PREPARED BY
NINA EISENMAN

North Salem
Climate Smart Community

TOWN OF NORTH SALEM, NY

LOCAL GOVERNMENT OPERATIONS GREENHOUSE GAS EMISSIONS INVENTORY REPORT 2019 – 2021

ABOUT NORTH SALEM, NY

North Salem, NY (North Salem) is the northern most town in Westchester County, bordered by Putnam County, NY to the north and Connecticut to the east. Only 55 miles and roughly an hour and fifteen minutes by train or car from New York City, North Salem is 23 square miles of rolling hills, horse paddocks, meadows, and woods. Incorporated in 1788, North Salem is prized by its 5,243 residents (Division of Local Government Services, 2021) and visitors for its historic charm, scenic beauty, horse farms, orchards, as well as its preserves and parks with their many miles of hiking and riding trails.

About the 2019–2021 greenhouse gas inventory report

This local government operations greenhouse gas (GHG) inventory report (the Inventory) has been conducted by Nina Eisenman (the Consultant) on behalf of North Salem, NY's municipal government, the Town of North Salem, NY (the Town). Sponsors of The Inventory include North Salem Town Supervisor Warren Lucas (Town Supervisor Lucas), North Salem Town Councilwoman and Climate Smart Community Program Coordinator Katherine Daniels (Town Councilwoman Daniels), and the Town Climate Smart Community (CSC) Leadership Committee (CSC Leadership Committee). the Town's primary, day-to-day point person for The Inventory is North Salem Town Clerk, Maria Hlushko (Town Clerk Hlushko).

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CONTENTS

Climate Action Partners 2

Goals Served by The Inventory 4

Approach and GHG Protocol 5

GHG Emission Results and Analysis 11

Opportunities for Energy Efficiency, Innovation, and Risk Management 21

Future GHG Benchmarking Goals 22

Conclusion 23

Appendix A – Emissions Factors, Global Warming Potential and Conversions 24

Appendix B – 2019–2021 Energy Use Activity Data by Source 25

Appendix C – 2019–2021 Scope 1 and 2 GHG Emissions Data by Subsector and Gases 26

Appendix D – 2019–2021 Vehicle Fleet by Vehicle Make and Fuel Type Used 28

Appendix E – 2021 Scope 3 Employee Commutation GHG Emissions 29

Sources 30

Local Government Profile	
Jurisdiction Name:	Town of North Salem, NY
Street Address:	266 Titicus Rd.
City, State, Zip:	North Salem, NY 10560
Country:	USA
Size (sq. miles):	22.84
2021 Population:	5243
2021 Budget:	$10,201,228
Full-time Employees:	30
Climate Zone:	4

CLIMATE ACTION PARTNERS

New York State Department of Environmental Conservation Climate Smart Communities

The Town registered as a Climate Smart Community (CSC) and took the CSC pledge in October 2009. In May 2021, the Town Councilwoman Daniels formed the CSC Leadership Committee to help the Town achieve CSC certification status and accelerate climate action. The CSC Leadership Committee is a volunteer task force comprised of employees of the Town as well as North Salem residents. Publishing a Climate Action Plan is one of the requirements for CSC Bronze Certification. The CSC Leadership Committee is currently developing the Town's Climate Action Plan which will include 2030 emissions reductions goals and a net-zero target date as well as a step-by-step road map for reducing GHG emissions.

NY State Climate Smart Communities

Climate Smart Communities (CSC) is a New York State program that helps local governments take action to reduce greenhouse gas emissions and adapt to a changing climate. The program offers free technical assistance, grants, and rebates for electric vehicles.

North Salem
Climate Smart Community

Members of North Salem's Climate Smart Community Leadership Team, along with Sustainable Westchester and NYSEG representatives at North Salem's first LED Light Bulb Swap held October 16, 2021 during National Energy Awareness Month.

New York State Energy Research and Development Authority Clean Energy Community

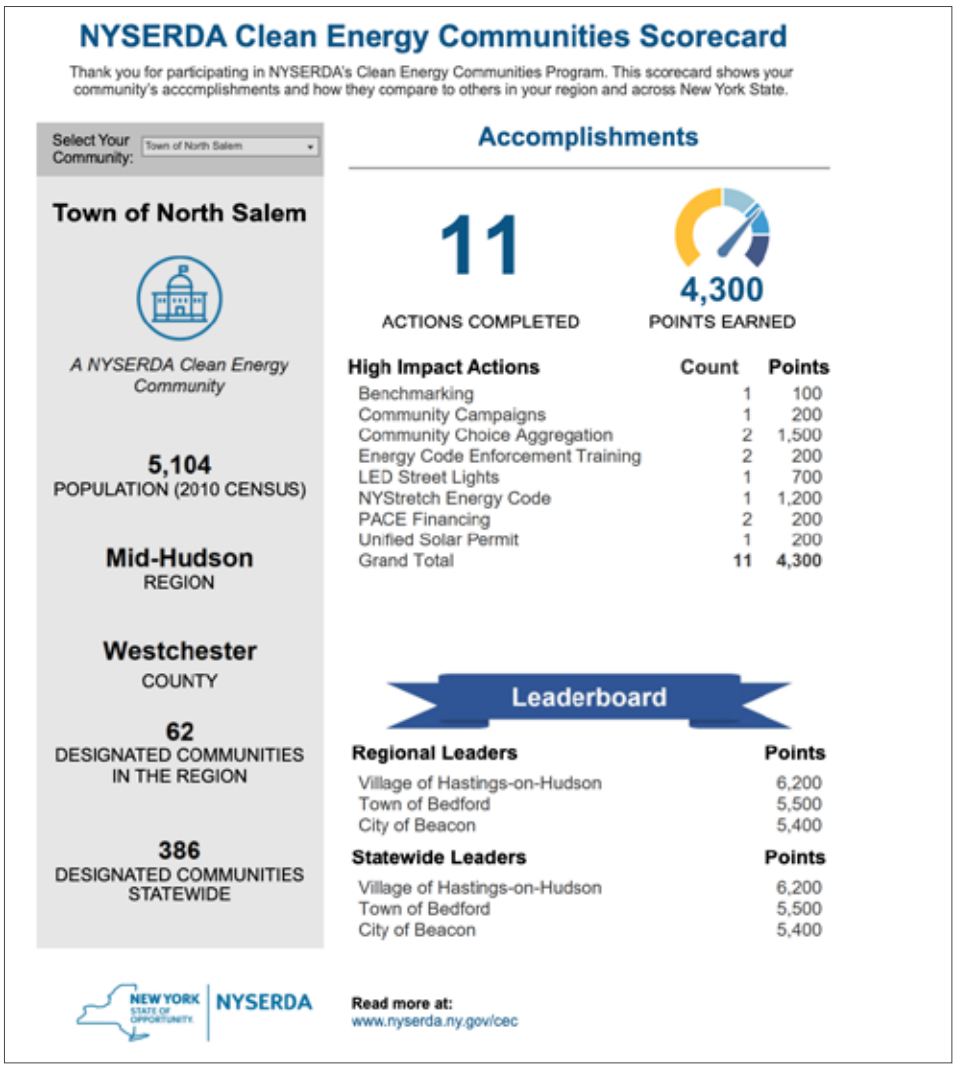
North Salem participates in New York State Energy Research and Development Authority (NYSERDA)'s Clean Energy Community (CEC) program which "promotes energy efficiency and the use of renewable energy sources" (The State of New York, 2021) among New York State municipalities. CEC is a points-based system that offers grants to communities who implement a specific set of "High Impact actions". The Town currently has completed 11 High Impact Actions including an LED lighting program, a Community Solar Campaign and Community Choice Aggregation (CCA) earning the Town a total of 4,300 CEC Scorecard points and $20,000 in NYSERDA grants to be used for clean energy programs.

Sustainable Westchester

Town Supervisor Lucas is on Sustainable Westchester's Board. North Salem participates in Sustainable Westchester's Community Choice Aggregation (CCA) program, "Westchester Power", a "community-based bulk energy purchasing program intended to control costs and increase the use of renewable energy in Westchester County" (Sustainable Westchester, 2021) as well as their Community Solar and other clean energy programs.

NYSERDA Clean Energy Communities

NYSERDA's Clean Energy Communities Leadership Round program helps local governments "create a healthy and sustainable environment by investing in future-focused clean energy solutions". NYSERDA provides resources and grants to help communities achieve their clean energy goals.



NYSERDA Clean Energy Communities Scorecard

Thank you for participating in NYSERDA's Clean Energy Communities Program. This scorecard shows your community's acccmplishments and how they compare to others in your region and across New York State.

Select Your Community: Town of North Salem

Town of North Salem

A NYSERDA Clean Energy Community

5,104
POPULATION (2010 CENSUS)

Mid-Hudson
REGION

Westchester
COUNTY

62
DESIGNATED COMMUNITIES IN THE REGION

386
DESIGNATED COMMUNITIES STATEWIDE

Accomplishments

11
ACTIONS COMPLETED

4,300
POINTS EARNED

High Impact Actions	Count	Points
Benchmarking	1	100
Community Campaigns	1	200
Community Choice Aggregation	2	1,500
Energy Code Enforcement Training	2	200
LED Street Lights	1	700
NYStretch Energy Code	1	1,200
PACE Financing	2	200
Unified Solar Permit	1	200
Grand Total	11	4,300

Leaderboard

Regional Leaders	Points
Village of Hastings-on-Hudson	6,200
Town of Bedford	5,500
City of Beacon	5,400

Statewide Leaders	Points
Village of Hastings-on-Hudson	6,200
Town of Bedford	5,500
City of Beacon	5,400

NEW YORK STATE OF OPPORTUNITY. NYSERDA

Read more at:
www.nyserda.ny.gov/cec

North Salem had completed 11 of NYSERDA's Clean Energy Community high impact actions earning the Town 4,300 Clean Energy Community points as of December 7, 2021.

Sustainable Westchester

Sustainable Westchester is a nonprofit, consortium of Westchester County local governments that facilitates effective collaboration on sustainability initiatives.

GOALS SERVED BY THE INVENTORY

The Inventory provides the data-driven insights needed to set the Town's Climate Action Plan 2030 GHG emission reduction goal and net-zero target date. In addition, The Inventory will support the Town's July 13, 2021 "Resolution #208-21 To Establish Energy Benchmarking Requirements for Certain Municipal Buildings." The Inventory establishes 2019 as the Town's emissions base year, facilitating future reporting and tracking of emissions reductions initiatives against base-year emissions. The Inventory will identify which of the Town's energy use sectors, sub-sectors and properties are the largest consumers of energy and the largest sources of GHG emissions. This information will allow the CSC Leadership Committee, the Town executive leadership, and the Town Board to prioritize energy efficiency initiatives and set realistic municipal energy and GHG emissions reduction targets and identify the highest value operational energy efficiency initiatives. The Inventory is a tool that can be updated yearly to help the Town lower its energy use and operating expenses, reduce its GHG emissions, gain CSC certification and become a leading Clean Energy Community.

New York State's CSC and NYSERDA's CEC are both points-based systems tied to financial grant awards. Once a municipality registers for CSC it can advance to Bronze, Silver or Gold Certification levels by earning points awarded for completing specific actions. The benefits of CSC Certification include better scores on grant applications and state-wide recognition. To merit CSC Bronze Certification a municipality must earn 120 CSC points. So far, the Town has earned 47 CSC points. Producing a Government Operations GHG inventory is CSC Certification Action "Pledge Element 2: Inventory emissions, set goals, and plan for climate action" and has a value of 16 CSC points. Publishing the GHG inventory report will bring the Town 16 points closer to achieving its 2022 goal of CSC Bronze Certification Status.

A GHG inventory also counts towards NYSERDA's "Benchmarking" High Impact Action. Filing a GHG Inventory report will improve the Town's CEC ranking and ability to secure future CEC grants.

"The priorities outlined in this Climate Action Plan will put the Town of North Salem on a path to reach net carbon neutrality as follows: TBD% reduction in greenhouse gas (carbon dioxide, methane and nitrous oxide) emissions by 2030 and net zero emissions by 20XX-TBD."

–Town of North Salem Climate Action Plan: Goals

The Inventory provides data-driven insights the Town can use to set realistic, achievable 2030 GHG emission reduction goals and a net-zero target date in its Climate Action Plan.

APPROACH AND GHG PROTOCOL

To align with New York CSC PE2 Action: Government Operations GHG Inventory (The State of New York, 2021B) guidelines, The Inventory follows the **ICLEI Local Government Operations Protocol *For the quantification and reporting of greenhouse gas emissions inventories* Version 1.1** (The Protocol), May 2010. Partial, estimated Scope 3 emissions calculations follow the methodology of the World Resource Institute's (WRI) *Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions*, Category 7: Employee Commuting (WRI, 2013).

Per CSC *PE2 Action: Government Operations GHG Inventory*, The Inventory is "an accounting, analysis, and report of the GHG emissions resulting from the day-to-day operations of" the Town (The State of New York, 2021B). The Inventory summarizes the GHG emissions from the consumption of energy and materials in government buildings, from wastewater and water treatment facilities, from municipal vehicle fleets, from government-owned outdoor lighting, and from other sources" (The State of New York, 2021B).

GHG Inventory Parameters	
GHG Protocol	ICLEI Local Government Operations Protocol for the quantification and reporting of GHG emissions inventories Version 1.1
Base Year	**2019**
Time Frame	2019-2021
Organizational Boundary	**Operational Control**
Operational Boundary	Scopes 1, 2 and partial 3 (See page 6 for definitions of scopes 1, 2 and 3)

Base Year and Reporting Time Frame

The Inventory follows a regular calendar year with a base year of 2019. The Inventory reports on Scopes 1 and 2 emissions for 2019 through 2021 and Scope 3 emissions for 2021. 2019 and 2021 energy use and emissions are partially estimated (Please see Estimates section, below, for details). The Consultant set 2019 as the base year and three-year, 2019–2021 time frame for The Inventory's accounting of Scopes 1 and 2 emissions for the following reasons:

1. The Town implemented an energy efficiency LED retrofit project in October 2019. The 2019–2020, year-over-year inventory results demonstrate the GHG emissions reductions resulting from that program.
2. The Town had complete data for 2020 and partial (~80%) data for 2019 and 2021.
3. Including partially estimated 2021 results in The Inventory, provides insights on trends and, importantly, validates whether the emissions reductions resulting from 2019 energy efficiency initiatives were short-term or permanent reductions.

Stakeholders

Stakeholders of this inventory include the Town's executive leadership, the Town Board, the Town CSC Leadership Committee, the Town's employees, and North Salem residents.

Definition of Boundaries

Organizational boundary

The Inventory employs an Operational Control (ICLEI, 2010) organizational boundary encompassing the emissions produced by buildings, vehicles water districts and street-lights owned, leased, and operated by the Town. Scope 3 emissions encompass emissions produced by full-time employees' vehicles used during their commutes to work.

Operational boundaries

As specified in The Protocol, this GHG inventory categorizes direct and indirect emissions into "scopes" following the WRI/WBCSD GHG Protocol Corporate Standard. This GHG inventory covers Scopes 1, 2 and 3 as follows:

SCOPE 1: **Direct GHG emissions (excluding direct biogenic CO_2 emissions) from heating fuel used in buildings and facilities, and fuel used for transportation under the operational control of the Town.**

SCOPE 2: **All indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling used by buildings, streetlights and traffic signals, water delivery facilities, and wastewater facilities under the operational control of the Town.**

SCOPE 3: **Estimated indirect 2021 emissions resulting from the Town's full-time employees' commutes to and from work.**

Note: Fugitive emissions are not included in The Inventory as data was not available.

Categorization of Emissions – Local Government Sectors

The Inventory categorizes emissions sources under two broad sectors – Stationary and Transportation – and the following local government sub-sectors:

Stationary	Buildings and other facilities	**Transportation**	Vehicle Fleet
	Streetlights and traffic signals		
	Water delivery facilities		Employee Commuting
	Wastewater facilities		

The Town does not operate port, airport, power generation or solid waste facilities, or a transit fleet so these sectors are not covered in The Inventory.

The Town's GHG Emission Sources

The Town's GHG emissions sources include buildings, water delivery and wastewater facilities, streetlights and traffic signals, and vehicles under the Town's operations control. The Town's Buildings and Wastewater Facilities use electricity as well as a variety of heating and energy generation fuels. Please see Appendix B for fuel use by building and facility. The Town's Streetlights and Traffic Signals, and Water Delivery Facilities are powered by electricity. The Town's Vehicle Fleet includes a variety of gasoline- and diesel-powered internal combustion engine vehicles and equipment. Please see Appendix D for a list of vehicles and fuel used.

The Inventory is a year-over-year analysis of GHG emissions by:

Sector • Subsector • Property • Energy Source • Scope

Town of North Salem GHG Emission Sources

Stationary

Buildings and Other Facilities

- 66 June Road
- Annex
- Lobdell House
- North Salem Highway Department
- Ruth Keeler Memorial Library
- Town Hall

Streetlights and Traffic Signals

- 667 Titicus Rd Barn – Balanced Rock Street Light
- Route 116 Lights
- Purdy's Lighting District Street Lights
- Street Lights at Large
- Croton Falls Lighting District Street Lights
- Near 28 Sunset Drive – Joe Bohdrum Park Lights
- 4 West Cross Street Parking Lot Lights
- Near 2 Cross Street Parking Lot Lights
- Back Street Lot Lights
- June Road – Courthouse Parking Lot
- Close Hill Road Christmas Tree

Transportation

Vehicle Fleet

- Highway Department Fleet
- Police Car Fleet
- Animal Conrol Van
- Building Department Cars
- Senior Services Car
- Recreation Deptartment Vehicle

Please see Appendix D for a complete list of The Town's fleet of vehicles

Water Delivery Facilities

- Jessitar Road Pump – Candlewood Park Water District Well Pump
- Nash Road – Candlewood Park Water District Source of Supply
- Lakeview Road – Salem Acres Water Disctrict Source of Supply
- 8 Close Hill Road Pump Station
- Mahopac Ave. Pump House – Croton Falls Water District
- Route 22 – Croton Falls Water District
- Ridgeway Ave. – Sunset Ridge Water District

Wastewater Facilities

- Peach Lake Sewer District – 10 Maple Lane
- East Peach Lake Road Pump House
- Bridge Street Pump House – Peach Lake Sewer

Employee Commutation

- 30 full-time employee cars
- Estimate assumes all employee vehicles are gas-powered, internal combustion engine cars

GHG Emission Factors and Global Warming Potential (GWP)

The Inventory uses emission factors from the EPA.gov GHG Emissions Factors Hub, April 2021 to calculate Scope 1 Stationary Source GHG emissions including #2 fuel oil, natural gas, and propane; Scope 1 Transportation emissions including diesel and gasoline; and Scope 3 Employee Commuting emissions (EPA, 2021). The Inventory uses the EPA eGRID Summary Tables 2019 for the sub-region NYCW (NPCC NYC/Westchester) to calculate emission factor for Scope 2 electricity for Stationary and Transportation source emissions (EPA, 2021).

GWP values from IPCC AR4 of 25x for Methane (CH_4), and 298 for Nitrous Oxide (N_2O) were used (IPCC, 2007).

Please see Appendix A for a complete list of Emissions Factors, GWP and Conversions used in The Inventory.

GHG Gases Included in the Inventory

Emissions from the following greenhouse gases are included in the Inventory:

- **Carbon Dioxide, CO_2 (GWP=1x)**
- **Methane, CH_4 (GWP=25x)**
- **Nitrous Oxide, N_2O (GWP=298)**

Global warming potential (GWP) is how much a GHG contributes to global warming relative to one unit of CO_2. CH_4 and N_2O retain 25 and 298 times more atmospheric heat, respectively than CO_2.

Carbon Dioxide equivalent (CO_2e) is the combined impact of CO_2 + CH_4 + N_2O emissions adjusted for their GWPs.

Data Collection Process

Interviews

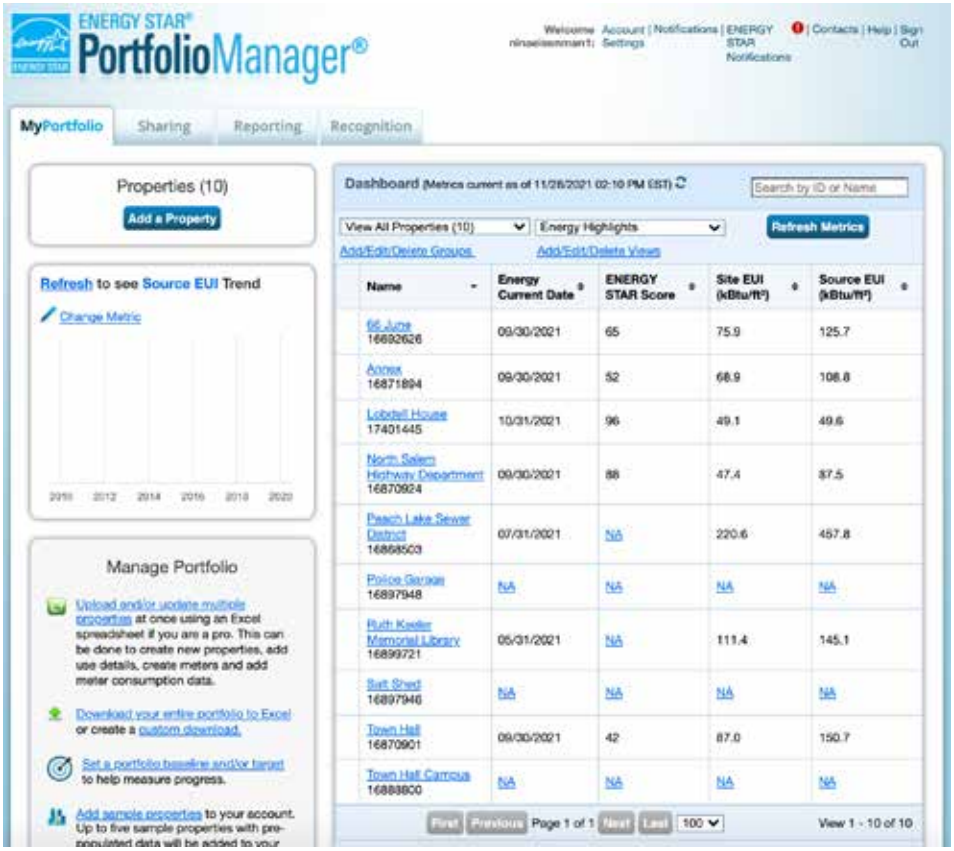
In addition to collecting data from the sources listed below, The Consultant conducted interviews with Town Supervisor Lucas and Town Clerk Hlushko.

Buildings and Other Facilities

The Town uses the Energy Star® Portfolio Manager® (Portfolio Manager) online platform to record and track energy use data for buildings operated by the Town. The Consultant was provided with a Portfolio Manager account and given an orientation on how to access building energy data. It was found that some energy use data was missing or had to be updated or amended. Town Clerk Hlushko reviewed all 2019 to 2021 Portfolio Manager data for accuracy and made adjustments as necessary. The Consultant then designed a three-year electricity and fuel use report for all buildings using Portfolio Manager's reporting feature. Portfolio Manager reports convert raw energy bill data into energy use activity data with units that can easily be used for GHG emissions analysis segmented by yearly or monthly time periods. However, Portfolio Manager's reporting function requires a full year of data to generate a report. The Town's 2019 and 2021 energy use data was incomplete and so the three-year report only generated 2020 results with "Not Available (NA)" results for 2019 and 2021. Consequently, The Consultant downloaded individual Excel files from Portfolio Manager for each energy source used by each property. This method provided all the necessary data, however the exported data was the raw electricity and fuel bill data the Town had entered into the system. Importantly, this data was segmented by billing cycles, rather than months or year. Some billing cycles span two years. Estimates were made for energy use attributable to each specific year for billing periods that overlapped two years.

Data for the Wastewater Facility, Peach Lake Sewer District Sewage Plant, was also sourced from the Portfolio Manager platform using this same method.

Maria Hlushko, North Salem Town Clerk



ENERGY STAR PARTNER

ENERGY STAR®

"ENERGY STAR® is a joint program of the Environmental Protection Agency (EPA) and the Department of Energy (DOE). Its goal is to help consumers, businesses, and industry save money and protect the environment through the adoption of energy-efficient products and practices" (Glickman, 2021)

The Town uses the Energy Star® Portfolio Manager® (Portfolio Manager) online platform to record and track energy use data for buildings operated by the Town.

Streetlights and Traffic Signals, Water Delivery Facilities, and Wastewater Facilities

Town Clerk Hlushko provided The Consultant with a spreadsheet with 2019, 2020 and 2021 electric bills for all meters including all streetlights, parking lights, water delivery facilities and sewers under the Town's operational control.

Transportation – The Town Fleets

"Fuelmaster" vehicle fuel use reports, as well as the number and types of vehicles in the Town's fleets were provided by The Highway Department. The fuel data for all Highway Department Fleet vehicles was provided as yearly totals, in gallons, of diesel and gasoline used for the Highway Department Fleet, the Police Car Fleet, and other vehicles under the Town's operational control. (Please see Appendix D for a full list of vehicles).

Scope 3 – Employee Commuting

Town Clerk Hlushko provided The Consultant with a spreadsheet specifying the number of full-time employees and the towns they commute from. Please see Appendix E for Employee Commuting data.

Tools and calculations used to report emissions

CO_2, CH_4, N_2O and CO_2e emissions from all sources within the Town's operational boundary were calculated using emissions factors and GWPs listed above in section "*GHG Emission Factors and Global Warming Potential (GWP)*". An "Activity Data" Excel worksheet containing all raw data was created. Please see Appendix B for Activity Data. Individual Excel worksheets for Stationary and Transportation emissions used data from the Activity Data sheet and conversion factors to make all units consistent with emission factor units and calculate emissions for all activities under the Town's operational control. A separate Excel worksheet was created for Scope 3 Employee Commuting emissions calculations. Excel pivot tables and charts for various subsets of data were created to chart year-over-year GHG emissions. A 2020 Portfolio Manager GHG Emissions report encompassing the Town's buildings was generated and used to validate the estimated emissions values calculated using the method described above.

Energy Use and GHG Emissions Estimates

The Inventory relies on estimated energy use data in certain circumstances for the following reasons:

- 2021 energy use data was incomplete. For most of the Town's GHG emissions sources, 2021 energy use data was available for January 2021 through October 2021, however in a few cases data was only available through June 2021. Estimates for missing 2021 energy use data were made using average 2019 and 2020 energy use for the same time periods.
- Energy use data based on the Town's electricity and heating fuel bills is segmented by billing cycles, rather than by month or year. Billing periods for electricity and heating fuel vary and some billing periods span two years. When a single billing period spanned two years, the energy used attributed to each year was estimated.
- Streetlight and traffic light energy use is estimated. NYSEG, the Town's electric company, does not calculate Streetlight energy use using individual electric meters. Instead, NYSEG calculates daily streetlight energy use by multiplying wattage of each light fixture and bulb by the number of non-daylight hours in the specific day. If a streetlight bulb burns out or a fixture in broken, NYSEG will report and bill for energy use as if the fixture and bulb are working, rather than reflecting zero energy use.
- Water delivery and wastewater facility energy use for 2020 and 2021 as stated on NYSEG electricity bills was estimated. Energy use for these sources is relatively steady year over year. NYSEG crews were not reading electric meters during the height of the COVID-19 pandemic and NYSEG's bills based on estimates rather than actual meter readings ranged widely, resulting in a false appearance of energy use fluctuations.
- The Town's Highway Department vehicle fuel use data was provided as total, consolidated yearly fuel use for all Highway Department fleet vehicles. Vehicles included a mix of on and off-road trucks and maintenance equipment. The Consultant used emissions factors for "Agricultural Off-road Trucks" as the best approximation for the mix of Highway Department vehicles to calculate Diesel CH_4, Diesel N_2O, Motor Gasoline CH_4, and Motor Gasoline N_2O emissions. Please see Appendix D for a list of Highway Department vehicles.

GHG EMISSION RESULTS AND ANALYSIS

Town of North Salem GHG Emissions by Subsector and Scope 2019–2021 (tCO_2e)									
	Stationary					Transportation			
	Buildings and Other Facilities	Streetlights and Traffic Signals	Wastewater Facilities	Water Delivery Facilities	Stationary Total	Town Fleet	Employee Commuting	Transportation Total	Total
2019	124	30	145	41	341	326		326	**667**
Scope 1	80		44		124	326		326	450
Scope 2	44	30	101	41	217				217
2020	115	17	130	30	291	296		296	**587**
Scope 1	71		39		110	296		296	405
Scope 2	43	17	91	30	182				182
2021	116	17	124	26	283	319		319	**603**
Scope 1	76		40		116	319		319	435
Scope 2	39	17	85	26	167				167
Scope 3							49		49

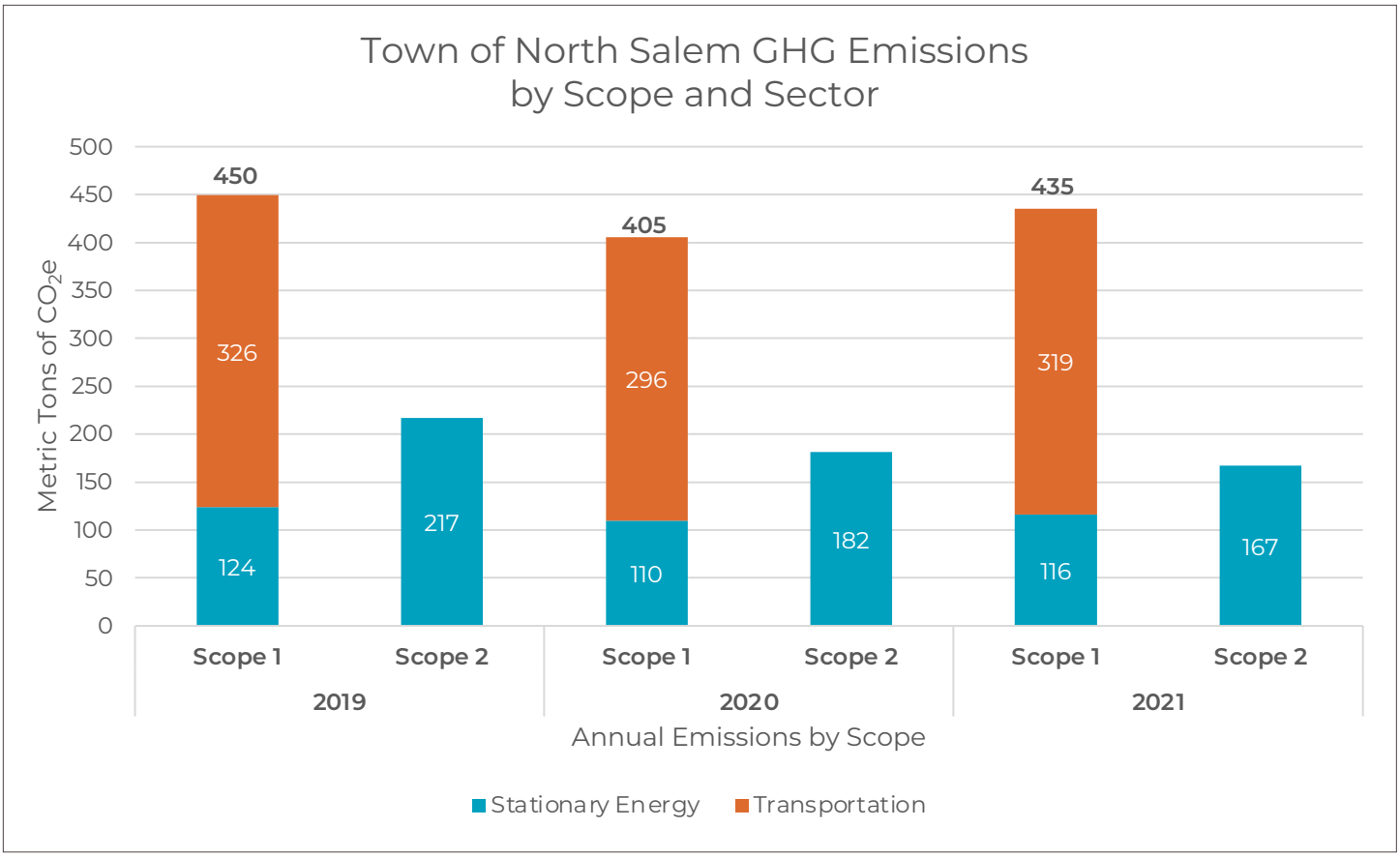
Overview

The Town's total 2019, 2020 and 2021 combined Scope 1 and 2 emissions were 667, 587 and 603 metric tons of CO_2 equivalent (tCO_2e) respectively. This represents a 12% year-over-year (YoY) decline in combined Scope 1 and 2 GHG emissions from 2019 to 2020, a 3% increase from 2020 to 2021 and a three-year decline of 10% from 2019 to 2021. The largest contributing sub-sector to combined Scope 1 and 2 GHG emissions was Vehicle Fleet by a wide margin at 326, 296 and 319 tCO_2e followed by Wastewater Facilities at 145, 130 and 124 tCO_2e and Buildings and Other Facilities at 124, 115 and 116 tCO_2e for 2019, 2020 and 2021 respectively. See Appendix C for a complete accounting of GHG emissions by source and gas.

In all three years, the Town's Scope 1 emissions were more than double Scope 2 emissions. Scope 1 emissions declined 10% YoY from 450 to 405 tCO_2e in 2019 to 2020 respectively, primarily due to lower Vehicle Fleet fuel, use but bounced back up 7% to 435 tCO_2e in 2021. Scope 2 emissions declined 16% YoY from in 2019 to 2020 respectively and declined an additional 8% in 2021 due to the Town's LED energy efficiency program.

Estimated Scope 3 GHG emissions attributable to full-time employee commuting was 59 tCO_2e, higher than GHG emissions from Streetlights and Traffic Signals, and Water Delivery Systems, Scope 2 emissions from Buildings and Other Facilities and Scope 1 emissions from Wastewater Facilities. Please see Appendix E for 2021 Scope 3 emissions calculations.

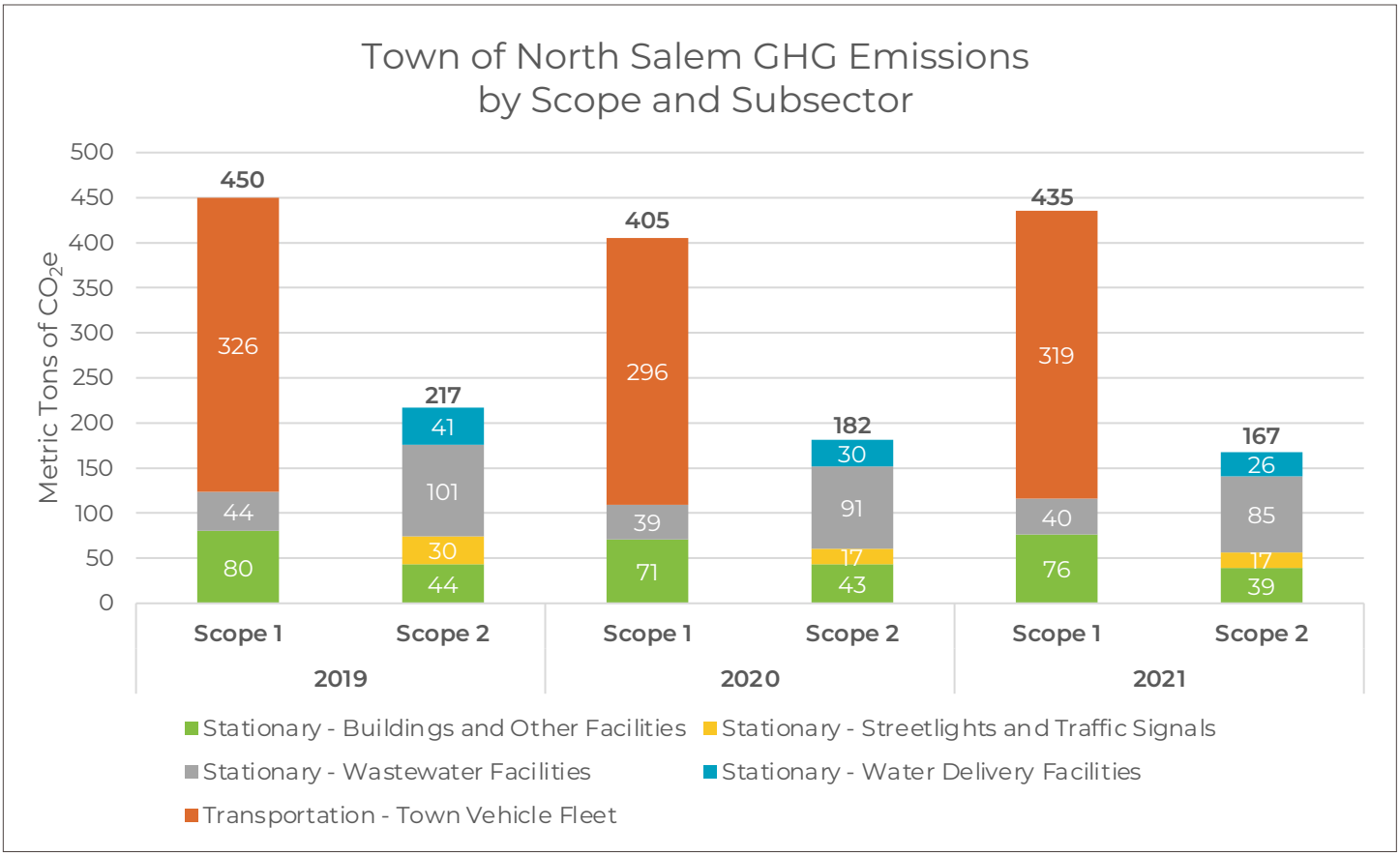
Details about GHG emissions by sector and sub-sector follows.

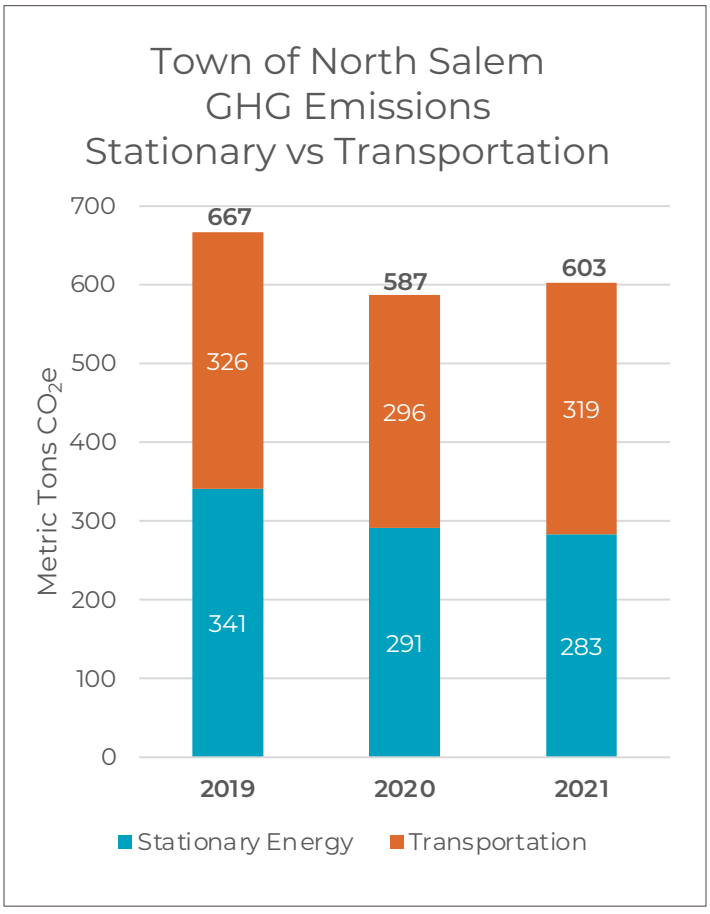


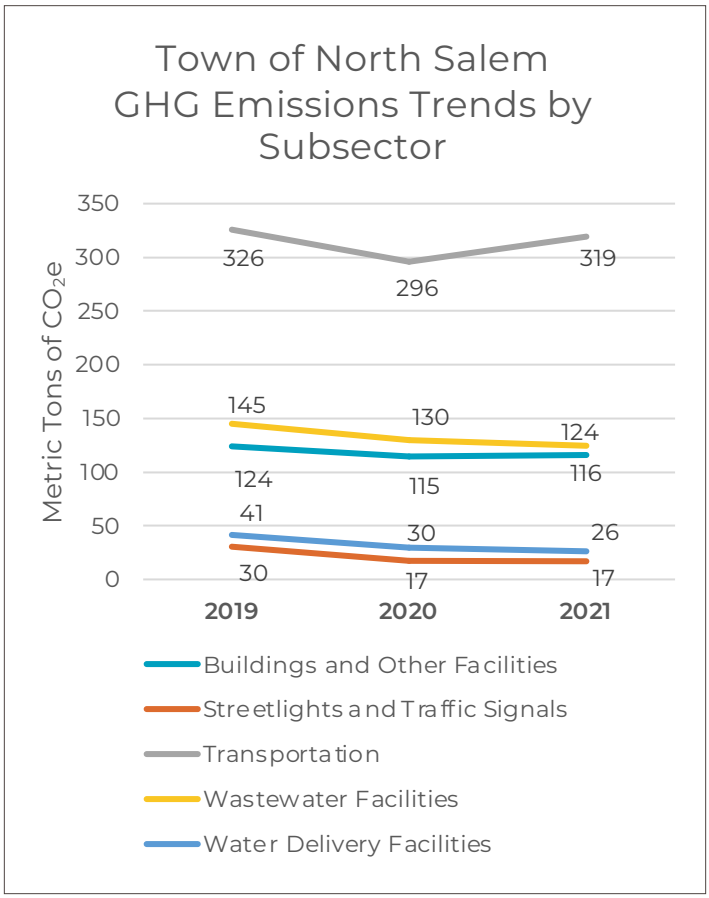
Stationary vs Transportation

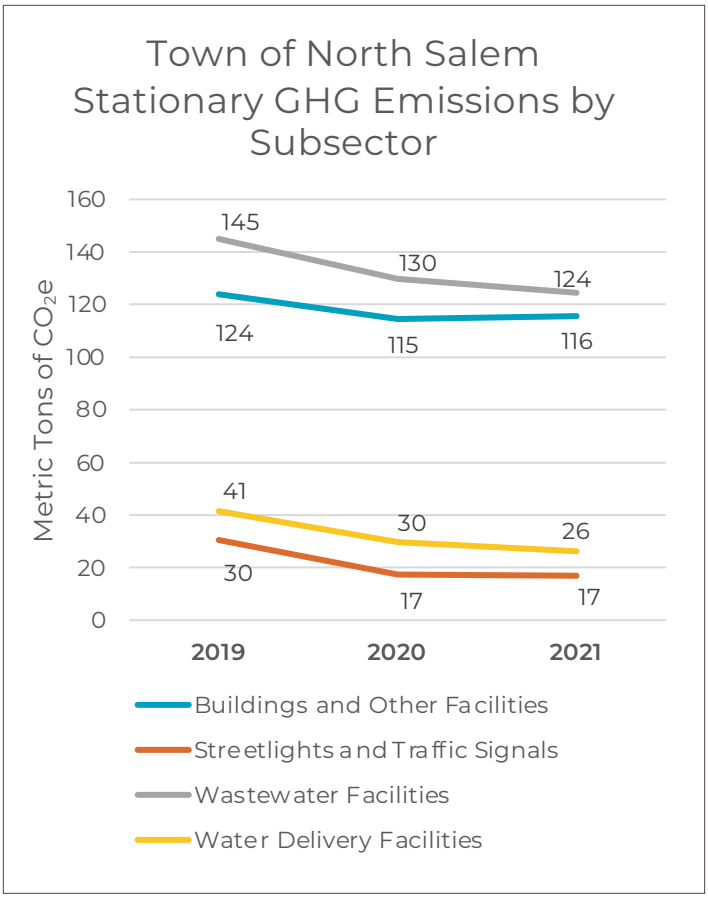
In base year 2019, the Stationary sector was responsible for the majority of the Town's GHG emissions at 341 tCO_2e. That is 5% greater than the 326 tCO_2e of emissions from the Transportation sector in the same year. In October 2019, the Town implemented an LED energy efficiency upgrade to its streetlights and some of its building as part of the NYSEG Energy Saver Program. The LED retrofit initiative resulted in YoY Stationary GHG emissions reductions of 15% from 2019 to 2020 of 341 to 291 tCO_2e respectively and a further 3% YoY reduction to 283 tCO_2e in 2021. Transportation sector emissions declined 9% in 2020 YoY from the base year to 296 tCO_2e but exceeded emissions from stationary sources by a narrow margin. The 2020 reduction in Transportation sector emissions was due to a mild winter (January – March 2020) with almost half the snow fall of the corresponding 2019 or 2021 time periods. The unusually light snowfall resulted in reduced Highway Department snowplows and other vehicles use. Emissions from the Transportation sector bounced back up 8% to 319 tCO_2e in 2021. In 2021, emissions from the Transportation sector's diesel and gasoline powered fleet were the Town's largest sources of emissions, exceeding emissions from the Stationary sector by 13%.

In 2021, the Town's diesel and gasoline powered fleet were largest sources of emissions. Transportation sector emissions exceeded emissions from the Stationary sector by 13%.


Town of North Salem GHG Emissions
by Scope and Subsector
Metric Tons of CO_2e
500
450
400
350
300
250
200
150
100
50
0
450
326
44
80
217
41
101
30
44
405
296
39
71
182
30
91
17
43
435
319
40
76
167
26
85
17
39
Scope 1
Scope 2
Scope 1
Scope 2
Scope 1
Scope 2
2019
2020
2021
Stationary - Buildings and Other Facilities
Stationary - Streetlights and Traffic Signals
Stationary - Wastewater Facilities
Stationary - Water Delivery Facilities
Transportation - Town Vehicle Fleet


Town of North Salem
GHG Emissions
Stationary vs Transportation
Metric Tons CO_2e
700
600
500
400
300
200
100
0
667
326
341
587
296
291
603
319
283
2019
2020
2021
Stationary Energy
Transportation


Town of North Salem
GHG Emissions Trends by
Subsector
Metric Tons of CO_2e
350
300
250
200
150
100
50
0
326
296
319
145
130
124
124
115
116
41
30
26
30
17
17
2019
2020
2021
Buildings and Other Facilities
Streetlights and Traffic Signals
Transportation
Wastewater Facilities
Water Delivery Facilities



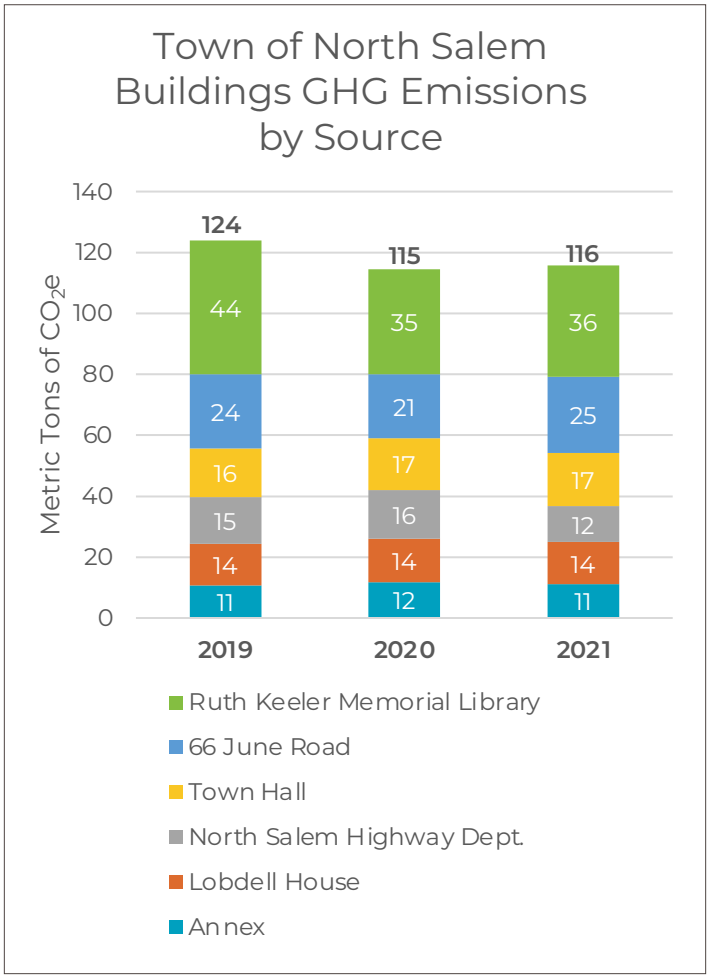
Ruth Keeler Memorial Library emits the most GHG of all Buildings and Other Facilities with ~89% of the library's emissions attributable to #2 fuel oil.

Stationary

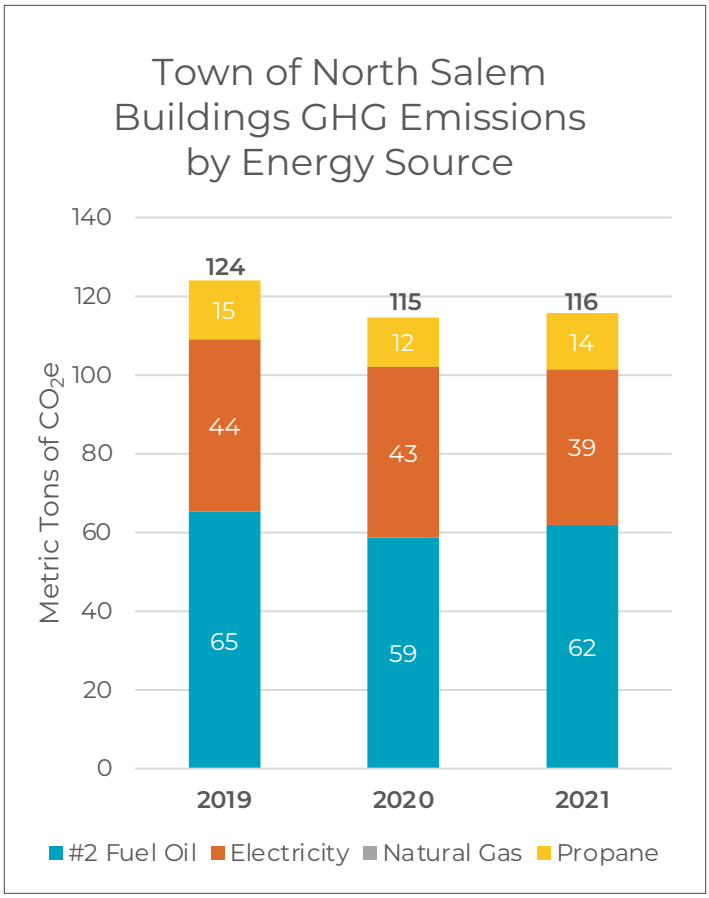
Of the Stationary sector, the largest GHG emissions contributing sub-sector is Wastewater Facilities followed closely by Buildings and Other Facilities.

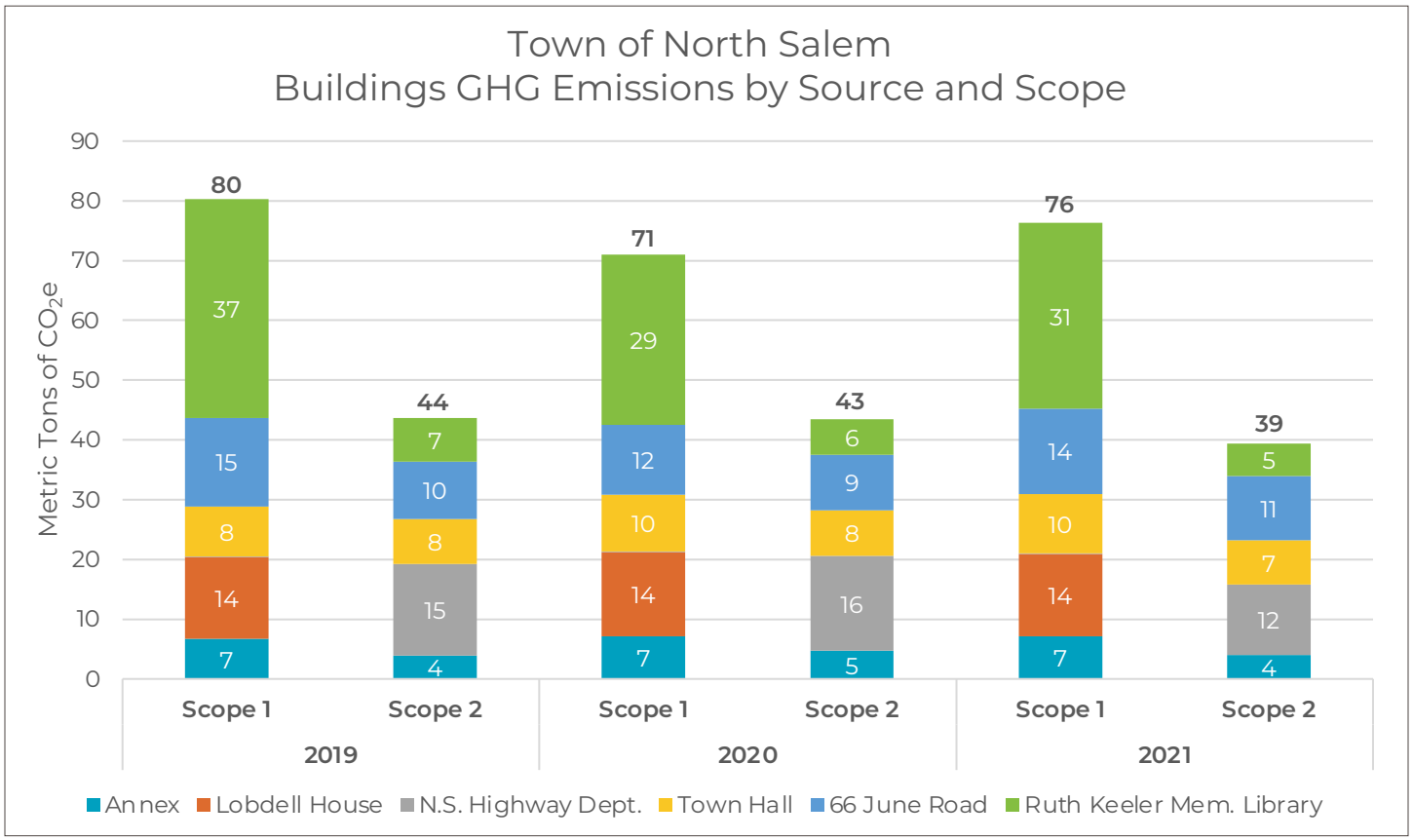
Buildings and Other Facilities

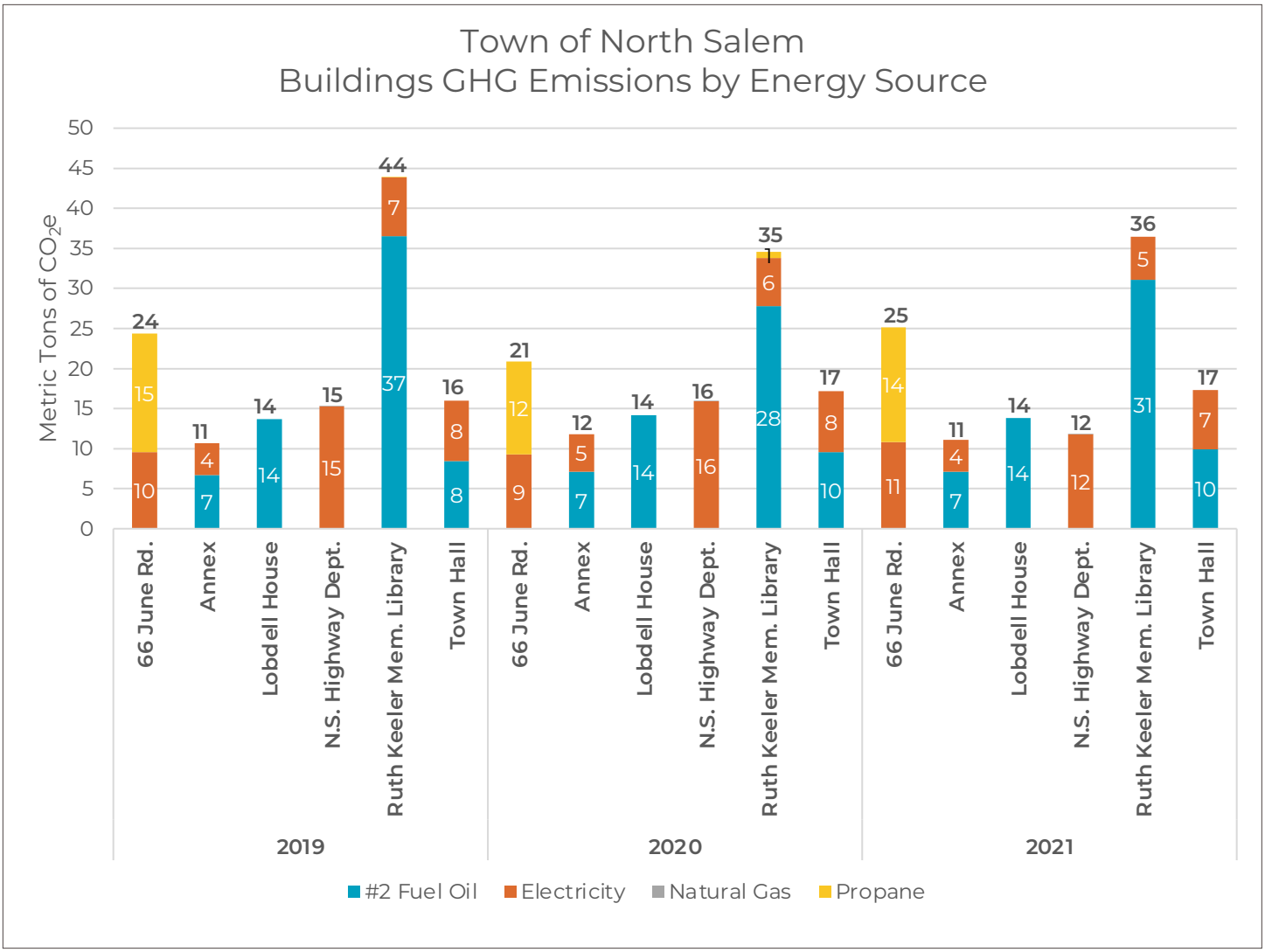
Emissions from Buildings and Other Facilities declined 6% from 2019 to 2020 primarily due to a NYSEG-sponsored LED lighting retrofit project that the Town implemented in late 2019. According to Town Supervisor Lucas, building fixtures and bulbs, including 66 June Road's fluorescent light fixtures and bulbs as well as the North Salem Highway Department's mercury halide vapor fixtures and bulbs were replaced with LED bulbs that use half the energy of the bulbs they replaced. Building and Other Facilities emissions come from a combination of energy sources, including electricity, #2 fuel oil,



propane, natural gas. In all three years, over half of all building emissions were attributable to #2 fuel oil. Ruth Keeler Memorial Library contributed the most GHG emissions of all Buildings and Other Facilities in all three years with ~89% of the library's emissions attributable to #2 fuel oil, 10% to electricity and 1% to propane in 2020. The library's energy use declined 18% YoY from 2019 to 2021 and an additional 10% due to the LED light bulb program as well as reduced public programming related to COVID-19. It is interesting to note that, although the North Salem Highway Department's yearly electricity use is more than double that of Ruth Keeler Memorial Library, the Highway Department's 2020 Scope 1 and 2 GHG emissions were less than a third that of the library. The library's comparatively higher GHG emissions are due to the building's use of #2 oil for heating.







Although the North Salem Highway Department building's yearly electricity use is more than double that of Ruth Keeler Memorial Library, the Highway Department's 2020 Scope 1 and 2 emissions were 32% that of the library. The library's comparatively higher GHG emissions are due to #2 oil use.

Wastewater Facilities

The Wastewater Facilities subsector contributes approximately 44% of all Stationary Scope 1 and 2 GHG emissions, making it the largest subsector contributor to the Town's Stationary GHG emissions. 96% of the Town's Wastewater Facilities energy use is attributable to the Peach Lake Sewer District sewer plants with the remaining 4% used by the Sewers. 98% of the Peach Lake Sewer District Wastewater Facilities emissions are attributable to the electricity used to power its pumps with the remaining 2% attributable to propane. According to billing data used for The Inventory, total Wastewater Facility emissions from the Peach Lake Sewer District and Sewers appears to have declined 14% from 2019 to 2021. However, according to the Town Supervisor, energy use by the Town's Wastewater Facilities is relatively stable. The dramatic variations in energy use reflected in data from NYSEG electric bills is due to NYSEG not reading meters during the height of COVID-19 which led to highly inaccurate energy use estimates, as noted in the section, "Energy Use and GHG Emissions Estimates", above.

The Wastewater Facilities subsector contributes ~44% of the Town's Stationary Scope 1 and 2 GHG emissions. 96% of the Town's Wastewater Facilities energy use is attributable to the Peach Lake Sewer District.

Lobdell House, North Salem, NY

Salt Shed, North Salem, NY

Water Delivery Facilities

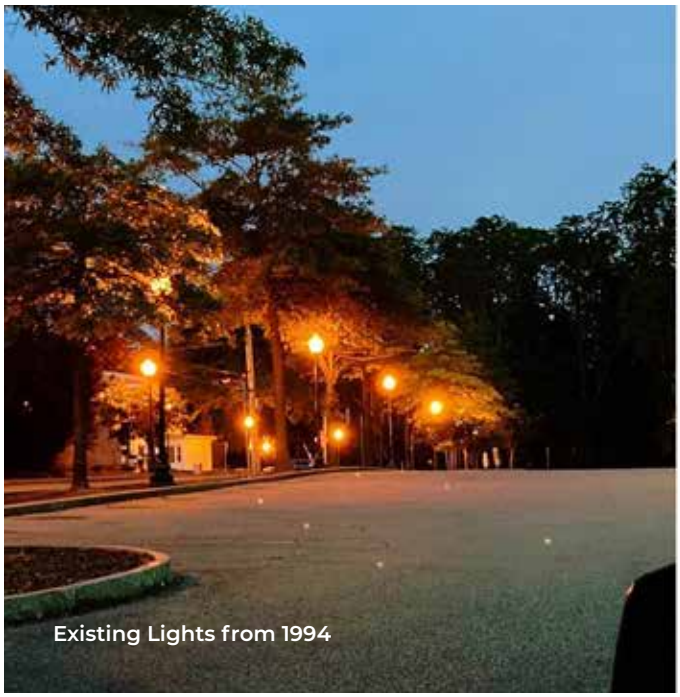
Water Delivery Facilities are responsible for, on average, 11% of the Town's Stationary sector emissions. Prior to the base year, the Town installed energy efficient variable frequency device (VFD) pumps that prevent start-up and shut-down amperage spikes wherever possible making the water delivery system's pumps very energy efficient. Water Delivery Facilities energy use is usually stable. Energy use data for The Inventory was sourced from the Town's NYSEG electric bills and as noted above, the accuracy of that data was negatively impacted by NYSEG's COVID-19-related lack of meter reading and inaccurate estimating. Overall water delivery facility energy use declined in 2020 due to a pump shutdown caused by invasive watercress flooding the Cottage Lane area of Peach Lake, submerging a manhole with lake water, and burning out the pump.

Court and Police Building, North Salem, NY

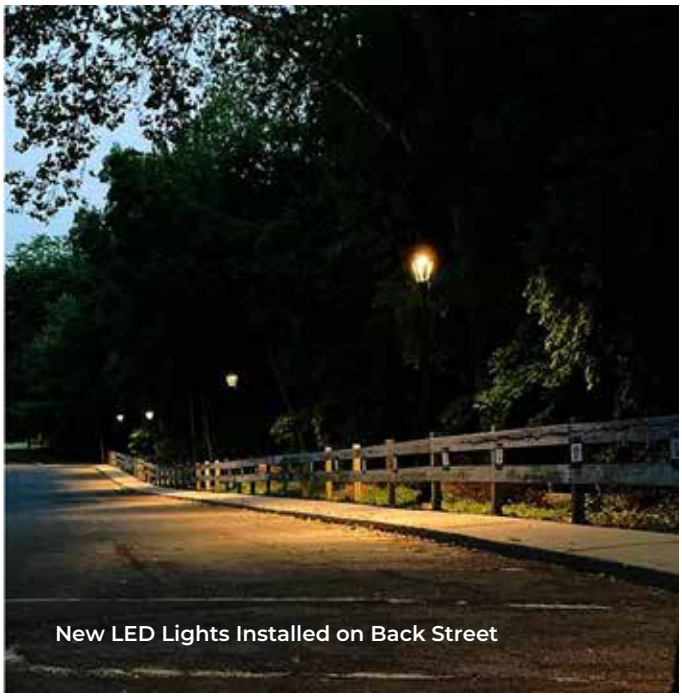
Annex Lobdel Store, North Salem, NY

Streetlights and Traffic Signals

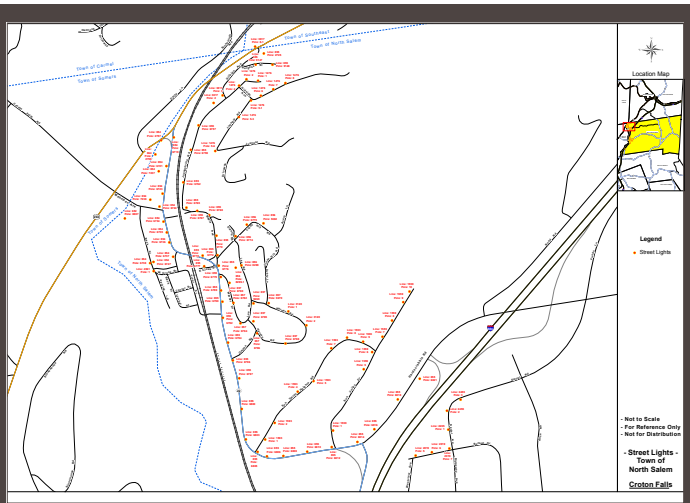
In 2019, Streetlights and Traffic Signals emitted 30 tCO_2e, accounting for 9% of the Town's Scope 1 and 2 Stationary emissions. In October 2019, North Salem implemented an NYSEG-sponsored energy efficiency LED streetlight program, retrofitting all town streetlights with LED fixtures and bulbs. This initiative led to a reduction in Streetlights and Traffic Signals' reported energy use (and associated energy costs) of 50% and reduced GHG emissions from 30 to 17 tCO_2e. Not all lights included in this sub-sector are streetlights. The overall 2019 to 2020 reduction in emissions from the Streetlights and Traffic Signals sub-sector was 43%. The LED initiative dropped the subsector's contribution to Stationary GHG emissions from 9% to 6%. As noted in the Estimates section of the Inventory, Streetlights and Traffic Signals daily energy use is estimated by NYSEG by multiplying the wattage of each streetlight by the number of non-daylight hours.



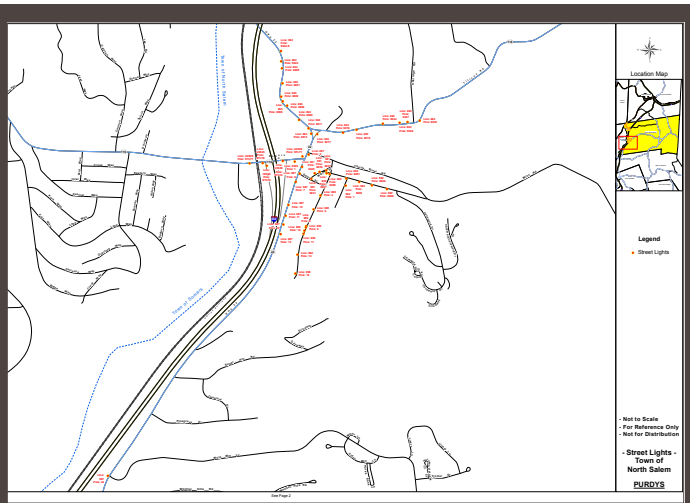
Existing Lights from 1994



New LED Lights Installed on Back Street



Croton Falls Street Lights



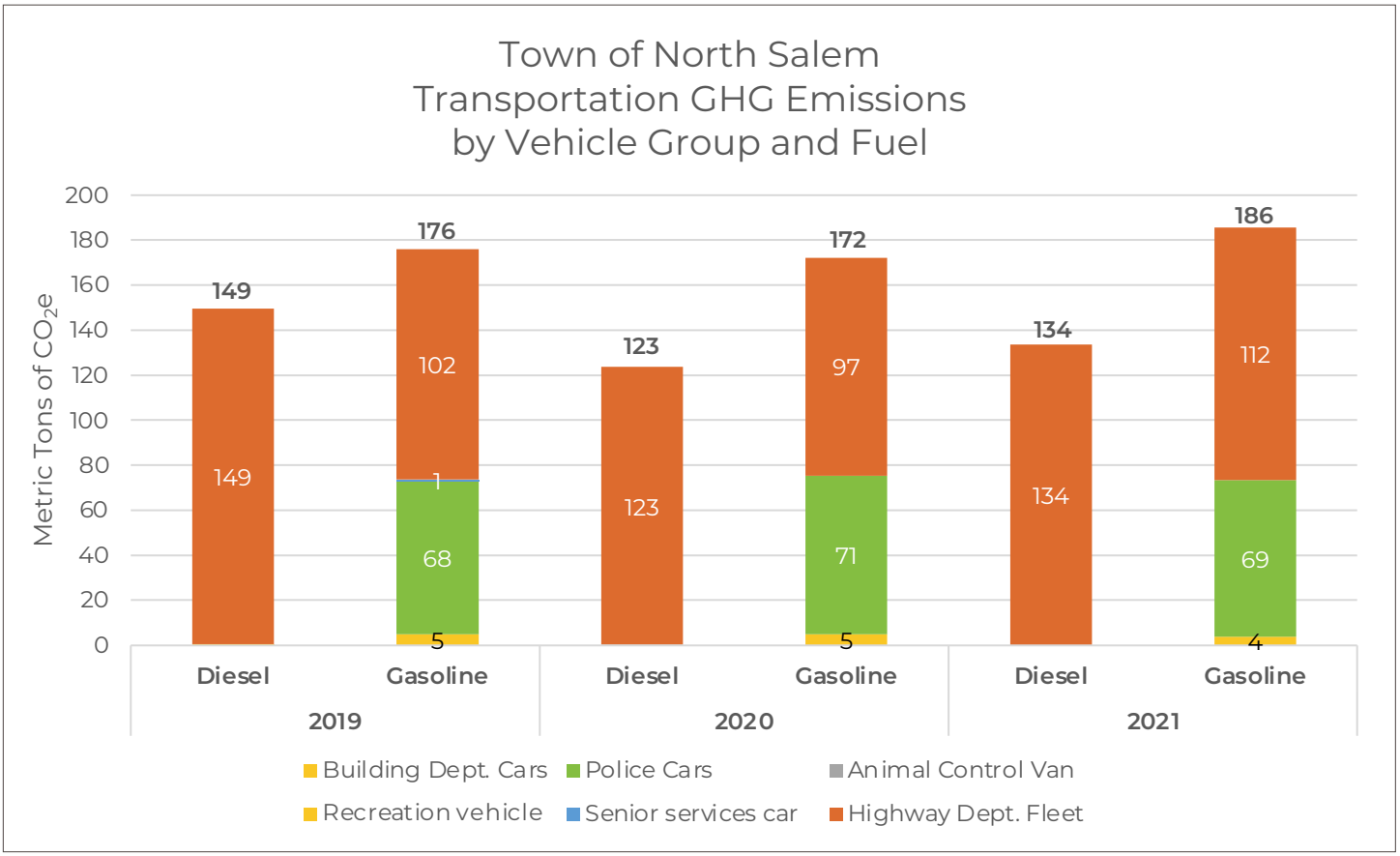
Purdy's Street Lights

Transportation

Town Fleets

The Transportation sector is responsible for 51% of the Town's Scope 1 and 2 GHG emissions, on average. Approximately 75% of Transportation sector emissions and 39% of all the Town's Scope 1 and 2 emissions are attributable to the Highway Department's fleet of diesel and gasoline powered, internal combustion engine (ICE) vehicles. The fleet includes snowplows, dump trucks, pickup trucks, and lawn maintenance equipment. Please see Appendix D for a list of all Town Fleet vehicles and the fuel they use. ~56% of the Highway Department fleet's emissions come from diesel-powered vehicles. Although diesel engines are ~20% more thermal efficient than gas-powered engines, translating into 20% better fuel economy, (UTI, 2019) diesel is 16% more GHG intensive than gasoline with a GHG emission factor of 10.21 kg CO_2/gallon compared to gasoline's 8.78 kg CO_2/gallon. Another 21–24% of Transportation emissions are attributable to the Town's fleet of gasoline-powered, ICE police cars.

The Transportation sector is responsible for roughly 51% of Scope 1 and 2 GHG emissions. Approximately 75% of Transportation emissions and 39% of all of the Town's Scope 1 and 2 emissions are attributable to the Highway Department's diesel and gas-powered, internal combustion engine (ICE) vehicles.



OPPORTUNITIES FOR ENERGY EFFICIENCY, INNOVATION, AND RISK MANAGEMENT

Stationary

Wastewater Facilities and Buildings and Other Facilities are the Town's two largest contributors to Stationary GHG emissions. The Town has already implemented several energy efficiency measures including the NYSEG LED light project and the switch to VFD pumps described above. The Town should consider additional energy efficiency measures, including solar power, to lower electricity related GHG emissions in these two subsectors. #2 fuel oil is the largest energy source of Building and Other Facility emissions. The Town should therefore explore investing in lower emitting heating options such as electric heat pumps and geothermal systems. Prior to the Inventory base year, The Town installed radiant heat floors and improved insulation in the North Salem Highway Department building, lowering the building's heating fuel use significantly and, according to the Town Supervisor "paying dividends". The results of this inventory encourage further investments in energy efficiencies. Ruth Keeler Memorial Library emits the most GHG of Buildings, predominantly due to #2 fuel oil. The library should be targeted for energy efficiency heat pumps, geothermal and solar upgrades. By switching from #2 fuel to a heat pump, the library could lower its emissions by roughly 18 tCO_2e a year or 53% of its total emissions (New Hampshire Electric Co-op, 2021).

Transportation

Transportation was the largest contributor to the Town's combined Scope 1 and 2 emissions in 2020 and 2021 with Highway Department Vehicles responsible for, on average, 77% of Transportation GHG emissions. Conversion of the transportation fleet to EV or hybrid vehicles is the Town's greatest opportunity for energy efficiency and emissions reductions. The Town recently placed orders for three hybrid police cars and a fourth has been donated by a North Salem resident. As mentioned above, diesel engines are more energy efficient than gasoline-powered engines, but diesel has a higher GHG emission factor. The Town should convert as many of its Highway Department Vehicle Fleet as practicable to hybrid or EV. Retrofitting a snowplow truck with a hybrid electric system can reduce emissions by 20% while a plug-in hybrid retrofit can reduce emissions by 33% on average (SnowPlowNews, 2021). Reducing the Highway Department Fleet's 2021 emissions of 246 tCO_2e by 20% would equate to a reduction of 49 tCO_2e which is 8% of the Town's total 2021 Scope 1 and 2 emissions. A 33% reduction in the Highway Department Fleet's 2021 emissions would reduce the Town's overall Scope 1 and 2 emissions 13%.

FUTURE GHG BENCHMARKING AND GOALS

Going forward, a yearly GHG Inventory should be conducted using 2019 as the base year. The yearly GHG inventory should be conducted as soon as a full year of energy use bills are available, in February (if possible) with the yearly GHG Inventory Report to be published in March or April. This Inventory and the Excel document created for The Inventory, including the Activity Data and Stationary and Transportation Emissions templates are tools that can be updated yearly to track the Town's municipal emissions and its progress against GHG emissions reductions goals. The Inventory shows that in three years, from the base year of 2019 to 2021, the Town lowered its Scope 1 and 2 GHG emissions by 10%. It is not unreasonable to suggest that **the Town set a conservative 2030 GHG emissions reduction target of 25% emissions reduction from the 2019 base year levels by 2030.** This would represent a reduction of 166.75 tCO_2e from base year 2019 down to 500.25 tCO_2e total Scope 1 and 2 by 2030. The Town should consider **a stretch 2030 target of 40% reduction** of GHG emissions from 2019 levels which would mean bringing emissions down 266.8 tCO_2e to 400.2 tCO_2e. Recommended "Phase II" GHG inventory and reporting steps are to: include optional indicators from The Protocol Section 13.1.2.4 including "drinking water treated" and "total vehicle miles traveled by on-road vehicles"; conduct a more comprehensive Scope 3 analysis for the Town; and conduct a Community Wide GHG inventory for North Salem.

Recommended Goals

25% reduction in GHG emissions by 2030 from 2019 base	**Stretch target of 40% GHG emissions reduction by 2030**	**2050 Net-zero target**	**Climate Smart Community Bronze Certification in 2022**

CONCLUSION

The Town has taken proactive energy efficiency and emissions reductions actions but there are ample opportunities for more reductions across Stationary and Transportation sectors. In 2021, transportation-related emissions accounted for 73% of Scope 1 emissions and 53% of all scope 1 and 2 emissions. Converting the Town's Transportation fleets from ICE to hybrid or EV presents the greatest opportunity for rapid emissions reductions. Using solar and heat pumps or geothermal to lower Building and Other Facilities emissions is also an opportunity for further emissions reductions. Conducting yearly GHG Inventories will help the town pinpoint the highest value emissions reductions opportunities. Improving the accuracy of the GHG Inventory data will result in more accurate accounting of current and YoY emissions efforts. Electricity bills reflect inconsistent time periods. YoY, quarter over quarter (QoQ) or month to month energy use and emissions comparisons must be estimated if electric bills are used as the data source. The Consultant recommends recording data from all electric meters at regular monthly, quarterly, or even yearly intervals to increase accuracy of period-over-period emissions data. In addition, one person should be responsible for entering all energy bills into Portfolio Manager and a second person should proof the entries for accuracy. The Inventory demonstrates that the Town is poised to be a Certified CSC and has the potential to be Westchester's leading Clean Energy Community.

Since taking the CSC pledge, the Town has made progress in lowering its GHG emissions. There are opportunities for further reductions. Converting the Town's Transportation fleets from ICE to hybrid or EV presents the greatest opportunity for rapid emissions reductions. Installing solar, heat pumps and/or geothermal to lower Building and Other Facilities emissions is an opportunity for significant emissions reductions as well.

APPENDIX A – EMISSIONS FACTORS, GLOBAL WARMING POTENTIAL AND CONVERSIONS

Emissions Factors, Global Warming Potential and Conversions			
Stationary (Source: GHG Emissions Factors Hub April 2021)			
	(kg CO2/mmBtu)	(kg CH4/mmBtu)	(kg N2O/mmBtu)
Nat Gas	66.88	0.003	0.0006
	(kg CO2/scf)	(kg CH4/scf)	k(g N2O/scf)
Propane	0.15463	0.000007548	0.00000151
Transportation (Source: GHG Emissions Factors Hub April 2021)			
	(kg CO2/gallon)	(kg CH4/gallon) (Agricultural offroad trucks)	(kg N2O/gallon) (Agricultural offroad trucks)
Diesel	10.21	0.00013	0.00049
Motor Gasoline	8.78	0.00724	0.00021
	(kg CO2/gallon)	(kg CH4/gallon)	(kg N2O/gallon)
#2 Fuel Oil	10.21	0.00041	0.00008
Scope 3 Category 7: Employee Commuting (Source: GHG Emissions Factors Hub April 2021)			
	(kg CO2/vehicle-mile)	(kg CH4/vehicle-mile)	(kg N2O/vehicle-mile)
Distance-based Commuting – Passenger Car	0.341	0.000009	0.000008
Electricity – total output emission factors (Source: eGRID 2019 NYCW)			
lbsCO_2/MWh	lbsCH_4/MWH	lbsN_2O/MWH	lbsCO_2e/MWH
553.8	0.021	0.002	555.1
kgCO_2/MWH	kgCH_4/MWh	kgN_2O/MWH	kgCO_2e/MWH
251.20368	9.53E-03	9.07E-04	251.79336
Global Warming Potential (Source: IPCC AR4)			
CO_2	1		
CH_4	25		
N_2O	298		
Conversions			
Liters/gallon	3.785	CCF/Therm	1.0
kg/lbs	0.4536	scf/gallon propane	35.97
MMBtu/therm	0.0999761	mmBtu/Therm	0.0999761
Therms/CCF	1.037		

APPENDIX B – 2019–2021 ENERGY USE ACTIVITY DATA BY SOURCE

Sector	Source	Units	Sub-sector	2019 Activity amount	2020 Activity amount	2021 Activity amount	ESTIMATED
	Buildings and Other Facilities						
Stationary Energy	Electricity	kWh	66 June Road	37,933	36,752	43,073	
	Propane Use	gallons	66 June Road	2,654	2,082	2,562	
	Electricity	kWh	Annex	15,678	18,662	15,775	
	B5 #2 fuel oil	gallons	Annex	656	693	694	
	B5 #2 fuel oil	gallons	Lobdell House	1,336	1,384	1,352	
	Electricity	kWh	North Salem Highway Department	60,798	63,096	46,818	
	Natural gas	therms	North Salem Highway Department	2,760	1,893	1,718	
	Electricity	kWh	Ruth Keeler Memorial Library	29,051	23,844	21,411	
	Propane Use	gallons	Ruth Keeler Memorial Library	7	137	-	
	B5 #2 fuel oil	gallons	Ruth Keeler Memorial Library	3,565	2,712	3,033	
	Electricity	kWh	Town Hall	29,967	30,304	29,385	
	B5 #2 fuel oil	gallons	Town Hall	821	930	969	
	Streetlights and Traffic Signals						
	Electricity	kWh	667 Titicus Rd Barn – Balanced Rock Street Light	2,317	3,327	4,449	
	Electricity	kWh	Route 116 Lights	2,247	1,432	1,181	
	Electricity	kWh	PURDYS LTG DIST – Purdy's Lighting District Street Lights	24,355	8,628	8,645	
	Electricity	kWh	Street Lights at Large	16,259	5,182	5,575	
	Electricity	kWh	Croton Falls Lighting District Street Lights	34,734	14,556	16,243	
	Electricity	kWh	Near 28 Sunset Drive – Joe Bohdrum Park Lights	1,156	1,288	1,178	
	Electricity	kWh	4 W CROSS ST LOT LGTS – Parking Lot Lights	15,713	13,921	10,496	
	Electricity	kWh	NEAR 2 CROSS ST PKNG LOT Lights	17,686	14,173	11,066	
	Electricity	kWh	BACK ST LOT LGTS	6,577	6,246	1,963	
	Electricity	kWh	JUNE RD – Courthouse Parking Lot	20	40	18	
	Electricity	kWh	Close Hill Road Christmas Tree	-	-	6,365	
	Water Delivery Facilities						
	Electricity	kWh	JESSITAR RD PUMP – Candlewood Park Water District Well Pum	980	1,046	1,147	
	Electricity	kWh	NASH RD – Candlewood Park Water District Source of Supply	16,217	14,559	9,560	
	Electricity	kWh	LAKEVIEW ROAD – Salem Acres Water Disctrict Source of Supply	-	-	9,788	
	Electricity	kWh	8 CLOSE HILL RD Pump Station	107	129	127	
	Electricity	kWh	MAHOPAC AVE PUMP HSE – Croton Falls Water District	46,977	32,191	13,658	
	Electricity	kWh	ROUTE 22 – Croton Falls Water District	57	57	24	
	Electricity	kWh	RIDGEWAY AVE – Sunset Ridge Water District	100,320	69,600	69,760	
	Wastewater Facilities						
	Electricity	kWh	Peach Lake Sewer District – 10 Maple Lane	372,150	340,400	314,800	
	Propane Use	gallons	Peach Lake Sewer District – 10 Maple Lane	7,800	6,899	7,098	
	Electricity	kWh	E PEACH LAKE RD PUMP HOUSE	21,833	14,753	15,178	
	Electricity	kWh	BRIDGE ST PUMP HOUSE – Peach Lake Sewer	8,770	7,105	6,998	
	Vehicle Fleet						
Transportation	Unleaded gasoline	gallons	Highway Trucks – (XX dump trucks, XX plows, XX pickup trucks & XX mowers)	11,348	10,734	12,439	
	Diesel	gallons	Highway Trucks – (XX dump trucks, XX plows, XX pickup trucks & XX mowers)	14,408	11,919	12,898	
	Unleaded gasoline	gallons	7 police cars	7,547	7,822	7,696	
	Diesel	gallons	Animal conrol	18	17	-	
	Unleaded gasoline	gallons	2 building department cars	536	536	439	
	Unleaded gasoline	gallons	Senior services car	80	-	-	
	Diesel	gallons	Recreation Dept	25	-	-	

APPENDIX C – 2019–2021 SCOPE 1 AND 2 GHG EMISSIONS DATA BY SUBSECTOR AND GASES

Buildings and Other Facilities				
	tCO2	tCH4	tN2O	tCO2e
2019	123.6	5.00E-03	8.14E-04	123.9
Scope 1	80.0	3.35E-03	6.56E-04	80.3
Scope 2	43.6	1.65E-03	1.57E-04	43.7
2020	114.2	4.60E-03	7.36E-04	114.5
Scope 1	70.8	2.95E-03	5.79E-04	71.0
Scope 2	43.4	1.64E-03	1.57E-04	43.5
2021	115.4	4.67E-03	7.66E-04	115.7
Scope 1	76.1	3.18E-03	6.24E-04	76.3
Scope 2	39.3	1.49E-03	1.42E-04	39.4

Wastewater Facilities				
	tCO2	tCH4	tN2O	tCO2e
2019	144.6	5.95E-03	7.89E-04	145.0
Scope 1	43.4	2.12E-03	4.24E-04	43.6
Scope 2	101.2	3.84E-03	3.65E-04	101.4
2020	129.4	5.32E-03	7.03E-04	129.7
Scope 1	38.4	1.87E-03	3.75E-04	38.5
Scope 2	91.0	3.45E-03	3.29E-04	91.2
2021	124.1	5.14E-03	6.91E-04	124.5
Scope 1	39.5	1.93E-03	3.86E-04	39.6
Scope 2	84.6	3.21E-03	3.06E-04	84.8

ESTIMATED

Transportation				
	tCO2	tCH4	tN2O	tCO2e
2019	318.8	1.43E-01	1.12E-02	325.7
Scope 1	318.8	1.43E-01	1.12E-02	325.7
2020	289.5	1.40E-01	9.86E-03	295.9
Scope 1	289.5	1.40E-01	9.86E-03	295.9
2021	312.3	1.51E-01	1.06E-02	319.3
Scope 1	312.3	1.51E-01	1.06E-02	319.3

Streetlights & Traffic Lights				
	tCO2	tCH4	tN2O	tCO2e
2019	30.4	1.15E-03	1.10E-04	30.5
Scope 2	30.4	1.15E-03	1.10E-04	30.5
2020	17.3	6.55E-04	6.24E-05	17.3
Scope 2	17.3	6.55E-04	6.24E-05	17.3
2021	16.9	6.40E-04	6.09E-05	16.9
Scope 2	16.9	6.40E-04	6.09E-05	16.9

Water Delivery Facilities				
	tCO2	tCH4	tN2O	tCO2e
2019	41.4	1.57E-03	1.49E-04	41.5
Scope 2	41.4	1.57E-03	1.49E-04	41.5
2020	29.5	1.12E-03	1.07E-04	29.6
Scope 2	29.5	1.12E-03	1.07E-04	29.6
2021	26.1	9.91E-04	9.44E-05	26.2
Scope 2	26.1	9.91E-04	9.44E-05	26.2

APPENDIX C (CONT.) – 2019–2021 SCOPE 1 AND 2 GHG EMISSIONS DATA BY SOURCES AND GASES

Property	Year	Sector	Sub-sector	Scope	Source	Units	Activity amount	tCO2	tCH_4	tN_2O	tCO_2e
66 June Road	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	37,933	9.53	3.61E-04	3.44E-05	9.55
66 June Road	2019	Stationary	Buildings and Other Facilities	1	Propane	scf	95,472	14.76	7.21E-04	1.44E-04	14.82
Annex	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	15,678	3.94	1.49E-04	1.42E-05	3.95
Annex	2019	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	656	6.70	2.69E-04	5.25E-05	6.72
Lobdell House	2019	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	1,336	13.64	5.48E-04	1.07E-04	13.68
North Salem Highway Department	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	60,798	15.27	5.79E-04	5.52E-05	15.31
North Salem Highway Department	2019	Stationary	Buildings and Other Facilities	1	Natural gas	mmBtu	276	0.07	8.28E-04	1.66E-04	0.14
Ruth Keeler Memorial Library	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	29,051	7.30	2.77E-04	2.64E-05	7.31
Ruth Keeler Memorial Library	2019	Stationary	Buildings and Other Facilities	1	Propane	scf	255	0.04	1.93E-06	3.86E-07	0.04
Ruth Keeler Memorial Library	2019	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	3,565	36.40	1.46E-03	2.85E-04	36.52
Town Hall	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	29,967	7.53	2.85E-04	2.72E-05	7.55
Town Hall	2019	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	821	8.38	3.36E-04	6.57E-05	8.41
Street lights & Parking Lot Lights	2019	Stationary	Streetlights and Traffic Signals	2	Electricity	kWh	121,064	30.41	1.15E-03	1.10E-04	30.48
Water districts, source of supply, well pumps	2019	Stationary	Water Delivery Facilities	2	Electricity	kWh	164,658	41.36	1.57E-03	1.49E-04	41.46
Peach Lake Sewer District	2019	Stationary	Wastewater Facilities	2	Electricity	kWh	372,150	93.49	3.54E-03	3.38E-04	93.70
Peach Lake Sewer District	2019	Stationary	Wastewater Facilities	1	Propane	scf	280,555	43.38	2.12E-03	4.24E-04	43.56
Sewers	2019	Stationary	Wastewater Facilities	2	Electricity	kWh	30,603	7.69	2.92E-04	2.78E-05	7.71
Town Vehicle Fleet	2019	Transportat	Town Vehicle Fleet	1	Gas & Diesel	Gallons		318.83	1.43E-01	1.12E-02	325.74
66 June Road	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	36,752	9.23	3.50E-04	3.33E-05	9.25
66 June Road	2020	Stationary	Buildings and Other Facilities	1	Propane	scf	74,900	11.58	5.65E-04	1.13E-04	11.63
Annex	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	18,662	4.69	1.78E-04	1.69E-05	4.70
Annex	2020	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	693	7.08	2.84E-04	5.55E-05	7.10
Lobdell House	2020	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	1,384	14.13	5.67E-04	1.11E-04	14.18
North Salem Highway Department	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	63,096	15.85	6.01E-04	5.72E-05	15.89
North Salem Highway Department	2020	Stationary	Buildings and Other Facilities	1	Natural gas	mmBtu	189	0.07	5.68E-04	1.14E-04	0.11
Ruth Keeler Memorial Library	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	23,844	5.99	2.27E-04	2.16E-05	6.00
Ruth Keeler Memorial Library	2020	Stationary	Buildings and Other Facilities	1	Propane	scf	4,921	0.76	3.71E-05	7.43E-06	0.76
Ruth Keeler Memorial Library	2020	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	2,712	27.69	1.11E-03	2.17E-04	27.78
Town Hall	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	30,304	7.61	2.89E-04	2.75E-05	7.63
Town Hall	2020	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	930	9.50	3.81E-04	7.44E-05	9.53
Street lights & Parking Lot Lights	2020	Stationary	Streetlights and Traffic Signals	2	Electricity	kWh	68,793	17.28	6.55E-04	6.24E-05	17.32
Water districts, source of supply, well pumps	2020	Stationary	Water Delivery Facilities	2	Electricity	kWh	117,582	29.54	1.12E-03	1.07E-04	29.61
Peach Lake Sewer District	2020	Stationary	Wastewater Facilities	2	Electricity	kWh	340,400	85.51	3.24E-03	3.09E-04	85.71
Peach Lake Sewer District	2020	Stationary	Wastewater Facilities	1	Propane	scf	248,139	38.37	1.87E-03	3.75E-04	38.53
Sewers	2020	Stationary	Wastewater Facilities	2	Electricity	kWh	21,858	5.49	2.08E-04	1.98E-05	5.50
Town Vehicle Fleet	2020	Transportat	Town Vehicle Fleet	1	Gas & Diesel	Gallons		289.48	1.40E-01	9.86E-03	295.91
66 June Road	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	43,073	10.82	4.10E-04	3.91E-05	10.85
66 June Road	2021	Stationary	Buildings and Other Facilities	1	Propane	scf	92,153	14.25	6.96E-04	1.39E-04	14.31
Annex	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	15,775	3.96	1.50E-04	1.43E-05	3.97
Annex	2021	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	694	7.08	2.84E-04	5.55E-05	7.11
Lobdell House	2021	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	1,352	13.80	5.54E-04	1.08E-04	13.85
North Salem Highway Department	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	46,818	11.76	4.46E-04	4.25E-05	11.79
North Salem Highway Department	2021	Stationary	Buildings and Other Facilities	1	Natural gas	mmBtu	172	0.07	5.15E-04	1.03E-04	0.11
Ruth Keeler Memorial Library	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	21,411	5.38	2.04E-04	1.94E-05	5.39
Ruth Keeler Memorial Library	2021	Stationary	Buildings and Other Facilities	1	Propane	scf	0	0.00	0.00E+00	0.00E+00	0.00
Ruth Keeler Memorial Library	2021	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	3,033	30.97	1.24E-03	2.43E-04	31.07
Town Hall	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	29,385	7.38	2.80E-04	2.67E-05	7.40
Town Hall	2021	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	969	9.89	3.97E-04	7.75E-05	9.92
Street lights & Parking Lot Lights	2021	Stationary	Streetlights and Traffic Signals	2	Electricity	kWh	67,179	16.88	6.40E-04	6.09E-05	16.92
Water districts, source of supply, well pumps	2021	Stationary	Water Delivery Facilities	2	Electricity	kWh	104,064	26.14	9.91E-04	9.44E-05	26.20
Peach Lake Sewer District	2021	Stationary	Wastewater Facilities	2	Electricity	kWh	314,800	79.08	3.00E-03	2.86E-04	79.26
Peach Lake Sewer District	2021	Stationary	Wastewater Facilities	1	Propane	scf	255,329	39.48	1.93E-03	3.86E-04	39.64
Sewers	2021	Stationary	Wastewater Facilities	2	Electricity	kWh	22,176	5.57	2.11E-04	2.01E-05	5.58
Town Vehicle Fleet	2021	Transportat	Town Vehicle Fleet	1	Gas & Diesel	Gallons		312.33	1.51E-01	1.06E-02	319.27

ESTIMATED

APPENDIX D – 2019–2021 VEHICLE FLEET BY VEHICLE MAKE AND FUEL TYPE USED

North Salem Highway Truck Fleet

TRUCK #	YEAR		MAKE
1A	2018		Ford F350 (Ward) #0588
2	2019		Ford F350 (Bo) #3186
3A	2010		Ford F350 (Ward's old Truck 1) #4586
4	2010	Gas	Ford F350 (Bo's old truck 2) #4585
5B	2019		Ford F350 #3185
6			
7B	1986		Chevy Pickup (Surplus) #3410 (old Tk 5A)
8			
9	2022		Freightliner (#2109) - NEW
10A	2009		Freightliner (Surplus) #3140
11A	2002		2002 Freightliner (Surplus) #8488
12A	2008		Freightliner (Surplus) #3012
13	2011	Diesel	New International #0264
14	1994		International Tank (Surplus) #1439
15	2010		Freightliner (Surplus from CA) #1245
16	1998		Freightliner (Surplus) #2076
17A	2002	Gas	Ford F6S (#01771)
18	2006	Diesel	Freightliner (Surplus) #4083
19	1995		International (Surplus) #2463
20A	2017		Ford 550 Dump (Van Bortel Ford) #0823
21A	2017		Ford 550 Dump (Van Bortel Ford) #0822
22			
23A	2015	Gas	Ford F-550 #3777
24	2012		Ford F550 #9108
25	2006		New Holland Grader #0214
26	2001	Diesel	Sweeper – Surplus (TX) #8881
27	2006		New Holland Backhoe #4706
28	2016		Komatsu 2016 Wheel Loader
29	2017		New Holland Tractor with Alamo Interstater mower
30			
31	1976	Diesel	Ford Tractor #6428
32			
33			
34	2011	Diesel	Case Loader #1569
35			
36	1994		Bucket Truck (Surplus) #3193
37	2016	Diesel	2016 Freightliner VacAll #6647
38	2016		Skid Steer Loader #8541
39	2002	Gas	Dog Control (blue truck) #8256
40			
41		Diesel	Bandit 18" Chipper
42	2013		Kubota Excavator #26275

APPENDIX E – 2021 SCOPE 3 EMPLOYEE COMMUTATION GHG EMISSIONS

TOWN OF NORTH SALEM
2021 Employee Data

Scope 3: Employee Commuting – GHG Protocol Distance-based Method									
						Yearly Distance-based Commuting GHG Emissions – Passenger Car			
	FULL TIME	PART TIME	RESIDENCY/TRAVEL	Fulltimers daily commute (miles)	Fulltimers yearly commute (miles)	tCO2	tCH4	tN2O	tCO2e
TOWN SUPERVISOR	2	1	2 NS Residents, 1 PT from Brewster 3 days/week	28	6,720	2.29	6.05E-05	5.38E-05	2.31
TOWN BOARD		4	NS Residents		0	0.00	0.00E+00	0.00E+00	0.00
ASSESSOR	2		1 North White Plains, 1 Brewster	74	17,760	6.06	1.60E-04	1.42E-04	6.10
BUILDING DEPT	4		1 NS Resident, 1 Katonah, 1 Peekskill, 1 Mahopac	94	22,560	7.69	2.03E-04	1.80E-04	7.75
FINANCE	1		Travels from Pawling	40	9,600	3.27	8.64E-05	7.68E-05	3.30
HIGHWAY	14		9 NS Residents, 1 Carmel, 3 Brewster, 1 Stormville	247	59,280	20.21	5.34E-04	4.74E-04	20.37
HISTORIAN		1	NS Resident		0	0.00	0.00E+00	0.00E+00	0.00
PLANNING	1		1 Carmel	23	5,520	1.88	4.97E-05	4.42E-05	1.90
POLICE		14	5 NS Residents, 4 Brewster, 1 Somers, 1 Pawling, 2 Carmel, 1 Peekskill		0	0.00	0.00E+00	0.00E+00	0.00
RECREATION	1	5	NS Residents	14	3,360	1.15	3.02E-05	2.69E-05	1.15
TAX RECEIVER	1	1	NS Residents	14	3,360	1.15	3.02E-05	2.69E-05	1.15
TOWN CLERK	2		NS Residents	28	6,720	2.29	6.05E-05	5.38E-05	2.31
TOWN JUSTICE	2	3	NS Residents	28	6,720	2.29	6.05E-05	5.38E-05	2.31
TOTAL	**30**	**29**				**48.29**	**1.27E-03**	**1.13E-03**	**48.66**
North Salem Town Hall (miles) (Source: Google Maps)									
North Salem	14								
Brewster	16								
North White Plains	58								
Katonah	18								
Pawling	40								
Peekskill	40								
Mahopack	22								
Somers	20								
Carmel	23								
Stormville	50								
Working weeks per year, assuming holidays and persoanl time off (PTO)	48								
Days in a week	5								
Days in a working year	240								

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