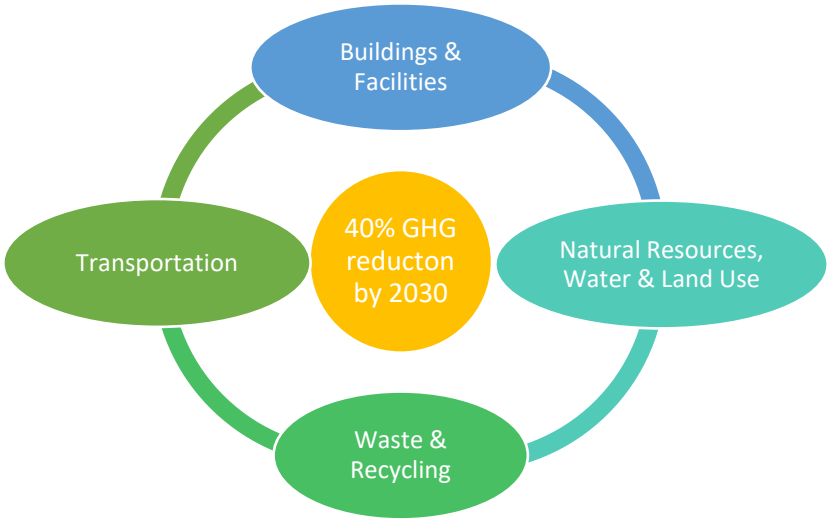
Climate Action Plan for Municipal Operations

Village of Bronxville, NY 2023-2030

Village of Bronxville Climate Smart Task Force, November 2023



Supported by Hudson Valley Regional Council through the NYSDEC Climate Smart Communities Coordinator Program

MARY C. MARVIN
Mayor

August 2023

I am pleased to present the 2023 Climate Action Plan (CAP) for the Village of Bronxville Municipal Operations to our Trustees, Village staff, and our larger community. With this Plan, for the first time, we are formally adopting a comprehensive set of climate action steps for Village Trustees to undertake in an ongoing journey to monitor the greenhouse gas (GHG) emissions generated by Village operations and make meaningful reductions in our use of fossil fuels. Scientists worldwide agree we must implement such reductions to protect our community and the planet from irreversible harm from climate change.

In this year of the world's highest temperatures, with lung choking wildfire smoke in our own community, and the increasing threat of destructive flooding due to ever more intense storms, we all need to reduce our use of fossil fuels and adopt sustainable living habits. I am pleased that the Village is showing that making adjustments to our energy consumption and caring responsibly for our local landscape can help the Village of Bronxville address climate change. We are joining other local Westchester municipalities and communities across the nation and the world in this effort.

The Village has already completed a number of climate-oriented actions. In 2022 our ongoing efforts were recognized by the New York State Climate Smart Communities program when we were awarded Bronze Certification. We were one of 117 other New York State municipalities that had been recognized for their significant progress.

Among our accomplishments are a 2005 installation of a state-of-the-art geothermal heating and cooling system in Village Hall, which saved money while significantly reducing our use of fuel oil. For more than a decade we have partnered with the Bronxville Chamber of Commerce to operate the Farmers Market to support local agriculture and business. We offer residential yard waste pick-up for composting, keep recycling bins in all municipal offices, and in 2021 launched a residential Food Scrap Recycling program that saves on waste transfer fees while turning food waste into a useable compost.

In addition, the Village has installed three dual outlet public charging stations for electric vehicles, in the Parkway Road parking lot and the Kensington Road garage. Recently we also completed the transformation of all Village traffic and streetlights to LED bulbs, which are 75% more energy efficient.

This Climate Action Plan aligns with the 2019 New York State Climate Leadership and Community Protection Act (CLCPA), which seeks to reduce the GHG emissions associated with municipal operations 40% by 2030. (We are using emissions from our 2018 GHG inventory as our baseline.) To accomplish this goal, we will look to improve the energy efficiency of government buildings, switch our police and DPW vehicles to hybrids or EVs, and use environmentally friendly equipment, supplies, and operations in all areas of Village activity. We will continue to manage our green spaces with sustainability in mind, increase our public tree canopy, and invest in hard and green infrastructure to reduce flooding, with a sharp eye on ensuring that our storm sewer system functions at optimal efficiency.

Through these efforts, Village government will be doing its part to address our climate crisis. In the coming months, we will also engage with all sectors of the community to develop communitywide climate action goals for businesses, organizations, schools, and residents. We look forward to joining with all members of the Village of Bronxville in this essential, on-going work to preserve what we love best about our community.

Sincerely,

Mary C. Marvin
Mayor

200 Pondfield Road * Bronxville, NY 10708 * (914) 337-6500 * Fax (914) 337-2683

ACKNOWLEDGEMENTS

Mary Marvin, Mayor, Village of Bronxville

Helen Knapp, Trustee, Village of Bronxville, Co-Chair, Climate Smart Communities Task Force, and Member, Climate Action Plan Working Group

James Palmer, Village Administrator

Stephen Shallo, Assistant Village Administrator, Coordinator for the Climate Smart Communities Task Force and Member, Climate Action Plan Working Group

Carole Upshur, Ed.D., Lead Author and Analyst, Climate Smart Communities Task Force and Climate Action Plan Working Group, Member, Bronxville Green Committee

Ellen Edwards, Co-Chair, Climate Smart Communities Task Force, Chair Bronxville Green Committee, Member Climate Action Plan Working Group

Maria Terjanian, Member Climate Smart Communities Task Force, Climate Action Plan Working Group, Community Engagement Chair, Bronxville Green Committee

Special Acknowledgements

Melanie Patapis, M.Ed., Climate Smart Communities Coordinator, Hudson Valley Regional Council

Eleanor Peck, MA, Mid-Hudson Clean Energy Communities Manager and CEC Coordinator, Hudson Valley Regional Council

Hudson Valley Regional Council Government Operations Climate Action Planning (GOCAP) program for municipalities working on Climate Action Plans, February-June 2023, and our 9 cohort communities from the Lower Hudson Valley

ICLEI Local Governments for Sustainability USA

Photographs

Unless otherwise noted, all photos were provided by Village of Bronxville Green Committee Volunteers

TABLE OF CONTENTS

EXECUTIVE SUMMARY

OVERVIEW OF CLIMATE SMART COMMUNITIES

The Village of Bronxville Trustees endorsed the Village joining New York State's Climate Smart Communities (CSC) Program in February of 2021 and the Village joined ICLEI, an international organization promoting local community climate planning and actions, in September 2021, to gain technical assistance to complete aspects of the CSC program. The Climate Smart Communities Program supports New York State's ambitious climate goals to reduce greenhouse gas (GHG) emissions produced by burning of fossil fuels and recognizes scientific evidence that large emissions reductions are needed in the next few years to protect the globe from the worst effects of climate warming.

The Village of Bronxville was awarded Bronze Certification from the Climate Smart Communities Program in September 2022, joining 132 other communities with recognition for significant progress on climate actions out of the 399 registered New York communities.

DEVELOPMENT OF THE MUNICIPAL CLIMATE ACTION PLAN

To maintain our certification, progress to Silver status, and do our part to mitigate climate change, the Village seeks to continue to implement climate smart actions**. A major milestone, consistent with New York state goals, is to reduce greenhouse gas emissions (GHG) from municipal operations by 40% by 2030, through the development and implementation of a local Climate Action Plan (CAP) for both municipal operations and the overall community.**

The Village of Bronxville Trustees voted in February 2023 to participate in a planning process sponsored by the New York State Department of Environmental Conservation Climate Smart Communities Program and administered by the Hudson Valley Regional Council to provide technical assistance to municipalities in the Lower Hudson Valley to develop CAPs. The TA group was called the Government Operations Climate Action Planning Group or GOCAP.

This proposed plan is a product of a working group of CSC Task Force Members (Helen Knapp, Trustee, Stephen Shallo, Assistant Village Administrator, and Carole Upshur, Ellen Edwards, and Maria Terjanian, CSC and Green Committee volunteers). Members of the group attended five meetings of GOCAP and consulted with Hudson Valley Regional Council TA staff and other participating communities to identify feasible strategies best suited to the Village.

PROPOSED VILLAGE OF BRONXVILLE MUNICIPAL CLIMATE ACTION PLAN

We used our 2018 baseline estimated GHG emissions for municipal operations and ICLEI software to calculate various planning scenarios for reduction of emissions. Since more than 90% of emissions are in the transportation and building sectors, these are priority areas, while other sectors can contribute smaller reductions. **The proposed actions are estimated to reduce Village annual municipal operations emissions 40% from 765 MT CO2e to 457 MTCO2e by 2030.** The plan provides a roadmap of targeted action steps, a timeline, measurement strategies, and recommended ways to adapt on-going planning as needed to achieve the high-level goal of significant GHG emissions reductions from municipal operations.

The following pages provide a summary of proposed actions consistent with the GOCAP planning process in four major planning sectors, and a timeline for implementation. The remainder of the report provides details and reduction goals for:

- Transportation
- Buildings and Facilities
- Natural Resources, Water and Land Use
- Waste and Recycling

Figure 1. Strategies for Reducing GHG Emissions from Village Operations by 2030

Transportation

Village fleet

- Adopt Environmentally Preferred Purchasing Policy
- Implement size and route efficiencies
- Purchase efficient vehicles:
  - Purchase 7 police hybrid vehicles
  - Purchase 2 administrative EVs
  - Purchase 2 EV garbage trucks
- Install one Level 2 charging station
- Plan for Level 3 charger

Employee commute

- Survey employees periodically on commute methods
- Assess barriers to public transportation
- Educate employees about and encourage public transit & consider pretax payroll program for public transit passes
- Provide information, encourage transition to hybrid and EVs
- Install additional Level 2 charging station for employee use on Village/Library property if indicated

Buildings and Facilities

Street & other lighting

- Complete & document LED streetlight conversion
- Make sure all interior lighting is LED/efficient
- Install lighting motion detectors

Building energy efficiecy

- Implement Environmentally Preferred Purchasing Policy office equipment, supplies, services
- Enroll all buildings in benchmarking program
- Complete & implement Level 2 energy audits
- Engage Eastchester for Firehouse upgrades
- Install energy management systems for HVAC
- Implement energy conservation measures for equipment/lighting/water fixtures

Renewable energy

- Investigate purchasing clean energy renewable energy certificates
- Consider community solar, community choice aggregation & grid rewards
- Replace hot water heaters with heat pump hot water heaters
- Install solar on DPW
- Assess for additional solar installations, parking lots etc.

Natural Resources, Water & Land Use

Park & open space maintenance

- Irrigation controls/water conservation
- Limit mowing, use mulching mowers; eliminate pesticides
- Inventory, retire old equipment & purchase electric maintenance equipment
- Use permeable paving surfaces for storm control

Preservation & planting

- Conduct public tree inventory, promote preservation, planting of diverse species
- Enact tree ordinance
- Plant native species
- Use bioswales, tree pits for storm control

Waste & Recycling

Recycling in municipal buildings

- Educate/implement effective recycling processes
- Expand food waste recycling to all municipal buildings

Improve municipal waste programs

- Audit existing programs for efficiencies
- Promote & increase participation in food scrap recycling and yard composting, work to develop local compost facility
- Continue community education, expand Take Back items

Figure 2. Estimated GHG reductions from high impact actions

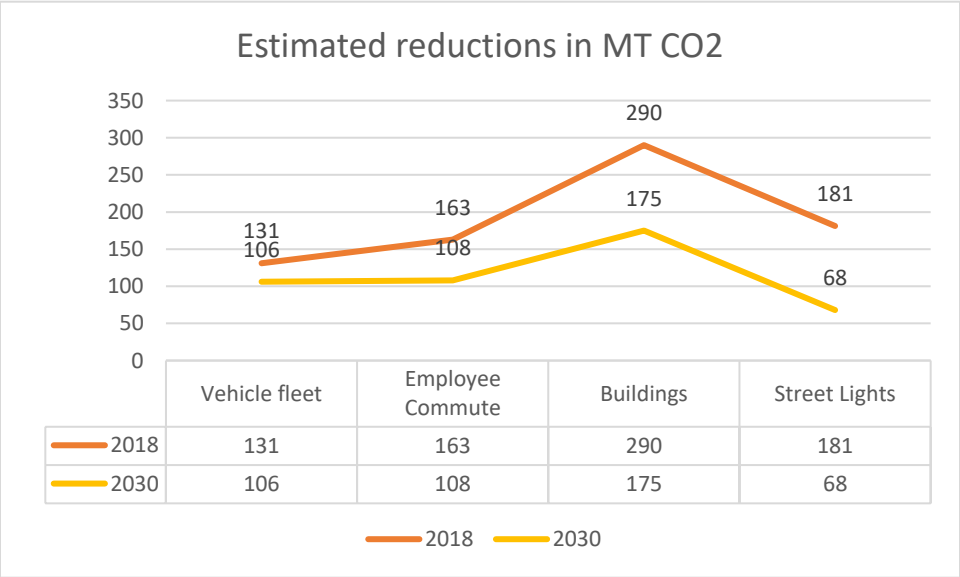
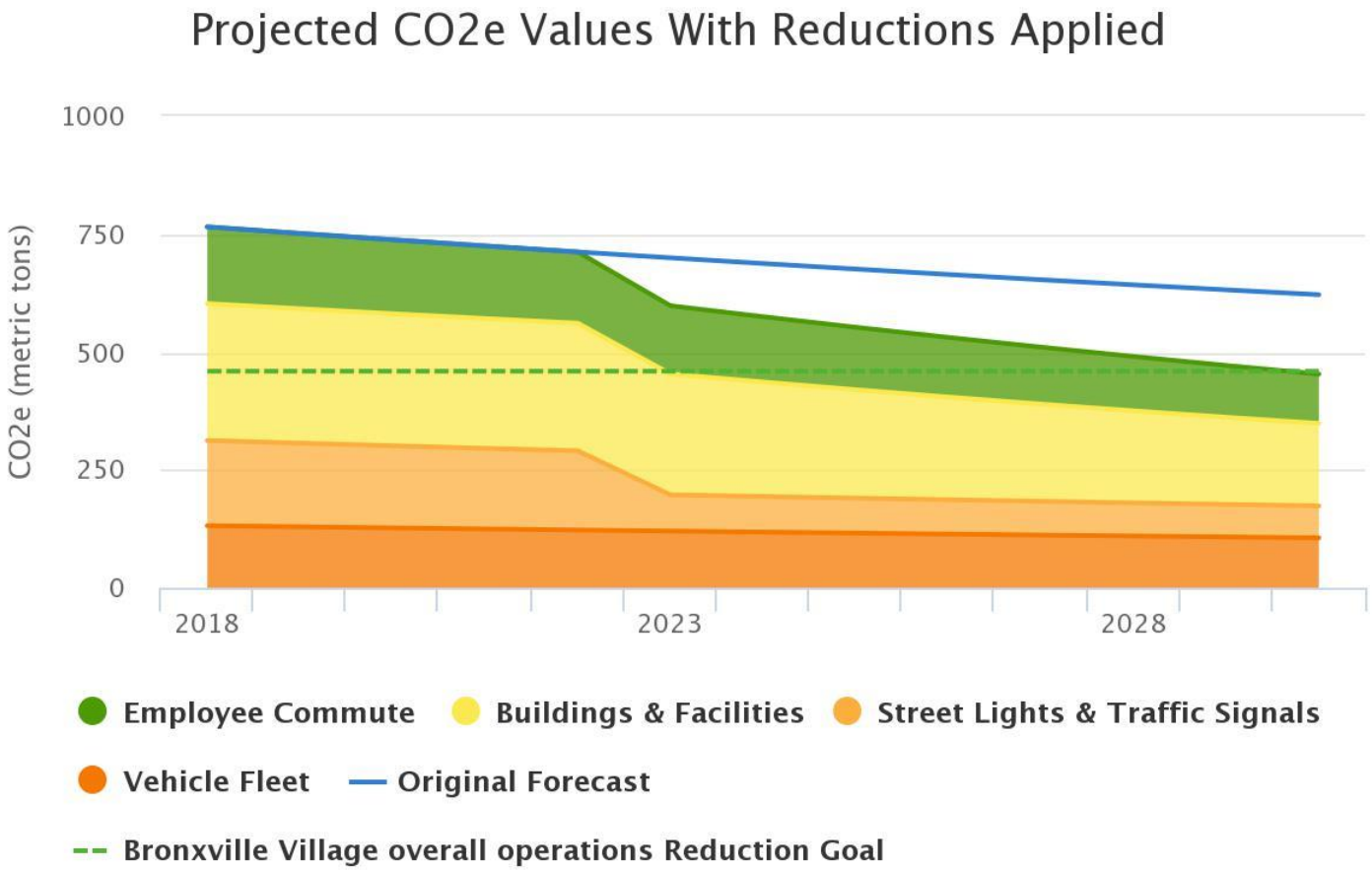


Figure 3. ICLEI Planning Scenario software projected CO2e reductions 2018-2030



INTRODUCTION

The Village of Bronxville (BXV) recognizes that greenhouse gas (GHG) emissions from human activity are catalyzing profound climate change, the consequences of which pose substantial risks to the future health, wellbeing, and prosperity of our community. While over the last decade the Village has taken steps to become more energy efficient, by installing a geothermal heating and cooling system in Village Hall, transitioning traffic signals to LED bulbs, promoting recycling, and inaugurating a residential food scrap recycling program, these efforts have taken place without an understanding of the overall climate impacts of Bronxville's municipal operations and ways they might be lessened.

In order to take steps both to mitigate climate change and to strengthen the Village's ability to adapt to its impacts, in February 2021, the Bronxville trustees passed a resolution to join New York State's Climate Smart Communities (CSC) program. (CSCFactSheetModelRes2020_v2.pdf (ny.gov)) The CSC program supports local government efforts to reduce greenhouse gas emissions, adapt to the increasing threats of climate change, and develop a productive green economy for its residents and businesses. The CSC program seeks to improve the livability, health, resilience, and equity of all communities.

The Village created a Climate Smart Communities (CSC) Task Force consisting of a staff coordinator, a Village Trustee, and several members of the Bronxville community to guide the CSC work. The Village of Bronxville's Climate Smart Communities Task Force identified and implemented a number of action steps outlined in the CSC program that address areas of opportunity in climate mitigation and resiliency within its municipal operations and overall community activities. As a result, the Village of Bronxville was recognized in September of 2022 as achieving Bronze Status in the Climate Smart Communities Program, completing and/or documenting 149 points and 20 action steps.

Table 1. summarizes the action steps the Village has been recognized for under the CSC program.

In addition to achieving recognition for initiating climate-mitigation actions, the Village now needs to act upon the significant new information developed about our municipal greenhouse gas (GHG) emissions to develop a specific Climate Action Plan to reduce emissions. (See Green House Gas Report - Municipal | Bronxville NY (villageofbronxville.com) The purpose of this CAP is to set goals, develop strategies, and develop metrics to achieve meaningful municipal GHG reductions in a timeframe indicated by the scientific consensus to prevent the most catastrophic impacts of already destructive climate change. A plan to engage the entire community to develop community-wide climate planning with participation by businesses, organizations, churches and residents will be a future step.

The Village of Bronxville Trustees voted in February, 2023 to participate in a planning process sponsored by the New York State Department of Environmental Conservation Climate Smart Communities Program and administered by the Hudson Valley Regional Council to provide technical assistance to municipalities in the Lower Hudson Valley to develop CAPs. The TA group was called the Government Operations Climate Action Planning Group or GOCAP.

This proposed plan is a product of a working group of CSC Task Force Members (Helen Knapp, Trustee, Stephen Shallo, Assistant Village Administrator, and Carole Upshur, Ellen Edwards, and Maria Terjanian, CSC and Green Committee volunteers). Members of the group attended five meetings of GOCAP and consulted with Hudson Valley Regional Council TA staff and other participating communities to identify feasible strategies best suited to the Village.

Table 1. Completed Village of Bronxville Climate Smart Communities Actions

CSC Action Step Area	BVX Implementation/documentation
1.Build a climate smart community	• Established a CSC Task Force of 11 members including Helen Knapp, Village Trustee, Stephen Shallo, Assnt Village Administrator and 9 community members and students • Appointed Stephen Shallo, Assnt Village Administrator as CSC Task Force Coordinator • Participates in regional/national climate programs: ICLEI USA, a TA consortium of municipalities working on climate solutions; Sustainable Westchester recycling program; NYSERDA Charge Ready Program • Partnerships on climate action with Sustainable Westchester, NYSERDA Charge Ready; New York State Association of Conservation Commissions; Pollinator Pathways; Eastchester Community Action Council; Bronx River Watershed Coalition; Scarsdale Conservation Advisory Council
2.Inventory emissions, set goals and plan for climate action	• Completed Government Operations Greenhouse Gas emissions report Green House Gas Report - Municipal | Bronxville NY (villageofbronxville.com) • Completed Community Greenhouse Gas emissions report Greenhouse Gas Report - Community | Bronxville NY (villageofbronxville.com)
3.Decrease energy use	• Conducted a fleet inventory to document fuel use by Village vehicles • Converted all traffic signals to LEDs
4.Shift to clean/renewable energy	• Documented 2005 Village Hall heating conversion to geothermal/ground source heat pump heating and cooling system
5.Use climate smart materials management	• Documented an organics waste management plan including municipal Yard Waste collection, and Food Scrap program • Installed recycling bins in government buildings • Organic waste program for government buildings-installing of food waste collection bins • Waste reduction education campaign – staff communications; Take Back Day; articles about recycling and food waste in: https://myhometownbronxville.com ; Village web site: Waste Not (bronxvillegreencommittee.org); Village newsletters and Instagram posts @bxvgreencommittee • Residential organics waste program, including curbside yard waste pick up, Food Scrap program
6.Implement climate smart land use	• Comprehensive Plan with Sustainability Elements: • Alternative fuel infrastructure: Three dual port electric charging stations available for EV permit holders and to the public- Parkway Road lot and Kensington Street garage • Traffic calming-adoption of a speed hump policy, 2021
8.Support a green economy*	• Bronxville Farmers Market since 2012
9.inform and inspire the public	• Local climate action website: Bronxville Green Committee | Bronxville NY (villageofbronxville.com) • Social media: Bronxville Green Committee Instagram @bxvgreencommittee 400 followers

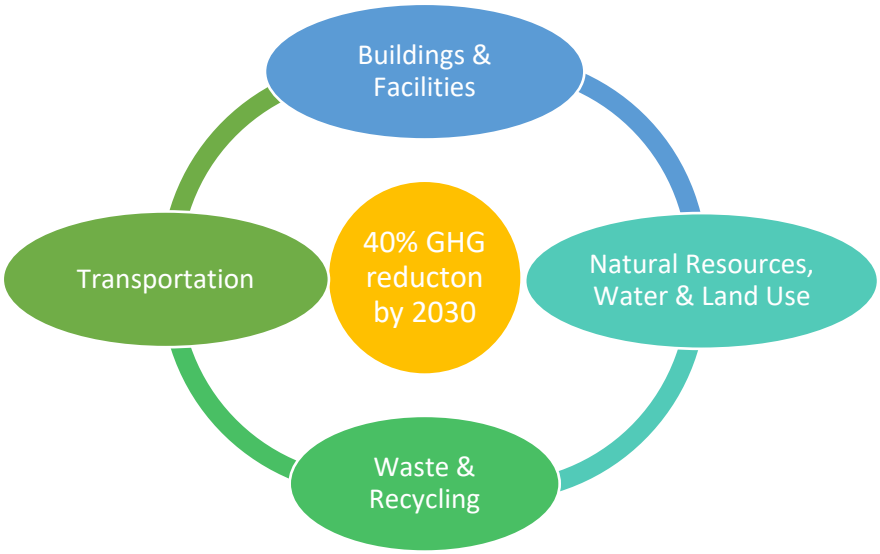
*Note: The Village has not yet undertaken actions under area *#7 Enhancing resilience to climate change*, but a number of new actions in this CAP address adaptation and mitigation strategies to promote climate resilience in BXV

Methodology

This Village of Bronxville Climate Action Plan for Municipal Operations pledges to reduce municipal GHG emissions estimated in 2018 by 40% by 2030 in alignment with the 2019 New York State Climate Leadership and Community Protection Act. Baseline years and target reductions are set differently in various climate plans. However, the baseline year used in this report reflects approximate emissions as far back as 2010 based on a 2012 report by New York State Energy Resource and Development Agency (NYSERDA) for Hudson Valley counties. (See Mid-Hudson Regional Greenhouse Gas Emissions Inventory (orangecountygov.com) p. 51.) resulting in a 20-year timeline to achieve the targeted reductions.

Specific emissions for various sectors of Village operations were measured in the Village's 2018 municipal GHG report. Green House Gas Report - Municipal | Bronxville NY (villageofbronxville.com) **Accordingly, our target goal for emission reductions is from 765 MT CO2e in emissions as of 2018 to 457 MT CO2e by 2030.** Because the Village does not operate our own wastewater treatment facility or municipal waste facility, all but a fraction of the Village's operational emissions are from Buildings, Street Lighting, and Transportation sectors, and therefore will be critical areas of emphasis in achieving reductions in emissions.

Figure 4. Interconnected sector areas addressed by the CAP to achieve 40% emissions reduction by 2030



A municipal GHG emissions report and CAP require that Scope 1 and 2 emissions be accounted for. Scope 1 is the direct burning of fossil fuels in municipal operations (e.g. fuel oil, gasoline, diesel, natural gas); Scope 2 is the indirect use of fossil fuels used to produce purchased electricity. Municipal operations that are not directly conducted by the Village are considered Scope 3 emissions. In our calculations of 2018 municipal GHG emissions we included two Scope 3 entities: the operation of the Midland Avenue Firehouse which is contracted with the Town of Eastchester, and employee commuting emissions. With the full cooperation of the Eastchester Fire District we obtained data about energy use for the Firehouse. We also conducted a BXV employee survey of all full and part-time Village workers to estimate commuting emissions based on the distance and type of vehicles used, public transportation or walking/bicycling. By including these two Scope 3 emissions as part of our overall climate planning we recognize that addressing the full footprint of Village operations is important and that only with widespread organizational and community commitments will significant reductions be achieved.

The action steps in this plan for reducing GHG emissions were drawn from the Technical Assistance provided by the Hudson Valley Regional Council and the five GOCAP presentations attended by the CAP Working Group, action steps in New York State's Climate Smart Communities and Clean Energy Communities Programs, the advice and reports from other New York State communities who have initiated actions not yet undertaken by the Village of Bronxville, and the existing literature and technical reports on ongoing innovations in green technology that may be utilized by the Village.

The following four sections detail the action steps most relevant to the Village of Bronxville's current operations and past achievements and identify the possible GHG reductions achievable. Together these actions are designed to significantly reduce Scope 1, 2, and 3 GHG emissions from village operations, as well as develop land use and natural resources management policies that can address the significant local threats of flooding, air quality, and increasing temperatures. These are followed by an implementation and monitoring plan, and a report of community outreach activities to develop this CAP. Appendices provide a summary of the baseline GHG emissions report completed in 2022, a timeline for action steps, and tables outlining metrics and considerations for each sector.

Pondfield Road business district Village of Bronxville

TRANSPORTATION SECTOR

This section of the CAP outlines the actions BXV will take to reduce GHG emissions from municipal transportation activities.

In the BXV 2022 Municipal GHG Emissions report (based on 2018 data), transportation represented over 38% of the total Village operations emissions:

- 131.5 metric tons of Co2e emissions or 17.1% of Village total come from the Village vehicle operations (inclusive of DPW, Police, and Admin)
- 161.4 metric tons of Co2e emissions or 21.2% come from estimated Village employee commute to work (almost exclusively driving gasoline powered cars, with 40% driving more than 20 miles a day round trip

We propose addressing GHG reductions in two areas as follows:

- **Fleet management and replacement**

1) Adopting environmentally Preferred Purchasing Policy and operating policies that will reduce emissions (such as assessing routes for waste collection, right sizing the fleet by eliminating unnecessary and especially older vehicles; adopting an anti-idling rule).
2) Maintaining and updating our fleet inventory annually, identifying turnover rate/mileage to project replacement needs.
3) Setting specific goals and adopting policies for replacement of existing vehicles by 2030:
    - ✓ 2 administrative EVs,
    - ✓ 7 hybrid police patrol vehicles
    - ✓ 2 electric garbage trucks
4) Installing a Level 2 charging station at Village Hall for municipal vehicles
5) Planning for a Level 3 fast charger for heavy duty vehicles and eventual conversion of all police vehicles to full EVs.

Planning for replacement vehicles and staying up to date with new vehicle developments will be important. Currently, NY State rebates are available to municipalities for EVs and plug-in hybrids. ZEV Rebate Fact Sheet (ny.gov)

Given that fully flexible EV police vehicles may not currently be available, Ford is promoting its Ford Explorer Hybrid vehicles for police use. Ford Police Vehicles | Police-Tested & Street-Proven | Ford.com These hybrids get 27mpg and expend no/limited emissions while idling, which is a major percent of time police vehicles are in use, compared to current 16-18mph for BXV gasoline police vehicles. These vehicles can be ordered through Westchester County Contract and other Westchester communities have already started using them. The costs for such vehicles above Ford Explorer gasoline models is less than $3000 which may be offset by cheaper operational costs. Note that about $247 per 1000 miles is the current cost of gasoline for a vehicle getting 16 mpg (typical of most current BXV vehicles), while EVs get 3-4 miles per kwh and at equivalent mileage the cost of electricity would be around $66. Using NYPA power as we do in BXV, that electricity is also 70% derived from clean sources (hydro and solar/wind).

There are currently 14 police vehicles; converting 7 of them to hybrid (those with mileage already beyond or approaching 40,000 miles) and the two administrative vehicles to total EVs by 2030 would result in gasoline GHG reductions of 33%--a reduction from about 6548 gallons gasoline/year to 4387 gallons/year.

In the next few years more options for full EV police vehicles will likely become available which, if substituted for some of the hybrid vehicles, will result in increased GHG reduction estimates.

Consideration of which other vehicles can feasibly be replaced with full EV entails assessing use (e.g., no good current options for snow plowing), as well as the need to install onsite charging capacity.

- DPW should be encouraged to explore existing, new heavy weight electric vehicles for some of its functions. An electric Ford F250 pick-up truck is to be coming out this year or 2024. There are currently 3 F250s on the DPW fleet list, one with mileage over 40,000. Ford Electric Vehicles | Charging, Range, Technology & More | Ford.com
- Electric chassis garbage trucks are already available and being placed on order by other Westchester communities. Given the considerable age of several of the current BXV garbage trucks planning should be initiated now to order these vehicles that are in great demand. When garbage trucks are not used for snow plowing as in BXV, they are more feasible for full EV conversion. We are recommending that by 2030 BXV has at least 2 electric garbage trucks with the appropriate charging infrastructure. There are growing numbers of electric waste/recycling trucks coming on line: The first fully integrated electric recycling and waste truck unveiled (electrek.co)

- **Promoting energy saving modes of employee commuting**

1. Periodically surveying employes about their commuting patterns, distances and modes
2. Assessing obstacles to public transportation and addressing those by considering pretax deductions for transportation passes, raffles or discounts if of interest to employees
3. Educating employees about, and encouraging them to use alternative transportation modes to work and consider purchasing an EV or hybrid for their next vehicle
4. Distribute information about EV rebates, costs and operational savings to employees
5. Consider installing a Level II EV charger in the VH or Library parking lots for employee commuting vehicles with employee use free of charge

Charging station at the Parkway Road municipal parking lot

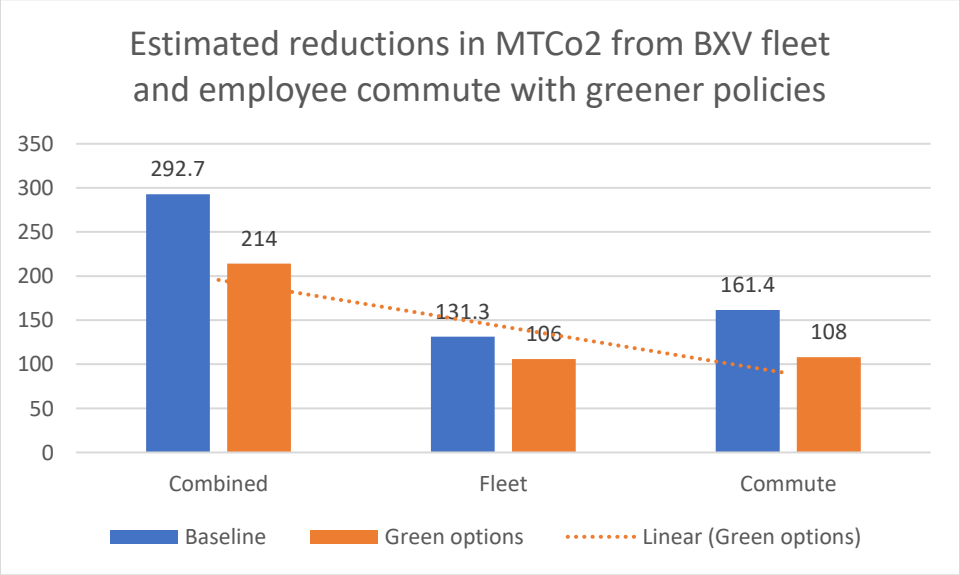
Cost benefit analysis

- The reductions in GHG emissions can be estimated by fuel type; measurable impact would come from replacing with hybrids or full EV committing to at a minimum 7 police hybrids, 2 administrative and 2 garbage truck EVs by 2030.
- For further substantial reductions, future conversions will need to be full EVs as new options come to market.
- The village will have to calculate savings/payback time for less gasoline (and maybe diesel) usage. Quick estimates are that around $9000 a year would be saved in gasoline costs for conversion of the police and admin vehicles as suggested. EV vehicles also have much less maintenance, providing additional savings.
- Figuring the benefits of leasing vs purchase is another possible analysis we could undertake.
- Addressing the potential need/costs for an onsite charging station. A Level 2 charger, which is around $1000 providing the proper 240 line is available, could serve administrative EVs and employee vehicles. A fast Level 3 charger, is much more expensive, and would require planning for capacity with ConEd. A Level 3 charger would be needed for the eventuality of full EV police vehicles as well as servicing heavy duty trucks.

Implementing these fleet policies and employee commute recommendations would reduce MT CO2e overall 27% from transportation related BXV municipal operations by 2030 as follows:

- Reduce the Village fleet emissions to 106 MT Co2e from 131MT by 2030 – approximately a 19% reduction. Additional reduction if some police vehicles were converted to full EV and/or more vehicles converted.
- Reduce the Village employee commute emissions to 108 from 161.4 MT Co2e emission by 2030- approximately a 33% reduction; changes are projected since the commercially available vehicles for purchase are increasingly efficient even if still gas powered, and there will be a gradual conversion to EVs and hybrids as individuals purchase new vehicles and more employees may choose public transportation.

Figure 5. Comparative estimates for MTCO2 reductions based on policy initiatives for fleet, employee commute, and combined.



BUILDINGS AND FACILITIES SECTOR

In the BXV 2022 Municipal GHG Emissions report (based on 2018 data), buildings and street and other outdoor lighting represented 62% of the total Village operations emissions:

- 290 MTC02 or 38% resulted from the electricity, natural gas, heating oil, and propane consumed by the village buildings.
- 181 MTC02 or 24% resulted from traffic lights, streetlights and other outdoor lighting.

Because this sector represents the biggest amount of emissions, it is also where the most savings can be realized. However, it may be even more complicated than transportation since the capital costs are larger.

The general areas to consider are:

1) Completion of municipal outdoor lighting conversions to LED bulbs
2) Building energy audits/benchmarking (enrolling with a utility to monitor use annually) and installing efficiency measures including envelope (windows, insulation, roofing), management systems (such as motion activated lighting and automatic systems monitoring and adjustments) etc.
3) Operations policies around use of equipment (shutting off overnight etc.)
4) Purchasing policies that focus on energy efficiency in office and other equipment (Environmentally Preferred Purchasing Policy and enroll in Green Purchasing Community Program)
5) Assessing for new energy installations that avoid burning fossil fuels such as additional geothermal, rooftop solar, parking lot solar, hot water heat pumps etc.

Because electrification of building systems (or geothermal) will be necessary to achieve substantial reductions in overall GHG emissions, the greening and capacity of the overall electric grid is an important consideration. Consultation with ConEd representatives suggests that expansion of local green electric generation such as installing solar on municipal buildings/parking lots (as well as commercial and homes) will go a long way to helping achieve the necessary GHG reductions while easing the overall grid demand.

Various Westchester communities have implemented local electricity production through solar installations (Clinton, Croton-on-Hudson, Mamaroneck), using the rooftops of municipal buildings that share electricity with the municipality and residents. BXV should consult with sister communities and work through the various technical and financing options to achieve significant solar generation by 2030.

Actions for the Village of Bronxville are categorized into three areas:

- Street and other lighting improvements
- Building energy efficiency
- Renewable energy development

- **Street and other lighting improvements**
  1. Complete and document LED streetlight conversion to near 100%
  2. Inventory and replace interior lighting in municipal buildings with LED or equivalently efficiency bulbs
  3. Install lighting motion detectors for municipal buildings

At the time of conducting our baseline municipal GHG inventory only 15% of outdoor municipal lighting (street, traffic and parking lot lights) consisted of LED bulbs. Other communities that converted all streetlighting and most other lighting had considerably lower GHG emissions from electric use. Based on software estimates, conversion of all outdoor lighting to LED bulbs would result in a 62% decrease in GHG emissions for municipal lighting, saving 113 MTCO2e. The Village undertook an ambitious plan to convert all its streetlighting to LED bulbs starting in 2022 and it was completed in early summer 2023. Documentation of changes in electric use for the 2023 calendar year should indicate substantial reductions, while a full annualized benefit will be shown in 2024 electric use. This will also produce operational cost savings for the Village of about $50,000 annually.

Similarly, while much of municipal building lighting has been converted to LED or florescent lighting, a complete inventory is not available. Any fixtures that are not energy efficient should be inventoried and replaced to further reduce electricity consumption. Additional savings may be accrued by installing motion sensors or timers, especially in areas not under continual use.

- **Building & equipment energy efficiency**
  1. Implement an Environmentally Preferred Purchasing Policy and enroll in the NYS Green Purchasing Community Program for buying recycled supplies, Energy Star office equipment etc.
  2. Enroll all buildings in energy benchmarking programs to track energy consumption and monitor reductions
  3. Complete and implement recommendations for Level 2 ASHRAE energy audits for VH, Library and DPW building to direct investments to achieve energy savings that are cost-effective
  4. Encourage Eastchester Fire District to conduct an energy audit of the Midland Avenue Firehouse
  5. Install energy management systems for HVAC equipment
  6. Implement low-cost energy conservation measures for equipment, lighting, water fixtures

The Village should enroll in the NYS Green Purchasing Community Program and should adopt an Environmentally Preferred Purchasing Policy so that all purchases by Village government are done with an eye toward the most energy efficient and most sustainable products. Apply Now to Become a Green Purchasing Community | Office of General Services (ny.gov) While some current equipment and supplies may meet these standards, adopting this policy will ensure that these standards are used in all purchasing activities and the NYS program can assist the Village in meeting

this goal. This includes office equipment, paper and other supplies, fleet vehicles, and maintenance equipment. Such purchases will incrementally contribute to overall efficiencies and GHG reductions, as well as in some cases cost savings.

In terms of building systems, where the bigger impact will be needed, the Village has completed a number of energy efficiencies in all Village buildings. Village Hall has a ground source geothermal heating and cooling system that provides part of the energy needed for the building, although over 4000 gallons of heating oil are still used to provide supplemental heat. A new, state-of-the-art Department of Public Works Building was brought online in 2021, designed to accommodate rooftop solar. The Village Library invested in major HVAC upgrades in the last three years. Most of these efficiencies were not online when a comprehensive review of energy use was conducted for the 2018 Municipal GHG inventory. Accordingly, the Village will undertake a 2023 update of the baseline GHG inventory to be completed in 2024 to document the energy changes from these activities, which will assess current progress towards our 40% reduction goal.

To continue to achieve feasible and incremental reductions in building energy consumption, regular monitoring through enrolling in a benchmarking program should also be initiated. Benchmark Your Building Using ENERGY STAR® Portfolio Manager® | ENERGY STAR A description of building benchmarking by the CSC Program can be found here: Actions (ny.gov) Benchmarking requires annual reporting of building energy consumption and can be used to set goals for reductions. Because major investment has already taken place in each of the major buildings, incremental improvements will be needed to achieve further reductions by implementing multiple smaller improvements. We are projecting a need to decrease energy use in buildings by 2% a year to cumulatively reach the target overall reductions. Benchmarking will assist the Village in understanding the impact of small changes such as changing over older inefficient office equipment, making sure all lighting is energy efficient, turning off equipment overnight, incremental thermostat setting adjustments, or installing lighting motion detectors and water saving fixtures that can be undertaken without major investment.

Further, the Village needs to assess the current status of its three main buildings in terms of additional energy systems improvements by conducting a Level 2 ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers) audit for each building. Here is a description of municipal building energy audits by the CSC Program: Actions (ny.gov) A Level 2 audit provides a site-specific assessment of energy use and a financial analysis of return on investment (ROI) for implementing specific energy savings measures. In this way, expert advice about envelope sealing, insulation, smart thermostats, roofing materials etc. can be obtained to help achieve our 2% annual reduction goal in a cost-effective manner. Among those possible assessments would be whether the current energy systems can be upgraded or retrofitted with systems controls that can improve efficiency. Such systems controls are currently available and a number of energy engineering companies in the NYC area provide such systems for large commercial properties and residential buildings with energy savings in the range of 10-30%. Such changes could help meet or exceed our targeted GHG reductions for the buildings sector. (See for example Empowered Building's Home Page - Empowered Buildings) The Village should also engage the Eastchester Fire District to consider at least a Level 1 energy audit of the Midland Avenue Firehouse.

Midland Avenue Firehouse

- **Renewable Energy**

1. Investigate purchasing clean energy renewable energy certificates (RECS)
2. Explore using community solar, community choice aggregation, and grid rewards programs to increased use of renewable energy for municipality and residents and save costs
3. Replace municipal building hot water heaters with heat pump hot water heaters
4. Complete a solar array installation on the DPW building
5. Evaluate other municipal locations such as VH parking lot or other parking lots for solar production

It will be difficult for the Village to substantially reduce its dependence on fossil fuels if clean energy options are not pursued either through development or purchasing power. Accordingly, in the area of renewable energy the Village needs to pursue programs that connect current energy use to cleaner sources as well as implement some electricity generation within the Village by using local solar arrays similar to what other Westchester communities have accomplished. All of these options require developing knowledge and cost-benefit analyses.

Clean energy renewable energy certificates (RECS), and community solar programs are a way for entities to purchase power from clean sources that are developed by public and private green energy companies outside of the local community. BXV currently purchases its electricity from the New York Power Authority (NYPA) which means that electricity used by municipal operations is already less dependent on fossil fuels than some commercial utilities due to a large portion of NYPA power being generated from hydroelectric operations.

NYPA is further expanding into developing solar and wind capacity, electric grid upgrades, and energy storage and has an ambitious development plan to continue to reduce use of fossil fuels in power generation by 2035. nypa-vision2030-at-a-glance.pdf NYPA also offers preferred rates to government entities. We should consider reviewing the tradeoffs between continuing to use NYPA-provided power versus other alternatives for municipal accounts. However, the advantages of purchasing from NYPA are considerable. NYPA also offers a community solar development assistance program that may help the Village develop solar generation on municipal property. services.nypa.gov/Services/Incentives/BuildSmart-NY

More importantly, learning about greener power development and purchase options available to our community can help the Village disseminate information to homeowners and businesses about purchasing greener electricity from other ECSOs (Energy Services Companies) accessible by nongovernmental account holders, or investing in community solar projects. The Village government can also act proactively to enroll Village residents and businesses in ESCOs that rely solely on renewable energy. For example, Community Choice Aggregation (CCA) through Westchester Power westchester power con edison utility territory – Sustainable Westchester allows a Westchester municipality to enter into a purchasing agreement for the entire community to purchase a preferred renewable energy supply mix. (See Actions (ny.gov) and Community Choice Aggregation Toolkits - NYSERDA). This process can include both electricity and natural gas. It does allow consumers to opt-out of the program for their own utility purchases and there are guidelines about community outreach and communication. The CCA process helps to build investment in renewable energy and thus contributes to ensuring the clean power infrastructure continues to expand to significantly reduce GHG emissions from fossil fuels. While CCA does not guarantee lower prices for energy, certain agreements can provide protection from rate increases; the program offers a simple way that community businesses and residents can assure they are contributing to renewable energy expansion.

Sustainable Westchester's GridRewards Program is another energy reduction strategy in which ConEd offers paybacks to account holders who reduce their energy use in times of high power demand. The Village could promote this program to residents and businesses. The purpose is to encourage users to cut back and conserve energy on specific days in the

summer when heat emergencies put increased demand on the grid and risk blackouts. GridRewards — Shift the Power. Typically during a 4 hour period around 10 days per summer customers are asked to cut back on energy use by raising thermostats and avoiding optional use of home appliances in order to temporarily shift power usage to other times of day. Once a year, cash payments (typically around $100) are sent to customers who have cut back energy during peak times. Bigger buildings can realize a return of several thousand dollars.

A final area of renewable energy planning is for the Village to develop solar generation on municipal property. The new DPW building that opened in 2021 was developed with the intention of eventually adding a solar installation. The Village has not yet solved technical or financial issues to bring this installation to fruition but intends to make the project a priority as part of ongoing climate action planning. Since realizing such projects can take 3-5 years, these actions need to be initiated early in our planning in order to achieve results by 2030. The Village will also explore other locations for subsequent solar development so that 10-20% of municipal electric use will be offset by 2030.

Roof of new Department of Public Works building

Among the financial options that need to be explored for solar installations are PACE financing Actions (ny.gov) Municipalities | NY | EIC (eicpace.org) and Power Purchasing Agreements Actions (ny.gov). Other resources for developing local solar power are also provided by NYSERDA. Solar Guidebook for Local Governments - NYSERDA

A very rough calculation of what the DPW building could generate (PVWatts Calculator (nrel.gov) is: Estimating a 100 DC kw array using 8000 of the 10,500sq ft roof, adjusting for orientation and location for weather and sun exposure, the output would be about 120,000 kwh per year, or about 25% of total kwh usage estimated in our 2018 municipal operations inventory. (Note: For NYPA or ConEd to finance an installation may require a minimum of 40,000 sq feet of array so our individual rooftops and parking lots may not be big enough singularly for some of the existing programs.) The estimated installation cost would be about $300,000 based on NY costs found online, and the estimated savings based on current NYPA electric rates would be about $21,000 per year or $147,000 total by 2030 (not adjusted).

a. In consultation with the Croton-on-Hudson CSC, which has installed solar on its DPW and Firehouse, and is developing a large project on Metro North parking lots (Ecogy Croton Community Solar — Ecogy Energy; https://www.crotononhudson-ny.gov/sites/g/files/vyhlif441/f/uploads/train_station_status_posting_022622.pdf), it appears our DPW rooftop may be large enough to garner a leasing arrangement with a private solar developer. We could utilize Croton's expertise in developing an RFP to start the process, pursuing both leasing for community solar and Village ownership options. Other RFA resources are available at Solarize Your Community - NYSERDA

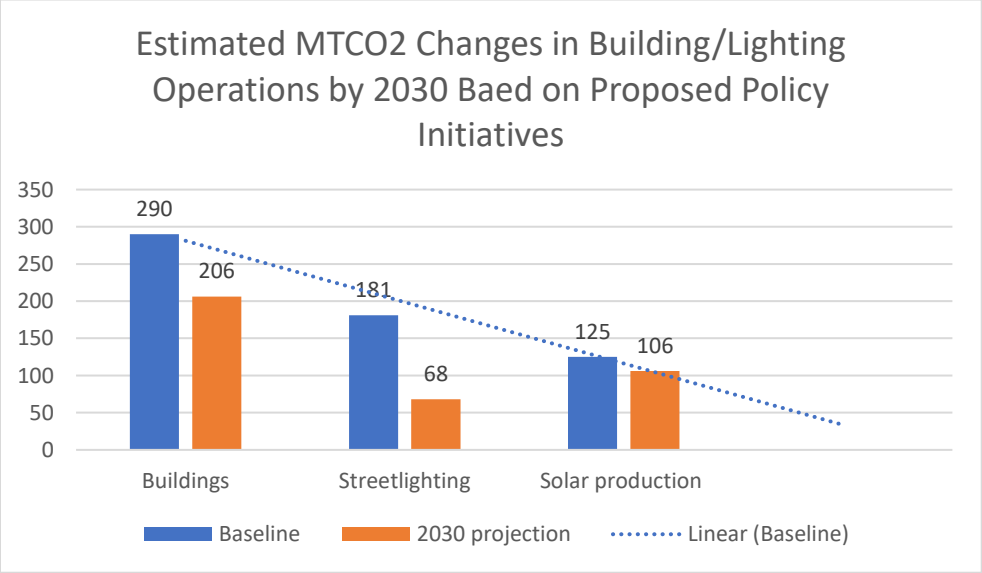
b. Covering the parking lot next to the firehouse would be an additional option before considering other village parking lots, including around the train station. There are a couple of flat roof areas on Village Hall that might be the most promising locations but overall project costs in terms of size and phasing will need to be considered.

Moving toward some solar generation would significantly increase the potential for covering village electric operating costs and reducing GHG emissions. In addition, installing solar canopies on parking lots not only generates energy but also reduces urban heat island effects. Solar Canopies: Bring Solar Panels to Your Parking Lot | EnergySage Because heat will be second only to flooding as a risk to the village, mitigating outdoor temperature will be an important challenge https://www.nytimes.com/2023/05/17/climate/record-heat-forecast.html.

As the technology and financing options for municipalities increase over the next few years, more options will be available to the Village.

Implementing the steps outlined here for lighting improvements, building energy efficiency, and developing renewable energy capacity should result in an overall reduction of approximately 36% in MTCO2 for municipal building and outdoor lighting operations.

Figure 6. Estimated MTCO2 emission changes based on policy actions for lighting improvements, building energy efficiency, and providing 15% of municipal electricity through self-generated solar installations.



NATURAL RESOURCES, WATER & LAND USE SECTOR

Since the Village of Bronxville is a compact one square mile area that is fully developed, with limited park and natural areas, there are not significant opportunities to implement green strategies that could impact GHG emissions. However, we can improve our air quality, temperature, shade, and flooding issues by paying careful attention to how our green spaces are maintained.

There are two areas where improving green resources can be addressed:

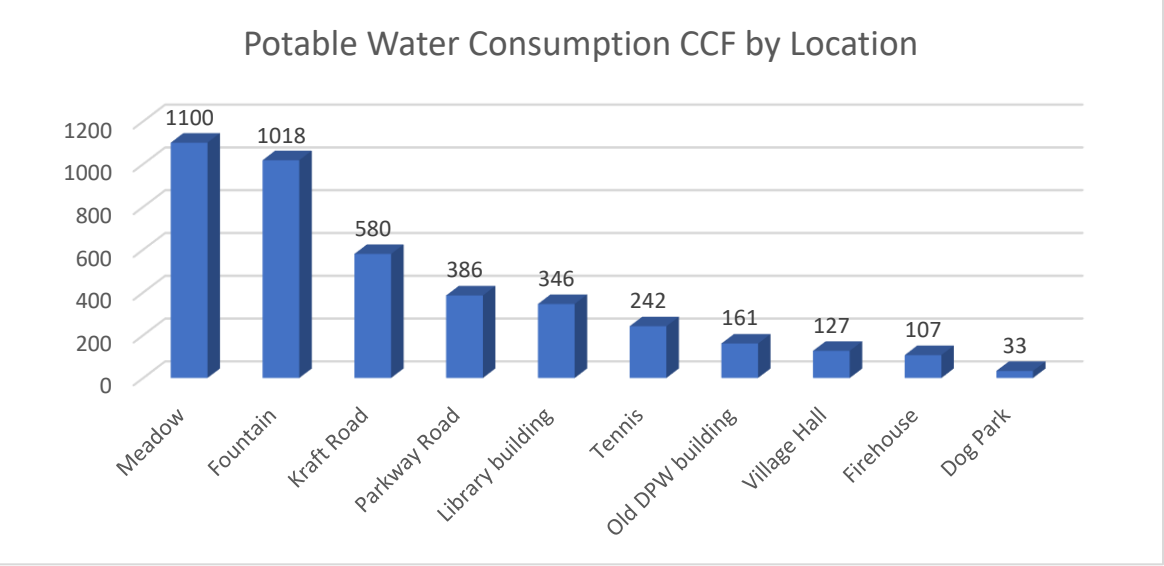
- Park and open space maintenance
- Preservation and planting of tress and native species

- **Park and open space maintenance**
  1. Assess irrigation controls and implement water conservation
  2. Limit mowing and use mulching mowers; eliminate pesticide use
  3. Inventory maintenance equipment and phase in all electric by 2030
  4. Use permeable paving to mitigate flooding

In terms of irrigation controls and water conservation, our 2018 GHG baseline report calculated water usage for buildings and green space in the Village. The data show wide ranges in the amount of water used in different areas. There was some indication that pipe breaks and other maintenance issues occurred. In order to ensure that Village water use is as efficient as possible, a review of irrigation systems with a goal of conservation needs to be completed.

See below for a summary of total water use by 100 cubic feet units. The total annual consumption was 4100 CCF. (Note, 1 cubic foot of water is 7.48 gallons, or 748 gallons per CCF for a total water consumption of 3,066,800 gallons of water.)

Figure 7. Water use CCF by location



In addition to water conservation, judicious use of mowing can reduce emissions, allow more carbon sequestration, promote pollinators and bird health, and enable some native species to take root which are more climate resilient than ornamentals and traditional lawns. Not mowing in May is suggested specifically to promote pollinator survival and has been implemented in other Westchester villages successfully. What is No Mow May: why and how to take part | (homesandgardens.com)

There are also grass seed mixes that reduce or eliminate mowing and require less to no watering in our climate region except for unusually hot drought periods. No Mow Fact Sheet (prairienursery.com)

Restricting pesticide use on lawns is important to protect pollinators and birds and has the further benefit of creating law areas that need less water. There are GHG emissions and costs saved by not purchasing lawn pesticides. Village Hall has already implemented pesticide free lawn care on the surrounding lawn areas. 5 Tips for a Healthy Lawn without Pesticides - Northwest Center for Alternatives to Pesticides

Electrifying lawn equipment will have the most direct impact on GHG emissions by saving on gasoline use, and reducing air and noise pollution, not the least protecting Village workers who use the equipment from respiratory and auditory damage. Currently there are growing options for electrification for all types of lawn maintenance equipment through use of battery technology. The Village will inventory its equipment, plan for charging areas, and gradually replace all mowers, leaf blowers, trimmers etc. with battery technology by 2030. This process will also conform to the Village's plan to implement an Environmentally Preferred Purchasing Policy and enroll in the NYS Green Purchasing Program.

Given that one of the biggest climate threats to the Village is storm water flooding, addressing ways in which water can be absorbed instead of gushing across hardscapes will be an important adjunct to storm water drain systems and more regional planning around the Bronx River watershed. Installing permeable pavement on parking lots in particular should be implemented. Other uses such as in park walkways etc. should be considered. Successful permeable pavement projects have been implemented in several municipalities in the Hudson Valley and in NYC, even for roadways. While permeable pavement requires some maintenance, it has proven to improve drainage and prevent pooling. Permeable Pavers - Gravel or Grass Infill Commercial Paving | TRUEGRID (truegridpaver.com)

The photo below compares traditional asphalt with permeable asphalt installed on the SUNY Ulster campus, courtesy of the Hurley Climate Smart Task Force.

- **Preservation and planting**
  1. Conduct a public tree inventory, promote preservation and planting of diverse species
  2. Enact a Village tree ordinance
  3. Plant native species
  4. Use bioswales and tree pits to assist with flood control

Green Committee members have investigated tree preservation issues and the Trustees have reviewed a draft tree ordinance for the Village and plan to finalize it in the coming months. The Village has also renewed its membership in Tree City USA, a program run by the Arbor Day organization. Moving forward with protecting and expanding the tree canopy of the Village is an important environmental and climate adaptation strategy as mature tress sequester CO2, help absorb storm water and reduce flooding, reduce ambient temperatures through shading, and provide habitat for birds, insects and pollinators that sustain a healthy ecosystem.

In gathering information about the contribution of trees to climate mitigation and adaptation, we found a website sponsored by a national non-profit group called American Forests which provides mapping of tree cover and analyzes adequacy and equity. Tree Equity Score While peripheral residential areas of the Village have adequate tree cover according to the geo-mapping done by this organization, the central business district, roughly bordered by Kraft Ave, Midland Ave, Garden Ave, Valley Road and Willow Road has an estimated 20% tree cover. Based on development and population density the area should have 30% tree cover to maximize positive environmental impacts of trees. This suggests we can improve our local environmental footprint by adding to the tree population of the central part of the village, and preserving older trees which can sequester five times the amount of carbon as young trees. In this process we also need to pay attention to native species. For example, oak trees are among the best carbon sinks and are native. Other important native trees are London Plane trees and some types of maples. Which Trees Have The Best Carbon Sequestration Ability? (tenereteam.com)

Different tree inventories have been used by other NY municipalities with differing ease of use, cost, accuracy etc. The Village should pursue funding to conduct a knowledgeable survey of public trees, maintenance requirements, and addition and replacement plans. Typically volunteers lack adequate knowledge to address these complicated surveys. Among the issues to consider are assuring the diversity in public trees planted, since climate change is leading to new pest and fungus invasions that are attacking and even wiping out major species of trees (ash is being decimated; beech are threatened; oak and maple are facing new threats).

Here are some resources that could be evaluated that include estimating how much carbon is sequestered by different plantings:

- Village of Mamaroneck's Urban Forest Management Plan – they used i-Tree for their tree inventory.
- List of tree tools:
  - https://www.fs.usda.gov/ccrc/tool/i-tree
  - https://www.fs.usda.gov/ccrc/tool/cufr-tree-carbon-calculator-ctcc
  - https://www.davey.com/environmental-consulting-services/treekeeper-inventory-management-software/
- Village of Rhinebeck- TreeKeeper inventory.

Because of recent and recurring storm water flooding here in Westchester, and high public interest in flood mitigation, the Village needs to access more expertise to consider paving options and natural landscape features that can mitigate flowing such as:

- permeable parking lot surfaces- see p.22 Permeable Pavers - Gravel or Grass Infill Commercial Paving | TRUEGRID (truegridpaver.com)
- bioswales and tree pits to divert streams of storm water to areas that can absorb the excess water Bioswale – Design, Applications and Advantages - The Constructor

Bioswales and tree pits are areas that are excavated and filled with permeable materials and plantings in order to absorb excess storm and runoff water and keep it from overwhelming the storm water systems. See Kingston's Main Street redevelopment with curbside tree pits as well as how a park area is being redesigned with bioswales, tree pits, and permeable pavement to capture storm water.
Welcome to the City of Kingston, NY - Land Use (kingston-ny.gov)

Welcome to the City of Kingston, NY - Land Use (kingston-ny.gov)

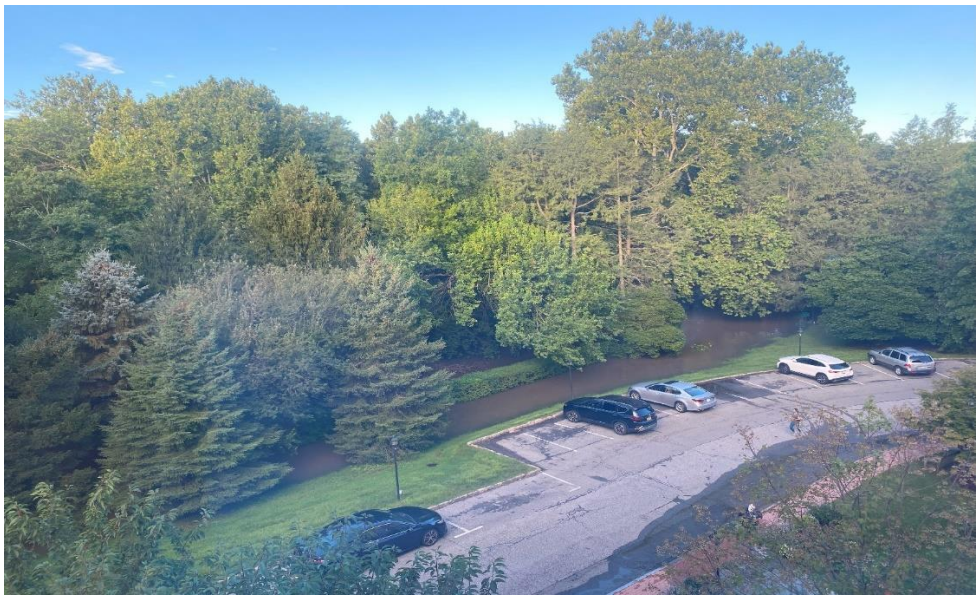
Broadway_Streetscape_Factsheet_2-1-2017_rev1.pdf (kingston-ny.gov)

HD_Parklet_Bird's_Eye_View_DESIGN_V93_300_dpi.pdf (kingston-ny.gov)

HD_Parklet_View_from_East_DESIGN_V9_300_dpi.pdf (kingston-ny.gov)

Bronxville has already initiated a number of actions that can be part of the Local Forestry Program CSC action step as we continue to enact aspects such as a tree ordinance, a public tree inventory, planned plantings and construction of natural features such as bioswales and tree pits that will assist with storm water control.

Bronx River flooding next to Midland Gardens complex, September 2021



WASTE & RECYCLING SECTOR

The Village of Bronxville uses Westchester County Department Environmental Facilities to handle solid waste, recycling, yard waste composting, and food scrap composting for Village and residential waste disposal. The Village participates in the full range of composting and recycling opportunities in the County and as part of our community-wide GHG inventory, we are tracking the volume of each type of waste. The Village has also instituted recycling bins and food scrap recycling within some Village buildings. These efforts will continue and the Village will continue to monitor building usage.

- **Maintain and improve recycling in municipal buildings**
  1. Educate staff and ensure continued use of recycling bins inside government buildings
  2. Expand food scrap recycling to all three municipal buildings and Midland Ave Firehouse

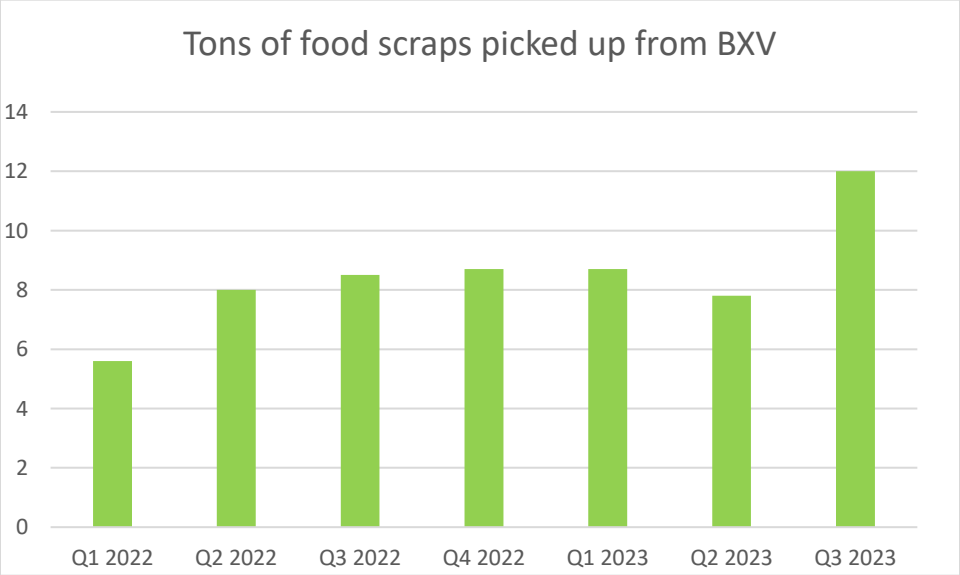
While the Village is not able to separate municipal building waste from residential waste collected by Village trucks, the Village will continually evaluate its municipal solid waste production and seek ways in which municipal operations and residential production of waste can be reduced and disposed of sustainably.

- **Improve municipal waste programs**
  1. Audit existing programs for efficiencies
  2. Promote and increase use of residential participation in food scrap recycling, yard waste composting; pilot large multifamily building pick-up of food scraps; assess curbside pick-up of food scraps
  3. Pursue with other local communities developing a local food scrap composting facility
  4. Continue community education, Take Back Day and other drop off options to reduce waste

Most recent county data indicate that the Village recycles 69% of 7856 tons of solid waste annually compared to an overall 50% average for Westchester County as a whole. In addition, the village sends about 750 tons annually of yard waste for composting. [Westchester County DEF Annual Report 2021 (westchestergov.com)]

The food scrap recycling program, which was started in December 2021, is currently utilized by about 5-6% of Village households. Many residents have not bought kits from Village Hall but bring their waste to the municipal parking lot behind Village Hall using biodegradable bags that are readily available from various retailers and online vendors. Over the 21 months of the program, total tonnage has averaged over 2.8 tons per month.

Figure 8. Tons of BXV food scraps picked up by Westchester County Residential Food Scrap Transportation and Disposal Program per quarter.



This program needs to be further promoted because it is both cost-effective for Village operations due to diversion of food waste from the solid waste stream and produces environmental benefits by creating useable compost. The county subsidizes transportation costs so that it is cost neutral or slightly beneficial for Westchester communities to participate. However, the transportation requirements obviate some of the benefits by producing GHG emissions due to hauling long distances. The Village will work with other local communities to consider how to develop a more local composting facility to reduce hauling distances and transportation related GHG emissions.

Reluctance to participate in food scrap recycling appears to stem largely from the inconvenience of having to bring food scraps to a central location. To expand utilization, the Village will evaluate the cost and implementation of curbside pick-up and consider piloting pick-up at large multifamily co-ops and apartment buildings, where 40% of Village residents live.

Twice a year the Village also sponsors Take Back Day, which with County assistance supports residents with paper shredding and electronic waste recycling, and engages local agencies such as animal shelters, Vietnam Veterans of America, and Big Brothers Big Sisters of Westchester to collect bedding, useable small household items, and useable clothing. The Village will explore ways to have permanent drop off for other hard to dispose of items at the DPW. For example, neighboring communities have successful ongoing electronics, paint and book drop off programs

IMPLEMENTATION AND MONITORING

The Village recognizes that this Climate Action Plan (CAP) is an important priority to meet GHG reduction goals and help control the negative impacts of climate change in our community. The CAP will require all departments and employees to understand and work towards CAP goals. Our first year will be focused on implementing formal policies, creating staff working groups, collecting data, determining the feasibility of various strategies, identifying necessary funding and financing options, and setting up implementation processes and monitoring.

Once the plan is adopted by the Trustees, the CAP working group and the Village Administrator will:

- ✓ create a list of new policies relevant to implementing the CAP and a schedule for review by Trustees, including the Environmentally Preferred Purchasing Plan, a No Idling policy for village vehicles, building benchmarking, sustainability requirements in all Village contracts, and a Tree Ordinance
- ✓ disseminate the CAP to the relevant Village departments and review each of the strategies selected
- ✓ assign organizational responsibility to relevant departments to implement key strategies such as replacing police vehicles with hybrid vehicles, planning for electrification of heavy duty DPW equipment, inventorying and converting outdoor maintenance equipment to electric/battery operated, changing watering and mowing schedules, expanding waste drop off programs, developing a local compost facility
- ✓ establish a specific workgroup to implement building efficiency actions, including those that can be implemented for no or low cost such as establishing procedures to reduce energy consumption by changing light bulbs or water fixtures, adding timers, implementing overnight equipment turn offs and monitoring completion of energy audits and implementation of GHG reducing improvements
- ✓ initiate a process for working with the Eastchester Fire District to assure the Midland Avenue firehouse is energy efficient
- ✓ establish a specific workgroup or hire consultants to plan for solar installations
- ✓ establish a specific workgroup or hire consultants to assess how ongoing Village maintenance activities such as roadway and green space maintenance can assist with flood control, such as through permeable pavement, bioswales, tree planting and tree pits
- ✓ investigate funding options for expert assistance on public tree inventories, maintenance and plantings

The CAP working group will provide leadership to the Village wide process along with the Village Administrator and Trustees and will monitor and update progress on implementation. The CAP working group will also collect relevant data to update progress of the CAP annually, estimate GHG reductions and adjust planning as necessary. The following data collection activities are planned:

- ✓ collect and analyze 2023 municipal operational data to update the Village 2018 baseline GHG inventory in early 2024 to provide further guidance on trajectory of Village emissions based on ongoing sustainability actions
- ✓ update the fleet inventory in late 2023 used to estimate 2018 vehicle emissions which will show progress to date and become the baseline for conversion to hybrid and EV vehicles by 2030
- ✓ update the employee commute survey in early 2024 for the 2023 year to estimate changes in patterns and vehicle use since 2018 and assess barriers to public transportation, EV use
- ✓ annual review and report to Trustees and community of CAP actions initiated and completed and estimates of GHG reductions

PUBLIC OUTREACH

Draft CAP documents reviewing feasible goals and actions to attain the goal of 40% GHG emission reductions by 2030 were prepared and discussed in the CAP working group meetings during March-April 2023. They were amended to reflect input from a Trustee and the Village Administrator. New information was added to explain possible actions and some actions were eliminated as the GOCAP process progressed with meetings and receipt of new information from the Hudson Valley Regional Council TA providers and other participating communities.

A draft document covering the four sectors of Transportation; Buildings and Facilities; Natural Resources, Water and Land; and Waste and Recycling was created. The draft identified at a high level 35 possible strategies and actions steps and a timeline. It was disseminated to all Trustees and the Village Administrator in early June 2023. The document was discussed at a working meeting of the Trustees on June 12, 2023 (ecode360.com) and posted for public review on the Village website under the Green Committee tab. Microsoft Word - Draft Climate Action Plan for Municipal Operations for the Village of Bronxville Subsequent discussions and incorporation of edits resulted in a final document with 39 action steps posted In August 2023 as a Final recommendation.
final_proposed_climate_action_plan_for_municipal_operations_for_the_village_of_bronxville.pdf (villageofbronxville.com)

Revisions were made based on input from the Village staff and Trustees and a formal presentation of the final document was made at a public meeting of the Village Trustees on October 16, 2023 (752979746.pdf (ecode360.com))

The Trustees discussed the report and endorsed an additional 30-day public comment period before final consideration. These comments were reviewed by the Village Administrator and Trustees and addressed in the final version of the plan.

During the public comment period between August and November 2023 a social media post was disseminated (Instagram @bxvgreencommittee), the document was presented at the monthly Green Committee meeting, it was announced in the Village newsletters (October 2023 Newsletter (canva.com); November 2023 Newsletter (canva.com), and an article appeared in My Hometown Bronxville about the development and importance of climate action planning for the Village. MyHometownBronxville.com - Public Meeting on Climate Action Plan for Bronxville on October 16

The Village received support and a number of comments on the CAP document which were considered before the adoption of the CAP. There were questions about making solar installations easier for homeowners, increasing vehicle charging stations at the train parking lots, concerns about trees and power lines and if underground lines could be considered. Costs of conversion to EV vehicles and damage due to mining minerals for EV batteries were raised. The plan points out numerous cost savings for the Village by utilizing greener products and processes in addition to the positive climate impacts, and notes that the costs of no action result in increased damage and impact from climate change.

The final version of the Village of Bronxville Climate Action Plan was unanimously adopted at a public Trustee meeting on November 13, 2023 at which time public comment was also encouraged. Agenda - Board of Trustees Meeting November 13, 2023 | Bronxville NY (villageofbronxville.com)The official adopted report was posted on the Village web site in November 2023 and publicized on the Green Committee web page Climate Action Plan (bronxvillegreencommittee.org) and in MyHometownBronxville.

APPENDIX A:

Summary of Findings from the 2018 Baseline GHG Inventory for the Village of Bronxville Municipal Operation

The baseline data collection focused on the required categories of GHG emissions to be in conformance with national and international protocols for how to conduct municipal and community GHG emissions inventories. The full report can be found at Green House Gas Report - Municipal | Bronxville NY (villageofbronxville.com) which outlines the data sources, methods, assumptions, and limitations. Both ICLEI and CSC staff reviewed the report and found it to be in compliance with recommended reporting standards based on the characteristic of the Village (e.g., size, population, types of facilities).

Table 1 shows the findings in terms of energy use and estimated carbon dioxide emission (CO2e) for the main measured sectors of Village operations. The municipal GHG inventory estimated that the Village operations generated a total of 765.3 MT CO2e in 2018. Buildings and Facilities accounted for the largest sector of GHG emissions, with 290 MT CO2e; Street Lights, Traffic Signals and Outdoor Lighting accounted for 181 MT CO2e emissions; municipal vehicles accounted for 131 MT CO2e, and employee commuting accounted for 161 MT CO2e. A very small amount of Process & Fugitive Emissions were estimated from natural gas leakage.

In order to meet recommended GHG reduction goals by 2030, the next benchmark date for making progress on climate mitigation, the goal is 40% reduction. For the Village of Bronxville, based on the 2018 inventory, a 40% reduction goal would be to reduce municipal operations emissions to 459 MTCO2e from the 765 MTCO2e.

The purpose of this planning document is to describe possible ways the municipal government can achieve this 40% reduction goal that is in line with NY state goals. Note that we do not have data for 2022 yet, which would be a better baseline year for calculating future change. However, it is likely that 2022 data might show a slight decrease in GHG emissions due to ongoing energy actions of the Village and therefore, if the enclosed action steps are implemented, a greater reduction will be shown in 2030. The Village CSC should periodically monitor ongoing changes in GHG emissions and should plan to update the 2018 inventory data with 2023 data for an early 2024 report.

While this report focuses on potential new, high impact GHG reduction strategies, it builds upon many activities of the last decade which have moved the Village toward greener operations. The Village remains committed to continuing ongoing efforts across the range of climate-friendly operations.

Table 2: Local Government Operations GHG Emissions Inventory for the Village of Bronxville for 2018

Sector	Fuel or source	2018 Usage	Usage unit	2018 Emissions ($MTCO_2e$)
Buildings & Facilities	Electricity	462724	kWh	125.5
	Natural gas	8229	Therms	43.8
	Heating oil	11266	Gallons	115.7
	Propane	935	Gallons	5.3
Buildings & Facilities total				**290.3**
Street Lights, Traffic Signals & Other Outdoor Lighting	Electricity	666385	kWh	180.7
Street Lights, Traffic Signals & Other Outdoor Lighting Total				**180.7**
Vehicle fleet	Gasoline (on-road)	6548	Gallons	58.0
	Diesel (on-road)	7185	Gallons	73.5
Vehicle Fleet total				**131.5**
Employee Commute	Gasoline	17390	Gallons	161.4
Employee Commute Total				**161.4**
Process & Fugitive Emissions	Natural gas usage	8229	Therms	**1.43**
Total government emissions				**765.3 MT C02e**

APPENDIX B: CAP STRATEGY TIMELINE

Table 3. Timeline for actions

Completion year	2024	2025	2026	2027	2028	2029	2030
TRANSPORTATION							
Village fleet							
Adopt Environmentally Preferred Purchasing Policy	X						
Implement size & route efficiencies-ongoing	X	X	X	X	X	X	X
Purchase efficient vehicles: 1 police patrol hybrid vehicle a year	X	X	X	X	X	X	X
2 administrative EVs as current vehicles are retired		X		X			
2 EV garbage trucks as current vehicle are retired				X		X	
Install one Level 2 charging station for village vehicles		X					
Install one Level 3 charging station for heavy duty vehicles				X			
Employee commute							
Periodic employee commute survey starting 2023	X		X		X		X
Assess barriers to use of public transit	X		X		X		X
Encourage public transit & provide pretax payroll program if employees indicate it will be beneficial	X	X	X	X	X	X	X
Provide information & encourage transition to hybrid and EVs	X	X	X	X	X	X	X
Install additional Level 2 charging stations at VH or Library for employee use if indicated			X			X	
BUILDINGS & FACILITIES							
Street & other lighting							
Complete & document LED streetlight conversion	X						
Make sure all building interior lighting is LED/efficient	X						
Install lighting motion detectors where appropriate	X	X					
Building energy efficiency							
Implement Environmentally Purchasing Policy for all office equipment, supplies, services	X	X	X	X	X	X	X
Enroll all buildings in energy benchmarking programs	X						
Complete Level 2 energy audits VH, Library, DPW	X	X	X				
Engage Eastchester in improving energy efficiency of Firehouse	X	X					
Install energy management systems for HVAC consistent with audits	X	X	X				
Implement energy conservation measures for office equipment & lighting, water fixtures	X	X	X	X	X	X	X
Renewable energy							
Investigate purchasing clean energy renewable energy certificates	X	X					
Consider community solar, community choice aggregation and Grid Rewards utility programs	X	X					
Replace building hot water heaters with heat pump hot water heaters		X	X	X	X	X	X
Install solar on DPW building		X	X	X			
Assess & plan for additional solar installations- VH & municipal parking lots-Library, Parkway Road, Kraft, Cedar St., Garden St				X	X	X	X

NATURAL RESOURCES, WATER & LAND USE							
Park & open space maintenance							
Irrigation controls/water conservation- to reduce 30% by 2030	X	X	X	X	X	X	X
Limit mowing, use mulching mowers; eliminate pesticides	X	X	X	X	X	X	X
Inventory /retire older equipment; purchase electric/battery operated maintenance equipment-15% each year to replace all feasible by 2030	X	X	X	X	X	X	X
Use permeable paving surfaces for storm control in park areas/parking lots			X	X	X	X	X
Preservation & planting							
Conduct public tree inventory, promote preservation; increase tree planting of diverse species		X	X	X	X	X	X
Enact tree ordinance	X						
Plant native species in all park and municipal landscape plans	X	X	X	X	X	X	X
Plan bioswales, tree pits where feasible		X	X	X	X	X	X
WASTE & RECYCLING							
Recycling in municipal buildings							
Educate/implement effective recycling processes	X	X	X	X	X	X	X
Add food waste recycling in other municipal buildings & firehouse		X	X	X	X	X	X
Improve municipal waste programs							
Audit existing programs for efficiencies	X	X	X	X	X	X	X
Promote community participation in food scrap recycling and yard composting, pilot food scrap pick-up from multifamily buildings assess curb side pick-up options	X	X	X	X	X	X	X
Pursue development with other communicates of a local composting facility for food scraps		X	X	X	X		
Continue community education & Take Back Day; expand local collection of some hard to dispose of items like electronics, paint or books	X	X	X	X	X	X	X

APPENDIX C: TRANSPORTATION SECTOR METRICS

Goal 1: Reduce emissions from municipal fleet & employee commute			
Strategy 1. Reduce mileage driven			
Initiatives	**Performance Indicator**	**Reduction Potential**	**BXV Specific**
1.1 Right size vehicle fleet	Maintain annual fleet inventory and monitor use	Medium	BXV will use current fleet inventory data as a baseline for annual monitoring
1.2 Adopt an anti-idling policy for government vehicles	Document policy date, communication with staff	Low-medium depending on #/type of vehicle	Conversion to hybrid police vehicles and EV for admin vehicles will produce increased GHG reductions
Strategy 2. Increase fleet efficiency			
Initiatives	**Performance Indicator**	**Reduction Potential**	**BXV Specific**
2.1 Fleet efficiency policy - require management/purchase policies to reduce average mpg	✓ Adoption of Green Purchasing policy ✓ # vehicles replaced with hybrid/EV ✓ Reduction in annual gasoline use	High	Proposed for conversion by 2030 approx. 50% of police; 2 admin vehicles, 2 garbage trucks NOTE: Ford Explorer policer vehicles current approx. 16 mpg Ford Explorer Hybrid: 25-27 mpg **GHG reduction: Approx 51% per new hybrid vehicle**
2.2 Replace traditional vehicles with advanced vehicles	✓ Increased mpg for vehicles ✓ # gallons less gasoline/diesel fuel consumed ✓ % fleet replaced	Medium-High	Explore County/State rebates for EV, plug in hybrid and ways in which movement to replacing heavier duty vehicles will increase CSC points
2.3 Install EV infrastructure	✓ EV charging for municipal employees in VH parking area ✓ Planning for future heavy duty and full EV policy, DPW vehicles	High	BXV has installed several Level 2 community stations; need to develop capacity on municipal site for municipal vehicles and expand to Level 3 as more advanced vehicles become possible
Strategy 3: Incentivize employee commuting by public transportation, walking, bicycling, car pooling			
Initiatives	**Performance Indicator**	**Reduction Potential**	**BXV Specific**
3.1 Survey employees on commute habits	✓ #/% survey responses ✓ mileage driven and mpg gasoline/diesel; ✓ public transportation, walking, bicycling etc.	Low to Medium depending on distance and change in habits	In 2018 BXV employee commute was f21% of total municipal GHG emissions; Update to 2023 to show newer patterns/ vehicles and barriers to greener commutes; 16% travel 30+ miles one way ; 24% travel 11-29miles one way
3.2 Incentivize low-emissions commutes	Change in mpg, fuel use and public transportation or walking, bicycling	Medium to high	Raffle Metro North or Bee line passes; Provide info on EV rebates; install 1-2 EV charging stations for employee use

APPENDIX D: BUILDINGS & FACILITIES SECTOR METRICS

SECTOR: BUILDINGS AND FACILITIES			
GOAL 1. Reduce Emissions from Government Buildings			
Strategy 1: Improve energy efficiency of govt buildings			
Initiatives	**Performance Indicator**	**Reduction potential**	**BXV specific**
1.1 Document completion of streetlight conversions	#/% streetlights replaced with LEDs;# of kWh of electricity consumed annually	High	Village has gone from 15% LED to 100% with aggressive implementation in the last year. Reductions in kwh will be documented.
1.2 Conduct Energy Audits of Government Buildings	# of buildings audited	Medium	Complete in-process VH audit; complete Library/DPW audits Work with Eastchester Fire District to audit Midland Ave Firehouse
1.e Use Energy Management Systems	# of buildings included in EM # of kWh, CCF natural gas, or heating oil reduced	Medium	Possible recommendation of energy audit
1.4 Upgrade interior and outdoor lighting to LEDs	#/% Interior lights replaced with LEDs;#/% exterior lights replaced with LEDs;# of kWh of electricity consumed annually	Low-Medium	Need inventory of LEDs interior and exterior buildings
1.5 Reduce number of outdoor lighting fixtures	#/% fixtures removed # of kWh of electricity consumed annually	Low	Survey or walk through to see what not be necessary or could be converted to motion sensor etc
1.6 Financing mechanism for government energy projects	Funds dedicated specifically to energy improvement and projects completed	Low to High	Part of assessing feasibility of solar installations; consider a policy such as an annual fund towards energy improvements in the budget process
1.7 Waste and energy provisions in government contracts	# contracts where these provisions are incorporated	Low to medium	Adopt contract language about how waste is handled by janitorial services (e.g. recycling) and pubic events; efficiency standards for equipment used by contractors (e.g. electric lawn equipment?); anti idling provisions

Strategy 2: Adopt policies to reduce emissions from government buildings			
Initiatives	**Performance Indicator**	**Reduction Potential**	**BXV specific**
2.1 Adopt green building and new construction standards	adoption of policy # of retrofitted buildings # of proposed green building projects # of buildings constructed	High if any new or major municipal construction	Document specs of new DPW building Currently BXV not planning new construction or retrofitting
2.2 Adopt renewable energy ordinance	adoption of policy ; increased % of municipal energy is clean energy	Medium	NYPA 70% hydro already Need to investigate rebates and other ways to use clean energy at municipal level
2.3 Adopt benchmarking requirement	% muni buildings benchmarked	Medium	Annual energy consumption analyzed and made public; adopt resolution US EPA Energy Star Portfolio Tool available to use to benchmark by building Benchmark Your Building Using ENERGY STAR® Portfolio Manager® | ENERGY STAR
2.4 Adopt green concrete resolution	#/% projects using low embodied carbon concrete	Low	no current plans for new construction
2.4 Adopt environmentally preferred purchasing plan and join state Green Purchasing communities list	Main products substituted with greener products such as paper, energy star office equipment etc. Avg energy savings compared to old equipment	Low to medium	Draft policy already under consideration. Need to sign up for Green Purchasing Communities which gives access to vetted equipment meeting energy star requirements. Apply Now to Become a Green Purchasing Community | Office of General Services (ny.gov)
2.5 Adopt energy saving policies around lighting use, computers, copiers, and other equipment to save electricity	Identify equipment left on overnight or on weekends that is not necessary; environmentally scan other ways to improve energy savings such as motion sensor lighting, set back thermostats, using blinds etc.	Low to medium	Will require policy development and some sort of survey as to what equipment left on, are room lights left on when no one in the room, how are blinds/curtains used to promote summer cooling, winter heating. Lighting and equipment use recommendations can be part of an energy audit Follow NYSERDA Clean energy upgrades (like lighting, water saving etc.)

2.6 Adopt green energy standard policy any new buildings and for upgrading buildings and achieve standard for projects	% buildings able to meet LEED, Energy Star, ASHRAE standards	Medium	Adopt policy; assess if new DPW building meets standards and can apply to CSC or NYSEDA points
2.7 Renewable energy feasibility study	Completed study with emission reduction projections	Medium to high	Commit to a DPW roof installation next 3 years and assessing other options to produce 15-20% annual municipal kwh via solar
Strategy 3: Eliminate fossil fuel use in government facilities			
Initiatives	**Performance Indicator**	**Reduction Potential**	**BXV specific**
3.1 Create HVAC Replacement Plan	#/% HVAC system replacements using clean heating and cooling technologies	High	VH, Library and DPW already upgraded; need to capture current reductions and continue to increase efficiencies
Strategy 4: Use renewable energy for government operations			
Initiatives	**Performance Indicator**	**Reduction Potential**	**BXV Specific**
4.1 Install solar panels in relevant locations	# solar installations (include types relevant for municipality – carport, roof, ground mount) kwh electricity generated annually	High	Explore either owing or leasing out solar installations; possible additional locations like Village Hall/ or Library rooftop; Parkway/Cedar/Paxton parking lots
4.2 Purchase NYGATS RECs for municipal operations	% of RECs purchased for operations	High	Explore purchasing Renewable Energy Certificates by buying renewable electricity instead of fossil fuel produced; we already use NYPA which is 70% hydro; need to find out if they also operate other renewable sources
4.3 Sign-up for Community Solar for Municipal Accounts	%/# of accounts signed up for community solar	High	Benefits to municipal and residential accounts but need to investigate how this works with NYPA programs
4.4 Install heat pumps in municipal buildings	% of space heated by these systems	High	Village Hall already geothermal; encourage Eastchester Fire District to plan for a geothermal or air source heat pump for any planed upgrades; Identify hot water heaters that could be replaced with heat pumps
4.5 Power Purchase Agreement	Kwh generated	Medium to High	Enter into agreement with a utility to install solar (for example); financing comes from utility and not Village; village agrees to buy the power.

APPENDIX E. NATURAL RESOURCES, WATER & LAND USE SECTOR METRICS

SECTOR: Natural Resources: Water and Land Use			
Goal 1: Water conservation in municipal operations			
Strategy 1. Improve Water Efficiency in Government Buildings			
Initiatives	**Performance Indicator**	**Reduction Potential**	**BXV Specific**
1.1 Upgrade water fixtures	# of gallons of water consumed annually # of water fixtures replaced	Low	Would require building audits
1.2 Install water consumption meters in all government buildings	# of gallons of water consumed annually # meters installed	Low	All buildings seem to already be metered so if not completely retrofitted with water saving fixtures that would be the main initiative
Strategy 2. Improve Water Efficiency of Municipal Property			
2.1 Water-smart landscaping	# gallons of water consumed annually	Low	We already have meters; use, timing and design should be assessed to reduce water usage
2.2 Install water-sense irrigation controllers	# of gallons of water consumed annually	Low	Inventory and assess effectiveness
Goal 2: Improve land management **Strategy 3. Decrease carbon burden of maintaining open space and increase carbon sequestration and flood mitigation**			
Initiatives	**Performance Indicator**	**Reduction Potential**	**BXV Specific**
3.1 Convert land to no-mow or low maintenance	acres of land converted	Medium	Are there areas that could be left more natural or reduced from all lawn to native plant beds
3.2 Electrify all municipal lawn maintenance equipment	% equipment electric	Medium	Need inventory of equipment owned and plan for conversion
3.3 Restore features that increase water absorption in flood prone areas	Acres of land planted/converted/newer permeable pavement installed; cisterns, new culverts etc.	Medium	Must work with County around Bronx River; other specific steps to develop Green Infrastructure in flood prone areas may need technical consultants
3.4 Maintain and increase tree canopy	Passing tree ordinance # trees planted of appropriate species	Low to medium	Already in process; need documentation method
3.5 Implement water-smart landscaping and paving in all municipal open areas	# acres converted	Medium	Reducing lawns, increasing native species, efficient watering systems etc. different approaches may need to be planned for each space

3.6 Local Forestry Program	# of actions implemented	Low to Medium	Public tree inventory, tree ordinance, join Tree USA, increase public tree planting of varied species– already in process
3.7 Make municipal parking lots more climate friendly	# of improvements implemented	Low to medium	Parking lots can: use permeable paving; have LED lighting; have appropriate shrubs and trees; space for bicycles and scooters; EV charging stations. They also may be a location for solar panels. Some of these have already been implemented.
3.8 Infrastructure for bicycling & walking & safe streets; safe routes to school	# improvements implemented	Low to medium	Safe sidewalks, greening of sidewalk areas, bike lanes, crosswalks that encourage biking and walking instead of cars in the Village; some of this is addressed BXV Comprehensive Plan

APPENDIX F. WASTE & RECYCLING SECTOR METRICS

SECTOR: Waste and recycling			
Goal 1: Reduce waste from government operations **Strategy 1: Improve recycling in government buildings**			
Initiatives	**Performance Indicator**	**Reduction Potential**	**BXV Specific**
1.1 Ensure effective recycling program in municipal buildings	% increase in recycling bins # lbs of recycling collected	Low	Ongoing education and monitoring for all policies in place
1.2 Implement food waste recycling in municipal buildings	# receptacles Lbs collected	Low	Extend from VH to Library, DPW, Firehouse
1.3 Conduct education to assure compliance	Increase in amount collected	Low	
Strategy 2: Improve overall government waste programs			
Initiative	**Performance Indicator**	**Emission Potential**	**BXV Specific**
2.1 Conduct overall audit of solid waste collection/disposal methods	Reduction in solid waste collection lbs	Low	Village has many programs in place; how can they be made more efficient or encourage more participation?
2.2 Increase resident participation in yard composting, food scrap program	Reduction in solid waste collection lbs; Increase # households participating in food scrap program	Low-Medium	Campaign to increase participation in food scrap recycling 5% a year to 40% by 2030; consider piloting large multifamily building pick-ups of food scraps; eventual curbside pick-up
2.3 Collaborate with other local communities to develop a more local food scrap composting facility	Successful development of a facility	Medium	A local facility will reduce GHG emissions due to long distance hauling to a composting facility of food scrap tonnage
2.4 Initiate local drop off for additional hard to get rid of items like electronics, paint or books	New drop off options developed for one or more items; lbs collected or # participating households	Low	We can learn from other communities that have successfully initiated ongoing drop offs of several types of items

Midland Avenue Bridge over Bronx River