

# Town of Skaneateles Climate Action Plan NOVEMBER 2015



Sunrise on Skaneateles Lake  
Photo Credit: Charles Major

## A MESSAGE FROM THE COMMITTEE

Dear friends and neighbors,

The Town of Skaneateles is committed to becoming a greener, more sustainable community. Scientific consensus is that human activities are causing the warming of the Earth's atmosphere with the primary culprit being environmental emissions from human activities. As a community we can take steps to reduce our greenhouse gas emissions and reduce our "Carbon Footprint".

Our Climate Action Plan provides a course of action for the town to continue its efforts to improve sustainability and maintain the lowest possible costs. The Plan provides a benchmark of the town's energy use and emissions and outlines a variety of actions that the town and our community members can take to reduce energy use, emissions, and dollars spent on energy. Together we can enhance Skaneateles' quality of life by continuing to make our community more sustainable.

Sincerely,

The Town of Skaneateles Climate Action Plan Advisory Committee

## ACKNOWLEDGEMENTS

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

### ADVISORY COMMITTEE

Hamilton Fish, Town Engineering Committee  
David Graham, Town Engineering Committee  
Ken Kaufman, Town Engineering Committee  
Mary Sennett, Town Supervisor  
William Volcko, Town Engineering Committee

### ADDITIONAL TOWN STAFF

Bridgett Winkleman, Town Budget Officer

### CNY REGIONAL PLANNING AND DEVELOPMENT BOARD

Chris Carrick, Energy Program Manager  
Amanda Mazzoni, Planner  
Anne Saltman, Principal Planner



Skaneateles County Club

Photo Credit: Charles Major

## The Central New York Regional Planning and Development Board

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

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## EXECUTIVE SUMMARY

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

The CAP provides local goals for reducing energy use from municipal operations and from the Skaneateles community as a whole and includes specific recommendations for categories such as transportation, solid waste disposal, and building energy efficiency. This CAP addresses emissions in the Town of Skaneateles independent from the Village of Skaneateles, which has its own Climate Action Plan. The objectives of the Climate Action Plan are to:

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

A Climate Action Plan Advisory Committee comprised of municipal representatives and community leaders met during 2015 to discuss emission reduction goals and specific strategies for reaching them. The committee agreed on a goal to reduce municipal greenhouse gas emissions by 25% by the year 2025 and reduce community emissions by 10% from the GHG inventory baseline year (2010).

This CAP was prepared for Skaneateles 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 160 municipalities in New York State (including the Town of Skaneateles) 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<sub>2</sub>IP).



Right: Skaneateles Country Club and sailboats

Photo Credit: Unknown

# 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.<sup>1</sup> Atmospheric testing shows that we have 402 parts per million (ppm) atmospheric CO<sub>2</sub>,<sup>2</sup> which is

1 Visit [http://www.antarctica.ac.uk/press/journalists/resources/science/ice\\_cores\\_and\\_climate\\_change\\_briefing-sep10.pdf](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<sub>2</sub>.

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

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

## Developing the Plan

The Town of Skaneateles' Climate Action Plan was developed by an advisory committee made up of Hamilton Fish, Town Engineering Committee; David Graham, Town Engineering Committee; Ken Kaufman, Town Engineering Committee; Mary Sennett, Town Supervisor; and William Volcko, Town Engineering Committee. The committee was provided technical assistance by the CNY RPDB, who analyzed energy and emissions reduction strategies for the town utilizing data from the GHG inventory report. CNY RPDB provided information and suggestions to the advisory committee as to which energy efficiency strategies would be most successful in the town, how many MTCO<sub>2</sub>e the strategies would prevent, co-benefits of the strategies, and other case studies explaining where the strategies have been implemented successfully. They also provided information about cost of implementation, possible funding sources, and payback period for the strategies. For more information on

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<sub>2</sub> record shows the present-day levels of CO<sub>2</sub> are unprecedented during the past 420k yr. Pre-industrial Holocene levels (~280 ppmv) are found during all interglacials, with the highest values (~300 ppmv) found approximately 323k yr BP.

## Thinking Sustainably: The Village of Skaneateles, NY

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

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

## Climate Impacts in the Northeast<sup>1</sup>

**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.

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

how the strategies were developed, including assumptions and references, refer to Appendix C: Action Strategy Summary Document.<sup>4</sup>

### Implementing the Plan

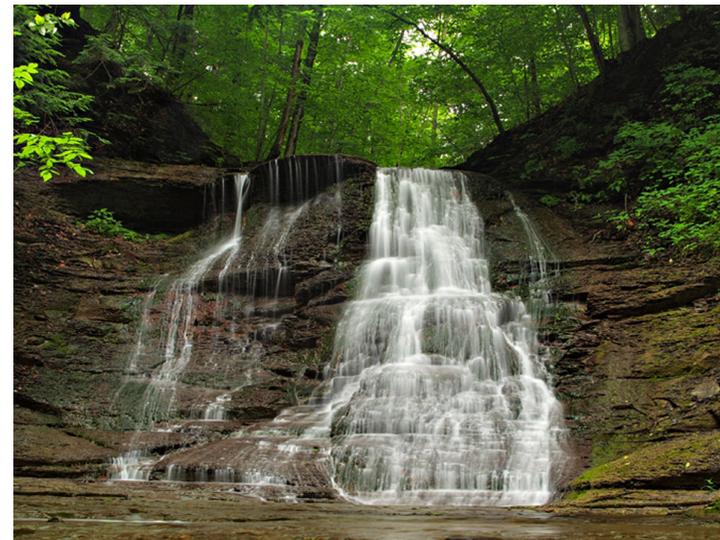
In order to implement the strategies in this plan and achieve Skaneateles' sustainability goals, it is recommended that the Climate Action Plan committee continue to meet and work towards implementation of the strategies within this plan. Sustainable Skaneateles, the town and the CNY RPDB should work with the Climate Action Plan committee to implement the strategies 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.

### Global Weather Extremes

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

<sup>4</sup> Available at <http://townofskaneateles.com/>



Guppy Falls, Skaneateles

Photo Credit: <http://falzguy.com/guppy-falls.html>

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

# NEW YORK STATE WEATHER CHARACTERISTICS

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

In 2011, the New York State Energy Research and Development Authority (NYSERDA) released a comprehensive assessment of the projected effects of climate change in New York State's critical systems and natural resources over the next century. ClimAID: the Integrated Assessment for Effective Climate Change Adaptation Strategies in New York State was compiled by more than 50 scientists and currently serves as an important tool for planners, policymakers, farmers, local governments and residents. The 600-page report presents projected changes in climate for seven geographic regions of the state, ranging from the coasts of Long Island to the mountains of the Adirondacks and the farms of Western New York. 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.

An update to the ClimAID report was released in 2014. In general, the updated study confirmed and refined previous projections:

- + Sea level could rise significantly, permanently flooding some areas and increasing the likelihood of damage to coastal infrastructure from storm surge, including roads and bridges.
- + Inland and upstate, heavy downpours and subsequent flooding are expected to increase. In the winter, more rainstorms in place of snow are expected.
- + While winters will be milder, summers are expected to see more extreme and longer heat waves, with more droughts as well<sup>5</sup>

Flooding is a growing concern throughout New York State, especially with the rise in urban development and the increased frequency of storm events. Although some areas are more prone to flooding than others, there are no areas in the State that are completely exempt from flood hazards. There are over 52,000 miles of river and streams in New York State and along their banks there are 1,480 communities that are designated as flood prone. An estimated 1.5 million people live in these flood prone areas and many more work, travel through, or use recreational facilities located in these areas.

<sup>5</sup> "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation". 2014 [www.nyserdera.ny.gov/ClimAID](http://www.nyserdera.ny.gov/ClimAID).



Beaver Dam on Gully Road  
Photo Credit: Charles Major

# LOCAL CLIMATE CHARACTERISTICS

Skaneateles is expected to experience a gradual increase in air temperature and a rise in the frequency of extreme weather events. According to Cooperative Extension, higher temperatures can lead to greater insect and disease pressures. The increased occurrence of storm events can contribute to flooding, stormwater runoff, and sediment loading to nearby Skaneateles and Owasco lakes.

Skaneateles committed to climate awareness and environmental protection by becoming a Climate Smart Community in July 2009 and has worked with the CNY RPDB for the past year on projects associated with the Climate Change Innovation Program. The Skaneateles Lake Association, NYS Soil and Water Conservation's Agricultural Environmental Management Program, and NYS Concentrated Animal Feeding Operations (CAFO) regulations are also designed to help communities address the impacts of storm events by reducing runoff and pollution loading from agricultural operations. Viticulture, the production of grapes, is an important part of the Finger Lakes wine industry which contributes to an estimated 50,000 jobs and a \$2.7 billion economic impact for the region. Vineyards and other businesses in the agricultural community are implementing long and short-term efforts to reduce greenhouse gas emissions that contribute to climate change and to protect field crops, grapes, orchards and livestock that serve as the foundation of the local economy.

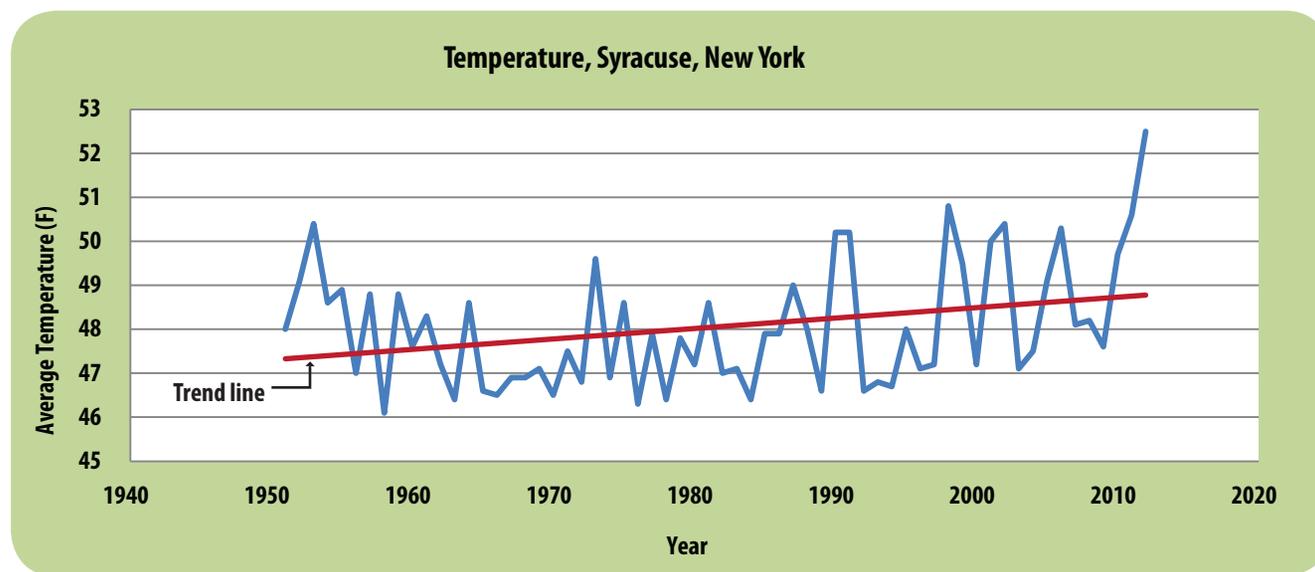


FIGURE 1- ANNUAL AVERAGE TEMPERATURE, SYRACUSE, NEW YORK. SOURCE: NOAA NATIONAL WEATHER SERVICE FORECAST OFFICE

## Temperature and Precipitation

The average July temperature (81.3°F) in Onondaga County is lower than the national average of 86.5°F. The average year-round temperature is 47.6°F, which is lower than the New York State average of 48.2°F, and much lower than the national average of 54.4°F. During the summer and parts of spring and autumn, temperatures rise during the daytime and fall rapidly after sunset. Figure 1 shows the annual average temperatures in the City of Syracuse since 1951. The trend line shows a gradual warming trend. This information was recorded at the NOAA weather station at the Hancock International Airport.

Increased air temperatures will eventually increase the water temperature in Skaneateles Lake. Because of the deep lake basin, this impact will not be as significant as with shallower lakes such as Oneida.

The Finger Lakes region provides excellent air and water quality and ranks better than the national average. The county also ranks higher (55) than the national average (44) on the comfort index. The comfort index is based on humidity during the hot month and is rated on a scale of 1 to 100. Higher numbers reflect a greater degree of comfort.

Skaneateles and neighboring communities

generally experience seasonable weather patterns that are characteristic of the northeastern U.S. cyclonic system. Onondaga County receives an average of 38.9 inches of rain each year. This is similar to the national average of 36.5 inches. Long-term precipitation trends recorded at the Hancock International Airport weather station in Syracuse New York are displayed below in Figure 2.

## Snowfall

The average annual snowfall in Skaneateles is 94.3 inches, which is higher than the New York State average of 57.9 inches. Central New York experienced exceptionally heavy snowfall, icy roads, and low temperatures during the 2013-14 winter season. Onondaga County normally receives an average of 98.5 inches of snow each year. This is significantly higher than the national average of 25 inches.

The Town of Skaneateles 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. Because of the increased water temperature and reduced duration of

ice cover on Lake Ontario, Skaneateles and other areas to the east and south of the lake are expected to experience heavier and more frequent individual lake-effect snowfall events. The average snowfall for the region, however, is gradually decreasing (Figure 3).

## Ice Cover

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

Ice characteristics on the Great Lakes are important to monitor because of the influence on hydropower generation, commercial shipping, the fishing industry and other societal impacts. Scientists at the Great Lakes Research Laboratory are observing long-term changes in ice cover as a result of global warming. Ice research is helping to determine the impacts on climate patterns, lake water levels, water movement patterns, water temperature structure, and spring plankton blooms. Ice coverage and duration influence lake water temperatures, as incoming solar radiation needs to melt the ice before it warms the lake water. However, weather conditions, lake depth, and heat storage capacity in the lakes are also important components that can influence the thermal cycle in the lakes. Because of the

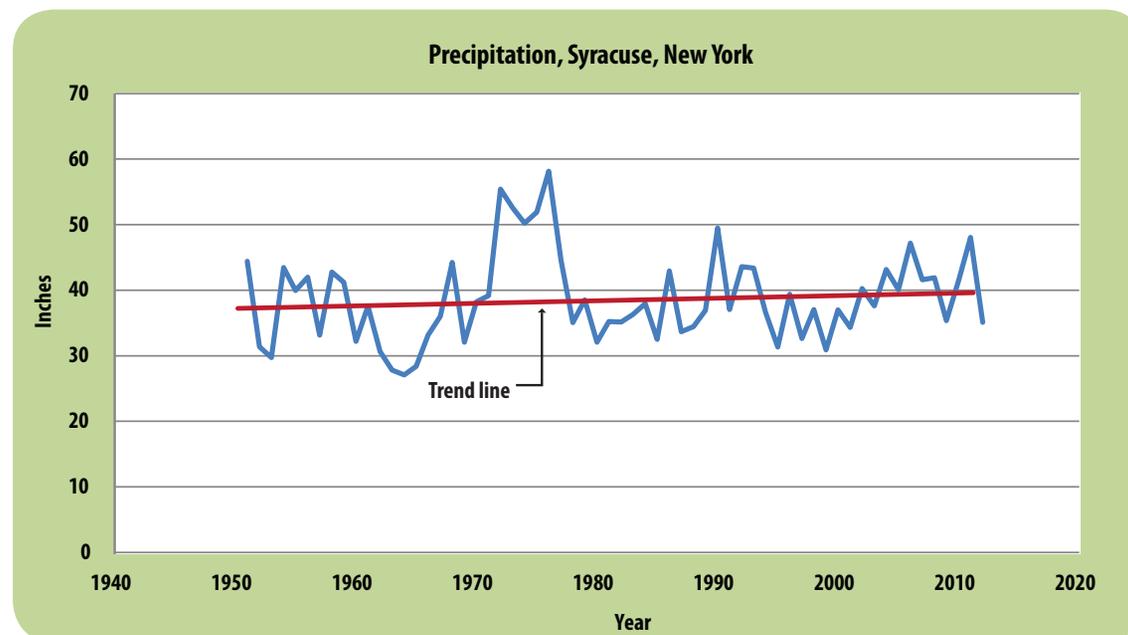


FIGURE 2- ANNUAL AVERAGE PRECIPITATION IN SYRACUSE, NEW YORK 1903-2008  
SOURCE: NATIONAL WEATHER SERVICE FORECAST OFFICE

importance that ice has on lake characteristics, lake communities in the Finger Lakes region are encouraged to compile ice-in and ice-out dates on an annual basis.

### Extreme Weather Events

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

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

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

control, and stormwater management.

Incorporating green infrastructure and enhancing stormwater management helps to reduce the threat of flooding and improves the water quality in local lakes and tributaries. In addition to improving air and water quality, green Infrastructure is a cost-effective approach that can provide additional community benefits such as reducing energy use and mitigating climate change; improving habitat for wildlife; reducing Skaneateles' infrastructure costs; and promoting economic growth.

### Flooding

Flooding is influenced by the intensity and amount of precipitation, spring snowmelt, groundwater levels, and the concentration of impervious surfaces and compacted soils from urban development. These conditions limit groundwater recharge and increase surface runoff and flooding. According to the Federal

TABLE 1- TOTAL ASSESSED VALUE (TAV) OF PARCELS INTERSECTING FLOOD PLAINS<sup>1</sup>

Municipality	TAV of Parcels Intersecting Flood Plain	# Acres of Parcels Intersecting Flood Plain	TAV of Municipality	TAV % Floodplain Parcels within the Municipality
Town of Skaneateles	\$296,902,960	8,949	\$810,670,342	36.6%

<sup>1</sup> Source: 2014 tax parcel data, Onondaga County

TABLE 2- PARCELS WITHIN 100-YEAR FLOODPLAIN<sup>1</sup>

Municipality	Parcels	Parcels in Floodplain	% of Parcels in Floodplain
Town of Skaneateles	3,021	514	17%

<sup>1</sup> Source: 2014 tax parcel data, Onondaga County

Emergency Management Agency (FEMA), floods have caused a greater loss of life and property, and have disrupted more people in the United States than the impact of all other natural hazards combined. FEMA reports that floods kill more people than any other form of severe weather with damages exceeding \$3.5 billion annually. Further, with the exception of fire, floods are the most prevalent and widespread of all natural disasters and approximately 75 percent of all presidentially declared disasters are the result of flooding.

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

The greatest potential for flooding in Central New York typically occurs in the early spring during periods of heavy precipitation, warming temperatures, and rapid snowmelt. Low elevation areas (including FEMA flood zones and wetlands) in Skaneateles are located along the eastern lake shoreline, along Skaneateles Creek, and in a localized area north of the lake. Flooding in this area is minimal because the City of Syracuse Water Department regulates Lake water level at the outlet.

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 2014, the total assessed value of property

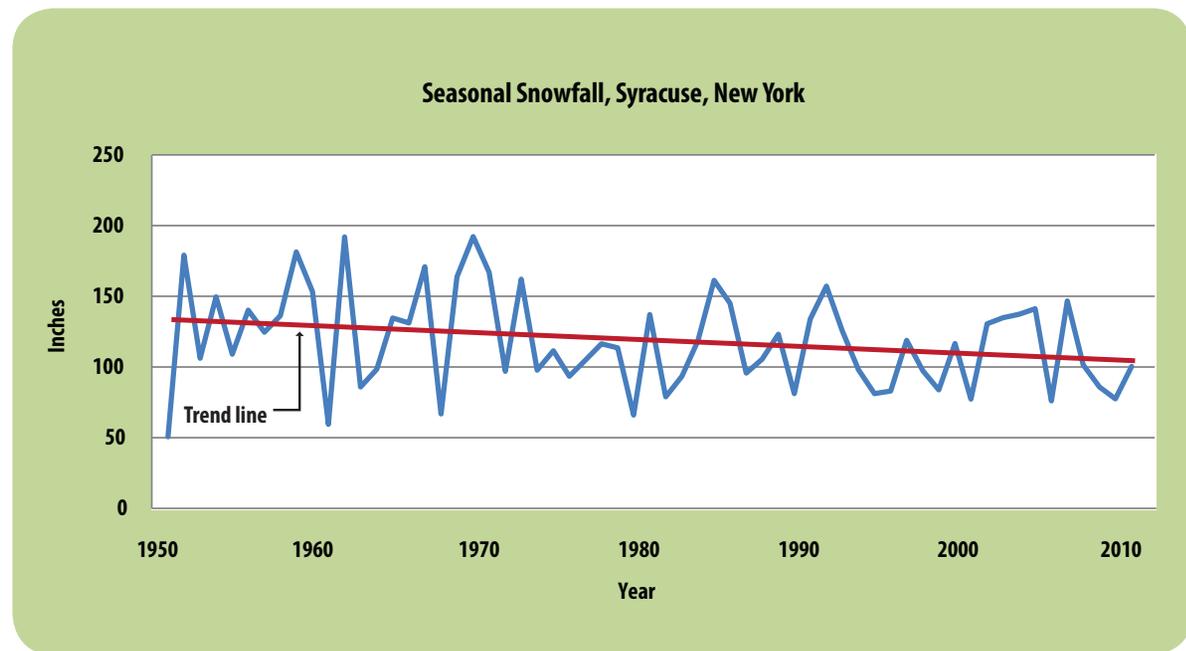


FIGURE 3- SEASONAL SNOWFALL IN SYRACUSE, NY, 1949-50 TO 2008-09  
SOURCE: NATIONAL WEATHER SERVICE FORECAST OFFICE

located within designated FEMA flood zones in Skaneateles represents 36.6% of the total assessed value of parcels throughout town (Table 1). Of the 3,021 land parcels in the Town, 17% is located in FEMA flood zones (Table 2).

### Tourism and Recreation

Weather has a significant impact on the tourism and recreation sector throughout the Finger Lakes region. 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 influences the duration and types of outdoor recreation activities that take place and plays

a predominant role in determining local economic vitality.

Warming trends are impacting the region's outdoor recreation opportunities and may reduce recreational income generated for the local economy. In addition to the ski industry, New York State maintains 8,000 miles of snowmobiling trails that also contributes to the local economy. Ski resorts and snowmobiling relies on natural snowfall which has declined in recent years. Snowfall totals are expected to continue this trend with warming weather patterns. This has the potential to reduce business generated from retail stores and associated ski and snowmobiling industries.

The local warming trend is also providing a longer growing season for agricultural crops

and backyard gardens and is providing a boost to water-based summer recreation such as boating and swimming. Skaneateles Lake and nearby tributaries provide opportunities for water-based recreation such as swimming, boating, and fishing. Higher air temperatures and a shorter duration of winter ice cover may slightly increase lake water temperatures, which could cause a minor shift in cold water fisheries populations. This impact won't be as apparent in Skaneateles Lake because of the lake basin depth. According to researchers at Cornell University, warming water temperatures may already be contributing to fish species modifications in shallower lakes such as Oneida which has a much shallower lake basin. Conditions may 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.

In addition, warmer air and water temperatures and decreasing ice coverage may provide a longer growing season for nuisance aquatic plants and algae which could result in recreational use impairment.

### Public Health

Changes in climate conditions are affecting human health. Several health impacts of warming temperatures have been documented throughout the country such as increased

illnesses and deaths from heat events, injuries and deaths from extreme weather events, and respiratory illnesses such as asthma due to changes in air quality. Projections of warmer winters, hotter summers, and unpredictable precipitation patterns may cause increases in certain types of diseases. For example, climate change in the Northeast is expected to result in the increased population rates of mosquitoes and ticks. Increasing populations could result in more frequent outbreaks of West Nile Virus and Lyme disease-causing bacteria.

### Invasive and Endangered Species

While insects and diseases are a natural part of the aquatic and terrestrial ecosystems, climate

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

The Hemlock Woolly Adelgid, Asian Longhorn Beetle and Emerald Ash Borer are some invasive tree pests that already pose a threat to Central New York. They have the potential to damage local tree populations and the



Storm coming on Skaneateles Lake

Photo Credit: Charles Major

communities and industries that rely on them. The destruction of hemlock in New England forests affects recreational activities such as fishing. As pests kill trees adjacent to streams, shade is no longer provided and stream water temperatures increase beyond what is ideal for coldwater fish such as trout. As the climate changes, Skaneateles might have to address other invasive species as well.

### Agriculture

The Town of Skaneateles is located at the northern end of Skaneateles Lake. Agriculture is an important component of the local economy and farming is the largest land use activity in the Town, with 42% of the land in Skaneateles classified as agricultural. Preservation of farmland and agricultural industries is a primary planning goal for the community. The Skaneateles Lake Watershed Agricultural Program, implemented in 1994 and maintained through the Onondaga SWCD, works to reduce agricultural pollution loading to the lake and tributaries without negatively impacting the farm economics. Soils in the Skaneateles Lake watershed exhibit poor permeability and erosion vulnerability which makes land use regulations that control development a priority for local planners.

Farmers participate in numerous conservation activities to avoid surface and groundwater contamination and to reduce pollution runoff to nearby waterbodies. The Onondaga County Soil and Water Conservation District (SWCD) and Skaneateles Lake Watershed Program develop erosion and sediment control plans,

assists with stormwater facility permitting, work on streambank restoration to reduce erosion and sedimentation, and provide assistance in the identification of green infrastructure opportunities. Skaneateles is working with the SWCD to identify priority erosion areas in the watershed and to design preventative measures to reduce stormwater runoff.

As with many New York State farming communities, the conversion of land from agricultural to non-agricultural uses is often caused by development pressures and land use

conflicts. Farmland protection in Skaneateles and neighboring communities involves laws, policies and programs that support a strong local economy and that protect agricultural land use. Several methods of farmland protection strategies are found at the state, county and local levels. Examples of these tools include agricultural value assessments, conservation easements and land use planning that is sensitive to the needs of farms and agriculturally based businesses.



Inspecting boats for invasive species prevention

Photo Credit: Skaneateles Lake Association

# COMMUNITY CHARACTERISTICS

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

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



Jones' Beach

Photo Credit: Charles Major

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

## Transportation

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

The vast majority of vehicles burn carbon fuels and this 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 communities therefore have the potential to make a significant contribution

to overall climate change mitigation.

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

According to data from the U.S. Census Bureau Center for Economic Studies, 12% of the residents in Skaneateles work within the town. Most residents that work outside of the town commute to the City of Syracuse (10.3%), while a significant population are also employed in Manhattan (6%). Additional transportation destinations are found in Table 4.

Single-passenger automobile trips to and from Skaneateles generate substantially more GHG emissions per mile than public transit and carpooling. According to the U.S. Census Bureau, 5,043 residents in Skaneateles were employed in 2013. Of this total, the majority was employed in retail (14.2%), health care and social assistance (12.2%) or educational services (10.7%).

Of the total number of employed residents, approximately 2,587 (80%) drove alone to work, 272 (8%) carpooled, and 241 (7%) worked from home (Table 5). Single-passenger automobile trips constituted the vast majority. Preparation of a commuting analysis would help determine the need for organized carpooling opportunities. The majority of workers (57.5%) commuted less than 30 minutes to work (Table 6). Carpooling, ridesharing, and similar efforts to reduce vehicle traffic will help to reduce greenhouse gas emissions.

### Land Use

Recommendations for urban design in smaller communities such as Skaneateles include the installation of green infrastructure to reduce stormwater runoff near homes and businesses. Support of localized food production and reliance on farmers markets will reduce shipping, storage, and packaging needs. These and other strategies that make use of land use and transportation alternatives could contribute to overall GHG mitigation.

TABLE 4- WHERE SKANEATELES WORKERS ARE EMPLOYED<sup>1</sup>

Municipality	Estimated percentage of Skaneateles Residents Commuting to Destination
Skaneateles town (Onondaga, NY)	12.0%
Syracuse city (Onondaga, NY)	10.3%
Manhattan borough (New York, NY)	6.0%
Auburn city (Cayuga, NY)	4.4%
De Witt town (Onondaga, NY)	3.3%
Albany city (Albany, NY)	3.1%
Buffalo city (Erie, NY)	2.0%
Colonie town (Albany, NY)	2.0%
Amherst town (Erie, NY)	1.8%
Marcellus town (Onondaga, NY)	1.6%
All Other Locations	53.4%

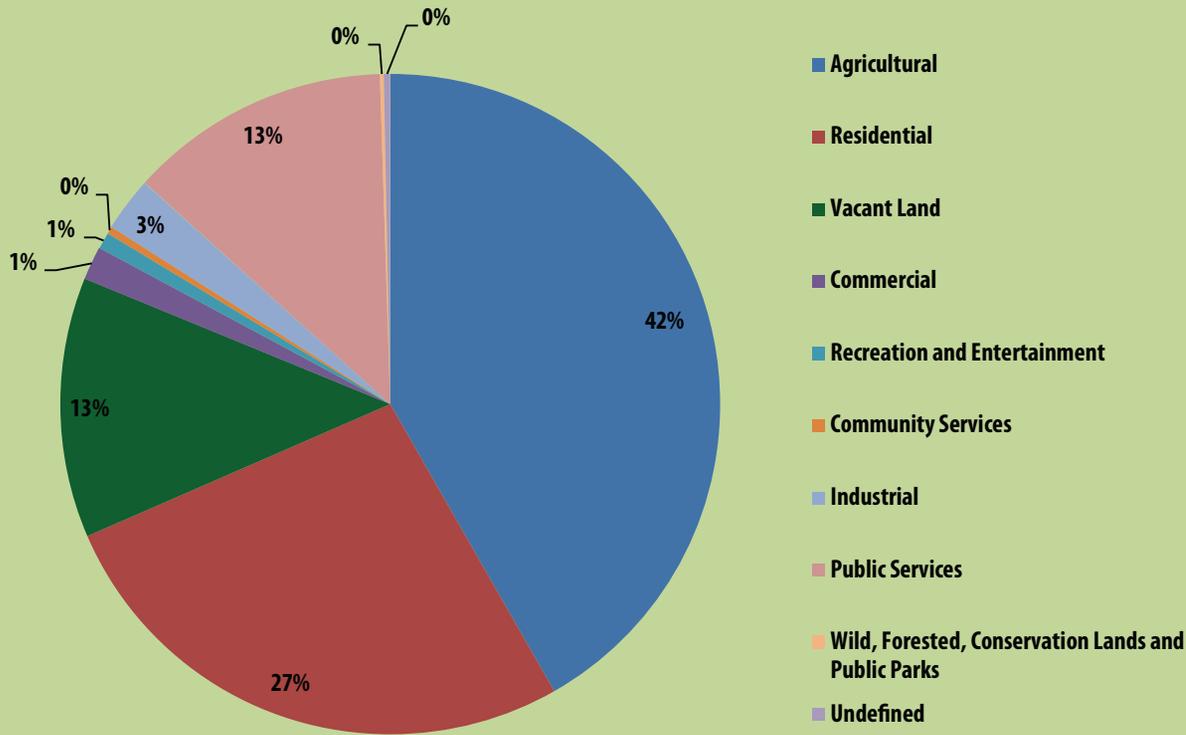
<sup>1</sup> Source: U.S. Census Bureau, Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics, 2013. Data provided through Unemployment Wage Records, the Office of Personnel Management, and the Quarterly Census for Employment and Wages.

TABLE 5- TRANSPORTATION TO WORK IN SKANEATELES<sup>1</sup>

Transportation to Work	Number of Workers	Percentage
Car, truck, van - drove alone	2,587	80%
Car, truck, van - carpooled	272	8%
Public transportation (excluding taxicab)	18	1%
Walk to work	91	3%
Worked from home	241	7%
Taxicab, motorcycle, bicycle, or other means	22	1%
TOTAL	3,231	100%

<sup>1</sup> Source: American Community Survey, 2009-2013

FIGURE 4- SKANEATELES LAND USE TYPES



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

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

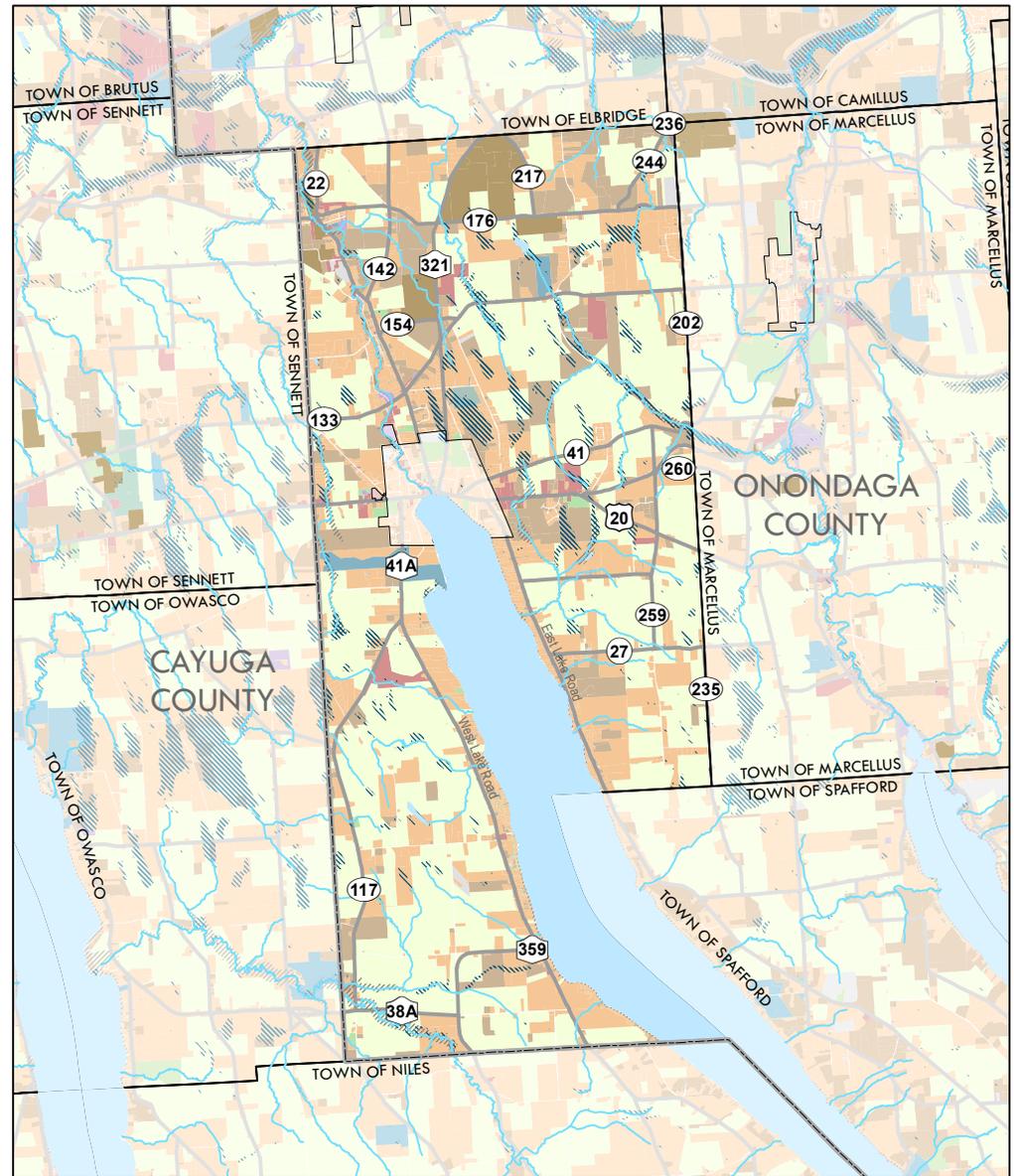
Examining existing land use patterns and transportation infrastructure provides insight into ways a community can reduce GHG emissions. Factors most directly influencing travel behavior include diversity of uses, proximity of uses, and density. Each of these topics is discussed on the following pages.

**Diversity of Use:** Diversity of use refers to the degree to which residential, commercial, industrial, institutional, and recreational uses are located together. Increasing the diversity of neighborhood-serving, and specifically job-rich, uses within a community could help reduce transportation-related GHG emissions. Increased diversity reduces travel distances and facilitates more walking and cycling trips. Improving the mix of uses within a community can also reduce commute distances, particularly if affordably priced housing is located in areas with a high number of jobs and employees can commute to work using alternative modes.

FIGURE 5- TOWN OF SKANEATELES LAND USE

A jobs/housing ratio is commonly used to evaluate the diversity of land uses within a community by describing the relationship between employment opportunities and housing supply. A ratio of 1.0 describes a balance between jobs and housing. A ratio above 1.0 indicates that there are more jobs than housing, while a ratio below 1.0 describes an undersupply of jobs relative to housing. In 2013, there were approximately 3,770 jobs in Skaneateles and 2,971 occupied households and the jobs/housing ratio was approximately 1.269. This demonstrates that there were more job opportunities than households in the community.

**Proximity of Uses:** Proximity of uses refers to the distance between neighborhood commercial services and residents' homes. The number of residential homes that are located within ¼ mile of commercial properties in Skaneateles was calculated and then used as a basis for the development of CAP recommendations. This provided insight into the effectiveness of the community's existing zoning and land use pattern from the pedestrian perspective. Of the 2,080 residential parcels in Skaneateles, 1,586 (32%) are located within ¼ mile of a commercial parcel. Although some residential areas are distant from commercial services, overall, the existing land use pattern creates some opportunities for pedestrian and bicycle travel.



**Land Use**  
Town of Skaneateles

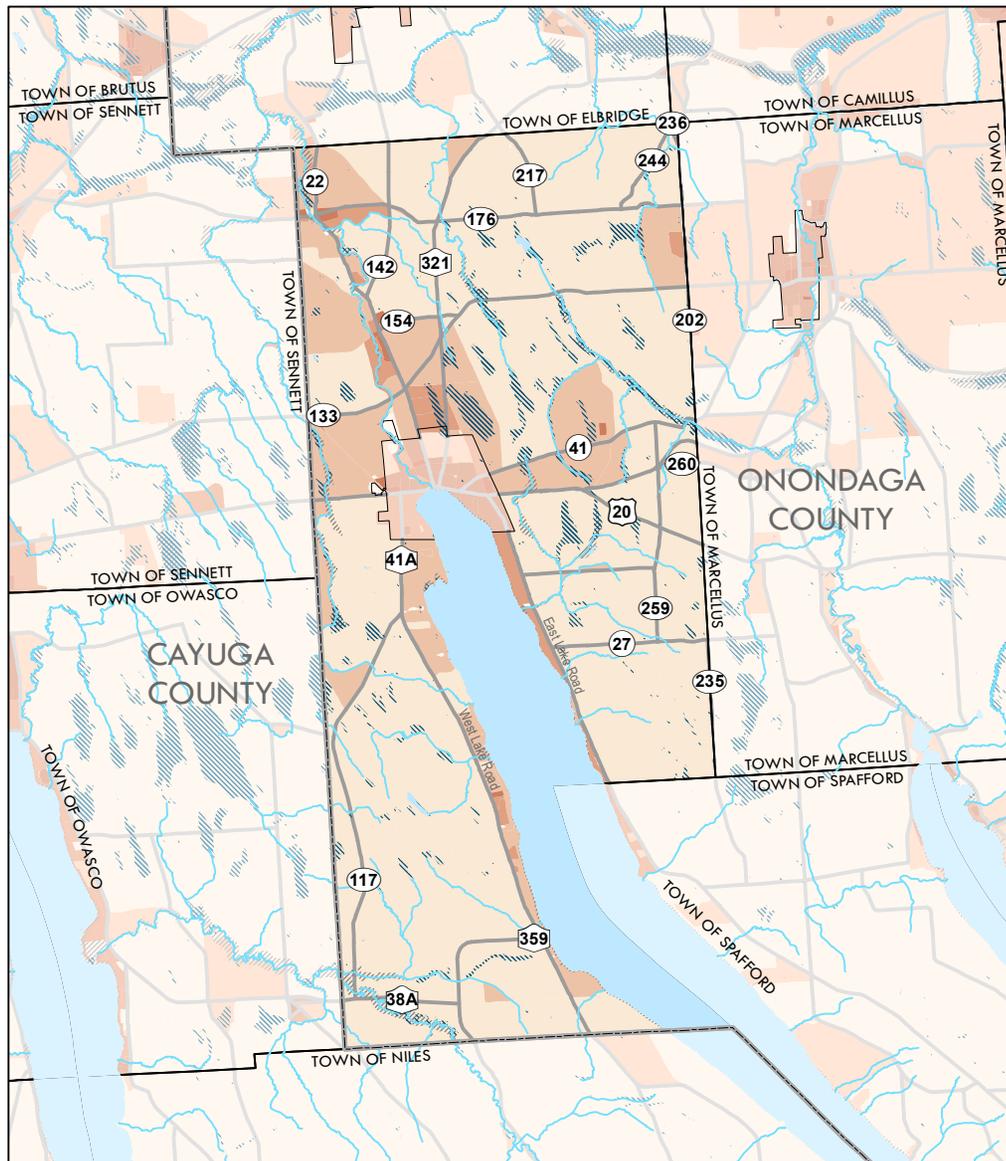
0 0.3 0.6 1.2 1.8 2.4 Miles

Central New York  
Regional Planning & Development Board

Prepared by CNY RPDB, September 2015

<b>Legend</b>			
FEMA Floodplains	No Data	Public Services	
Wetlands	Agricultural	Recreation and Entertainment	
County, State, and Federal Roads	Commercial	Residential	
	Community Services	Vacant Land	
	Industrial	Conservation Lands and Public Parks	

FIGURE 6- TOWN OF SKANEATELES POPULATION DENSITY



**Density:** Density refers to the number of housing units, people, or jobs in a given area. Higher densities refer to an increased number of services, shops, schools, and public buildings located within a neighborhood which increases the availability of transit and pedestrian infrastructure. These conditions tend to reduce the need for vehicle ownership and increase the use of alternative modes. Residential density is normally measured in terms of households per acre. According to the 2013 American Community Survey, Skaneateles has a relatively low residential density of 0.10 households per acre.

**Population Density**  
Town of Skaneateles



Prepared by CNY RPDB, September 2015

**Legend**

-  FEMA Floodplains
-  Wetlands
-  County, State, and Federal Roads

TABLE 6- COMMUTE TIMES TO WORK FROM THE TOWN OF SKANEATELES<sup>1</sup>

Commute Times	Workers	Percentage
Less than 15 minutes	1,118	37.4%
15-29 minutes	602	20.1%
30-59 minutes	1,091	36.5%
60-89 minutes	142	4.8%
90+ minutes	37	1.2%
TOTAL	2,990	100%

*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.*

<sup>1</sup> Source: American Community Survey, 2009-2013



Skaneateles Central Schools

Photo Credit: Charles Major

# Greenhouse Gas Inventory Summary

As part of the Climate Change Innovation Program, an inventory of the town's municipal and community Greenhouse Gas (GHG) emissions was conducted in 2015 with the assistance by CNY RPDB staff. The 2015 inventory report examined emissions generated in the Town of Skaneateles in 2010, which serves as the baseline year for the Climate Action Plan.

The inventory report found that in the 2010 base year, town municipal operations generated a total of 433 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>e), which were broken up into 4 sectors: buildings and facilities (167 MTCO<sub>2</sub>e, 39%), streetlights and traffic signals (42 MTCO<sub>2</sub>e, 10%), vehicle fleet (223 MTCO<sub>2</sub>e, 52%), and water delivery

facilities (1 MTCO<sub>2</sub>e, 0.2%).

Community emissions totaled 50,425 MTCO<sub>2</sub>e, which were broken up into 5 sectors: residential energy (13,019 MTCO<sub>2</sub>e, 26%), commercial energy (12,068 MTCO<sub>2</sub>e, 24%), industrial energy (3,595 MTCO<sub>2</sub>e, 7%), transportation (19,984 MTCO<sub>2</sub>e, 40%), and waste (1,759 MTCO<sub>2</sub>e, 3%).

**The Town of Skaneateles' Climate Action Plan uses the data gathered in the 2015 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 Skaneateles to reduce emissions, energy use, and dollars spent on municipal and community operations by the year 2025.**

**1 MTCO<sub>2</sub>e =**

-  CO<sub>2</sub> emissions from 112 gallons of gasoline consumed
-  CO<sub>2</sub> emissions from 2.3 barrels of oil consumed
-  CO<sub>2</sub> emissions from 41.7 propane cylinders used for home barbeques
-  Carbon sequestered by almost 1 acre of U.S. forests in one year

FIGURE 7- TOWN OF SKANEATELES MUNICIPAL EMISSIONS BY SECTOR MTCO<sub>2</sub>E (2010 BASELINE)

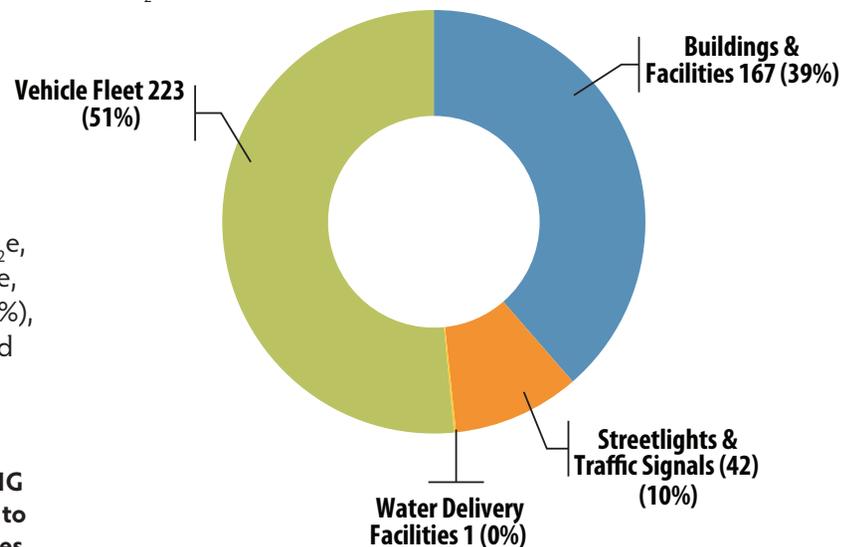


FIGURE 8- TOWN OF SKANEATELES COMMUNITY EMISSIONS BY SECTOR MTCO<sub>2</sub>E (2010 BASELINE)

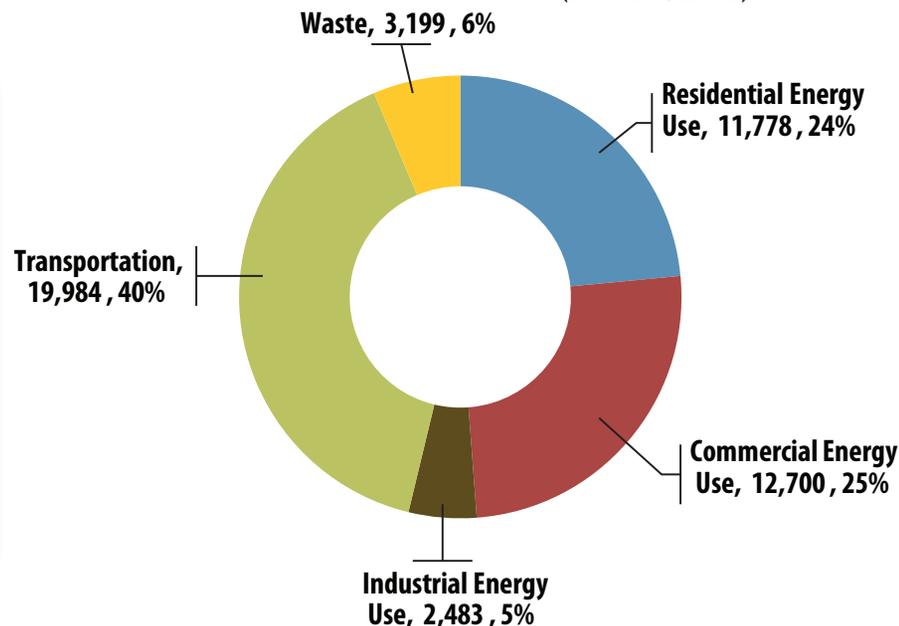
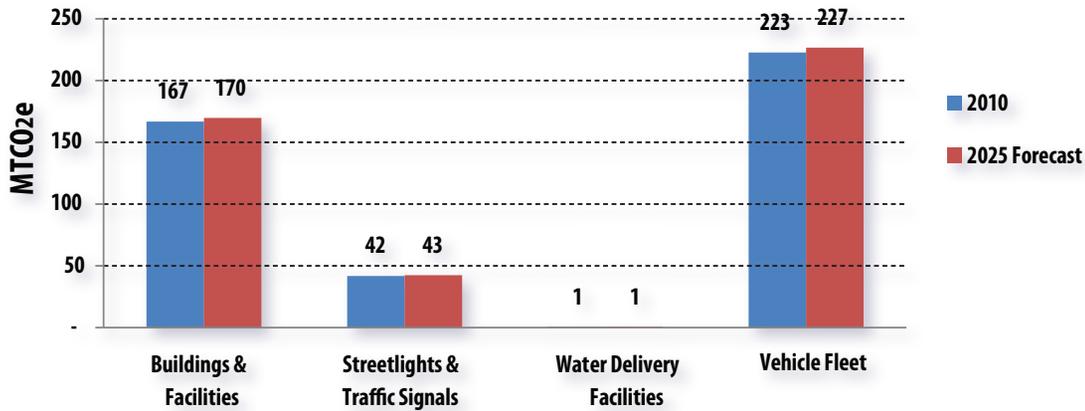


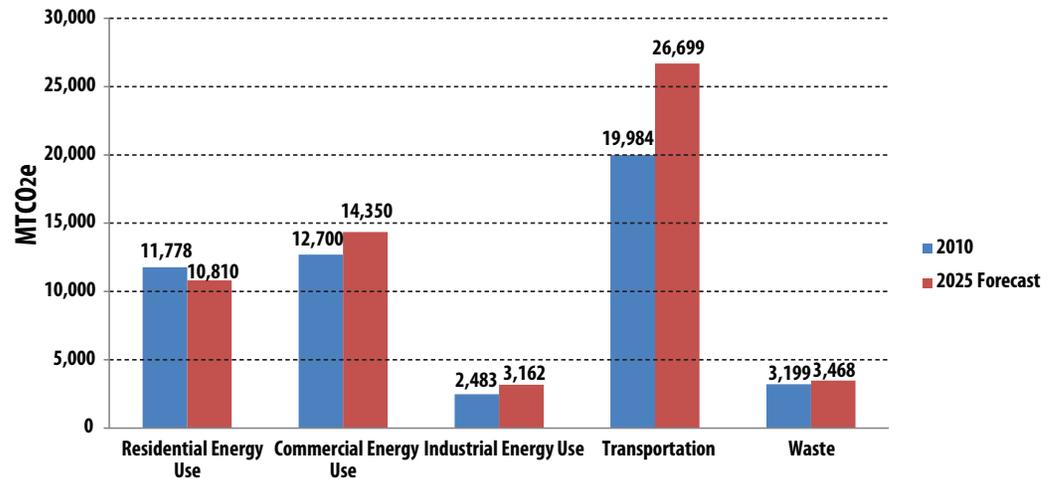
FIGURE 9- EMISSION FORECAST:  
MUNICIPAL OPERATIONS



The GHG inventory report also forecasted emissions for the Town of Skaneateles in 2025. The report explained that town municipal emissions are expected to total 440 MTCO<sub>2</sub>e in 2025, with a 3 MTCO<sub>2</sub>e increase in buildings and facilities emissions, a 1 MTCO<sub>2</sub>e increase in streetlights and traffic signals, and a 4 MTCO<sub>2</sub>e increase in vehicle fleet. Emissions from water delivery facilities are not expected to increase by 2025.

Community emissions are expected to total 58,798 MTCO<sub>2</sub>e in 2025, with a 1,060 MTCO<sub>2</sub>e decrease in the residential sector, a 1,635 MTCO<sub>2</sub>e increase in the commercial sector, a 983 MTCO<sub>2</sub>e in the industrial sector, a 6,715 MTCO<sub>2</sub>e increase in the transportation sector, and a 100 MTCO<sub>2</sub>e increase in the waste sector.

FIGURE 10- EMISSION FORECAST:  
COMMUNITY



# Climate Action Accomplishments

The Skaneateles community and county planners have been pro-active in adapting to climate change and have taken steps to reduce greenhouse gas emissions. The town, along with more than 160 other municipalities in New York State, signed municipal resolutions to become Climate Smart Communities. The town worked with the CNY Regional Planning and Development Board to complete a greenhouse gas inventory in July 2015. The following narrative provides a brief summary of several additional initiatives to protect the community against storm events, excessive heat, and other climate influences.

The Town of Skaneateles is in the process of creating an Open Space Plan with assistance from the CNY RPDB. The Open Space Planning Committee is using LEED's Technical Guidance Manual for Sustainable Neighborhoods to guide Plan development and discussions.

The Town of Skaneateles is participating in the CNY RPDB's Solarize program for municipalities. The town has selected municipally-owned sites within the town as possible locations for solar installations to offset municipal energy use and reduce emissions. These sites are currently being assessed by the CNY RPDB and their consultant, Optony, to determine the feasibility of the sites for solar PV.

The town is also helping to promote Solarize CNY, a solar PV bulk-purchasing program for Cayuga, Cortland, Madison, Onondaga, and Oswego Counties. The program offers significant discounts for solar PV installations for residents, businesses, and municipalities.

The Skaneateles Lake Watershed Agricultural program (SLWAP), implemented in 1994, addresses the impacts of storm events by reducing runoff and pollution loading from agricultural operations.

Sustainable Skaneateles is a group of Village and Town residents that works to promote "action, communication, education, and collaboration to achieve a sustainable community for current and future generations." Sustainable Skaneateles has sponsored "Re-Bike" events for the past two years with bicycle repair workshops, person-to-person bicycle sales or swaps, and a Bike Rodeo for children. The event included demonstrations on bike repair, tire changing, bike sizing and adjustment. In 2015, Sustainable Skaneateles also sponsored a tour of homes, farms and offices that have taken steps to be more sustainable.

The Village of Skaneateles renovated the abandoned fire station for use as their new Village Hall and Police Station which was the first net-zero-energy village hall in New York State. The Village's comprehensive approach reduced consumption

of energy at the Village Hall by approximately 50% annually. Village officials have applied for LEED certification for the Village Hall where a 50-kilowatt solar array was installed and are waiting for LEED distinction. Municipal officials have also installed car charging stations at the Village Hall. A new geothermal heating and cooling system was installed under the Village Hall public parking lot. Ground temperatures will be used to provide heat in the winter and cooling in the summer, providing long-term cost savings for taxpayers.

Permeable pavement has been installed to manage stormwater runoff and to protect lake water quality. Officials are working to create a "walkable village" with greater pedestrian safety and convenience. Village Trustees also purchased LED streetlights that are designed to conserve energy, last longer, and have a more downward-focused lighting.



Twin Birch Dairy Farm

Photo Credit: Charles Major

Free compact fluorescent light bulbs have also been distributed to Independent Energy Efficiency Program customers. The use of Energy Star rated appliances is encouraged throughout Skaneateles and financial incentives and appliance rebates are available to homeowners to implement energy efficient projects.

Skaneateles has an Alternative Energy Committee and an Open Space Committee, charged with identifying appropriate land, locating funding opportunities, and ways to implement the Town's goals to preserve open space. A Comprehensive Plan Review and Advisory Committee was also established to re-evaluate the Skaneateles Comprehensive Plan. The Skaneateles Architectural and Visual Identification Team was created to identify and catalog items of significant historical, natural, and cultural prominence within the Town and Village of Skaneateles. The Skaneateles Lake Eurasian Water Milfoil Eradication Foundation addresses invasive aquatic plants.

The Town of Skaneateles has obtained recreational land for preservation. The properties are located off Gully Road and New Seneca Turnpike. The New Seneca Turnpike Land has a pond, hiking trails, and picnic pavilion. Skaneateles Conservation Area Advisory Committee provides information about conservation areas in Skaneateles.

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



Road to DEC Boat Launch

Photo Credit: Town of Skaneateles

that, "Warming of the climate system is unequivocal and since the 1950s, many of the observed changes are unprecedented over decades to millennia." Their findings are based on numerous independent scientific analyses and observations of the climate system, paleoclimate archives, theoretical studies of climate processes and simulations using climate models. The Summary for Policymakers of the IPCC Working Group I assessment report was approved in September 2013 by the member governments of the IPCC meeting in Stockholm, Sweden.

Unprecedented human intervention will be required in the coming decades to reduce the extent of climate change. This can be done by avoiding the potential consequences (referred to as **mitigation**), or making changes to accommodate

those effects that are unavoidable (referred to as **adaptation**). Much of the mitigation policy discussion to-date has centered on reducing greenhouse gas (GHG) emissions through fuel substitution and fuel efficiency for vehicles and on energy efficiency for buildings and industries. Many of the mitigation and adaptation recommendations for Skaneateles were based on findings from the town's greenhouse gas inventory.

# Climate Adaptation vs. Mitigation

## Mitigation Strategies

CNY RPDB staff and the advisory committee worked throughout 2015 to analyze potential mitigation strategies for reducing the town's emissions for both municipal operations and from the community-at-large. CNY RPDB utilized a software tool developed by ICLEI-Local Governments for Sustainability known as CAPP (Climate and Air Pollution Planning Assistant) version 1.5 to calculate potential GHG reductions as well as cost savings for each mitigation strategy. CAPP is an Excel-based decision-support tool designed to help U.S. local governments explore and identify potential opportunities to reduce greenhouse gas emissions and other air pollution emissions. CAPP provides a starting point for two major tasks: determining an achievable emissions reduction target and selecting mitigation strategies to include in a local municipal-operations or community-scale emissions-reduction plan, commonly called a climate action plan. CAPP users can compare the relative benefits of a wide variety of emissions reduction and clean air measures, and identify those most likely to be successful for their community based on its priorities and constraints.

Utilizing CAPP, a variety of mitigation strategies were identified and analyzed to determine their potential for achieving emissions reductions either at the municipal operations level or the community scale. The CNY RPDB also explored the potential impacts of an external large scale factor on the



Barn, Skaneateles, NY

Credit: Unknown

community's emissions profile: New Federal CAFE Standards that will increase the average fuel economy of vehicles sold in the U.S. through 2025. The results of these analyses are summarized in the following pages and in Figures 11-13.

## Adaptation Strategies

The U.S. Environmental Protection Agency refers to the term 'adaptation' as the adjustment or preparation of natural or human systems to a changing environment which moderates harm or exploits beneficial opportunities. Examples of community adaptation to extreme weather include development of early storm warning

systems, air-conditioned cooling shelters, and policies that discourage people from building in flood prone areas. This type of initiative requires comprehensive, community-wide planning that addresses all climate risk factors that may be associated with storm events, flooding, snowfall, and wind damage.

The scale of intervention required to reduce and adapt to the effects of climate change will require action at all levels of government and society. International accords to limit overall carbon emissions will involve national governments. Setting carbon emission targets

and standards by industry or sector, or fuel efficiency standards for vehicles, falls within the traditional purview of federal and state governments. New York State, for example, has set aggressive energy and climate goals, including meeting 30% of the state's electric needs with renewable energy sources by 2030, and reducing greenhouse gas (GHG) emission by 80% (below 1990 levels) by 2050.

A primary goal for Central New York, as presented in *Vision CNY: Central New York Regional Sustainability Plan*, is to reduce CO<sub>2</sub> emissions, increase use of alternative energy such as solar and wind, and adapt to a changing climate by improving community resilience, protecting infrastructure, and protecting natural systems. A gradual increase in high and low temperature extremes, coinciding with an increase in the frequency and intensity of storm events are expected to impact transportation infrastructure, human health, agricultural practices, forest diversity, and migratory patterns of invasive species. Adapting to climate change will provide opportunities for Skaneateles- to improve the health and resilience of the community and will provide long-term protection of natural resources.

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



Snow geese at Five Mile Point

Credit: Charles Major

the public about adaptation measures and alternative energy choices.

Recommendations for climate mitigation and adaptation that are presented in the following pages are designed to help the Skaneateles community prepare for current and anticipated changes in climate conditions and to assist decision-makers in identifying opportunities to improve community resilience. The suggested actions will protect people, homes, buildings and natural systems by reducing risks from environmental hazards such as extreme heat and storm events. These are actions that the

community can take to reduce its emissions and promote energy efficiency through vehicle fuel efficiency, alternative transportation, land use planning, and other strategies. The Skaneateles community is encouraged to update these recommendations each year as additional data becomes available.

# TRANSPORTATION

According to the Town of Skaneateles' GHG Inventory Report, transportation accounted for 51% of government emissions and 40% of community emissions in the town in 2010. This

Climate Action Plan addresses two main transportation emissions reduction goals: reduce vehicle miles traveled and increase use of alternative fuels in transportation.



## Mitigation Strategy Goals for 2025

### Reduce vehicle miles traveled

Increase telecommuting: **249** MTCO<sub>2</sub>e annual reductions; payback **0** years.

This strategy assumes that 5% of people in Skaneateles telecommute.

Reducing the amount of vehicle miles traveled (VMT) would reduce the amount of gasoline and diesel use which would therefore reduce emissions, fuel costs, and reliance on foreign fossil fuels. E-mail, video conferencing, and telephones can replace face-to-face meetings, eliminating the need to travel and saving valuable work time.

### Adaptation Strategies

Skaneateles can reduce the amount of transportation-related GHG emissions by establishing local carpooling and ridesharing. Encourage residents to buy smaller cars and provide a cost benefit analysis to show financial savings and emission reduction comparisons.

## Mitigation Strategy Goals for 2025

### Increase use of Alternative Fuels

**Conversion of community vehicles to hybrid: 820** MTCO<sub>2</sub>e annual reductions; payback **4.7** years.

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

**Conversion of community vehicles to electric vehicles: 566** MTCO<sub>2</sub>e annual reductions; payback **6.1** years.

This strategy assumes 5% of community vehicles convert to electric.

**Conversion of municipal vehicles to CNG: 6** MTCO<sub>2</sub>e annual reductions; payback **0.6** years.

This strategy assumes two pick-ups are converted to CNG vehicles.

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

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



Skaneateles Boat Launch

Photo Credit: Marianne Angelillo

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

The town can also consider compressed natural gas (CNG) vehicles in place of traditional diesel. CNG produces less emissions than diesel or gasoline and saves in fuel costs in the long-term as well.

# ENERGY EFFICIENCY

According to town's GHG Inventory Report, emissions from municipal buildings/facilities accounted for 39% of total municipal emissions, water delivery facilities accounted for 0.2%, and streetlights and traffic signals accounted for 10%, while residential energy use accounted for 26% of the community's emissions commercial energy

use accounted for 24% of the community's total GHG emissions, and industrial energy accounted for 7% of emissions in the Town of Skaneateles 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.



Greenfield Farm, Skaneateles

Photo Credit: Charles Major

## Mitigation Strategy Goals for 2025

### Increase energy efficiency and reduce emissions from buildings

**Commercial facilities efficiency projects:** 1,166 MTCO<sub>2</sub>e annual reductions; payback uncertain.

This strategy assumes a 15% reduction in commercial energy use.

**Home weatherization:** 538 MTCO<sub>2</sub>e annual reductions; payback 4 years.

This strategy assumes 10% of households weatherize their homes.

**Promote loans/incentives for energy efficiency:** 233 MTCO<sub>2</sub>e annual reductions; payback 10.3 years.

This strategy assumes 10% of households undergo a retrofit with the assistance of loans/incentives.

**Improve municipal lighting efficiency:** 14 MTCO<sub>2</sub>e annual reductions; payback 9.7 years.

This strategy assumes a 15% reduction in lighting energy use at transfer station repair building, Austin Arena, and highway garage.

**LED streetlights:** 18 MTCO<sub>2</sub>e annual reductions; payback uncertain.

This strategy assumes all streetlights are converted to LED.

**Move Town Hall to more energy efficient facility:** 5 MTCO<sub>2</sub>e annual reductions; payback uncertain.

This strategy assumes the Town Hall is moved to a building that is 25% more energy efficient than the current facility.

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.

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

The initial cost of retrofitting heating units may seem daunting; however, the local government, NYSERDA, and the CNY RPDB can offer assistance

and support to make retrofits easier by providing educational materials, low-interest loans, and guidance on where to find potential grants or incentives to help cover costs. Improving energy efficiency can help to reduce criteria air pollutants as well as greenhouse gas emissions and increases energy and water cost savings.

The town also plans to move the Town Hall operations into a more energy efficient building. This may or may not require retrofits to that facility, but is expected to reduce energy use and emissions regardless.

### **Adaptation Strategies**

Skaneateles can modify local laws to incorporate measures for adaptation to climate change and ensure that climate adaptation is blended into the Skaneateles Comprehensive Plan and other local decision-making processes. The town can evaluate 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.

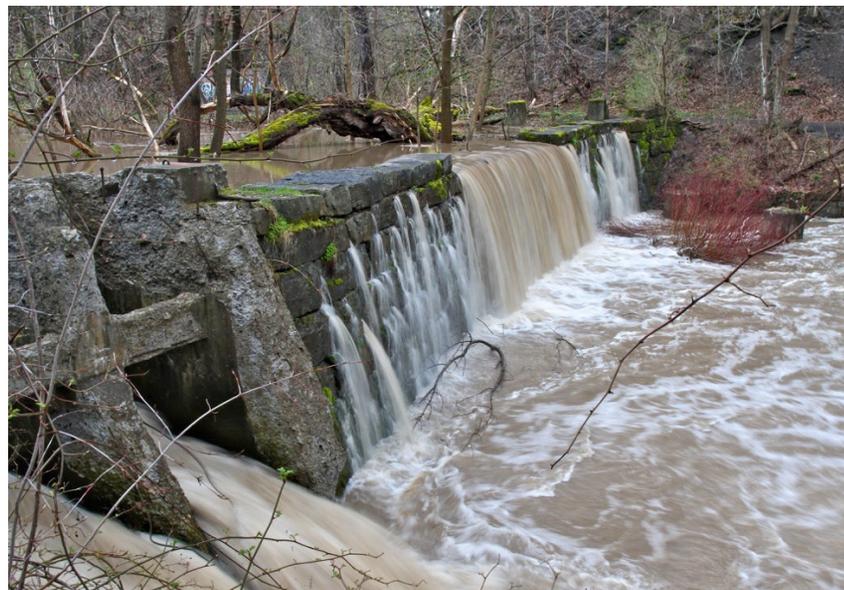


Trilliums along Skaneateles Creek

Photo Credit: Charles Major

## 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](http://dsireusa.org) to learn more about current incentive opportunities.



Dam, Skaneateles Creek

Photo Credit: Charles Major

## Mitigation Strategy Goals for 2025

### Increase use of renewable energy

**Commercial solar:** 615 MTCO<sub>2</sub>e annual reductions; payback 5 years.

This strategy assumes 2,475 kW of solar PV is installed.

**Residential solar:** 353 MTCO<sub>2</sub>e annual reductions; payback 5 years.

This strategy assumes 1,421 kW of solar PV is installed.

**Municipal solar:** 50 MTCO<sub>2</sub>e annual reductions; payback 5 years.

This strategy assumes 200 kW of solar PV is installed.

**Wind energy:** 86 MTCO<sub>2</sub>e annual reductions; payback 17.5 years.

This strategy assumes 250 kW of small wind energy systems are installed.

By installing renewable energies like solar or wind, Skaneateles 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, the Solarize Syracuse program offered in Syracuse in 2014. These programs are an effective way of combining public and private funds for renewable energy. The CNY RPDB and municipalities throughout Central New York are currently offering a bulk-purchasing program for residents and businesses, known as Solarize CNY.

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

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

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

Adoption of a standardized residential/small business solar permit is a key element to help New York municipalities remove barriers to

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

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

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



Stanley Barn next to State Boat Launch

Photo Credit: Charles Major

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

# WASTE

In 2010, 3% of the community's GHG emissions came from waste. In 2010, waste from the town was disposed of at the Auburn Landfill. Today, waste from the town is disposed of at the

Seneca Meadows Landfill. As the waste decomposes, it releases greenhouse gases that can be reduced by reducing the waste stream through composting.



Organics Composting

## Mitigation Strategy Goals for 2025

### Decrease the waste stream

**Kitchen composting:** 1 MTCO<sub>2</sub>e annual reductions; payback uncertain.

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

In 2010, waste generated in the Town of Skaneateles was sent to the Auburn Landfill for disposal. In 2011, the town began to contract with WeCare, which disposes of waste at the Seneca Meadows landfill. While Seneca Meadows does collect landfill gas produced from the decomposition of waste and uses it to create energy, the energy creation process also creates greenhouse gases that could be reduced even further by decreasing the waste stream through composting.

Composting produces fertilizer that can be used for farms or gardens, returning nutrients to the soil that were removed with food production and reducing the need for synthetic fertilizers. Composting also

reduces the volume of material sent to the landfill, 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.

# 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.



Grapes, Anyela's Vineyards, Skaneateles  
Photo Credit: Anyela's Vineyards

## Mitigation Strategy Goals for 2025

### Plant trees for carbon storage and energy savings

**Tree planting: 80** MTCO<sub>2</sub>e annual reductions; payback **5** years.

This strategy assumes 20% of households plant 1 tree (359 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, Skaneateles can protect and expand trees and woodland ecosystems to increase climate change mitigation potential. The town can plant living snow fences (evergreens planted at distances of at least 100 feet upwind of problem stretches of road) to reduce snow drifts and travel hazards for drivers. Road segments should be prioritized and landowners contacted for participation. Skaneateles can also plant and maintain trees and other vegetative buffers along the lake in order to reduce pollution loading, to reduce shoreline erosion, and to maintain cooler water temperatures through shading.

The town should continue to support the Village of Skaneateles Tree Advisory Board and Town Conservation Committee. Forested regions in and around Skaneateles provide valuable watershed protection, soil conservation, wildlife habitat and carbon sinks. Forested carbon sinks help mitigate atmospheric CO<sub>2</sub> and provide natural green

infrastructure to diminish storm water run-off. The town should protect and expand trees and woodland ecosystems to increase climate change mitigation potential.

Skaneateles can also encourage the US Forest Service and Onondaga County Cooperative Extension to monitor changes in tree composition and health. Skaneateles can plant low pollen tree species in recreation areas in order to minimize human health issues, and manage tree density throughout the town to reduce overcrowding and susceptibility to stress and disease.

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

The town can continue to support the Skaneateles Lake Association and water quality sampling in Skaneateles Lake. Water quality is influenced by storm events, streambank erosion, and nutrient runoff from agricultural and other land uses within the watershed. The town is considering pursuing detailed sampling along the tributaries (called segment analysis) to help identify non-point sources of pollution.

Skaneateles can update local maps that display low elevation areas in the town that may be susceptible to flooding and display this information on the town website, along with preparedness guidelines. The town can inventory exceptional natural areas and designate them, when warranted, as Critical Environmental Areas under State Environmental Quality Review regulations.

Farmers should continue to implement management practices to protect surface and ground water quality. Agricultural Best Management Practices should be followed to reduce nutrient and sediment loading from agriculturally-rich watersheds. The County Soil and Water Conservation District, Cornell Cooperative Extension and the Natural Resources Conservation Service are available to provide assistance to the Skaneateles farming community in developing and implementing best management practices.

Skaneateles can revise current town and village land use regulations (such as zoning, subdivision approval, erosion and sedimentation control, etc.) in order to achieve long range land use goals. They can also draft landscape ordinances to accommodate the use of heat and drought tolerant plants.

The town can encourage landowners to plant buffer strips along river and stream shorelines. Buffer strips help to control pollutant (nutrients



Conservation lands, Skaneateles

Photo Credit: Charles Major

and sediment) loading to a waterbody and are especially important in agricultural communities such as Skaneateles because they slow water runoff, trap sediment, and promote soil infiltration. Buffer strips can trap fertilizers, pesticides, pathogens, and heavy metals before they enter lake or stream. They also help stabilize streamside soil and reduce the water temperature.

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

Conservation Service to monitor the introduction and spread of invasive species. Skaneateles can also participate in Cornell Cooperative Extension's Emerald Ash Borer control strategy and in the New York State Invasive Species Task Force and work with Project Watershed to document annual invertebrate populations in the tributaries.

# ADDITIONAL ADAPTATION STRATEGIES

These strategies are additional actions Skaneateles 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.



Mable Reynolds Nature Preserve  
Photo Credit: Town of Skaneateles

## Infrastructure

One of Skaneateles' adaptation goals is to protect and upgrade local infrastructure to achieve cost savings, as well as stormwater and flood control. There are various actions Skaneateles 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. Skaneateles can continue to support the Village's Rain Catchers Program, designed to reduce flooding and stormwater runoff and improve the capacity of stormwater collection systems and infrastructure measures (rain gardens, porous pavement, rain barrels, and French storm drains) along Skaneateles Creek to maximize soil infiltration and groundwater recharge.

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

The town can also encourage agricultural and land-owner initiatives to protect and minimize impacts on sensitive environmental areas such as streams, drainage ways, wetlands, wooded areas, steep slopes, and watersheds.

Skaneateles can modify zoning to discourage or prevent new development in flood-prone areas or high hazard areas and maintain strong building codes concerning energy use.

## Public Health

Skaneateles should also establish ways to reduce or eliminate the negative effects of climate change on public health. Adaptation strategies Skaneateles 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. Skaneateles should train local building officials, planning boards, and elected official on flood hazards, risk reduction strategies, implementation of floodplain development regulations, post-flood reconstruction, and how to address flood hazards during planning board reviews.

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

The town can also provide emergency preparedness guidelines on the town websites, including recommendations for people living and working in flood prone areas, actions to take if a flash flood warning is issued, relevant emergency websites and information sources, items to include in a disaster/ flood supply kit, how to protect properties from flood damage, and guidelines for developing a

Family Disaster Plan. The town can also distribute brochures, fact sheets, and posters that show ways in which businesses and residents can prepare for and adapt to climate change and incorporate climate adaptation principals on town and agency websites in order to increase the awareness of severe weather risks, storm preparedness, and safety practices for homes and businesses. The town can provide regional topographic maps and information about flood preparedness to the public.

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

### Emergency Operations

Ensuring that emergency operations are current and maintaining open lines of communications between local agencies is also a significant part of successfully adapting to climate change. Skaneateles can update the community's inventory of emergency operations and public notification lists and collaborate with national, state, and local agencies to facilitate data collection, sharing, and synthesis of flood and storm event preparedness information. The town should reconfirm channels of communication with local police and fire departments, the local power utility, and media outlets.

Skaneateles can also review the potential use of Hyper-Reach with IPAWS, a government partnership between federal and local emergency responders that is designed to reach non-residents in the town for a more complete coverage during emergencies.

The town can also re-establish local protocols for sharing equipment during emergencies and update land hazard maps and inventories of infrastructure and at-risk communities. Skaneateles could establish a road watch program to alert the public of flooded areas and tree damage during storm events.

Skaneateles 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.

Finally, the town should provide for the routine collection of temperature, precipitation, storm frequency, endangered and invasive species, and public health information in order to evaluate the long-term impacts of climate change on local conditions and document ice in/ice out dates on Skaneateles Lake each year..

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



Skaneateles Town Hall  
Photo Credit: Joe Genco



Left: Fall on the Lake

Photo Credit: Charles Major

Total possible municipal reductions from mitigation strategies = 93 MTCO<sub>2</sub>e

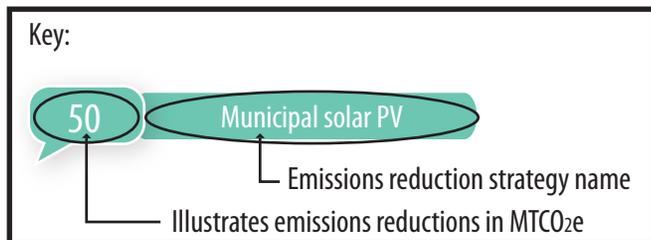
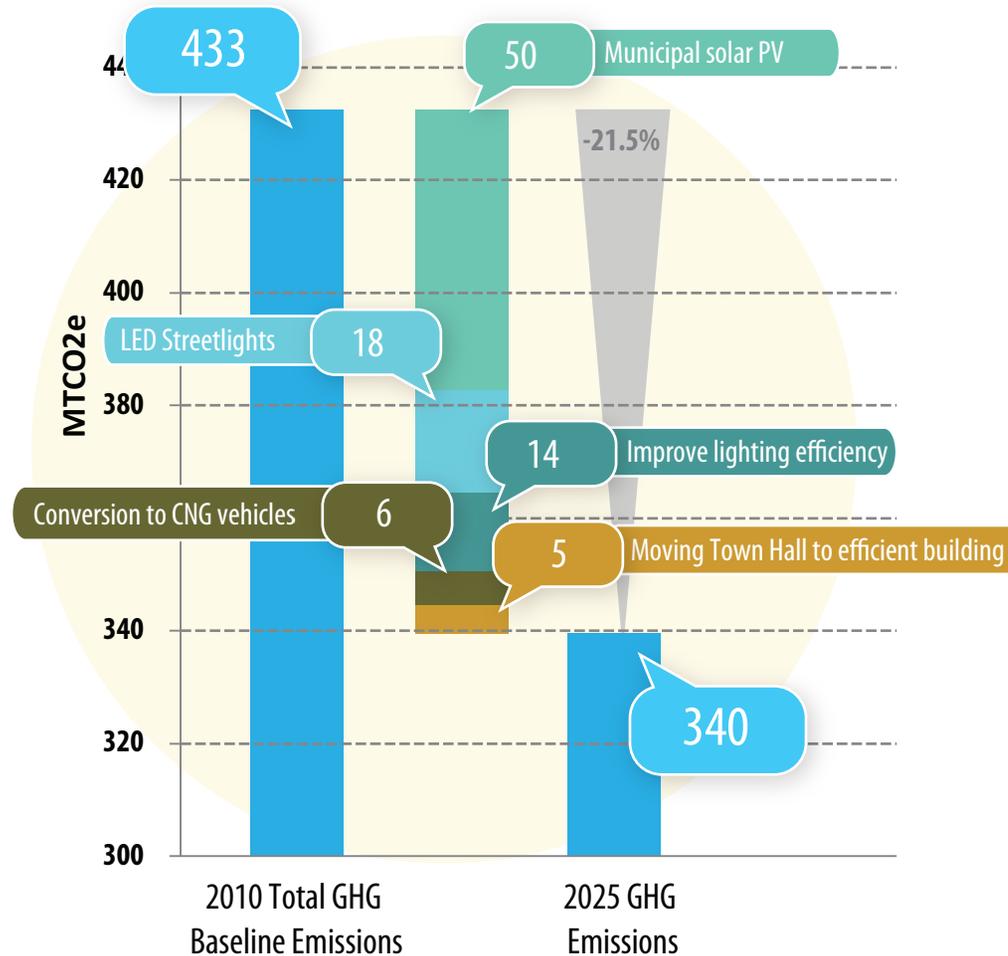


FIGURE 12- POTENTIAL MUNICIPAL REDUCTIONS FROM STRATEGY IMPLEMENTATION

Skaneateles' 2010 baseline municipal emissions as recorded by the GHG inventory report, potential reductions due to suggested strategies, and potential emissions in 2025 should each of the suggested strategies be implemented. It is estimated that there will be a 21.5% reduction in municipal emissions if all suggested strategies are implemented.

Total possible community reductions from mitigation strategies = 5,113 MTCO<sub>2</sub>e

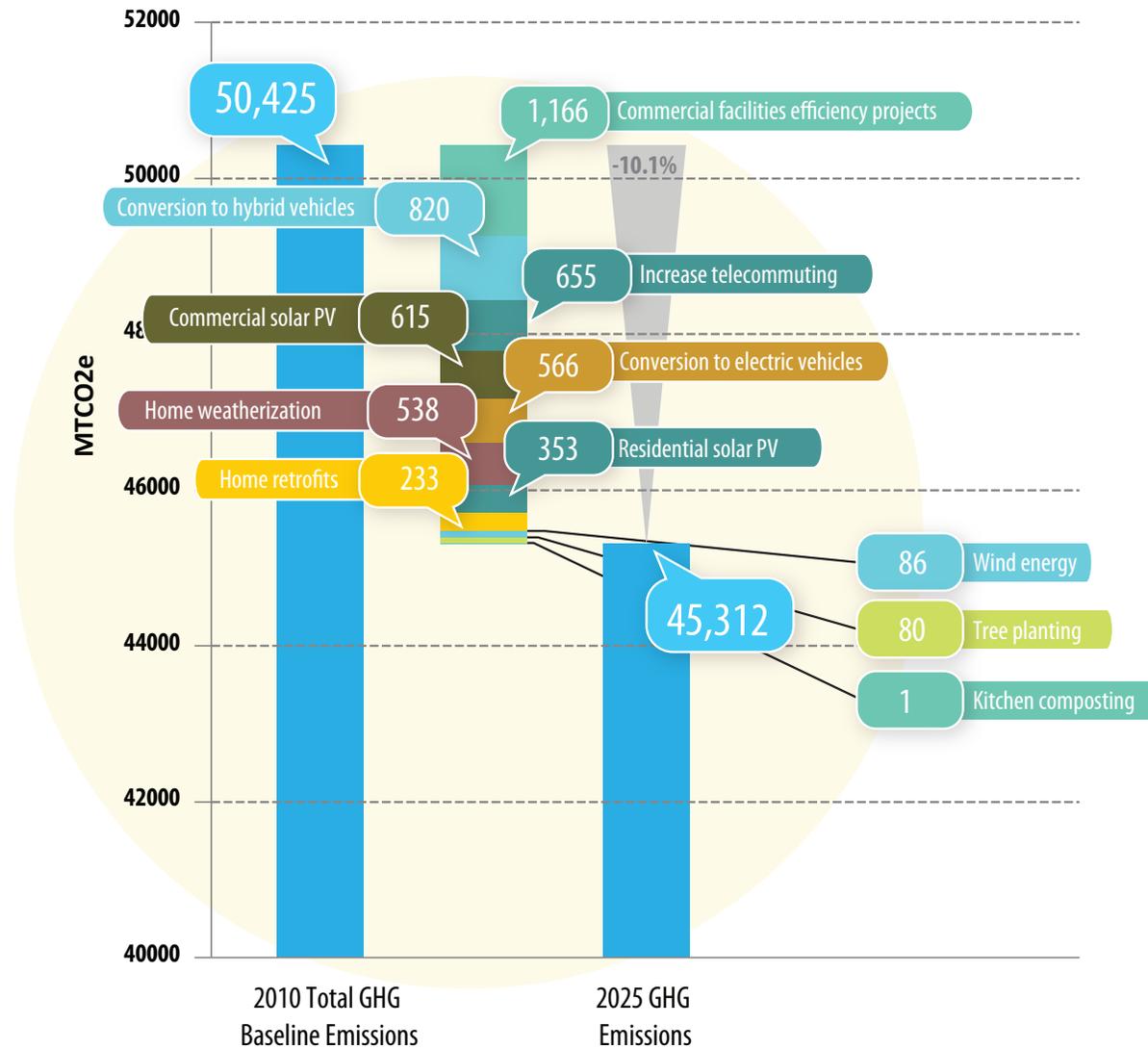


FIGURE 13- POTENTIAL COMMUNITY REDUCTIONS FROM STRATEGY IMPLEMENTATION

Skaneateles' 2010 baseline community emissions as recorded by the GHG inventory report, potential reductions due to suggested strategies, and potential emissions in 2025 should each of the suggested strategies be implemented. It is estimated that there will be a 10.1% reduction in community emissions if all suggested community reduction strategies are implemented.

# Concluding Remarks

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

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

Our thanks go to the local leaders and community members for a job well-done. Town officials are encouraged to now focus on implementation of these recommendations, to review the progress made on an annual basis, and to re-evaluate emission reduction goals. In this way, Skaneateles 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.



Skaneateles Lake

Photo Credit: George Hernandez

## 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<sub>2e</sub>:** Metric Tons of Carbon Dioxide Equivalent. MTCO<sub>2e</sub> 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	1			x	x				x
Transportation: Community	1. Conversion to hybrid vehicles	3	1	2			x	x	x	x		x
	2. Increase telecommuting	1	1	1		x		x		x		x
	3. Conversion to electric vehicles	2	1	3			x	x	x	x		x
Energy/Efficiency: Municipal	1. Solar PV	1	3	3		x	x	x	x	x		x
	2. Improve lighting efficiency	1	2	3	x	x	x	x		x		x
	3. Move Town Hall to energy efficient facility	*	1	*			x			x	x	x
	4. LED Streetlights	*	2	*			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: Residential	1. Home weatherization	2	1	2		x	x	x	x	x		x
	2. Residential solar PV	3	1	3		x	x	x	x	x		x
	3. Promote loans for energy efficiency improvements	3	1	4			x	x	x	x	x	x
	4. Small wind generation	2	1	4			x		x	x		x
Energy/Efficiency: Commercial	1. Commercial facilities efficiency projects	2	1	*		x	x	x	x	x		x
	2. Commercial solar PV	3	1	3		x	x	x	x	x		x
Waste	1. Kitchen composting	1	1	*				x				x
Natural Resources	1. Tree planting	1	1	3		x	x	x		x		x

\*Values are uncertain at present

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



Climate Smart Communities



TOWN OF SKANEATELES  
24 JORDAN STREET, SKANEATELES, NY 13152