Village of Minoa Climate Action Plan

APRIL 2015

Minoa Village Hall

Photo Credit: Village of Minoa

Central New York Regional Planning & Development Board

NEW YORK STATE OF OPPORTUNITY. Climate Smart Communities

Central New York climate change innovation program ...a Program of the Central New York Regional Planning and Development Board

CNY Energy Challenge ...a program of the Central New York Regional Planning & Development Board

A MESSAGE FROM THE MAYOR

The Village of Minoa has been a leader in environmental innovation over the last three decades. We continue to evaluate what we do and how we do it with the idea of making our community better tomorrow because of what we do today.

In that vane, this past year we've become a Climate Smart Community, which has been a community-based effort to address all the factors that potentially we can control or influence that may impact climate change.

We've invested in energy saving measures that range from alternative fuels, LED lights, variable speed pumps, computer controlled HAVC and motion light sensors to name a few. All of these actions reduce greenhouse gases as well as make our community more sustainable as we go forward into the future.

Sincerely,

Richard Donovan
Mayor

ACKNOWLEDGEMENTS

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

ADVISORY COMMITTEE

Richard Donovan, Mayor

Dan Engelhardt, Minoa resident

Steve Giarrusso, WWTP Supervisor

Sheri Hayner, C&S Companies and Minoa resident

Tom Petterelli, DPW Supervisor

Jim Powers, Minoa resident

Lance Stolp, DPW

CNY REGIONAL PLANNING AND DEVELOPMENT BOARD

Chris Carrick, Energy Program Manager

Anne Saltman, Principal Planner

Amanda Sopchak, Planner

Memorial Day Parade, Village of Minoa

Photo Credit: Village of Minoa

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.

CONTENTS

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 Minoa.

The CAP provides local goals for reducing energy use from municipal operations and from the Minoa 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 Minoa;
(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 2014-2015 to discuss emission reduction goals and specific strategies for reaching them. The committee agreed on a goal to reduce overall greenhouse gas emissions by 15% by the year 2020 from the GHG inventory baseline year (2010).

This CAP was prepared for Minoa 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 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 140 municipalities in New York State (including Village of Minoa) 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 (C_2IP).

Central New York
climate change innovation program
... a Program of the Central New York Regional Planning and Development Board

NEW YORK STATE OF OPPORTUNITY.
Climate Smart Communities

Left: Holiday Tree Lighting Party

Photo Credit: Village of Minoa

Right: Fall Festival and 5K Run Concert

Photo Credit: Village of Minoa

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 CO_2[2], which is 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 Village of Minoa's Climate Action Plan was developed by an advisory committee made up of Richard Donovan, Mayor; Tom Petterelli, DPW Supervisor; Lance Stolp, DPW; Steve Giarrusso, WWTP Supervisor; Dan Engelhardt, Minoa resident; Sheri Hayner, C&S Companies and Minoa resident; and Jim Powers, Minoa resident. The committee was provided technical assistance by the CNY RPDB, who analyzed energy and emissions reduction strategies for the village 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 village, how many $MTCO_2e$ 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.

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 CO_2.

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

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 CO_2 record shows the present-day levels of CO_2 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 323 kyr 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 Northeast[1]

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

For more information on how the strategies were developed, including assumptions 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 Minoa's sustainability goals, the creation of a permanent sustainability committee is highly recommended. The sustainability committee would be comprised of a group of village residents who are committed to Minoa's sustainable future and are willing to volunteer their time to help implement the strategies explained in 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.

4 Available at www.villageofminoa.com

Village of Minoa sign

Photo Credit: Village of Minoa

NEW YORK STATE WEATHER CHARACTERISTICS

Central New York's climate is characterized by warm, dry summers and cold, snowy winters. The 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. Serious droughts are rare but 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 was compiled by more than 50 scientists and currently serves as an important tool for planners, policymakers, farmers, local governments and residents. 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.

Highland Pipe Band at Lewis Park

Photo Credit: Village of Minoa

LOCAL CLIMATE CHARACTERISTICS

Temperature and Precipitation

The Village of Minoa normally experiences weather characteristics of the northeastern U.S. Cyclonic systems.

Annual weather data from the Hancock International Airport in Syracuse from 1950 to 2012 shows a 3.1% increase in average temperature.

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 December 1, 2013 through March 14, 2014 to warrant a Secretarial Disaster designation. The designation made farm operators in both primary and contiguous counties eligible to be considered for assistance (such as emergency loans) from the Farm Service Agency. The following graph shows the annual average temperatures in the City of Syracuse since 1951 (Figure 1) with a trend line showing a gradual warming.

Annual precipitation totals from the Hancock International Airport in Syracuse from 1950 to 2012 shows an increase of 2.3 inches (Figure 2).

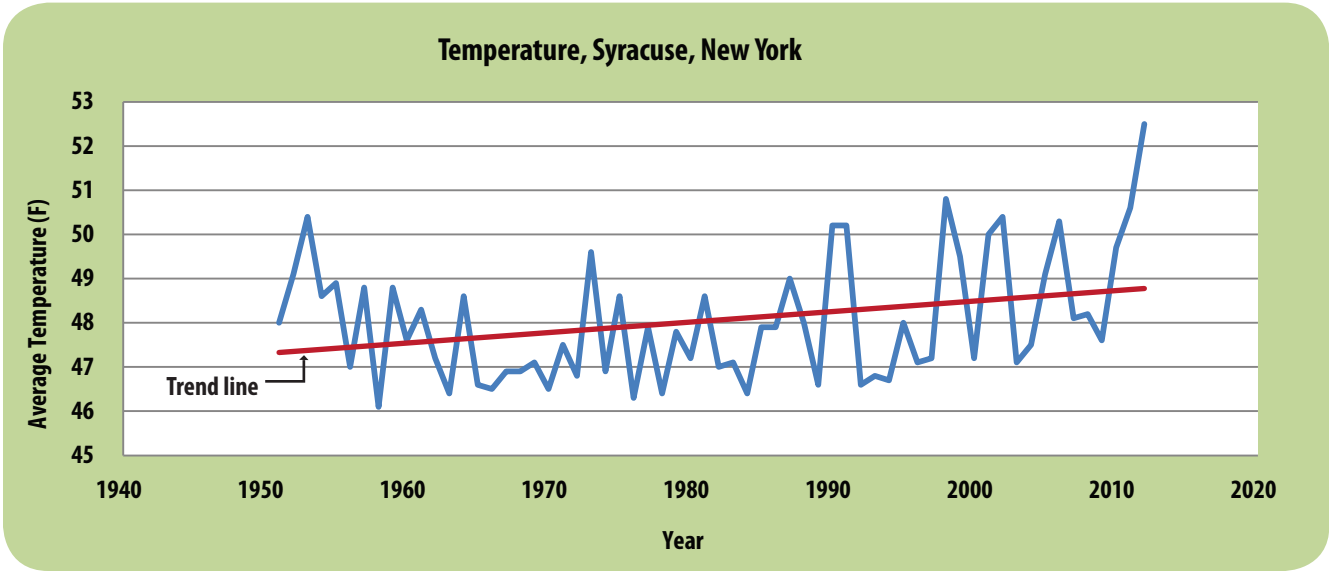


FIGURE 1- ANNUAL AVERAGE TEMPERATURE, SYRACUSE, NEW YORK.
SOURCE: NOAA NATIONAL WEATHER SERVICE FORECAST OFFICE

Extreme Weather Events

The relative intensity of local storm events is influenced by air temperature. As air temperature rises, moisture in the atmosphere increases. This, in turn, contributes to an increase in the intensity and frequency of precipitation events. Warming air temperatures observed throughout New York State are caused by emissions of heat-trapping gasses in the atmosphere including pollution from fossil fuels. Increasing air temperatures cause higher levels of oceanic evaporation which intensifies the water cycle throughout the globe. As a result, storm events around the world and in local communities are gradually becoming more extreme with stronger wind and higher levels of rainfall.

Onondaga County's Hazard Mitigation Plan categorizes flooding and storms in this area as "severe" and the probability of their occurrence is listed as "frequent". A severe storm hazard includes hailstorms, windstorms, lightning, thunderstorms, tornadoes, and tropical cyclones. Most severe winter storm hazards in Central New York include heavy snow, blizzards, sleet, freezing rain, ice storms and cold temperatures.

Meteorologists report that the total annual amount of precipitation is changing, as well as the distribution and intensity of storm events.

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. Strong storm events contribute to localized flooding, soil erosion, and stormwater runoff. These conditions can cause damage to roads, bridges, and other infrastructure in Minoa. 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, primarily because of their work with stream bank stabilization, erosion and sediment control, and stormwater management.

Green infrastructure improvements, such as planting trees and incorporating rain gardens into street designs, can help Minoa reduce flooding and stormwater runoff while achieving other environmental, public health, and economic benefits. Green infrastructure installations can provide a cost-effective approach with additional community benefits such as reducing energy use and mitigating climate change, improving habitat for wildlife, reducing infrastructure maintenance costs, and promoting local economic growth. For example, Minoa could reduce the potential for flooding by working with the SWCD to implement a "Snag and Drag" program on Limestone Creek. This would remove large woody debris that blocks water flow in the tributary. A similar program has been established on Chittenango Creek in Madison County.

Flooding

Flooding is influenced by the storm 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. 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 rain events increase pollution loading to local water bodies, increases the potential for flooding, and can decrease the

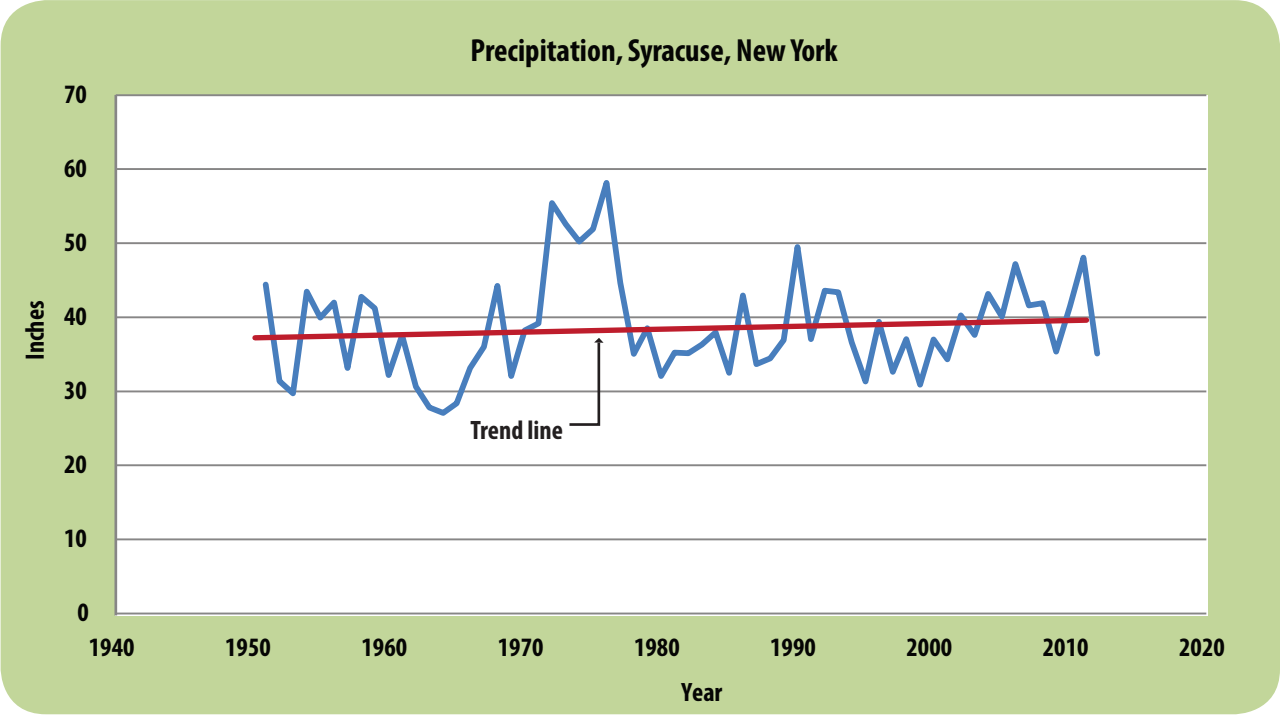


FIGURE 2- ANNUAL AVERAGE PRECIPITATION IN SYRACUSE, NEW YORK 1903-2008
SOURCE: NATIONAL WEATHER SERVICE FORECAST OFFICE

efficiency of wastewater treatment plants. Floods are the most frequent and costly natural hazards in New York State in terms of human hardship and economic loss, particularly to communities such as Minoa that lie within flood prone areas or flood plains of a major water source such as Limestone Creek.

In June 2012, the Federal Emergency Management Agency (FEMA) updated the Flood Insurance Study for Onondaga County. The report includes the following information for the Town of Manlius:

Flooding can occur in the study area during all seasons, but generally the most notable floods have occurred between the months of February and April, when snowmelt adds to heavy spring rains to produce increased runoff. Summer and fall floods also occur due to hurricane activity. Low-duration, high-intensity storms cause small streams like Pools Brook, Sweet Road Tributary, and Bishop Brook to exceed the capacity of the stream channels, thus causing localized flooding.

The following section was written about the Village of Minoa:

The most severe flooding events in the village were similar to those recorded at the Fayetteville gaging station approximately 2 miles upstream from Minoa. Severe floods occurred on March 20, 1950 with a discharge of 7,010 cfs; March 5, 1964 with a discharge of 4,160 cfs; and June 21, 1972 with a discharge of 3,800 cfs (USACE, 1973). Overbank flooding has occurred along Limestone Creek in the southeast portion of the village.

According to FEMA, there are no flood protection measures in the Limestone Creek basin that would impact the Village of Minoa. The New York State Department of Transportation operates the DeRuyter Reservoir which diverts water into Limestone Creek from the Middle Branch Tioughnioga River basin for lockage use in the Erie Canal system. There are no flood protection benefits associated with this diversion. Several dams are located on Limestone Creek but they do not provide any flood protection for the Village of Minoa or for the Town of Manlius. Some channel dredging, bank stabilization, and other temporary improvements have been made to the streams within the town.

TABLE 1- TOTAL ASSESSED VALUE (TAV) OF PARCELS INTERSECTING FLOOD PLAINS[1]

Municipality	TAV of Parcels Intersecting Flood Plain	# Acres of Parcels Intersecting Flood Plain	TAV of Municipality	TAV % Floodplain Parcels within the Municipality
Village of Minoa	32,832,887	329	168,888,086	19%

1 Source: 2012 tax parcel data, Onondaga County

TABLE 2- PARCELS WITHIN 100-YEAR FLOODPLAIN[1]

Municipality	Parcels	Parcels in 100-Year Floodplain	% of Parcels in 100-Year Floodplain
Village of Minoa	1,305	304	23.3%

1 Source: 2012 tax parcel data, Onondaga County

The term 'assessed value' refers to the dollar value assigned to a home or property by local government in order to calculate property taxes. According to tax parcel data from 2012, the total assessed value of property located within designated FEMA flood zones in Minoa represents 19% of the total assessed value of parcels throughout village (Table 1). Of the 1,305 land parcels in the village, 23.3% is located in FEMA flood zones (Table 2 and Figure 1).

Snowfall

Snow accumulates in Minoa at an average depth of 100 inches each year . Climate researchers at Cornell University predict that New York State will experience decreased snow cover by as much as 25 to 50% by the end of the next century .

The village is influenced by lake effect snowfall which is caused by a differential between cold air temperatures and warmer water temperatures found 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. Central New York has experienced a 21.6% decrease in snowfall since 1950 (Figure 3). Because of

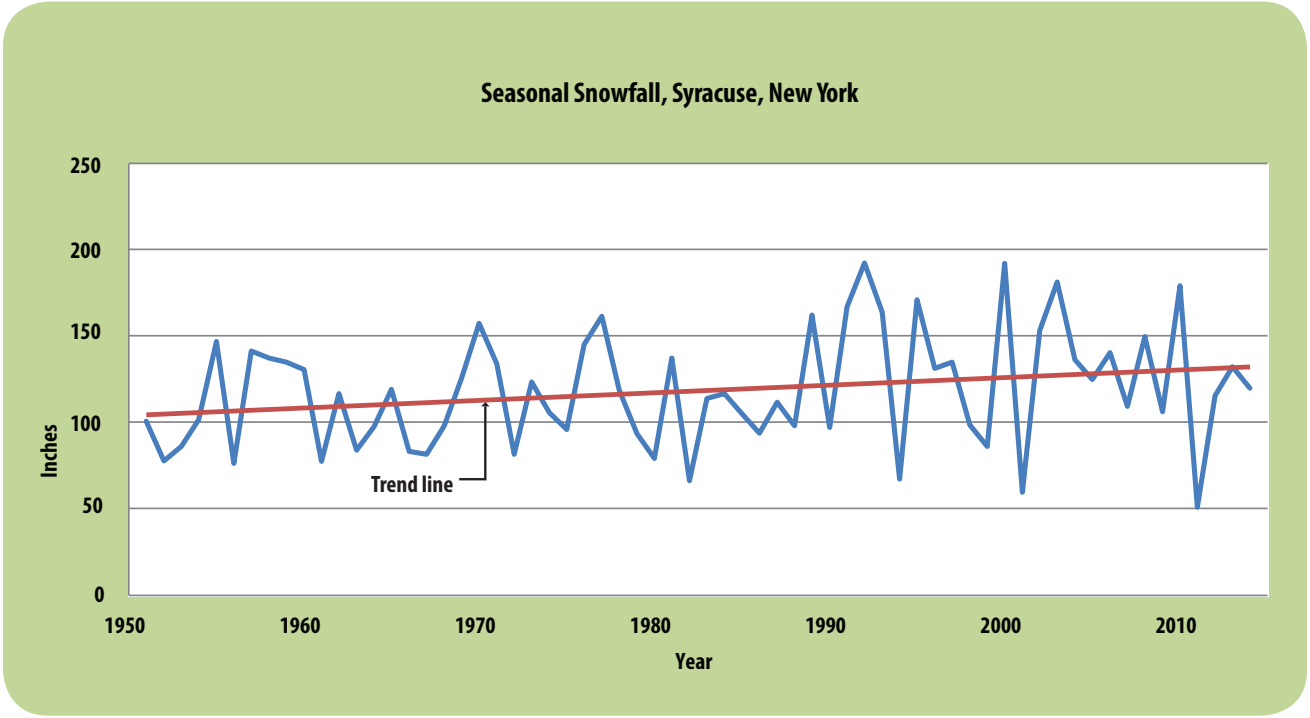


FIGURE 3- SEASONAL SNOWFALL IN SYRACUSE, NY, 1949-50 TO 2014-15
SOURCE: NATIONAL WEATHER SERVICE FORECAST OFFICE

the increased lake water temperature and the reduced duration of ice cover on Lake Ontario, Minoa and other areas to the east and south of the lake will continue to experience heavier and more frequent lake-effect snowfall events.

Snowfall influences municipal decisions relating to transportation, road maintenance, land use, and water resources management.

Tourism

Climate trends have a significant impact on the tourism and recreation sectors in Central New York. Seasonal weather patterns, especially precipitation rates, determine lake water levels for boating, the rate of erosion and pollution loading of nutrients and sediment, snow cover for skiing, and waterfowl breeding rates for sport hunting. Weather patterns influence the duration and types of outdoor recreation activities that take place and play a principal role in the local economic vitality.

Warming trends are anticipated to impact Central New York's outdoor recreation opportunities such as skiing and may modify recreational income generated for the local economy. Several ski resorts are now developing year-round events because of

reduced snowfall during the winter months. In addition to the ski industry, New York State maintains 8,000 miles of snowmobiling trails that also contributes to the local economy.

Fishing along Limestone Creek is a popular water-based activity in Minoa and neighboring municipalities. Higher air temperatures and a shorter duration of winter ice cover may cause an increase in surface water temperatures, which would then contribute to 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. A slight increase in lake water 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 long-term warming trend is providing a longer growing season for both 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, combined with decreasing ice coverage, will likely cause an increase in the growth of nuisance aquatic plants and algae in nearby lakes which would result in recreational impairments.

Public Health

Changes in climate conditions have the potential to affect human health, primarily through deteriorating air quality. An increase in health impacts from warming temperatures (such as asthma and other respiratory illnesses due to changes in air quality) have also been documented throughout the country. Food, water, and animal-borne diseases affecting humans, livestock, and wildlife are governed by environmental conditions. Projections of warmer winters, hotter summers, and unpredictable precipitation patterns are expected to increase certain types of diseases. For example, climate change in the Northeast is expected to result in the increased population rates of mosquitoes and ticks. As the populations of these insects increase, it could result in more frequent outbreaks of West Nile Virus and Lyme disease-causing bacteria.

Invasive and Endangered Species

While insects and diseases are a natural part of the aquatic and terrestrial ecosystems, gradual warming trends are thought to be causing a gradual northern shift in pest populations of both invasive and 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 invasive species populations throughout New York State.

Teal Ribbon Run, Village of Minoa

Photo Credit: Village of Minoa

The Hemlock Woolly Adelgid, Asian Longhorn Beetle and Emerald Ash Borer are invasive tree pests that pose a threat to Central New York. They have the potential to damage local tree 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 the Adelgid kills trees adjacent to streams, shade is no longer provided and stream water temperatures increase beyond what is ideal for coldwater fish such as trout. Early detection and a rapid response of new infestations of invasive species are the most effective ways that Minoa and neighboring communities can address this problem.

ESM Interns work on compost pile through the Cleanwater Educational Research Facility project. Heat produced from the pile is used to heat the small building to the left, which has been converted into a greenhouse.

Photo Credit: Village of Minoa

COMMUNITY CHARACTERISTICS

There is a growing acknowledgement by scientists and policy analysts that a substantial part of the global warming challenge may be met through the design and development of cities and towns. The form and function of human settlements can either reduce or increase the demand for energy, and can also influence how energy is produced, distributed, and used. Planning and urban design measures can substantially reduce the number and distance of vehicle trips by organizing human activity in compact communities with a range of housing types, providing reliable transit to and from employment, and placing services within easy walking distance of home.

Lewis Park, Village of Minoa

Photo Credit: Village of Minoa

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.

LAND USE

Urban design in smaller communities such as Minoa can rely on green infrastructure to reduce stormwater runoff and protect water quality. These and other strategies that make use of transportation alternatives contribute significantly to overall GHG mitigation. 49% of the land in the village is classified as residential and 20% is classified as vacant. Additional land use categories are summarized in Figures 4 and 5.

TRANSPORTATION

Despite an efficient and convenient transportation system that supports social and economic development, national reliance on petroleum-based fuels is causing damaging environmental impacts and changes in climate patterns. There are, however, several transportation recommendations that can reduce these impacts.

+ Drive vehicles with a higher fuel efficiency, such as hybrids;
+ Drive electric cars and vehicles that use biofuels;
+ Reduce the miles traveled by providing alternative modes of transportation and well-connected neighborhoods

The use of carbon fuels is expected to continue 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. Well-designed urban planning that incorporates compact communities with services in close proximity to residential neighborhoods, a reliable public transportation system, and hiking and biking trails can decrease our use of petroleum-based fuels by reducing the number and distance of vehicle trips.

Commuting to Work: Single-passenger automobile trips to and from Minoa generate substantially more greenhouse gas emissions per mile than public transit and carpooling. Transportation statistics, compiled by the American Community Survey, is presented below (Table 4). Single-passenger automobile trips constitute the vast majority. Preparation of a Minoa 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.

Examining existing land use patterns and transportation infrastructure provides insight into ways a community can reduce GHG emissions. Factors most directly influencing travel behavior generally include diversity of uses, proximity of uses, density, pedestrian and bicycle conditions, transit accessibility, parking, and streetscape design. 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

FIGURE 4- VILLAGE OF MINOA LAND USE

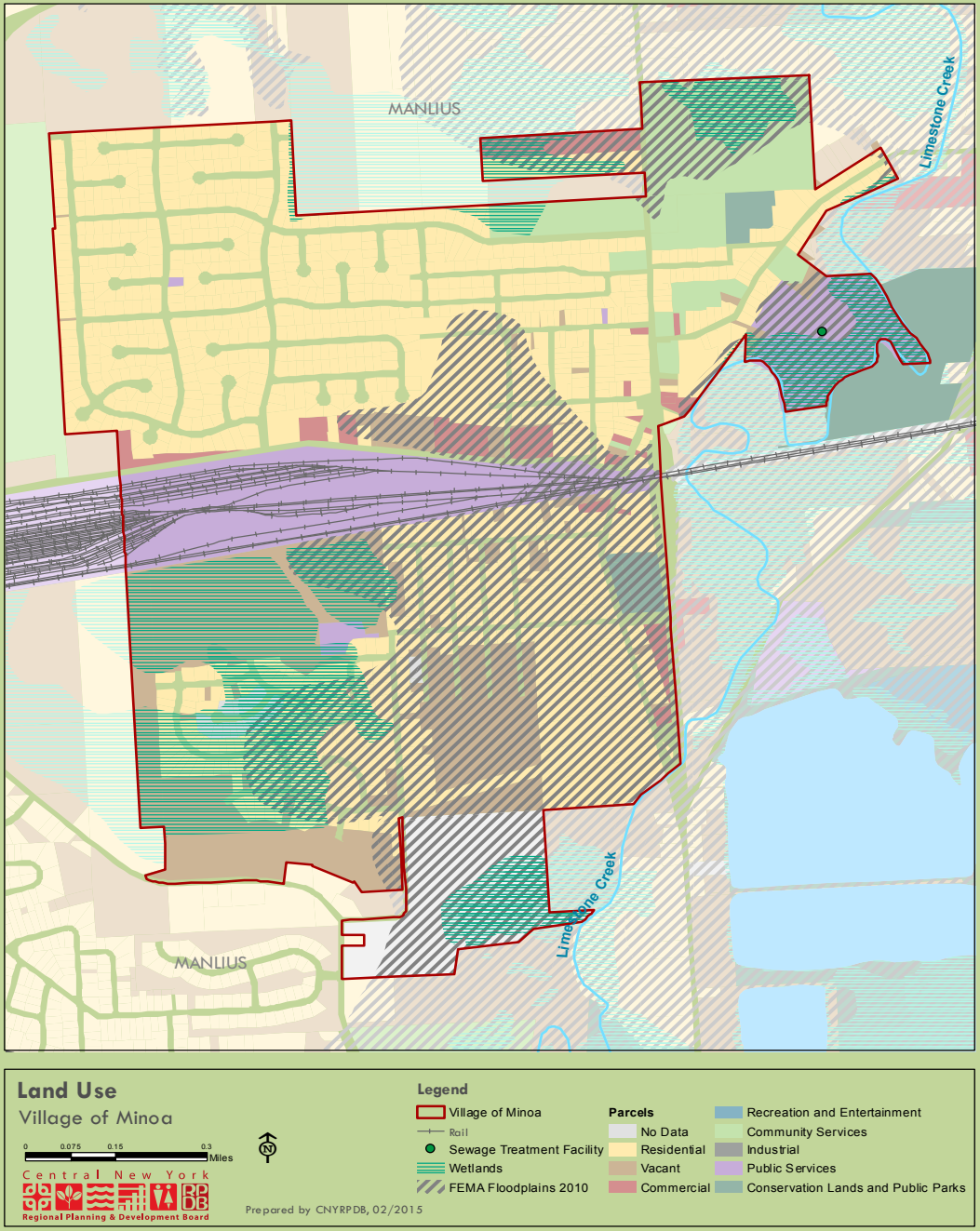
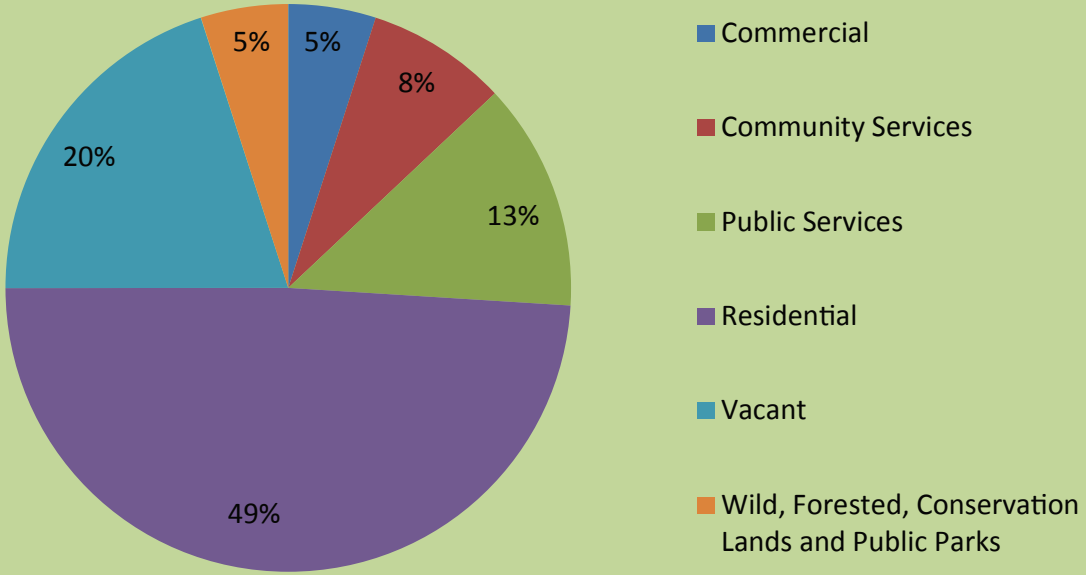


FIGURE 5- MINOA LAND USE TYPES



Source: Onondaga County, NY 2012

TABLE 4- TRANSPORTATION TO WORK IN MINOA[1]

Transportation to Work	Number of Workers	Percentage
Car, truck, van - drove alone	1,607	89%
Car, truck, van - carpooled	72	4%
Public transportation (excluding taxicab)	0	0%
Walk to work	70	4%
Worked from home	45	2%
Taxicab, motorcycle, bicycle, or other means	10	1%
TOTAL	1,804	100%

1 Source: American Community Survey 2009-2013

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. There are approximately 385 jobs in Minoa and 1,401 households and the jobs/housing ratio was approximately .27. This demonstrates that there were 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. Two methods were used to evaluate the proximity of residences to commercial uses in Minoa and to support the development of recommendations in this Climate Action Plan. The first measured proximity of residences to commercial centers and the second measured proximity of residences to neighborhood services.

Proximity to commercial centers: The first method examined how many residential parcels are located within ¼ mile of commercial districts. This provided insight into the effectiveness of the community's existing zoning and land use pattern from

the pedestrian perspective. Although some residential portions of Minoa are distant from commercial services, overall, the existing land use pattern creates many opportunities for pedestrian and bicycle travel. Of the 1,178 total residential parcels, 69% are located within ¼ mile of commercial parcels.

Proximity to neighborhood services: The second method of proximity analysis identified eleven categories of neighborhood services (schools, libraries, drugstores, grocery stores, medical facilities, post offices, nursery schools, parks, nursing homes, hardware stores, and restaurants), mapped the locations of these services within Minoa, and then examined how many of these distinct uses are within a ¼ mile walking distance of individual residential parcels. The analysis determined that 22% of the residential parcels in Minoa are located within ¼ mile of three or more amenities. Residents with low levels of pedestrian access to neighborhood-serving uses are more likely to drive to purchase their daily goods and services.

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

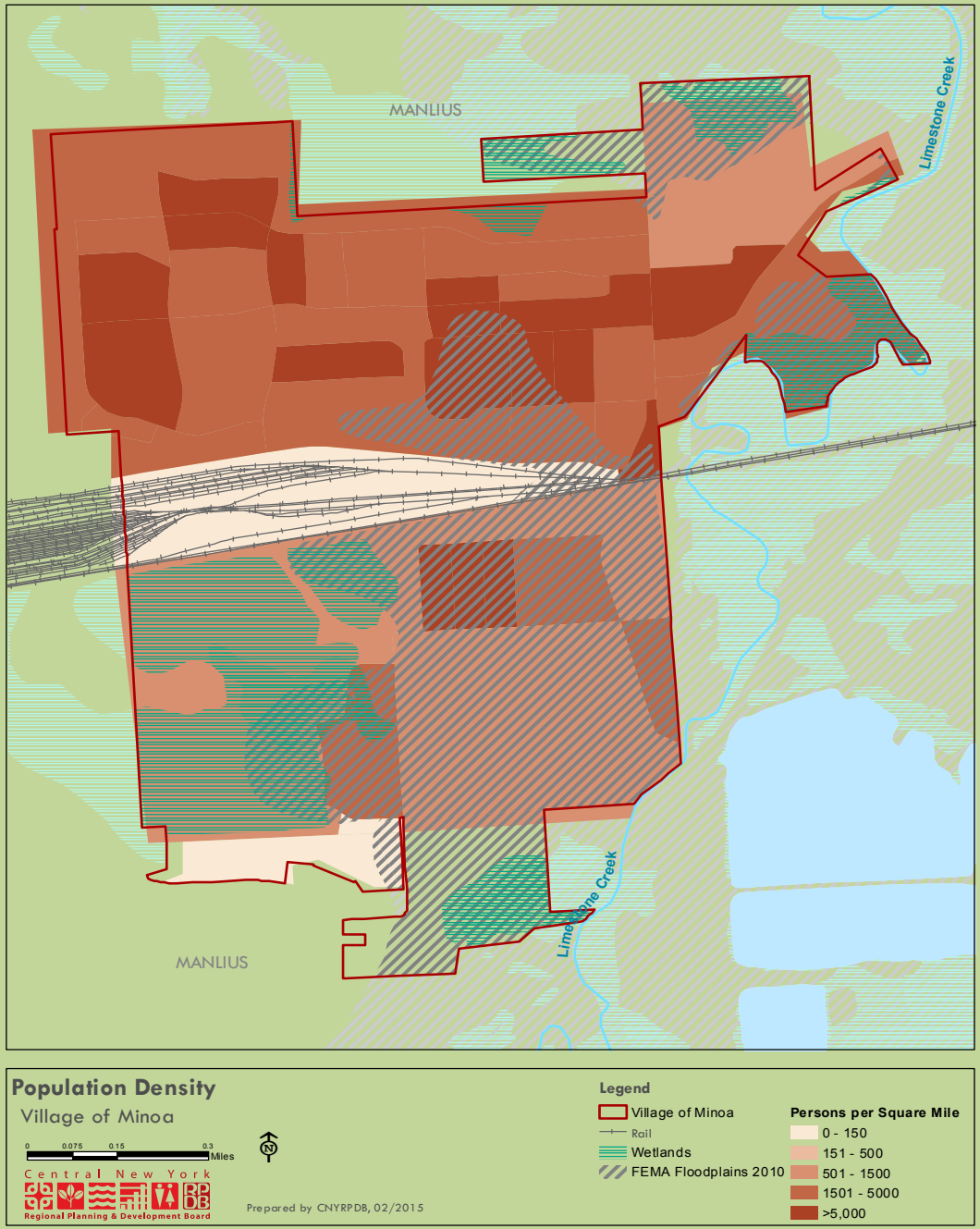
TABLE 5- RESIDENTIAL DENSITY IN MINOA[1]

The average residential density (households per acre)	4.05
Number of residential parcels in the community	1,178
Single-family residential parcels	1,129
Single-family residential density (the number of single-family parcels divided by the acreage of all residential parcels)	3.4
Total residential acres	345.6
Number of vacant parcels	78
Vacant land (acres)	141.6
Number of two and three-family (multiple-residential) parcels	49
Average density of multiple-residential parcels	3.3
Number of parcels with apartment buildings	7
Density of apartment buildings	0.4
Percent of residential land use that is classified as low-density	27%
Percent of residential land use that is classified as medium-density	66%
Percent of village's residential land use that is classified as high-density	7%

1 Sources: American Community Survey 2009-2013, 2010 Census, 2013 NYS Office of Real Property Service parcel data

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.

FIGURE 6- VILLAGE OF MINOA POPULATION DENSITY



housing units per acre. Minoa has a relatively moderate to low residential density (Figure 6).

Infill development refers to the use of vacant land within a built-up area for additional construction. This term is often associated with community redevelopment or growth management programs or as a component of smart growth. Infill development focuses on the reuse of underutilized buildings and sites where buildings are constructed on vacant property or between existing buildings. 141.6 acres (78 parcels) of land in Minoa is classified as vacant. Potential opportunities for infill development should be evaluated.

Pedestrian and Bicycle Conditions: Well-developed pedestrian and bicycle infrastructure and pedestrian-friendly design are essential if walking and biking are to be important travel modes in a community. Highly connected sidewalks and bicycle infrastructure reduce travel distances between destinations and improve access and safety. Pedestrian and bicycle infrastructure refers to sidewalks, crosswalks, traffic calming devices, bike lanes, and racks/storage facilities.

Transit Accessibility: Transit accessibility refers to the ease with which people can access public transit service and the quality of that service. Residents and employees are more likely to use public transit if traveling by bus or train is relatively time-competitive with driving, if transit stations are accessible to pedestrian and cyclists, and if the transit experience is pleasant. There is currently one bus route in Minoa.

Parking: This category refers to the supply, price, and regulation of parking facilities in a community. Inexpensive and abundant parking increases automobile ownership and use. Large parking lots also reduce walking and public transit convenience and use. Limiting the availability of parking spaces and imposing fees in city environments can reverse the equation, reducing the number of cars on the road and increasing use of alternative modes of transportation. This strategy isn't applicable for small communities such as Minoa where parking is generally available.

Streetscape Design: Streetscape design refers to the scale and design of streets, sidewalks, and adjacent uses. Urban design research demonstrates that people walk more and drive less in pedestrian-oriented commercial districts than in automobile-dominated commercial centers. Street designs that reduce vehicle traffic speeds, improve walking and cycling conditions, and enhance the pedestrian experience encourage use of alternative modes.

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.

Residential neighborhood, Village of Minoa

Photo Credit: Village of Minoa

Greenhouse Gas Inventory Summary

As part of the Climate Change Innovation Program, an inventory of the village'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 Village of Minoa in 2010, which serves as the baseline year for the Climate Action Plan.

The inventory report found that in the 2010 base year, village municipal operations generated a total of 558 metric tons of carbon dioxide equivalent ($MTCO_2e$), which were broken up into 5 sectors: buildings and facilities (285 $MTCO_2e$, 51%), streetlights and traffic signals (27 $MTCO_2e$, 5%), vehicle fleet (157 $MTCO_2e$, 28%), wastewater treatment facilities (80 $MTCO_2e$, 14%), and wastewater treatment processes (9 $MTCO_2e$, 2%).

Community emissions totaled 12,907 $MTCO_2e$, which were broken up into 4 sectors: residential (6,709 $MTCO_2e$, 52%), commercial (2,627 $MTCO_2e$, 20%), transportation (3,079 $MTCO_2e$, 24%), and waste (492 $MTCO_2e$, 4%).

The Village of Minoa'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 Minoa to reduce emissions, energy use, and dollars spent on municipal and community operations by the year 2020.

FIGURE 7- VILLAGE OF MINOA MUNICIPAL EMISSIONS BY SECTOR $MTCO_2E$ (2010 BASELINE)

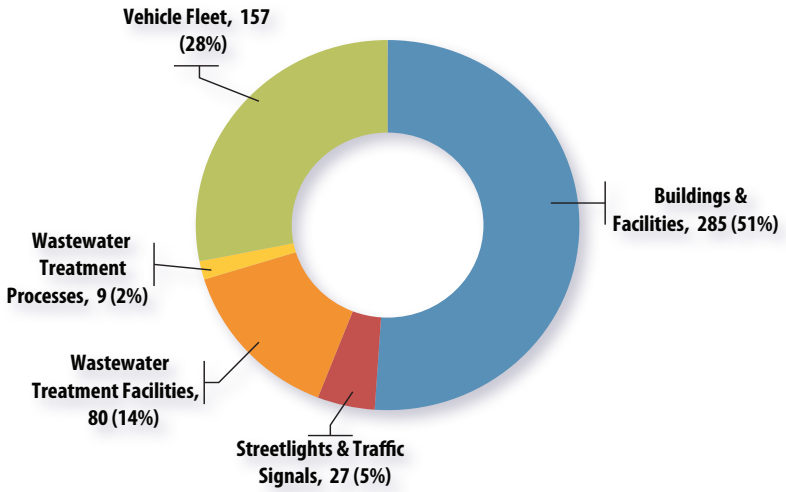
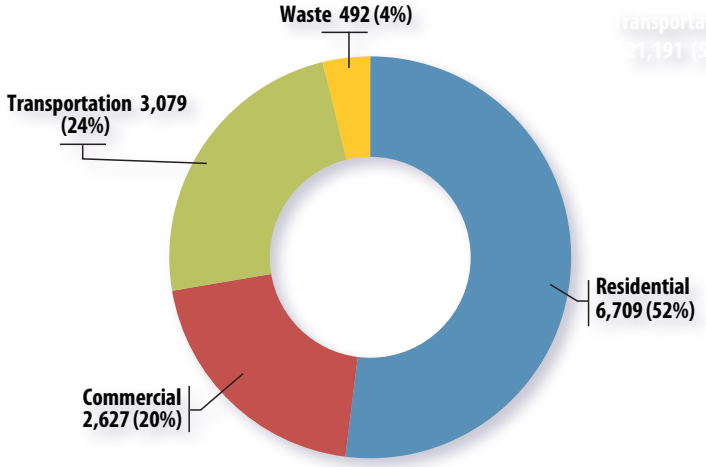


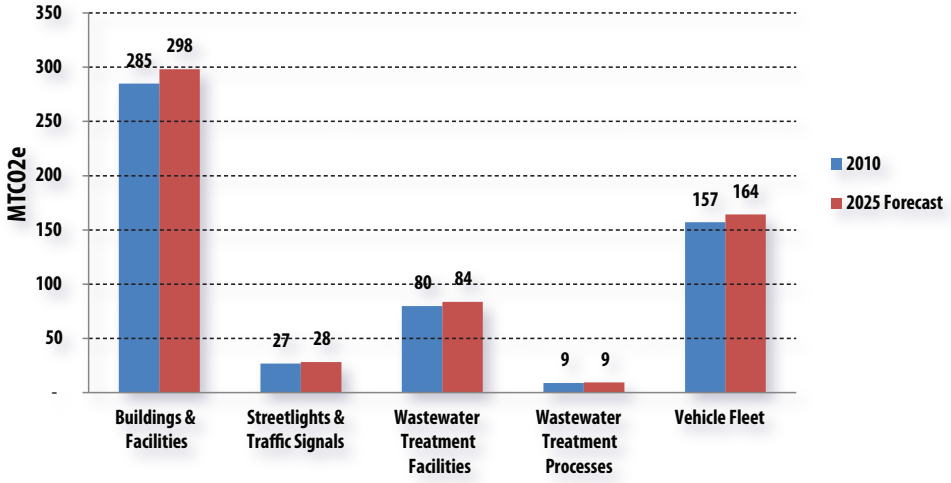
FIGURE 8- VILLAGE OF MINOA COMMUNITY EMISSIONS BY SECTOR $MTCO_2E$ (2010 BASELINE)



1 $MTCO_2e$ =

- CO_2 emissions from 112 gallons of gasoline consumed
- CO_2 emissions from 2.3 barrels of oil consumed
- CO_2 emissions from 41.7 propane cylinders used for home barbeques
- Carbon sequestered by almost 1 acre of U.S. forests in one year

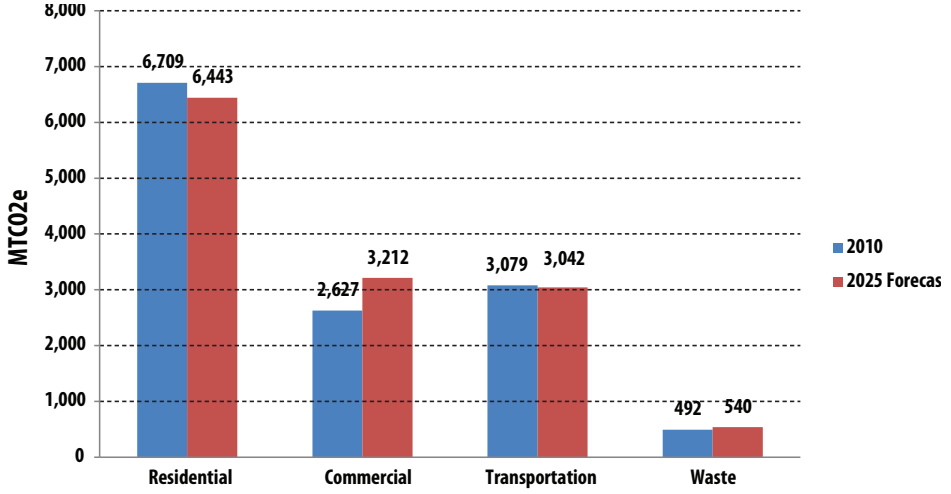
FIGURE 9- EMISSION FORECAST:
MUNICIPAL OPERATIONS



The GHG inventory report also forecasted emissions for the Village of Minoa in 2025. The report explained that village municipal emissions were expected to total 584 $MTCO_2e$ in 2025, with a 13 $MTCO_2e$ increase in buildings and facilities emissions, a 7 $MTCO_2e$ increase in vehicle fleet, a 4 $MTCO_2e$ increase in wastewater treatment facilities, and a 1 $MTCO_2e$ increase in streetlights and traffic signals.

Community emissions were expected to total 13,237 $MTCO_2e$ in 2025, with a 266 $MTCO_2e$ decrease in the residential sector, a 585 $MTCO_2e$ increase in the commercial sector, a 37 $MTCO_2e$ decrease in the transportation sector, and a 48 $MTCO_2e$ increase in the waste sector.

FIGURE 10- EMISSION FORECAST:
COMMUNITY



Climate Action Accomplishments

The Village of Minoa has joined over 140 municipalities in New York State that have signed resolutions to become Climate Smart Communities. This program is a partnership between New York State and local governments to address climate change through measures that reduce energy use and greenhouse gas (GHG) emissions.

Since 2003, Minoa has actively worked with other Municipal Separate Storm Sewer System operators to meet regulatory stormwater management requirements while improving water quality throughout Central New York. Minoa has a Stormwater Management Plan and has been a member of the Central New York Stormwater Coalition since its inception in 2011. Stormwater management is becoming increasingly important in Central New York, especially during storm events. Through this partnership, municipalities reduce and share the cost of regulatory compliance, minimize duplicative efforts, and leverage available grant funding. The Stormwater Coalition is administered by the CNY RPDB. In addition to sponsoring public education and municipal training programs, the village reviews stormwater management plans for all new construction projects and conducts construction and post-construction site inspections to ensure erosion and sedimentation practices are functioning and stormwater runoff is contained on-site. The village has an ongoing catch-basin cleaning and maintenance program and partners with Onondaga County to conduct a stormwater outfall inspection and illicit discharge elimination program. These efforts help keep sediment, nutrients and other pollutants out of local waterways.

In 1997 the village completed a construction upgrade for the wastewater treatment plant. Project implementation, which occurred over several years, included installation of plastic media in the original trickling filters, construction of sequencing batch reactors, and installation of three constructed wetlands. Since a large section of the collection system is built below groundwater levels, the wetlands were originally built to handle wet weather flows. The wetlands have been very efficient at removing water pollutants.

The list below provides a brief summary of additional projects that the village has initiated over the past several years to reduce emissions and to protect the community against storm events and other climate influences.

+ The village worked with the CNY RPDB to compile a greenhouse gas inventory in 2014.
+ Lighting upgrades were installed at the Fire Hall and several additional municipal facilities. The upgrades were expected to reduce energy use by 56,228 kWh per year, a savings of about 19 $MTCO_2e$ per year.
+ The village has reduced manual treatment of wastewater by 130,000 gallons per day by having the wastewater pass through a wetland system at the WWTP for treatment. This process does not require the

ESM students working on WWTP upgrades

Photo Credit: Village of Minoa

use of any energy or chemicals, as it is an all-natural, gravity-fed system operating at no cost to the village. This system saves the village $31,622 per year in treatment costs. The WWTP has also become certified for removal of pharmaceuticals in wastewater.

+ Lighting occupancy sensors have been installed in all village municipal buildings. Thermostats that are set on timers were also installed which reduce heating and cooling expenses during non-office hours. In addition, all of the holiday lights throughout the village have been converted to LEDs. These measures were implemented to reduce taxpayer expenses and improve energy efficiency.

+ A single North Main Street municipal building was constructed in place of three previous buildings that had been used for the same purposes. The building was constructed with guidance from NYSERDA using energy efficiency measures such as lighting occupancy sensors and variable speed boilers.

+ The village converted all holiday lilghting to LED bulbs to reduce energy use and emissions from electric use.

+ The Town of Manlius Highway Department maintains catch basins, culverts, pipes, and ditches in the Village of Minoa. This preventive maintenance helps to reduce the threat of flooding during and after storm events.

+ A new salt shed (completed in 2014) was constructed using in-house labor, thereby saving the village over $100,000 in bonding for a commercial product.

CNG vehicle, Village of Minoa

Photo Credit: Village of Minoa

+ Students at the East Syracuse Minoa school and the SUNY College of Environmental Science and Forestry work together to grow flowers that are used throughout the village during the summer months. The flowers are grown in a greenhouse that is heated by a compost pile which is supplemented by food waste from Minoa Elementary and Woodland Elementary schools. This saves money for the school system.

+ The village converted one of its trucks to compressed natural gas, reducing emisisons and fuel costs for the village.

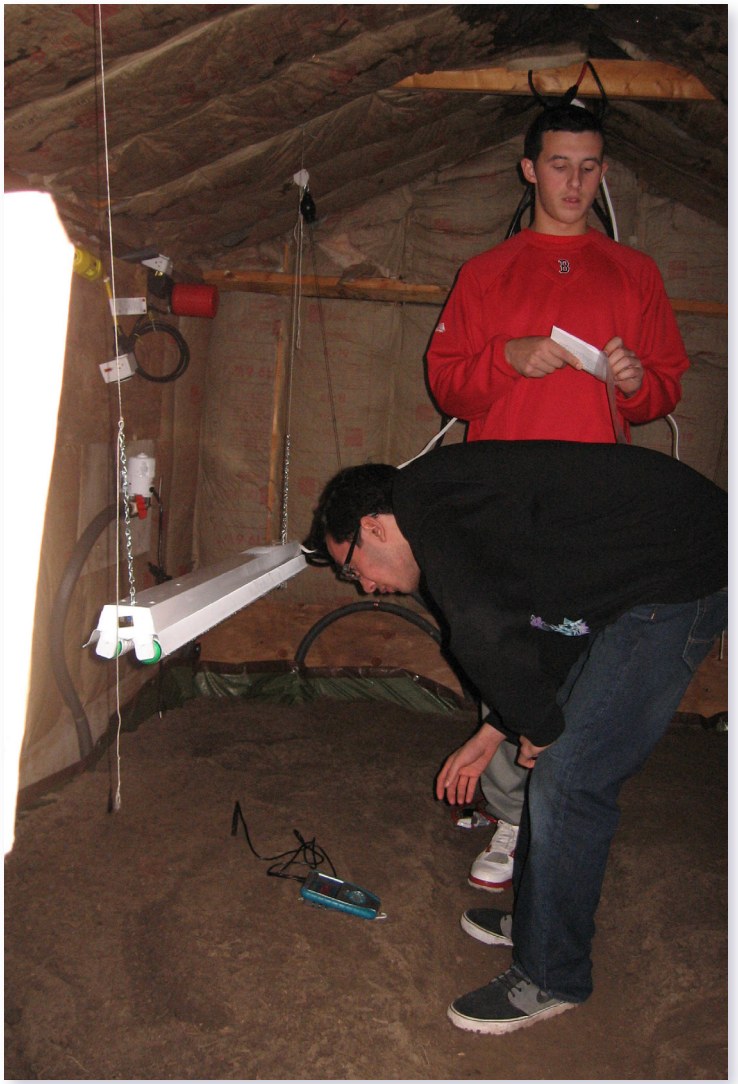
+ The CNY RPDB is a member of the Solar Ready II (SRII) team that is participating in the U.S. Department of Energy SunShot Initiative Rooftop Solar Challenge (RSCII). Through SRII and RSCII, CNY RPDB works with municipalities to implement solar energy best management practices (BMPs) that will lead to more streamlined and standardized solar processes. The CNY RPDB will work with the Village of Minoa on reducing system costs to make solar more affordable, adopting new solar ordinances and policies, and implementing improved permitting and installation processes.

Hazard Mitigation: The Onondaga County Hazard Mitigation Plan was updated in 2011 with assistance from national, state and local agencies. By identifying vulnerabilities and assessing local risks in the report, the county increased its capacity for planning for hazard avoidance and mitigation. The plan was written to improve the overall understanding of local hazards, thereby leading to more sustainable and disaster-resistant communities. Recommendations included in the plan are designed to protect human health and reduce potential impacts on infrastructure from significant storm events. The plan (which includes a chapter on the Village of Minoa) is available at the following website: http://www.ongov.net/planning/haz.html.

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."

Human intervention to reduce the rate or extent of climate change can be accomplished in two ways: by avoiding the potential consequences through emissions reduction (referred to as **mitigation**), or making changes to adjust to climate impacts that are unavoidable (referred to as **adaptation**).



ESM Interns help build a greenhouse heated by compost pile waste heat.

Photo Credit: Village of Minoa

Mitigation Strategies

The mitigation recommendations that are found in this Climate Action Plan were based on the findings from the village's greenhouse gas inventory. CNY RPDB staff worked throughout the fall of 2014 to analyze potential mitigation strategies for reducing the village'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 CAPPA (Climate and Air Pollution Planning Assistant) version 1.5 to calculate potential GHG reductions as well as cost savings for each mitigation strategy. CAPPA 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. CAPPA 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. CAPPA 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 CAPPA, 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

Adaptation strategies require community-wide planning that addresses local conditions associated with storm events, flooding, snowfall, and wind damage. Examples of climate adaptation strategies include, for example, development of early storm warning systems, air-conditioned cooling shelters, stormwater control, and policies that discourage people from building in flood prone areas.

The recommendations for climate mitigation and adaptation that are presented in the following pages were developed with local input from the Minoa community. They are designed to help prepare for anticipated changes in climate conditions and to assist decision-makers in identifying opportunities to improve community resilience. Minoa is encouraged to update these strategies each year as additional data becomes available.

Clock, Village of Minoa

Photo Credit: Village of Minoa

TRANSPORTATION

According to the Village of Minoa's GHG Inventory Report, transportation accounted for 28% of government emissions and 24% of community emissions in the village 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.

Inserting sidewalks on Main Street

Photo Credit: Village of Minoa

Mitigation Strategy Goals for 2020

Increase Options for Low-Carbon Transportation

Increase telecommuting: 332 $MTCO_2e$ annual reductions.

This strategy assumes that 10% of people with primary jobs in Minoa telecommute.

Conversion to smaller vehicles: 88 $MTCO_2e$ annual reductions.

This strategy assumes that 15% of community vehicles convert to a vehicle with better fuel efficiency.

Expand bicycling infrastructure: 61 $MTCO_2e$ annual reductions.

This strategy assumes that 10% of weekly trips less than 2 miles are converted to bicycle.

Expand pedestrian infrastructure: 26 $MTCO_2e$ annual reductions.

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

Encourage carpooling: 25 $MTCO_2e$ annual reductions.

This strategy assumes 10% of workers from Minoa who travel to work outside of the village carpool and reduce trips by 10%.

WWTP biosolid trucking reduction: 1 $MTCO_2e$ annual reductions.

This strategy takes into account the reduction in trucking of biosolids to landfill due to actions taken at the WWTP. 4 truckloads per year have been reduced so far, a reduction of 448 miles per year.

Increasing options for low-carbon transportation would reduce the amount of vehicle miles traveled (VMT), reducing gasoline and diesel use which would therefore reduce Minoa's emissions, fuel costs, and reliance on foreign fossil fuels. Encouraging community members to use transit, bicycles, and walking 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.

Bicycling as a mode of transportation creates no GHG emissions, and by expanding bicycling infrastructure in the community, community members can better take advantage of this form of transportation. 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.

Encouraging community members to convert to vehicles with better fuel efficiency will also reduce fuel use and emissions. Carpooling is another way community members can reduce emissions and save money. One way to encourage carpooling/ vanpooling 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 village website or some other easily accessible location.

CSX has a large presence in the village as well, as is illustrated previously in Figures 4 and 6. Rail emissions from passing and idling train cars could be significant in the village, and further investigation of emissions with the assistance of CSX is encouraged. CSX has been recognized for sustainable practices throughout the United States, including achieving LEED certification at its headquarters building in Jacksonville, FL. CSX has also earned a spot on the Dow Jones Sustainability Index four years in a row, has been recognized by the CDP, the world's only global environmental disclusre system, by raising its Climate Disclosure Leadership Index performance score in 2014, and others. The village urges CSX to follow their lead on reducing GHG emisisons in Minoa by investigating idling reduction strategies and other potential emissions reduction strategies for operations in the Village of Minoa.

ESM students working with Village Mechanic to convert village vehicle to Propane

Photo Credit: Village of Minoa

Mitigation Strategy Goals for 2020

Increase use of Alternative Fuels

Conversion of municipal vehicle fleet to compressed natural gas (CNG) vehicles: 5 $MTCO_2e$ annual reductions.

This strategy assumes 3 light trucks are converted.

The Village of Minoa has already converted one vehicle to compressed natural gas (CNG), reducing both energy costs and emissions. The village is interested in investigating the conversion of other municipal vehicles to CNG or some form of hybrid, such as bi-fuel or dual fuel. The village has also converted a vehicle to propane for experimental purposes and is interested in eventually powering the propane vehicle with methane produced from the WWTP. The village also has an electric GEM vehicle for use around town and in parades.

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 Minoa's emissions and provide other benefits to community members as well.

ENERGY EFFICIENCY

According to village's GHG Inventory Report, emissions from municipal buildings/ facilities accounted for 51% of total municipal emissions, wastewater facilities accounted for 14%, and streetlights and traffic signals accounted for 5%, while residential energy use accounted for 52% of the community's emissions and commercial energy use accounted for 20% of the community's total GHG emissions in the Village of Minoa 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.

ESF interns at WWTP

Photo Credit: Village of Minoa

Mitigation Strategy Goals for 2020

Increase energy efficiency and reduce emissions from buildings

Energy efficiency education for residents: 192 $MTCO_2e$ annual reductions.

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

Home weatherization: 121 $MTCO_2e$ annual reductions.

This strategy assumes 10% of households weatherize their homes.

Promote loans/incentives for energy efficiency: 65 $MTCO_2e$ annual reductions.

This strategy assumes 15% of households undergo a retrofit with the assistance of loans/incentives.

Convert outdoor municipal lighting to LED: 41 $MTCO_2e$ annual reductions.

This strategy takes into account the village's project with SmartWatt Energy that was completed in the winter of 2014-2015.

Retrofits of existing municipal facilities: 25 $MTCO_2e$ annual reductions.

This strategy assumes 17,654 square feet of municipal facilities undergo retrofits with 25% energy savings.

Energy efficiency education for businesses: 23 $MTCO_2e$ annual reductions.

This strategy assumes 5 businesses participate in an educational program.

Convert indoor lighting to LED: 1 $MTCO_2e$ annual reductions.

This strategy assumes 25% of light fixtures in the Municipal Building are converted to T8 LED bulbs.

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 Minoa may also not be equipped with the most recent energy efficient technologies, causing the village 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 village'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.

The East Syracuse-Minoa Central School District has been very proactive in retrofitting its facilities to be energy efficient. Many of the buildings have already undergone energy efficiency retrofits, and the High School has installed a solar array on the roof to help cover electric usage in the building. Minoa Elementary, located within the Village of Minoa, has also undergone many energy efficient upgrades, including:

+ Using a Direct Digital Control system to electronically control heating as needed (lower temperatures used when the building is unoccupied),
+ Installing lighting occupancy sensors in some areas of the building,
+ Recycled food project with ESF and Village of Minoa, and
+ Installing an energy efficient roof.

Minoa Elementary also has plans to replace outdoor lighting with LEDs, saving even more energy, emissions, and long-term costs.

Over the years, the village has also invested in various upgrades at the WWTP that have reduced energy use, costs, and emissions as well, including:

+ Repairing lights and installing occupancy sensors
+ Installing energy efficient level sensor and PLC program to run WWTP main pumps
+ Pex tubing for compost heating system
+ New 40HP SBR Blower
+ Replacing motors with new energy efficient ones
+ Modifying main drying bed for sludge- less trips to landfill

LED flood light installation at WWTP

Photo Credit: Village of Minoa

+ Installed an aquaponic and fish closed loop system for system water reuse
+ Installed photo cells on new outdoor lights
+ Replaced pumps with new energy efficient ones

Adaptation Strategies

Minoa 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. Minoa can also identify and remove local barriers to green infrastructure and re-evaluate building and zoning codes to discourage/prevent new development in flood-prone and high hazard areas.

"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)

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.

Friday Night "Cruisin in Minoa" at Lewis Park

Photo Credit: Village of Minoa

Mitigation Strategy Goals for 2020

Increase use of renewable energy

Residential solar: 228 $MTCO_2e$ annual reductions.

This strategy assumes 1,146 kW of solar PV is installed.

Commercial solar: 99 $MTCO_2e$ annual reductions.

This strategy assumes 400 kW of solar PV is installed.

Municipal solar: 12 $MTCO_2e$ annual reductions.

This strategy assumes 50 kW of solar PV is installed.

By installing renewable energies like solar, Minoa 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 New York State Energy Research and Development Authority (NYSERDA) provides incentives for the installation of solar PV based on system size. Additionally, there are state and federal tax credits for residential and commercial solar PV and small wind turbine 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 Village of Minoa 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, known as Solarize CNY. 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.

The Village of Minoa is currently investigating installing a municipal solar system with the assistance of the Camden Group that will help cover a significant portion of municipal electric use.

GEM vehicle, Village of Minoa

Photo Credit: Village of Minoa

WASTE

In 2010, 4% of the community's GHG emissions came from waste. Waste from the village is disposed of at the Onondaga County Waste to Energy (WTE) Facility. The waste is combusted, producing steam that turns turbines and produces energy. However, combustion of the waste also creates GHG emissions.

ESM Interns work on compost pile through CERF project

Photo Credit: Village of Minoa

Mitigation Strategy Goals for 2020

Decrease the waste stream

Kitchen composting: 1 $MTCO_2e$ annual reductions.

This strategy assumes each community member reduces food waste by 60 lbs.

Waste generated in the Village of Minoa is sent to the Onondaga County Resource Recovery Agency's (OCRRA) Waste-to-Energy (WTE) Facility for disposal. The WTE facility processes 97% of OCRRA's total non-recyclable waste. Close to 100% of the incoming waste stream is processable by the WTE facility. This means that almost all of the waste brought to the WTE facility is combusted and turned into steam to be used for electricity generation. The electricity generated at the facility is then sold to National Grid, providing enough electricity to power approximately 25,000-30,000 households and the Facility itself. The combustion of this waste does, however, create 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 WTE facility, reducing disposal costs.

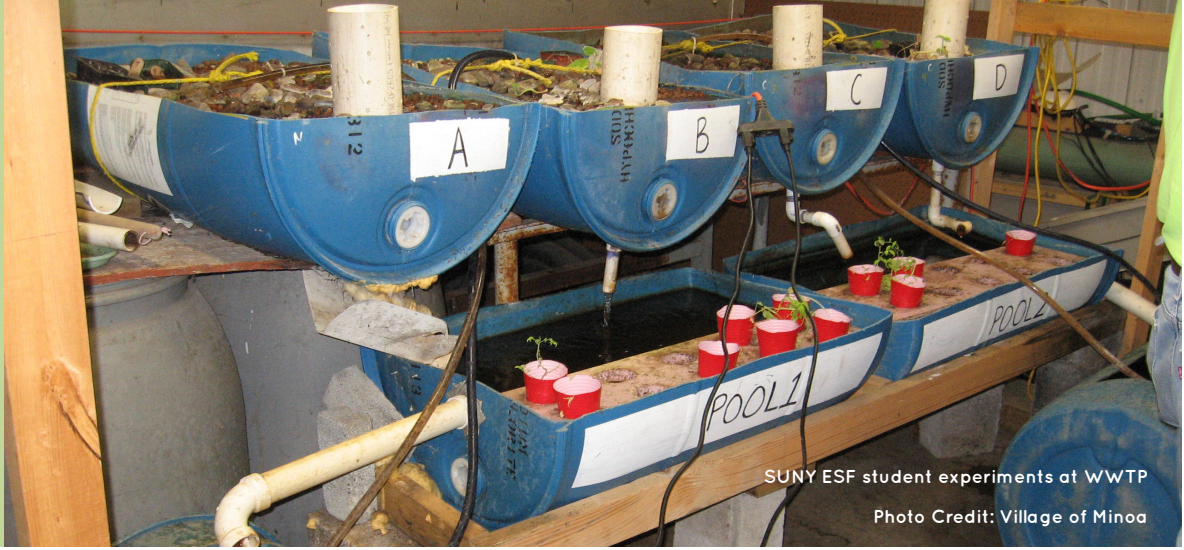
Composting is something that can be done at individual households or at the community scale. New York State's "Beyond Waste" Plan advances food scrap recycling as a key environmental strategy to help communities increase their waste diversion rates, and community composting sites, such as the Amboy Compost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

The Village of Minoa has also engaged in a pre- and post-consumer waste food collection program using the East Syracuse Minoa schools over the past three years. Tons of food waste have been collected and composted since the beginning of this program, but the main goal of the program is to eventually feed the food waste to the digester at the wastewater treatment facility to boost methane gas production which could then be used as energy at the facility. The village will collect and haul the food waste to the WWTP for this process. While the schools will not receive any of the energy produced by this program, they will save money by not having to pay a hauler to take the waste to landfill, and the students will learn about recycling, composting, and food waste-to-energy processes at a young age.

It is the village's hope to start a village resident waste-to-energy collection program as well. The village also hopes that the next garbage truck used for this program will have the ability to run on CNG as well as diesel using a bi-fuel or dual fuel system.

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.



SUNY ESF student experiments at WWTP

Photo Credit: Village of Minoa

Mitigation Strategy Goals for 2020

Plant trees for carbon storage and energy savings

Tree planting: 17 $MTCO_2e$ annual reductions.

This strategy assumes 5% of households plant 1 tree (76 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, Minoa can protect and expand urban trees and woodland ecosystems to increase climate change mitigation potential. Planting living snow fences (evergreens planted at distances of at least 100 feet upwind of problem stretches of a road) will help to reduce snow drifts and travel hazards for drivers. Road segments should be prioritized and landowners should be contacted for participation. Planting and maintaining trees and other vegetative buffers along Limestone Creek will reduce the flow of contaminants (primarily sediments and nutrients) from entering the tributary, to reduce shoreline erosion, and to maintain cooler water temperatures through shading. Planting low pollen tree species in open areas and parks can help to minimize human health issues. Managing tree density throughout the village can reduce overcrowding and susceptibility to stress and disease. The village can remove dead or dying trees and replacing them with heat and invasive tolerant species.

In order to accomplish these goals, Minoa can also encourage the US Forest Service and Onondaga County Cooperative Extension to monitor changes in tree composition and health.

The Village of Minoa should promote the resilience of natural systems and resources through open space conservation and smart growth strategies. The village can protect open space through conservation land grants, landowner incentives, fee acquisition, and the purchase of conservation easements. They should explore options for hiking and biking trails to enhance open space preservation and soil infiltration. Minoa should also update local maps that display low elevation areas that may be susceptible to flooding and display this information on the village website along with flood preparedness guidelines; maps should display varying levels of flood hazard potential. Minoa can also maintain an annual program to remove branches, ice jams, and other debris from Limestone Creek in order to reduce the potential for flooding in the area.

Minoa should also provide for the routine collection of temperature, precipitation, storm frequency, and endangered and invasive species, and public health information in order to evaluate the impact of climate change on local conditions. To do this, Minoa should work with Project Watershed (Isaac Walton League) to document invertebrate population trends in Limestone Creek, and compile a database of vulnerable populations (e.g. the elderly and people with special needs) and develop a system to contact them in case of emergency.

Minoa should also focus on protecting local trees and water resources by controlling the introduction and spread of invasive species. To do this, they can take adaptation measures such as educating the public and elected officials on the value of prevention and early detection of invasive species; working with the Onondaga County Soil and Water Conservation District and the Natural Resource Conservation Service to monitor the introduction and spread of invasive species; and designating a Minoa Village Board member to learn about Cornell Cooperative Extension's Emerald Ash Borer control strategy and to participate on the New York State Invasive Species Task Force.

Inserting sidewalks, Minoa

Photo Credit: Village of Minoa

ADDITIONAL ADAPTATION STRATEGIES

These strategies are additional actions Minoa 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.

ESM student experimentation at WWTP

Photo Credit: Village of Minoa

Infrastructure

One of Minoa'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 Minoa 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. Minoa can also reduce the threat of flooding by working with the Onondaga County Soil and Water Conservation District (SWCD) to implement a "Snag and Drag" program for Limestone Creek (similar to the program on Chittenango Creek). This would remove large woody debris that blocks water flow.

Minoa should work with the SWCD to identify and improve the capacity of stormwater collection systems and to maximize soil infiltration and groundwater recharge.

GIS mapping can also be used to identify priority locations for the installation of green infrastructure to re-divert flood waters to open land and away from populated areas. This land should then be maintained as open space for the purpose of flood control and protect it from future development. Minoa can also encourage downspout disconnection, bioinfiltration, and rainwater harvesting in Minoa's residential and business communities to reduce stormwater runoff to Limestone Creek.

Public Health

Minoa should also establish ways to reduce or eliminate the negative effects of climate change on public health. Adaptation strategies Minoa can pursue in this area include: working with the Onondaga 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.

Education

Education is an important part of climate adaptation as well. Minoa should implement a comprehensive public outreach and stakeholder engagement campaign to build awareness of climate change. The community can encourage the East Syracuse-Minoa School District to teach students at all grade levels about climate change and energy efficiency efforts such as recycling, water conservation, transportation efficiencies, landscaping, and natural habitat rehabilitation. These initiatives will result in GHG reductions and will teach students about sustainability and conservation issues.

The village can train local building officials, planning boards, and elected officials on flood hazards, risk reduction strategies, implementation of floodplain development regulations, post-flood reconstruction, and how to address flood hazards during planning board reviews, and train local building officials and the construction industry on flood proofing techniques for retrofitting existing flood prone development.

The village can also provide information to community members on the village website, such as climate adaptation principals to increase the awareness of severe weather risks, storm preparedness, and safety practices for homes and businesses. They can provide emergency preparedness guidelines for people living and working in flood prone areas such as 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 village website can also include regional topographic maps and information about flood preparedness.

The village 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 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. Minoa can achieve this goal by updating the community's inventory of emergency operations and public notification lists, collaborating with national, state, and local agencies to facilitate data collection, sharing, and synthesis of flood and storm event preparedness information, and updating land hazard maps and inventories of infrastructure and at-risk communities.

Minoa should also re-establish local protocols for sharing equipment during emergencies, reconfirm channels of communication with local police and fire departments, the local power utility, and media outlets, establish a road watch program to alert the public of flooded areas and tree damage during storm events, 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 village for a more complete coverage during emergencies.

Finally, Minoa should work with Onondaga County officials to update the County's Hazard Mitigation Plan every five years and provide public access to the Plan by adding it to municipal and agency websites.

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

Minoa Fire Department Recruit NY Day

Photo Credit: Village of Minoa

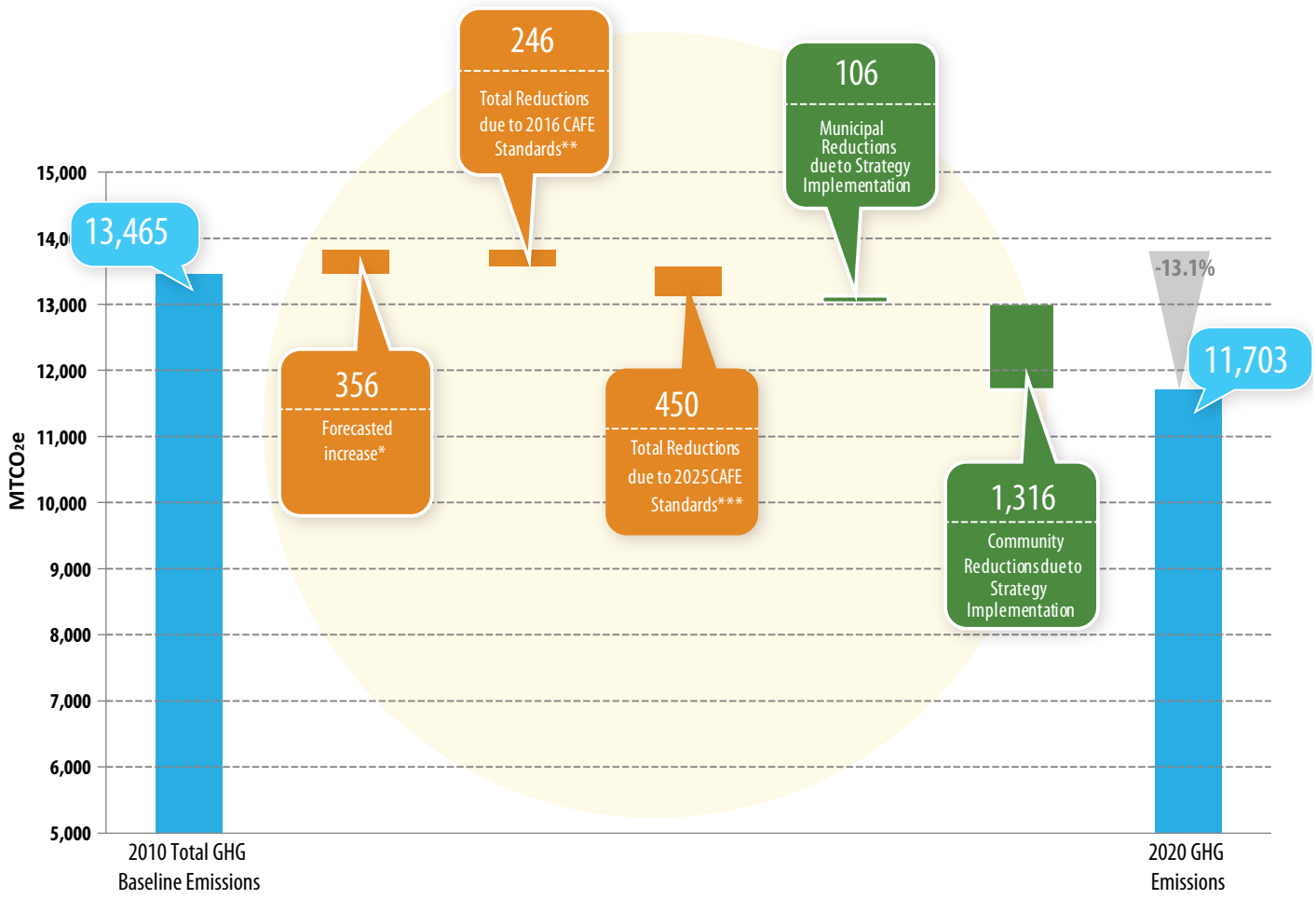
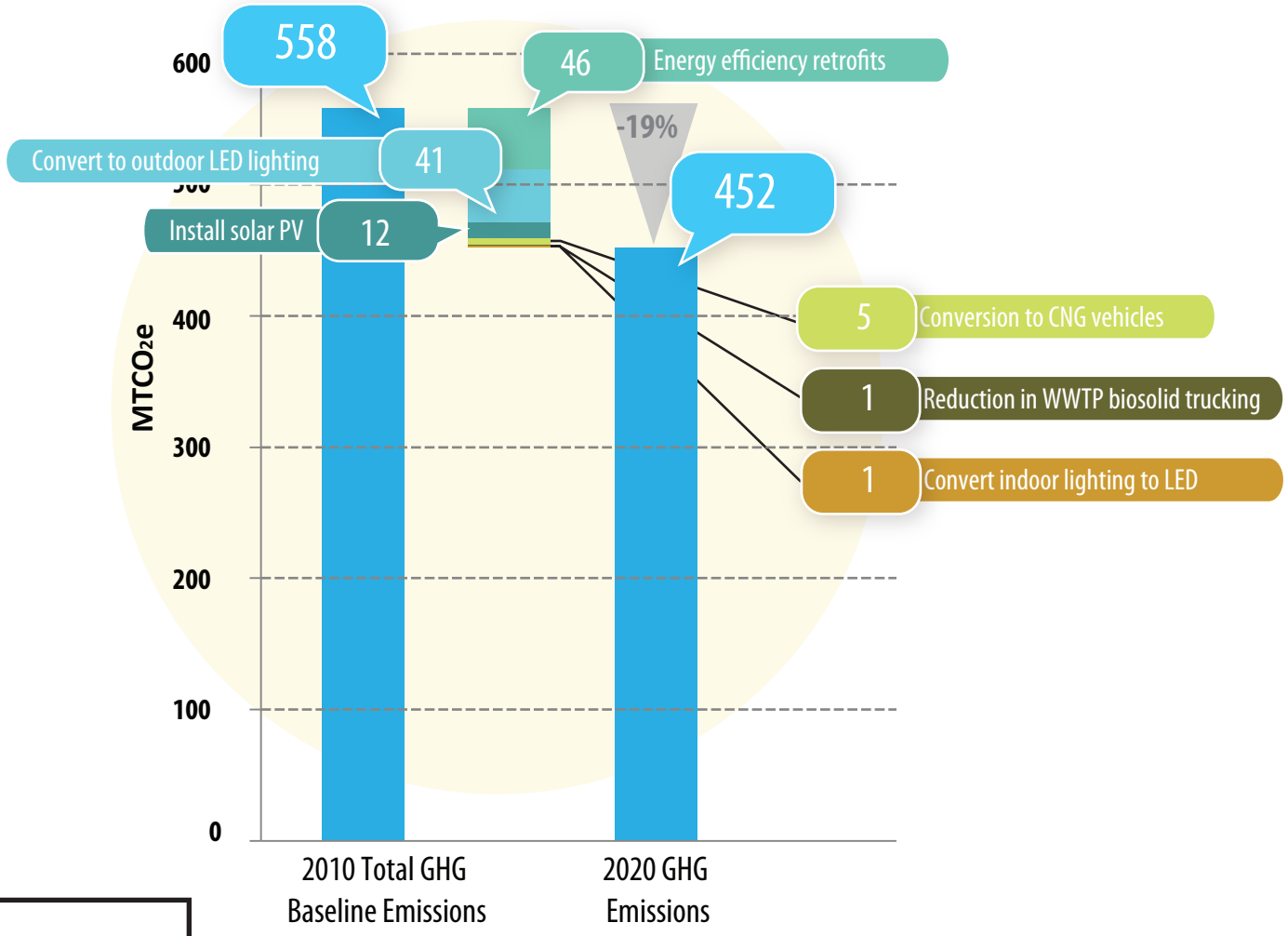


FIGURE 11- TOTAL POSSIBLE REDUCTIONS BY 2020

Figure 11 summarizes the results of the Village of Minoa's GHG inventory, a 2020 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 village separated into community-wide measures as well as municipal operations measures. Reductions due to Minoa actions are shown in green while changes in emissions that will occur regardless of this Plan are shown in orange. It is projected that Minoa's total GHG emissions in 2020 could be reduced by 13.1% if the village implements all of the recommended community-wide and municipal operations measures.

*2013 GHG inventory reported a forecasted an increase of 356 $MTCO_2e$ from the 2010 baseline to 2025 due to increases in commercial energy use, waste, and population increase,
**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 = 106 $MTCO_2e$



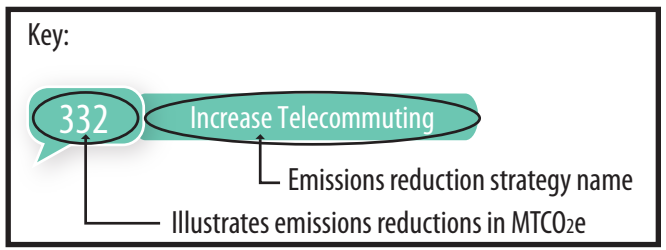


FIGURE 12- POTENTIAL MUNICIPAL REDUCTIONS FROM STRATEGY IMPLEMENTATION

Minoa's 2010 baseline municipal emissions as recorded by the GHG inventory report, potential reductions due to suggested strategies, and potential emissions in 2020 should each of the suggested strategies be implemented. It is estimated that there will be a 19% reduction in municipal emissions if all suggested strategies are implemented.

Total possible community reductions from mitigation strategies = 1,316 $MTCO_2e$

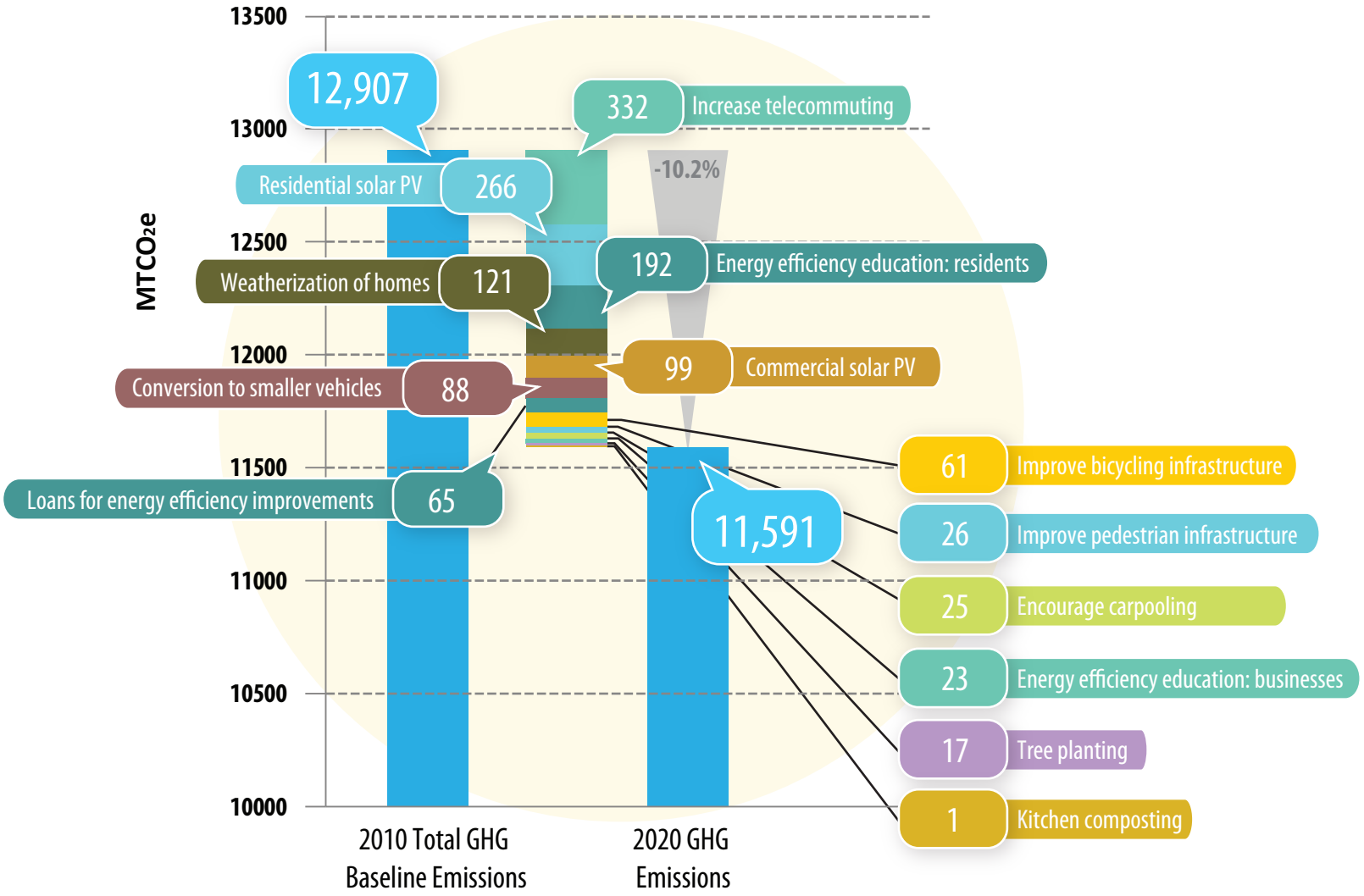


FIGURE 13- POTENTIAL COMMUNITY REDUCTIONS FROM STRATEGY IMPLEMENTATION

Minoa's 2010 baseline community emissions as recorded by the GHG inventory report, potential reductions due to suggested strategies, and potential emissions in 2020 should each of the suggested strategies be implemented. It is estimated that there will be a 10.2% reduction in community emissions if all suggested community reduction strategies are implemented.

Concluding Remarks

The Minoa Greenhouse Gas Inventory and Climate Action Plan provided an opportunity for the village 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 Minoa 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. Village 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, Minoa 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.

Inserting sidewalks on Main Street

Photo Credit: Village of Minoa

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.

$MTCO_2e$: Metric Tons of Carbon Dioxide Equivalent. $MTCO_2e$ 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. Conversion to CNG vehicles	1	1	2			x					x
	2. Conversion to bi-fuel and/or dual fuel	N/A	N/A	N/A			x					x
Transportation: Community	1. Increase telecommuting	1	4	1				x		x		x
	2. Conversion to smaller vehicles	1	1	1		x	x	x		x		x
	3. Expand bicycling infrastructure	1	1	2			x	x		x		x
	4. Expand pedestrian infrastructure	2	1	5			x	x		x		x
	5. Encourage carpooling	1	1	1		x		x		x		x

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. Convert outdoor lighting to LED	1	3	2			x		x	x		x
	2. Energy efficiency retrofits to existing facilities	1	2	4			x			x	x	x
	3. Install solar PV	1	2	2		x	x	x	x	x		x
	4. Convert indoor lighting to LED	1	1	2		x	x			x		x
	5. WWTP upgrades: reduction in biosolid trucking	N/A	1	N/A			x		x	x		x
	6. Food waste-to-energy	N/A	N/A	N/A		x		x				x
Energy/Efficiency: Residential	1. Residential solar PV	3	2	3		x	x	x	x	x		x
	2. Energy efficiency education: residents	1	1	1		x		x		x	x	x
	3. Weatherization of homes	2	1	5		x	x		x	x		x
	4. Loans for energy efficiency improvements	3	1	5		x		x	x	x		x
Energy/Efficiency: Commercial	1. Commercial solar PV	2	1	4		x	x	x	x	x		x
	2. Energy efficiency education: businesses	1	1	1		x		x		x	x	x
Waste	1. Kitchen waste composting	1	1	N/A		x		x				x
Natural Resources	1. Tree planting	1	1	3			x					x

VILLAGE OF MINOA
240 NORTH MAIN STREET, MINOA, NY 13116

Central New York Regional Planning & Development Board

NEW YORK STATE OF OPPORTUNITY. Climate Smart Communities

Central New York climate change innovation program ...a Program of the Central New York Regional Planning and Development Board

CNY Energy Challenge ...a program of the Central New York Regional Planning & Development Board