

# Town of DeWitt

Sustainability Plan  
DRAFT JULY 24, 2014



Central New York Regional Planning & Development Board



## A MESSAGE FROM THE TOWN SUPERVISOR



Dear Friends & Neighbors,

I am proud that the Town of DeWitt has established itself as a statewide leader in municipal sustainability, adopting the New York State Climate Smart Pledge, completing its first inventory of greenhouse gas emissions, and developing this Sustainability Plan document. With unanimous support from the DeWitt Town Board, the Town adopted a comprehensive Sustainability Policy and a number of related guidelines including a green purchasing policy and a new solar energy ordinance that will encourage the deployment of renewable energy. The Town has accomplished many goals while striving to attain the best for our residents and businesses, improving community sustainability, and maintaining the lowest possible costs.

One of our sustainability projects was the installation of a 51kW solar photovoltaic roof at the Town Hall. A total of 100,188.67 kWh of electricity have been produced by the panels to date. By utilizing the solar array our carbon footprint was reduced by 154,615 pounds of CO<sub>2</sub>.

We are working on a town-wide bike and trail system which will connect with bike lanes and trails in the City of Syracuse and surrounding Towns. We have been working with our State Senator to close the gap in the trail system along the Erie Canal, to create a continuous connective link and preserve the historical canal.

DeWitt has examined ways to reduce storm water runoff and improve water quality. We have

incorporated a wetland buffer zone into the zoning code and we have begun to utilize green infrastructure practices such as rain barrels and rain gardens which have been installed at Town parks and other facilities. The Town has established a Tree Committee that adopted a Tree Ordinance and an Urban Forestry Management Plan which will enhance our urban forest. Over 200 new trees have been planted to date. We have built sidewalks and implemented bike lanes on major road projects including Jamesville Road, North Street, Bridge Street, Route 173, and Park Hill.

Last, but not least, we continue to work on a sustainable future for our economy. We have been working closely with Carrier Corporation, New Venture Gear, and Bristol Myers to transform their campuses in an environmentally responsible way. The Town is exploring ways to establish its own municipal power authority to attract new businesses and industry through cost effective energy.

As you can see, we have been busy charting a new course for the Town of DeWitt. Thank you for the continued opportunity to serve as Supervisor and to move our community forward to a greener future.

Sincerely,

Ed Michalenko, Supervisor

## ACKNOWLEDGEMENTS

The Town of DeWitt wishes to thank the following community members, organizations, and staff for their contributions to developing this Sustainability Plan.

## TOWN STAFF

Ed Michalenko, PhD. DeWitt Town Supervisor  
Sam Gordon, Director of Planning and Zoning  
Chris Manchester, Sustainability Coordinator

## SUSTAINABILITY PLAN ADVISORY COMMITTEE

Joe Chiarenza, Chair  
Laura Bradford  
Ilana Cantrell  
Alan Drucker  
Mike Gilman  
Vicki Baker  
Yvonne Rothenberg  
Charles Bertuch  
Mike Moracco  
Jim Stacey, PhD.

## CNY REGIONAL PLANNING AND DEVELOPMENT BOARD

Chris Carrick, Energy Program Manager  
Anne Saltman, Principal Planner  
Amanda Sopchak, Planner  
Sarah Hutchins, Intern  
Nathan Sleight, Intern



Sustainability Plan Meeting, DeWitt

## A NOTE FROM THE CENTRAL NEW YORK REGIONAL PLANNING AND DEVELOPMENT BOARD

This Sustainability Plan document was prepared for the Town of DeWitt by the Central New York Regional Planning and Development Board (CNY RPDB), 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. The CNY RPDB provided services to this project under the auspices of the United States Environmental Protection Agency's Climate Showcase Communities Program and the New York State Climate Smart Communities Program.

The purpose of this document is to (1) gather information on emission reduction projects and programs already being undertaken in the Town; (2) give public officials, community leaders, and residents the information and support that is needed to advance sustainable programs in their communities; (3) identify opportunities for new emission reduction programs and initiatives; and (4) engage and encourage local participation in greenhouse gas emission reduction strategies.

The Town of DeWitt Sustainability Plan 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, this document provides estimates of emission reductions that are meant to help public officials, community leaders, and residents better decide which actions may be worthwhile for the community to pursue in the coming years. As such, this document is not meant to be fixed or prescriptive, but rather fluid and flexible.

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## 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>2</sub>e:** Metric Tons of Carbon Dioxide Equivalent. MTCO<sub>2</sub>e 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.

## FRAMEWORK FOR LOCAL CLIMATE PROTECTION

### Climate Showcase Communities Program

The US Environmental Protection Agency (EPA)'s Climate Showcase Communities Program is designed to assist local governments in creating community-based greenhouse gas reduction projects related to energy production, residential and commercial energy efficiency, waste management, transportation, and land use. The goal of the program is to pilot projects that are replicable and cost-effective so that communities can reduce greenhouse gas emissions while improving environmental, economic, and social conditions. There are currently 50 communities throughout the US that are participating as part of the Climate Showcase Communities Program. CNY RPDB was selected as an awardee of the program, receiving \$497,793 in federal funding for their Climate Change Innovation Program (C2IP).

### Central New York Climate Change Innovation Program

Through the Climate Change Innovation Program (C2IP), CNY RPDB is working with 7 municipalities to conduct GHG emission inventories, develop Climate Action Plans, host community engagement events, and implement clean energy demonstration projects. Each municipality was provided \$30,000 in order to implement demonstration projects (DeWitt's Town Hall Retrofit) or to complete feasibility studies for clean energy projects. The C2IP began in February 2010 and was completed in December 2013 with the creation of DRAFT Climate Action Plans.

In order to participate in the program, DeWitt agreed to:

- + Follow the 5 Milestone Process established by the Cities for Climate Protection campaign administered by ICLEI-Local Governments for Sustainability, which includes completion of a GHG inventory and completion of a Climate Action Plan
- + Adopt the Climate Smart Communities Pledge, which is a voluntary program administered by the NYS Department of Environmental Conservation (DEC) whereby communities pledge to reduce GHG emissions and subsequently receive notification of state and federal assistance to help them adopt technologies and programs by which to do so
- + Become a Pledge Driver for the US EPA's "Change the World, Start with Energy Star" campaign, which challenges people to make energy-efficient choices in their households and communities



**Climate Showcase Communities**  
Local Climate and Energy Program





Fishing Derby, DeWitt



Erie Canal Bridge, DeWitt



Solar Panels, DeWitt Town Hall

# Introduction

## What is Sustainability?

**Sustainability** is commonly defined as meeting the needs of the present without compromising the needs of future generations.

Sustainability means meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. Sustainability is based on the principle that water, materials, and resources necessary for survival and well-being are all dependent upon the natural environment. Sustainability allows for social, economic, and other requirements of present and future generations to be met by creating and maintaining the conditions under which humans and nature can co-exist in productive harmony.<sup>1</sup>

There is a direct relationship between economic growth, greenhouse gas emissions, and resource consumption that must be realigned to achieve Sustainable Development. The ability to achieve sustainability globally is under scrutiny; currently, rates of resource consumption exceed the capacity of natural systems to regenerate. Our dependence upon finite resources places the potential of sustainably in jeopardy. The United States comprises just 5% of the total world population yet consumes 25% of the world's resources. The US is the second largest producer of greenhouse emissions, following China.

<sup>1</sup> <http://epa.gov/sustainability/basicinfo.htm#sustainability>

As human beings we are highly innovative and capable of collective action. Communities, companies, and individuals across the nation have embraced sustainable practices, developed technological innovations, and implemented emerging concepts—serving as role models for the rest of the nation. The goals outlined in this document are fully achievable and realistic. Through policy changes, DeWitt can continue to lead local efforts on achieving a Sustainable Community

### Sustainability & 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 a natural part of our atmosphere, and they serve a vital role in making our planet habitable. Greenhouse gases trap energy (in the form of long wave radiation) that is being emitted by the Earth, reflecting it back into the atmosphere. In essence, these gases act like a blanket trapping heat and warming the planet. During the hearing on “The President’s Climate Action Plan” on January 16, 2014, Dr. Daniel A. Lashof, Ph.D. Director, Climate and Clean Air Program, for the Natural Resources Defense Council cited

### Thinking Sustainably: New College at Oxford Example

Founded in the late 1300s, New College at Oxford was built with enormous oak beams in the great dining hall. In the late 1800s, the beams were discovered to be infested with beetles. The College Council was concerned when they heard the news; where would they be able to find oak beams of that size and caliber to replace the beetle-infested ones?

They decided to look into what types of trees were growing on the College lands to see if there were any oaks that could be used to replace the beams. Due to sustainable forestry practices, there were.

Planting stands of mixed broadleaf trees, like oak, hazel, and ash, is standard practice for sustainable woodland management. The hazel and ash are harvested every 20-25 years, while the oaks are left for 150 or more years to grow large so they can be used in major construction work, as beams for example.

New College was able to replace their beams using the oaks that had been growing on their lands for over 100 years for that exact purpose. They continue to grow many oaks on their land so that 150 years from now the beams can be replaced again.

## Projected Climate Impacts in the Northeast

**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.

Source: US EPA

<http://www.epa.gov/climatechange/impacts-adaptation/northeast.html>

that 2012 was the hottest year on record for the continental United States. In fact, every one of the past 37 years has been warmer than the 20th century average. The 12 warmest years on record have all occurred since 1998.<sup>2</sup>

The amount of carbon dioxide in the atmosphere and the planet's temperature has increased 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. Today, there is more carbon dioxide in the atmosphere than at any time in history, as measured by these samples, and further atmospheric testing shows that we have extended to 402ppm atmospheric CO<sub>2</sub>, which is well above any other measure in time. Scientists expect that this will lead to a gradual but continual warming of the planet in most areas. Today, we accept that the abundance of greenhouse gases is mainly anthropogenic (human induced) from the burning of fossil fuels. Power plants are attributed as the largest producer of carbon pollution, accounting for 40% of the nation's total carbon footprint.

Climate change is already having significant and costly effects on our climate, our health, and our environment. Climate change has serious worldwide implications, though the type and magnitude of local effects varies considerably by region. Immediate action is

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<sup>2</sup> Union of Concerned Scientists [http://www.ucsusa.org/global\\_warming/](http://www.ucsusa.org/global_warming/)

necessary to reduce affects caused by excessive greenhouse gas emissions.

### A Local Opportunity

DeWitt is characterized by rich physical features, diverse culture, and impressive history. Approximately 26,000 residents live in the Town of DeWitt. The natural environment and successive waves of growth and immigration are woven throughout the Town's land use patterns, housing stock, and demographic composition.

DeWitt's natural environment includes some of the area's finest parks and green spaces including our signature park—Ryder Park—offering year round activities. Clark Reservation State Park, also located in DeWitt, is a geologic wonder of the last ice age and a botanist's paradise. We also have direct access to a 36 mile stretch of the Old Erie Canal Towpath spanning from DeWitt to New London—a few short miles west of Rome. This multi-use path has been designated a National Recreation Trail by the National Parks Service suitable for hiking, picnicking, horseback riding, bicycling, canoeing, fishing, and snowmobiling.

DeWitt is fortunate to have a prominent location at the "crossroads" of New York State where industry and commerce have settled due to the accessible transportation options of a regional airport, rail yards, the NYS Thruway, the north-south Interstate 481, and a small section of Interstate 690 along with close proximity to Canada. The Town

includes the Village of East Syracuse and the hamlets of Jamesville and Collamer with residential areas of charming older neighborhoods, contemporary homes and condominiums, plus upscale newer subdivisions. DeWitt's density varies from open space, to single and multi-family neighborhoods, to industrial sectors. DeWitt's commercial activity is fairly widespread.

A total sustainable community requires all sectors of the community to work in unison. The private residential, commercial, and industrial sectors of DeWitt account for approximately 90% of the Town's local energy consumption.

The central focus of this plan is public policy, however, many of the recommendations are applicable to other sectors of the community. The Town will continue to build community partners to achieve complete Sustainability—parent-teacher associations, neighborhood advocacy groups, houses of worship, business leaders, local colleges, civic groups, and others.

### Developing the Plan

In 2009, a sustainability advisory group was formed by the Town Supervisor to identify and develop strategies for sustainable living within DeWitt. This group became the Sustainability Committee and developed a Sustainability Policy that was formally adopted by the Town Board on December 13, 2010 outlining specific goals. The **Sustainability**



DeWitt Town Hall

**Policy** incorporated 10 policy statements and the following mission statement: "The Town of DeWitt will provide leadership and pursue practical solutions to improve environmental sustainability in our community while reducing long term costs. The Town will adopt and support programs, policies and actions in pursuit thereof."

This Sustainability Plan was developed to provide strategies for achieving the stated goals of the Sustainability Policy, to guide municipal operations, and to provide a framework for community growth and development. The plan was prepared on behalf of the Town by the CNY RPDB, as a component of the Town's participation in the Central New York Climate Change Innovation Program. The CNY RPDB prepared an Action Strategy Summary Document (Appendix C, under separate cover) to provide detailed information and suggestions

to the Sustainability Committee as to which reduction strategies would have the most potential for achieving emissions reductions within the Town, the co-benefits of the strategies, and applicable case studies outlining successful implementation in comparable communities. The Action Strategy Summary Document also provides information about cost of implementation, possible funding sources, and payback period for the strategies.<sup>3</sup>

### Implementing the Plan

The Sustainability Plan in unison with the Sustainability Policy will guide future actions of the Sustainability Committee as it works to implement specific actions for public policy. In addition to advising on implementation options within government operations, the Committee will consider ways to provide incentive for actions in the commercial and residential sectors. An important function of the Committee is to make recommendations to the Supervisor that will minimize associated impacts and improve implementation across all sectors.

Progress toward the Sustainability Plan's goals can be measured over time by conducting subsequent GHG emissions inventories. Future inventories can be compared against the baseline year of 2010 to determine progress.

<sup>3</sup> For more information on how the strategies were developed, including assumptions and references, refer to Appendix C: Action Strategy Summary Document.

## Potential Impacts of Climate Change within the Town of DeWitt

### HUMAN HEALTH & WELFARE

DeWitt highways are heavily travelled by commuters and commerce. Public transportation is underutilized and limited in DeWitt. The Town's air quality will likely diminish as greenhouse gases increase, especially on hot summer days. We can expect to see an increase in air pollution warnings as air quality fails to meet standards. The health of compromised individuals, young children, the elderly, outdoor workers, the homeless, those without access to air conditioning, and people without access to adequate health care will be the most impacted by increased temperatures and decreased air quality. Northeastern cities are predicted to experience some of the highest incidents of heat-related illnesses and deaths, compared with the rest of the nation."<sup>4</sup>

Roughly 160 acres in DeWitt are designated as nursery, vineyard, cropland, or farmland. Transportation costs, health and welfare, and equity to farmers and producers have prompted many regions—including Central New York—to explore locally grown food options. Since 2010, there has been a sharp increase in demand for locally produced food in this region. Projected increases in temperatures and changing precipitation patterns may have a significant impact on the existing and emerging agricultural market in

and around DeWitt as well as the entire state as a whole.

Some other impacts of climate change include illnesses and deaths that result from climate related changes in ecosystems and infectious agents. The projected changes in the Northeast's climate will most likely encourage population growth of some nuisance species and decline in some beneficial species. For example, mosquitoes are a natural and healthy part of our ecosystem but have been found to carry viruses such as the West Nile and eastern equine encephalitis (EEE).<sup>5</sup> Bats are the primary predator of night flying insects including mosquitoes, eating thousands of insects nightly. Bats are crucial to maintaining forest health and human health and to the agriculture industry. However, bats are experiencing a serious decline in populations due to several pressures including habitat destruction and climate change. The Indiana bat is already listed as endangered, the long-eared bat is proposed pending a study, and several others are in peril.<sup>6</sup>

Human incidence of Lyme disease (LD) caused from the bacterium *Borrellia* is likely to continue increasing with warming temperatures. Deer ticks become infected with the bacterium when they feed upon an infected bird, mouse, or other small mammal. White-tailed deer primarily aid in wider dispersal of ticks but do not carry the LD caus-

ing bacterium. Computer models suggest that a warming climate will allow ticks to expand their continental range northward into Canada, cause an overlap in the stages of the life cycle, and increase the survivability of overwintering mice causing an increased risk to humans.

DeWitt is taking several actions to help mitigate some of the potential human health and welfare risks associated with climate change. For example, the Town is actively reviewing ways to incentivize residents and businesses to install more solar panels and wind turbines reducing demand on Grid produced power. DeWitt is also exploring ways to create climate friendly transportation systems including installation of electric Photovoltaic (PV) charging stations, improved bike lanes, and walkable communities. Air quality will continue to be a challenge as reconstruction of I-81 commences, potentially diverting traffic flows through DeWitt on I-481 and I-690. The Town is involved in this process and staying abreast of plans. Deer populations are being monitored by a group of researchers from SUNY-ESF. Findings are reported promptly. Town representatives attend regular workshops, symposiums, forums and meetings to guide decisions that will impact residents of DeWitt.

### WATER AND WETLANDS

Increased temperatures will have a significant impact on the water and wetlands in and around the Town of DeWitt. The Town of DeWitt is located along Butternut Creek. The tributary flows north through the Jamesville Reservoir and under an Erie Canal aqueduct in the Town of DeWitt. At Fayetteville,

<sup>4</sup> <http://www.epa.gov/climatechange/impacts-adaptation/northeast.html>

<sup>5</sup> Centers for Disease Control and Prevention, 2007

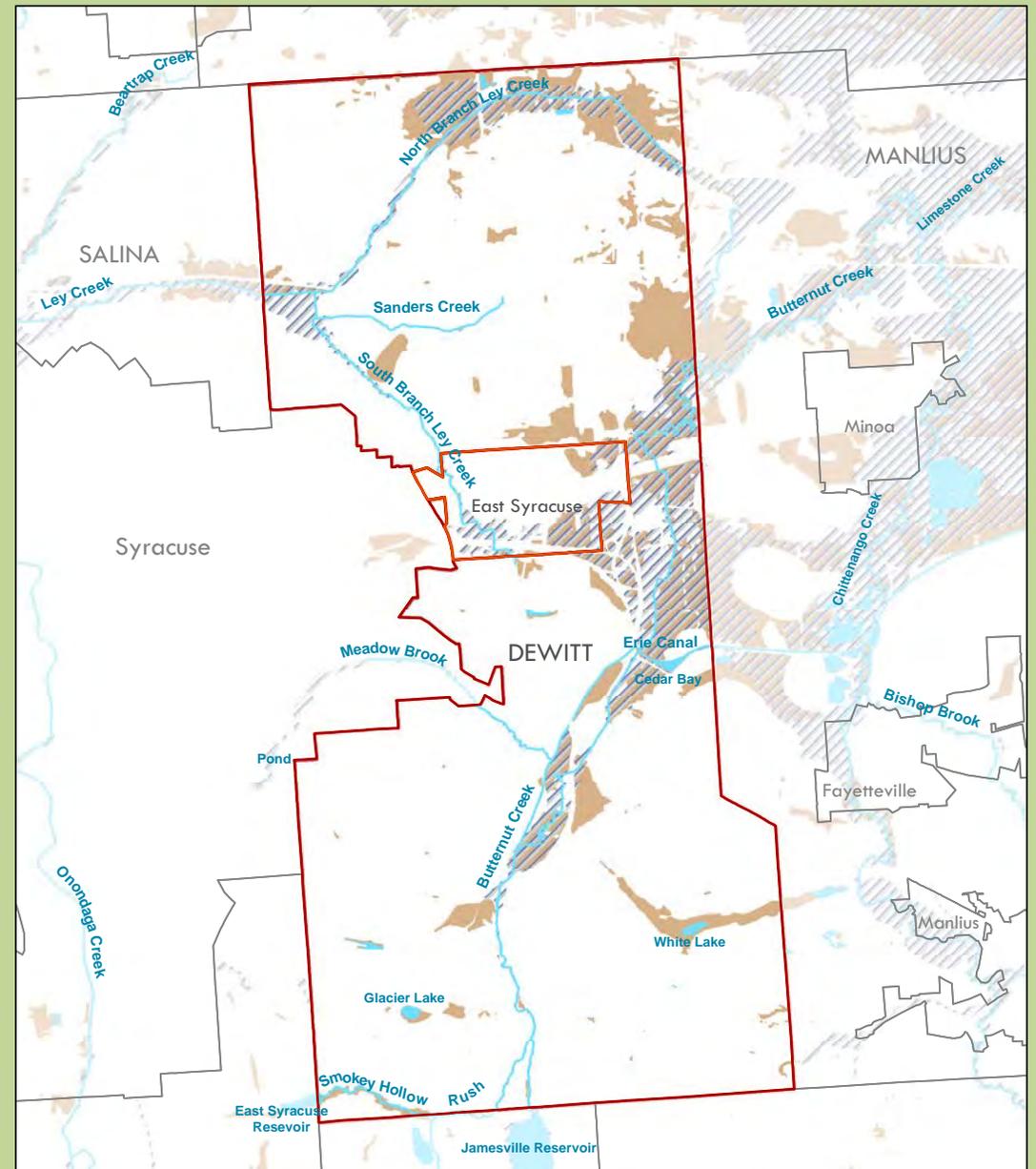
<sup>6</sup> [http://www.batconservation.org/about-bats/conservation/white-nose-syndrome?gclid=COrU1\\_udwrwCFelaMgoddC-gACg](http://www.batconservation.org/about-bats/conservation/white-nose-syndrome?gclid=COrU1_udwrwCFelaMgoddC-gACg)

before the confluence of Limestone and Butternut Creeks, a structure diverts flow from Limestone to the Old Erie Canal in order to maintain adequate water supply to the Barge Canal. Butternut joins the north flowing Limestone Creek approximately 1.5 miles north of the Village of Minoa in Onondaga County. Within less than a mile, the stream then joins Chittenango Creek in the northern portion of the Town of Manlius and flows into Oneida Lake six miles farther north near Bridgeport.

Warming waters will reduce the ability for cold water fish to survive in these waters, while decreasing ice coverage will provide a longer season for nuisance plants and algae. Also, warm water species that previously could not survive the cold will be able to establish themselves, threatening the native species. This is already occurring with aquatic invasive species on the rise around the state.

According to researchers, warming water temperatures may be contributing to fish species modifications such as 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 also at risk due to changes in habitat resulting from climate change and the presence of invasive species. Brook trout are also expected to become increasingly vulnerable as water and air temperatures rise.

**FIGURE 1: TOWN OF DEWITT WETLANDS AND FEMA FLOODPLAINS**



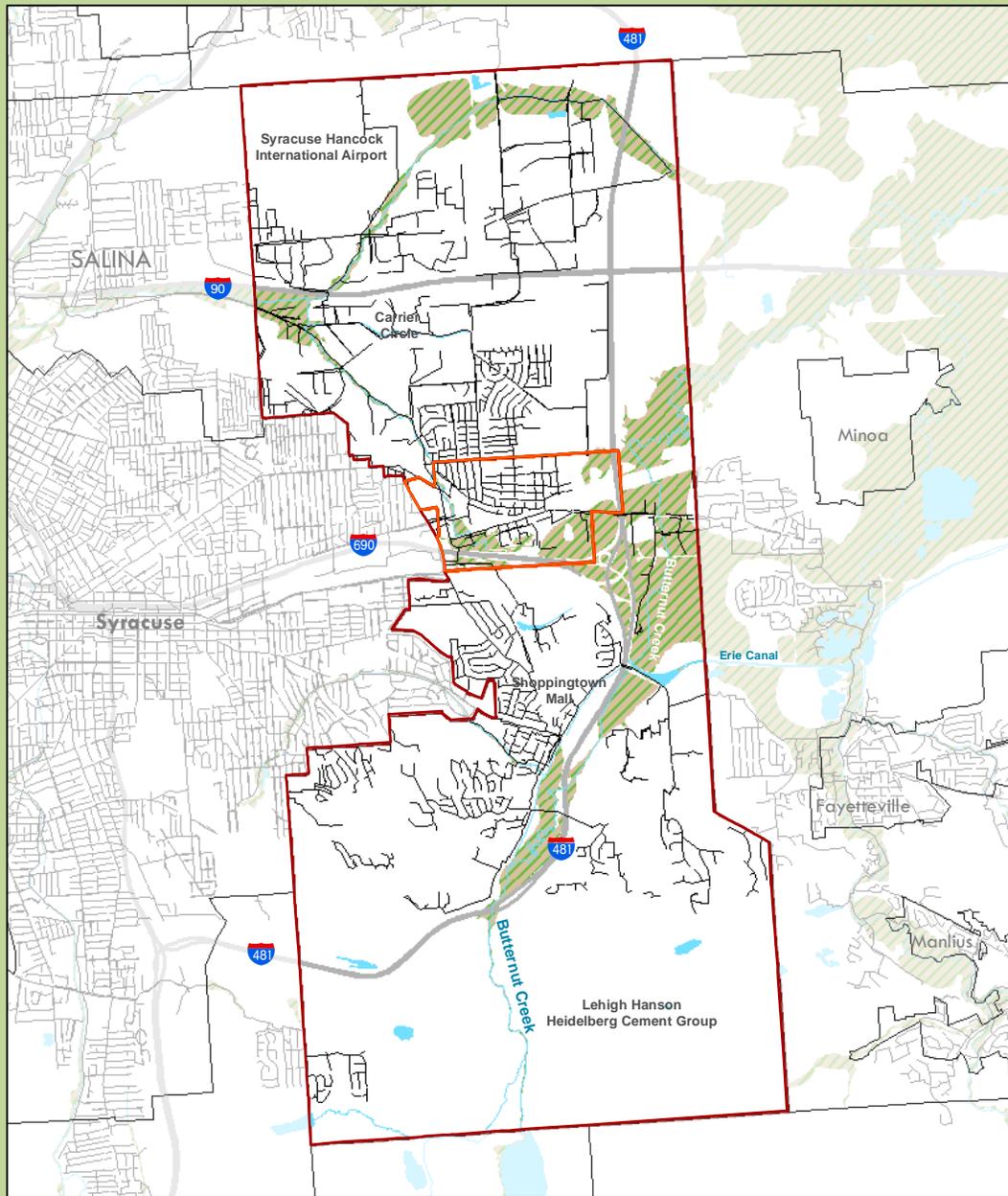
**Federal and State Wetlands and FEMA Floodplains**



**Legend**

- FEMA Floodplains 2010
- USFWS and NYSDEC Wetlands 2010
- Water Resources
- Village of East Syracuse
- Town of DeWitt

**FIGURE 2: TOWN OF DEWITT SEWER LINES AND FLOODPLAINS**



**Sewer Lines and Floodplains**

Town of DeWitt

- |                     |                            |
|---------------------|----------------------------|
| — Sewer Lines       | ▭ Village of East Syracuse |
| ▨ FEMA Flood Plains | ▭ Town of DeWitt           |
| — Interstates       | ▭ Water Resources          |



**FORESTS AND WOODLANDS**

The impact of changing temperatures and rainfall to forested regions in and around DeWitt is not yet completely understood. However, forests and woodlands create valuable watershed protections, soil conservation, wildlife habitat, and carbon sinks. A recent study found that large old trees have a greater ability to sequester carbon as they age and increase in size.<sup>7</sup> Preservation of specific wooded areas in DeWitt may be of particular importance based on these findings.

It is anticipated that climate change will impact forested areas in several ways. First, we can expect to see a species shift. Cold weather species will most likely occupy ranges further north than today allowing new species to colonize in the newly opened spaces. The North Eastern Forest—“Northern Hardwood Forest” sugar maple, beech, birch, and ash are projected to decline and be replaced by mostly oak and hickory.

While insects and pathogens are a natural part of the forest and woodland ecosystems, climate change is shifting the pest species and aggressiveness of some invasive as well as native species. Changes have been observed in the distribution and frequency of many insects such as the gypsy moth, eastern budworm, eastern larch beetle, and others.<sup>8</sup>

<sup>7</sup> Oregon State University (2014, January 15). Oldest trees are growing faster, storing more carbon as they age. ScienceDaily. Retrieved January 24, 2014, from <http://www.sciencedaily.com/releases/2014/01/140115132740.htm>

<sup>8</sup> Wilderness.net

The devastating impact of the invasive Emerald Ash Borer (EAB) to ash trees is now felt right here in DeWitt. Other invasive pests that will likely pose a threat to DeWitt forests are the Hemlock Woolly Adelgid and the Asian Longhorned Beetle (ALB). The destruction of hemlock and hardwoods will affect recreational activities, including fishing (as invasive pests kill trees along cold water streams, shade is no longer provided, therefore warming stream temperatures beyond what is ideal for trout). The negative economic impact of the EAB has been estimated in the billions in additional costs to state and local governments as well as landowners.

Historically, harsh winters and predation controlled the populations of many species including the white-tailed deer. Over the past several years, many herds are reducing their range areas and thriving in urban environments. In a recent study performed in areas of DeWitt and Syracuse, it was estimated that deer abundance can be as high as 90 deer per square mile.<sup>9</sup> This is of great concern as deer are a known vector for the Lyme bacteria found in some species of ticks. According to recent reports, Onondaga County has seen a dramatic rise in human cases of Lyme disease in the past several years.

### **WEATHER PATTERNS AND EVENTS**

Climate change is expected to influence DeWitt's weather patterns, increasing the frequency of extreme weather events, precipitation, and flooding.



Cedar Bay Trail, DeWitt

*Extreme Weather Events:* Storm intensity is influenced by air temperatures. As air temperature rises, the moisture in the atmosphere increases which contributes to a greater intensity and frequency of precipitation events. Warming air temperatures are caused by emissions of heat-trapping gases in the atmosphere including pollution from fossil fuels. Warm temperatures in the atmosphere cause higher levels of evaporation which intensifies the water cycle. As a result, precipitation events are more intense and result in higher levels of rainfall.

New York State experienced a 64% increase in extreme precipitation frequency from 1948-2011. On average, storms that used to occur every 12 months now occur every 7.7 months in the mid-Atlantic region, and from 1948-2011, the largest annual storm precipitation measured by weather stations across New York increased by 25%. The number of severe storms is also expected to increase, with 100-year storms likely to occur every 80 years by the end of the century.<sup>10</sup>

According to meteorologists, the total annual amount of precipitation has been changing, as well as the distribution and intensity. Tropical Storm Lee resulted in significant damage for Central New York. In May 2012, Governor Cuomo formally requested that President Obama declare a major federal disaster for 26 counties in New York State, including Onondaga County. FEMA estimated more than \$38 million in infrastructure repair and debris removal.

*Precipitation:* The Town of DeWitt has a temperate climate with an annual precipitation rate of approximately 47" per year. Precipitation rates are normally sufficient in this region to maintain municipal and industrial water supplies, transportation and recreation resources, and provide enough moisture during the growing season for agricultural crops, lawns, gardens, shrubs, forests, and woodlands. Snowfall is moderately heavy with an annual average of approximately 100 inches.

Central New York is experiencing an increase in heavy precipitation, more winter precipitation falling as rain, reduced snowpack, and earlier spring snowmelt resulting in earlier peak river flows. Precipitation rates are more difficult to predict, than projections for temperature. ClimAID analyses for New York suggest that precipitation levels may increase, especially during the winter months, but the nature of this change is uncertain. According to climate models, changes in precipitation patterns may continue to produce heavier events with hotter

9 Underwood, 2013

10 USGCRP 2009, NYSERDA 2011

and drier periods in between. Central New York is experiencing reduced snowpack, and by the end of this century, the length of the winter snow season in northern New York is predicted to be reduced by half.

Because of the reduced duration of ice cover on Lake Ontario, DeWitt and other areas to the east and south of Lake Ontario will continue to experience heavier and more frequent lake-effect snow. Rising temperatures will cause annual spring runoff due to snowmelt to occur earlier in the year. This is expected to decrease runoff water later in the year, stressing ecosystems that depend on the availability of water during the summer.

*Flooding:* Jamesville Reservoir, built as a feeder to the Barge Canal, was formed by the impounding of a section of Butternut Creek. Jamesville Beach County Park borders most of the south west corner of the reservoir. The Reservoir is maintained at or near the spillway level during the summer for recreational purposes. As a result, there is little flood control storage left to alleviate summer flood events.

The frequency of localized downpours has increased over the past fifty years and this trend is expected to continue. Heavy precipitation events increase stormwater runoff with impacts on wastewater treatment



Erie Canal, DeWitt

plants and pollutant loading to downstream water resources.

The greatest potential for flooding in DeWitt typically occurs during the early spring when heavy precipitation, warming temperatures, and rapid snowmelt produce heavy flows and high tributary runoff rates. DeWitt is located within the Erie Ontario Lowlands, a region characterized by flat terrain and high groundwater levels. During periods of heavy runoff and high flow rates, large quantities of water flow down the tributaries and often cause erosion. Flooding occurs when these waters reach the lowland region.

Nearly all studies that analyzed data from the Northeastern United States have estimated that on average, annual stream flow will show minimal yearly change as a result of climate impacts. However, these studies project an increase in late winter and

early spring flows and a shift in the timing of spring snowmelt. This means that even if streams have noticeably more volume in late winter and early spring by late summer and autumn the volume will be noticeably lower thus balancing the total annual stream flow. This temporal shift in flow rates have already been observed in stream records in New York State.

Flooding and extreme precipitation events in DeWitt and throughout Central New York can threaten public health and safety by displacing families and businesses, threatening food and water supplies, weakening infrastructure, and causing an increase in insect-borne diseases.

While there are ways to mitigate some of these impacts, it will take vigilance and planning. DeWitt's focus on rain gardens, porous pavement, rain barrels, and French storm drains helps to reduce the impacts of flooding events. In 2013, the Town received two Suburban Green Improvement grants through Onondaga County Water Environment Protection (WEP) totaling \$342,000. The grant will provide rain barrels, trees and underground drainage piping for the Franklin Park and Park Hill areas. The Town is also focusing on downspout disconnection, bioinfiltration, and rainwater harvesting to reduce runoff to Butternut Creek.

# CLIMATE ADAPTATION

According to climate researchers, “Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions.” These are the key conclusions from an assessment by the

Intergovernmental Panel on Climate Change (IPCC) that was released in January 2014. 259 scientists from 39 countries around the world further stated that, “Warming of the climate system is unequivocal and since the 1950s, many of the observed changes are unprecedented over decades to millennia.”



Rain garden and rain barrel, DeWitt

The findings discussed above 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. The U.S. Environmental Protection Agency refers to the term “adaptation” as the adjustment or preparation of natural or human systems to a new or changing environment which moderates harm or exploits beneficial opportunities.<sup>1</sup> A reduction of greenhouse gas emissions can be achieved through an increased understanding and endorsement of climate adaptation strategies. Community responses to extreme weather (early storm warning systems, air-conditioned cooling shelters, and policies that discourage people from building in flood prone areas)

<sup>1</sup> EPA 2012: <http://epa.gov/climatechange/glossary.html>

will require comprehensive, community-wide planning that addresses all risk factors.

A primary goal for Central New York, as presented in *Vision CNY: Central New York Regional Sustainability Plan*, is to adapt to a changing climate and improve the resilience of the region’s communities, infrastructure, and 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 DeWitt to improve the health and resilience of the community and will provide long-term protection of the natural environment.

The policy recommendations for climate adaptation that are presented in the following table (pages 18 and 19) are designed to help the

DeWitt community prepare for current and anticipated changes in climate conditions and to assist decision-makers in identifying opportunities to improve community resilience.

The table provides a summary of actions that the community can take to protect people, homes, buildings and natural systems by reducing risks from environmental hazards such as extreme heat and storm events. The recommendations also provide ways to reduce the Town’s energy costs and to improve the quality of life for Town residents.

Planning for future weather impacts will enable DeWitt to be better prepared and resilient. Long-term monitoring and evaluation of adaptation efforts is also important in order to document the efficiency of different strategies and how they can be improved. In addition, the Town is encouraged to build climate adaptation into existing planning documents.

# CLIMATE ADAPTATION RECOMMENDATIONS FOR THE TOWN OF DEWITT

Focus Areas and Recommendations	Actions
<p><b>Monitoring, Assessment and Data Collection:</b> Provide for the routine collection of temperature, precipitation, and storm event data and public health information</p>	<ul style="list-style-type: none"> <li>• Monitor climate impacts such as heat-related illnesses and “unhealthy air quality days”</li> <li>• Develop a regional inventory of flood-hazard occurrence areas</li> <li>• Assess the economic impacts of climate change through revenue potential from tourism and recreation, as well as costs associated with adaptation measures</li> <li>• Assess areas at risk during weather events (such as steep slopes prone to erosion) and the effectiveness of current adaptation and preparedness strategies</li> <li>• Monitor tributary water temperatures and cold-weather ice in/ice out dates</li> <li>• Monitor changes in forest composition and the northward spread of invasive species</li> <li>• Improve assessment of infrastructure conditions and vulnerabilities in the areas of energy, water, transportation, and telecommunications</li> <li>• Assess public perceptions of climate change through measured outcomes</li> </ul>
<p><b>Infrastructure Design and Maintenance:</b> Protect local infrastructure to facilitate stormwater and flood control</p>	<ul style="list-style-type: none"> <li>• Improve the capacity of stormwater collection systems. DeWitt’s continued focus on infrastructure measures (rain gardens, porous pavement, rain barrels, and French storm drains) will help to control stormwater runoff and reduce the impacts of flooding. In 2013, the Town received two Suburban Green Improvement grants through Onondaga County Water Environment Protection (WEP). Support the Town’s goal of providing rain barrels, trees and underground drainage piping for the Franklin Park and Park Hill areas</li> <li>• Continue to focus on downspout disconnection, bioinfiltration, and rainwater harvesting to reduce runoff to Butternut Creek</li> <li>• Work with the Onondaga County Soil and Water Conservation District on a stream maintenance program and install green infrastructure measures to reduce runoff and flooding</li> </ul>
<p><b>Public Health:</b> Establish mechanisms to reduce or eliminate the negative effects of climate change on public health</p>	<ul style="list-style-type: none"> <li>• Improve local capacity of health preparedness, response, and recovery programs</li> <li>• Implement extreme-heat response plans that include community centers with air conditioning</li> <li>• Expand capacity for monitoring, disease surveillance, and disease outbreak investigation and control</li> <li>• Provide alerts regarding heat events, flooding, and other potential health risks</li> </ul>
<p><b>Community and Regional Collaboration:</b> Develop and support regional partnerships that promote research, public awareness of climate change issues, and strategies that enhance the resiliency of the region, its residents and its institutions</p>	<ul style="list-style-type: none"> <li>• Provide accurate land hazard maps and inventories of infrastructure and at-risk of change communities in the town</li> <li>• Improve communication and regional preparedness during extreme weather events</li> <li>• Implement measures to reduce dependency on vehicles and incorporate expanded opportunities for public transit</li> <li>• Promote Smart Growth principals</li> </ul>

Focus Areas and Recommendations	Actions
<p><b>Local Laws and Planning:</b> Modify local laws to incorporate measures for adaptation to climate change; build climate adaptation considerations into watershed management plans and other local decision-making processes</p>	<ul style="list-style-type: none"> <li>•Modify zoning to discourage/prevent new development in flood-prone areas or high hazard areas</li> <li>•Update building codes to require more effective flood-resistant structures in flood zones</li> <li>•Establish strong building codes regarding energy use, including movement to performance-based codes</li> <li>•Draft landscape ordinances to accommodate the use of heat and drought tolerant plants</li> <li>•Identify and remove local barriers to green infrastructure</li> <li>•Review local documents to ensure that climate adaptation is incorporated into documents such as the Town Master Plan and Parks and Recreation Master Plan (updated in 2004)</li> </ul>
<p><b>Natural Resources:</b> Ensure the resilience of natural systems and resources through open space conservation and smart growth strategies</p>	<ul style="list-style-type: none"> <li>•Protect open space through conservation land grants, landowner incentives, regulation, fee acquisition, and purchase of conservation easements</li> <li>•Restore wetlands, floodplains, and wildlife habitat to strengthen capacity of natural systems to respond to weather events, stream flow changes, and flooding. Wetlands provide sedimentation and filtration benefits that minimize flooding and stormwater runoff, thereby improving water quality of downstream resources</li> </ul>
<p><b>Forest Ecosystems:</b> Protect and expand forest ecosystems to increase climate change mitigation potential</p>	<ul style="list-style-type: none"> <li>•Support the continuation of DeWitt's Tree Management Program and the Town Beautification Committee. Forested regions in and around DeWitt 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. This is especially important as an increase in rain activity and intense storms are predicted for DeWitt</li> <li>•Plant low pollen tree species to minimize health issues and plant local/native species with a tolerance for higher temperatures</li> <li>•Manage forest density to reduce overcrowding and susceptibility to stress</li> </ul>
<p><b>Invasive Species:</b> Control the introduction and spread of invasive species</p>	<ul style="list-style-type: none"> <li>•Protect local trees from the impacts of invasive species. The impact of invasive species such as the Emerald Ash Borer (EAB) can be seen and felt throughout the region. DeWitt is encouraged to continue to participate in Cornell Cooperative Extension's EAB control strategy and participate in the NY State Invasive Species Task Force</li> <li>•Remove dead or dying trees and replace them with heat and invasive tolerant species</li> <li>•Implement tree management strategies well ahead of infestations</li> </ul>
<p><b>Outreach and Education:</b> Implement proactive and comprehensive public outreach and stakeholder engagement campaigns to build awareness of climate change impacts</p>	<ul style="list-style-type: none"> <li>•Continue to maintain the DeWitt website</li> <li>•Most of the campus and all of the academic buildings of Le Moyne College are located in the town. Collaborate with the college community to educate and promote climate initiatives</li> <li>•Continue to develop brochures, fact sheets, and posters that include ways that municipalities and homeowners can prepare for and adapt to climate change</li> <li>•Develop and enhance climate education programs for all grade levels in DeWitt schools</li> </ul>

# What can be done in DeWitt?

The Town of DeWitt has chosen to adopt the NYS Department of Environmental Conservation (DEC)'s Climate Smart Communities Pledge, and has already begun to reduce energy use and GHG emissions from municipal operations.

In 2010, the Central New York Regional Planning and Development Board (CNY RPDB) selected the Town of DeWitt as a participant in the Central New York Climate Change Innovation Program (C2IP) funded through a grant from the US Environmental Protection Agency (EPA)'s Climate Showcase Communities Grant Program.

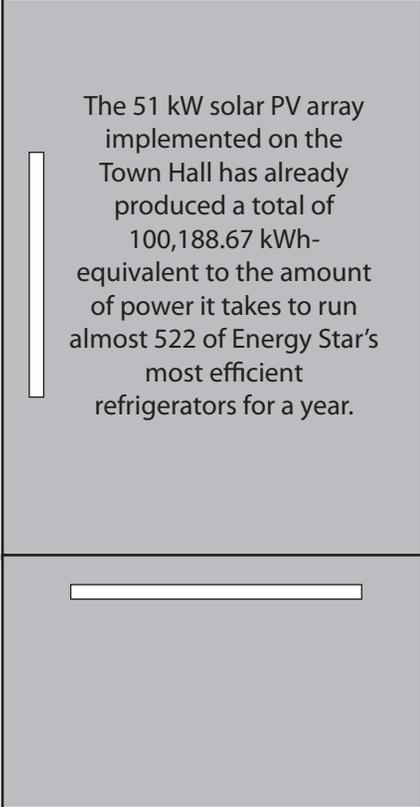
The CNY RPDB provided the Town with \$30,000 of grant funding towards the development of a clean energy demonstration project. With additional technical assistance from the CNY RPDB, DeWitt was able to perform a retrofit of the Town Hall facility, including upgrading the roof to a reflective white material, adding insulation, and installing a 51 kW solar photovoltaic rooftop system.

The total carbon emissions reduction for the project is projected to be 12.5 Metric Tons of Carbon Dioxide Equivalent (MTCO<sub>2</sub>e) annually. Since installation, the 51 kW system has produced 100,188.67 kW and reduced emissions by 154,615 pounds of CO<sub>2</sub>. While DeWitt's

Town Hall retrofit is commendable, the strategies noted in this document represent further efforts that can be made by the municipality as well as by the community members to reduce energy use and GHG emissions even further.

In 2012, a GHG inventory report was compiled to detail energy use and the sources of emissions in DeWitt in 2010 (baseline year). This Sustainability Plan uses the data provided in the GHG inventory report to address strategies that both government operations and community members can take to reduce energy use and GHG emissions by 2020. Specifically, using 2010 as the base year, the emissions reduction target for DeWitt is 15%.

Guided by the strategies explored in this Sustainability Plan, DeWitt has the potential to reduce energy use and GHG emissions significantly. By implementing the strategies noted in this document, community members will not only be able to reduce GHG emissions, they will also be able to reduce their overall energy costs, be more comfortable in their own homes, reduce reliance on non-renewable, foreign sources of energy, and conserve DeWitt's resources for the future.



The 51 kW solar PV array implemented on the Town Hall has already produced a total of 100,188.67 kWh-equivalent to the amount of power it takes to run almost 522 of Energy Star's most efficient refrigerators for a year.

# TOWN HALL RETROFIT

## AT A GLANCE

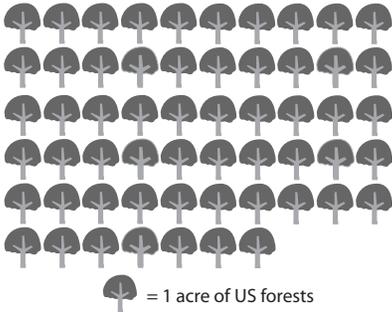


**51KW SOLAR PHOTOVOLTAIC PANELS**  
will generate approximately 55,080 kWh of electricity per year.

**NEW WHITE MATERIAL ON ROOF**  
reflects sunlight and reduces energy used to cool the building in summer.

**ADDITIONAL INSULATION**  
better maintains building temperatures while using less energy to heat and cool.

Installing a 51 kW solar PV array has already reduced emissions by about 70 MTCO<sub>2</sub>e; equivalent to the amount of carbon sequestered by about 57 acres of US forests in one year.



# GHG Inventory Summary

As part of the Climate Change Innovation Program, an inventory of DeWitt's municipal and community GHG emissions was conducted in 2012 with the assistance of a student team from the State University of New York College of Environmental Science and Forestry with additional oversight and technical review by CNY RPDB staff. The 2012 inventory report examined emissions generated in DeWitt in 2010, which serves as the baseline year for the Sustainability Plan.

The inventory report found that in the 2010 base year, DeWitt Town government operations generated total of 1,782 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>e), which were broken up into 6 sectors: buildings and facilities (309 MTCO<sub>2</sub>e, 18%), streetlights and traffic signals (392 MTCO<sub>2</sub>e, 22%), vehicle fleet (936 MTCO<sub>2</sub>e, 52%), water delivery facilities (93 MTCO<sub>2</sub>e, 5%), wastewater facilities (46 MTCO<sub>2</sub>e, 3%), and waste (6 MTCO<sub>2</sub>e, 0.3%).

ties (46 MTCO<sub>2</sub>e, 3%), and waste (6 MTCO<sub>2</sub>e, 0.3%).

DeWitt community emissions totaled 502,375 MTCO<sub>2</sub>e, which were broken up into 5 sectors: residential energy use (50,893 MTCO<sub>2</sub>e, 10%), commercial energy use (128,238 MTCO<sub>2</sub>e, 26%), industrial energy use (77,046 MTCO<sub>2</sub>e, 15%), transportation (245,430 MTCO<sub>2</sub>e, 49%), and waste (768 MTCO<sub>2</sub>e, 0.2%).

DeWitt's Sustainability Plan uses the data gathered in the 2012 GHG inventory report as a baseline for analyses to determine which energy efficiency strategies will be most effective in the town. The strategies suggested in this document can help DeWitt to reduce emissions, energy use, and dollars spent on municipal and community operations further by 2020.

Figure 3- DeWitt Municipal Emissions by Sector MTCO<sub>2</sub>e (2010 Baseline)

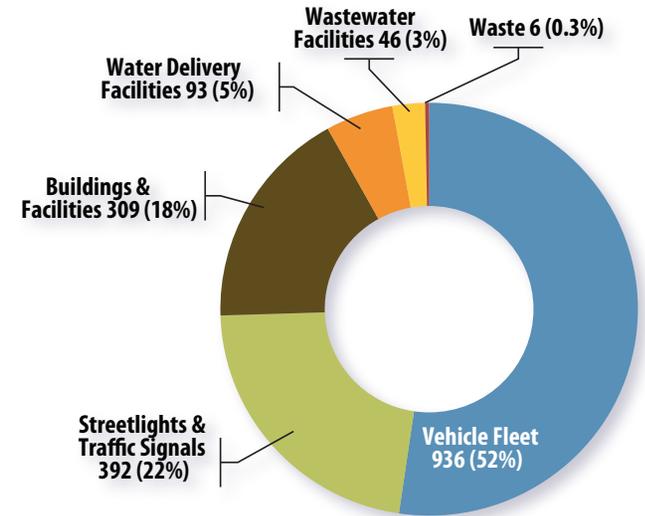
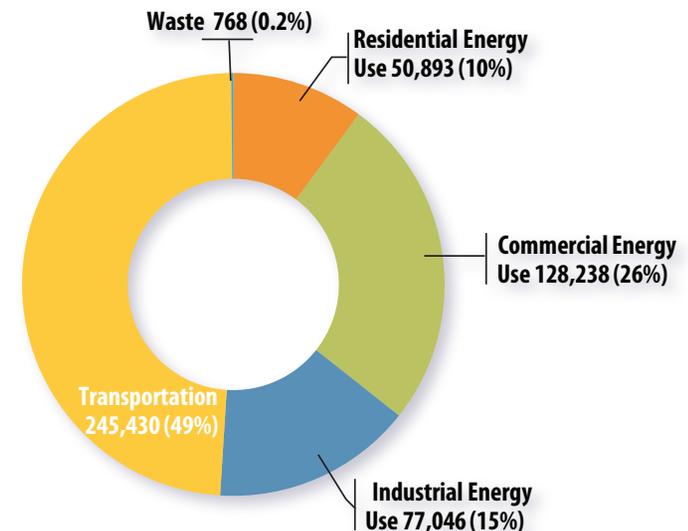


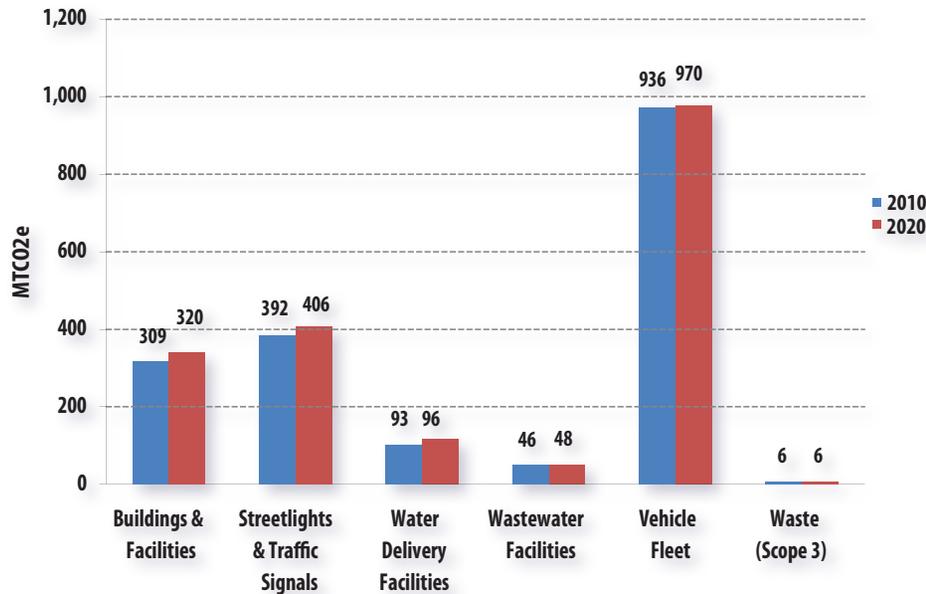
Figure 4- DeWitt Community Emissions by Sector MTCO<sub>2</sub>e (2010 Baseline)



**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

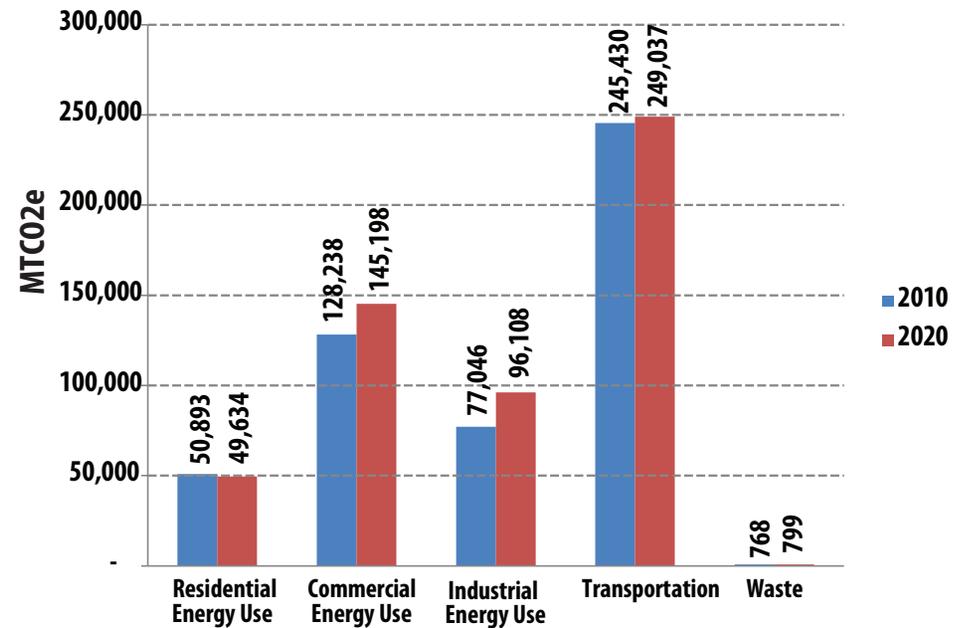
FIGURE 5- EMISSION FORECAST:  
MUNICIPAL OPERATIONS



The community forecast showed similar increases, and were expected to total 540,776 in 2020, with 1,259 MTCO<sub>2</sub>e decrease in residential energy use, 16,960 MTCO<sub>2</sub>e increase in commercial energy use, 19,062 increase in industrial energy use, 3,607 MTCO<sub>2</sub>e increase in transportation, and 31 MTCO<sub>2</sub>e increase in waste.

The GHG inventory report also forecasted emissions for DeWitt in 2020. The report explained that DeWitt government emissions were expected to total 1,846 MTCO<sub>2</sub>e in 2020, with 11 MTCO<sub>2</sub>e increase in buildings and facilities emissions, 14 MTCO<sub>2</sub>e increase in streetlights & traffic signals, 3 MTCO<sub>2</sub>e increase in water delivery facilities, 2 MTCO<sub>2</sub>e increase in wastewater facilities, and 34 MTCO<sub>2</sub>e increase in vehicle fleet.

FIGURE 6- EMISSION FORECAST:  
COMMUNITY



# Strategies Overview

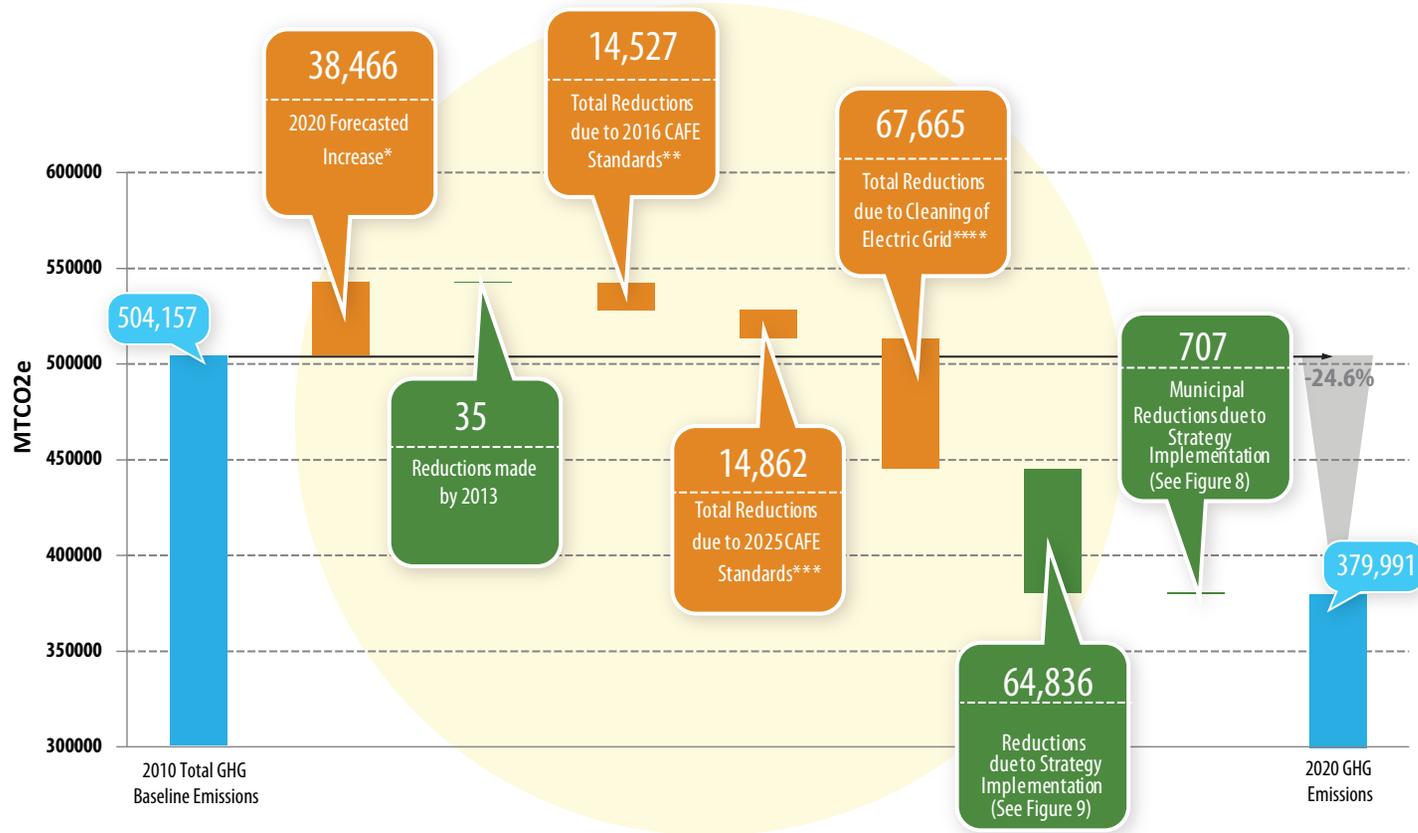
CNY RPDB staff worked with a team of interns throughout the spring and summer of 2013 to analyze potential strategies for reducing the Town's emissions for both municipal operations as well as at the community-wide scale. The team utilized a software tool developed by ICLEI-Local Governments for Sustainability known as CAPP (Climate and Air Pollution Planning Assistant) version 1.5 to calculate potential GHG reductions as well as cost savings for each 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 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 strategies were identified and analyzed to determine their potential for achieving emissions reductions either at the municipal operations level or the community scale. The analysis team also explored the potential impacts of two external large scale factors on the town's emissions profile: New Federal CAFE Standards that will increase the average fuel economy of vehicles sold in the U.S. through 2025 and changes taking place within the electric generation sector that are leading to overall emissions reductions, including the decommissioning of coal fired power facilities, fuel switching to natural gas, and increased investment in renewable or alternative energy generation (i.e., solar and wind). **The results of these analyses are summarized in Figures 7-9.** In most cases, if there were multiple potential strategies addressing a singular target area (e.g. vehicle fuel sources: electric, diesel, hybrid, natural gas), the strategy that was the most cost effective with the largest emissions reduction impact was chosen to be included in the final summary.



Tree Planting Seminar, DeWitt

**FIGURE 7: TOTAL POSSIBLE REDUCTIONS BY 2020**



**Figure 7- Total Possible Reductions by 2020**

Figure 7 summarizes the results of the DeWitt GHG inventory, a 2020 emissions forecast based on current trends, impacts from the strengthening of Federal CAFE standards, the cleaning of the electric grid in Upstate New York, as well as the reductions associated with the Climate Action Strategies that were analyzed for the Town separated into community-wide measures as well as municipal operations measures. Reductions due to DeWitt actions are shown in green while changes in emissions that will occur regardless of this Plan are shown in orange. It is projected that DeWitt’s total GHG emissions in 2020 could be reduced by 24.6% if the Town implements all of the recommended community-wide and municipal operations measures.

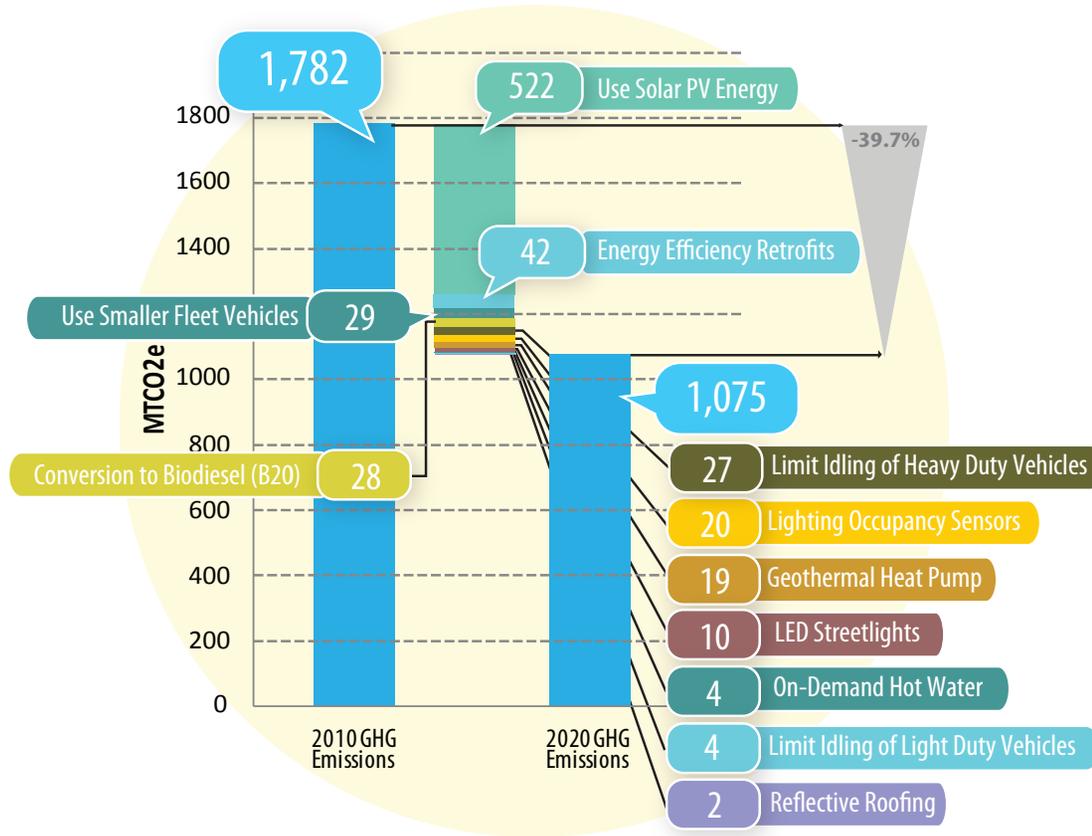
\*2010 GHG inventory reported a forecast of 38,466 MTCO<sub>2</sub>e increase due to population increases and increased energy use by the commercial, industrial, transportation, and waste sectors.

\*\*2010 Federal CAFE (Corporate Average Fuel Economy) standards have been set at 34.1 miles per gallon by 2016.

\*\*\*2012 Federal CAFE standards raises average fuel economy to up to 54.5 mpg for the model year 2025. Reductions included in graph reflect calculated reductions by 2020.

\*\*\*\*Since the 2010 base year, the electric grid for Upstate New York has become cleaner by using a higher percentage of cleaner burning and/or renewable energy sources. Therefore, since 2010, the changes in the electric grid alone have caused reductions of 67,665 MTCO<sub>2</sub>e.

**FIGURE 8: POTENTIAL MUNICIPAL REDUCTIONS FROM STRATEGY IMPLEMENTATION**



Key:

522 Use Solar PV Energy

— Emissions reduction strategy name

— Illustrates emissions reductions in MTCO2e

**Figure 8- Potential Municipal Reductions from Strategy Implementation**

DeWitt’s 2010 baseline municipal emissions as recorded by the GHG inventory report, potential reductions due to suggested strategies, and potential emissions in 2020 should each of the suggested strategies be implemented. It is estimated that there will be a 39.7% reduction in municipal emissions if all suggested strategies are implemented.

**FIGURE 9: POTENTIAL COMMUNITY REDUCTIONS FROM STRATEGY IMPLEMENTATION**

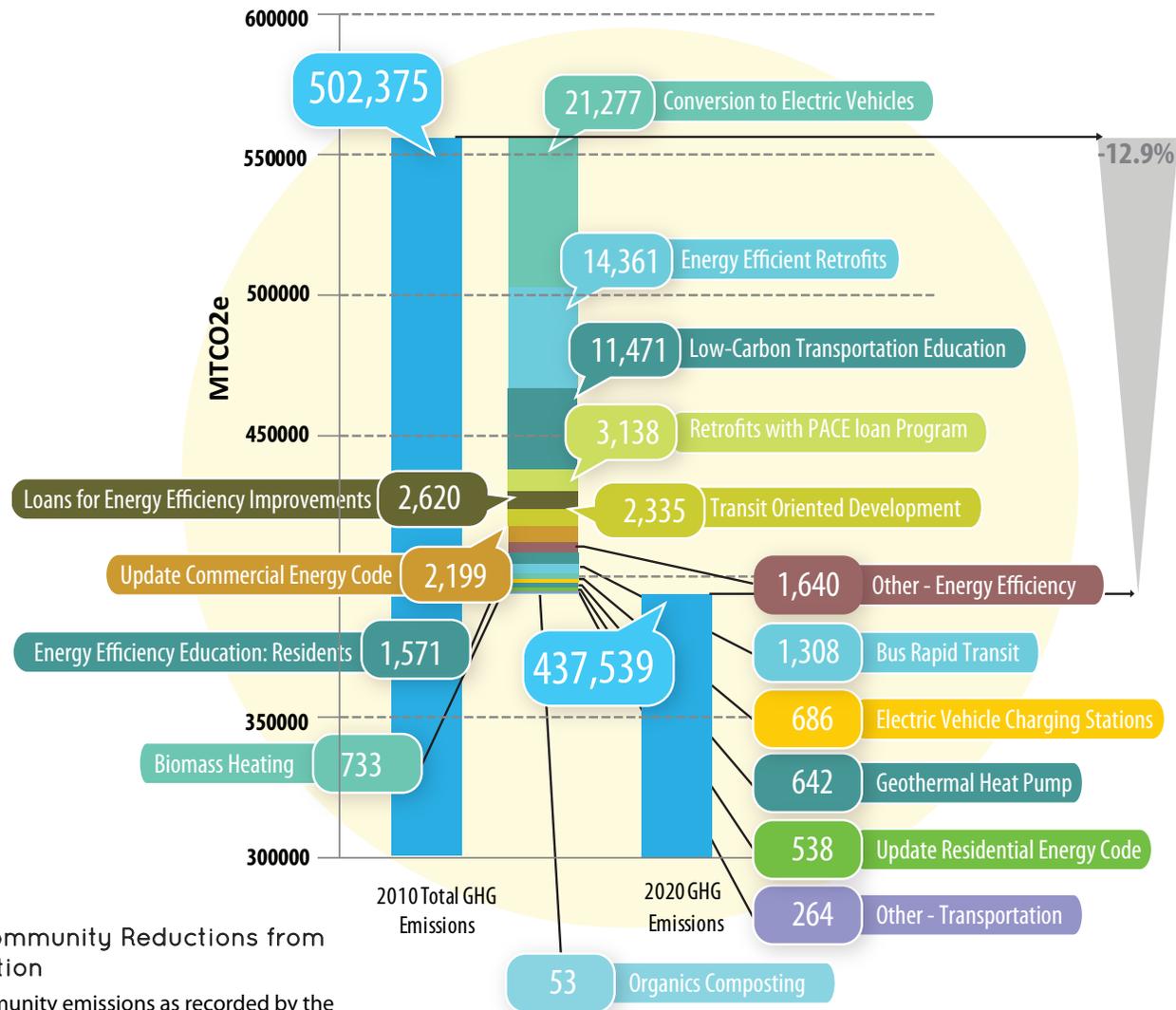


Figure 9- Potential Community Reductions from Strategy Implementation  
 DeWitt's 2010 baseline community emissions as recorded by the GHG inventory report, potential reductions due to suggested strategies, and potential emissions in 2020 should each of the suggested strategies be implemented. It is estimated that there will be a 12.9% reduction in community emissions if all suggested community reduction strategies are implemented.

# TRANSPORTATION

According to DeWitt's GHG Inventory Report, transportation accounted for 52% of government emissions and 49% of community emissions in DeWitt in 2010. The largest amount of GHG reductions is possible and necessary in this

sector. This Sustainability Plan addresses three main transportation emissions reduction goals: increase options for low-carbon transportation; increase use of alternative fuels; and reduce vehicle idling time.



## Increase Options for Low-Carbon Transportation

**Education about low-carbon transportation:** 11,471 MTCO<sub>2</sub>e annual reductions

This strategy assumes an 8% reduction in community VMT.

**Transit Oriented Development:** 2,335 MTCO<sub>2</sub>e annual reductions

This strategy assumes 500 residential units are built in TOD with an annual VMT reduction of 4,770 miles per person.

**Implement Bus Rapid Transit:** 1,308 MTCO<sub>2</sub>e annual reductions

This strategy assumes 800 new daily transit passengers with an average trip length of 10.1 miles.

**Expand bicycling paths and facilities:** 158 MTCO<sub>2</sub>e annual reductions

This strategy assumes 2,000 weekly trips of an average of 4 miles in length are switched from car to bicycle.

**Increase bus ridership:** 32 MTCO<sub>2</sub>e annual reductions

This strategy assumes there are an additional 150 daily bus passengers.

**Acquire more fuel efficient government vehicles:** 29 MTCO<sub>2</sub>e annual reductions

This strategy assumes 16 vehicles will be replaced by 2020.

**Safe Routes to School Program:** 27 MTCO<sub>2</sub>e annual reductions

This strategy assumes 500 students with average VMT of 3 miles to and from school are covered by the program.

**Expansion of walking-friendly environments:** 25 MTCO<sub>2</sub>e annual reductions

This strategy assumes 500 weekly trips, or 3% of trips, are switched from car to walking.

**Provide bikes for daily trips:** 20 MTCO<sub>2</sub>e annual reductions

This strategy assumes 20 bicycles are available with an average trip length of 4 miles and 20% of trips displacing car trips.

## Increase use of alternative fuels

**Conversion to electric vehicles:** 21,277 MTCO<sub>2</sub>e annual reductions

This strategy assumes that 20% of the community vehicle fleet is converted to electric vehicles.

**Construct electric vehicle charging facilities:** 686 MTCO<sub>2</sub>e annual reductions

This strategy assumes that 150 charging spaces are constructed.

**Municipal conversion of diesel fleet to biodiesel (B20):** 28 MTCO<sub>2</sub>e annual reductions

This strategy assumes that 10 of the municipal diesel vehicles are converted to biodiesel.

## Reduce vehicle idling time

**Limit idling of heavy duty municipal vehicles (trucks):** 27 MTCO<sub>2</sub>e annual reductions

This strategy assumes that municipal vehicles reduce idling time by about 35%.

**Limit idling of light duty municipal vehicles:** 4 MTCO<sub>2</sub>e annual reductions

This strategy assumes that municipal vehicles reduce idling time by about 30%.

## Increase options for low-carbon transportation

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

There could potentially be plans for transit oriented development in the Town of DeWitt along Erie Boulevard. Shoppingtown mall could be a central hub where housing units, shops, grocery stores, and offices could be located. The condensed nature of this type of development would make walking or using public transportation much easier, ultimately reducing the Town's overall greenhouse gas emissions.

The current bus system needs to be much more efficient in order to get citizens more interested in utilizing this form of transportation. One way to improve efficiency of the bus system is to implement Bus Rapid Transit (BRT). BRT designates a lane in which only buses can drive, making bus trips much quicker by avoiding the usual traffic. Also, BRT includes implementing elevated station platforms and pre-order ticket systems which make bus travel much more convenient. Implementing BRT could increase bus use and efficiency, reduce emissions, fuel costs, and reliance on foreign fossil fuels.

DeWitt has also identified a need to introduce more sidewalks into the Town to make it easier to walk from one place to the next. Therefore, the Town has planned an upgrade in its sidewalk infrastructure, including the installation of approximately 13.5 miles of sidewalk. One



Multi-use Trail sign, DeWitt

way to help ensure that decisions are made wisely in regards to pedestrian (or even bicycling) infrastructure is to implement a Complete Streets Policy in the Town of DeWitt. A complete streets policy is a pledge to consider every mode of transportation when building new roads in a municipality.

There are many possible low-carbon transportation options that could be successful in the Town of DeWitt. These low-carbon transportation options can benefit community members in a variety of ways, including reducing greenhouse gas emissions, fuel costs, and reliance on foreign fossil fuels, improving physical well-being, and revitalizing the community.

## Increase use of alternative fuels

According to the 2010 GHG Inventory Report, emissions from gasoline and diesel fuels used for transportation accounted for 52% of government emissions and 42% of community emissions in DeWitt in 2010. These fuels are

not only non-renewable fossil fuels; they also produce significantly more carbon emissions than alternative fuels, such as electricity and biodiesel. Conversion to alternative fuels can therefore be extremely effective when trying to reduce emissions from the transportation sector.

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. Electric vehicles are also less expensive to operate and have significantly lower fuel costs than conventional gasoline-powered vehicles. Biodiesel, on the other hand, can be created by using recycled agricultural and cooking oils and can be suitable for conventional diesel engines without retrofit up to a blend of B20 (20% biodiesel).

Increasing the use of alternative fuels would greatly reduce DeWitt's emissions and provide other benefits to community members as well.

## Reduce vehicle idling time

Idling refers to when a vehicle is left running when not in use. Limiting the idling of vehicles decreases fuel use and greenhouse gas emissions by decreasing the amount of time vehicles are burning fuel uselessly. In New York State, it is illegal for many diesel-powered vehicles to idle for longer than 5 consecutive minutes; however, whether or not this rule is being followed is uncertain. Limiting the idling of vehicles decreases emissions, fuel costs, and reliance on foreign fossil fuels, while also improving local air quality.

# ENERGY EFFICIENCY

According to DeWitt's GHG Inventory Report, emissions from government buildings/facilities accounted for 18% of total government emissions and streetlights and traffic signals accounted for 22%, while residential energy use accounted for 10% of community emissions, commercial energy use accounted for 26%, and

industrial energy use accounted for 15% of the community's total GHG emissions in DeWitt in 2010. This Sustainability Plan addresses two main energy/efficiency emissions reduction goals: increase energy efficiency and reduce emissions from buildings and facilities; and increase use of renewable energy.

## Increase energy efficiency and reduce emissions from buildings

**Retrofit of commercial buildings: 14,361** MTCO<sub>2</sub>e annual reductions

This strategy assumes 10,698,000 square feet of commercial space is retrofitted.

**Promote commercial energy efficiency through establishment of PACE loan program: 3,138** MTCO<sub>2</sub>e annual reductions

This strategy assumes 5,349,000 square feet of buildings are retrofitted using PACE loan program.

**Promote residential energy efficient retrofits using loans: 2,620** MTCO<sub>2</sub>e annual reductions

This strategy assumes 100% of fuel oil-heated homes, 50% of electrically heated homes, and 20% of gas heated homes undergo retrofits.

**Update Town's commercial energy code: 2,199** MTCO<sub>2</sub>e annual reductions

This strategy assumes 4,000,000 square feet of commercial buildings are constructed using the updated code.

**Promote residential energy efficiency through CNY Energy Challenge Team program: 1,571** MTCO<sub>2</sub>e annual reductions

This strategy assumes 10% of households are targeted.

**"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)**

**Update Town's residential energy code: 538** MTCO<sub>2</sub>e annual reductions

This strategy assumes an updated energy code will reduce energy use by 10% and that 1,000 new homes are constructed using the updated code.

**Commercial roofing challenge: Install green and reflective**

**roofing: 167** MTCO<sub>2</sub>e annual reductions

This strategy assumes 1,306,800 square feet of reflective roofing is installed and 217,800 square feet of green roofing is installed.

**Retrofit of Town buildings: 42** MTCO<sub>2</sub>e annual reductions

This strategy assumes 5,600 square feet of Town buildings undergo energy efficiency retrofits.

**Install lighting occupancy sensors in Town buildings 20** MTCO<sub>2</sub>e annual reductions

This strategy assumes that lighting occupancy sensors are installed in 25,000 square feet of government buildings.

**LED Streetlights: 10** MTCO<sub>2</sub>e annual reductions

This strategy assumes all 113 Town-owned streetlights are converted to LEDs.

**On-demand heating for water requirements in Town buildings: 4** MTCO<sub>2</sub>e annual reductions

This strategy assumes 3 on-demand water heaters are installed in Town buildings.

**Reflective roofing on Town buildings: 2** MTCO<sub>2</sub>e annual reductions

This strategy assumes 19,000 square feet of reflective roofing is installed on government buildings

**Energy efficient equipment in Town buildings\***

**Better monitoring of utility data for Town operations and buildings\***

**Combined heat and power and district energy\***

## Increase use of renewable energy

**Residential geothermal heating/cooling: 815** MTCO<sub>2</sub>e annual reductions

This strategy assumes half of the homes that currently use fuel oil and half of the homes that currently use electricity in DeWitt install geothermal systems.

**Residential biomass heating: 733** MTCO<sub>2</sub>e annual reductions

This strategy assumes half of the homes that currently use fuel oil switches to biomass.

**Municipal solar PV energy: 522** MTCO<sub>2</sub>e annual reductions

This strategy assumes installation of a 100 kW solar PV array on government buildings as well as a 2,000 kW solar PV array at the old landfill site.

**Commercial solar PV energy: 435** MTCO<sub>2</sub>e annual reductions

This strategy assumes installation of ten 25 kW solar PV systems.

**Residential solar thermal water heating: 401** MTCO<sub>2</sub>e annual reductions

This strategy assumes 5% of occupied homes in DeWitt install solar hot water.

**Residential solar PV energy: 364** MTCO<sub>2</sub>e annual reductions

This strategy assumes 5% of occupied homes in DeWitt install a 4 kW solar PV array.

**Commercial solar thermal water heating: 100** MTCO<sub>2</sub>e annual reductions

This strategy assumes 10 businesses install solar hot water.

**Municipal geothermal heating/cooling: 19** MTCO<sub>2</sub>e annual reductions

This strategy assumes installation of 25,000 square feet of geothermal systems.

**\*These strategies are included as informational items and therefore do not have associated emissions reductions or strategy implementation levels listed.**

## “THERE CAN BE NO SUSTAINABLE DEVELOPMENT WITHOUT SUSTAINABLE ENERGY DEVELOPMENT.”

—Margot Wallstrom, European Union Environmental Commissioner (2004)

### Increase energy efficiency and reduce emissions from buildings

Updating older heating and cooling equipment and inserting additional insulation are some effective strategies for reducing energy use in buildings. The initial cost of undergoing energy efficiency retrofits in buildings 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.

Community members can also take smaller steps to make buildings more efficient, such as replacing older, less efficient appliances and light bulbs with newer, more efficient ones, or installing lighting occupancy sensors.

Installing green or reflective roofing can also reduce the amount of energy required to heat and cool buildings. Green roofing also reduces the amount of run-off during precipitation events, therefore reducing erosion and storm water that needs to be treated by local wastewater treatment facilities.

Energy efficiency education can also be crucial in working to reduce emissions from buildings and facilities. Without the knowledge of actions that can be taken to increase building efficiency and reduce emissions, it is less likely that important actions, such as the ones listed above, will be taken. Participating in the Central New York Energy Challenge Team Program is a great way to educate community members on actions they can take at home to reduce energy use and emissions, and businesses can be targeted in a similar educational program and/or energy challenge competition.

Reducing energy used for heating and cooling will not only reduce emissions, it will also reduce energy bills while having various other co-benefits.

### Increase use of renewable energy

By installing renewable energies such as geothermal, biomass, and/or solar at the local level, DeWitt can ensure that their energy is provided by clean and local renewable energy sources, therefore reducing greenhouse gas emissions, energy cost, reliance on fossil fuels, and even improving air quality.

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 in Madison County. These programs are an effective way of combining public and private funds for renewable energy. NYSERDA provides incentives for the installation of solar PV systems based on system size. Additionally, there are state and federal tax credits for residential and commercial solar PV and geothermal installations. Educational and technical assistance programs can also promote renewable energies. Local governments can offer information clearingshouses and connect consumers with renewable energy installers.

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

## National DSIRE Database

Because incentives available for renewable energies are constantly changing, it is important to remain familiar with which incentives are currently available. 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 [dsire-usa.org](http://dsire-usa.org) to learn more about current incentive opportunities.

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.

DeWitt has already installed a 51 kW solar PV rooftop system that, along with the reflective roofing upgrade on the Town Hall, is projected to reduce energy use by 187,933 MMBtu annually, reducing emissions by 12.5 MTCO<sub>2</sub>e each year.

Increasing the use of renewable energy reduces emissions while also providing clean, locally-produced energy that will save money spent on utility bills over time.

# WASTE

In 2010, 0.3% of the government's GHG emissions and 0.2% of the community's GHG emissions came from waste. Waste from the Town is disposed of at the Onondaga County Waste to Energy (WTE) Facility. The waste is combusted, producing steam that turns tur-

bines and produces energy. However, combustion of the waste also creates GHG emissions. The Town has worked on reducing the amount of waste generated for many years, including implementing a volume-based trash collection service over 10 years ago.



## Promote composting

**Encourage and educate community about organics and yard waste composting: 53** MTCO<sub>2</sub>e annual reductions

This strategy assumes 167 lbs. per person will be diverted each year.

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

The Town of DeWitt has worked to reduce the amount of waste generated for many years following the EPA's waste management hierarchy (avoid,

reduce, reuse, recycle, recover, and dispose, respectively). The Town utilizes OCRRA's single-stream recycling program to achieve high rates of recycling, reducing waste that would have otherwise gone to the WTE facility.

Composting is another strategy the Town can implement to reduce the waste stream. Composting produces fertilizer that can be used for farms or gardens, returning nutrients to the soil that were removed with food production and reducing the need for synthetic fertilizers. Composting also reduces the volume of material sent to the WTE facility, reducing disposal costs.

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

The Town operated a landfill that was used from 1954 to 1990 but is currently closed and capped.

Landfills emit methane as the refuse in them decomposes in the absence of oxygen, and methane is a potent greenhouse gas that is 21 times more powerful than carbon dioxide. To date, the emissions from the landfill have not been tracked for the Town of DeWitt; however, this measure suggests monitoring Town landfill emissions and performing any necessary steps to reduce them, including capturing if deemed practical. If these emissions were counted, they would most likely represent a significant increase in overall Town emissions.

There are 594 landfill sites throughout the US that capture methane and use it directly or use it to generate electricity. Even though DeWitt's landfill is older and not currently in use, it still has the potential to be used to capture methane to generate electricity. Methane emissions can be calculated or monitored to determine potential for capture using methods such as Tracer Plume Correlation Method and Chamber Method. If the Town decides to implement this kind of strategy in the future, it is recommended that they first calculate emissions created by the landfill so that they can also calculate emissions reduction potentials.

# LAND USE

There is a growing acknowledgement by scientists and policy analysts that a substantial part of the global warming challenge may be met through the design and development of cities and towns. The form and function of human settlements can either reduce or increase the demand for energy, and can also influence how energy is produced, dis-

tributed, and used. Planning and urban design measures can substantially reduce the number and distance of vehicle trips by organizing human activity in compact communities with a range of housing types, providing reliable transit to and from employment, and placing services within easy walking distance of home.



Aerial of Shoppingtown Mall

## BACKGROUND

Unprecedented human intervention will be required in the coming decades to reduce the extent of climate change and thereby avoid its worst potential consequences (referred to as mitigation), or make changes to accommodate those effects that are unavoidable (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.

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 electricity needs with renewable energy sources by 2030, and

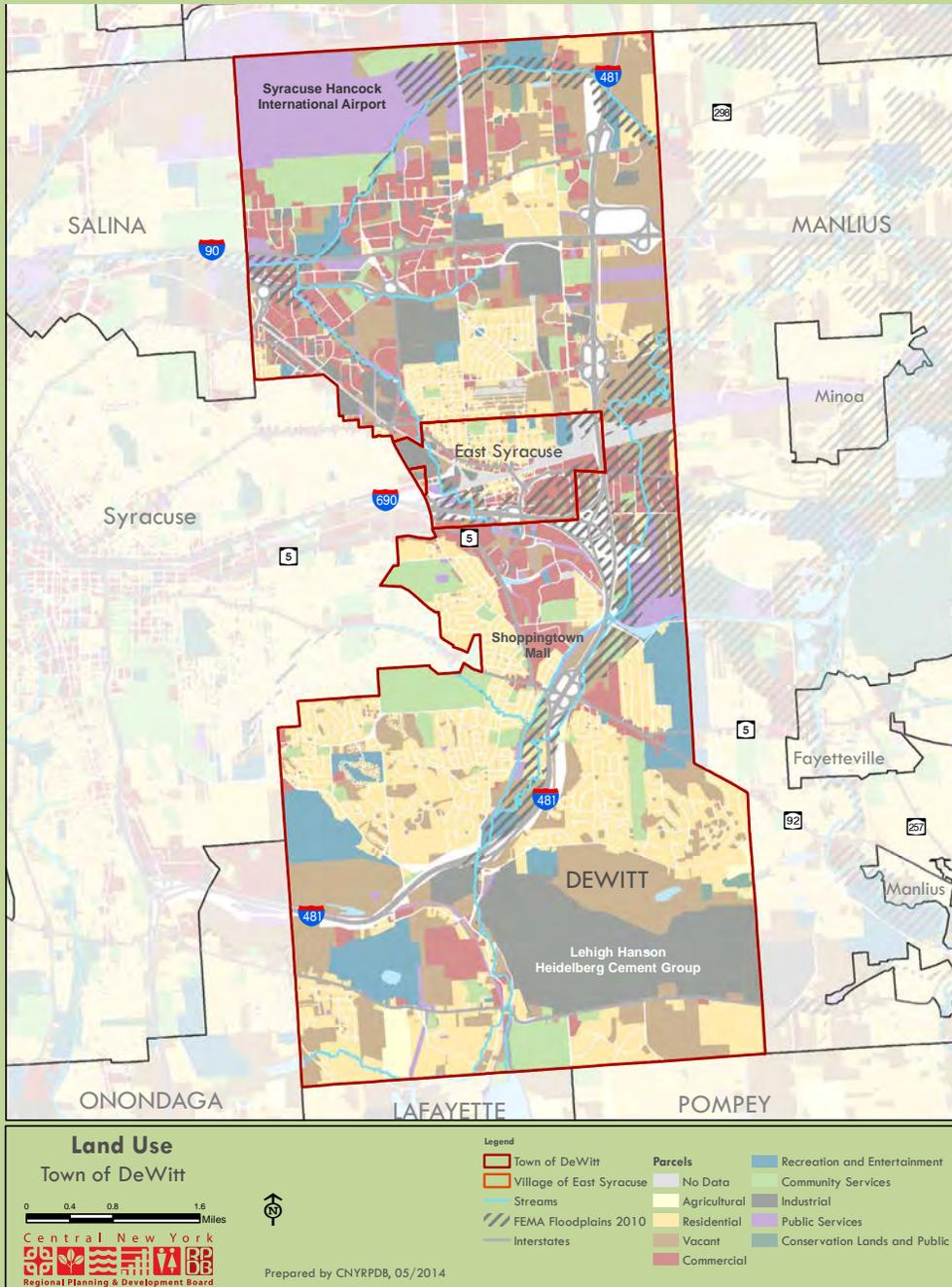
reducing greenhouse gas emission by 80% below 1990 levels by 2050.

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

Transportation activity of all forms contributes about 33 percent of energy-related GHG production in the United States, and single-occupant automobile travel makes up about half of that activity. The vast majority of vehicles now burn carbon fuels and will continue to do so for some time (even with aggressive fuel substitution and efficiency measures), so strategies that reduce travel by limiting low-density development and encouraging more compact, walkable, full-spectrum living and working environments can potentially make a significant contribution to overall climate change mitigation.

Studies indicate that a GHG reduction of up to 10 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 2050 will be new or will have been redeveloped since 2007, suggesting that combined land use and transportation strategies could be quite powerful in mitigating the increases in GHGs.

FIGURE 10: TOWN OF DEWITT LAND USE



The way that land uses and transportation infrastructure are arranged within a community has a strong influence on whether residents choose to walk, bike, use public transit, or drive. These travel choices directly affect the amount of transportation-related GHG emissions produced in DeWitt. Single-passenger automobile trips generate substantially more GHG emissions per mile than public transit and carpooling. Walking and biking are GHG-free transportation alternatives. Transportation and land use strategies provide a variety of measures that strive to increase resident use of alternative travel modes and reduce automobile dependence in DeWitt.

Additional carbon reductions could come from exploiting other aspects of land use planning and redevelopment. Using the critical mass of buildings and activities at the district scale, it is possible to develop practical and efficient heating and cooling systems (district energy systems). This approach shows great promise in reducing the carbon footprint of urban development. Other energy conservation benefits may result from common-wall and vertical living structures typical of multifamily urban locations. It has been reported that per capita energy consumption and GHG emissions are 2 to 2.5 times higher in low-density developments than in high-density areas.

Urban design also offers the potential for cities to claim some of the attributes now associated primarily with rural living, including green infrastructure, such as natural systems that handle storm water and reduce heating loads, and localized food production and farmers markets that reduces shipping, storage, and packaging needs. These and other strategies that exploit the non-transportation aspects of urban form may contribute significantly to overall GHG mitigation.

#### LAND USE ANALYSIS AND RECOMMENDATIONS

According to information from OnTheMap, there were 43,223 jobs in DeWitt in 2011. According to the American Community Survey 2006-2010 data, 11,804 people work in the Town of DeWitt. Of the 89% that drove vehicles, approximately 91.9% drove alone and 8.08% carpooled. 1.3% rode public transit, 4.4% walked, 1.1% biked to work, 0.07% took a taxi, and 0.24% used other means. 3.9% worked from home. While alternative travel modes make up a notable share of commute trips in DeWitt, single-passenger automobile trips constitute the vast majority. Combined commuting and shopping trips constitute the majority of a household's annual vehicle trips and generate a large portion of the community's transportation-related GHG emissions.



Butternut Creek Foot Trail,  
DeWitt

Examining DeWitt's existing land use pattern and transportation infrastructure provides insight into ways the community can reduce GHG emissions. A variety of land use, transportation, and urban design factors affect travel behavior. By making subtle land use changes and improving transportation infrastructure, DeWitt can increase walking, bicycling, and transit use. Factors most directly influencing travel behavior in DeWitt include: diversity of uses, proximity of uses, density, pedestrian and bicycle conditions, transit accessibility, parking, and streetscape design. Each of these is discussed in detail below.

***Diversity of uses – 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 DeWitt could help reduce the community's transportation-related GHG emissions. Increased diversity reduces travel distances, and facilitates more walking and cycling trips. Improving the mix of uses within DeWitt can also reduce commute distances, particularly if affordably priced housing is located in areas with a high number of jobs and employees can commute to work using alternative modes.

A jobs/housing ratio is commonly used to evaluate the diversity of land uses within a community, by describing the relationship between employment opportunities and housing supply. A ratio of 1.0 describes a balance between jobs and housing. A ratio above 1.0 indicates that there are more jobs than housing, while a ratio below 1.0 describes an undersupply of jobs relative to housing. In 2010, there were approximately 11,804 jobs and 9,217 households in DeWitt and the jobs/housing ratio was approximately 1.28/1. This demonstrates that there are considerably more jobs than housing opportunities within the Town, and that many workers commute into DeWitt from other communities.

An improved jobs/housing ratio does not guarantee that residents will work

within the Town, but it does increase the likelihood that residents will have employment opportunities within the community. Thus, Dewitt's employment development efforts should strive to create jobs that match the skills and income needs of the community's labor force. Increasing the diversity of uses and particularly job-rich land uses may help reduce the community's automobile-generated GHG emissions.

***Proximity of uses – The distance between neighborhood commercial services and residents' homes.***

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. Two methods of spatial analysis were used to evaluate the proximity of residences to commercial uses in Dewitt and support the development of CAP measures. The first measured proximity of residences to commercial centers and the second measured proximity of residences to a diversity of uses.

The first method examined how many residential parcels are located within ¼ mile of commercial districts and provides insight into the effectiveness of



In January 2014, the Town of Dewitt granted its first Parratt-Schick Award of Excellence to the Dewittshire neighborhood in recognition of its quality of design and for creating a model neighborhood environment.

the Town's existing zoning and land use pattern from the pedestrian perspective. This analysis found that 75% of Dewitt's residential parcels are located within ¼ mile of commercial districts.

Although some residential portions of Dewitt are distant from commercial services; overall, the Town's existing land use pattern creates many opportunities for pedestrian and bicycle travel. The second method of proximity analysis may explain this behavior as it demonstrates that many Dewitt residents do not have an adequate number of stores or services within easy walking distance of their homes. The analysis identified eleven categories of neighborhood services (i.e., schools, libraries, drugstores, grocery stores, medical facilities, post offices, nursery schools, parks, nursing homes, hardware stores, and restaurants), mapped the locations

of these services within Dewitt and adjacent cities, and then examined how many of these distinct uses are within a ¼ mile walking distance of individual residential parcels.

This analysis determined that 30% of the residential parcels are located within ¼ mile of three or more amenities and 24% are located within ¼ mile of four or more. Residents living near the intersection of East Genesee Street and Erie Boulevard have the highest level of access to diverse uses; residents in other areas of the Town have access to few or none. Residents with low levels of pedestrian access to neighborhood-serving uses are more likely to drive to purchase their daily goods and services. Town-directed land use and zoning changes, small business loans and other incentives could help improve the proximity to diverse uses. These actions could encourage pedestrian travel and reduce automobile dependence in Dewitt.

***Density – The number of housing units, people, or jobs in a given area.***

Higher densities tend to increase the number of services, shops, schools, and public buildings located within a neighborhood and increase the availability of transit and pedestrian infrastructure. These conditions tend to reduce the

**FIGURE 11: TOWN OF DEWITT POPULATION DENSITY**

need for vehicle ownership and increase the use of alternative modes.

**Residential Density:** Residential density is normally measured in terms of housing units per acre. Dewitt has a relatively high/moderate residential density for a predominantly residential suburban community. Approximately 95% of the Town's residential land use consists of single-family housing built on small parcels at an average density of about 1.9 units per acre. There are 331 two and three family (or multiple residential) parcels, with an average density of 3.3 units per acre. Apartment buildings are located on 58 parcels, with an average density of 0.29 apartment buildings per acre.

Approximately 5% of the Town's residential land use is classified as low-density, 86% as medium density, and 9% is classified as high density. The highest residential density areas in Dewitt are located near LeMoyne College where multifamily apartments are located.

Infill development potential exists for medium and high density residential development in the commercial districts along the Erie Boulevard and Bridge Street corridors. The Town can consider ways to encourage such development through overlay zoning and other techniques that can be included

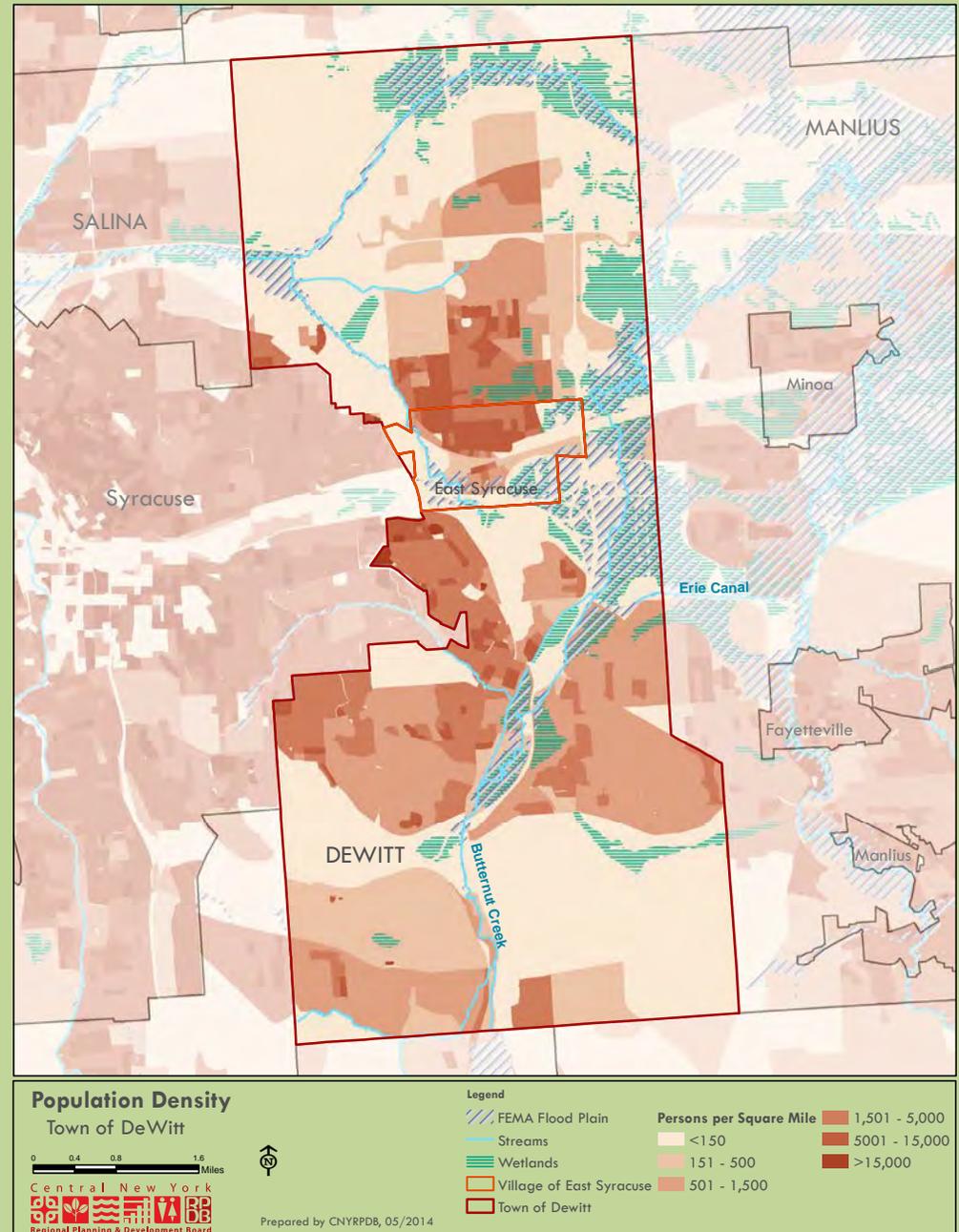
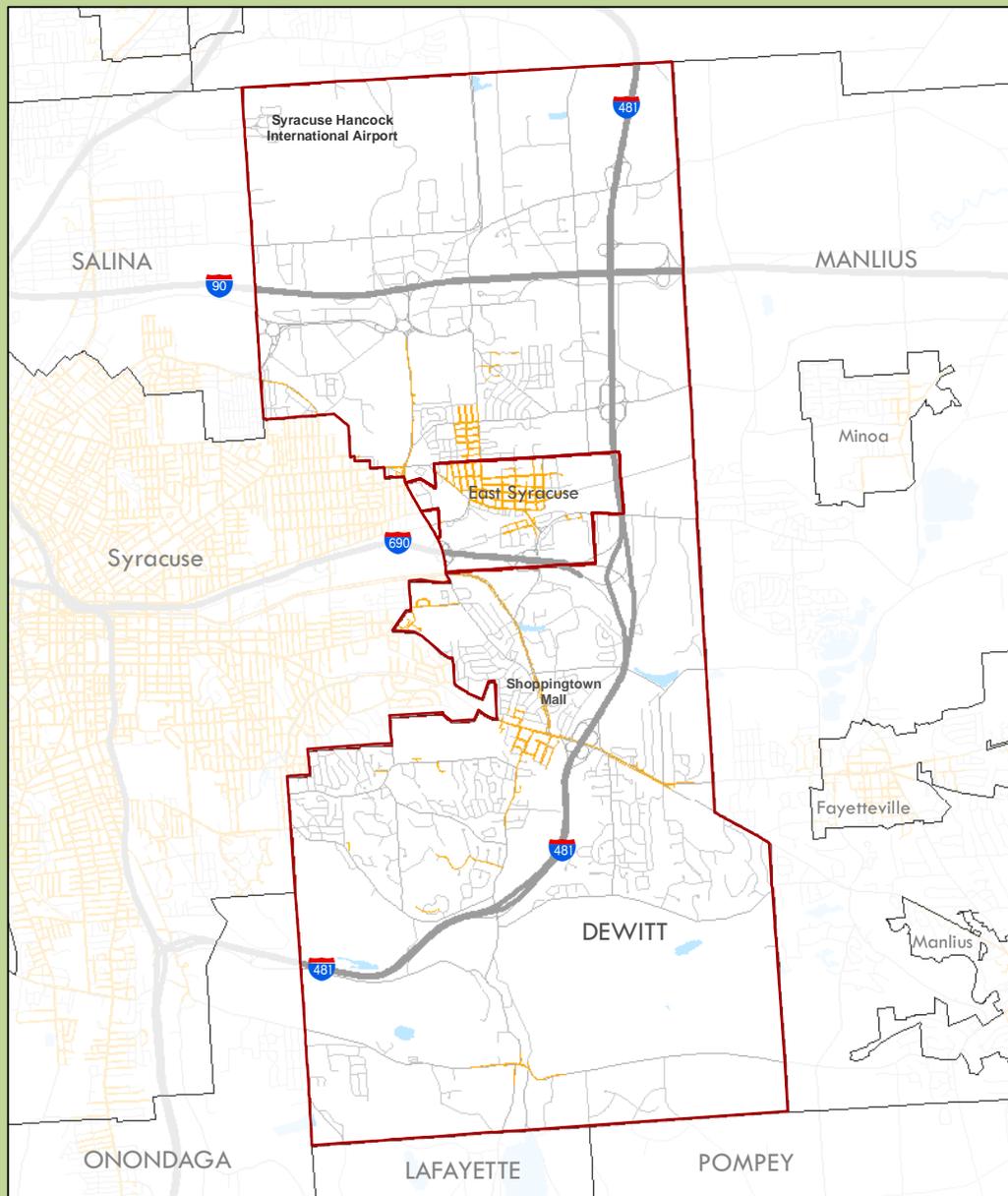


FIGURE 12: TOWN OF DEWITT SIDEWALKS



**DeWitt Sidewalk Infrastructure**

- Legend
- Sidewalks
  - Major Roads
  - Local Roads



Data Source for Sidewalks: Syracuse Metropolitan Transportation Council, 2011

in an update to the Town's Comprehensive Plan and zoning codes.

**Commercial Intensity:** Commercial building intensity is measured using a floor-area ratio (FAR), which is obtained by dividing a building's floor area by the underlying parcel's area. The Town's current zoning codes discourage compact and mixed-use development by requiring large street setbacks for multi-story buildings, which disrupts the streetscape and makes walking and bicycling difficult. The Town can consider revising its Comprehensive Plan and zoning codes to allow for greater commercial intensity by establishing a higher floor-area ratio allowances for mixed-use buildings than for other buildings. Such allowances can be provided for targeted commercial districts along the Erie Boulevard, Bridge Street and East Genesee Street corridors.

***Pedestrian and bicycle conditions – The quantity and quality of sidewalks, crosswalks, paths and bike lanes, and the level of pedestrian security.***

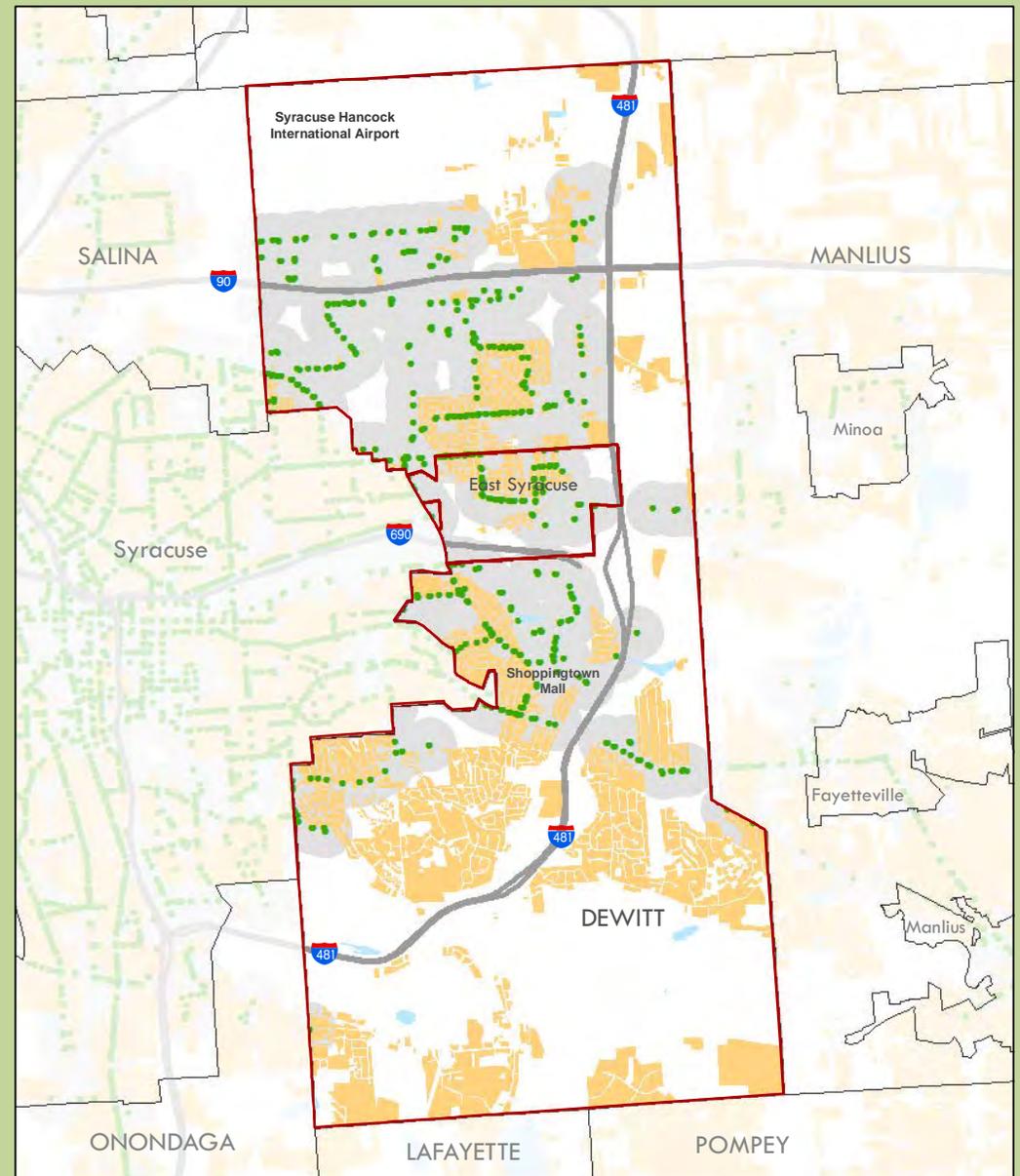
Well-developed pedestrian and bicycle infrastructure and pedestrian-friendly design are essential if walking and biking are to be important travel modes in a community. Highly connected sidewalks and bicycle infrastructure reduce travel distances between desti-

FIGURE 13: TOWN OF DEWITT BUS STATION ACCESSIBILITY

nations and improve access and safety. Pedestrian and bicycle infrastructure includes sidewalks, crosswalks, traffic calming devices, bike lanes, and racks/storage facilities.

**Pedestrian Infrastructure:** Dewitt's pedestrian infrastructure is underdeveloped, with an incomplete sidewalk network, and considerable pedestrian obstacles. In addition, a number of Town sidewalks are in poor condition and others lack sidewalk cuts. These conditions create difficulties for strollers and the less physically-able and barriers for the physically disabled. Striped crosswalks are present on arterials and streets near schools, but there is little use of traffic calming devices such as curb extensions (known as bulb outs), refuge islands (small section of pavement where pedestrians can stop before finishing crossing a road), and chokers (build-outs added to a road to narrow it). 87 pedestrian collisions occurred between January 1, 2002 and December 31, 2011, with the highest concentration occurring on James Street, Erie Boulevard East, and within the populated portion of East Syracuse.

**Bicycle Infrastructure:** Dewitt's existing bike infrastructure and network are minimal, covering only 1% of the mileage of Town streets. New York State Bike Route 11 travels through the Town of DeWitt along East Molloy Road



Proximity of Bus Stops to Residential Parcels



- Legend
- Centro Bus Stops
  - Residential Parcels
  - Quarter Mile Buffer - Bus Stops

(leaving the Town of Salina and entering the Town of DeWitt on East Molloy Rd) and then heads north on Northern Boulevard in the Town of DeWitt, and continues north into the Town of Cicero. Bike Route 11 is marked with bike route signs across the state and in some instances includes Share the Road signs. Also in the Town of DeWitt, Tow Path Road between Kinne Road and Widewaters Parkway is marked as an on-road multi-use trail. The Erie Canalway Trail is an off-road multi-use trail in the Town of DeWitt that begins at Ryder Park in the Town and heads east into the Town of Manlius. The trail in DeWitt, Manlius and heading further east is considered part of the Old Erie Canal State Historic Park. 41 cycling accidents occurred in DeWitt between January 1, 2002 and December 31, 2011.

Bike racks can be found in various parts of the Town, but shortages exist near civic and commercial uses, which may limit residents' desire to bike to these locations. Additionally, bike racks are often not provided in conjunction with bus stops.

***Transit accessibility – The ease with which people can access transit service and the quality of that service.***



Erie Canal Trail, DeWitt

Residents and employees are more likely to use transit if traveling by bus or train is relatively time-competitive with driving, if transit stations are accessible to pedestrian and cyclists, and if the transit experience is pleasant. People are generally willing to walk ½-mile to a light rail station or ¼-mile to a bus stop. A ¼-mile walk takes the average person around 10 minutes. In DeWitt, about 65% of residential parcels are located within ¼ mile of a bus station. There are 46 Centro routes that stop in DeWitt, two of which are express routes.

***Parking – The supply, price, and regulation of parking facilities.***

Cheap and abundant parking increases automobile ownership and use. Large parking lots also disperse destinations and reduce walking and public transit

convenience and use. Parking management and fees can reverse the equation, reducing driving and increasing use of other travel modes. Parking on all DeWitt streets is free. Relatively few large parking lots are located in the commercial districts along the East Genesee Street, Erie Boulevard, and Bridge Street corridors.

***Streetscape design – The scale and design of streets, sidewalks, and adjacent uses.***

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

Recommended improvements on East Genesee Street and Erie Boulevard would include pedestrian-friendly design features such as widened sidewalks, street trees, benches, decorative street lights, and bulb-out pedestrian crossings. Coordination with NYS Department of Transportation would be required to make such improvements.

### **Case Study: Shoppingtown Mall**

The Town of Dewitt lacks a dense town center or “Main Street” which typically serves as a hub for civic life in many towns in the region. The Town’s vision is that Shoppingtown Mall will be redeveloped as a vibrant mixed-use town center that could provide a cluster of economic activity and a focal point for the civic life of the town.

In its current configuration, the Shoppingtown Mall will have an increasingly difficult time competing in the regional marketplace as DestinyUSA expands its footprint and attracts more shoppers. However, Shoppingtown can take advantage of its location advantages such as proximity to high-income households and access to highways to transform itself into a mixed-use lifestyle center complete with unique natural amenities such as Butternut Creek and the Erie Canal Trail.

The Town and the CNY RPDB have investigated a number of examples of this kind of redevelopment approach which can be used as models. These include Mashpee Commons in Mashpee, Massachusetts; the Jordan Creek Town Center in West Des Moines, Iowa; Belmar in Lakewood, Colorado; Paseo Col-

orado in Pasadena, California; and City Place in Long Beach, California.

Redevelopment of the Shoppingtown Mall can meet the needs of both the town and the property owner by enhancing the distinctiveness, and thus the competitiveness of the mall, particularly if the following goals are reached:

- +Retain existing national retailers while attracting and retaining new retailers
- +Add housing and commercial space to the site
- +Create open space that is walkable, low maintenance, and usable year-round
- +Increase the pedestrian traffic to the site
- +Connect the site to other developments within the Town of Dewitt (Butternut Road, Kinne Road, and Erie Boulevard East)
- +Create a “town center” type of space which could be used by residents for multiple, all-season activities



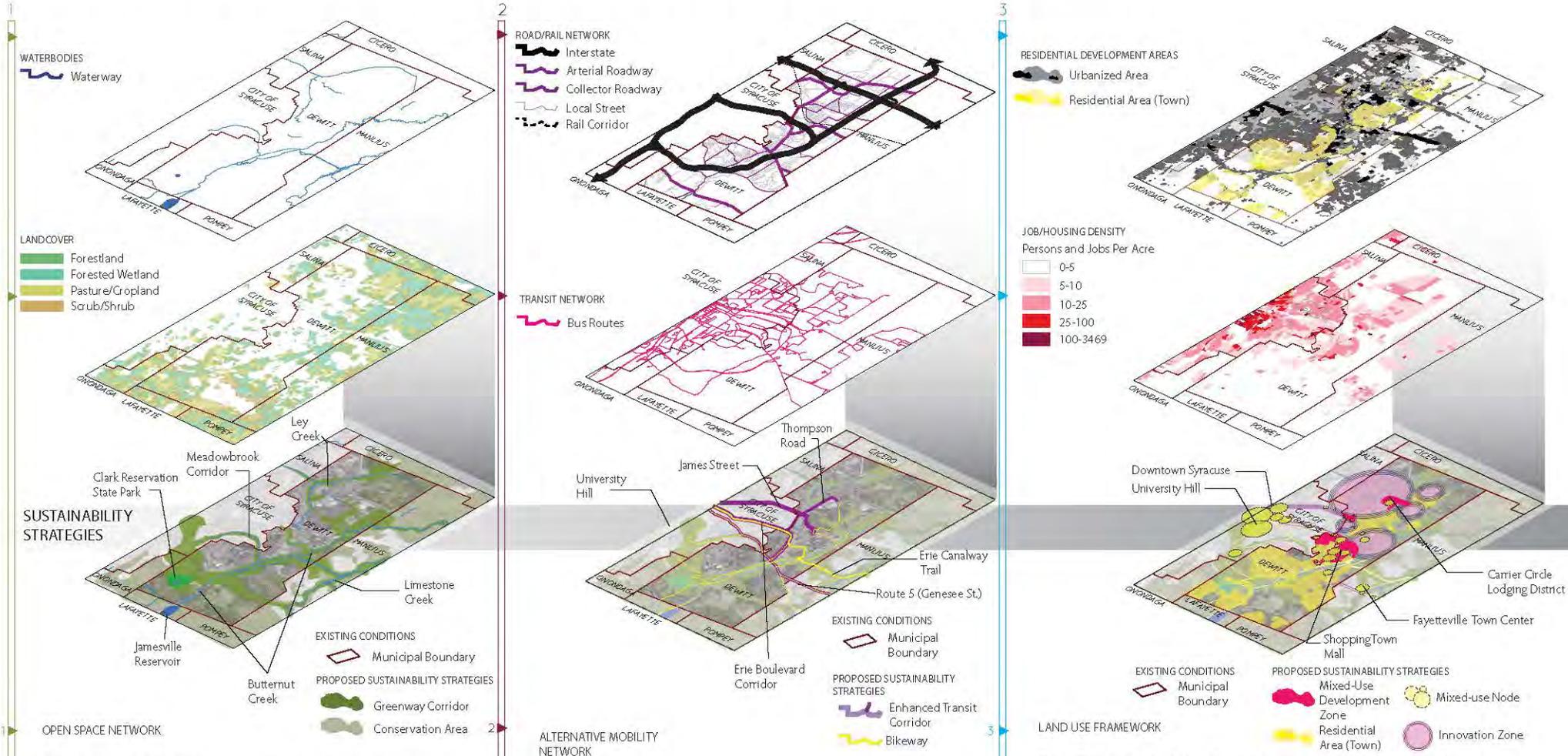
Shoppingtown Mall,  
DeWitt

# APPENDIX A: TOWN OF DEWITT SUSTAINABLE LANDSCAPE ASSESSMENT

This assessment focuses on existing landscape conditions within the Town of DeWitt as well as the connections between landscape systems within the Town and surrounding municipalities. The assessment identifies potential

ecological corridors within the town that are not currently recognized in a formal way. The assessment also identifies areas within the Town that could be focal areas for new infill development as well as investment areas for

improving mobility options within the town through improved bicycle and pedestrian infrastructure as well as enhanced transit services.



The Town of DeWitt can provide protection for waterway networks within the Town and also provide protections for the rural landscapes and wetland areas to the south and north.

The Town of DeWitt can work with NYSDOT and CENTRO to improve and enhance transit service along designated corridors within the Town. These enhanced transit corridors would provide access to employment and entertainment destinations within the Town as well as connect to Downtown Syracuse. In addition, there are opportunities for the development of both on road and off-road bicycle and pedestrian corridors that can provide both recreational access to the Towns greenway network, as well as provide for alternative mobility options to reach employment and entertainment destinations.

The Town of DeWitt has an opportunity to develop a mixed-use center at the eastern end of Erie Boulevard centered on the Shoppingtown Mall site. Shoppingtown Mall, Widewaters, and several of the strip shopping center facilities along Erie Boulevard have experienced significant disinvestment. Implementing a new mixed-use zoning district could help to transition these car-oriented areas into mixed-use centers within easy walking distance of the surrounding residential neighborhoods. The northern portion of the Town has a considerable concentration of R&D, light/heavy manufacturing, as well as office uses - these areas should continue to be supported as major employment and innovation centers for the region.

# SUSTAINABILITY CONCEPT

## LEGEND

### OPEN SPACE NETWORK

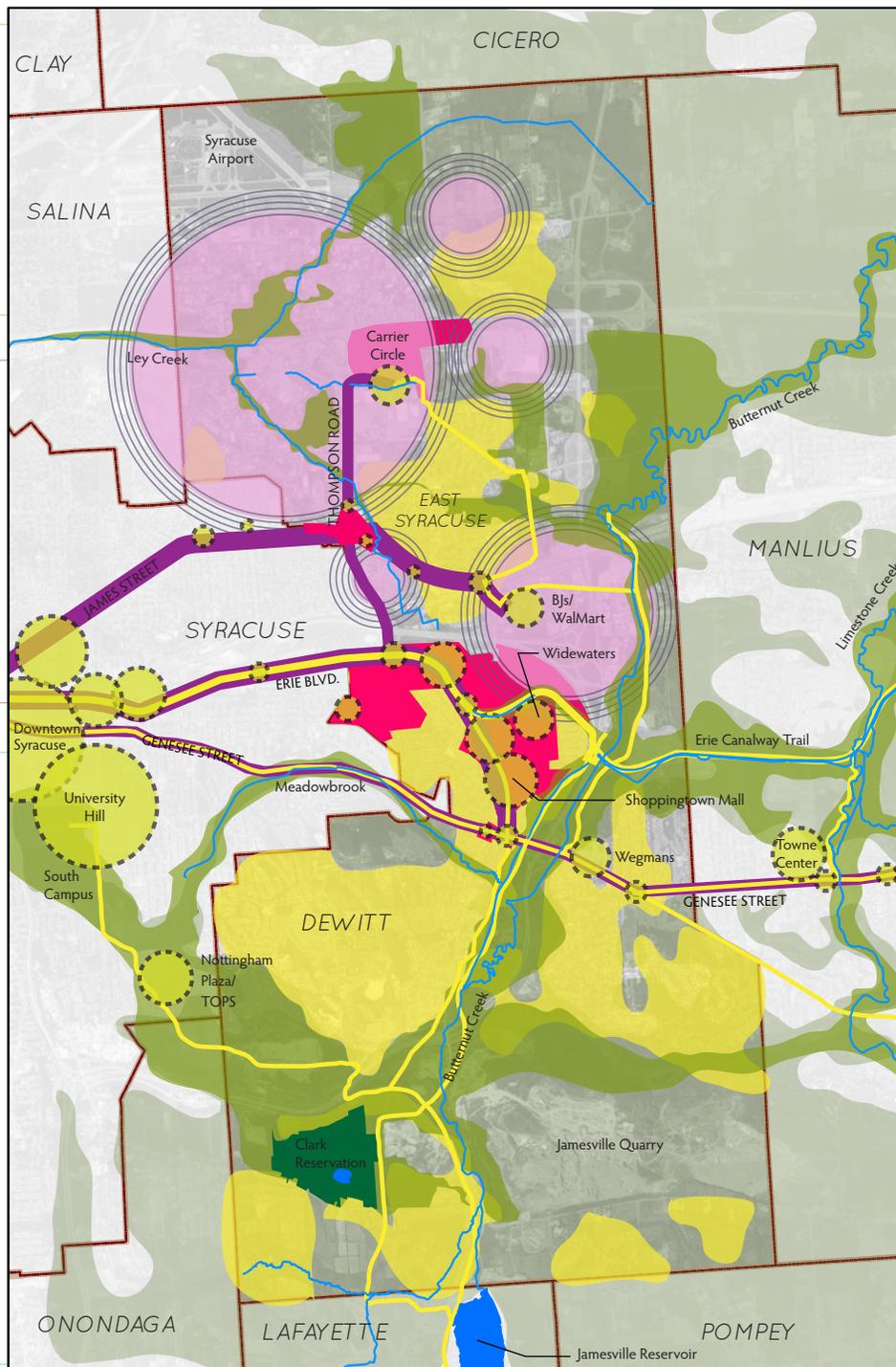
-  **Greenway Corridor**  
 A greenway corridor is a linear system of protected open space that typically provides recreational amenities as well as enhancing larger ecological networks.
-  **Conservation Area**  
 Conservation areas provide safeguards for and can unify cultural, natural, and recreational resources providing opportunities to experience our agricultural landscapes, forests, and wetlands.

### ALTERNATIVE MOBILITY NETWORK

-  **Enhanced Transit Corridor**  
 Improvements to transit service like dedicated busways, dedicated station stops, prioritization of buses (known as Bus Rapid Transit), or the development of light rail service along selected corridors could combine to increase transit ridership and reduce VMT.
-  **Bikeway**  
 Bikeways contain dedicated bicycle infrastructure like bike lanes or bicycle parking and provide recreational and alternative mobility options connecting residential neighborhoods to employment and entertainment centers.

### LAND USE FRAMEWORK

-  **Mixed-Use Development Zone**  
 These areas incorporate mixed-use zoning allowing for residential and commercial development. They can also reduce parking requirements and allow for the development of walkable, transit-oriented neighborhoods that are accessible by foot or bicycle to existing residential areas within the Town.
-  **Mixed-use Node**  
 Mixed-use nodes are areas of slightly higher densities that incorporate multi-story structures combining commercial and residential uses.
-  **Innovation Zone**  
 Innovation Zones support the on-going research and development, light/heavy-manufacturing, as well as low-carbon or net zero-energy office and large-retail uses within the town.
-  **Residential Area (Town)**  
 Residential areas preserve the existing residential neighborhoods within the Town.



## Land Use and Sustainability

Sustainable landscape assessments analyze a series of ecological conditions and trends; natural and human influences; and opportunities for resource conservation, restoration, and development within a defined region or area. The assessment maps potential conservation elements, which are areas of high ecological value; and identifies areas that do not provide essential habitat, that are not ecologically intact or readily restorable, and where development activities can be directed to minimize impacts to important ecosystem values, as well as to enhance the relationships between already developed areas.

# APPENDIX B: STRATEGY IMPLEMENTATION CHART

Issue	Strategy	Ballpark Rankings (see key below)			Possible 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 biodiesel	1 <sup>A</sup>	1	N/A	x			x				x
	2. Limit idling of heavy duty vehicles	1	1	1	x			x		x		x
	3. Limit idling of other vehicles	1	1	1	x			x		x		x
	4. Acquire more fuel efficient government vehicles	2	1	5	x	x	x	x				x
Transportation: Community	1. Electric vehicle charging stations	3	1	5			x	x	x			x
	2. Educate citizens about low-carbon transportation options	2	2	1		x		x		x		x
	3. Improve/expand bicycling infrastructure	1	1	2		x	x	x	x	x		x
	4. Implement bus rapid transit	4	1	5		x	x		x	x		x
	5. Improve/expand pedestrian infrastructure	3	1	5		x	x	x	x	x		x
	6. Increase bus ridership	3	1	5		x		x		x		x
	7. Safe Routes to School program	1	1	3	x	x	x	x		x		x
	8. Provide bikes for daily trips	1	1	2		x	x	x	x	x		x
	9. Transit oriented development	1	1	1		x	x		x	x		x
	10. Electric Vehicles	3	2	2			x	x	x	x		
Energy/Efficiency: Municipal	1. Solar PV installation on Town buildings	3	5	4	x		x	x	x			x
	2. LED streetlights	N/A	1	2	x		x	x	x			x

<sup>A</sup>While there would be no initial investment costs of using B20 biodiesel, conversion to biodiesel would be an annual cost of \$572.09 in increased fuel costs.

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)			Possible Implementation Methods				Additional Benefits			
		Costs (1-5)	GHG Reductions (1-5)	Payback (1-5)	Policy	Program	Capital Projects	Education/ Outreach	Green Job creation	Quality of Life	Water Conservation	Other
Energy/Efficiency: Municipal, Continued	3. Occupancy sensors	1	1	1			x					x
	4. On-demand heating for hot water	1	1	4			x					x
	5. Geothermal heat pump	1	1	4		x	x		x	x		
	6. Retro commissioning/retrofit of Town buildings	2	2	5		x	x	x	x	x	x	x
	7. Reflective roofing	1	1	2			x	x	x	x		
	8. Energy efficient equipment/appliances	N/A	N/A	N/A		x	x	x	x	x	x	
	9. Improved monitoring utility data for Town operations/ buildings	N/A	N/A	N/A	x	x		x	x	x	x	
10. Landfill emissions tracking	N/A	N/A	N/A	x	x		x	x	x			
Energy/Efficiency: Residential	1. Participation in CNY Energy Challenge Team Program	1	1	1		x		x		x	x	x
	2. Promote energy efficiency loans/education at time of sale	3	1	4	x	x		x		x	x	x
	3. Renewable energy for heating: geothermal	3	1	5		x	x		x	x		x
	4. Renewable energy for heating: biomass	2	1	3		x	x		x	x		x
	5. Solar PV installation	3	1	4			x	x	x	x		x
	6. Residential Solar Thermal water heating	2	1	3			x	x	x	x		x
Energy/Efficiency: Commercial	1. Retrofit commercial buildings	4	1	4		x	x	x	x	x	x	
	2. PACE loan program	3	1	4		x	x	x	x	x	x	
	3. Commercial solar PV installation	3	1	5		x	x		x			x
	4. Commercial solar thermal water heating	1	1	3		x	x		x			x
	5. Green/reflective roofing challenge	2	1	3-5		x	x	x	x	x	x	x
	6. Combined heat and power/district energy	N/A	N/A	N/A	x	x	x	x	x			x
Waste	1. Food composting	1	1	N/A	x	x	x		x			x



TOWN OF DEWITT  
5400 BUTTERNUT DR, EAST SYRACUSE, NY 13057  
[WWW.TOWNOFDEWITT.COM](http://WWW.TOWNOFDEWITT.COM)