

Town of Minetto Climate Action Plan OCTOBER 2015



View of Minetto Bridge from River View Park

Photo Credit: Dick Drosse



Central New York Regional Planning & Development Board



Climate Smart
Communities





A MESSAGE FROM THE COMMITTEE

Dear friends and neighbors,

The Town of Minetto is committed to becoming a greener, more sustainable community. Not only have we adopted the Climate Smart Communities pledge, we have also undergone many energy efficiency projects that have helped reduce our ecological footprint while saving taxpayer dollars. This Climate Action Plan provides a course of action for the town to continue its efforts to improve sustainability and maintain the lowest possible costs.

One of the energy efficiency projects that the town has completed is the conversion of outdoor lighting at the park to LED. This project eliminated the use of less efficient lights that were used previously, and it has reduced the town's energy costs and greenhouse gas emissions.

This Climate Action Plan provides a benchmark of the town's energy use and emissions and outlines a variety of other similar actions that the town and our community members can take to reduce energy use, emissions, and dollars spent on energy. Together we can enhance Minetto's quality of life by continuing to make our community more sustainable.

Sincerely,

The Town of Minetto Climate Action Plan Advisory Committee

ACKNOWLEDGEMENTS

The Town of Minetto wishes to thank the following community members, organizations, and staff for their contributions to developing this Climate Action Plan:

ADVISORY COMMITTEE

Jennifer Allen, Town Clerk
Larry Battles, Town Resident
Richard Drosse, Town Resident
John Familo, Town Councilman
Dominick Yacco, Town Councilman

CNY REGIONAL PLANNING AND DEVELOPMENT BOARD

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Canal Boat, Lois McClure, passing through Minetto Lock O-5, Oswego Canal River

Photo Credit: Dick Drosse

The Central New York Regional Planning and Development Board

The Central New York Regional Planning and Development Board (CNY RPDB) is a public agency that was established in 1966 by Cayuga, Cortland, Madison, Onondaga, and Oswego Counties under the provisions of Article 12B of the New York State General Municipal Law. The CNY RPDB provides a comprehensive range of services associated with the growth and development of communities in Central New York with a focus on the following program areas: Energy Management, Community Development, Economic Development, Environmental Management, Information and Research Services, Intergovernmental Coordination, and Transportation Planning.

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EXECUTIVE SUMMARY

A Climate Action Plan (CAP), often considered a blueprint for the future, evaluates how a community can reduce greenhouse emissions and adapt to climate change. The CAP also identifies the extent to which local actions support New York State's goal for a clean-energy economy. New York State's goal is to reduce greenhouse gas emissions by 80% (below the levels emitted in 1990) by the year 2050. To help reach this goal, local representatives have joined many other municipalities throughout the State to compile a CAP for Minetto.

The CAP provides local goals for reducing energy use from municipal operations and from the Minetto community as a whole and includes specific recommendations for categories such as transportation, solid waste disposal, and building energy efficiency. The objectives of the Climate Action Plan are to:

- (1) Present information on emission reduction projects and programs that are currently being implemented in Minetto;
- (2) Provide municipal elected officials, community leaders, and residents with information and support to advance these and additional energy sustainability programs throughout the community;
- (3) Identify opportunities for new emission reduction programs and initiatives; and
- (4) Engage and encourage local participation in greenhouse gas emission reduction strategies.

A Climate Action Plan Advisory Committee comprised of municipal representatives and community leaders met during 2015 to discuss emission reduction goals and specific strategies for reaching them. The committee agreed on a goal to reduce municipal greenhouse gas emissions by 50% by the year 2025 and reduce community emissions by 15% from the GHG inventory baseline year (2010).

This CAP was prepared for Minetto with guidance from the Central New York Regional Planning and Development Board (CNY RPDB). The CNY RPDB provided this assistance under the sponsorship of the New York State Climate Smart Communities Program.

The CAP is not intended to provide precise information about the potential emission reductions that can be achieved by specific recommendations, and cannot be used as a substitute for thorough project or program planning. Instead, the document provides estimates of emission reductions for specific local recommendations. The report is designed to help public officials, community leaders, and residents decide which actions may be worthwhile for the community to pursue in the coming years and is intended to be a flexible framework for local climate protection.



**Climate Smart
Communities**



Climate Smart Communities Program

The Climate Smart Community (CSC) program is a successful partnership between the New York State Department of Environmental Conservation and local governments. The program helps communities reduce greenhouse gas emissions, save taxpayer dollars, and advance community goals for health and safety, economic vitality, and energy independence. Over 160 municipalities in New York State (including the Town of Minetto) are CSCs. The CNY RPDB is the Climate Smart Communities coordinator for five counties in Central New York (Cayuga, Cortland, Madison, Onondaga, and Oswego) and provides technical assistance for greenhouse gas inventories, climate action plans, and energy efficiency projects. The CNY RPDB's work as Climate Smart Communities coordinator is referred to as their Climate Change Innovation Program (C₂IP).



Left: Mural on Canal Building with artists

Photo Credit: Dick Drosse



Right: Kayak/canoe race during Magic in Minnetto

Photo Credit: Chuck Forbes

INTRODUCTION

What is climate change?

Global concern with climate change is primarily focused on the amount of greenhouse gases in the atmosphere. Greenhouse gases, such as carbon dioxide, water vapor, and methane, among others, are an essential part of our atmosphere, and they serve a vital role in making our planet warm enough for life.

Greenhouse gases trap energy (in the form of long wave radiation) that is being emitted by the Earth, keeping it in the atmosphere to warm the planet. As the amount of carbon dioxide in the atmosphere has increased or decreased over time, the planet's temperature has changed in roughly the same proportion.

Scientists have determined this relationship by studying Antarctic ice core samples that reveal the atmospheric carbon dioxide from 400,000 years ago to present day. There is currently more carbon dioxide in the atmosphere than at any time in history, as measured by these samples.¹ Atmospheric testing shows that we have 402 parts per million (ppm) atmospheric CO₂,² which is

¹ Visit http://www.antarctica.ac.uk/press/journalists/resources/science/ice_cores_and_climate_change_briefing-sep10.pdf to learn more about the Antarctic ice core findings with accompanying graphs for temperature and CO₂.

² According to the Scripps Institute and NOAA, Mauna Loa Observatory

higher than at any other time in history.³ Scientists expect that this is leading to a gradual warming of the planet in most areas.

Developing the Plan

The Town of Minetto's Climate Action Plan was developed by an advisory committee made up of Jennifer Allen, Town Clerk; Larry Battles, Town Resident; Richard Drosse, Town Resident; John Familo, Town Councilman; and Dominick Yacco, Town Councilman. The committee was provided technical assistance by the CNY RPDB, who analyzed energy and emissions reduction strategies for the town utilizing data from the GHG inventory report. CNY RPDB provided information and suggestions to the advisory committee as to which energy efficiency strategies would be most successful in the town, how many MTCO₂e the strategies would prevent, co-benefits of the strategies, and other case studies explaining where the strategies have been implemented successfully. They also provided information about cost of implementation, possible funding sources, and payback period for the strategies. For more information on how the strategies were developed, including assumptions

³ In January 1998, the collaborative ice-drilling project between Russia, the United States, and France at the Russian Vostok station in East Antarctica yielded the deepest ice core ever recovered, reaching a depth of 3,623 m (Petit et al. 1997, 1999). The extension of the Vostok CO₂ record shows the present-day levels of CO₂ are unprecedented during the past 420k yr. Pre-industrial Holocene levels (~280 ppmv) are found during all interglacials, with the highest values (~300 ppmv) found approximately 323k yr BP.

Thinking Sustainably: The Village of Skaneateles, NY

The Village of Skaneateles serves as a showcase for energy efficiency and environmental stewardship. Renovations were completed in 2013, making the new Village Hall the first municipal net-zero energy building in New York State. The project was launched in 2012 when municipal officials partnered with the Central New York Regional Planning and Development Board (CNY RPDB) under its EPA-funded Climate Change Innovation Program. With an initial EPA grant from the CNY RPDB and funds from the sale of the old Village Hall, municipal officials repurposed a vacant fire station in the Village Center and turned it into the net-zero energy facility. The building, which now houses administrative offices and a police station, is expected to produce more energy than it consumes.

The renovations included a 54 kW PV system on the roof, a geothermal well field and heat pump system to provide on-site energy extracted from the ground, LED lighting, and green exterior upgrades such as insulation and energy efficient windows. The improvements are expected to reduce energy usage by more than 62,000 kilowatt hours of electricity each year and will result in the avoidance of 46 metric tons of greenhouse gas emissions annually. The building has an educational display in the lobby so that visitors can see how the building is performing. The village made every effort to utilize technologies developed in Central New York including the HVAC system that was manufactured in Auburn. Local leaders also worked with the CNY RPDB to complete a greenhouse gas inventory in 2013, and energy efficiency goals and recommendations were presented in a Climate Action Plan that was adopted by village trustees in September 2014.

Climate Impacts in the Northeast¹

Temperature: Average temperatures across the Northeast have risen more than 1.5 degrees Fahrenheit since 1970, with even more significant changes in average winter temperatures, rising 4°F between 1970 and 2000.

Precipitation: The Northeast region is projected to see a 20 to 30% increase in winter precipitation, and, due to increases in temperatures, less winter precipitation will fall as snow and more will fall as rain.

Additionally, heavy, damaging rainfall events have already increased measurably across the Northeast in recent decades. For example, Hurricane Irene and Superstorm Sandy brought intense rains to the region in 2011 and 2012, causing widespread flooding.

Drought: Rising summer temperatures coupled with little change in summer rainfall are projected to increase the frequency of short-term (one to three month) droughts in the Northeast, therefore increasing stress on both natural and managed ecosystems.

¹ US EPA, <http://www.epa.gov/climatechange/impacts-adaptation/northeast.html>

and references, refer to Appendix C: Action Strategy Summary Document.⁴

Implementing the Plan

In order to implement the strategies in this plan and achieve Minetto's sustainability goals, the creation of a permanent sustainability committee is highly recommended. The sustainability committee would be comprised of a group of town residents who are committed to Minetto's sustainable future and are willing to volunteer their time to help implement the strategies explained in this plan. It is recommended that the Climate Action Plan committee continue to meet in this capacity and work towards implementation of the strategies within this plan.

Progress towards the Climate Action Plan's goals can be measured over time by conducting subsequent GHG emissions inventories. Future inventories can be compared against the baseline years to determine progress.

Global Weather Extremes

Regions throughout the world are experiencing dramatic weather extremes. A primary influence on wind and precipitation variability can be attributed to the natural climate cycles of El Nino and La Nina that originate in the equatorial Pacific region. The cycles influence the direction and characteristics of jet streams, causing them to meander in the northern and southern hemispheres. The heat and water vapor resulting from these cycles enter the atmosphere and influence weather patterns around the globe.

⁴ Available at www.townofminetto.net



Two members of the Beautification Committee along River View Park

Photo Credit: Dick Drosse

Another significant influence on weather patterns can be attributed to human activity. The long-term accumulation of greenhouse gases in the atmosphere is trapping heat and increasing temperatures in both terrestrial and aquatic ecosystems. The average surface temperature worldwide has increased approximately one degree Fahrenheit within the past four decades. As a result of this warming trend, Arctic sea ice has lost approximately 40% of its summer sea ice since the 1980s and autumn ocean temperatures have risen 3.6 to 9°F. As the ocean temperature increases, more moisture is released into the atmosphere. During the past twenty five years, scientists have measured a 4% average rise in water vapor in the air column which increases the potential for strong storm events. The following sections present information on how these global findings impact local climate characteristics in New York State and in Central New York.

NEW YORK STATE WEATHER CHARACTERISTICS

Central New York's climate is characterized by warm, dry summers and cold, snowy winters. Local weather patterns are influenced by topography, prevailing westerly wind direction, and proximity to Lake Ontario. Frost can be expected from early October until late May and the growing season is approximately 18 to 20 weeks long. Although serious droughts are rare, most growing seasons do experience limited periods of low soil moisture.

In 2011, the New York State Energy Research and Development Authority (NYSERDA) released a comprehensive assessment of the projected effects of climate change in New York State's critical systems and natural resources over the next century. ClimAID: the Integrated Assessment for Effective Climate Change Adaptation Strategies in New York State is a 600-page report that presents projected changes in climate for seven geographic regions in the State. It has served as a valuable resource for planners, policymakers, farmers, local governments and residents. The ClimAID report outlines the potential impacts of climate changes on eight sectors: water resources, coastal zones, ecosystems, agriculture, energy, transportation, telecommunications and public health, as well as steps that government, businesses, and private citizens can take to adapt to those impacts. According to the report, the annual average temperature in New York has risen approximately 2.4°F since 1970, with winter warming exceeding 4.4°F. Sea level along New York's coastline has risen

about a foot since 1900 and the frequency of intense precipitation and heavy downpours has increased in recent decades.

In 2014, NYSERDA released updated data and projections of climate changes throughout the State that will likely result in greater impacts on flooding, agriculture, winter tourism, and many other areas. The report applies up-to-date climate models and methods to evaluate potential changes to New York State's climate as a result of increasing greenhouse gas emissions. The results reinforce the importance of preparing New York for the realities of a changing climate. The study confirms and refines the following projections that had originally been presented in the ClimAID report:

- + Sea level could rise significantly, permanently flooding some areas and increasing the likelihood of damage to coastal infrastructure from storm surge, including roads and bridges.
- + Inland and upstate, heavy downpours and subsequent flooding are expected to increase. In the winter, more rainstorms in place of snow are expected.
- + While winters will be milder, summers are expected to see more extreme and longer heat waves, with more droughts as well⁵

⁵ http://www.nyc.gov/html/planyc/downloads/pdf/publications/NPCC2_Climate%20Methods%20Memorandum_2013.pdf



Clean Sweep Minetto during Oswego County Earth Week

Photo Credit: Dick Drosse

LOCAL CLIMATE CHARACTERISTICS

Temperature and Precipitation

Minetto generally experiences seasonable weather patterns that are characteristic of the northeastern U.S. cyclonic system. Climate conditions are influenced by westerly winds, gently rolling topography, and the close proximity to Lake Ontario. During the summer and parts of spring and autumn, temperatures rise during the daytime and fall rapidly after sunset. The average temperature is 48.1°F, which is slightly lower than the New York State average temperature of 48.2°F, and significantly lower than the national average temperature of 54.4°F.

Central New York experienced exceptionally heavy snowfall, icy roads, and low temperatures during the 2013-14 winter season. The U.S. Department of Agriculture determined that Cortland, Madison and Oswego counties suffered sufficient production losses due to a freeze that occurred from Dec. 1, 2013 through March 14, 2014, to warrant a Secretarial Disaster Designation. The designation makes farm operators in both primary and contiguous counties eligible to be considered for assistance from the Farm Service Agency (FSA) provided eligibility requirements are met. This assistance includes FSA emergency loans.

Figure 1 shows the annual average temperatures in the City of Syracuse since 1951. The trend line shows a gradual warming trend. This information was recorded at the

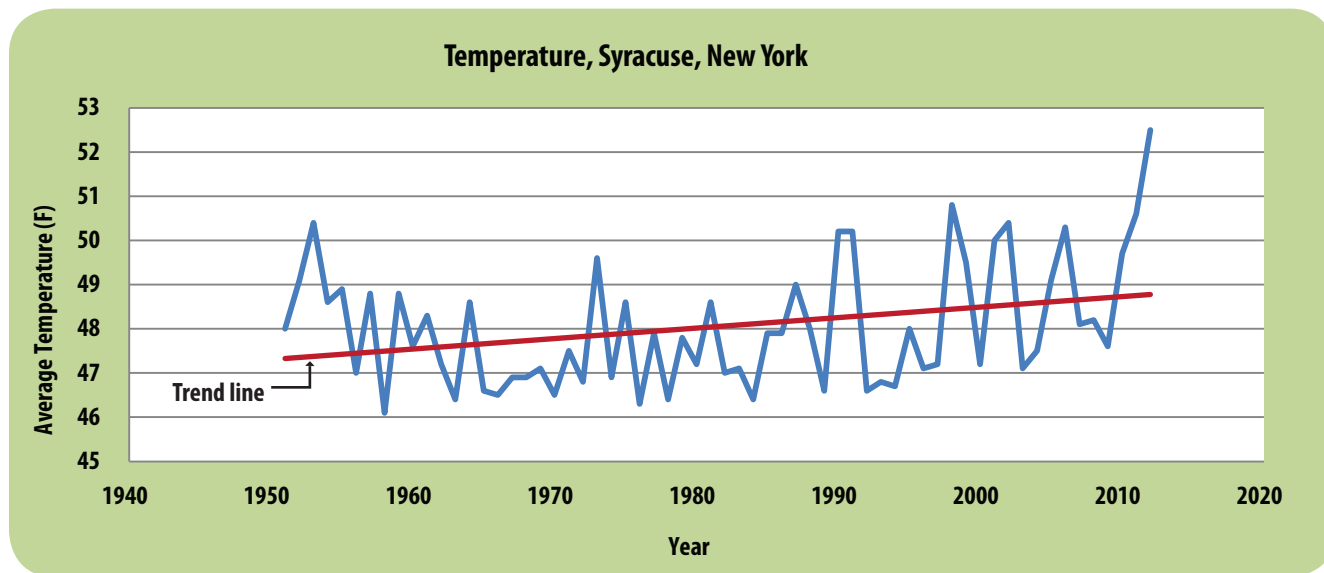


FIGURE 1- ANNUAL AVERAGE TEMPERATURE, SYRACUSE, NEW YORK.
SOURCE: NOAA NATIONAL WEATHER SERVICE FORECAST OFFICE

weather station at Hancock International Airport.

The average annual precipitation in Minetto is 42.5 inches, which is slightly lower than the New York State average of 42.8 inches. According to the Oswego County Multi-Jurisdictional Hazard Mitigation Plan, the total rainfall in the county can vary from an annual average of 36 inches in the southwest section of the county to 55 inches in the northeast section near the Tug Hill region. Figure 2 shows a gradual increase in the annual precipitation in the City of Syracuse from 1950 to 2012 of 2.3 inches.

Oswego County is situated in the Eastern Lake Ontario snowbelt. The average annual snowfall in Minetto is 141 inches, substantially higher than New York State's average of 59 inches. County-wide snowfall totals range from less than 90 inches in the southwest section to more than 200 inches in the Tug Hill area. The Tug Hill region has a short growing season and is one of the wettest and snowiest areas of New York State.

Snowfall

The Town of Minetto is influenced by lake effect snowfall which is caused by a differential

between cold air temperatures and warmer water temperatures in Lake Ontario. As cold air flows over the warm water, the bottom layer of air over the surface of the water is heated from below. Since warm air is lighter and less dense than cold air, the heated air rises and cools. As it cools, the moisture from the lake condenses and forms clouds. When enough moisture condenses, snow bands develop over the region downwind of Lake Ontario. The greater the temperature contrast between the cold air and the warm water, the heavier the resulting lake effect snow fall will be. Extreme lake effect snows impacted areas of western New York State with some parts of Oswego County recording over 130 inches of snow for the month and over 3 feet for a single 3-day event near the end of January 2014.⁶ Because of the increased water temperature and reduced duration of ice cover on Lake Ontario, Minetto and other areas to the east and south of the lake will continue to experience heavier and more frequent lake-effect snowfall events. The following graph (Figure 3) displays long-term trends for seasonal snowfall in Syracuse New York between 1949 and 2009.

Ice Cover

The amount and duration of ice cover on nearby Lake Ontario and other Great Lakes is variable from year to year. Despite the anomaly of winter weather conditions during the 2013 and 2014, scientists have documented an overall decrease in ice extent since the early 1970s. From 1973 to 2010, annual ice coverage on the Great Lakes has declined by 71 per-

cent, relative to 1973. Ice characteristics on the Great Lakes are important to monitor because of the influence on hydropower generation, commercial shipping, the fishing industry and other societal impacts. Scientists at the Great Lakes Research Laboratory are observing long-term changes in ice cover as a result of global warming and their research is helping to determine the impacts on climate patterns, lake water levels, water movement patterns, water temperature structure, and spring plankton blooms. Ice coverage and duration influence lake water temperatures, as incoming solar radiation needs to melt the ice before it warms the lake water. Weather conditions, lake depth,

and heat storage capacity in the lakes are also important components that can influence the thermal cycle in lakes.

Extreme Weather Events

The relative intensity of local storm events is influenced by air temperature. As the air temperature rises, moisture in the atmosphere increases which contributes to a greater intensity and frequency of precipitation events. Warming air temperatures, as seen throughout New York State, are influenced by emissions of heat-trapping gasses in the atmosphere including pollution from fossil fuels. Warming air temperatures cause higher levels of oceanic

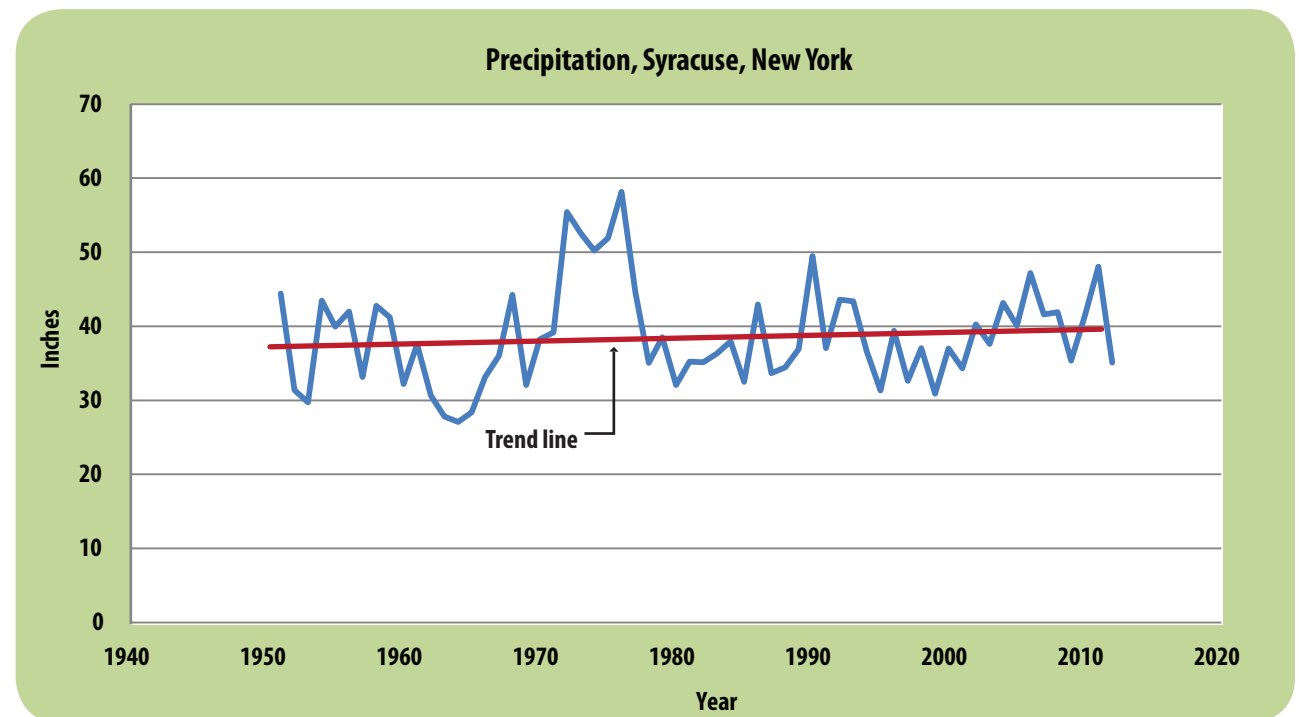


FIGURE 2- ANNUAL AVERAGE PRECIPITATION IN SYRACUSE, NEW YORK 1903-2008
SOURCE: NATIONAL WEATHER SERVICE FORECAST OFFICE

⁶ NOAA National Centers for Environmental Information, State of the Climate: National Snow & Ice for January 2004, published online February 2004, retrieved on July 28, 2015 from <http://www.ncdc.noaa.gov/sotc/snow/200401>.

evaporation which intensifies the water cycle throughout the globe. As a result, storm events in Minetto, throughout New York State, and around the globe are gradually becoming more extreme with stronger wind and higher levels of rainfall.

According to the ClimAID report, New York State experienced a 64% increase in extreme storm frequency between 1948 and 2011. The increased number of severe storms is expected to gradually continue, with 100-year storms likely to occur every 80 years by the end of the century. Meteorologists report that the total annual amount of precipitation is changing as well as the distribution and intensity of storm events.

Oswego County experienced seven Presi-

dential Disaster Declarations between 1954 and 2010. According to NYSOEM and FEMA records, Presidential Disaster Declarations in Oswego County included an ice storm in 2003; a statewide terrorist attack in 2001; flooding in 1985; Hurricane Eloise in 1975; severe storms and flooding in 1974; high winds, wave action and flooding in 1973; and Tropical Storm Agnes in 1972. In addition, five Emergency Declarations were issued between 1974 and 2010 that included Oswego County. These Emergency Declarations included lake effect snowstorms in 2007; the statewide Hurricane Katrina evacuation in 2005; a lake effect storm in 2004; a power outage in 2003; and the New York West Nile virus threat in 2000.⁷

Strong storm events in Minetto can contribute

⁷ <http://www.co.oswego.ny.us/emo/hmp%20final%20sept%202012.pdf>

to localized flooding, soil erosion, and stormwater runoff. These conditions can cause damage to roads, bridges, and other infrastructure in Minetto. The role of agencies such as the Onondaga County Soil and Water Conservation District and the Natural Resource Conservation Service will become increasingly important in the coming years, especially in terms of their work with stream bank stabilization, erosion and sediment control, and stormwater management.

Green infrastructure and stormwater management helps to reduce pollution runoff and improves water quality in the Oswego River and in local tributaries. Green Infrastructure is also a cost-effective approach that can provide community benefits for Minetto such as reducing

TABLE 1- TOTAL ASSESSED VALUE (TAV) OF PARCELS INTERSECTING FLOOD PLAINS¹

Municipality	TAV of Parcels Intersecting Flood Plain	# Acres of Parcels Intersecting Flood Plain	TAV of Municipality	TAV % Floodplain Parcels within the Municipality
Town of Minetto	22,649,500	738	108,365,600	21%

¹ Source: 2012 tax parcel data, Oswego County

TABLE 2- PARCELS WITHIN 100-YEAR FLOODPLAIN¹

Municipality	Parcels	Parcels in 100-Year Floodplain	% of Parcels in 100-Year Floodplain
Town of Minetto	813	85	10.4%

¹ Source: 2012 tax parcel data, Oswego County

energy use, mitigating climate change, improving habitat for wildlife, reducing infrastructure costs, and promoting economic growth.

Flooding

Flooding is influenced by the intensity and amount of precipitation, spring snowmelt, groundwater levels, and the concentration of impervious surfaces and compacted soils from urban development. These conditions limit groundwater recharge and increase surface runoff and flooding. According to the Federal Emergency Management Agency (FEMA), floods have caused a greater loss of life and property, and have disrupted more people in the United States than the impact of all other natural hazards combined. FEMA reports that floods kill more people than any other form of severe weather with damages exceeding \$3.5 billion annually. Further, with the exception of fire, floods are the most prevalent and widespread of all natural disasters and approximately 75 percent of all presidentially declared disasters are the result of flooding.

The frequency of localized downpours in Central New York has increased over the past fifty years and this trend is expected to continue. Heavy precipitation events increase the potential for localized flooding and stormwater runoff. Heavy rain events also increase pollution loading to local waterbodies and can decrease the efficiency of wastewater treatment plants.

Assessed value refers to the dollar value assigned to a home or property by local government in order to calculate property taxes.

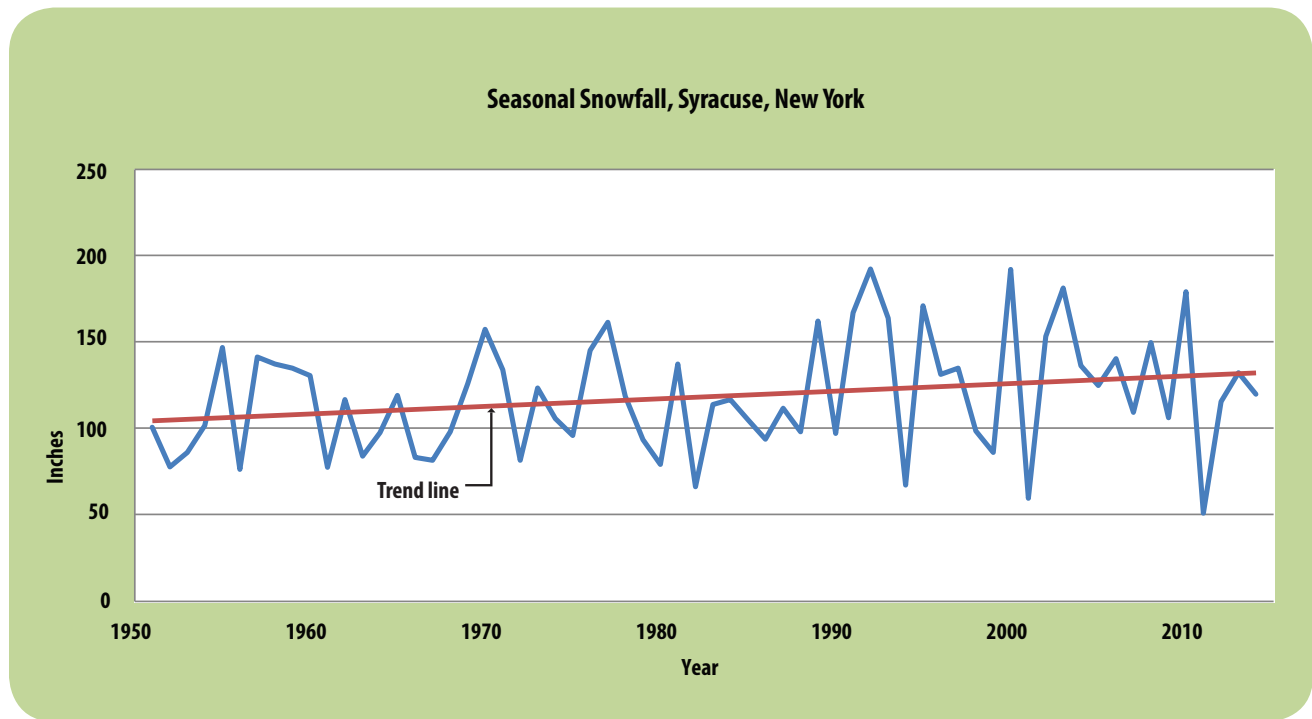


FIGURE 3- SEASONAL SNOWFALL IN SYRACUSE, NY, 1949-50 TO 2014-15
SOURCE: NATIONAL WEATHER SERVICE FORECAST OFFICE

According to tax parcel data from 2012, the total assessed value of property located within designated FEMA flood zones in Minetto represents 21% of the total assessed value of parcels throughout town (Table 1). Of the 813 land parcels in the town, 10.4% is located in FEMA flood zones (Table 2).

Tourism

Weather has a significant impact on the tourism and recreation sector. Weather patterns influence the duration and types of outdoor recreation activities and play a predominant role in determining local economic vitality. Seasonal

weather patterns, especially precipitation rates, influence water levels for safe boating, the rate of erosion, pollution loading of nutrients and sediment, and waterfowl breeding habits for sport hunting.

Warming trends will impact the region's outdoor recreation opportunities and may reduce income generated for the local economy. In addition to the ski industry to the east and south of Minetto, New York State maintains 8,000 miles of snowmobiling trails that also contributes to the economy. Ski resorts and snowmobiling relies on natural snowfall which is forecasted to decrease with climate change.

This has the potential to reduce business generated from retail stores and associated snowmobiling industries.

Fishing and boating in Minetto are popular water-based activities. Higher air temperatures and a shorter duration of winter ice cover will increase surface water temperatures, which will likely cause a gradual shift in coldwater fisheries. According to researchers at Cornell University, warming water temperatures may already be contributing to fish species modifications in Oneida Lake. Higher temperature is thought to be causing an increased production of largemouth and smallmouth bass, gizzard shad, and other species near the northern extent of their range. Additionally, at the southern edge of their range, Burbot may be in decline. Brook trout, commonly found in New York State tributaries, are at risk due to changes in habitat resulting from climate change and the presence of invasive species.

The local warming trend is also providing a longer growing season for agricultural crops and backyard gardens and is providing a boost to water-based summer recreation such as boating and swimming. However, the combined effect of warmer air and water temperatures and decreasing ice coverage will likely cause an increase in the growth of nuisance aquatic plants and algae along the Oswego River which could cause recreational impairments.

Public Health

Changes in climate conditions are affecting human health. Several health impacts of warming temperatures have been documented throughout the country such as increased illnesses and deaths from heat events, injuries and deaths

from extreme weather events, and respiratory illnesses such as asthma due to changes in air quality. Projections of warmer winters, hotter summers, and unpredictable precipitation patterns may cause increases in certain types of diseases. For example, climate change in the Northeast is expected to result in the increased



Paddlers in Minetto Lock O-5 for 2014 Paddlefest

Photo Credit: Joe Wallace

population rates of mosquitoes and ticks. Increasing populations could result in more frequent outbreaks of West Nile Virus and Lyme disease-causing bacteria.

Invasive and Endangered Species

While insects and plants are a natural part of the aquatic and terrestrial ecosystems, climate change is gradually shifting pest populations of some invasive as well as native species. Some warm-weather species that previously could not survive cold temperatures are now able to establish themselves, threatening populations of native species. This is already occurring with increasing invasive species populations throughout New York State. Early detection and a rapid response of new infestations of invasive species are the most effective ways that Minetto can address this problem.

The Hemlock Woolly Adelgid, Asian Longhorn Beetle and Emerald Ash Borer are invasive tree pests that pose a threat to Central New York. The Town of Minetto also encounters issues with invasive water chestnuts and hydrilla in the Oswego River. These invasive species have the potential to damage local tree and aquatic populations and the communities and industries that rely on them. The destruction of hemlock in New England forests affects recreational activities such as fishing. As pests kill trees adjacent to streams, shade is no longer provided and stream water temperatures increase beyond what is ideal for coldwater fish such as trout.



Volunteers pulling invasive water chestnuts from the Oswego River

Photo Credit: Dick Drosse

COMMUNITY CHARACTERISTICS

There is a growing recognition by scientists and policy analysts that a substantial part of the global warming challenge could be met through a change in the design of cities and towns. The form and function of municipalities can reduce the demand for energy by influencing how energy is

produced, distributed, and used. Urban planning, for example, can reduce the number and distance of vehicle trips by designing compact communities with reliable transportation to and from employment, and by placing services within easy walking distance from home.



Veterans' Memorial, River View Park

Photo Credit: Dick Drosse

National studies show that a GHG reduction of up to ten percent may result from a change in land use approach alone, and additional reductions will result from employing other strategies such as investments in transit, encouraging development around transit stops, and parking charges. By one estimate, approximately two-thirds of all development in the nation by 2050 will be new or will have been redeveloped since 2007, suggesting that combined land use and transportation strategies could be quite influential in mitigating the increases in GHGs.

Transportation

Research has shown that miles driven are reduced by between 20 and 40 percent in compact urban development compared to miles driven in the auto-dependent suburbs that have prevailed in North America since the Second World War. Transportation contributes about 33 percent of energy-related greenhouse gas (GHG) production in the United States, and single-occupant automobile travel makes up about half of that activity.

The vast majority of vehicles burn carbon fuels and are expected to continue to do so for some time, even with aggressive fuel substitution and efficiency measures. Strategies that reduce travel by limiting low-density development and encouraging compact, walkable, full-spectrum living and working environments therefore have the potential

to make a significant contribution to overall climate change mitigation.

Commuting to Work: The way that land uses and transportation infrastructure are developed within a community influences whether residents choose to walk, bike, drive, or use public transit. These travel choices directly affect the amount of transportation-related GHG emissions that are produced.

According to data from Census Transportation Planning Products, 35.2% of the residents in Minetto that work outside of the home commute to jobs in the City of Oswego. Additional transportation destinations are found in Table 4.

Single-passenger automobile trips to and from Minetto generate substantially more GHG emissions per mile than public transit and carpooling. According to the American Community Survey, 735 Minetto residents were employed in 2013. Of the total number that drove vehicles to their jobs, approximately 90.5% drove alone, 7.1% carpooled, and 1.9% worked from home (Table 5). Single-passenger automobile trips constituted the vast majority. Preparation of a commuting analysis would help determine the need for organized carpooling opportunities. Carpooling, ridesharing, and similar efforts to reduce vehicle traffic will help to reduce greenhouse gas emissions.

Land Use

Additional carbon reductions could come from applying other types of land use planning and redevelopment. Using the critical mass of buildings and activities at the district scale, it is possible to develop practical and efficient heating and cooling systems (district energy systems). This approach shows great promise in reducing the carbon footprint of urban development in large municipalities. Other energy conservation benefits may result from common-wall and vertical living structures found in multifamily city locations.

Recommendations for urban design in smaller communities such as Minetto include the potential to install green infrastructure to reduce stormwater runoff. Support of localized

TABLE 4- COMMUTING DESTINATIONS FROM MINETTO, NY¹

Municipality	Estimated percentage of Minetto Residents Commuting to Destination
City of Oswego	35.2%
City of Fulton	8.1%
City of Syracuse	7.8%
Town of Scriba	7.1%
Town of Oswego	5.3%
Town of Minetto	3.6%
Town of DeWitt	3.4%
Other	29.5%

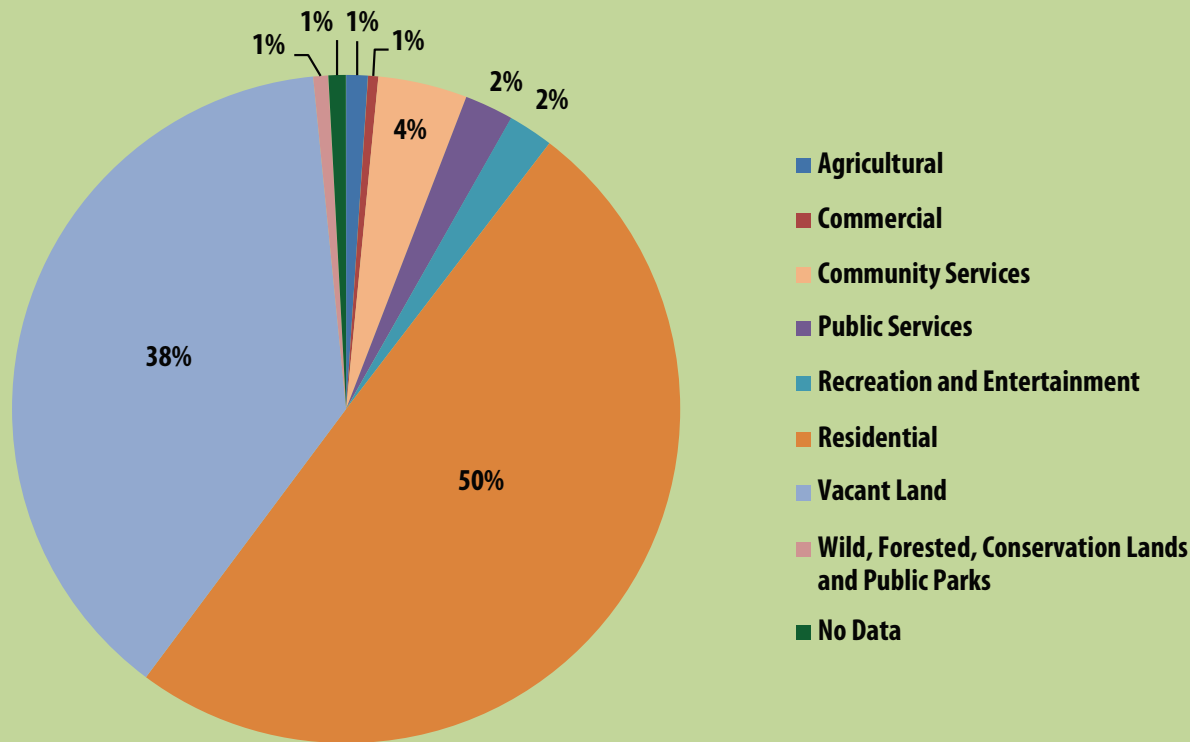
¹ Source: U.S. Census Bureau, Center for Economic Studies, 2013

TABLE 5- TRANSPORTATION TO WORK IN MINETTO¹

Transportation to Work	Number of Workers	Percentage
Car, truck, van - drove alone	665	90.5%
Car, truck, van - carpooled	52	7.1%
Public transportation (excluding taxicab)	0	0%
Walk to work	4	0.5%
Worked from home	14	1.9%
Taxicab, motorcycle, bicycle, or other means	0	0%
TOTAL	735	100%

¹ Source: American Community Survey, 2009-2013

FIGURE 4- MINETTO LAND USE TYPES



Research has shown that per capita energy consumption and GHG emissions are 2 to 2.5 times higher in low-density developments than in high-density areas.

food production and reliance on farmers markets will reduce shipping, storage, and packaging needs. These and other strategies that make use of land use and transportation alternatives could contribute significantly to overall GHG mitigation.

Land use categories for the Town of Minetto are summarized in Figures 4 and 5. The category called 'wild, forested, conservation lands and public parks' includes land tracts with merchantable timber, state-owned forest land, county-owned reforested land, public parks, and wetlands. The category called 'Vacant' includes non-productive and abandoned agricultural land, and residential vacant land.

Examining existing land use patterns and transportation infrastructure provides insight into ways a community can reduce GHG emissions. Factors most directly influencing travel behavior include diversity of uses, proximity of uses, and density. Each of these topics is discussed on the following pages.

Diversity of Use: Diversity of use refers to the degree to which residential, commercial, industrial, institutional, and recreational uses are located together. Increasing the diversity of neighborhood-serving, and specifically job-rich, uses within a community could help reduce transportation-related GHG emissions. Increased diversity reduces travel distances and facilitates more walking and cycling trips. Improving the mix of

uses within a community can also reduce commute distances, particularly if affordably priced housing is located in areas with a high number of jobs and employees can commute to work using alternative modes.

A jobs/housing ratio is commonly used to evaluate the diversity of land uses within a community by describing the relationship between employment opportunities and housing supply. A ratio of 1.0 describes a balance between jobs and housing. A ratio above 1.0 indicates that there are more jobs than housing, while a ratio below 1.0 describes an undersupply of jobs relative to housing. In 2013, there were approximately 119 jobs in Minetto and 650 households and the jobs/housing ratio was approximately 0.18. This demonstrates that there were significantly more households than job opportunities in the community.

Proximity of Uses: Proximity of uses refers to the distance between neighborhood commercial services and residents' homes. The number of residential homes that are located within ¼ mile of commercial properties in Minetto was calculated and then used as a basis for the development of CAP recommendations. This provided insight into the effectiveness of the community's existing zoning and land use pattern from the pedestrian perspective. Of the 1,023 residential parcels in Minetto, 20% are located within ¼ mile of a commercial parcel. Although some residential areas are

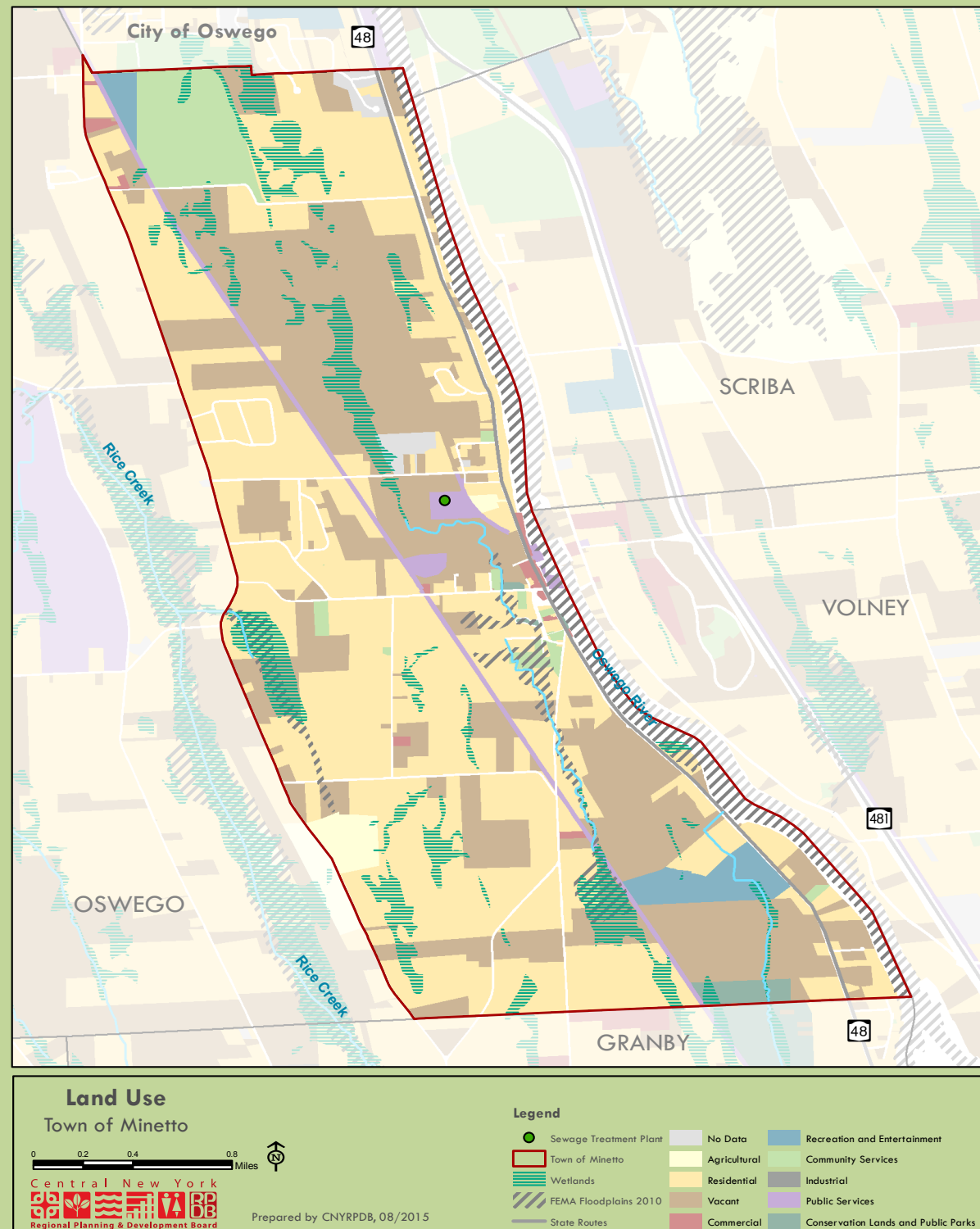
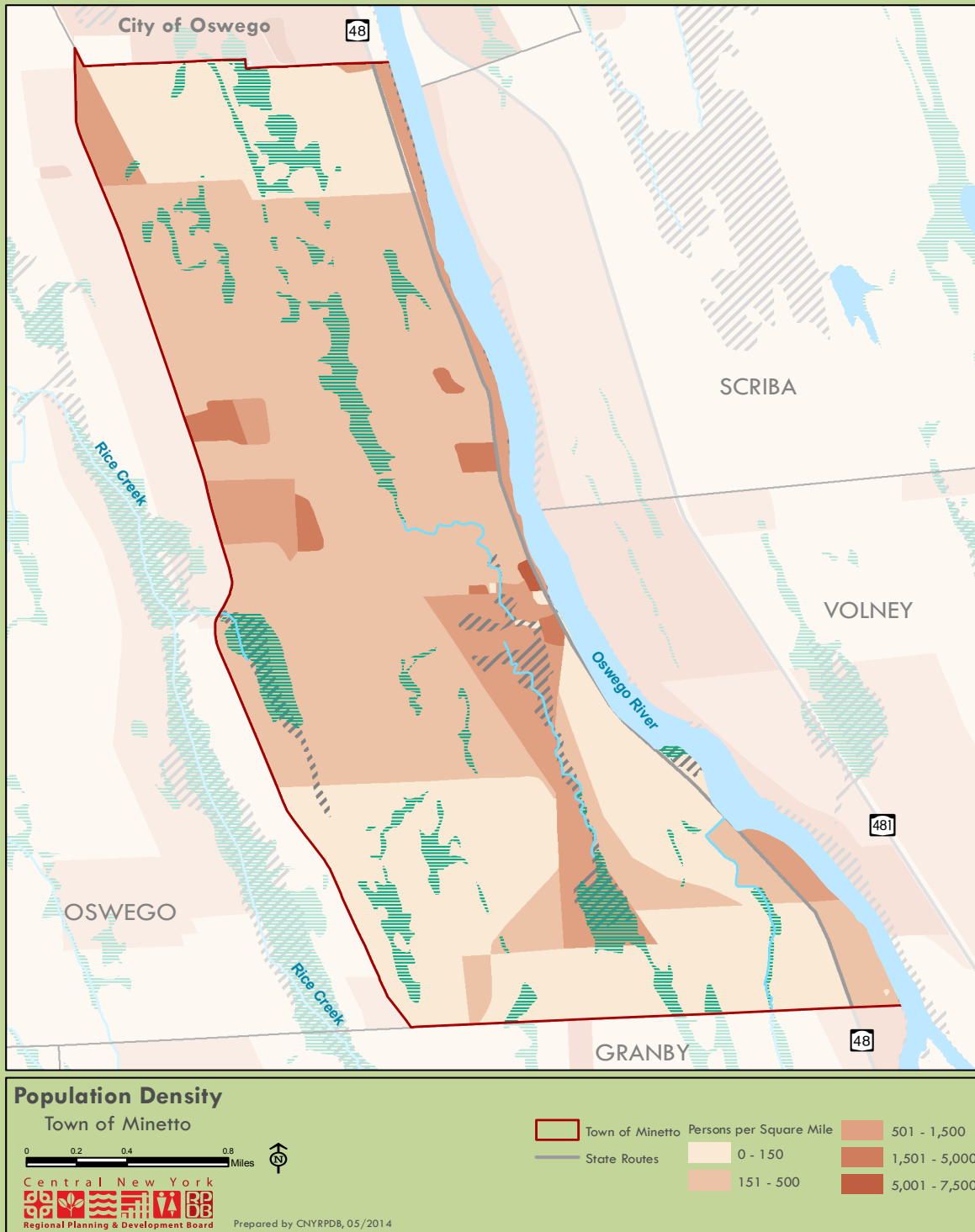


FIGURE 6- TOWN OF MINETTO POPULATION DENSITY



distant from commercial services, overall, the existing land use pattern creates some opportunities for pedestrian and bicycle travel.

Density: Density refers to the number of housing units, people, or jobs in a given area. Higher densities refer to an increased number of services, shops, schools, and public buildings located within a neighborhood which increases the availability of transit and pedestrian infrastructure. These conditions tend to reduce the need for vehicle ownership and increase the use of alternative modes. Residential density is normally measured in terms of households per acre. According to the 2013 American Community Survey, Minetto has a relatively low residential density of 0.17 households per acre.

Urban design research demonstrates that most people will walk to destinations that are within ¼ mile or a 5-minute leisurely walk. Neighborhoods are considered to be pedestrian-friendly if residents' homes are within ¼ mile of a diverse array of commercial and civic uses.



Minnetto Elementary School Student Council during Spring Cleanup at Town Hall

Photo Credit: Nancy Prarie

Greenhouse Gas Inventory Summary

As part of the Climate Change Innovation Program, an inventory of the town's municipal and community Greenhouse Gas (GHG) emissions was conducted in 2014 with the assistance by CNY RPDB staff. The 2014 inventory report examined emissions generated in the Town of Minetto in 2010, which serves as the baseline year for the Climate Action Plan.

The inventory report found that in the 2010 base year, town municipal operations generated a total of 279 metric tons of carbon dioxide equivalent (MTCO₂e), which were broken up into 5 sectors: buildings and facilities (26 MTCO₂e, 9%), streetlights and traffic signals (27 MTCO₂e, 10%), vehicle fleet (155 MTCO₂e, 55%), wastewater treatment

facilities (69 MTCO₂e, 25%), and wastewater treatment processes (2 MTCO₂e, 1%).

Community emissions totaled 12,283 MTCO₂e, which were broken up into 4 sectors: residential energy (5,148 MTCO₂e, 42%), commercial energy (713 MTCO₂e, 6%), transportation (6,170 MTCO₂e, 50%), and waste (252 MTCO₂e, 2%).

The Town of Minetto's Climate Action Plan uses the data gathered in the 2014 GHG inventory report as a baseline for analyses to determine which energy efficiency strategies will be most effective. The strategies presented in this document are based on goals that will help Minetto to reduce emissions, energy use, and dollars spent on municipal and community operations by the year 2025.





- 1 MTCO₂e =**
-  CO₂ emissions from 112 gallons of gasoline consumed
 -  CO₂ emissions from 2.3 barrels of oil consumed
 -  CO₂ emissions from 41.7 propane cylinders used for home barbeques
 -  Carbon sequestered by almost 1 acre of U.S. forests in one year

FIGURE 7- TOWN OF MINETTO MUNICIPAL EMISSIONS BY SECTOR MTCO₂E (2010 BASELINE)

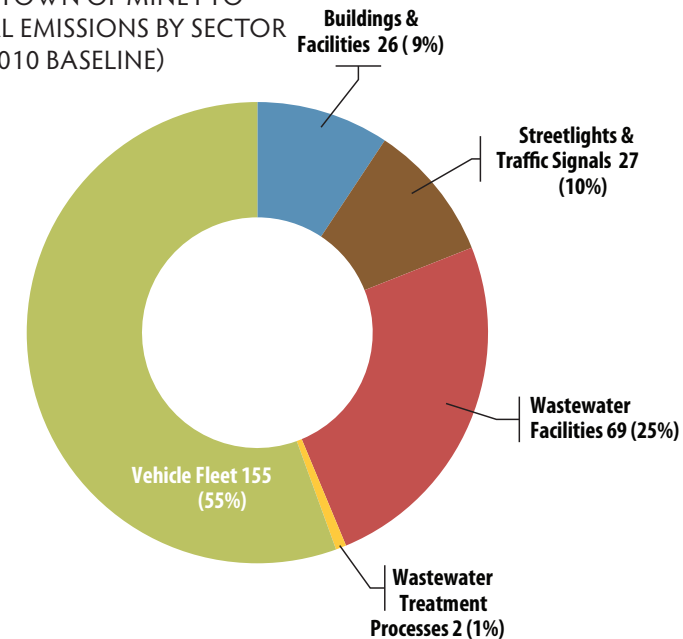


FIGURE 8- TOWN OF MINETTO COMMUNITY EMISSIONS BY SECTOR MTCO₂E (2010 BASELINE)

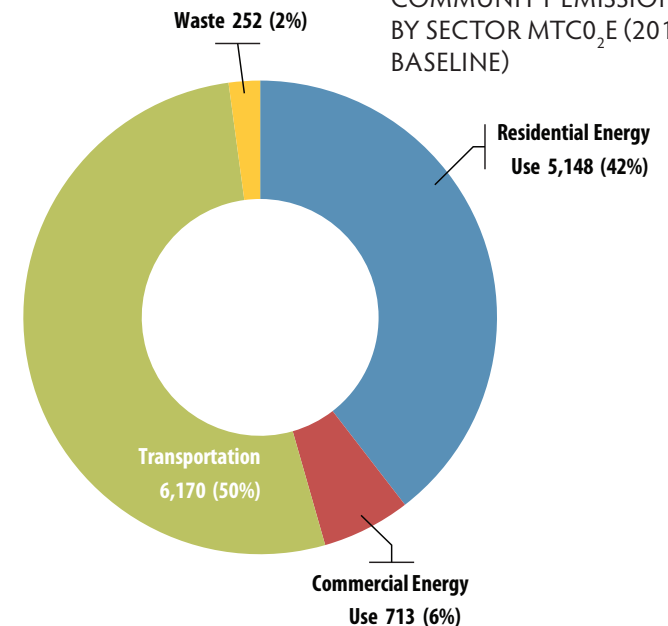
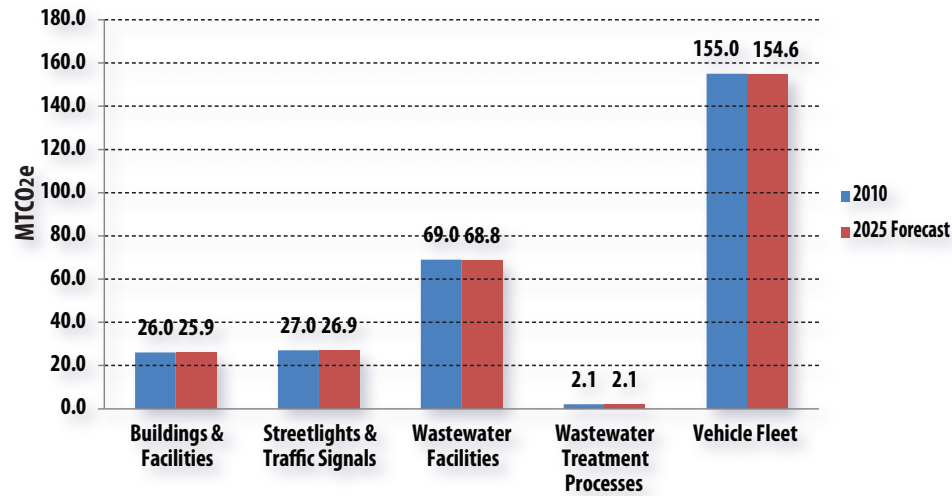


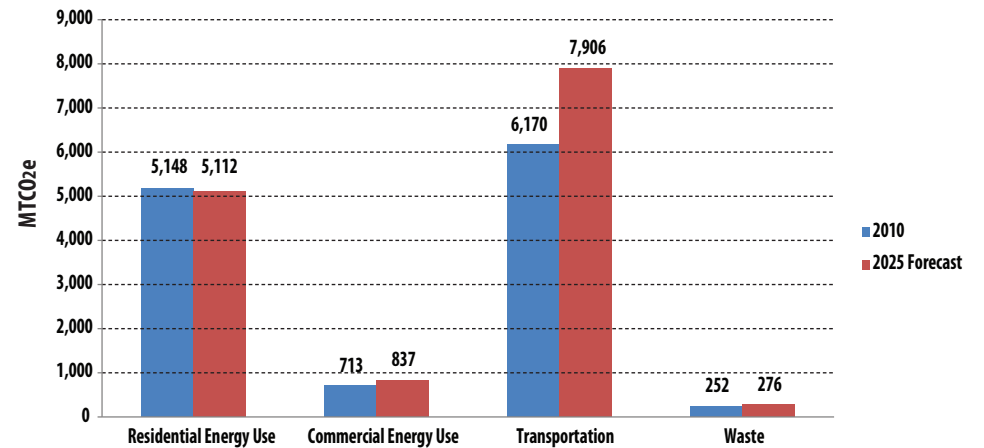
FIGURE 9- EMISSION FORECAST:
MUNICIPAL OPERATIONS



The GHG inventory report also forecasted emissions for the Town of Minetto in 2025. The report explained that town municipal emissions were expected to total 278 MTCO₂e in 2025, with a 0.1 MTCO₂e decrease in buildings and facilities emissions, a 0.1 MTCO₂e decrease in streetlights and traffic signals, a 0.2 MTCO₂e decrease in wastewater treatment facilities, and a 0.4 MTCO₂e decrease in vehicle fleet.

Community emissions were expected to total 14,131 MTCO₂e in 2025, with a 36 MTCO₂e decrease in the residential sector, a 124 MTCO₂e increase in the commercial sector, a 1,736 MTCO₂e increase in the transportation sector, and a 24 MTCO₂e increase in the waste sector.

FIGURE 10- EMISSION FORECAST:
COMMUNITY



Climate Action Accomplishments

The Minetto community and county planners have been pro-active in adapting to climate change and have taken steps to reduce greenhouse gas emissions. The town, along with more than 160 other municipalities in New York State, signed municipal resolutions to become Climate Smart Communities. The town worked with the CNY Regional Planning and Development Board to complete a greenhouse gas inventory in November 2014. The following narrative provides a brief summary of several additional initiatives to protect the community against storm events, excessive heat, and other climate influences.

Town of Minetto Comprehensive Emergency Management Plan

Emergency management planning is a proactive way to minimize repair costs and loss of life through the implementation of prevention and risk reduction measures and by defining a response strategy and timeline for emergencies or disasters. The Town of Minetto Comprehensive Emergency Management Plan was developed to enhance the town's ability to provide leadership and direction to help prevent, mitigate, respond and recover from the dangers and problems arising from emergencies and disaster conditions.

The plan provides general all-hazards management guidance, using existing organizations and lines of authority that allow Minetto to meet its responsibilities before, during and after an emergency occurs. Town officials and residents worked together on the plan in partnership with the Oswego County Emergency Management Office. Authorization to develop it was provided by Article 2-B of the New York State Executive Law.

Minetto's Comprehensive Emergency Management Plan defines the interrelationship of activities, functions, and expertise necessary to deal with disasters and assigns responsibility for emergency

management to town departments and agencies. Each department and agency determined the management organization and procedures needed to fulfill the responsibilities assigned to it. The town departments' management responsibilities are outlined in separate plans and operating procedures, which form part of the overall plan. If a disaster involves the entire town, the Supervisor/Designee is designated to provide the centralized direction of requests for assistance.

The objectives of Minetto's Emergency Management Plan are to:

- + identify, assess, and prioritize local and regional vulnerabilities to emergencies or disasters and the resources available to prevent or mitigate, respond to, and recover from them;
- + outline short, medium, and long-range measures for improving the town's all-hazards management capability;
- + provide that the town will take the necessary actions to prevent or mitigate the effects of disasters and be prepared to respond to and recover from them;
- + provide for the utilization of private and all public emergency resources to protect against and deal with an emergency or threatening situation;
- + provide for the coordination with the County of Oswego to assist victims of disasters, with particular attention to the needs of the elderly, disabled, poor and other groups which may be especially affected;
- + provide for the coordination with the County of Oswego for programs dealing with recovery from an emergency or disaster with particular attention to the development of mitigative action programs.



Clean Sweep Minetto during Oswego County Earth Week

Photo Credit: Mark Prarie

Oswego County is responsible for assisting local governments in the event that they have reasonably committed their resources and are still unable to cope with any disaster. New York State is also obligated to provide assistance to the County after resources have been exhausted and if the County is unable to cope with the disaster. Minetto's plan outlines the type of request for assistance with the understanding that the governmental jurisdiction most affected by an emergency is required to involve itself prior to requesting assistance. Specific emergency management guidance for situations requiring special knowledge, technical expertise, and resources are addressed in separate reports attached to the plan.

Fifteen hazards are evaluated in the management plan. The following two conditions were reported as being moderately high:

- + Severe winter storms: moderately high hazard based on extreme temperatures, food shortage, ice jam, ice storm, infestation, severe storm, structural collapse, transportation accident, utility failure, and winter storms.
- + Floods: moderately high hazard occurring at infrequent times with impacts on dam failure, hazmat (fixed site), landslide, structural collapse, transportation accident, utility failure, and water supply contamination.

Oswego County has designated a County Hazard Mitigation Coordinator who is responsible for coordinating County efforts in reducing hazards in Oswego County, including the Town of Minetto.

Stormready Status

In 2007, NOAA's National Weather Service renewed Oswego County's Stormready status. StormReady is a national preparedness program that supports municipalities that take a proactive approach to improving local hazardous weather operations and public awareness and provides



Trash barrels for park painted by Minetto Elementary School Book Club

Photo Credit: Dick Drosse

improved communication and safety skills that can be utilized before and during severe weather and flooding events.

The program provides communities with guidance from a partnership between local National Weather Service forecast offices and state and local emergency managers. To be recognized as StormReady, a community must:

- + Establish a 24-hour warning point and emergency operations center;
- + Have more than one way to receive severe weather forecasts and warnings and to alert the public;
- + Create a system that monitors local weather conditions;
- + Promote the importance of public readiness through community seminars;
- + Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

The Oswego County Emergency Management Office facilitated Oswego County's designation as a National Weather Service StormReady Community.

County Operations

Minetto benefits from several emergency management programs that are administered by Oswego County. These services include the following:

- + Disaster education programs for school children and community groups focus on family disaster planning, weather emergencies and hazardous chemical awareness
- + Disaster planning assistance for community organizations and businesses including how to develop a comprehensive emergency management plan
- + The Oswego County Sheriff's Department offers emergency planning training on boater safety and snowmobile safety courses
- + Suspicious package recognition training provides school personnel and others with information and skills to safely respond to threats of suspicious packages.
- + An opportunity is available to have fingerprints taken and identification information gathered on family members which can be used for the identification of people in emergency situations

Oswego County Emergency Management Office

The Oswego County Emergency Management Office (EMO) serves as the disaster services and emergency preparedness center for the County. It maintains and administers an integrated emergency management program designed to ensure life safety, property and environmental protection from all natural, human-caused, and technological hazards through preparedness, prevention/mitigation, response and recovery. The EMO provides planning and training resources, response and warning coordination, and information distribution through communications to the public, local government officials, and public safety agencies to assist them in emergency management. It coordinates plans for emergency response, including county-wide and local comprehensive emergency management and hazard-specific plans such as radiological, hazardous materials, or multiple-casualty.

The Emergency Management Office manages the Emergency Medical Services course sponsorship program through the New York State Department of Health/Emergency Medical Services Bureau. In addition, during disaster response, the Emergency Management Office facilitates the County Emergency Operations Center, which coordinates and allocates resources, planning, public warning and information, and recovery with agencies involved in emergency response.

National Incident Management System (NIMS)

NIMS is a federal program that was developed so that emergency responders from different jurisdictions and disciplines can better respond



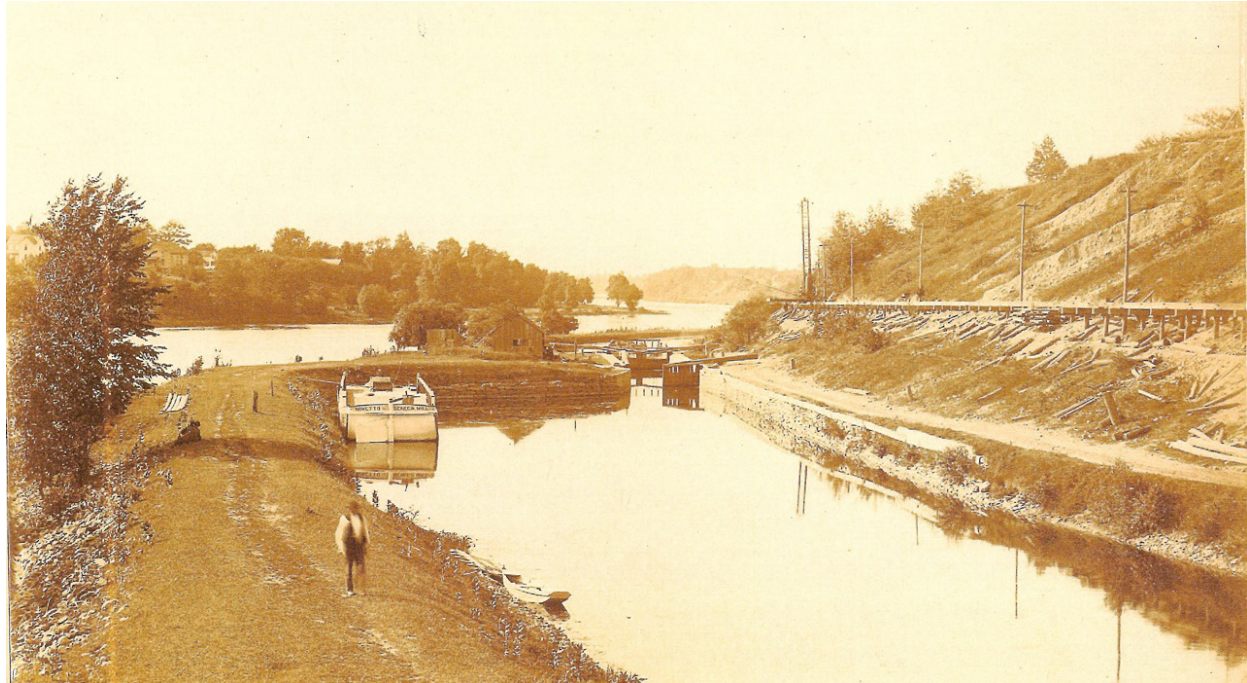
AmeriCorps members at Minetto Lock O-5

Photo Credit: Dick Drosse

to natural disasters and emergencies. NIMS establishes a command and management structure with emphasis on preparedness, mutual aid and resource management. NIMS provides training for emergency responders and others that work with response agencies during emergencies and disasters. These include fire, emergency medical services, and law enforcement personnel, as well as municipality chief elected officials, schools, hospitals, volunteer agencies and others. The Director of the Oswego County Emergency Management Office is the point-of-contact for NIMS compliance for local governments and emergency response agencies.

Oswego County Soil and Water Conservation District

The Oswego County Soil and Water Conservation District (SWCD) develops erosion and sediment control plans, assists with stormwater facility permitting, works on streambank restoration to reduce erosion and sedimentation, and provides assistance in the identification of green infrastructure opportunities. The Town of Minetto is working with the SWCD to identify priority erosion areas in the watershed and to design preventative measures to reduce stormwater runoff.



Lock #13 Minetto, 1895

Credit: Minetto History Buffs

Climate Adaptation vs. Mitigation

According to climate researchers, continued emissions of greenhouse gases will cause further warming with changes anticipated in all components of the global ecosystem. Reducing the rate of climate change will require substantial and sustained decrease of greenhouse gas emissions. These are the key conclusions from an assessment by the Intergovernmental Panel on Climate Change (IPCC) that was released in January 2014. 259 scientists from 39 countries around the world further stated that, "Warming of the climate system is unequivocal and since the 1950s, many of the observed changes are unprecedented over decades to millennia." Their findings are based on numerous independent scientific analyses and observations of the climate system, paleoclimate archives, theoretical studies of climate processes and simulations using climate models. The Summary for Policymakers of the IPCC Working Group I assessment report was approved in September 2013 by the member governments of the IPCC meeting in Stockholm, Sweden.

Unprecedented human intervention will be required in the coming decades to reduce the extent of climate change. This can be done by avoiding the potential consequences (referred to as mitigation), or making changes to accommodate those effects that are unavoidable (referred to as adaptation). Much of the mitigation policy information in this report has centered on reducing greenhouse gas (GHG) emissions through fuel substitution and fuel efficiency for vehicles and on energy efficiency for buildings and industries.

Mitigation Strategies

The mitigation recommendations that are found in this Climate Action Plan were based on the findings from the town's greenhouse gas inventory. CNY RPDB staff and the advisory committee worked throughout 2015 to analyze potential mitigation



Minetto Beautification Committee at Veterans' Memorial

Photo Credit: Dick Drosse

strategies for reducing the town's emissions for both municipal operations as well as at the community-wide scale. CNY RPDB utilized a software tool developed by ICLEI-Local Governments for Sustainability known as CAPP (Climate and Air Pollution Planning Assistant) version 1.5 to calculate potential GHG reductions as well as cost savings for each mitigation strategy. CAPP is an Excel-based decision-support tool designed to help U.S. local governments explore and identify potential opportunities to reduce greenhouse gas emissions and other air pollution emissions. CAPP provides a starting point for two major tasks: determining an achievable emissions reduction target and selecting mitigation strategies to include in a local municipal-operations or community-scale emissions-reduction plan, commonly called a climate action plan. CAPP users can compare the

relative benefits of a wide variety of emissions reduction and clean air measures, and identify those most likely to be successful for their community based on its priorities and constraints.

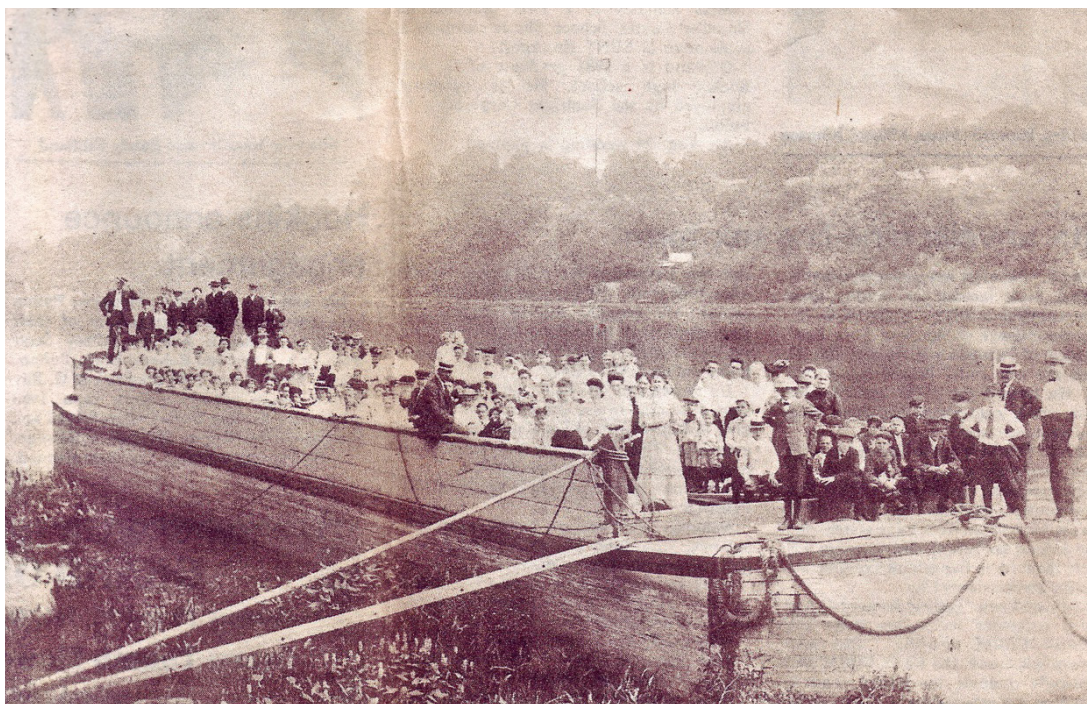
Utilizing CAPP, a variety of mitigation strategies were identified and analyzed to determine their potential for achieving emissions reductions either at the municipal operations level or the community scale. The CNY RPDB also explored the potential impacts of an external large scale factor on the community's emissions profile: New Federal CAFE Standards that will increase the average fuel economy of vehicles sold in the U.S. through 2025. The results of these analyses are summarized in the following pages and in Figures 11-13.

Adaptation Strategies

The U.S. Environmental Protection Agency refers to the term 'adaptation' as the adjustment or preparation of natural or human systems to a changing environment which moderates harm or exploits beneficial opportunities. Examples of community adaptation to extreme weather include development of early storm warning systems, air-conditioned cooling shelters, and policies that discourage people from building in flood prone areas. This type of initiative requires comprehensive, community-wide planning that addresses all climate risk factors that may be associated with storm events, flooding, snowfall, and wind damage.

The scale of intervention required to reduce and adapt to the effects of climate change will require action at all levels of government and society. International accords to limit overall carbon emissions will involve national governments. Setting carbon emission targets and standards by industry or sector, or fuel efficiency standards for vehicles, falls within the traditional purview of federal and state governments. New York State, for example, has set aggressive energy and climate goals, including meeting 30% of the state's electric needs with renewable energy sources by 2030, and reducing greenhouse gas (GHG) emission by 80% (below 1990 levels) by 2050.

A primary goal for Central New York, as presented in *Vision CNY: Central New York Regional Sustainability Plan*, is to reduce CO₂ emissions, increase use of alternative energy such as solar and wind, and adapt to a changing climate by improving community resilience, protecting infrastructure, and protecting natural systems. A gradual increase in high and low temperature extremes, coinciding with an increase in the frequency and intensity of storm events are expected to impact transportation infrastructure, human health, agricultural practices, forest diversity, and migratory patterns of invasive species. Adapting to climate change will provide opportunities for Minetto to improve the health and resilience of the



Old Minetto tour boat

Credit: Minetto History Buffs

community and will provide long-term protection of natural resources.

Town governments are leading by example by reviewing options to reduce energy usage in municipal facilities through alternative fuels for transportation fleets and renewable energy sources. Local officials and the CNY RPDB are meeting with community leaders to review building codes and standards, analyze public transportation options to reduce commuting time, and to explore options to educate the public about adaptation measures and alternative energy choices.

Recommendations for climate mitigation and adaptation that are presented in the following pages are designed to help the Minetto community

prepare for current and anticipated changes in climate conditions and to assist decision-makers in identifying opportunities to improve community resilience. Several of these recommendations are consistent with those presented in Minetto's Comprehensive Emergency Management Plan. The suggested actions will protect people, homes, buildings and natural systems by reducing risks from environmental hazards such as extreme heat and storm events. These are actions that the community can take to reduce its emissions and promote energy efficiency through vehicle fuel efficiency, alternative transportation, land use planning, and other strategies. The Minetto community is encouraged to update these recommendations each year as additional data becomes available.

TRANSPORTATION

According to the Town of Minetto's GHG Inventory Report, transportation accounted for 55% of government emissions and 50% of community emissions in the town in 2010. This Climate Action

Plan addresses two main transportation emissions reduction goals: increase options for low-carbon transportation and increase use of alternative fuels.



Mitigation Strategy Goals for 2025

Increase Options for Low-Carbon Transportation

Increase telecommuting: 104 MTCO₂e annual reductions.

This strategy assumes that 5% of people with primary jobs in Minetto telecommute.

Expand pedestrian infrastructure: 51 MTCO₂e annual reductions.

This strategy assumes that 5% of weekly trips less than 1 mile are converted to walking.

Encourage carpooling: 208 MTCO₂e annual reductions.

This strategy assumes a 10% reduction in vehicle trips to and from work.

Expand bicycling infrastructure: 4 MTCO₂e annual reductions.

This strategy assumes that 100 weekly trips less than 2 mile are converted to bicycling.

Consolidate municipal vehicle trips: 2 MTCO₂e annual reductions.

This strategy assumes 1,825 miles are reduced annually, about the same as reducing municipal trips by half.

Create single waste district for town

Increasing options for low-carbon transportation would reduce the amount of vehicle miles traveled (VMT), reducing gasoline and diesel use which would therefore reduce Minetto's emissions, fuel costs, and reliance on foreign fossil fuels. Encouraging community members to use bicycles or walk instead of driving will allow municipalities to reduce VMT. E-mail, video conferencing, and telephones can replace face-to-face meetings, eliminating the need to travel and saving valuable work time.

High quality low-carbon forms of transportation provide multiple co-benefits besides energy savings and emission reductions, including congestion reductions, road and parking facility cost savings, consumer savings and affordability, improved mobility for non-drivers, support for strategic land development objectives (i.e. reducing sprawl), and improved public fitness and health.

Carpooling and consolidating trips is another way community members can reduce emissions and save money. Currently, there are multiple waste haulers that travel down the same roads in the town on the same days. Residents also often choose to haul

their own waste to transfer stations. A single waste district for the town would significantly cut down on vehicle miles traveled by waste hauling vehicles, thus reducing energy use and emissions in the town.

Adaptation Strategies

Minetto can prepare a commuting analysis to evaluate the need for organized carpooling and ride-sharing opportunities. One way to encourage carpooling is to create an electronic bulletin board where community members can go to request or offer rides. This bulletin board could be placed on the town website or some other easily accessible location. The town can also promote telecommuting and encourage local jobs through mixed use zoning in the town.

Providing education and incentive programs to encourage carpooling and bus ridership could also help to reduce the number of student drop-off and pick-up trips to and from the school, which would also help reduce emissions. Only using smaller school buses when only a few students are being transported to and from school and events is another policy that can reduce emissions from transportation in the town.

The town can also encourage residents to buy smaller cars by providing a cost-benefit analysis showing financial savings and emission reduction comparisons.



Minetto Bridge, winter

Photo Credit: Mark Prarie

Mitigation Strategy Goals for 2025

Increase use of Alternative Fuels

Conversion to hybrid vehicles: 218 MTCO₂e annual reductions.

This strategy assumes 15% of community vehicles convert to hybrid.

Conversion to electric vehicles: 76 MTCO₂e annual reductions.

This strategy assumes 30 community vehicles convert to electric.

Install electric vehicle charging facilities: 24 MTCO₂e annual reductions.

This strategy assumes 5 charging facilities are installed in the town.

Governor Cuomo announced on April 11, 2013 that more than 360 electric vehicle and plug-in hybrid charging stations will be installed across the state in support of his Charge NY initiative, which is an initiative to create a statewide network of up to 3,000 public and workplace charging stations over the next five years and to put up to 40,000 plug-in vehicles on the road during that period.

Hybrid and electric vehicles are less expensive to operate than regular vehicles, and while certain issues related to battery life still remain, maintenance and fuel cost savings are expected to outweigh the price of battery replacement.

Not only will using alternative fuels reduce greenhouse gas emissions, it will also reduce US dependence on imported fuels and reliance on fossil fuels in general. Increasing the use of alternative fuels would greatly reduce Minetto's emissions and provide other benefits to community members as well.

ENERGY EFFICIENCY

According to town's GHG Inventory Report, emissions from municipal buildings/facilities accounted for 9% of total municipal emissions, wastewater facilities accounted for 25%, and streetlights and traffic signals accounted for 10%, while residential energy use accounted for 42% of the community's

emissions and commercial energy use accounted for 6% of the community's total GHG emissions in the Town of Minnetto in 2010. This Climate Action Plan addresses two main energy/efficiency emissions reduction goals: increase energy efficiency in buildings; and increase use of renewable energy.



Minnetto Town Hall sign

Photo Credit: Dick Drosse

Mitigation Strategy Goals for 2025

Increase energy efficiency and reduce emissions from buildings

Home weatherization: 237 MTCO₂e annual reductions.

This strategy assumes 25% of households weatherize their homes.

Energy efficiency education for residents: 138 MTCO₂e annual reductions.

This strategy assumes 10% of households participate in an educational program.

Promote loans/incentives for energy efficiency: 88 MTCO₂e annual reductions.

This strategy assumes 25% of households undergo a retrofit with the assistance of loans/incentives.

Energy efficiency education for businesses: 23 MTCO₂e annual reductions.

This strategy assumes 5 businesses participate.

Retrofits of existing wastewater facilities: 17 MTCO₂e annual reductions.

This strategy assumes all wastewater facilities undergo retrofits with 25% energy savings.

LED streetlights: 11 MTCO₂e annual reductions.

This strategy assumes all streetlights are converted to LED.

Lighting occupancy sensors at municipal facilities: 9 MTCO₂e annual reductions.

This strategy assumes all facilities install occupancy sensors.

Retrofit of DPW garage: 6 MTCO₂e annual reductions.

This strategy assumes the DPW garage is retrofit with 35% energy savings.

Lighting occupancy sensors: 5 MTCO₂e annual reductions.

This strategy assumes 10,000 square feet of commercial buildings install sensors.

Power-down at night policy: 5 MTCO₂e annual reductions.

This strategy assumes 10,000 square feet of commercial buildings power-down.

Behavior changes at Town Hall: 1 MTCO₂e annual reductions.

This strategy assumes 10% energy savings due to behavior changes.

LED holiday lights: 0.1 MTCO₂e annual reductions.

This strategy assumes 360 holiday bulbs are replaced.

On-demand water heater for bath house at park

Energy efficiency education can be crucial in working to reduce emissions from buildings and facilities. Being familiar with actions that can be taken to increase building efficiency and reduce emissions, such as the ones listed above, is the first step in carrying out those actions. Participating in the Central New York Energy Challenge Team Program is a great way to educate community members on actions they can take at home to reduce energy use and emissions, and businesses can be targeted in a similar educational program and/or energy challenge competition.

Buildings in Minetto may also not be equipped with the most recent energy efficient technologies, causing the town and community members to use more energy than is necessary. Retrofitting existing facilities through measures like replacing appliances and light bulbs with more efficient ones, increasing insulation, and upgrading HVAC systems can greatly improve energy efficiency and therefore reduce emissions from the town's buildings and facilities.

The initial cost of retrofitting heating units may seem daunting; however, the local government, NYSERDA, and the CNY RPDB can offer assistance and support to make retrofits easier by providing educational materials, low-interest loans, and guidance on where to find potential grants or incentives to help cover costs. Improving energy efficiency can help to reduce criteria air pollutants as well as greenhouse gas emissions and increases energy and water cost savings.

Adaptation Strategies

Minetto can modify local laws to incorporate measures for adaptation to climate change, such as evaluating the use of Property Assessed Clean Energy (PACE) financing as a way for commercial property owners to pay for energy upgrades, on-site renewable projects and water conservation measures.



Christmas lights, Minetto

Photo Credit: Mark Prarie

National DSIRE Database

Incentives available for renewable energies are constantly changing. The Database of State Incentives for Renewables & Efficiency, or DSIRE, is a website that offers comprehensive information on incentives and policies that support renewables and energy efficiency in the United States. Established in 1995, DSIRE is currently operated by the N.C. Solar Center at N.C. State University, with support from the Interstate Renewable Energy Council, Inc. DSIRE is funded by the U.S. Department of Energy. Visit dsireusa.org to learn more about current incentive opportunities.



Passive solar home, Minetto

Photo Credit: Dick Drosse

Mitigation Strategy Goals for 2025

Increase use of renewable energy

Residential solar: 115 MTCO₂e annual reductions.

This strategy assumes 462 kW of solar PV is installed.

Commercial solar: 70 MTCO₂e annual reductions.

This strategy assumes 280 kW of solar PV is installed.

Municipal solar at WWTP: 68 MTCO₂e annual reductions.

This strategy assumes 275 kW of solar PV is installed.

Other municipal solar: 32 MTCO₂e annual reductions.

This strategy assumes 130 kW of solar PV is installed.

Geothermal (residential): 24 MTCO₂e annual reductions.

This strategy assumes half of homes (6 homes) currently using fuel oil convert to geothermal.

By installing renewable energies like solar, Minetto can ensure that their energy is provided by clean and local renewable energy sources, therefore reducing greenhouse gas emissions, energy cost, and reliance on fossil fuels.

Many residents or businesses would like to use renewable energies, but the large up-front cost is an obstacle. The local government can help overcome this barrier by offering low-interest loans or organizing group buying programs to negotiate lower prices, such as the Solarize Madison program offered in Madison County in 2012-2013 and the Solarize Syracuse program offered in Syracuse in 2014. These programs are an effective way of combining public and private funds for renewable energy. The CNY RPDB and municipalities throughout Central New York are currently offering a bulk-purchasing program for residents and small businesses, known as Solarize CNY.

The New York State Energy Research and Development Authority (NYSERDA) provides

incentives for the installation of solar PV based on system size. Additionally, there are renewable energy tax credits for residential and commercial solar PV and geothermal installations. Educational and technical assistance programs can also promote renewable energies. Local governments can offer information clearinghouses and connect consumers with renewable energy installers.

NYSERDA, New York Power Authority (NYPA) and City University of New York (CUNY) developed a NYS Unified Solar Permit that helps to reduce costs for solar projects by streamlining municipal permitting processes and supports the growth of clean energy jobs across the state. The unified solar permit is part of Governor Cuomo's NY-Sun initiative to quadruple in 2013 the amount of solar capacity in New York that was added during 2011.

Adoption of a standardized residential/small business solar permit is a key element to help New York municipalities remove barriers to local economic development in the growing

solar industry. The standardized permit cuts costs by creating a uniform permitting process in municipalities across the state. Installers in New York State have had to work with different permits and permitting processes in each of the State's 1,550 municipalities, which increased the complexity of permitting and have caused project delays and added costs. The Town of Minetto has adopted the unified solar permit to reduce soft costs associated with solar installations.

An increasingly popular way for a local government to overcome the financial hurdles of installing a photovoltaic system is through the "solar services model" also known as a Power Purchase Agreement (PPA). Through this type of arrangement, the owner of a property can provide the space for a power producer to install the system. The property owner then agrees to buy the power produced from that system at a set rate that is competitive with grid electricity. Since the power producer retains ownership of the equipment, there are no installation and maintenance costs to the consumer of the electricity produced. This is particularly attractive to government entities that are unable to take advantage of tax-based incentives for renewable energy.

The CNY RPDB is also currently offering a bulk solar purchasing program for municipalities that the Town of Minetto has submitted information to participate in if the conditions are right. This program will bundle solar installations from multiple local municipalities into a single Request For Proposals (RFP), allowing solar installers to offer lower installation prices than if each municipality were to pursue options individually. The CNY RPDB will choose the solar installer and complete the up-front leg-work for the municipalities to help save municipal time and money.



Solar PV system installed at a home in Minetto

Photo Credit: Dick Drosse

"WE ARE LIKE TENANT FARMERS CHOPPING DOWN THE FENCE AROUND OUR HOUSE FOR FUEL WHEN WE SHOULD BE USING NATURE'S INEXHAUSTIBLE SOURCES OF ENERGY – SUN, WIND AND TIDE... I'D PUT MY MONEY ON THE SUN AND SOLAR ENERGY. WHAT A SOURCE OF POWER! I HOPE WE DON'T HAVE TO WAIT UNTIL OIL AND COAL RUN OUT BEFORE WE TACKLE THAT." – Thomas Edison in conversation with Henry Ford and Harvey Firestone (1931)

WASTE

In 2010, 2% of the community's GHG emissions came from waste. Waste from the town is disposed of at the Bristol Hill Landfill or the Oswego Energy Recovery Facility. As the waste breaks down in landfill, it produces greenhouse

gases that can be reduced by composting. As the waste is combusted at the Energy Recovery Facility, it produces steam that turns turbines and produces energy. However, combustion of the waste also creates GHG emissions.



Mitigation Strategy Goals for 2025

Decrease the waste stream

Kitchen composting: 1 MTCO₂e annual reductions.

This strategy assumes that food waste is reduced by 25%.

Waste generated in the Town of Minetto is sent to the Bristol Hill Landfill or the Energy Recovery Facility for disposal. The decomposition and combustion of this waste creates GHG emissions and other pollutants that can be reduced by decreasing the waste stream through composting.

Composting produces fertilizer that can be used for farms or gardens, returning nutrients to the soil that were removed with food production and reducing the need for synthetic fertilizers. Composting also reduces the volume of material sent to the landfill and energy recovery facility, reducing disposal costs.

Composting is something that can be done at individual households or at the community scale. New York State's "Beyond Waste" Plan advances food scrap recycling as a key environmental strategy to help communities increase their waste diversion rates, and community composting sites, such as the Amboy Compost Site in Camillus, New York, have effectively composted yard and food waste for years.

Adaptation Strategies

Minetto should work with Oswego County Planning to research and implement food composting and recycling options for local colleges, schools, and restaurants. This will help reduce emissions from waste produced in Minetto.

NATURAL RESOURCES

Planting trees in strategic ways to shade buildings can reduce energy used to cool buildings. Trees that are properly planted with energy savings in mind can reduce the amount

of energy (electricity, natural gas, or other fuel) used to cool and heat buildings. This not only reduces associated emissions, but also saves money.



Mitigation Strategy Goals for 2025

Plant trees for carbon storage and energy savings

Tree planting: 29 MTCO₂e annual reductions.

This strategy assumes 20% of households plant 1 tree (129 trees).

The shade from a single well-placed mature tree reduces annual air conditioning use from two to eight percent (in the range of 40-300 kWh), and peak cooling demand from two to ten percent (as much as 0.15-0.5 kW), therefore reducing GHG emissions. The Arbor Day Foundation provides information on its website explaining how to plant trees to conserve energy most effectively.

Tree planting can also reduce storm water runoff, decreasing the amount of water that needs to be treated at wastewater treatment facilities. Finally, tree planting increases the aesthetic appeal of homes, increasing property values.

Adaptation Strategies

To adapt to a changing environment, Minetto can plant living snow fences (evergreens planted at distances of at least 100 feet upwind of problem stretches of road) to reduce snow drifts and travel hazards for drivers. Minetto can also plant and maintain trees and other vegetative buffers along the Oswego River shoreline in order to reduce the flow rate of sediments and nutrients from entering the river and tributaries, to reduce shoreline erosion, and to maintain cooler water temperatures through shading.

Minetto can also encourage the US Forest Service and Oswego County Cooperative Extension to monitor changes in tree composition and health. Minetto can plant low pollen tree species in recreation areas in order to minimize human health issues, and manage tree density throughout the town to reduce overcrowding and susceptibility to stress and disease. The town can remove tree and vegetative growth along power lines and remove dead and dying trees and replace them with heat and invasive tolerant species.

The town can also ensure the resilience of natural systems and resources through open space conservation and smart growth strategies, such as maintaining hiking trails and protecting open space through conservation land grants, landowner incentives, regulation, fee acquisition, the purchase of conservation easements, and promotion of smart growth principals.

Minetto can update local maps that display low elevation areas in the town that may be susceptible to flooding and display this information on the town website, along with preparedness guidelines. Maps should display varying levels of flood hazard potential. The town can remove branches, ice jams, and other debris from local tributaries to reduce the potential for flooding.

To overcome invasive species issues, the Town of Minetto can educate the public and elected officials on the value of prevention and early detection of invasive species. The town can work with the Oswego County Soil and Water Conservation District

and the Natural Resource Conservation Service to monitor the introduction and spread of invasive species. Minetto can also participate in Cornell Cooperative Extension's Emerald Ash Borer control strategy and in the New York State Invasive Species Task Force.

The town may wish to assess the economic impacts of climate change through revenue potential from tourism and recreation associated with natural resources in Minetto.



Minetto Lock 5 under construction

Credit: Minetto History Buffs



Midway Drive-in Theater Fund-raiser

Photo Credit: Dick Drosse

ADDITIONAL ADAPTATION STRATEGIES

These strategies are additional actions Minetto can take to become more resilient in the face of a changing climate. Four

key strategy areas are explained here, including infrastructure, public health, education, and emergency operations.



Boats on Oswego River, Minetto

Photo Credit: Dick Drosse

Infrastructure

One of Minetto's adaptation goals is to protect and upgrade local infrastructure to achieve cost savings, as well as stormwater and flood control. There are various actions Minetto can take to address this goal, such as assessing the condition of local infrastructure and documenting climate vulnerabilities in the areas of energy, water, transportation, and telecommunications. Minetto can also reduce the threat of flooding by working with the Oswego County Soil and Water Conservation District (SWCD) to improve the capacity of stormwater collection systems and maximize soil infiltration and groundwater recharge.

Minetto can inventory and prioritize road culvert and shoulder ditch repairs, install green infrastructure measures (i.e. rain gardens, porous pavement, and rain barrels), and encourage downspout disconnection, bioinfiltration, and rainwater harvesting in residential and business communities to reduce stormwater runoff.

The town can promote policies, programs and activities to reduce climate-related risks by encouraging the adoption of zoning ordinances, subdivision

regulations, and building codes that address climate hazards, establish compliance with and enforcement of existing laws, regulations, and building codes that are related to energy use and climate risk reduction, and re-evaluate building codes, subdivision regulations, and zoning ordinances that discourage/prevent new development in flood-prone and high hazard areas along the Oswego River shoreline. The town can conduct an energy evaluation of the town's water distribution system and water pumping station, and install LED lighting upgrades.

Public Health

Minetto should also establish ways to reduce or eliminate the negative effects of climate change on public health. Adaptation strategies Minetto can pursue in this area include: working with the Oswego County Health Department to document trends in asthma, Lyme disease, and heat-related illnesses that may be influenced by a warming climate; improving local capacity for health preparedness, response, and recovery programs, such as the development of a extreme-heat response plan and designation of a community location with air conditioning during heat events; and notifying the community regarding heat events,

air quality, and other climate related health risks. The town and residents can sign up online through the Clean Air Campaign to receive Smog Alerts on days when the concentrations of ozone and/or particulate pollution are expected to reach unhealthy levels. The town could then make this information available to residents who may not have signed up for this information.

Education

Education is an important part of climate adaptation as well. Minetto should support the Emergency Planning Committee and the Oswego County Emergency Management Office in training local building officials, planning boards, and elected official on flood hazards, risk reduction strategies, implementation of floodplain development regulations, and post-flood reconstruction.

The town can train local building officials and the construction industry on flood proofing techniques for retrofitting existing flood prone development, encourage homeowners to sign up for NYSEDA energy audits, and encourage the Minetto Elementary School to develop and implement climate education programs.

The town can also provide emergency preparedness guidelines on the town websites, including recommendations for people living and working in flood prone areas, actions to take if a flash flood warning is issued, relevant emergency websites and information sources, items to include in a disaster/flood supply kit, how to protect properties from flood damage, and guidelines for developing a Family Disaster Plan. The town can also distribute brochures, fact sheets, and posters that show ways in which businesses and residents can prepare for and adapt to climate change and incorporate climate adaptation principals on town and agency websites in order to increase the awareness of severe weather risks, storm preparedness, and safety practices for homes and businesses.

The town can also sponsor workshops to teach residential and business owners how to calculate their Energy Use Intensity (EUI), and sponsor workshops to teach homeowners, local planning boards, elected officials, code enforcement officers, county agencies, businesses, citizen associations and real estate agents about Emerald Ash Borer, storm preparedness, watershed land use influences, and floodplain management.

Emergency Operations

Ensuring that emergency operations are current and maintaining open lines of communications between local agencies is also a significant part of successfully adapting to climate change. Minetto can achieve this goal by establishing and maintaining an Emergency Planning Committee that will identify potential hazards, determine the probably impact each of those hazards could have on people and property, delineate the geographic areas affected by potential hazards, plot them on maps, and designate them as hazard areas.

Minetto should also review and update the town's Comprehensive Emergency Management Plan every

five years, updating the community's inventory of emergency operations and public notification lists, updating land hazard maps and inventories of infrastructure and at-risk communities, and working with Oswego County officials to update the County's Hazard Mitigation Plan every five years.

Minetto should continue to endorse the use of the Incident Command System (ICS) as formally adopted by New York State for emergencies requiring multi-agency response. ICS allows flexibility in its implementation so that its structure can be tailored to the specific situation at hand. Under ICS, an Incident Commander (IC) has the overall responsibility for the effective on-scene management of the incident, and must ensure that an adequate organization is in place to carry out all emergency functions.

Minetto should also re-establish local protocols for sharing equipment during emergencies, collaborate

with national, state, and local agencies to facilitate data collection, sharing, and synthesis of flood and storm event preparedness information, and review the potential use of Hyper-Reach with IPAWS, a government partnership between federal and local emergency responders that is designed to reach non-residents in the town for a more complete coverage during emergencies.

Finally, Minetto could establish a road watch program to alert the public of flooded areas and tree damage during storm events, and they can compile a database of vulnerable populations (i.e. the elderly and people with special needs) and develop a system to contact them in case of emergency.

All of these additional adaptation strategies will allow Minetto to be a resilient and sustainable community in the long-term, despite the effects of climate change.



Minetto Volunteer Fire Department water rescue during Magic in Minetto

Photo Credit: Chuck Forbes

Total possible reductions = 1,665 MTCO₂e

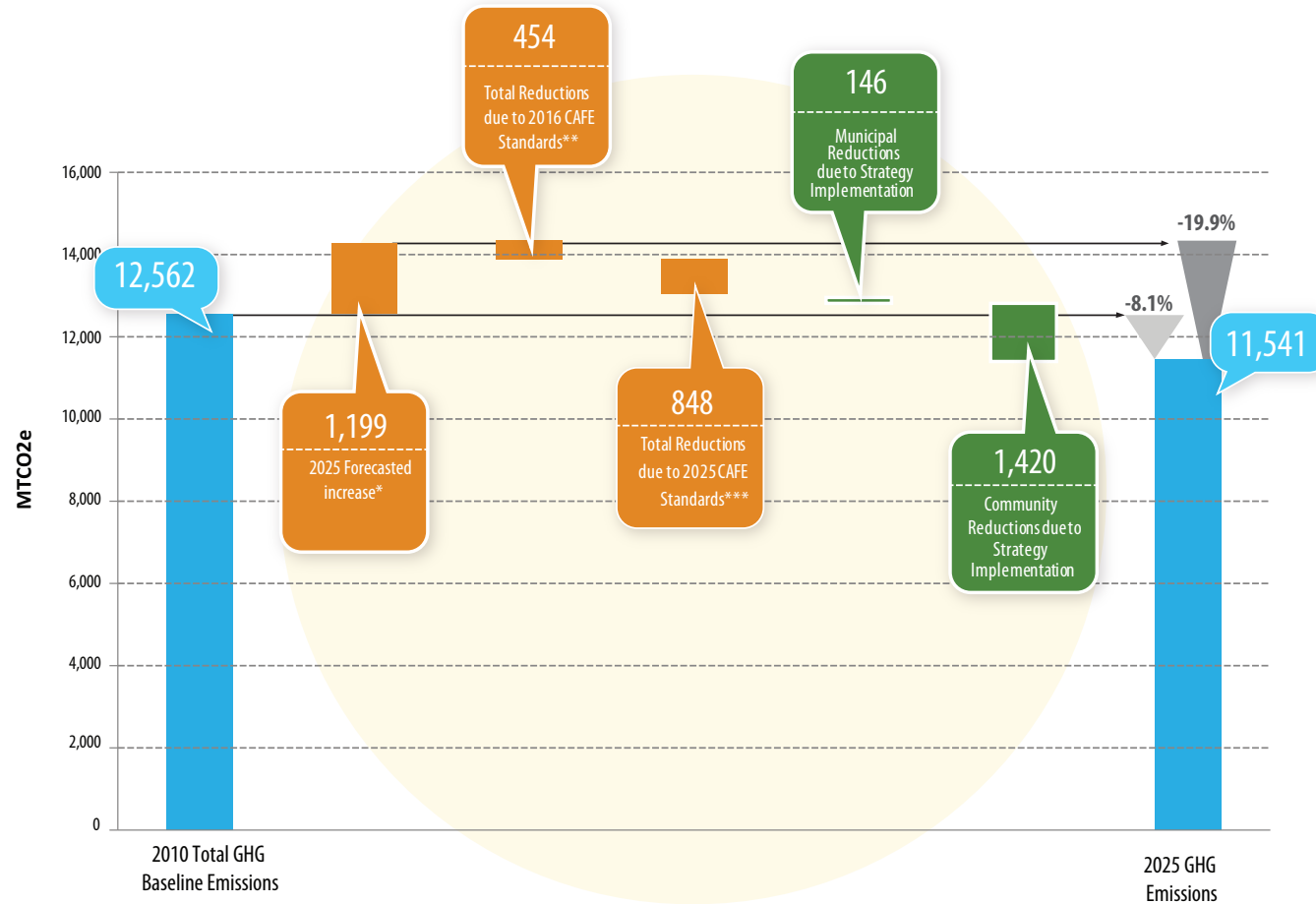


FIGURE 11- TOTAL POSSIBLE REDUCTIONS BY 2025

Figure 11 summarizes the results of the Town of Minetto's GHG inventory, a 2025 emissions forecast based on current trends, impacts from the strengthening of Federal CAFE standards, as well as the reductions associated with the Climate Action Strategies that were analyzed for the town separated into community-wide measures as well as municipal operations measures. Reductions due to Minetto actions are shown in green while changes in emissions that will occur regardless of this Plan are shown in orange. It is projected that Minetto's total GHG emissions in 2025 could be reduced by 8.1% if the town implements all of the recommended community-wide and municipal operations measures. There would also be a 19.9% reduction from 2025 forecasted emissions.

*2014 GHG inventory reported a forecasted an increase of 1,199 MTCO₂e from the 2010 baseline to 2025 due to increases in emissions from transportation, commercial energy use, and waste.
 **2010 Federal CAFE (Corporate Average Fuel Economy) standards have been set at 34.1 miles per gallon by 2016.
 ***2012 Federal CAFE standards raises average fuel economy to up to 54.5 mpg for the model year 2025.

Total possible municipal reductions from mitigation strategies = 146 MTCO₂e

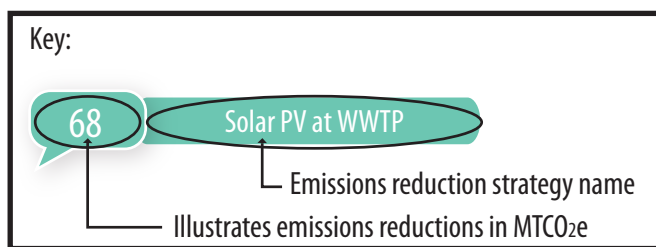
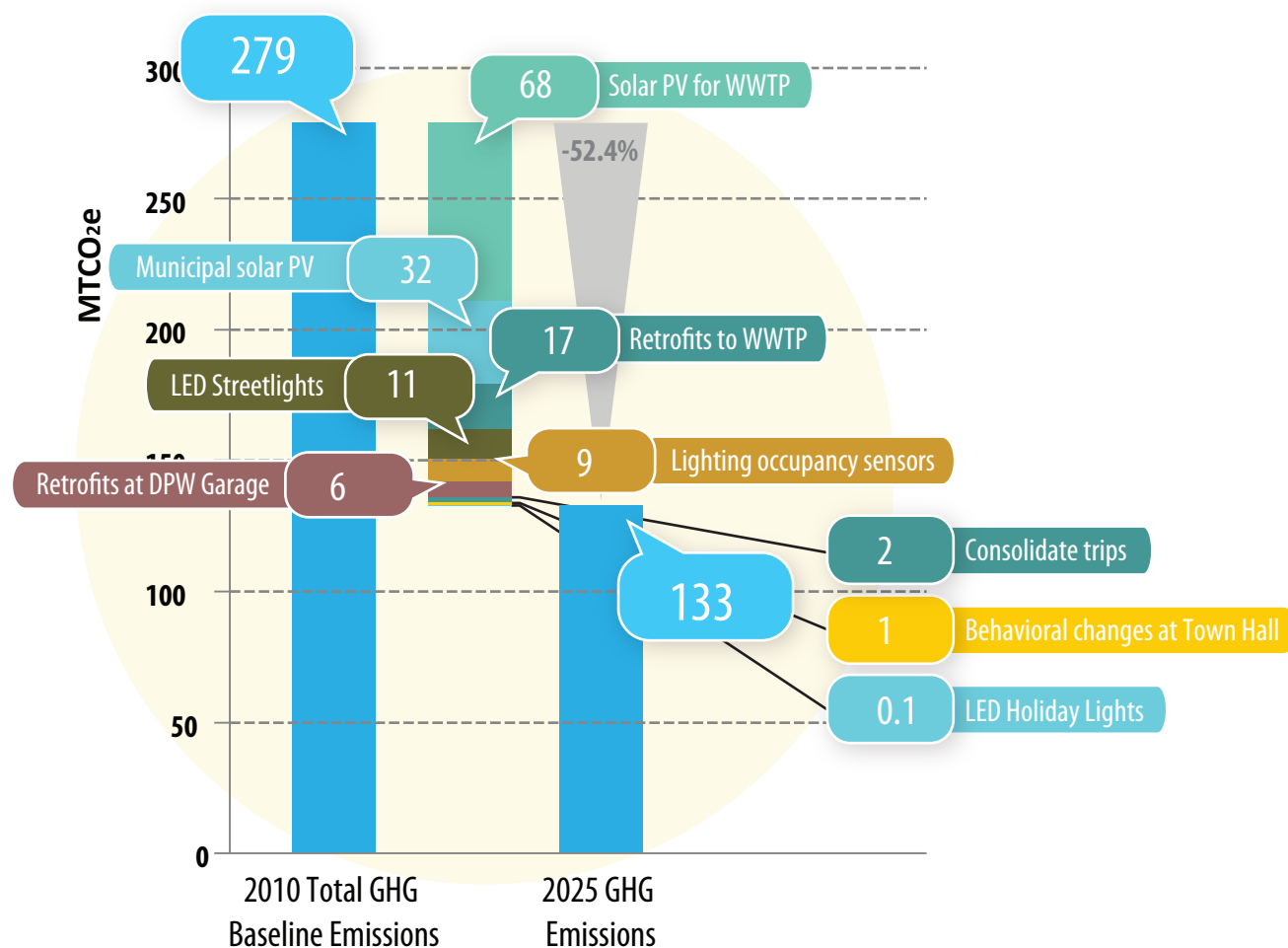


FIGURE 12- POTENTIAL MUNICIPAL REDUCTIONS FROM STRATEGY IMPLEMENTATION

Minetto's 2010 baseline municipal emissions as recorded by the GHG inventory report, potential reductions due to suggested strategies, and potential emissions in 2025 should each of the suggested strategies be implemented. It is estimated that there will be a 52.4% reduction in municipal emissions if all suggested strategies are implemented.

Total possible community reductions from mitigation strategies = 1,420 MTCO₂e

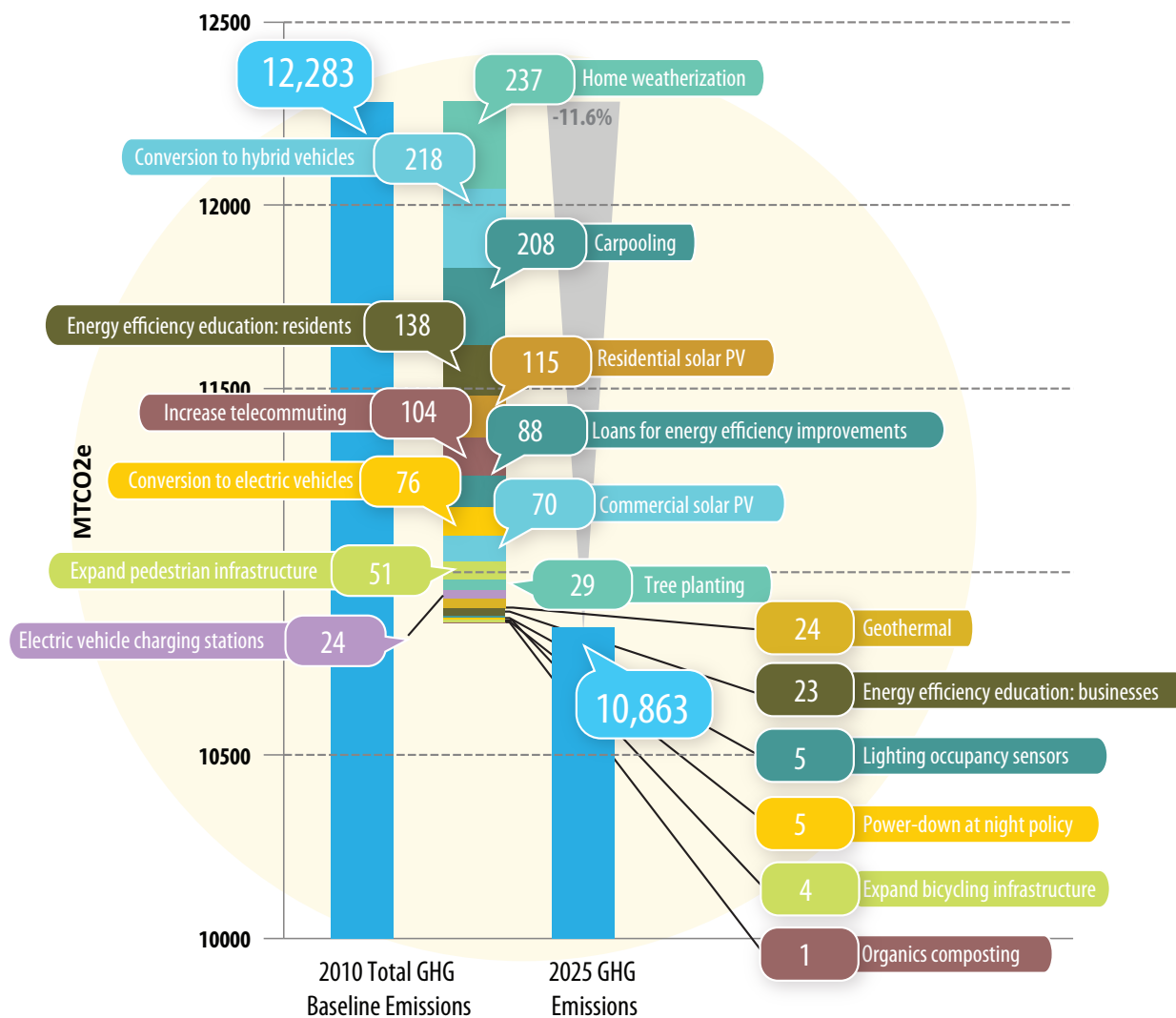


FIGURE 13- POTENTIAL COMMUNITY REDUCTIONS FROM STRATEGY IMPLEMENTATION

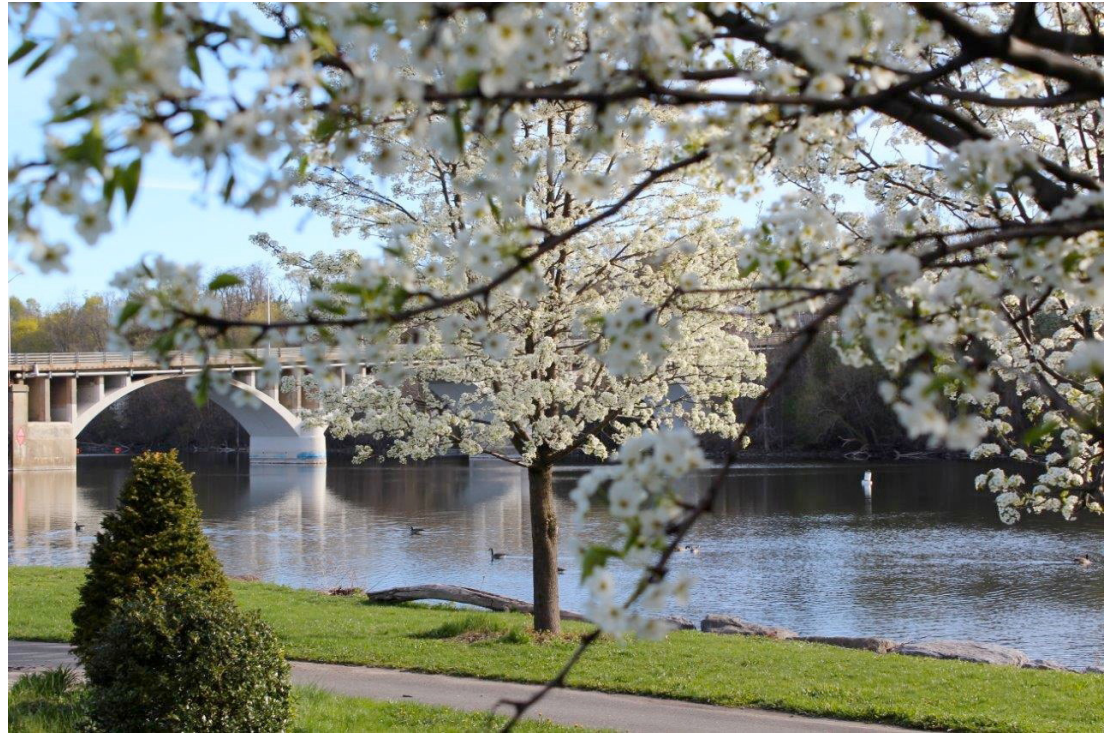
Minetto's 2010 baseline community emissions as recorded by the GHG inventory report, potential reductions due to suggested strategies, and potential emissions in 2025 should each of the suggested strategies be implemented. It is estimated that there will be a 11.6% reduction in community emissions if all suggested community reduction strategies are implemented.

Concluding Remarks

The Minetto Greenhouse Gas Inventory and Climate Action Plan provided an opportunity for the town to develop energy efficiency and emission reductions strategies. The planning effort encouraged local participation and brought together representatives from local government, citizens, and other key stakeholders to evaluate regional strengths and goals. The process provided a chance to gather information on sustainable community and economic development projects, to give community leaders support to advance sustainable projects, and to identify goals for new sustainable programs and initiatives.

Participants in the planning process worked for about 6 months to identify goals and strategies to improve the environment and address climate change through energy management, infrastructure, land use, and transportation. As a blueprint for the future, the Climate Action Plan efficiently summarizes an action-oriented guide containing strategies to ensure that Minetto meets the needs of current and future generations. In addition, the document will now provide State and local officials with the information needed for long-term commitments and investments in economic, social, and environmental resilience.

Our thanks go to the local leaders and community members for a job well-done. Town officials are encouraged to now focus on implementation of these recommendations, to review the progress made on an annual basis, and to re-evaluate emission reduction goals. In this way, Minetto will continue to protect natural resources, reduce emissions, become more resilient to climate change, and serve as a prominent showcase for energy efficiency and environmental stewardship.



Minetto bridge, spring
Photo Credit: Mark Prarie

APPENDIX A: ACRONYMS EXPLAINED

Btu and MMBtu: British Thermal Units and Millions of British Thermal Units. A Btu is the amount of energy needed to cool or heat one pound of water by one degree Fahrenheit, and MMBtu represents 1 million Btu.

CAFE: Corporate Average Fuel Economy. CAFE standards have been set by the federal government for the years 2016 and 2025.

CAPPA: Climate and Air Pollution Planning Assistant. CAPPA is a tool provided by ICLEI – Local Governments for Sustainability to help local communities assess the effectiveness of certain emissions reduction strategies in their communities. CAPPA is the tool that was used for all of the calculations in this document.

CNY RPDB: Central New York Regional Planning and Development Board. The CNY RPDB is a public agency that provides a range of services associated with the growth and development of communities in Cayuga, Cortland, Madison, Onondaga, and Oswego Counties.

GHG: Greenhouse Gas. Greenhouse Gases are gases in the Earth's atmosphere, such as water vapor, methane, carbon dioxide, and nitrous oxide, that allow sunlight to enter the atmosphere but also trap heat in the atmosphere, causing rises in Earth's atmospheric temperatures.

ICLEI: ICLEI-Local Governments for Sustainability is a non-profit organization that provides tools to local governments to assist with greenhouse gas inventories and climate action planning.

kW: Kilowatt. kW is a unit of power equal to 1,000 watts.

kWh: Kilowatt hour. A kilowatt-hour (symbolized kWh) is a unit of energy equivalent to one kilowatt (1 kW) of power expended for one hour (1 h) of time.

MTCO₂e: Metric Tons of Carbon Dioxide Equivalent. MTCO₂e converts the warming potential of each greenhouse gas (i.e. carbon dioxide, nitrous oxide, methane, etc.) into one measurement.

NYSERDA: New York State Energy Research and Development Authority. NYSERDA is a public benefit corporation created in 1975. Its goal is to help New York meet its energy goals of reducing energy consumption, promoting the use of renewable energy sources, and protecting the environment. NYSERDA offers a variety of incentive programs to help New York residents achieve these goals.

PV: Photovoltaic. Solar PV systems convert sunlight directly into electricity.

VMT and DVMT: Vehicle Miles Traveled and Daily Vehicle Miles Traveled. Vehicle Miles Traveled (VMT) is the total number of miles driven by all vehicles within a given time period and geographic area. It is used by regional transportation and environmental agencies for planning purposes. VMT is influenced by factors such as population, age distribution, and the number of vehicles per household. However, the greatest factor by far is how land uses are arranged. Daily Vehicle Miles Traveled (DVMT) is the total number of miles driven by all vehicles within a geographic area in one day.

APPENDIX B: STRATEGY IMPLEMENTATION CHART

Issue	Strategy	Ballpark Rankings (see key below)			Implementation Methods				Additional Benefits			
		Costs (1-5)	GHG Reductions (1-5)	Payback (1-5)	Policy	Program	Capital Projects	Education/ Outreach	Green Job creation	Quality of Life	Water Conservation	Other
Transportation: Municipal	1. Consolidate vehicle trips	1	1	1		x		x		x		x
Transportation: Community	1. Conversion to hybrid vehicles	2	1	3			x	x	x	x		x
	2. Carpooling	1	1	1		x		x		x		x
	3. Increase telecommuting	1	1	1		x		x		x		x
	4. Conversion to electric vehicles	1	1	3			x	x	x	x		x
	5. Expand pedestrian infrastructure	3	1	5			x	x		x		x
	6. Install electric vehicle charging facilities	2	1	5			x	x	x	x		x
	7. Expand bicycling infrastructure	1	1	3			x	x		x		x
	8. Create single waste district for town	*	*	*	x					x		x

*Values are uncertain at present

Key to Ballpark Rankings		
Est. Total Costs	Est. Total GHG Impact	Est. Payback
1 = Less than \$250,000	1 = 0-9.9% of goal	1 = Less than 1 year
2 = \$250,000-\$999,999	2 = 10-24.9% of goal	2 = 1-4.9 years
3 = \$1 million-\$24,999,999	3 = 25-49.9% of goal	3 = 5-9.9 years
4 = \$25 million-\$99,999,999	4 = 50-74.9% of goal	4 = 10-19.9 years
5 = \$100 million or more	5 = 75-100% of goal	5 = 20 years or more

Issue	Strategy	Ballpark Rankings (see key below)			Implementation Methods				Additional Benefits			
		Costs (1-5)	GHG Reductions (1-5)	Payback (1-5)	Policy	Program	Capital Projects	Education/ Outreach	Green Job creation	Quality of Life	Water Conservation	Other
Energy/Efficiency: Municipal	1. Solar PV for WWTP	2	3	3		x	x	x	x	x		x
	2. Solar PV for other municipal facilities	1	2	2		x	x	x	x	x		x
	3. Retrofits to WWTP	1	2	2			x		x	x	x	x
	4. LED streetlights	*	1	*		x	x		x	x		x
	5. Lighting occupancy sensors	1	1	1			x			x		x
	6. Retrofits to DPW garage	1	1	5			x		x	x		x
	7. Behavioral changes at Town Hall	1	1	1				x		x	x	x
	8. LED holiday lights	1	1	4			x					x
	9. On-demand water heater for bath house at park	*	*	*			x			x		x
Energy/Efficiency: Residential	1. Home weatherization	2	1	4		x	x	x	x	x		x
	2. Energy efficiency education: residents	1	1	1		x		x		x	x	x
	3. Residential solar PV	2	1	3		x	x	x	x	x		x
	4. Promote loans for energy efficiency improvements	3	1	5			x	x	x	x	x	x
	5. Geothermal	1	1	5			x		x	x		x
Energy/Efficiency: Commercial	1. Commercial solar PV	1	1	4		x	x	x	x	x		x
	2. Energy efficiency education: businesses	1	1	1		x		x		x	x	x
	3. Lighting occupancy sensors	1	1	1			x			x		x
	4. Power-down at night policy	1	1	1	x	x		x		x		x
Waste	1. Kitchen composting	1	1	*				x				x
Natural Resources	1. Tree planting	1	1	2		x	x	x		x		x

*Values are uncertain at present



Climate Smart
Communities



TOWN OF MINETTO
6 COMMUNITY DRIVE, MINETTO, NY 13115