Reporting Greenhouse Gas Emissions (LGO Protocol), both of which are described below.

Quantifying Greenhouse Gas Emissions

Emissions Scopes

For the government operations inventory, emissions are categorized by scope. Scopes 1, 2 and 3 are included in this report.

Scope 1: All direct emissions from a facility or piece of equipment operated by the local government, usually through stationary fuel combustion. Examples include emissions from fuel consumed by the City's vehicle fleet, and onsite fuel combustion (e.g. natural gas and fuel oil) used primarily for heating.

Scope 2: Indirect emissions associated with the consumption of purchased electricity, heating, and cooling of City facilities/buildings.

Scope 3: This includes all other indirect emissions associated with the city's upstream and downstream operations (e.g. employee commute).

Three greenhouse gases are included in this inventory: carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). Many of the charts in this report represent emissions in "carbon dioxide equivalent" (CO2e) values, calculated using the Global Warming Potentials (GWP) for methane and nitrous oxide from the IPCC 5th Assessment Report, prepared by the International Panel on Climate Change:

Table 1: Global Warming Potential Values (IPCC, 2014)

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO2)	1
Methane (CH4)	28
Nitrous Oxide (N2O)	265

Local Government Operations (LGO) Protocol

In 2010, ICLEI, the California Air Resources Board (CARB), and the California Climate Action Registry (CCAR) released Version 1.1 of the LGO Protocol 3. The LGO Protocol serves as the national standard for quantifying and reporting greenhouse gas emissions from local government operations. The purpose of the LGO Protocol is to provide the principles, approach, methodology, and procedures needed to develop a local government operations greenhouse gas emissions inventory.

The following activities are included in the LGO inventory:
- Energy and natural gas consumption from buildings & facilities
- Wastewater treatment processes and water pumps
- On-road transportation from employee commute and vehicle fleet
- Streetlights and Traffic Signals

Quantifying Greenhouse Gas Emissions

Sources and Activities

Communities contribute to greenhouse gas emissions in many ways. Two central categorizations of emissions are used in the community inventory: 1) GHG emissions that are produced by "sources" located within the community boundary, and 2) GHG emissions produced as a consequence of community "activities".

Source	Activity
Any physical process inside the jurisdictional boundary that releases GHG emissions into the atmosphere	The use of energy, materials, and/or services by members of the community that result in the creation of GHG emissions.

By reporting on both GHG emissions sources and activities, local governments can develop and promote a deeper understanding of GHG emissions associated with their communities. A purely source-based emissions inventory could be summed to estimate total emissions released within the community's jurisdictional boundary. In contrast, a purely activity-based emissions inventory could provide perspective on the efficiency of the community, even when the associated emissions occur outside the jurisdictional

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[3] ICLEI. 2008. Local Government Operations Protocol for Accounting and Reporting Greenhouse Gas Emissions. Retrieved from http://www.icleiusa.org/programs/climate/ghg-protocol/ghg-protocol

boundary. The division of emissions into sources and activities replaces the scopes framework that is used in government operations inventories, but that does not have a clear definition for application to community inventories.

Base Year

The inventory process requires the selection of a base year with which to compare current emissions. The City of White Plains' LGO greenhouse gas emissions inventory utilizes 2019 as its baseline year, for which the necessary data are available.

Quantification Methods

Greenhouse gas emissions can be quantified in two ways:
- Measurement-based methodologies refer to the direct measurement of greenhouse gas emissions (from a monitoring system) emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility.
- Calculation-based methodologies calculate emissions using activity data and emission factors. To calculate emissions accordingly, the basic equation below is used:

Activity Data x Emission Factor = Emissions

Most emissions sources in this inventory are quantified using calculation-based methodologies. Activity data refer to the relevant measurement of energy use or other greenhouse gas-generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled. Please see appendices for a detailed listing of the activity data used in composing this inventory.

Known emission factors are used to convert energy usage or other activity data into associated quantities of emissions. Emissions factors are usually expressed in terms of emissions per unit of activity data (e.g. lbs CO_2/kWh of electricity). For this inventory, calculations were made using ICLEI's ClearPath tool.

Government Operations Emissions Inventory Results

Government operations emissions for 2019 are shown in Table 3 and Figure 6.

Table 2: Local Government Operations Inventory

Sector	Fuel or source	2019 Usage	Usage unit	2019 Emissions (MTCO$_2$e)
Buildings & Facilities	Electricity	12,173,865	kWh	614
	Natural Gas	384,555	Therms	2,045
	Fuel Oil	3216	Gallons	33
Buildings & Facilities total				**2,692**
Street Lights & Traffic Signals	Electricity	4,953,741	kWh	250
Street Lights & Traffic Signals total				**250**
Vehicle Fleet	Diesel	121,255.263	Gallons	1,238
	Gasoline	164,341.55	Gallons	1,447
Vehicle Fleet total				**2,685**
Employee Commute	Gasoline	3,084,821	Miles	1,294
	Biodiesel/Ethanol	134,197	Miles	78
Employee Commute Total				**1,372**
Water and wastewater	Emissions from Wastewater Pumps	1,371,121	kWh	69
Water and wastewater total				**69**
	Total government emissions			**7,068+**

Next Steps:

The local government operations emissions inventory points to a need for further analysis of ways to reduce GHG emissions from Building and Facilities and from the Vehicle Fleet. Possible next steps can include expanding the use of demand reduction response for larger municipal buildings, exploring opportunities to transition buildings to cleaner energy sources, and continuing to electrify the vehicle fleet as existing vehicles are replaced.

White Plains is committed to continuing to fight climate change and reduce carbon emissions. Using our One White Plains Draft Comprehensive Plan as a guideline or set of goals for the community, we plan to do so by implementing the initiatives outlined in greenWP. We understand that this is not an easy task and that it requires a comprehensive and collaborative approach, involving city government and members of our community.

The City of White Plains is participating in the Hudson Valley Regional Council's (HVRC) Climate Action Planning Institute (CAPI), a facilitated working group of nine Westchester municipalities developing individual government greenhouse gas inventories and government climate action plans. As part of CAPI, the City is taking a collaborative approach to climate action planning, to learn from its neighbors and subject matter experts in order to more efficiently address this global issue at the local level. Additional goals, following the initiatives further articulated in the One White Plains Draft Comprehensive Plan, may include:

1. Explore Renewable Energy: Continue to explore investments in energy sources like solar, hydro, and geothermal power, as well as in infrastructure and policies that promote the adoption of clean energy technologies.
2. Promote Energy Efficiency: Encourage the use of energy efficiency appliances and promote sustainable building practices.
3. Promote Public and Alternative Transportation: Strengthen the efforts to encourage the use of public transit, bicycles, and EVs or hybrid vehicles.
4. Implement Waste Management Strategies: Promote waste management strategies, including recycling programs and reduction of single-use plastics.
5. Adopt a Government Operations Climate Action Plan.
6. Educate and Involve the Community: Increase environmental awareness and highlight the importance of protecting our planet.

Conclusion

This Inventory marks the completion of Milestone One of the Five ICLEI Climate Mitigation Milestones. The next steps are to forecast emissions, set an emissions-reduction target, and build upon the existing City of White Plains' clean energy strategies with a more robust climate action plan that identifies specific quantified strategies that can cumulatively meet that target. Creating a Climate Action Plan is a main goal within the greenWP section of the One White Plains Draft Comprehensive Plan, and climate change continues to be a driving force behind many of the City's sustainability efforts.

The Intergovernmental Panel on Climate Change (IPCC) states that to meet the Paris Agreement commitment of keeping warming below 1.5°C, we must reduce global emissions by 50% by 2030 and reach climate neutrality by 2050.

Science-Based Targets are calculated climate goals, in line with the latest climate science, that represent a community's fair share of the global ambition necessary to meet the Paris Agreement commitment. To achieve a science-based target, community education, involvement, and partnerships will be instrumental.

In addition, the City of White Plains will continue to track key energy use and emissions indicators. It is recommended that the City update its GHG emissions inventory on a regular basis, especially as plans are implemented to ensure measurement and verification of impacts. Regular inventories also allow for "rolling averages" to provide insight into sustained changes and can help reduce the change of an anomalous year being incorrectly interpreted. Over time, as the City builds its capacity to conduct inventories on a regular basis, the process also helps to increase its ability to operate efficiently and use taxpayer resources effectively.

This government operations greenhouse gas emissions inventory will assist the City of White Plains in achieving additional environmental, economic, and social benefits beyond reducing emissions.

Appendix: Methodology Details

Energy

The following tables shows each activity, related data sources, and notes on data gaps.

Table 3: Energy Data Sources

Activity	Data Source	Data Gaps/Assumptions
Local Government Operations		
Electricity consumption	NYPA bills	
Natural gas consumption	Con Edison bills	
Fuel Oil Consumption	Sprague Operating Resources, LLC	Includes Purdy House, Paddle Ball Courts, and Sweepers

Table 4: Emissions Factors for Electricity Consumption

Year	CO_2 (lbs./MWh)	CH_4 (lbs./GWh)	N_2O (lbs./GWh)
2019	110.010538	21	2

Transportation

Table 5: Transportation Data Sources

Activity	Data Source	Data Gaps/Assumptions
Local Government Operations		
Government vehicle fleet	Department of Public Works	Fleet Inventory Report
Employee commute	Office of the Mayor	A survey was sent to all employees in 2023 asking them for data about their 2019 commute. 115 employees responded. In 2019, the City had 953 employees, so the numbers were "scaled up".

For vehicle transportation, it is necessary to apply average miles per gallon and emissions factors for CH4 and N2O to each vehicle type. The factors used are shown in Table 6.

Table 6: MPG and Emissions Factors by Vehicle Type

Fuel	Vehicle type	MPG	CH_4 g/mile	N_2O g/mile
Gasoline	Passenger car	24.1	0.0183	0.0083
Gasoline	Light truck	17.6	0.0193	0.0148
Gasoline	Heavy truck	5.3716552	0.0785	0.0633
Gasoline	Motorcycle	24.1	0.0183	0.0083
Diesel	Passenger car	24.1	0.0005	0.001
Diesel	Light truck	17.6	0.001	0.0015
Diesel	Heavy truck	6.392468	0.0051	0.0048

Wastewater

Table 7: Wastewater Data Sources (data from wastewater pumps only)

Includes: Orchard Street Pump Station (OSPS). There are water pumps located within the building that pump water to pressure basins and ultra violet lights that kill bacteria. Central Avenue Pump station, a second source of water pumping that supplies water to residents, is also included. Tibbits Avenue pump has a small KWH and cost and is charged to the Department of Recreation & Parks.

Activity	Data Source	Data Gaps/Assumptions
Energy used in wastewater facilities	NYPA	

Inventory Calculations

The 2019 inventory was calculated following the US Community Protocol and ICLEI's ClearPath software. As discussed in Inventory Methodology, the [IPCC 2014 Assessment] was used for global warming potential (GWP) values to convert methane and nitrous oxide to CO2 equivalent units. ClearPath's inventory calculators allow for input of the sector activity (i.e. kWh or VMT) and emission factor to calculate the final CO2e emissions.