

CAPITAL

| Region |

Sustainability Plan





Acknowledgements

We would like to thank the following people for their work on the Capital Region Sustainability Plan

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Erik Deyoe
Climate Adaptation Committee Chair

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CENTER FOR ECONOMIC GROWTH

anything's possible™

December 10, 2012

Dear Capital Region Cleaner, Greener Communities Planning Team:

On behalf of the Center for Economic Growth (CEG), I would like to commend everyone who has been involved in the Capital Region's Cleaner, Greener Communities Program.

When I was approached to become involved in the program, I gladly accepted for one fundamental reason: Sustainability is good for business. At CEG, we believe that a company -- and a community -- should plan for the future, be careful with its resources, and operate with a unified vision to maximize its full potential.

The Cleaner, Greener Communities Program in the Capital Region encompasses Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren and Washington counties, a vast area with diverse assets and challenges.

From my perspective, the program provided an opportunity for the Capital Region to evaluate where we are, where we're headed; and where we want to be. Citizens were encouraged to attend public forums and to participate online by posting ideas on virtual sticky notes and through online forums. The process has been open, transparent and participatory.

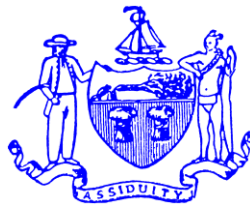
As a result, the sustainability plan sets forth regional goals and metrics to reduce greenhouse gas and improve the energy supply, transportation, water management, waste management, land use, open space, agriculture, housing and economic development in the region.

Since the plan is the first step, CEG also looks forward to supporting regional businesses and communities in a subsequent implementation phase. Continued support throughout the region, therefore, will help to ensure the plan's success.

Again, congratulations on a job well done.

Sincerely,

F. Michael Tucker
President & CEO
Center for Economic Growth



CITY OF ALBANY
STATE OF NEW YORK
OFFICE OF THE MAYOR
12207



GERALD D. JENNINGS
MAYOR

Dear Capital Region Residents:

It is with great pride that the City of Albany and all of the participating elected officials present the residents of our region with the Capital Region Sustainability Plan. This document, a first for our region, provides a roadmap to a sustainable future from our smallest hamlets to our largest cities, from our productive farms to our centers of traditional industry, and to our new hubs of nanotechnology.

When Governor Andrew Cuomo announced his forward thinking of the Cleaner Greener Communities Program late in 2012, I was eager to begin a regional dialogue encouraging cooperation and collaboration in order to create a region where all residents enjoy the highest quality of life, and where future generations will reap the environmental, social, and economic benefits of our collective efforts. It was with this vision in mind that I invited all municipalities within our eight-county region to sit and discuss this Cleaner Greener opportunity.

I am happy to report that there was overwhelming support and enthusiasm for this initiative, and I am proud to provide you with this blueprint that leads us to a sustainable 21st century.

Sincerely,

Gerald D. Jennings
Mayor, City of Albany
Lead Municipality, Capital Region Sustainability Plan

| | | | |
|------------------------|---|----------------|--|
| ADA | Americans with Disabilities Act | LID | Low Impact Development |
| ARRA | American Recovery and Reinvestment Act | LDC | Land Development Corporation Washington County |
| BMP | Best Management Practices | LSWMP | Local Solid Waste Management Plan |
| BRT | Bus Rapid Transit | MGD | Million Gallons per Day |
| C&D | Construction & Demolition Debris | MS4 | Municipal Separate Stormwater Systems |
| CGC | Cleaner Greener Communities | MSW | Municipal Solid Waste |
| CHP | Combined Heat and Power | MW | Megawatt |
| CO₂e | Carbon Dioxide Equivalent | NAAQS | National Ambient Air Quality Standards |
| CNG | Compressed Natural Gas | NOAA | National Oceanic and Atmospheric Administration |
| CNU | Congress for New Urbanism | NRCS | Natural Resources Conservation Service |
| CDTA | Capital District Transportation Authority | NYSERDA | New York State Energy Research and Development Authority |
| CDTC | Capital District Transportation Committee | NYSDEC | New York State Department of Environmental Conservation |
| CDRPC | Capital District Regional Planning Commission | NYSDOT | New York State Department of Transportation |
| CEG | Center for Economic Growth | NYSEG | New York State Electric and Gas |
| COE | U.S. Army Corps of Engineers | OPRHP | Office of Parks Recreation and Historic Preservation |
| DASNY | Dormitory Authority State of New York | PPA | Power Purchase Agreement |
| DOE | U.S. Department of Energy | PPM | Parts Per Million |
| EDC | Economic Development Corporation Warren County | PV | Photovoltaic |
| EV | Electric Vehicle | RPI | Rensselaer Polytechnic Institute |
| FEMA | Federal Emergency Management Agency | TBD | To Be Determined |
| FHWA | Federal Highway Administration | TOD | Transit-Oriented Development |
| FTA | Federal Transit Administration | USDA | U.S. Department of Agriculture |
| GIS | Geographic Information System | USDOT | U.S. Department of Transportation |
| GHG | Greenhouse Gas | USEPA | U.S. Environmental Protection Agency |
| HOV | High-Occupancy Vehicle | USFS | U.S. Forest Service |
| HVAC | Heating, Ventilation, and Air Conditioning | USGBC | U.S. Green Building Council |
| IGCC | International Green Construction Code | USGS | U.S. Geological Survey |
| kW | Kilowatt | WTE | Waste to Energy |
| LED | Light Emitting Diode | WWTP | Wastewater Treatment Plant |
| LEED | Leadership in Energy and Environmental Design | | |



Executive Summary

In 2011, Governor Andrew Cuomo announced the creation of the Cleaner, Greener Communities Program, which focuses on creating more sustainable communities across New York State. The Program, which will be fully developed in two phases, is intended to guide and support integrated, sustainable solutions and improve the quality of life throughout the State. Key goals of the Program are to:

- ✓ Establish sustainable land use policies
- ✓ Guide infrastructure investment
- ✓ Promote sustainable growth

Funding for the Cleaner, Greener Communities comes from the Regional Greenhouse Gas Initiative (RGGI) and is administered by the New York State Energy Research and Development Authority (NYSERDA). Through this Program, NYSERDA will provide up to \$100 million in funding to help New York State communities, businesses and organizations establish sustainability plans and implement smart development practices. The Cleaner Greener Communities Program is also intended to align sustainability efforts with the strategic planning being done by the Capital Regional Economic Development Council (CREDC).

The Capital Region

The Capital Region Sustainability Plan encompasses the eight counties of Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren, and Washington and is home to approximately 1.1 million people. The Capital Region has tremendous assets that define its quality of life including, but not limited to:

- ✓ Continued robust growth in the technology sector.
- ✓ Twenty institutions of higher education.



including several professional and graduate-level programs.

- ✓ Excellent access to all major markets in the Northeast.
- ✓ An abundance of cultural and recreational attractions including Proctors, the Palace Theater, the Saratoga Performing Arts Center, the New York State Museum, numerous parks and historic and heritage areas.

In the last several years, the Capital Region has moved forward on the path of sustainability. The growth of farmers markets; expanded sustainability related curricula in secondary schools and universities; a steady increase in private investment in our cities; expansion of transit systems; an increase in multi-modal related projects; and expanded waste reduction and recycling programs are just a few examples.

Regional Challenges

There are challenges, however, that will continue unless systemic problems are addressed within the framework of regional sustainability. A couple examples of these challenges include the continued loss of farmland (45,000 acres between 2002- 2007) and the significant investment required to address necessary sewer and water improvements (\$2.5 billion as estimated by the NYS Environmental Facilities Corporation) in the Capital Region. In addition, three obstacles must be overcome as the Capital Region works to be more sustainable. These are:

- ✓ **Regional Sustainability “Champion”**
Successful implementation of any plan requires a champion; a person or organization that can promote the plan, educate the public, and monitor and assist with its implementation. Currently there is not an organization in the Capital Region that has the capacity or infrastructure needed to serve as the Plan’s champion. While a regional

planning agency is one option, no single existing planning organization currently serves all of eight counties.

- ✓ **Inter-Municipal Cooperation**

Sustainability does not respect municipal boundaries. Transportation, land use, energy, and climate adaptation challenges, require a holistic regional approach to develop sustainable solutions. While the Capital Region has examples of the types of inter-municipal cooperation that will be needed to implement the Sustainability Plan, additional work in this area will be needed.

- ✓ **Education**

On-going, aggressive regional education about the Sustainability Plan is essential to its success. Municipalities, public and private agencies, business owners, and individuals will all need to understand the benefits of the Sustainability Plan and its implications for the Capital Region.

Planning Process

In response to the Governor’s announcement of the Cleaner Greener Communities Program, in January 2011, twenty-five county and municipal representatives from around the Capital Region came together to discuss the opportunity and unanimously selected the City of Albany to lead the grant proposal development process on behalf of the Capital Region. In an effort to garner region-wide support, all 159 municipalities and eight counties were invited to join the Consortium and twenty accepted the invitation.

Stakeholder Engagement

The planning process was launched in May 2012. The Consortium established an Executive Committee to oversee the planning process and selected a Planning Team to organize and manage the process. Eight Technical Committees were established by



the Executive Committee. The Executive Committee included representatives from each of the eight counties, the chair of each of the eight Technical Committees, and a representative from the Lead Municipality. The Technical Committees consisted of:

- ✓ Climate Adaptation
- ✓ Economic Development
- ✓ Energy
- ✓ Food Systems
- ✓ Land Use and Livable Communities
- ✓ Transportation
- ✓ Solid Waste
- ✓ Water

The Technical Committees undertook a comprehensive process that assessed the existing conditions in the Capital Region, set goals, identified and prioritized strategies, developed implementation plans for these strategies, and identified priority sustainability indicators and targets, while integrating public comments received throughout the process.

In addition to the engagement of the Executive and Technical Committees, a robust plan for broader public engagement was developed and implemented. Opportunities for input included a public website, online survey, Facebook page, Twitter account, and two rounds of public workshops.

Prior to the first round of public workshops, held in July 2012, the Technical Committees met to review baseline data, identify data gaps, and begin to develop regional sustainability goals for each focus area. The first round of public workshop allowed the public to identify examples of sustainability, discuss potential ideas, and develop their vision and goals for the Capital Region. The Technical Committees evaluated information collected at the first round of public workshops, as well as comments collected online, to refine goals and to develop sustainability initiatives.

The second round of public workshops,

completed in October 2012, included presentation of the preliminary sustainability initiatives and refinement and prioritization exercises to determine what was important to the Capital Region. Subsequently, the Technical Committees reviewed workshop and online comments to further refine the prioritization of the initiatives. In November 2012, the Executive Committee met and finalized the prioritized initiatives.

Vision

The Capital Region Sustainability Plan will provide a framework for programs and projects that will reduce air, water and land pollution and improve our quality of life through smart growth and sustainable development. Implementing the Sustainability Plan will result in improved energy efficiency, increased use and availability of renewable energy, reduction of greenhouse gas emissions, and the creation of green job opportunities throughout the Capital Region. This important endeavor will provide a framework for future growth, increase economic competitiveness, improve livability, and enhance the Capital Region's resilience to climate change. The vision includes five key priorities:

- 1 Local government policies and programs that integrate climate change mitigation and adaptation.
- 2 A multi-modal system that includes expanded transit opportunities, a well-developed bicycle and pedestrian infrastructure with continued reduction in single occupancy vehicle miles.
- 3 A comprehensive "Buy Local" program that supports our local farms and locally developed and manufactured goods and services.
- 4 An aggressive campaign to reduce poverty levels and increase employment and housing opportunities for low income and minority populations.
- 5 The creation of vibrant urban centers to reduce development pressure on rural areas.



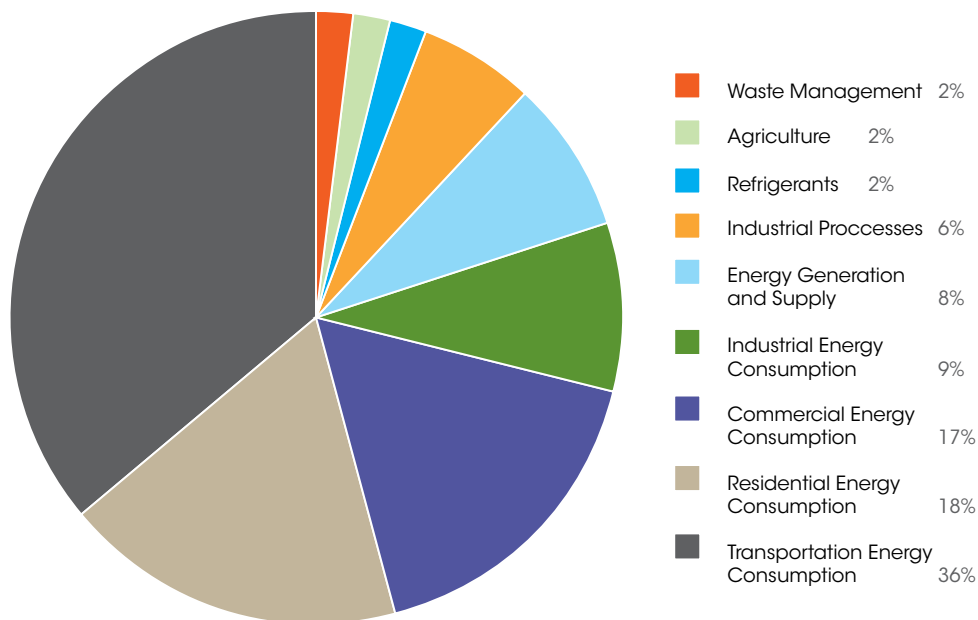
Greenhouse Gas Inventory

As part of the sustainability planning process, a regional greenhouse gas (GHG) emissions inventory was conducted based on a newly developed statewide protocol. In 2010, total GHG emissions in the Capital Region were estimated to be 17.6 million metric tons of carbon dioxide-equivalent (MMT CO_2e). The largest source of GHG emissions for the Capital Region as a whole was mobile energy consumption in transportation. This source, which includes emissions from fuel consumption in on- and off-road vehicles, rail, and marine vehicles, produced 6.27 MMT CO_2e , accounting for 36 percent of total emissions. The majority of this—5.5 MMT CO_2e or 88 percent—was from on-road vehicle fuel consumption. This is a reasonable finding given the Capital Region's location, limited density, and the presence of numerous highways and interstate traffic. The second largest source of emissions was residential energy consumption, which was responsible for 18 percent of total regional emissions (3.14 MMT CO_2e). Residential energy consumption includes the direct use of

heating oil, wood, and natural gas, as well as indirect emissions associated with electricity use. The third largest contributor was commercial energy consumption, producing 18 percent of emissions (2.97 MMT CO_2e), just slightly less than the residential sector. Finally, when including the nine percent of emissions from industrial energy use, stationary and mobile energy consumption contribute 80 percent of total regional GHG emissions, a trend that is consistent with other regional scale inventories, including the inventory profile of the neighboring Mid-Hudson Region of New York.

Given its higher population and activity levels as the Capital of New York and its central location in the state, it is not surprising that Albany County's emissions were the largest portion of the total region at 35 percent. However, on a per capita emissions basis, the greatest contributors were Greene County and Warren County.

Figure 2.1: 2010 Capital Region GHG Emissions by Sector



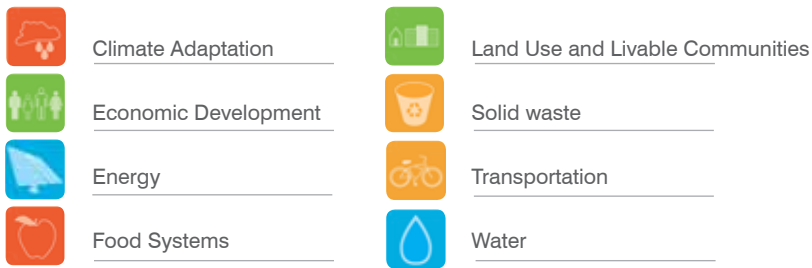
Sustainability Initiatives

The planning process resulted in the Capital Region identifying twenty-seven priority initiatives to promote sustainability. While each of the eight Technical Committees identified three priority initiatives that align with the Focus Area goals, most of the priority initiatives will promote sustainability across multiple focus areas. Of the twenty-seven initiatives, three initiatives were identified as overarching and will be critical to successful implementation of the Sustainability Plan. These overarching initiatives will have an impact on every initiative included in the Sustainability Plan.

Table 1 provides a summary of the twenty-seven priority initiatives. Additional information on each priority initiative, including responsible parties, potential partners, relevant cost, available funding sources and governance recommendations, can be found in Sections 4 through 12.



Table E1 Summary of Priority Initiatives



| Initiative | Implementer | Partners | Preliminary Cost* | Climate Adaptation | Economic Development | Energy | Food Systems | Land Use and Livable Communities | Solid waste | Transportation | Water |
|--|--|---|-------------------|--------------------|----------------------|--------|--------------|----------------------------------|-------------|----------------|-------|
| Overarching Initiatives | | | | | | | | | | | |
| Establish Regional Sustainability Coordinator to support Plan implementation | Center for Economic Growth | <ul style="list-style-type: none"> Local Governments State Agencies Regional Green Alliance | \$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Establish regional green alliance to promote the Sustainability Plan throughout the Capital Region. | Center for Economic Growth | <ul style="list-style-type: none"> Local Governments Community Loan Fund Capital District Regional Planning Commission (CDRPC) Lake George-Lake Champlain Regional Planning Board Capital Region Economic Development Council Capital District Transportation Committee | \$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Develop regional sustainability website to provide centralized information about sustainability in the Capital Region. | Center for Economic Growth | <ul style="list-style-type: none"> Local Governments Regional and State Agencies | \$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Climate Adaptation | | | | | | | | | | | |
| Promote the use of green infrastructure in new construction and major retrofits. | Local governments | <ul style="list-style-type: none"> Albany County Stormwater Coalition | \$ | ✓ | | | | ✓ | | | ✓ |
| Complete local climate vulnerability assessments and adaptation planning to assess impact of climate change. | Local governments | <ul style="list-style-type: none"> Climate Smart Communities Regional Coordinators | \$ | ✓ | ✓ | | | ✓ | | | ✓ |
| Develop a guidance document on how to integrate climate change impacts into existing planning documents and local government approval processes. | State, local governments or non-profit | <ul style="list-style-type: none"> The Environmental Clearinghouse Climate Smart Communities Regional Coordinators | \$ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |









* \$ =<\$100,000; \$\$=\$100,000 to \$500,000; \$\$\$=>\$500,000













| Initiative | Implementer | Partners | Preliminary Cost* | | | | | | | |
|--|--|--|-------------------|---|---|---|--|---|--|---|
| Economic Development | | | | | | | | | | |
| Strengthen regional small business support programs to improve efficiency, effectively share resources, and reduce regional redundancies. | Capital Region Economic Development Council | <ul style="list-style-type: none"> • Center for Economic Growth (CEG) • Empire State Development • County IDA's • Chamber of Commerce • Economic Development Corporation • Community Loan Fund of the Capital Region | \$\$ | ✓ | ✓ | ✓ | | | | |
| Support expansion of land banking through existing and new mechanisms. | County-Municipal Partnerships | <ul style="list-style-type: none"> • Empire State Development • Local Governments • County IDA's | \$\$\$ | ✓ | ✓ | | | ✓ | | |
| Expand support of green jobs training programs to include green infrastructure design and maintenance. | Center for Economic Growth | <ul style="list-style-type: none"> • Adirondack Community College • Schenectady Community College • Hudson Valley Community College • Columbia Greene Community College • Capital District BOCES | \$\$ | ✓ | ✓ | ✓ | | | | |
| Energy | | | | | | | | | | |
| Establish energy efficiency and renewable energy financing districts (or PACE program). | County level or multiple municipalities/ counties | <ul style="list-style-type: none"> • Municipalities – Town, Village, and County • NYSERDA and/or NYSDEC • 3rd Party Financing Entity • NYS Homes and Community Renewal • Local Housing Authorities | \$\$\$ | ✓ | ✓ | ✓ | | | | ✓ |
| Establish a revolving energy efficiency improvement fund for local businesses to supplement NYSERDA's Green Jobs/ Green New York Program. | Capital District Regional Planning Commission (CDRPC) or non-profit partnership between financial entity and municipality(ies) | <ul style="list-style-type: none"> • CDRPC • Municipalities • Banks • Chambers of Commerce • Center for Economic Growth • Community Loan Fund of the Capital Region | \$\$ | ✓ | ✓ | ✓ | | ✓ | | |
| Adopt a local energy-efficient building code that would exceed the NYS Energy Construction Code to improve the efficiency of buildings in all sectors. | Local government (whichever level enforces building code) | <ul style="list-style-type: none"> • NYS Builders Association • Local Developers • Building Performance Contractors Association | \$ | ✓ | ✓ | ✓ | | | | |



| Initiative | Implementer | Partners | Preliminary Cost* |  |  |  |  |  |  |  |  |
|---|---|--|-------------------|---|---|---|---|---|---|---|---|
| Food Systems | | | | | | | | | | | |
| Create a food hub for regional food processing, storage, and distribution of locally produced food products. | Capital District Community Gardens and Regional Food and Agricultural Coalition | <ul style="list-style-type: none"> Capital District Cooperative, Inc. Capital District Community Gardens USDA Distributors Food Service Corps Institutions/Hospitals Skidmore College SUNY Albany Cornell Cooperative Extension Farmers Economic Development Stakeholders County IDAs | \$\$\$ | ✓ | | ✓ | ✓ | | | ✓ | |
| Re-establish a regional food and agricultural coalition for the Capital Region to identify needs, gaps, and advocate for the agricultural sector. | Capital District Community Gardens | <ul style="list-style-type: none"> Local governments or elected officials Emergency Food provider; USDA Statewide food policy council Farm Bureau American Farmland Trust Northeast Organic Farm Association Cornell Cooperative Extension (Farm and Nutrition) Local food and public health leaders Urban representatives (such as the Affordable Housing Partnership) Skidmore College and other higher education institutions | \$ | ✓ | | ✓ | ✓ | | | ✓ | |
| Establish an initiative to create/increase "local food" transactions, to encourage the Capital Region's grocery stores, restaurants, residents, and institutions to purchase local food from the Capital Region's farms. | Capital Region Economic Development Council | <ul style="list-style-type: none"> Grocery store chain owners and managers Cornell Cooperative Extension Regional Food and Agricultural Coalition Restaurant owners Local government officials and planning staff | \$\$ | ✓ | | ✓ | | | | ✓ | |



| Initiative | Implementer | Partners | Preliminary Cost* |  |  |  |  |  |  |  |  | |
|---|---|---|-------------------|---|---|---|---|---|---|---|---|--|
| Land Use and Livable Communities | | | | | | | | | | | | |
| Modify local codes and regulations to encourage form based codes, provisions for walkable communities, green infrastructure, green buildings, and other sustainable strategies. | Any municipality | <ul style="list-style-type: none"> Metropolitan Planning Organizations (MPOs) and regional planning agencies (CDTC,A/GFTC, CDRPC) County Planning departments, Department of Health Community gardens and citizen groups Could involve multiple communities working together Developers and large property owners | \$ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| Repair and modernize existing infrastructure including water, sewer, parks, transportation, and telecommunications in existing population centers. | Local governments, regional coalitions, Sewer districts | <ul style="list-style-type: none"> Local governments Regional coalitions Sewer districts | \$\$\$ | ✓ | ✓ | ✓ | | ✓ | | | ✓ | |
| Develop a regional greenway connectivity plan to bring together existing trail and greenway plans and support their completion. | Local/County government, Coalition | <ul style="list-style-type: none"> MPOs NYS Department of Transportation (NYSDOT) NY Parks and Trails Local advocacy groups | \$\$\$ | ✓ | | | | ✓ | | ✓ | | |
| Solid Waste | | | | | | | | | | | | |
| Improve and increase composting options through a combination of backyard composting, community scale composting, and the expansion of leaf and yard waste composting facilities. | Municipalities or Local Solid Waste Planning Units | <ul style="list-style-type: none"> Institutions, Non-profits, and Private companies | \$\$ | | | ✓ | | | | ✓ | ✓ | |
| Adopt C&D waste reduction and recycling policies at the local level. | Municipalities | <ul style="list-style-type: none"> Private developers and facility operators to develop additional C&D recycling facilities as needed | \$ | | | | | | | ✓ | ✓ | |
| Site and develop anaerobic digestion facilities that can accept food waste and other biosolids to generate energy. | Municipalities or other Local Government Entities | <ul style="list-style-type: none"> Private facility owners or operators | \$\$\$ | | | ✓ | | | | ✓ | | |



| Initiative | Implementer | Partners | Preliminary Cost* |  |  |  |  |  |  |  |  |
|---|--|---|-------------------|---|---|---|---|---|---|---|---|
| Transportation | | | | | | | | | | | |
| Implement a bicycle and pedestrian infrastructure improvement program to create new connections and eliminate gaps between existing trails, sidewalks, and bicycle facilities. | Municipalities (especially across municipal boundaries), counties, state agencies, and other agencies such as CDTC and CDTA. | <ul style="list-style-type: none"> Community groups Businesses Developers, etc. | \$\$ | ✓ | | ✓ | | ✓ | | ✓ | |
| Improve transit service through technology improvements to include items such as signal priority, signal optimization, off board fare collection, vehicle tracking systems, and smart card fare media. | Transit Agencies throughout the region | <ul style="list-style-type: none"> Municipalities and NYSDOT | \$\$\$ | | ✓ | ✓ | | ✓ | | ✓ | |
| Optimize transportation system through alternative street design and advanced signal technology to improve travel flow, reduce travel times, and make communities more attractive for walking, biking, and transit. | Municipalities, NYSDOT, transit agencies, counties | <ul style="list-style-type: none"> Development community Community organizations Non-profits | \$\$ | | | ✓ | | ✓ | | ✓ | |
| Water | | | | | | | | | | | |
| Complete asset management plan for water & sewer systems include inventory and assessment, capital improvement plans, and educational plans. | System owner | <ul style="list-style-type: none"> State Health Dept. County Health Dept. Professional Organizations Watershed coalitions* Combined Sewer Overflow (CSO) interests NYS Department of State (NYSDOS) | \$\$ | ✓ | | | | ✓ | | ✓ | |
| Develop small grant program for innovative water quality projects that can be implemented at the local level. | Water quality committees or soil & water conservation districts | <ul style="list-style-type: none"> NYSDEC NYSDOS Regional planning commission Water and sewer districts Darrin Freshwater | \$ | ✓ | | | | ✓ | | ✓ | |
| Watershed assessments for stormwater management that includes inventory and assessment of existing drainage systems and identifies measures to mitigate water quality issues. | Counties, coalitions, colleges and universities | <ul style="list-style-type: none"> Stormwater coalitions Soil and water conservation districts | \$\$ | ✓ | | | | ✓ | | ✓ | |



Sustainability Targets and Indicators

An important aspect of implementing the Sustainability Plan is establishing metrics which will track progress towards achieving goals. To that end, twelve indicators will be used to evaluate the Capital Region's success in implementing the Sustainability Plan in coming years. Table 2 identifies the indicators, the current baseline measurement and a target. Additional information on the targets and indicators can be found in Section 13. Annual monitoring of the baseline and comparing it to the targets is essential in understanding the impact the initiatives are having in helping the Capital Region become more sustainable.

Next Steps

Phase II provides up to \$90 million towards regional projects that support the regional sustainability goals identified during the planning process. Phase II is expected to launch in 2013.

Furthermore, coordination between the Executive Committee and the CREDC will continue to ensure that the Sustainability Plan and the CREDC's Strategic Plan support and complement each other for the benefit of the Capital Region.

Table E2 Sustainability Targets and Indicators

| Proposed Indicator | Current Baseline | Plan Target |
|---|---|---|
| Annual Regional Energy Consumption Per Capita (Million British Thermal Units (MMBtu)) | 225 MMBtu/Capita | Reduce per capita energy consumption 20% by 2020 |
| Annual Waste Disposal Per Capita | Total Waste: 1.22 tons/ capita/year Municipal Solid Waste: 0.72 tons/ capita/ year. | Reduce per capita disposal of MSW to 0.11 tons/capita/ per year by 2030. |
| Annual Agriculture - Farm Production Dollars) | \$31.6 million | Increase by 30% by 2025 |
| Per Capita Land Consumption | 0.000276 square miles/capita | Reduce by 5% by 2030 |
| Total Annual Water Permit Notice of Violations (Number) | Approximately 593 violations/yr over past 5 years | 40% reduction by 2020; 0 permit violations by 2030 |
| Housing + Transportation Index | Current baseline: Household H & T > 45%: 225,033 (66.5%) | Reduce percent of households with H & T >45% 10% by 2030 |
| Percent of Passengers Traveling by Mode | Single Occupancy Vehicle (SOV): 79.7% | Reduce SOV miles 25% by 2030 |
| Annual Vehicle Miles Traveled (VMT) Per Capita | 11,593 miles/capita | Reduce VMT per capita 20% by 2030 |
| Annual Median House-hold (MHH) Income, Families Below the Poverty Line, Population Below the Poverty Line | MHH: \$55,683 Families below poverty level: 6.71%: Population below poverty level: 10.62% | Increase MHH 3% above rate of inflation by 2020; Reduce total population and number of families below the poverty line 50% by 2020 |
| Economic Value of Property Vulnerable to Flooding | \$10.8 Billion | Maintain current level through 2030 |
| Number of Climate Smart Communities within Region. | 16 | Increase by 25% annually |
| Greenhouse Gas emissions per capita (metric tons of CO2 equivalent per person) | 16.3 MTCDE (Metric Tons of Carbon Dioxide Equivalent) per capita | 12 MTCDE per capita by 2020 |



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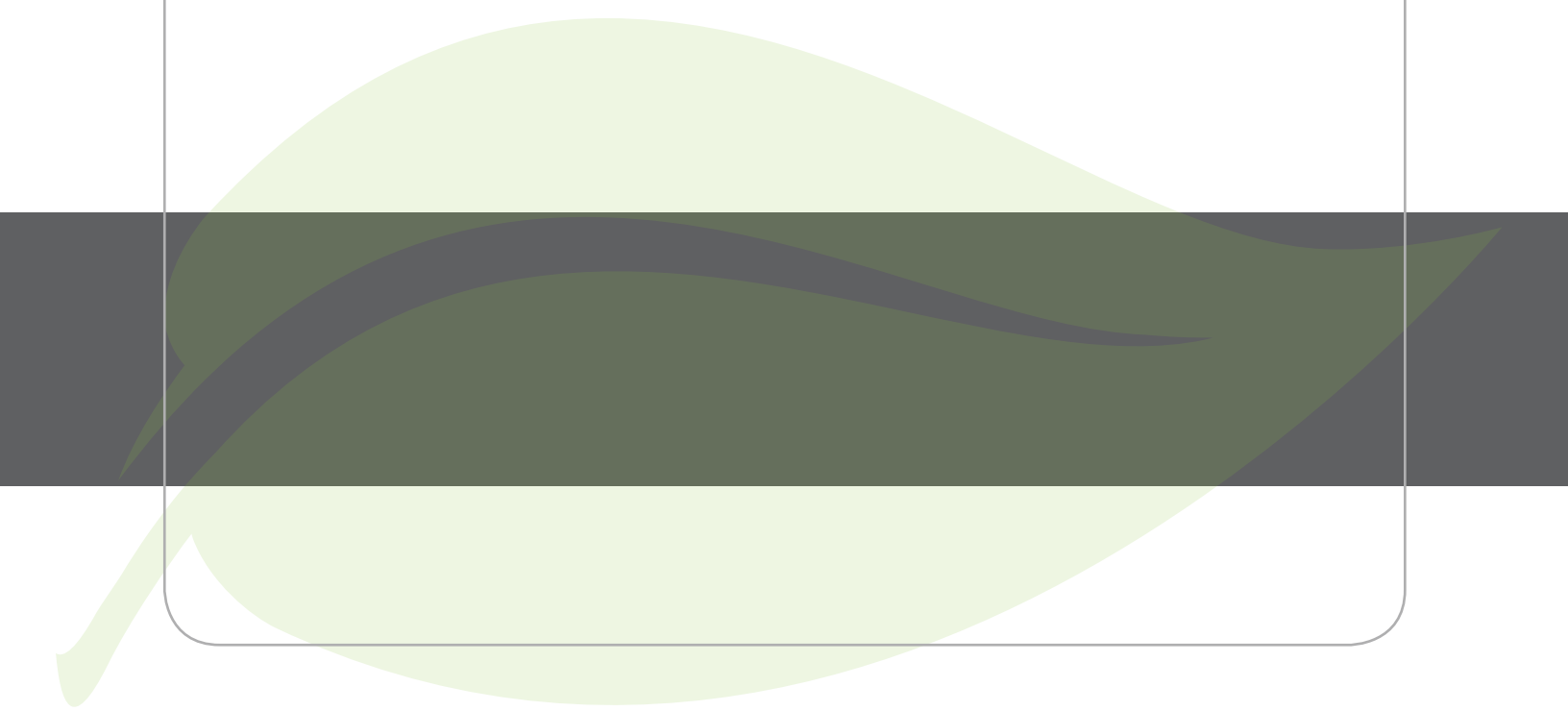
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Section 1.0
Introduction



Agricultural fields in Rensselaer County



SECTION 1.0: **Introduction**

About the Cleaner, Greener Communities Program

The Cleaner, Greener Communities Program was announced by Governor Andrew M. Cuomo in his 2011 State of the State address. The Program empowers regions to create more sustainable communities by funding smart development practices. Planning teams are partnering with public and private experts across a wide range of fields, along with community residents, to lead the development of regional sustainability plans and to implement the projects that will significantly improve the economic and environmental health of their areas. This effort will guide integrated, sustainable solutions—from statewide investments to regional decision-making on land use, housing, transportation, infrastructure, energy, and environmental practices—to improve our quality of life.

Funding for Cleaner, Greener Communities comes from the Regional Greenhouse Gas Initiative (RGGI) and is administered by the New York State Energy Research and Development Authority (NYSERDA). NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise and funding to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce their reliance on fossil fuels.

Through this Program, NYSERDA committed \$100 million in funding to help New York's 10 regions establish sustainability plans and adopt smart development practices. NYSERDA designed a two-phase competitive grant process to disseminate these funds:



Phase I provided nearly \$10 million in funding to regional planning teams to create comprehensive sustainability plans or to expand the scope of existing sustainability plans. Up to \$1 million per region was awarded. Grants were awarded to a municipality (county, city, town, village within New York State), acting on behalf of a consortium of other municipalities located in one of the 10 Regions defined by the Regional Economic Development Council (REDC).

Phase II will provide up to \$90 million toward regional projects that support the regional sustainability goals identified during the planning process, provide the greatest opportunity to reduce greenhouse gas emissions, save energy and deploy renewable energy, and improve the economic and environmental health of our communities. Phase II is expected to launch in 2013.

The Capital Region

The Sustainability Plan defines the Capital Region as the eight counties of Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren, and Washington.

Current State of the Capital Region

The Capital Region of New York includes 159 municipalities, including 10 cities and 43 villages and is home to approximately 1.1 million people. It is a geographically and culturally diverse region with tremendous assets.

The Capital Region offers excellent access to all major markets in the Northeast. It is approximately a three hour drive to New York City, Montreal, and Boston. Its location also means products manufactured in the Capital Region are within one day's delivery time of 52% of the combined U.S. and Canadian populations.

The Capital Region is well served by its multi-modal transportation system.

Situated at the crossroads of three major interstate corridors, I-90, I-88 and I-87, the Capital Region is well connected in all directions. The Hudson River, Erie and Champlain Canals, the Port of Albany, and several smaller port facilities offer extensive water access. The Capital Region boasts a modern international airport and is served amply by both passenger and freight rail.

The Capital Region is home to 20 institutions of higher education, including several professional and graduate-level programs. These institutions educate an average of 67,000 students annually.

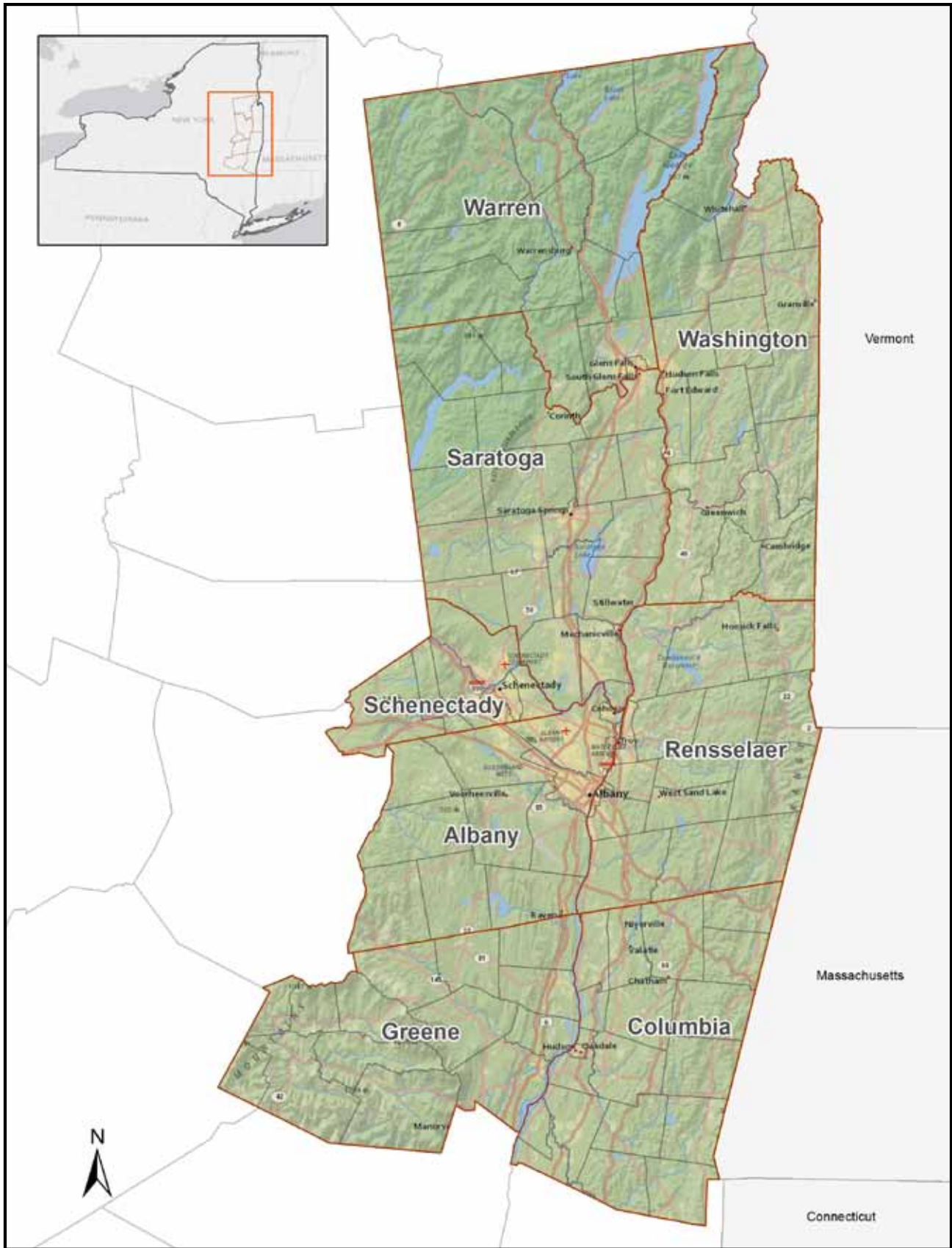
The Capital Region also has an abundance of cultural attractions including Proctors, the Palace Theater, the Saratoga Performing Arts Center, the New York State Museum, and numerous historic and heritage areas. In addition to arts and cultural institutions, the Capital Region is home to world-renowned tourist attractions including Saratoga Springs, Lake George, the Erie Canal and Erie Canalway Trail.

In recent years, the Capital Region has welcomed economic growth in the area of technology. The College of Nanoscale Science and Engineering, located at the University at Albany, currently houses several initiatives designed to advance nanotechnology research and application in the energy and environmental industries. General Electric has located its Renewable Energy Headquarters and Advanced Sodium Battery Plant at the Main Plant in Schenectady bringing cutting edge renewable energy technology to the Capital Region. The establishment of the Global Foundries microchip fabrication plant and the relocation of SEMATECH and the International Sematech Manufacturing Initiative (ISMI) to the Capital Region are likely to attract many semiconductor companies and create additional jobs in the Capital Region.

These collective assets contribute to a strong economy and a high quality of life in the Capital Region. Further, listed below are a few highlights of the Capital Region's current actions towards a more sustainable future.



Figure 1.1 The Capital Region





With its innovative glycol collection system and its fleet of alternative fuel vehicles, Albany International Airport is actively making strides to become more sustainable.

Farmers' Markets

The Capital Region has seen a steady growth in the number and size of farmers markets. Each weekend more than fifty farmers' markets can be found throughout the Capital Region, providing access to fresher, healthier local produce and promoting a buy local attitude.

Education

The Capital Region's community colleges and the Capital District BOCES (Board of Cooperative Education Services) have all incorporated sustainability into their curricula.

Downtown Revitalization

Private investment in cities has been steadily increasing. The City of Saratoga Springs boasts a thriving mixed use downtown. The Schenectady downtown has seen a significant commercial turn around in recent years. The downtowns in Albany and Troy are beginning to see a stronger residential market, reversing a decades long trend.

Small Business Resources

The Community Loan Fund of the Capital Region, along with a number of other county economic development agencies, has

increased its small business lending, training and financial literacy programs targeted at low income, minority, and women business owners.

Infrastructure Improvements

The Capital District Transportation Committee (CDTC) has funded a total of 73 projects, supported by \$4.7 million in federal, state and local funds, under its Linkage Program and is continuing to develop a Bus Rapid Transit system through the Central Avenue and Western Avenues corridors in Albany.

Eliminating Waste

Waste reduction and recycling program implementation and the development of a private single-stream recycling facility in South Albany has resulted in a significant reduction in landfill waste.

Protecting Open Space

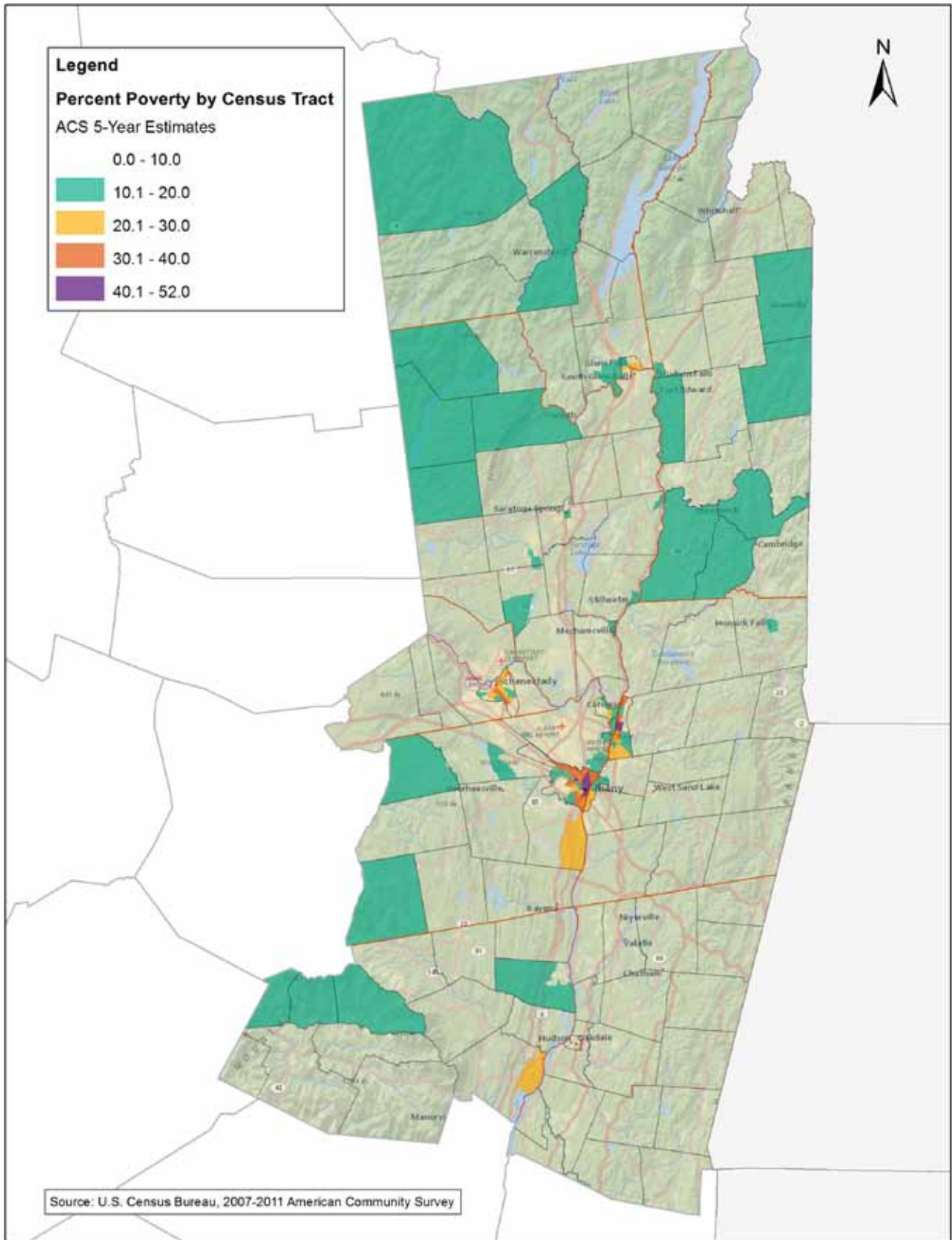
The Capital Region is home to 24 state parks and historic sites with a combined annual attendance of over 4 million.

Taking Action Against Climate Change

Sixteen communities in the Capital Region have taken the Climate Smart Communities Pledge and



Figure 1.2 Poverty Concentration



are currently taking action to reduce greenhouse gas emissions and become more resilient to a changing climate.

These examples demonstrate a strong foundation towards a more sustainable future, but challenges still remain. The most prevalent challenges to sustainability in the Capital Region are population growth, sprawl outside of the urban centers, and a high dependence on public sector jobs.

Moreover, despite recent economic downturns nationally, the Capital Region continues to see an increase in population. From 2000 to 2010 the Capital Region was the second fastest growing region in the state, with a growth rate of 4.8%.

The Capital Region has also experienced significant urban sprawl since the 1950's. Demonstrated by the steady population growth in suburban and exurban areas. This sprawl has resulted in the extension of roads and infrastructure, new and expanded schools, and increased municipal workforce, all of which increase municipal operating costs. In contrast, almost all of the Capital Region's cities and villages (with the City of Saratoga Springs being the most prominent exception) have experienced diminishing property values, loss of essential businesses, vacant buildings and abandoned properties.

The Sustainability Plan seeks to address this challenge by promoting reinvestment in the urban cores as well as the rural communities and an enhancement of the availability of services and economic opportunities to the underserved populations. Furthermore, the presence of the large base of public sector jobs provides a stable economy but the heavy dependence upon these positions places the Capital Region in a disproportionately vulnerable position when reductions to the state workforce occur.

A sustainable Capital Region will have a greater diversity of employment opportunities

including those in the expanding green jobs sector. To offer a more diverse set of employment opportunities, the Capital Region must also begin to sufficiently train its workforce to meet the needs of the existing and emerging industries.

By the Numbers

The Capital Region has and will continue to be challenged on a variety of fronts.

\$2.5 billion - the estimated cost of improvements to water and sewer infrastructure in the Capital Region, according to the NYS Environmental Facility Corporation.

45,000- the acres of farmland that were lost between 2002 and 2007.

16- the number of municipalities in the Capital Region that are near the top in New York for per capita debt.

Some of the Capital Region's challenges were exemplified in a 2008 Brookings Institute report that studied the nation's 100 biggest metro areas, which includes the Albany-Schenectady-Troy Metropolitan Statistical Area (MSA).

- ✓ The share of all families considered middle-class fell by 9.2 percentage points between 1970 and 2005. Over the same period of time, the middle-class share dropped by an average of 10.7 percentage points in the 100 largest metros and 8.4 percentage points in the U.S. as a whole.
- ✓ The average resident emitted 2.524 metric tons of carbon from residential and transportation energy consumption in 2005. Emissions in the 100 largest metros averaged 2.235 metric ton per capita while the U.S. per capita carbon footprint equaled 2.602 metric tons.
- ✓ Total vehicle miles travelled (VMT) from passenger and freight vehicles amounted to 10,983 per capita in 2005. The 100 largest metros and the nation as a whole recorded 9,079 miles per capita and



10,083 miles per capita, respectively.

- ✓ Between 1980 and 2000, the Albany metro area consumed 4.68 acres of rural land—areas with less than one housing unit per 40 acres—for every new housing unit built, more than the 99-metro average of 0.90 rural acres per new housing unit.

Moreover, there are three obstacles that will need to be overcome as the Capital Region works to be more sustainable. These are:

- ✓ Regional Sustainability “Champion”—Successful implementation of any plan requires a champion; a person or organization that can promote the plan, educate the public, and monitor and assist with its implementation. Currently there is not an organization in the Capital Region that has the capacity or infrastructure needed to serve as the champion for the Capital Region Sustainability Plan. Both the Center for Economic Growth and the Capital Region Economic Development Council serve all eight counties. However, both are focused on economic development, which is only one element of the Sustainability Plan.

Neither organization is currently structured to effectively act as a champion for all aspects of the plan.

While a regional planning agency could be an option, no single planning organization serves the entire eight county regions. For example, The Capital District Regional Planning Committee (CDRPC) focuses on the Albany, Schenectady, Troy and Saratoga Counties. Similarly, Warren and Washington counties are served by the Lake George-Lake Champlain Regional Planning Board and Columbia and Greene Counties are not part of a regional planning organization.

- ✓ Inter-municipal Cooperation—Sustainability does not respect municipal boundaries. Addressing transportation, land use, energy, and climate adaptation

challenges requires a holistic regional approach to develop sustainable solutions. To that end, inter-municipal cooperation is critical to successfully implement the Sustainability Plan. A study by the Office of State Comptroller (OCJ, 1994) regarding inter-municipal cooperation indicates the Capital Region falls roughly in the middle statewide for all regions with respect to inter-municipal cooperation.

The report states the inter-municipal cooperation has been a challenge because *“a simple lack of trust between the potential partnering communities can stand in the way of cooperation efforts. This may be brought on by a perception that one community will be taken advantage of...Personalities and disputes between local officials in neighboring communities can hamper cooperation efforts as well. Inexperience and a lack of legal knowledge also threaten cooperation by discouraging even an initial exploration of opportunities.”*

- ✓ Education—On-going, coordinated regional education about the Sustainability Plan and its goals and initiatives is essential to its success. Municipalities, public and private agencies, business owners and individuals will all need to understand the benefits of the Plan and its implications for the Capital Region. The education program, which would be spearheaded by the Regional Sustainability Champion, will also need to help overcome misconceptions about sustainability including ...it’s just about the environment...it results in a loss of property rights....it cost more.... it results in a lower standard of living..., etc.

What the Sustainability Plan Does

The Sustainability Plan provides a framework for programs and projects that will reduce air, water and land pollution and improve our quality of life through smart growth and sustainable development. In addition, the Sustainability Plan guides work to improve



Capital District Sustainability Planning Consortium

| | | |
|---|-------------------------|--------------------------|
| Capital District Regional Planning Commission | Albany County | City of Rensselaer |
| Capital District Transportation Committee | Town of Bethlehem | Rensselaer County |
| Warren County Economic Development Council | Town of Clifton Park | Saratoga County |
| Capital District Transportation Authority | City of Cohoes | City of Saratoga Springs |
| Adirondack/Glens Falls Transportation Council | Town of Colonie | City of Schenectady |
| City of Albany | Town of Glenville | Schenectady County |
| | Village of Green Island | City of Troy |
| | Town of Guilderland | Warren County |
| | Village of Lake George | Washington County |
| | Town of Niskayuna | City of Watervliet |

energy efficiency, promote renewable energy, reduce greenhouse gas emissions, and create green job opportunities throughout the Capital Region. This is an important endeavor that provides a framework for future growth, increases economic competitiveness, improves livability, and enhances resilience to climate change.

Specifically, the Sustainability Plan:

Provides policy guidelines for encouraging reinvestment in the urban cores as well as suburban and rural communities.

Discusses methods to increase the availability of services and economic opportunities to underserved populations.

Makes recommendations for creating greater diversity of employment opportunities including those in the expanding green jobs sector.

Considers how to sufficiently train its workforce to meet the needs of the existing and emerging industries.

Addresses changes to the regional public transportation system that will allow for

increased employment levels and equity as well as as decreased dependency on automobiles.

Identifies ways for the Capital Region to maintain its position as a leader in the technology sector, including methods to attract and support established and emerging research and development facilities.

Provides a framework to keep recent college graduates in the Capital Region.

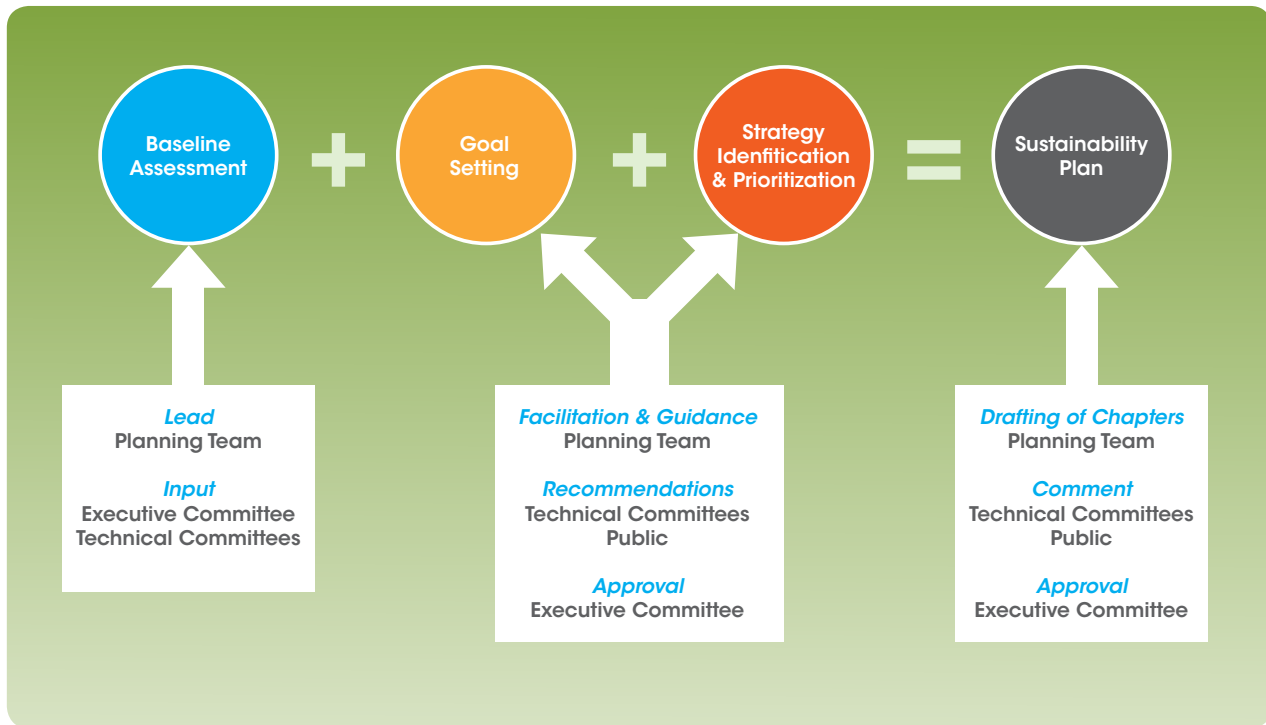
Highlights opportunities for the Capital Region to thrive in a new economy that creates sustainable jobs.

Positions the Capital Region as a national hub of sustainability.

As the state capital and in concert with the governor's mission to implement the New NY Works agenda the Capital Region is well positioned to link its economic opportunities with the creation of sustainable communities where people want to live, work, and play.



Figure 1.4 Planning Process



Capital Region Sustainability Planning Consortium

In response to the governor’s 2011 announcement of the Cleaner Greener Communities program, the City of Albany contacted every county and municipality in the eight-county Capital Region to discuss a response to the opportunity. On October 3, 2011, approximately 25 county and municipal representatives from around the Capital Region came together to discuss the opportunity and unanimously voted for the City of Albany to lead the grant proposal development process on behalf of the Capital Region. As part of the proposal, a governance structure was established for the program, which included a Regional Consortium to guide the overall process. In an effort to garner region-wide support, all 159 municipalities and eight counties were contacted about joining the Consortium twice prior to submission of the grant application. By the time the grant was submitted the Consortium consisted of 26 members.

Once the Consortium was successful in securing a grant through the Cleaner Greener Communities Program in early 2012, it undertook an effort to secure a team to provide the technical expertise in sustainability planning. By spring of 2012, the Consortium had selected a Planning Team and they were tasked with organizing the planning process and implementing the vision of the Consortium.

Working with the City of Albany acting as a Lead Municipality for the Consortium, the Planning Team developed and refined the overall process for the Sustainability Plan as well as the governance structure for the process.

Executive Committee

The Sustainability Plan was overseen by an Executive Committee, which consists of one representative from each county within the Capital Region, the chair of each of the eight Technical Committees, and the City of Albany as the lead municipality.



The primary responsibilities of the Executive Committee are:

- ✓ **Oversee planning process**
- ✓ **Encourage municipal involvement**
- ✓ **Promote public engagement opportunities**
- ✓ **Provide final approval of sustainability strategies**

The Executive Committee meetings were convened and moderated by the Planning Team in May, August and October of 2012. The May meeting established the structure for the planning process, discussed goals of the Cleaner Greener Communities program, finalized the schedule, and reviewed the structure and responsibilities of the Technical Committees. The August meeting, was a conference call to review and discuss in more detail the evaluation criteria that were identified to guide the goal setting and initiative identification process by the Technical Committees. At the October 2012 meeting, the Executive Committee reviewed public input gathered to date and the work of the Technical Committees and finalized the list of recommended priority sustainability initiatives.

Technical Committees

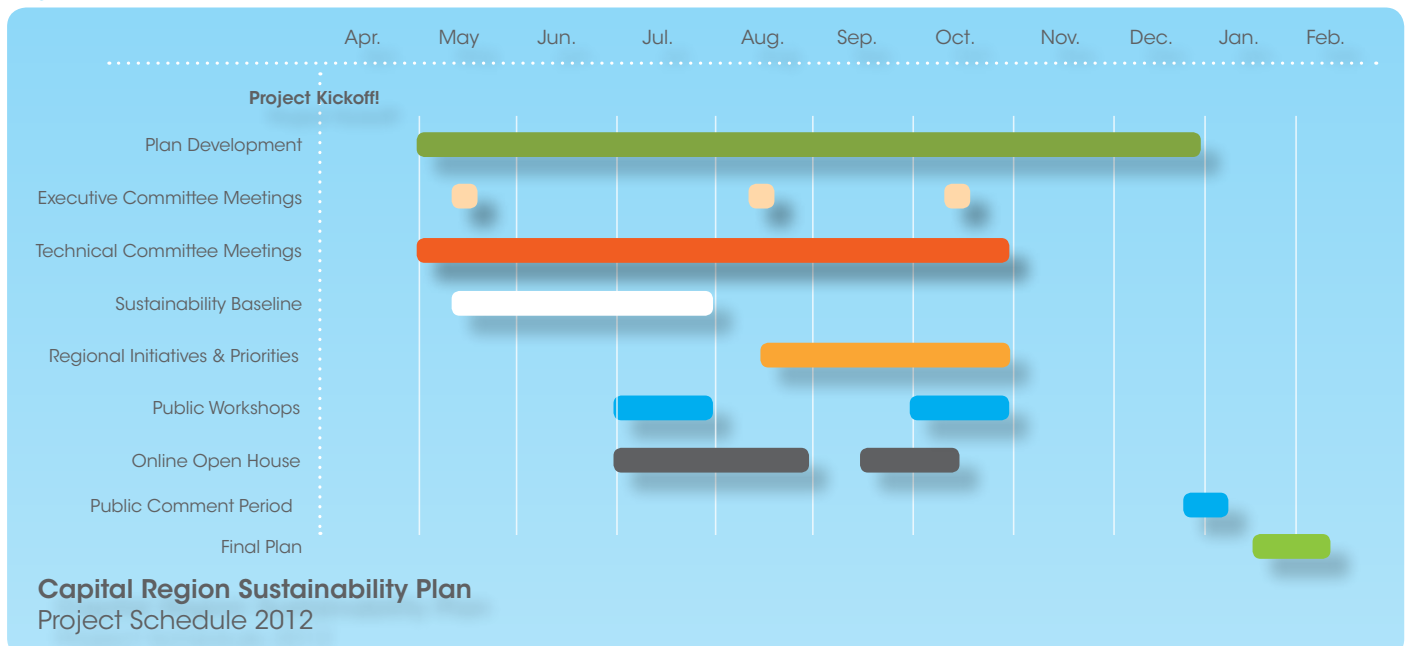
The majority of the work on the Sustainability Plan was completed by the eight Technical Committees, which were established around the following focus areas:

- ✓ **Climate Adaptation**
- ✓ **Economic Development**
- ✓ **Energy**
- ✓ **Food Systems**
- ✓ **Land Use & Livable Communities**
- ✓ **Solid Waste**
- ✓ **Transportation**
- ✓ **Water**

Each Technical Committee had between 15 and 25 members with a broad geographic representation. Technical Committee membership represented a mix of municipal, county, and state agencies, public and private higher education institutions, private industry and not-for-profit agencies. Members were solicited based on their experience and leadership in the Capital Region related to the specific focus area.

Primary responsibilities of the Technical Committees included:

Figure 1.5 Project Timeline



- ✓ Review Regional baseline assessment
- ✓ Develop goals
- ✓ Identify and prioritize sustainability initiatives
- ✓ Confirm implementation strategies for priority initiatives

A member of the Planning team served as the technical support lead for each Technical Committee. The Planning Team member's role was to schedule and facilitate meetings, document the work of the committee, and prepare the narrative that will form the basis of the Sustainability Plan. Technical Committees met three times between June and October of 2012, with their work outlined in the planning process described here.

Vision

Engagement with the Executive Committee, the Technical Committees and the public

- ✓ State and local government policies and programs that integrate climate change mitigation and adaptation.
- ✓ A multi-modal system that includes expanded transit opportunities, a well-developed bicycle and pedestrian infrastructure with continued reduction in single occupancy vehicle miles.
- ✓ A comprehensive "Buy Local" program that supports our local farms and goods and services developed and manufactured locally.
- ✓ An aggressive campaign to reduce poverty levels and increase employment and housing opportunities for low income and minority populations.
- ✓ The creation of vibrant urban centers that in turn will reduce urban sprawl by limiting development pressure on rural areas.

helped shape a vision for the Sustainability Plan. There were several common themes that came out of this integrated process and are summarized in the vision for the Capital Region which includes five key points:

Planning Process

The Sustainability Plan was developed through a comprehensive process that consisted of assessing the current conditions in the Capital Region, setting goals, identifying and prioritizing strategies, developing implementation plans for these strategies, and identifying priority sustainability indicators and targets in each of the eight focus areas.

Baseline Assessment

A baseline assessment was conducted for each of the eight focus areas that comprise the Sustainability Plan. The baseline assessment provides an overview of the existing conditions and issues associated with each focus area and identifies where there may be gaps in achieving sustainability.

The assessment includes economic, demographic, infrastructure, energy, and other data from the U.S. Census; regional, state, and federal agencies; academic institutions; and regional, state and national organizations. The baseline assessment information was presented at the first round of Technical Committee meetings.

Goal Setting

Each Technical Committee discussed and established goals related to how sustainability could be achieved in their respective focus area. These goals became the foundation for discussions with the technical committees and the public related to the identification of sustainability initiatives.

Identification and Prioritization of Regional Initiatives

Using the baseline assessment as a foundation and the goals as guidance, each technical committee considered current and projected actions that could be implemented to achieve these goals. Ideas generated from the Technical Committees and the public were organized into up to ten strategic initiatives for each focus area. These strategic initiatives were then evaluated based on



criteria identified by the Executive Committee.

The evaluation criteria included replicability, greenhouse gas reduction potential, ease of implementation, timeline for implementation, and cost. Additional information on the evaluation criteria and the screening process can be found in Appendices 1 & 2. The results of the evaluation were provided to the Technical Committees for consideration for the prioritization process.

Initiatives were ranked by each Technical Committee as well as by the public through online tools and in-person meetings. The results of these rankings were then provided to the Executive Committee, who made the final decision on the top three priority initiatives for each focus area. The results of the prioritization exercises are provided in Appendix 3.

Implementation Strategy

The three priority initiatives for each focus area were further discussed to consider what implementation could look like in the Capital Region. Each implementation strategy identifies a responsible party, partners, potential cost, funding sources, a timeline, and the greenhouse gas reduction potential. The governance section of the implementation strategies lays out the process a local government should take to implement applicable initiatives, level of implementation, and related initiatives throughout the Sustainability Plan that have potential synergies or cross-purposes with this initiative.

Indicators & Target Establishment

The overall planning process also resulted in the development of sustainability indicators and targets that will measure the progress towards achieving the goals and initiatives of the Sustainability Plan.

The indicators are relevant to the individual focus areas and provide a method for tracking meaningful outcomes that resonate with stakeholders and decision makers. Indicators

were categorized as either Priority 1 or Priority 2 to identify those that might be most effective given limited resources available to measure and track implementation. A total of ten Priority 1 indicators were identified. Priority 1 Indicators are found in Section 12, with Priority 2 indicators provided in Appendix 4. Targets were identified for each Priority Indicator. These targets are connected to the baseline assessment which provides the data which the Capital Region can use to measure the progress towards achieving the long-term goals established for each focus area. Sustainability targets can be found in Section 12 of this Sustainability Plan.

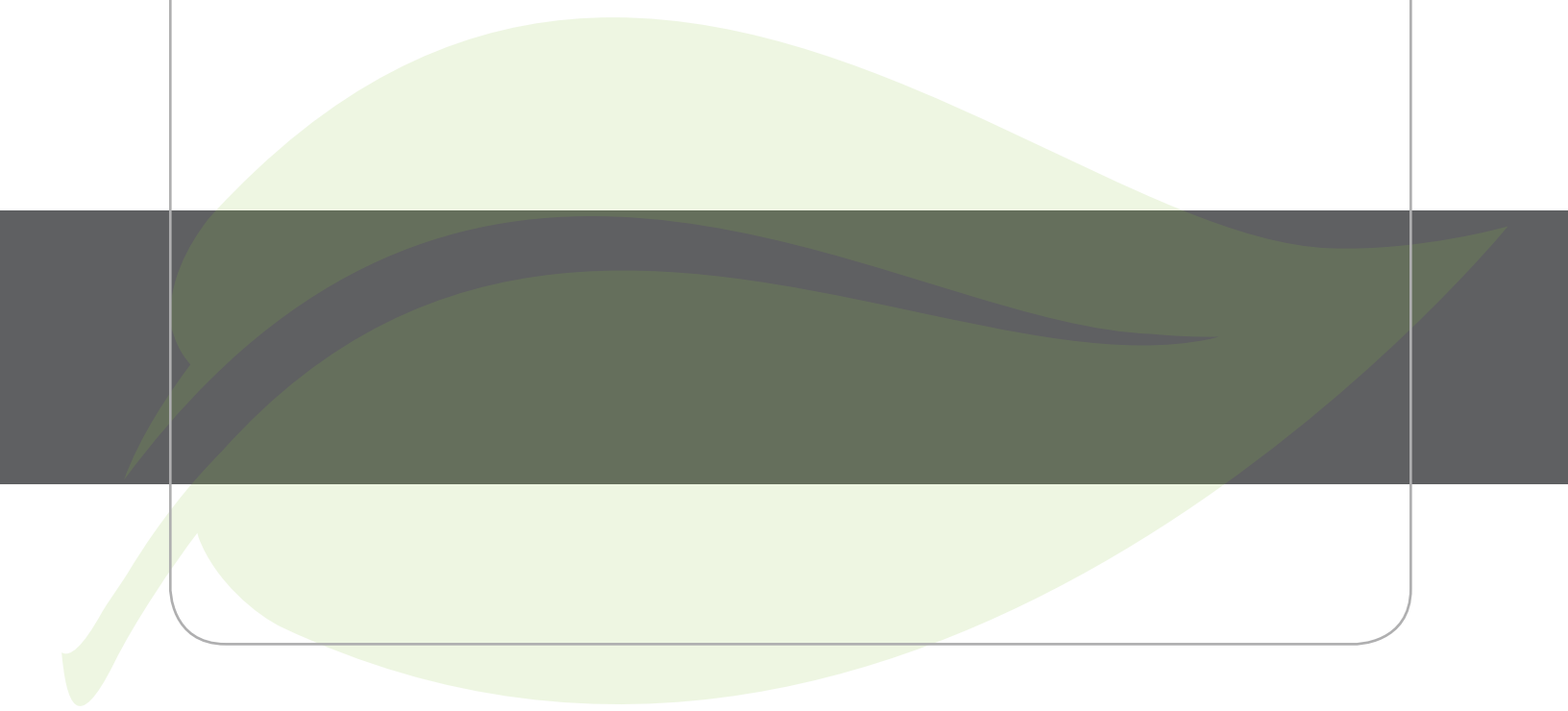
Each focus area chapter of the Plan has four sections designed to present the results of the planning process:

- ✓ Baseline Assessment
- ✓ Sustainability Goals
- ✓ Regional Initiatives
- ✓ Implementation Strategy and Governance Recommendations



Section 2.0

Regional Greenhouse Gas Inventory



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SECTION 2.0: **Regional Greenhouse Gas Inventory**

A key step in developing the Capital Region Sustainability Plan was to conduct a baseline assessment of greenhouse gas (GHG) emissions and energy use to help inform the development of sustainability strategies.

NYSERDA provided each region with a basic Tier 1 GHG Inventory that served as a first draft for summarizing emissions. In a coordinated effort between the Climate Smart Communities program and the Cleaner Greener Communities program, a more detailed Tier 2 GHG Inventory was conducted. This summary provides the results of that Tier 2 Inventory for the Capital Region, which is comprised of Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren, and Washington Counties.

For the development of this inventory, the State convened the NYGHG Working Group to develop a standard New York GHG Protocol (NYGHG Protocol). This group was responsible for defining the Tier 2 inventory parameters, data sources, methodologies, and reporting formats. While a formal NYGHG Protocol has not yet been released, the data sources and methodologies utilized for this inventory were in compliance with the proposed New York GHG Protocol. This Protocol also determined the 2010 baseline year.

The sectors and sources of GHG emissions evaluated for the inventory included:

- ✓ **Stationary Energy Consumption (Built Environment)**– Residential, Commercial, and Industrial
- ✓ **Transportation (Mobile Energy Consumption)**– On-road, Rail, Marine, and Off-Road
- ✓ **Energy Generation and Supply**



- ✓ Industrial Processes
- ✓ Refrigerant Use
- ✓ Waste Management – Solid Waste and Sewage Treatment
- ✓ Agricultural –Livestock, Crop Production and Soil Management

Energy consumption plays a significant role in all of the focus areas identified for this Sustainability Plan. Throughout the Capital Region, energy is consumed in buildings, equipment, outdoor lighting, as well as in the vehicles used to transport people and goods. That energy comes from a variety of sources including power generation facilities, both within and outside the Capital Region. Fuel types include coal, hydropower, fuel oil, natural gas, biomass, and propane. Energy is generated and consumed within all sectors of the economy: commercial, residential, industrial, institutional, agricultural, government and transportation.

Understanding the baseline energy consumption and associated emissions is an integral component of planning for a cleaner, more sustainable Capital Region. Strategies related to renewable energy and energy conservation will provide opportunities to reduce GHG emissions, while also stimulating a greener economy and creating green jobs. In addition to energy, GHG emissions are produced through industrial processes that occur within the Capital Region, in the treatment of its sewage from the decomposition or incineration of its waste, from products used to keep buildings and equipment cool, and from the agricultural practices that are a vital component of the Capital Region's economy. Strategies within each of the focus areas of this Sustainability Plan will have an impact, whether direct or indirect, on the levels of GHG emissions produced within the Capital Region.

Water management practices are directly connected to treatment processes for wastewater as well as the energy consumed

for the treatment and distribution of water for potable uses. Efforts to manage waste more responsibly, diverting waste from landfills and incinerators can reduce emissions while also providing new economic development opportunities. Food systems are deeply connected to nearly all sources of GHG emissions as well as opportunities to reduce emissions—both stationary and mobile energy consumption, agricultural processes, waste management, refrigerant use, and energy supply.

Transportation initiatives offer opportunities to reduce GHG emissions associated with both mobile and stationary energy consumption. Similarly, numerous opportunities lie within the Land Use and Livable Communities focus area for finding more efficient ways to organize building, people, transportation services and amenities, open space, and agricultural assets throughout the Capital Region such that emissions will be reduced. Finally, while adaptation efforts will be a response to global climate change, many actions that will increase the Capital Region's resiliency may also have GHG emission reduction benefits.

Summary of Tier II GHG Emission Inventory Results

In 2010, total GHG emissions in the Capital Region were estimated to be 17.6 million metric tons of carbon dioxide-equivalent (MMT CO_2e). The largest source of GHG emissions for the Capital Region as a whole was mobile energy consumption in transportation. This source, which includes emissions from fuel consumption in on- and off-road vehicles, rail, and marine vehicles, produced 6.27 MMT CO_2e , accounting for 36 percent of total emissions. The majority of this—5.5 MMT CO_2e or 88 percent—was from on-road vehicle fuel consumption. This is a reasonable finding given the Capital Region's location, lack of density, and the presence of numerous highways and interstate traffic.

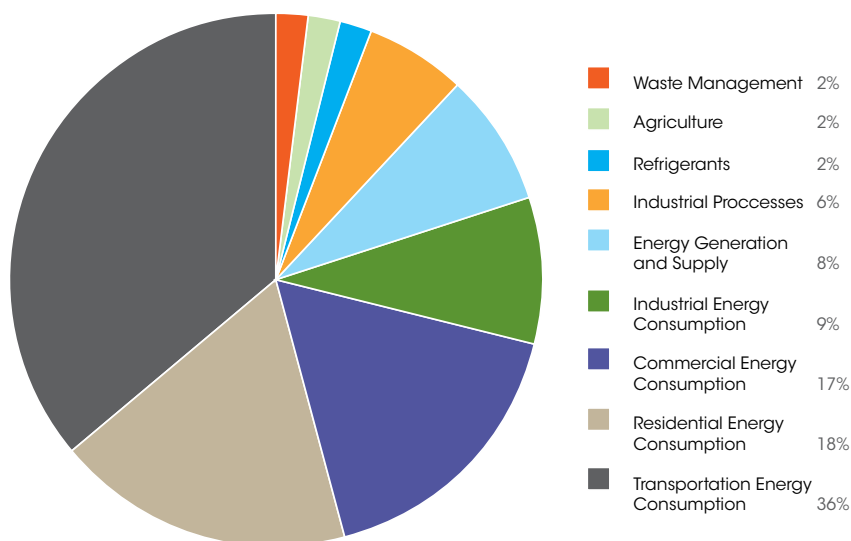




Table 2.1 Capital Region Total

| Sector | GHG Emissions (MMT-CO ₂ e) | % of Total Emissions |
|-----------------------------------|---------------------------------------|----------------------|
| Transportation Energy Consumption | 6.27 | 36% |
| Residential Energy Consumption | 3.14 | 18% |
| Commercial Energy Consumption | 2.97 | 17% |
| Industrial Energy Consumption | 1.69 | 10% |
| Energy Generation and Supply | 1.38 | 8% |
| Industrial Processes | 1.03 | 6% |
| Refrigerants | 0.40 | 2% |
| Agriculture | 0.38 | 2% |
| Waste Management | 0.36 | 2% |
| TOTAL | 17.62 | 100% |

Figure 2.1: 2010 Capital Region GHG Emissions by Sector



The second largest source of emissions was residential energy consumption, which was responsible for 18 percent of total regional emissions (3.14 MMTCO₂e). Residential energy consumption includes the direct use of heating oil, wood, and natural gas, as well as indirect emissions associated with electricity use. The third largest contributor was commercial energy consumption, producing 18 percent of emissions (2.97 MMTCO₂e), just slightly less than the residential sector. Finally, when including the nine percent of emissions from industrial energy use, stationary and mobile energy consumption

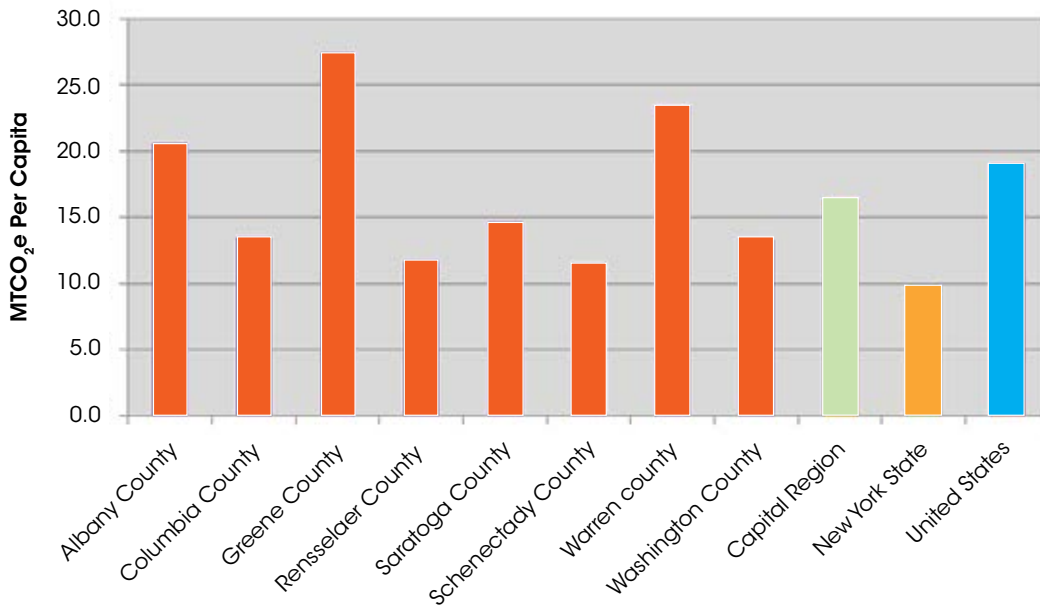
contribute 80 percent of total regional GHG emissions, a trend that is consistent with other regional scale inventories, including the inventory profile of the neighboring Mid-Hudson Region of New York.

Given its higher population and activity levels as the Capital of New York and its central location in the state, it is not surprising that Albany County's emissions were the largest portion of the total region at 35 percent.

However, on a per capita emissions basis, the greatest contributors were Greene County and



Figure 2.2: 2010 Per Capita GHG Emissions



Warren County, as demonstrated in Figure 2.2. Overall, the Capital Region's per capita GHG emissions rate of 16.3 was above the state average (9.8), but below the national average of 19MMTCO₂e. It is important to note that the state average includes New York City, which has a uniquely low per capita emissions rate due to high population density and lower

vehicle miles traveled. For a more complete picture of the per capita emissions for each county, however, it is important to look at the distribution of sources of emissions within each county as shown in Figures 2.3 and 2.4. As Figure 2.4 demonstrates, the higher per capita emissions rates in Greene and Warren Counties is in part due to emissions from

Figure 2.3: 2010 Capital Region GHG Emissions, by County and Sector

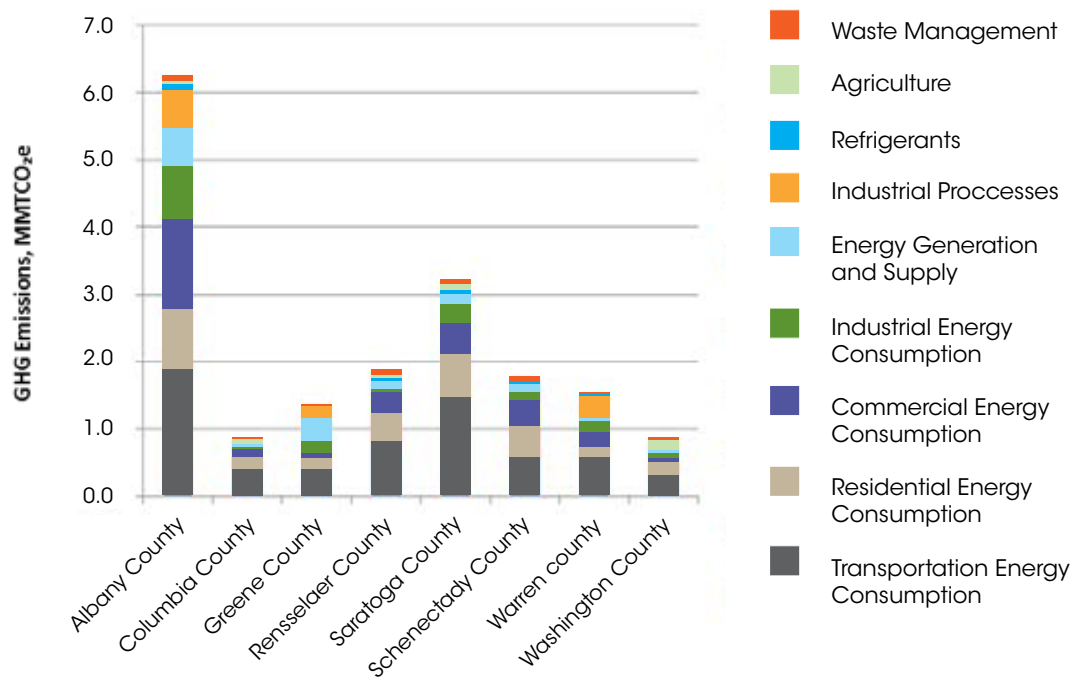
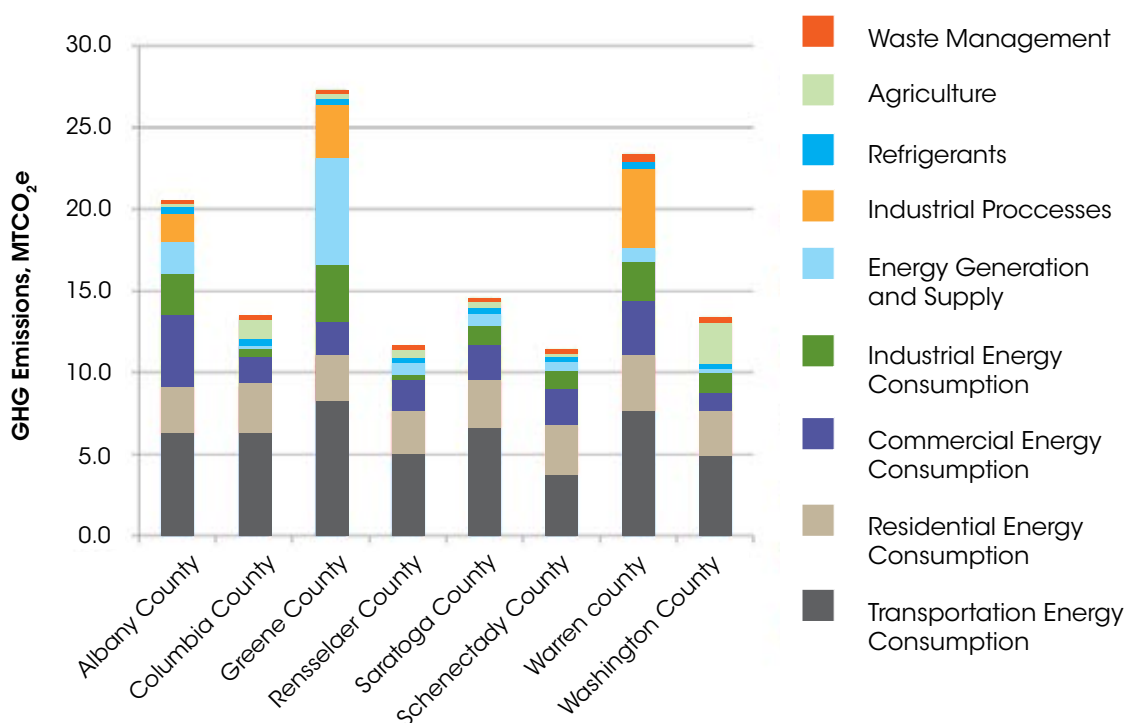




Figure 2.4: 2010 Capital Region Per Capita GHG Emissions, by Sector and County



industrial activity in those locations, as well as higher emissions from energy generation and supply in Greene County, which hosts two power generation facilities burning natural gas and petroleum. Overall, the distribution of emissions sources is similar among all of the counties, though with some differences due to more urban (Albany and Schenectady) versus more rural (Greene and Washington) areas. For example, there is a larger portion of agricultural emissions in Washington County than the others and a larger commercial energy use contribution in Albany due to greater business activity in that area.

Conclusion

The most significant step to reduce the Capital Region's contribution to climate change is to reduce the consumption of fossil fuels. This must be done through efforts to decrease energy consumption in vehicles, homes, businesses, and industrial facilities. Strategies that promote energy efficiency, renewable energy, alternative fuels

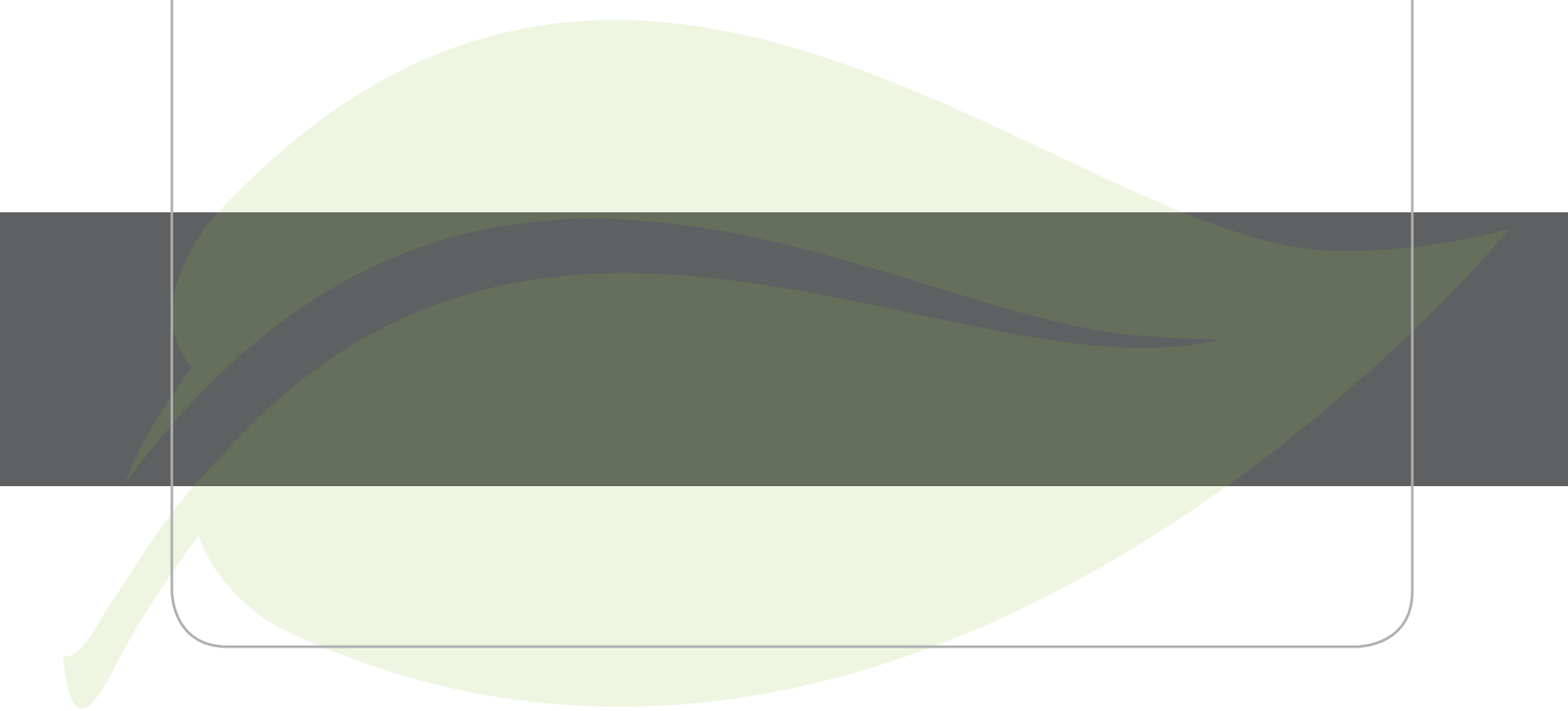
for vehicles, and that promote land use and transportation strategies that reduce vehicle use will all be an essential component of the Capital Region's efforts to address climate change. Many of these types of strategies have been identified in the Sustainability Plan.

In addition, while smaller in comparison, emissions from waste management, agriculture and other processes can be addressed through waste reduction and diversion strategies, innovative agricultural practices, and industrial efficiency improvements. The Cleaner Greener Communities program has laid important groundwork in measuring the Capital Region's impact on climate change and in taking key planning steps for minimizing that impact. This baseline inventory should be revisited in future years to measure the Capital Region's progress.



Section 3.0

Stakeholder Engagement





Doane Stuart Public Workshop



SECTION 3.0: **Stakeholder Engagement**

The stakeholder engagement process to develop the Cleaner, Greener Sustainability Plan for the Capital Region was launched in May 2012. A variety of mediums were used to ensure that diverse stakeholders from throughout the Capital Region had the opportunity to provide feedback during the development of this Sustainability Plan.

Early in the planning process, a Stakeholder Engagement Strategy was developed to guide public outreach and engagement (included in the Appendix 9). The strategy emphasized key communication tools to engage each audience identified through the existing governance structure- the Executive Committee, the Technical Committees, and the public. The communication tools included a project collaboration site (Executive Committee and Technical Committees only), a website; an online survey; a Facebook page and Twitter account; a virtual forum, through Crowdbrite; and in-person workshops.

Executive and Technical Committees

As discussed in Section 1.0, the Sustainability Plan was developed under the leadership of an Executive Committee. The Executive Committee consisted of one representative from each county, the chair of each Technical Committee and the primary staff liaison from the City of Albany, as the lead municipality. Their primary role was to oversee the process, provide a framework for initiative identification, and make final decisions on what is included in the Sustainability Plan. The Executive Committee met three times between May and October 2012.

The planning process revolved around eight focus areas:



Residents, business owners, government agency representatives, and others were brought together to work in teams to start building a shared understanding of potential solutions through the use of a variety of different visual mapping techniques .

Each phase of the process built on the work completed in the previous phase, focusing on the priorities and further refining them through both the Executive Committee, Technical Committees and public process. Public input therefore informed the work of the Technical and Executive Committees, and their work then formed the basis of additional rounds of public input.

- ✓ Climate Adaptation
- ✓ Economic Development
- ✓ Energy
- ✓ Food Systems
- ✓ Land Use and Livable Communities
- ✓ Transportation
- ✓ Solid Waste
- ✓ Water

With the exception of Food Systems, these focus areas were the standard categories recommended by the State’s Cleaner, Greener Communities Program. The Food Systems focus area was added by the Executive Committee in response to a strong interest in initiatives supporting agriculture and local food markets in the Capital Region. In May 2012, eight Technical Committees, each dedicated to one Focus Area, were formed.

The Committees included elected and appointed officials, local government staff, representatives from non-profit organizations, and private sector stakeholders from around the Capital Region. The Technical Committees were supported by a technical expert member of the Planning Team. Their role was to develop a baseline assessment that outlined the existing state of each focus area, set sustainability goals that considered the needs of the Capital Region, and identify and prioritize initiatives that addressed those goals. The Technical Committees met three times and corresponded over email and collaborative online tools to conduct their work.

Public

The broader public was engaged through the

Stakeholders

The stakeholder engagement goal was to provide as many opportunities as possible for stakeholders to offer feedback at every step of the planning process. Stakeholders successfully engaged included:

Elected officials

Local Government staff

Businesses

State agencies

General public

Educational institutions (K-12 and higher education)

Regional agencies

Non-governmental organizations

Non-profit and community-based organizations

Organized labor

Sector-based groups and associations

Social advocacy groups

website, the Facebook and Twitter accounts, and media blasts. To support the public engagement process, the Crowdbrite tool was incorporated into the engagement process. The Crowdbrite approach involves both online and in-person engagement connected with a complete and integrated technology platform. Crowdbrite uses a combination of high tech and “high touch” approaches where users can post virtual sticky notes, images, video clips





and comments. The tool also allows users to vote for top ideas utilizing an interactive “canvas” and to witness other people adding their comments in real time. These canvases were a unique way to share information and build capacity both at the meetings and online. By visually organizing information, the tool highlights the relationships between ideas, their benefits and potential impacts on moving the Capital Region to a more sustainable future.

Two rounds of public workshops, with three meetings each were held in July and October 2012. The results of the Executive Committee and Technical Committee meetings as well as the input from the ongoing online collaboration were presented and refined at these meetings. See Tables 3.1 and 3.2, respectively for a summary of each round of workshops.

Capital Region EDC

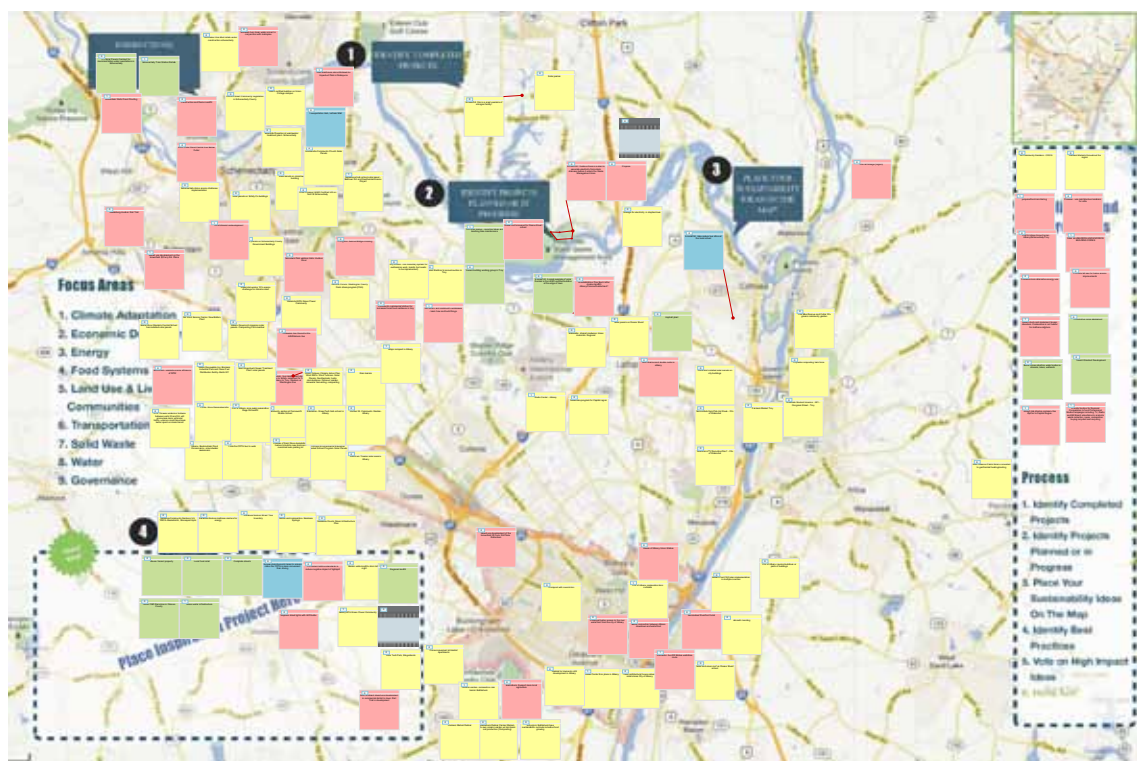
The Capital Region Economic Development Council is a critical stakeholder in the

development and implementation of the Sustainability Plan. The CREDC has prepared a Strategic Plan that covers the same eight counties as the Sustainability Plan. While the Strategic Plan focuses on growing and strengthening the economy, both plans strive to make the Capital Region a better place to live, work, learn and play.

To ensure that the Sustainability Plan aligned with the Strategic Plan, Todd Erhling, Executive Director of the Hudson Valley Agribusiness Development Cooperation and member of the CREDC Board of Directors, served as a liaison to the Executive Committee. The full CREDC Board was allowed to review and comment on critical milestones and deliverables during the planning process.

Furthermore, Mike Tucker, from the Center for Economic Growth and a member of the CREDC Board, served as a spokesman for the Sustainability Plan. In this role, he attended and participated in the public workshops and coordinated regularly

Figure 3.1 Snapshot of Crowdbrite’s cloud-based canvas



with the Planning Team and the City of Albany in its role as Lead Municipality.

Since the two plans complement each other, they must be closely coordinated throughout the implementation. The Executive Committee and the CREDC should work closely together in effort to promote the success of both plans. To that end, Table 3.1 maps the relationship of twenty-seven priority initiatives from the Sustainability Plan with the goals of the Strategic Plan.

Engagement Opportunities

Committee Coordination

An initial meeting was held with the Executive Committee on May 10, 2012. This meeting focused on introducing the project and engaging the committee members in small

group discussions about regional strengths, regional challenges and their vision for the future. The Planning Team used PlaceMatters' Brainstorm Anywhere tool and Turning Points' keypad polling to gather and prioritize ideas (see the report in Appendix 10). The Team also asked the Executive Committee to help identify stakeholders who should be involved in the process. In addition, the Committee identified regional strengths and challenges and the core issues or themes that should be part of a regional vision.

The Technical Committees were formed in June 2012. The first series of meetings included a review of baseline data, identification of gaps, and a goal-setting exercise specific to each focus area. The Technical Committees met again for a second round of meetings in July to confirm the goals, discuss examples of potential

Capital Region Economic Development Council Goals

Leverage and collaborate

Leverage existing partnerships while building new collaborations across academia, the private sector, and government to make the Capital Region a destination of choice.

Open new doors

Create ready access to capital by making it easy to identify existing sources and creating new collaborative sources of funding to stimulate economic expansion.

Prepare for tomorrow

Leverage the strength of the education system, from kindergarten through post-graduate, while collaborating with the public and private sectors to create a workforce that gives employers what they need and students what they deserve.

Build a superhighway

Ensure that a 21st Century infrastructure exists so the Capital Region will become the first destination for business in New York State and be accessible to build, grow, and expand business.

Bring cities to life

Capitalize on our urban centers within the Capital Region that have a history rich in vibrancy and return them to centers of influence that are alive with business, residential, and cultural programs that will revitalize them as active neighborhoods.

Celebrate and optimize our surroundings

Attract visitors, new residents, and businesses by sustaining and optimizing our rural assets and working landscapes that provide a backdrop for the Capital Region.

Showcase our beauty

Capitalize on our inherited and created assets, leveraging the beautiful, natural environment, deeply rooted in history, arts, and culture and use them as beacons and anchors to make our communities thrive.

Spotlight our strengths

Create and celebrate our distinct and comprehensive regional identity by reaching out to other geographies to feature these assets and make the Capital Region the first destination in New York.



Table 3.1 REDC Synergies with Sustainability Plan

| Sustainability Initiative | REDC Goal | | | | | | | |
|---|--------------------------|----------------|----------------------|----------------------|----------------------|---|---------------------|------------------------|
| | Leverage and collaborate | Open new doors | Prepare for tomorrow | Build a superhighway | Bring Cities to life | Celebrate and optimize our surroundings | Showcase our beauty | Spotlight our strength |
| Overarching | | | | | | | | |
| Establish Regional Sustainability Coordinator to support Plan implementation | X | | | | | | | |
| Establish regional green alliance to promote the Sustainability Plan | O | X | | X | X | | | |
| Develop regional sustainability website to provide centralized information about sustainability | X | | | | | | | |
| Climate Adaptation | | | | | | | | |
| Promote the use of green infrastructure in new construction and major retrofits | | | | O | X | X | | |
| Complete local vulnerability assessments and adaptation planning to assess impact of climate change | | | | X | | | | |
| Develop a guidance document to integrate climate change impacts into existing planning documents and local government processes | X | | | | | | | |
| Economic Development | | | | | | | | |
| Strengthen regional small business support programs to improve efficiency, effectively share resources, and reduce regional redundancies. | X | O | | | X | | | |
| Support expansion of land banking through existing and new mechanisms | X | | | | O | | | |
| Expand support of green jobs training programs to include green infrastructure design and maintenance | X | | O | | | | | |
| Energy | | | | | | | | |
| Establish energy efficiency and renewable energy financing districts (or PACE program) | X | | | X | | | | |
| Establish a revolving fund for local businesses to undertake energy efficiency projects | | O | | | X | | | |
| Adopt a local energy efficient building code that would exceed the NYS Energy Construction Code to improve the efficiency of buildings in all sectors | X | | | | | | | |
| Food Systems | | | | | | | | |
| Create a food hub for regional food processing, storage, and distribution of locally produced food products. | O | | | | | X | | X |

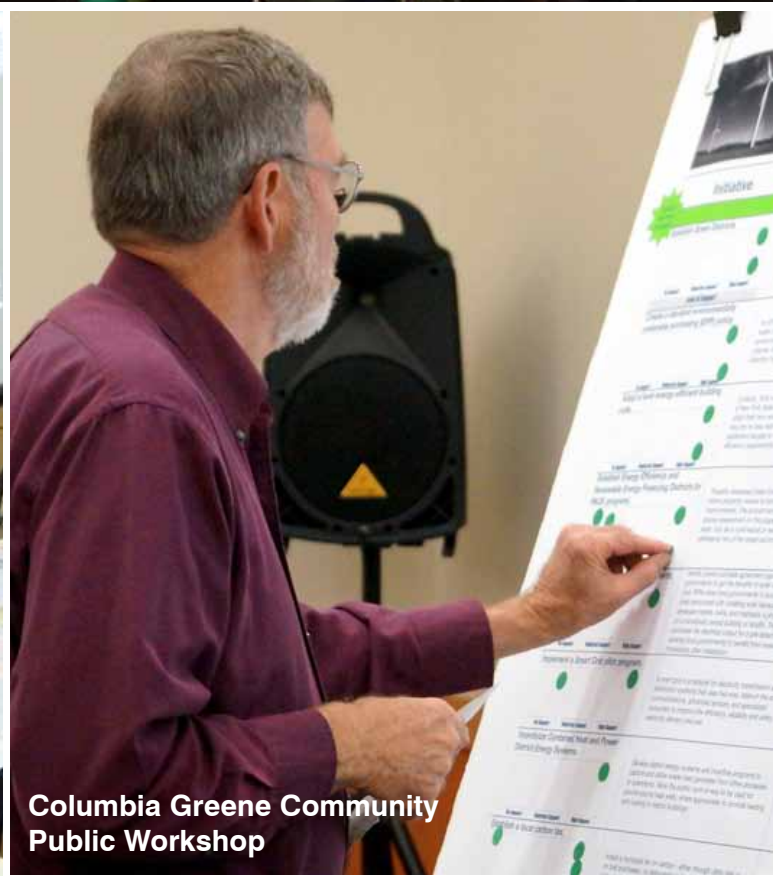




Queensbury Public Workshop



Doane Stuart Public Workshop



Columbia Greene Community Public Workshop



initiatives that could accomplish those goals, and determine whether and how those examples were applicable to the Capital Region.

The final round of Technical Committee meetings was held in September to review the feedback collected at the first round of workshops and online. The list of final initiatives was prioritized using keypad polling. Each Technical Committee prioritized initiatives from their own focus area, as well as those of the other seven focus areas.

First Round of Public Workshops and Online Open House – July 2012

The first formal engagement with the public was through a mass email, introducing the project and giving recipients the opportunity to “opt-in” to receive updates and receive invitations to participate in future activities. Recipients were also encouraged to spread the word and invite others they felt would be interested in the program. In July 2012, a series of three public workshops took place around the Capital Region to gather citizen input and ideas on improving sustainability practices.

During the workshops, participants were asked to partake in three interactive exercises guided by table facilitators. The first involved brainstorming and mapping examples of existing sustainability projects and best practices currently in use within the Capital Region onto Crowdbite paper maps and then onto Crowdbite online mapping and collaboration tool (see Figure 3.2). Best practice examples were highlighted by many and were used by the Technical Committees as they developed policy language for the eight focus areas. The language used by the participants in the workshops was collected in their own words and visually analyzed using an online platform for word priority associations.

Crosscutting ideas that would impact more than one focus area were identified separately and discussed in the reports. Prioritization was completed in teams voting with dots and



Participants at the Rensselaer County Meeting

supported by individual keypad polling. As ideas were developed and entered onto maps, a visual clustering analysis was completed for the identification and refinement of current and proposed sustainability initiatives.

Working in teams, participants at the workshops provided important feedback on proposed goals, including suggestions to improve them and also crafting 75 new potential goals. Over 300 strategies were also identified across the eight focus areas to move the Capital Region to a more prosperous and sustainable future. All information (ideas, comments, photos, etc.) entered into Crowdbite was then sorted by top votes and presented to the Technical Committees and the public. See Table 3.1 for a summary of the workshops, the exercises and the six top strategies that emerged.

Second Round of Public Workshops and Online Open House – October 2012

Email announcements were sent in three batches to residents and stakeholders on the listserv to spread the word about the time, location and purpose of the second round of workshops. Press releases were developed for local newspapers and media outlets and information was posted on the Sustainable





Capital Region website, Facebook page and via Tweeter. Identified strategies were posted online for the public and Technical Committees to deliberate and vote on which should be prioritized for implementation.

All of this information was available online using the Crowdbrite platform and it was also duplicated in paper format during the public meeting process. This inclusive and transparent process was the first crowd sourced sustainability plan as part of the Cleaner, Greener Communities Program. People were invited to review the topics and initiatives and provide feedback online by posting comments on the Crowdbrite canvases covering each of focus areas and/ or by attending one of three workshops.



Prioritization Exercise

Table 3.2 First round of workshops summary

Round 1 Workshop Details

Approximately 150 residents participated in the first round of workshops. The objectives for these workshops were to:

1. Present the visions for the Capital Region suggested by the Executive Committee
2. Review the goals for each focus area and prioritize the goals based on feedback from small group discussions; and
3. Brainstorm and prioritize initiatives for achieving goals

The workshops were held from 7 to 9PM at the following locations:

- July 23: Coxsackie High School (Greene County);
 - July 24: Doane Stuart School (Rensselaer County);
 - July 25: Queensbury High School (Warren County).
- Keypad polling devices were used to gather demographics and help prioritize initiatives across all eight focus areas (see results in Appendix 11).

Round 1 Workshop Format

The first round of public workshops included three exercises:

Exercise 1 - Attendees brainstormed and mapped examples of existing sustainability projects and best practices in the Capital Region onto paper maps. These were then mapped on Crowdbrite's interactive platform with the help of a facilitator and note-taker. Residents unable to attend a workshop could participate online utilizing the Crowdbrite canvas anytime during the open house period. Appendix 12 shows the results of this mapping exercise.

Exercise 2 - Small group discussions were organized around each focus area. Attendees chose a focus area they were interested in and then reviewed the goals from each Technical Committee, discussed any potential changes to the goals. The groups then brainstormed and prioritized initiatives for the goals in each focus area.

Exercise 3 - The third exercise was a repetition of the second with attendees choosing a second focus area to discuss.

Round 1 Workshop Results

The top initiatives from the first round of workshops include:

1. Build capacity for agencies, governments, institutions, and individuals to adapt to a changing climate.
2. Promote HOV, ride shares and public transit.
3. Transit-oriented design, affordable public transit and improved bike and trail networks.
4. Promote Buy Local Food and Buy Local Forest Products to support agricultural and forested land use.
5. Give funds to local co-ops that involve the community and local food. Coordinate purchase of local food for multiple school districts and create distribution systems from farms to inner cities
6. Reduce sprawl, create vibrant centers to reduce development pressure on rural areas.

See Appendix 13 for a full summary of the first round of workshops.



Upon arrival participants were given a sheet of green sticky dots and invited to view the Crowdbrite 3x4 foot poster boards stationed around the room, one for each focus area with the proposed initiatives underneath. Next to each initiative was a space for participants to place dots indicating their level of support for the initiative (no support, some support, high support) as well as write comments. Images of the Crowdbrite canvases for the second round of public input can be found in Appendix 15.

During the second round of workshops, there was a group of participants concerned about the role of government linked to this Cleaner Greener Communities Program, specific initiatives within, and, in some cases, Federal and State programs overall. During

the third meeting, a group of participants made a request to the facilitators to shorten the time dedicated to small group exercises so that there was more time to ask questions and vet concerns with the full group intact. Using the keypad polling devices the facilitators asked the group to approve the motion and with a super majority of votes in favor, an additional 45 minutes was allocated to Q&A. The outcome of these workshops was three top initiatives for each focus area. Attendees also discussed potential implementation strategies for the top initiatives and the resources necessary to achieve these initiatives. See Table 3.2 for a summary of the workshop structure, exercises, and results.

Table 3.3 Second round of workshops summary

Round 2 Workshop Details

Approximately 110 residents of the Capital Region came to the second round of workshops. The public was invited to provide feedback on the initiatives by posting comments on the online Crowdbrite canvases and/or by attending one of three workshops.

Workshops were held 7 to 9 p.m. as follows:

- October 1: Union College (Schenectady County);
- October 2: Fort Ann School (Washington County);
- October 3: Columbia-Greene Community College (Columbia County).

Using PlaceMatters' Brainstorm Anywhere tool, the participants' ideas were entered into laptops. Each table had a projector or screen making it possible for participants to view the notes in real time. Keypad polling was used to gather demographics and ask evaluation questions (see results in Appendix 14).

Round 2 Workshop Format

Participants were instructed to work in small groups where they were asked to partake in two topic discussions guided by table facilitators as follows:

1. Participants were asked to share their thoughts about the initiatives;
2. The small groups were asked to choose their top two initiatives based on a set of criteria, including: which should take priority in terms of timing, funding, etc.;
3. Attendees were asked to answer two questions on each initiative:
 - What is required to successfully implement this strategy (e.g. create partnerships, apply for grant funding, etc.)?
 - Who are the potential partners that can help implement this strategy?

Round 2 Workshop Results

Three priority initiatives were chosen for each of the eight focus areas (see following page).

1. The participants also identified key partners and implementation strategies that will be helpful in ensuring that the initiatives are successfully implemented at the local and regional level.
2. Partnerships with local farmers and coordination with regional planning are two examples of key partnerships identified during the discussions.
3. Participants were encouraged to continue providing feedback on the initiatives, for the week following the workshops, using the online Crowdbrite canvas.





Online Survey

To broaden the level of outreach, an online survey was distributed. The survey was designed to mirror the open house portion of the workshop with poster boards allowing the public to express their level of support and provide comments on the sustainability initiatives.

The Planning Team used a service offered by Care2 to send email blasts to targeted geographical areas. Through this effort, the online survey was sent to over 12,000 recipients in the Capital Region and adjacent counties. Each email included links to a Survey Gizmo survey and links to the project website. This broad-brush outreach effort made it possible to increase awareness and more than double the number of participants contributing comments to the development of the Sustainability Plan. Each email campaign had a greater than 10% “open” rate with more than 5% (155) of participants reading the email completing the survey as well as more than 5% (158) clicking website links provided in the emails (the New York, Cleaner, Greener Communities Program and the Facebook and Twitter pages)—(see Care2 report in Appendix 19). Full survey results are included in the reports by focus area under Appendix 16.

Outcomes from public input and choices of the Executive and Technical Committees

The comments and votes collected during the workshops and via the survey were summarized by the Planning Team. The initiatives that were selected as top priority via the workshops, the canvases and the survey were compared to those selected as top initiatives by the Technical and Executive Committees; a majority of the top initiatives matched for each focus area. For the other ones, the Executive and Technical Committees reviewed the reports under each focus area, taking into consideration level of support and additional suggestions and, in some cases, combining initiatives when appropriate. Details about this process can be found below for each



Care2's cause marketing for non-profits

focus area with full reports found in Appendix 16.

| Climate Adaptation |

At each stage of the process, the initiative promoting green infrastructure received high support. In addition, the public highly favored the tree planting program and the protection and enhancement of critical habitat, floodplains, and wetlands that are under threat from climate change. As per the public's input, the initiative promoting green infrastructure has been broadened to encompass additional tree planting and the protection and enhancement of critical habitat.

The other two initiatives that were selected by the Technical and Executive Committees were also directed towards natural habitats, as the first one promotes local vulnerability assessments and adaptation planning while the second one proposes the development of a guidance document on how to integrate climate change impacts into existing plans and processes.

| Economic Development |

Throughout the process, the public favored the following two initiatives: implement a “Buy Local” campaign and establish a financial literacy program. Those two initiatives have been combined with others (including the small business incubator program) under the umbrella of a new larger initiative to create a Regional Small Business Support Program.

Finally, the initiative for the establishment of a regional land bank has been reworded towards



the establishment of multiple regional land banks to allow for faster brownfield and vacant land acquisition processes.

| Energy |

Throughout the process, the initiative for the establishment of a revolving energy efficiency improvement fund for local businesses received high public support and was selected as well by the Technical and Executive Committees.

The other two initiatives that received high public support were the implementation of a Smart Grid Pilot program and the incentivization of Combined Heat and Power (CHP) District Energy Systems. Those two initiatives have however not been selected by the Technical and Executive Committees. Instead, they have chosen to promote the establishment of Energy Efficiency and Renewable Energy Financing Districts (or PACE program) and the establishment of a revolving energy efficiency improvement fund for local businesses. Smart Grid Pilot programs are already being piloted by utility companies for residential users, and CHP is not universally applicable. The Technical and Executive Committees believe the other initiatives are better suited to meet the identified goals and are more transferable to a greater mix of the community resulting in a greater impact on regional development.

| Food Systems |

Throughout the process, the initiative to create/increase “local food” transactions, especially between large grocery stores and farms received high public support and was selected as well by the Technical and Executive Committees.

The public also voted for the initiatives to build capacity for new and existing farmers by establishing a Farmers Support and Enhancement Program, to create a Regional Farmland Protection Plan and to establish a regional gleaning and food recovery program. Those three initiatives were not selected by the Technical and Executive Committees as their

top ones, but may be included in their other two top initiatives which are the creation of a food hub for regional food processing, storage, and distribution and the re-establishment of a Regional Food and Agricultural Coalition for the Capital Region.

| Land Use and Livable Communities |

Throughout the process, the initiative to repair and modernize existing infrastructure received high public support and was selected as well by the Technical and Executive Committees.

The public also voted to prioritize brownfield redevelopment. The Land Use Technical Committee has not selected this initiative as such, but brownfields were taken into consideration by the Economic Technical Committee through their multiple regional land banks creation initiative.

In addition, the public favored the development of a regional greenway connectivity plan along with improvements in public access to waterfront areas, which has been combined into a single initiative by the Technical and Executive Committees.

Finally, during the workshops the public voted in favor of modifying local codes and regulations to allow for sustainable, compact development, which has been supported by the Executive and Technical Committees as well.

| Solid Waste |

Throughout the process, the two initiatives to improve and increase composting options and site and develop anaerobic digestion facilities in the Capital Region received high public support and were selected as well by the Technical and Executive Committees.

The development of a Resource Recovery Park, while it received a high level of support in comments from the public, the Technical and Executive Committees instead decided to include the adoption of a construction and demolition waste reduction ordinance in the





Media Coverage

Various media and messaging vehicles were utilized to reach these target audiences, including:

- ✓ Press releases to local print, radio, and TV media
- ✓ Public service announcements (PSAs) on cable TV public access channels
- ✓ Notices in newspapers
- ✓ Social media and project website
- ✓ Personal engagement through Chambers of Commerce, county planning departments, and economic development agencies
- ✓ Media interviews

In addition to press releases and media advisories (see Appendix 18), a concerted

effort was made to secure PSAs as a free and effective means to reach the Capital Region's diverse populations and to encourage public participation. PSAs were secured across media, including: Fox 23; WNYT television and web promotion; Clear Channel, Albany Broadcasting, WGNA and the Regional Radio Group radio mentions; and The Eagle newspaper in Washington County.

Behan Communications also secured interviews for Michael Tucker, spokesperson for the Sustainability Plan, and other members of the planning committee, which led to coverage in the Times Union, Troy Record, Register-Star, Leader Herald, and on 90.3 WAMC, among others.

top three given it was felt this initiative would have a higher return on investment.

| Transportation |

Throughout the process, the two initiatives to implement a bicycle and pedestrian infrastructure improvement program and to optimize the transportation system through alternative street design and advanced signal technology received high public support and were selected as well by the Technical and Executive Committees.

The public also voted in favor of the creation of an interconnected regional transit system, which has not been selected by the Technical and Executive Committees. It was felt that this initiative would be too expensive to implement and that it made sense to instead focus on improvements. Along these lines, the Technical and Executive Committees decided to promote the improvement of the transit service through technology improvements.

| Water |

Throughout the process, the two initiatives to develop an Asset Management Plan for water

and sewer systems and to conduct a watershed assessment for stormwater management received high public support and were selected as well by the Technical and Executive Committees.

The public also voted in favor of the development of a purchasing consortium for municipal water projects. Instead, the Technical and Executive Committees decided to promote the creation of a small grant program for innovative water quality projects, which could also cover a purchasing consortium.

Public Comments on the Plan

The comments collected during the workshops and via the survey were summarized by the Planning Team. The initiatives that were selected as top priority via the workshops and survey were compared to those selected as top initiatives by the Technical Committees. were identified by both the Technical Committees and the public as priorities and were the foundation for the development of the Sustainability Plan.



A public comment period was conducted on the Draft Sustainability Plan from December 27, 2012 to January 14, 2013. The Draft Sustainability Plan was posted at sustainablecapitalregion.org and comments could be provided through the website. Written comments could also be submitted directly to the City of Albany, as lead municipality for the Sustainability Plan. Public comments were incorporated as appropriate. Refer to Appendix 23 for a listing of all comments received.

During the comment period, five additional initiatives were suggested related to waste, energy, food systems, and transportation. While the initiatives are reasonable, they have not been raised previously through the Technical Committee work or through the public engagement process. Therefore, the initiatives are not incorporated into this iteration of the Sustainability Plan. These initiatives will, however, be considered as part of the annual review and update process.

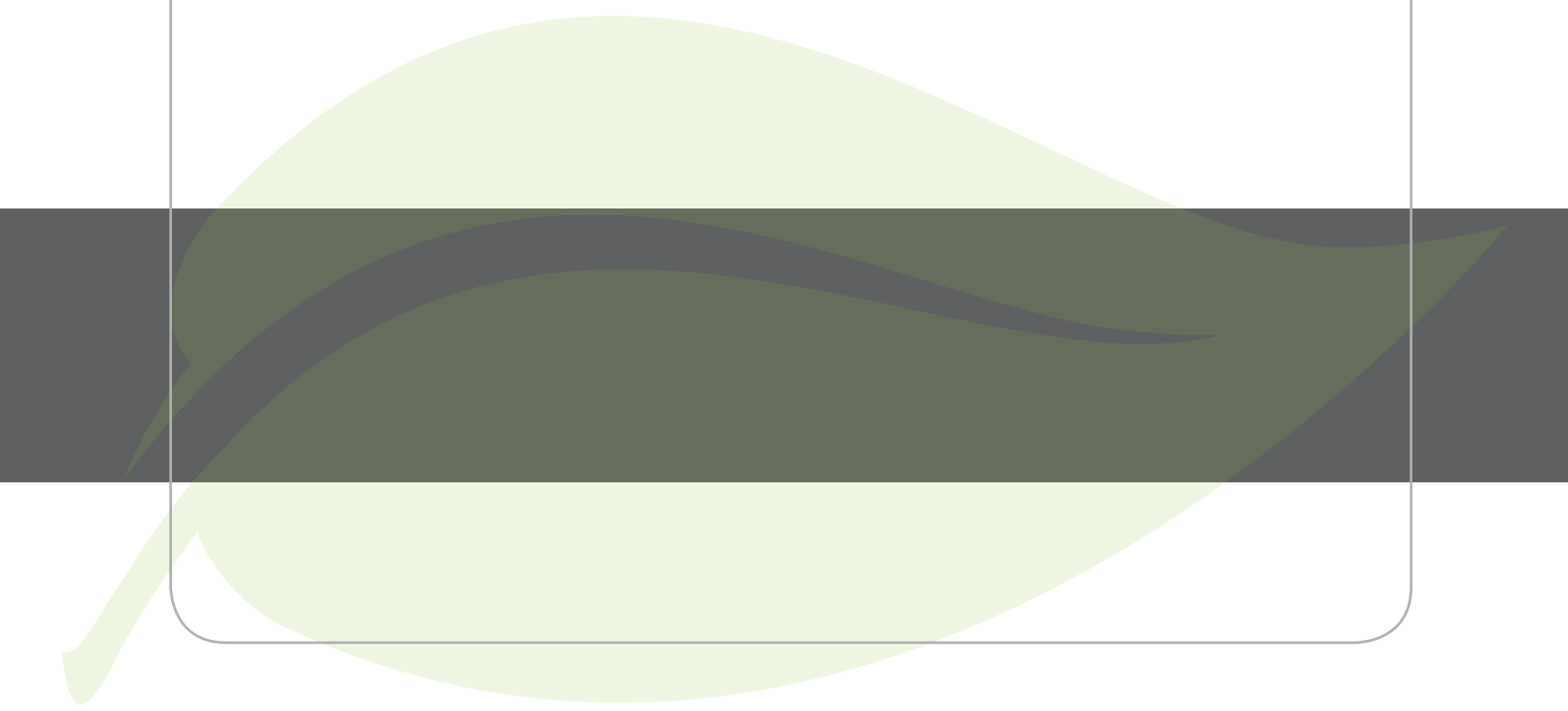
Four comments were received indicating the public comment period was too short. Typically a longer public comment period is preferable; however, there will be future opportunities for public input, as the Sustainability Plan is intended to be a “living document”. The Sustainability Plan should be reviewed annually and include additional opportunities for public comment to update the Sustainability Plan and maintain its relevance to the Capital Region.

Two comments raised concerns about the ability to fund implementation or “action items” identified in the Sustainability Plan. Phase II Implementation of the Cleaner Greener Community Program provides up to \$90 million toward regional projects that support the regional sustainability goals. Phase II is expected to launch in 2013. Furthermore, other state and federal grant programs, available annually, align with the initiatives presented in the Sustainability Plan and these programs may assist with implementation.



Section 4.0

Climate Adaptation





Town of Glenville



SECTION 4.0: **Climate Adaptation**

New York State has identified climate change– both mitigation and adaptation– as a priority area. Over the last several years, the State has led the way on identifying, and taking action, to reduce the impacts of a changing climate through the development of the Integrated Assessment for Effective Climate Change Adaptation Strategies in New York State (ClimAID) and the State Climate Action Plan Interim Report.

The Capital Region identified climate change as a priority and through the Cleaner Greener Communities program, has conducted a regional greenhouse gas emissions inventory, facilitated a Climate Change Adaptation Technical Committee, and completed a high level vulnerability assessment.

This chapter on climate adaptation provides an overview of the primary climate change impacts the Capital Region will experience, how various sectors will be affected by these impacts, and a summary of the results of the Climate Adaptation Technical Committee's efforts to identify a goal and strategies that, once implemented, can increase the resiliency of the Capital Region. While increasing resilience, a number of the strategies identified through this process will also assist in the reduction of greenhouse gas emissions. Unless otherwise specified, all climate data in this chapter is from the ClimAID report (NYSERDA, 2011).

This chapter discusses three primary climate impacts, or changes in climate directly related to the warming of the earth's atmosphere, on the Capital Region: changes in precipitation, changes in temperature, and sea level rise. Primary climate impacts can cause secondary

Best Practices

Crop Adaptation - Local apple orchards including Bowman's Orchard in Rexford (Saratoga County) and Borden's in Schaghticoke (Rensselaer County) have adapted their crops to include species that are not traditionally found in the Northeast, including Fuji and Granny Smith. Both of these varieties require warmer climates than the Capital Region could previously accommodate.



climate impacts (or climate hazards), such as flooding, drought, and hurricanes. Primary and secondary climate impacts cause climate effects – or the results of primary and secondary climate impacts on the social, natural, and built systems in a community. For example, poor air quality from high heat days and property damage resulting from a severe storm are both examples of how climate impacts affect the Capital Region.

The Capital Region has already experienced the impacts from a changing climate. In recent years, this has come through significant flooding in many parts of the Capital Region from Tropical Storm Irene and storm surge in Greene County from Hurricane Sandy. These types of events have caused road washouts, power outages, property damage, and flooded wastewater treatment facilities.

The complete climate vulnerability assessment is in Appendix 5, and provides an overview of the Capital Region’s past and projected future climate. It also outlines the climate hazards that currently impact the Capital Region and how they will affect each of the focus areas of the Sustainability Plan.

Regional Baseline

Climate Overview

The difference between climate and weather is often confused. Weather is the state of the atmosphere over a short period of time. Climate refers to the long term trends in weather (NASA, 2005).

“Weather is what conditions of the atmosphere are over a short period of time, and climate is how the atmosphere “behaves” over relatively long periods of time. When we talk about climate change, we talk about changes in long-term averages of daily weather.” (NASA, 2005)

The general climate of the Capital Region is “humid continental.” The average annual temperature is 48°F and the Capital Region experiences on average 39 inches of precipitation each year (NOAA). Climate conditions vary across the Capital Region: the northern and southern areas’ climate is moderated in the winter by its relative proximity to the Atlantic Ocean, whereas generally, the northern and western counties experience colder winters, with more precipitation falling as snow, and slightly warmer summers, with more days above 90°F. For example, Cairo in Greene County receives, on average, only 48.8 inches of snow per year, while Glens Falls in Warren County receives 67.4 inches per year (NOAA). Table 4.1 provides a complete comparison.

Climate Hazards

The Capital Region is impacted by the following climate hazards:

- ✓ Extreme heat
- ✓ Flood
- ✓ Hailstorm/Ice storms
- ✓ Hurricanes and other tropical storms (including nor’easters)

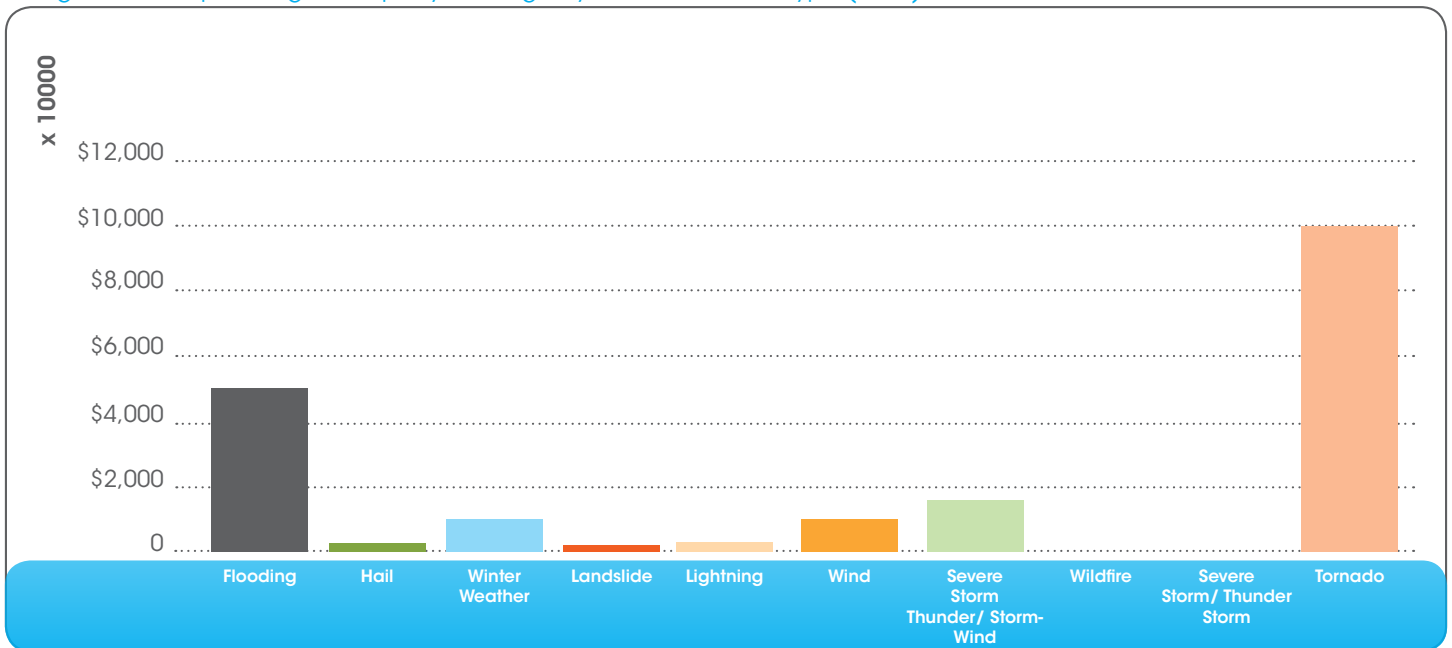
Table 4.1 Capital Region Average Climate Data

| | Annual average temp. (°F) | Annual average precipitation (in) | Snowfall (in) | Cooling degree days | Heating degree days | # of days with precipitation ≥1 inch | # of days with max. temp. ≥ 90°F | # of days with max. temp. ≤ 32°F |
|---|---------------------------|-----------------------------------|---------------|---------------------|---------------------|--------------------------------------|----------------------------------|----------------------------------|
| Glens Falls | 45.6 | 39.01 | 67.4 | 426 | 7402 | 7.9 | 6.2 | 51.7 |
| Albany | 48.3 | 39.31 | 61.7 | 612 | 6598 | 7.5 | 9.1 | 43.5 |
| Cairo | 47.8 | 40.97 | 48.8 | 516 | 6294 | 10.4 | 11.2 | 35.6 |
| Averages calculated from 1981 – 2011 Source: (NOAA) | | | | | | | | |





Figure 4.1 Capital Region Property Damage by Natural Hazards Type (2011)



- ✓ Tornadoes
- ✓ Wildfires
- ✓ Winter Weather

As shown in Figure 4.1, flooding and tornadoes are the most costly hazards in the Capital Region (SHELDUS, 2011). Though it is noted that flooding is significantly more frequent than tornadoes. Along those lines, winter weather has also had a strong impact on the Capital Region in recent years. The Capital Region must continue to anticipate increased costs associated with winter weather and flooding. Figure 4.2 shows the current FEMA floodplains throughout the Capital Region and Figure 4.3 shows 100-year potential in 2080. Figure 4.4 shows the storm surge inundation potential from a tropical storm, and figure 4.5 indicates potential storm surge inundation in 2080. The Troy Dam prevents storm surge impacts from the most northern part of the Capital Region, so

Figure 4.4 is focused on the southern end only. The recent impacts of Tropical Storm Irene are a great reminder and example of the damage that can result from flooding.

A tornado outbreak on May 31, 1998 spawned three tornadoes in the Capital Region (Figure 4.6). The most severe was an F3 that tore through Rensselaer and Saratoga counties, causing over \$97 million worth of damages (SHELDUS, 2011).

Observed Climate Trends

Historical weather patterns already indicate warming trends for New York State. The New York State Department of Environmental Conservation's Hudson River Estuary Program documents the following climate trends for the state (NYSDEC, 2012):

- ✓ Increasing average temperature: nearly 2°F in 30 years.

Table 4.2 Observed Climate Trends: Temperature Change per Decade

| | Annual | Spring | Summer | Fall | Winter |
|-----------|--------|--------|--------|------|--------|
| 1901-2000 | 0.18** | 0.25** | 0.13* | 0.06 | 0.29** |
| 1970-2008 | 0.64** | 0.23 | 0.69** | 0.47 | 1.23** |

Temperatures in °F per decade

*Significant at the 95% level

**Significant at the 99% level (NYSERDA, 2011)

Table 4.3 Observed Climate Trends: Precipitation Change per Decade (inches)

| | Annual | Spring | Summer | Fall | Winter |
|-----------|--------|--------|--------|--------|--------|
| 1901-2000 | 1.13** | 0.33 | 0.34 | 0.36** | 0.10 |
| 1970-2008 | 1.33 | 0.16 | 0.50 | 0.62 | -0.15 |

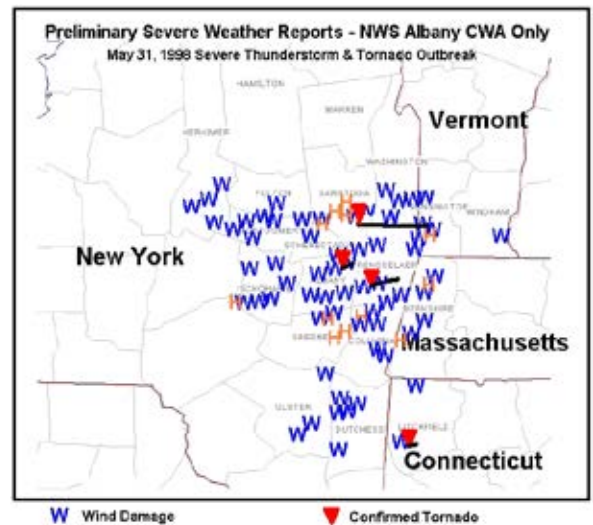
*Significant at the 95% level

**Significant at the 99% level (NYSERDA, 2011)

Table 4.4 Annual Average Climate Projections

| | Baseline 1981-2011* | 2020s | 2050s | 2080s |
|-------------------------|------------------------|----------------|---------------|---------------|
| Air temperature | 48°F | + 1.5 to 3.0°F | +3.0 to 5.5°F | +4.0 to 8.0°F |
| Precipitation | 39 in | 0 to +5% | 0 to +5% | +5 to 10% |
| Sea level rise | | Inches | Inches | Inches |
| GCM-based | n/a | +1 to +4 | +5 to +9 | +8 to +18 |
| Rapid ice-melt scenario | n/a | ~4 to +9 | ~17 to +26 | ~37 to +50 |

Figure 4.2





- ✓ Warmer winter average temperatures: 5°F in 30 years.
- ✓ Earlier bloom dates of many plant species: 4-8 days earlier on average than they were in the early 1970s.
- ✓ Increasing average rainfall and intensity of heavy downpours
- ✓ Decreasing days with snow cover
- ✓ Rising sea level: in New York Harbor sea level is 15 inches higher today than it was in 1850.

ClimAID documented specific observed climate trends for the Capital Region based on the weather station at Albany (see Tables 4.2 through 4.3) The statistically significant trends include an increase in temperatures between 1901 and 2011 as well as between 1970 and 2008, and an increase in precipitation between 1901 and 2000. However, it should be noted that there was no statistically significant increase in precipitation between 1970 and 2008. The number of days per year at or below 32°F has decreased by approximately seven days per decade. Non-statistically significant trends represent normal climate variation that occurs over time that is not likely related to global climate change.

Projected Changes in Climate

According to the global climate model (GCM), an increase in annual average temperature is extremely likely this century. If greenhouse gas (GHG) emissions continue on the current

Best Practice

The City of Kingston, NY

Kingston is a city on the Hudson River with a historic downtown vulnerable to flooding. The City's Conservation Advisory Council is engaged in a community-driven process to address the challenges of waterfront flooding, especially in the face of sea level rise. A task force of businesses, property owners, institutions, and government agencies will assess the waterfront's greatest vulnerabilities and opportunities. In 2013, the task force will make recommendations to ensure a secure, prosperous waterfront for many years to come.

<http://kingstoncac.org/index.php/initiatives>

trajectory, temperatures could increase by as much as 8°F by the end of the century (see Table 4.4). In the Capital Region, the number of days per year with maximum temperatures exceeding 90°F could increase from 10 to 75 days based on the high emission scenario. The number of days per year with minimum temperature at or below 32°F could decrease from 134 to 131. (NYSERDA, 2011).

The models also project an overall increase in annual precipitation; however most of this increase will occur in the winter, with possible decreases in precipitation in the summer and early fall. (NYSERDA, 2011). Intense precipitation events are also likely to increase, with potentially 14 days a year that exceed one inch of rainfall as shown in Table 4.5.

Sea level rise is extremely likely this century. For the tidal Hudson River, which extends up to the dam at Troy, the downscaled projections of the model show sea level rise between 8 and 18 inches by the 2080s, and under the a rapid ice melt scenarios the projections are 37 to 50 inches. Flooding along the Hudson River south of the dam at Troy will increase from storms as sea level rises. Figures 4.3 and



Example of storm flooding



Figure 4.3 Current Regional FEMA Floodplains

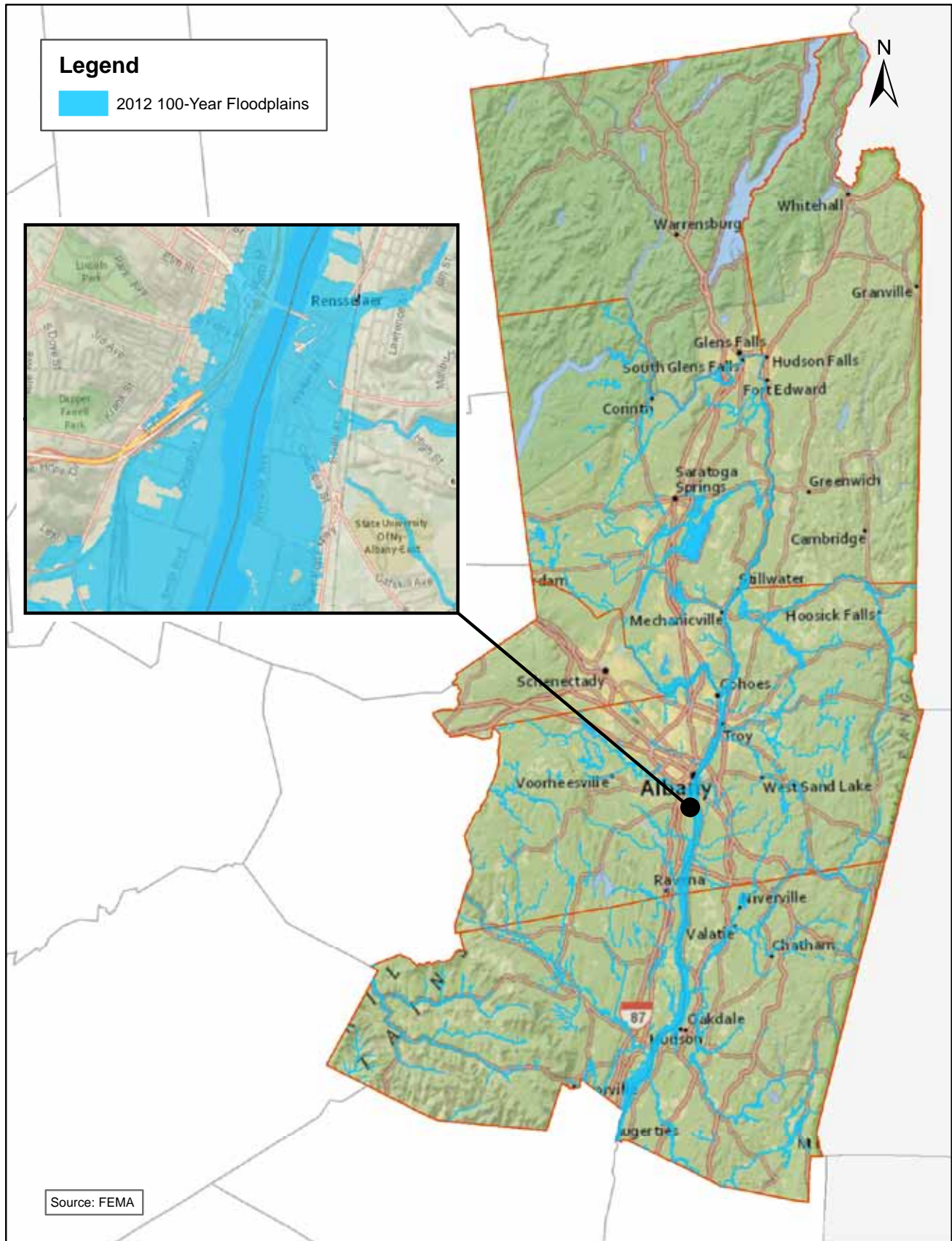




Figure 4.4 Floodplain Potential in 2080

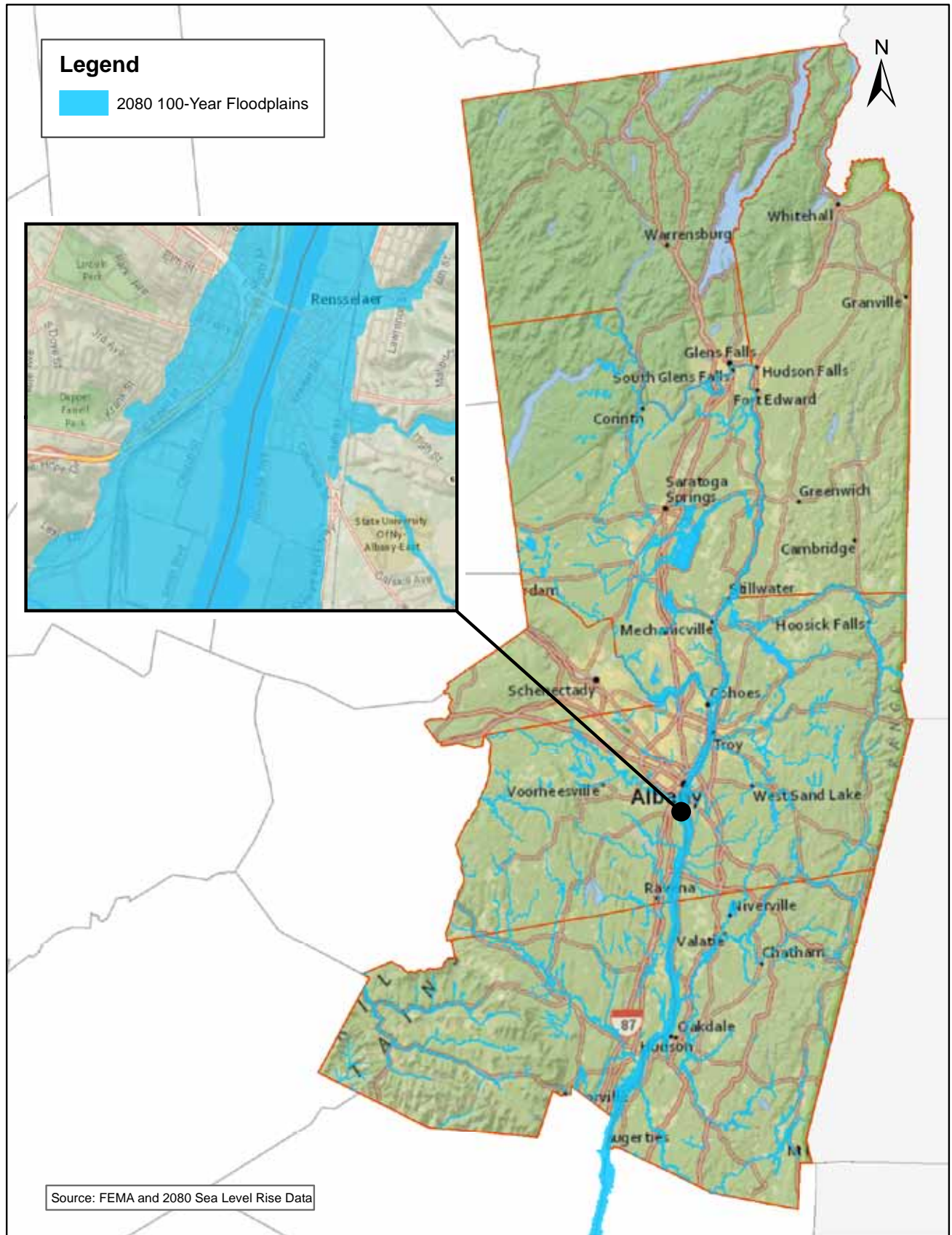


Figure 4.5 Storm Surge Inundation from a Tropical Storm

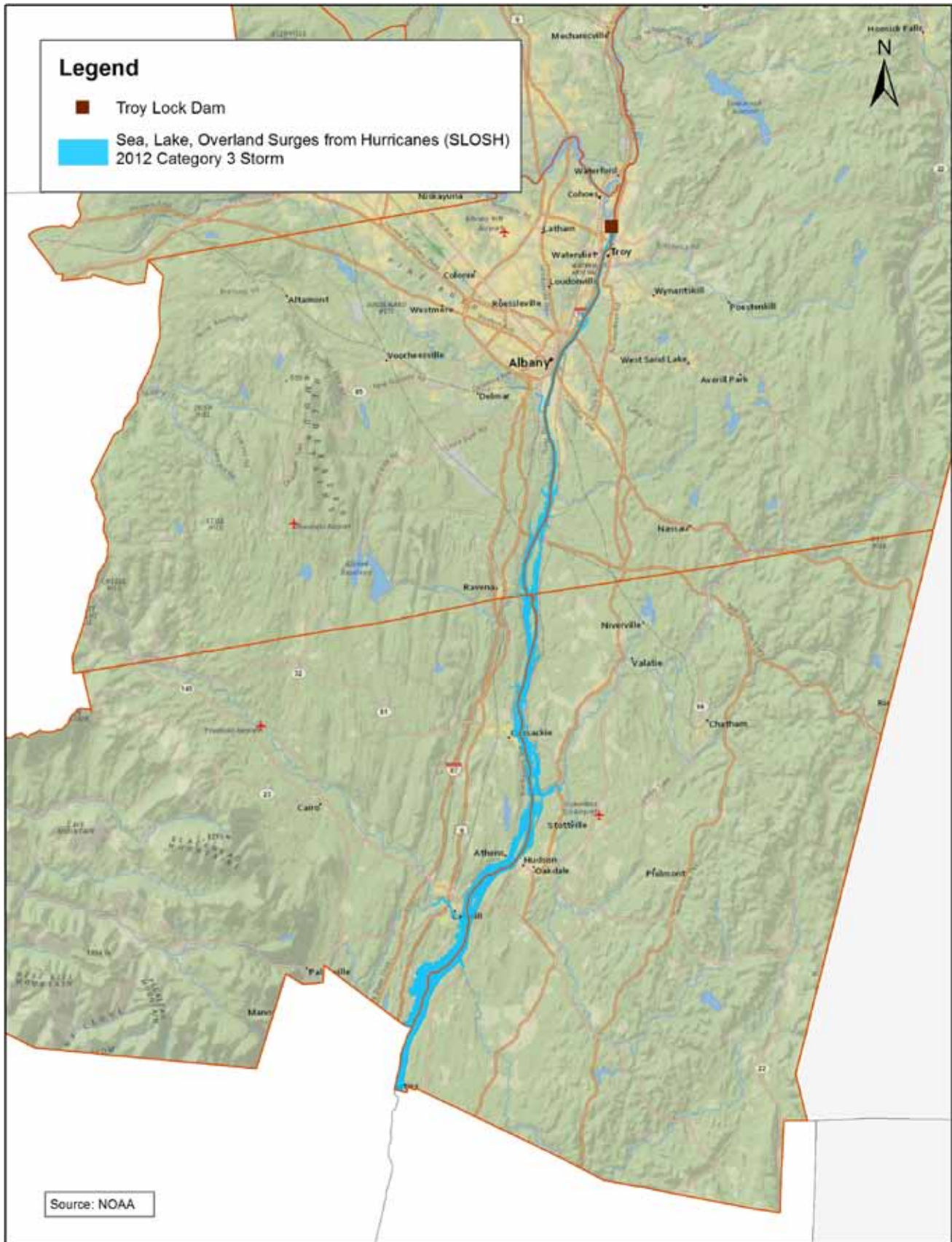




Figure 4.6 Storm Surge Inundation Potential in 2080

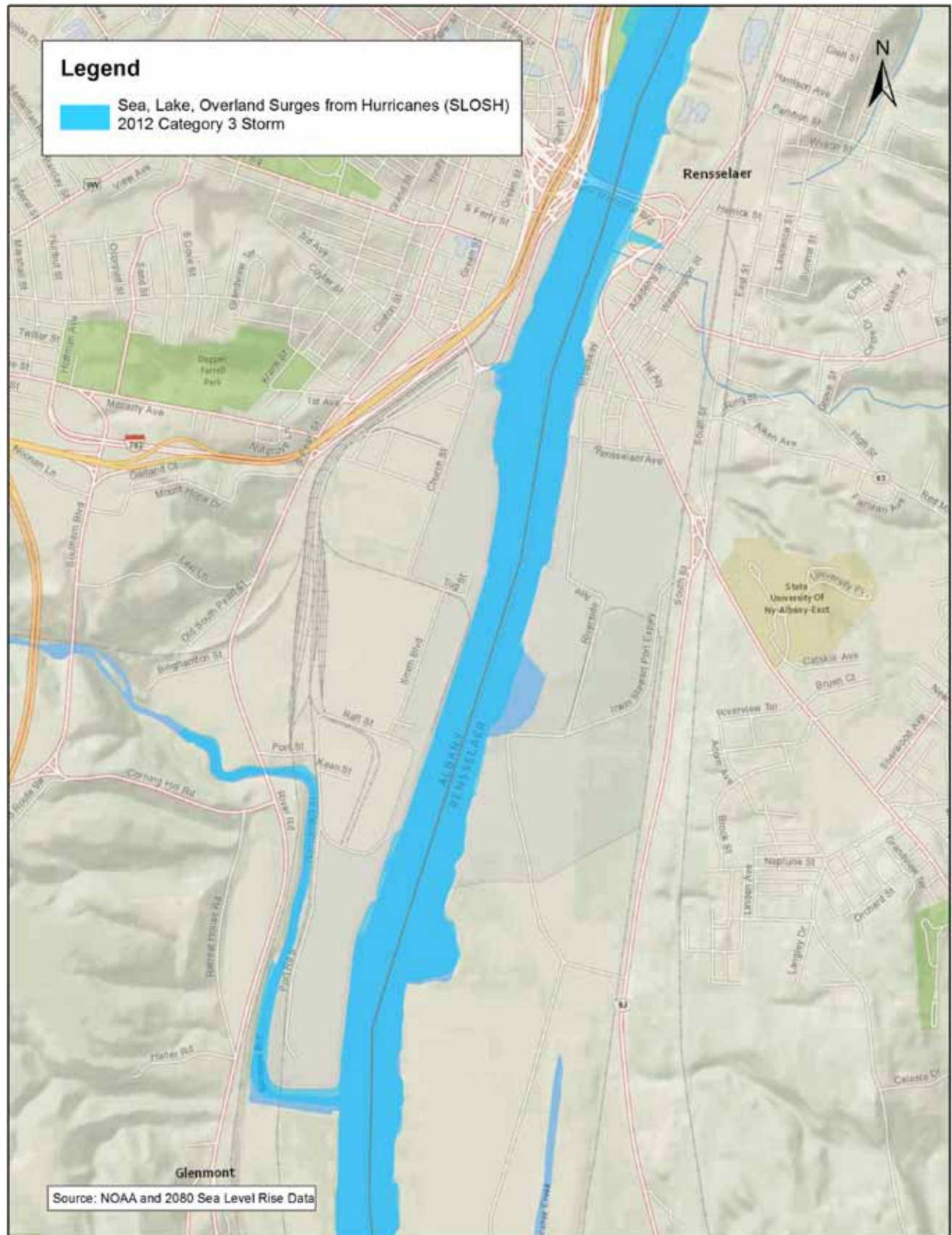


Table 4.5 Extreme Weather Climate Projections

| | Baseline (Saratoga Springs) 1971-2000 | 2020s | 2050s | 2080s | |
|--|---|-------|---------|--------|--------|
| Full range of changes in extreme events: minimum and maximum (NYSERDA, 2011) | | | | | |
| Heat Waves & Cold Events | Number of days per year with max. temperature exceeding | | | | |
| | 90° F | 10 | 11-28 | 17-49 | 18-75 |
| | 95° F | 1 | 1-7 | 3-21 | 3-42 |
| | # of heat waves/year | 2 | 2-4 | 2-7 | 3-9 |
| | Average duration | 4 | 4-5 | 4-6 | 4-9 |
| | # of days per year with min. temp. ≤32° F | 134 | 121-147 | 92-135 | 78-131 |
| Intense Precipitation | Number of days per year with rainfall exceeding: | | | | |
| | 1 inch | 10 | 8-12 | 9-12 | 10-14 |
| | 2 inches | 1 | 1-2 | 1-2 | 1-2 |

4.5 show the floodplain and the storm surge inundation potential in 2080. Other changes in extreme events are difficult to project due to their inherent variability. However, some qualitative data exists to support the following projections (NYSERDA, 2011):

- ✓ More frequent nor'easters
- ✓ More frequent intense hurricanes as sea surface temperatures increase
- ✓ Increase in frequency and intensity of downpours (intense precipitation occurring over a period of minutes or hours)

Goals

Based on the historical climate trends and the climate projections that have been identified for the Capital Region, the Climate Adaptation Technical Committee confirmed one overarching goal:

Enhance the Capital Region's resiliency in the face of climate change in order to maintain basic services and minimize the impacts of climate change on the most vulnerable populations and ecosystems.

The Committee identified nine specific initiatives that the Capital Region could implement to achieve this goal.

Regional Initiatives

The Climate Adaptation Technical Committee identified a number of initiatives that could help the Capital Region achieve the main overarching goal. The details of the initiatives were discussed by the Technical Committee and were evaluated for their overall benefit to the Capital Region, their cost and feasibility. The initiatives were ranked by the public and the Technical Committee, followed by a final review and ranking by the Executive Committee. The top three priority initiatives are described below. Preliminary scoring and prioritization process of all the initiatives considered can be found in Appendix 2 and 3, respectively.

Promote Green Infrastructure. According to the U.S. EPA, green infrastructure can be a cost-effective and resilient approach to addressing our water infrastructure needs while improving air quality, creating





or connecting habitat, and reducing the effects of heat island. Green infrastructure can include anything from green alleys and green roofs to urban tree canopy and rain gardens (EPA, 2012).

Local governments can update their zoning to provide incentives and/or requirements for green infrastructure in new construction and major retrofits. There are many zoning tools available such as landscape ordinances, on-site stormwater management requirements, ecological surface requirements, and open space/permeable surface requirements. It is important that different types of cities, towns, and villages leverage the tools that will be most effective in their community. In order to pay for and maintain green infrastructure practices, a management structure with a dedicated funding stream needs to be established.

The recommended structure to support the utilization of both grey and green infrastructure is a stormwater utility district (SUD). Currently there are no SUDs in New York State.

There are also issues related to the difficulty of assuring the long term functionality of stormwater infiltration mitigation measures on private parcels. This could potentially be addressed more effectively through a stormwater utility district, educational programs, and through regional partnerships like the MS4 Consortium program.

Complete Local Vulnerability Assessments and Adaptation Plans. The Intergovernmental Panel on Climate Change (IPCC) defines vulnerability as “the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity” (IPCC, 2007) The goal of a vulnerability assessment is

Best Practices

Green Roof Subsidy - “The City of Portland, OR offers an incentive to property owners and developers to add more ecoroofs. The incentive program is part of Portland’s Grey to Green initiative to increase sustainable stormwater management practices, control non-native, invasive plants, and protect sensitive natural areas. The incentive funds up to \$5 per square foot of an ecoroof project. Installation costs for ecoroofs in Portland range from \$5 to \$20 per square foot.

Best Practices

Tree Planning Coupon Incentive - Baltimore County, MD’s Growing Home Campaign has provided \$10 coupons to homeowners toward the purchase of trees at local nurseries. Each coupon represents \$5 of public funds and \$5 of retail funds. The County began the program as an innovative way to increase tree canopy cover as part of its larger “Green Renaissance” forest conservation and sustainability plan. In the first two months of the program, 1,700 trees were planted.



Normanskill Creek



to examine the impacts of climate change and assess how they will affect the Capital Region's systems and sectors. As part of the Sustainability Plan, a high level climate vulnerability assessment was conducted for the Capital Region. The local governments should leverage this effort to develop a more specific assessment for their own community. These local vulnerability assessments should include mapping of vulnerable infrastructure and identification of vulnerable populations. The assessments could provide communities guidance on how to avoid planning projects that would be vulnerable to climate change. The second phase of this strategy builds off of these vulnerability assessments and creates adaptation plans to reduce vulnerabilities. Sector-specific elements, such as transportation and agriculture, should be included in this strategy.

Develop a Guidance Document on How to Integrate Climate Change Impacts into Existing Plans and Processes. Local governments already have plans and processes. Rather than waiting for the next round of planning updates, the guidance document will help local governments integrate elements of climate change impacts into existing plans and processes without having to allocate significant resources to create a separate, new plan. Relevant plans could include master/comprehensive plans, waterfront plans, emergency management/hazard mitigation plans, public health plans, transportation plans, agriculture preservation plans, neighborhood plans, etc. New York's Climate Smart Communities Program is a potential resource that the Capital Region could take advantage of to provide technical assistance for some of these efforts.

Implementation

Identifying these priority initiatives in many ways is the easiest part of the planning process. Implementation of



Hurricane Irene damage Town of Prattsville
Source: FEMA

the priority initiatives identified in the Sustainability Plan can be far more difficult. The barriers to implementing these initiatives either in the past or moving forward are many.

Lack of funding and resources, conflicting priorities at the municipal level, absence of a strong proponent or implementer, lack of grassroots support, and lack of inter-municipal cooperation have and will continue to be barriers to implementation if not addressed. Additionally, adaptation is an emerging field that requires a new perspective when it comes to risk assessment and management, and as resources and education continue to expand, we will see more communities undertaking these initiatives.

To that end, an implementation strategy which outlines the resources, costs and timeline associated with achieving the priority initiatives and overcoming these barriers, is provided in Table 4.6.





Table 4.6 Climate Adaptation Implementation Strategy

| Initiative | Regional Priority | Implementer | Partners | Preliminary Cost | Greenhouse Gas Reduction Potential** | Potential Funding Sources | Timeline |
|--|-------------------|--|---|------------------|--------------------------------------|--|----------------------|
| Promote the use of green infrastructure in new construction and major retrofits. | 1 | Local Governments Private Developers | - Stormwater Coalition of Albany County - NYSEFC - MS4 Consortiums | \$ | Medium | - US EPA - Stormwater Utility District - NYSEFC | Mid-Term (1-5 years) |
| Complete local climate vulnerability assessments and adaptation planning to assess impact of climate change. | 2 | Local Governments | - Climate Smart Communities Regional Coordinators - NYSEFC - MS4 Consortiums | \$ | Low | FEMA- through integration with Hazard Mitigation Plans | Short Term (<1 year) |
| Develop a guidance document on how to integrate climate change impacts into existing planning documents and local government approval processes. | 3 | Local Governments or Non-Profit organization | - ECOS: The Environmental Clearinghouse - Climate Smart Communities - Regional Coordinators | \$ | Low | - US EPA - US DOE | Short-term (<1 year) |

*Overall Cost: \$ - < \$100,000, \$\$ - \$100,000 to \$500,000, \$\$\$ - > \$500,000

**Greenhouse Gas Reduction Potential: High – Strategy will result in a direct, quantifiable reduction in GHG emissions; Medium – Some GHG emissions reduction may occur but it cannot be quantified; Low – GHG reduction is very indirect, unlikely to occur, or unknown

In addition to the implementation strategy listed above, it is recognized that these initiatives will require action by local government. The governance overview in Table 4.7 provides guidance to jurisdictions on specific actions they can take to implement the Sustainability Plan’s various initiatives. It also evaluates each initiative against all others in the plan to identify where there are alignments or hindrances to implementation.

Sustainability Indicators

Sustainability indicators and targets have been established to allow the Capital Region to track its progress with each Focus Area. For Climate Adaptation, six indicators have been established:

- Annual Regional Energy Consumption Per Capita
- Per Capita Land Consumption
- Economic Value of Property Vulnerable to Flooding
- Annual Agriculture– Farm Production (Dollars)
- Total Annual Water Permit Notice of Violations
- Number of Climate Smart Communities within the Capital Region

Refer to Section 13 for specific information about the sustainability targets and indicators.



Table 4.7 Climate Adaptation Governance Recommendations

| Name of Initiative | Process to Implement (update zoning ordinance, adopt a policy or plan, resolution to approve funding, etc.) | Related Policies – positive link-ages and alignments | Related Policies – barriers and cross-purposes | Local Government Level of Implementation |
|---|---|--|--|--|
| <p>Promote the use of green infrastructure in new construction and major retrofits.</p> | <p>Local Jurisdictions Update and Adopt Zoning Codes</p> <p>Region Develops and Provides Technical Assistance to Communities</p> | <p>Code changes can be coordinated and vulnerability assessments used to inform code updates.</p> <p>This initiative should be coordinated with other code-related initiatives such as:</p> <ul style="list-style-type: none"> - Establish Model Zoning Code and Water - Revise Municipal Code to Incorporate Water/Stormwater Management Best Practices. <p>There are also synergies with several water-related initiatives including:</p> <ul style="list-style-type: none"> - Water <ul style="list-style-type: none"> - Develop a Predictive Model for Stormwater Management - Conduct a Watershed Assessment for Stormwater Management - Develop an Asset Management Plan for Municipal Water and Sewer Systems - Develop a Purchasing Consortium for Municipal Water Projects - Energy <ul style="list-style-type: none"> - Establish Green Districts and Land Use - Repair and Modernize Existing Infrastructure offer opportunities for coordination | <p>-Potential to be at cross-purposes with Land Use</p> <p>- Transit-oriented Development initiative if code changes are not well coordinated to integrate both density and green infrastructure objectives. Similarly, potential to be at cross purposes with Land Use</p> <p>- Modify Local Codes and Land Use Regulations to Allow for Sustainable, Compact Development if density requirements do not allow for sufficient green infrastructure.</p> | <p>Implementation at county, city, and town level, as well as in all other local jurisdictions (such as villages) with zoning authority.</p> |
| <p>Complete local climate vulnerability assessments and adaptation planning to assess impact of climate change.</p> | <p>Develop Assessments and Create Adaptation Plans. Plans could be stand-alone or integrated with other plans such as master/comprehensive plans.</p> | <p>Vulnerability assessments should be used to inform code changes as well as land acquisition.</p> <p>Vulnerability Assessments could be helpful to inform:</p> <ul style="list-style-type: none"> - Water <ul style="list-style-type: none"> - Asset Management Plans for Municipal Water and Sewer Systems as well as the establishment of a grant program for water projects in smaller communities - Develop a Predictive Model for Stormwater Management initiative could help inform the vulnerability assessments | <p>Significant education of local governments will be needed to support implementation</p> | <p>Implementation at county and city level; smaller jurisdictions could conduct joint planning with each other or with larger jurisdictions to leverage resources.</p> |



Section 5.0

Economic Development



Village of Fort Edward





SECTION 5.0: **Economic Development**

Sustainable economic development is defined as “examining and correcting conditions as needed to advance economic prosperity, social equity, and cultural diversity without compromising environmental quality, availability of natural resources, and biodiversity for future generations (Useful Community Development, 2012).”

The Capital Region’s economy has remained strong over the past several years, thanks in part to the strong presence of state government and related industries, population growth, and investments in technology and infrastructure. To enjoy sustained economic success, the Capital Region must build upon its strengths and encourage growth in markets and industries that will continue to prosper in the future.

The Strategic Plan prepared by the Capital Region Economic Development Council (REDC) in 2011 provides a comprehensive economic development strategy for the Capital Region. The REDC Strategic Plan focuses upon collaboration, empowerment, quality of life, and the growth of industries suited to thrive in the Capital Region. REDC’s recommendations were used to frame the initiatives considered by the Economic Development Technical Committee. The Sustainability Plan further emphasizes sustainability in the initiatives it proposes.

Of the REDC’s priority goals, the following weighed most heavily in identifying priority economic development initiatives for the Sustainability Plan:

- ✓ **Leverage and Collaborate:** Build partnerships and link resources within the Capital Region, in order to strengthen the Capital

Best Practices

Create Green Alliance – In Sacramento, CA, green building, energy and other sustainable enterprises band together to form an alliance that promotes awareness of services, marketing, business directories, networking and team-building capacity.



Table 5.1 Population Growth

| Geography | % Change in Population, 2000-2010 |
|------------------|-----------------------------------|
| Capital Region | +4.3% |
| Upstate New York | +1.5% |
| New York State | +2.1% |
| United States | +9.7% |

Table 5.2 Regional Income

| Geography | Median Household Income | Per Capita Income |
|----------------|-------------------------|-------------------|
| Capital Region | \$55,683 | \$29,175 |
| New York State | \$55,603 | \$30,948 |
| United States | \$51,904 | \$27,334 |

Table 5.3 Poverty Levels

| Geography | % Individual Poverty | % Household Poverty |
|----------------|----------------------|---------------------|
| Capital Region | 10.6% | 10.2% |
| New York State | 14.2% | 13.6% |
| United States | 13.8% | 13.0% |

- Region’s capital and competitiveness.
- ✓ **Open New Doors:** Foster opportunities for innovation and growth. Encourage entrepreneurship and support existing businesses.
- ✓ **Prepare for Tomorrow:** Use the Capital Region’s educational strengths and talented workforce to position it for success in emerging industries.
- ✓ **Bring Cities to Life:** Ensure that urban areas remain vibrant, appealing centers for cultural and economic activity.

This section’s baseline assessment provides a snapshot of the Capital Region’s current economic standing, in order to identify areas for improvement and to help track future progress. “Green industries” will help drive future economic growth, and will do so sustainably. It is important to develop these industries in the Capital Region, as well as local businesses that empower local residents and concentrate skills and wealth within the Capital Region. The goals and initiatives outlined below will encourage sustainable economic growth and prosperity in the Capital Region.

Regional Baseline

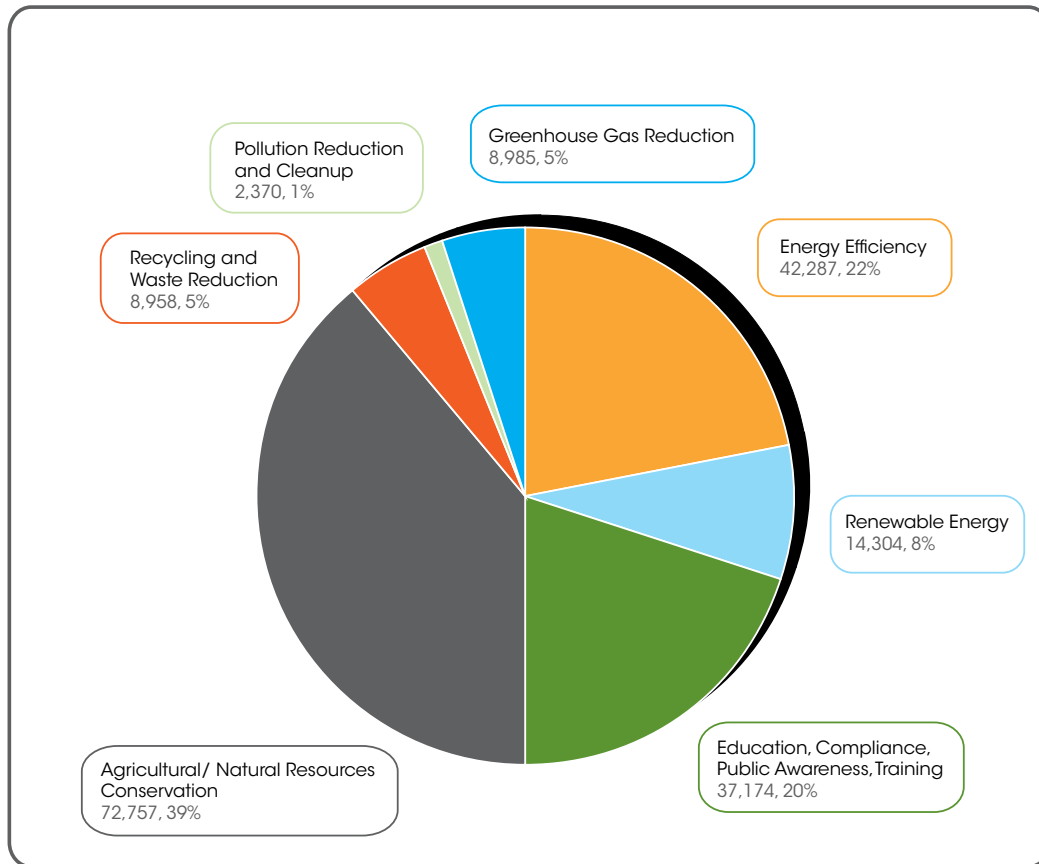
In 2010, the Capital Region had a total population of 1,074,639 (Census 2010), this marks a 4.3% increase in population from the Census 2000 count of 1,029,927. Over this time period, the Capital Region gained population at a faster rate than Upstate New York (1.5%) and New York State overall (2.1%), but at a slower rate than the United States as a whole (9.7%) (Table 5.1).

The median income for the Capital Region’s 430,474 households was \$55,683 (ACS, 2010). Per capita income was \$29,175. These income measures were highest in Saratoga, Albany, and Columbia Counties, and were lowest in Greene and Washington Counties. Median household income for the Capital Region was comparable to the statewide value and higher than the national value. Per capita income in the Capital Region was less than the statewide value and higher than the national per capita income. In the Capital Region, 10.6% of all individuals were living below the poverty line in 2010, this is slightly lower than the 2010 poverty rates for New York State (14.2%) and the United States as a whole (13.8%) (Table 5.2).





Figure 5.1 Green Industry Employment: Capital Region



At the household level, 10.2% of all Capital Region households had earnings below the poverty threshold. This rate compares favorably to the 13.6% household poverty rate for New York State and the 13.0% rate for the United States (Table 5.3).

Green Industry

The U.S. Bureau of Labor Statistics (BLS, 2012) has instituted a Green Goods and Services (GGS) Survey program to identify and count the number of “green jobs” and their contributions to the U.S. economy. The GGS program defines green jobs as “jobs in businesses that produce goods and provide services that benefit the environment or conserve natural resources.” The BLS lists all industries, based on the North American Industrial Classification System (NAICS) codes, involved in the provision of green goods and services.

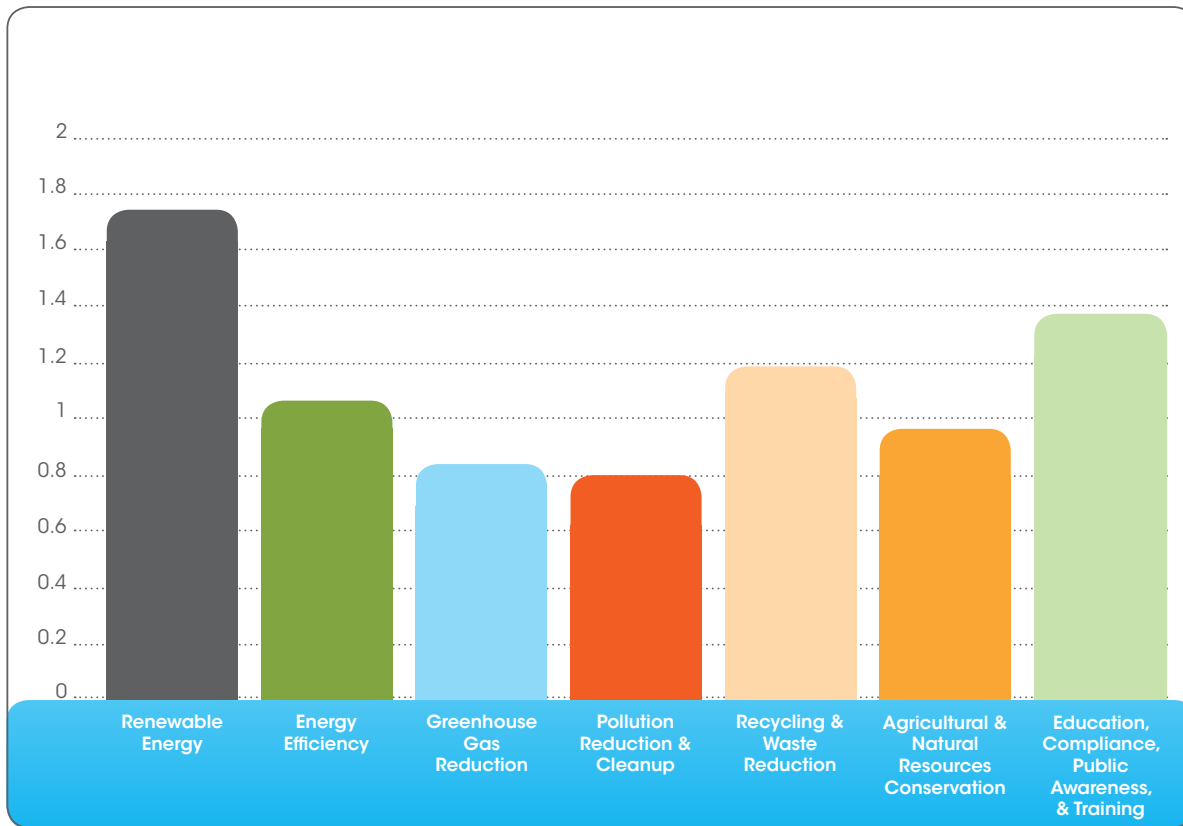
Green industries are assigned to one of the following seven categories:

- ✓ Renewable energy
- ✓ Energy efficiency
- ✓ Greenhouse gas reduction
- ✓ Pollution reduction and cleanup
- ✓ Recycling and waste reduction
- ✓ Agricultural and natural resources conservation
- ✓ Education, compliance, public awareness, and training

Employment information from the U.S. Census Bureau’s 2010 County Business Patterns (CBP) data set was used to estimate the number of Capital Region employees working in each green industry category, as shown in Figure 5.1. In 2010, green industry employment represented 186,835 of the Capital Region’s 384,629 total employees, or 48.6% of the total. It should be noted that while these



Figure 5.2 Location Quotients: Green Industry Categories in the Capital Region



industries serve “green” functions, not all employees within these industries are devoted to sustainable practices (NAICS, 2010).

To better understand how the Capital Region ranks in green services and employment, we can compare the level of green industry employment to a national standard. Location quotients (LQ) of greater than one mean that an industry or set of industries is concentrated (relatively strong) in that Capital Region, compared to the nation as a whole. Conversely, LQs of less than one mean that a given industry or set of industries is relatively weak in that Capital Region, compared to the nation as a whole. Location quotients were calculated for each of the BLS green industry categories. Results of these calculations are shown in Figure 5.2 and are as follows:

- ✓ Renewable energy, 1.70
- ✓ Energy efficiency, 1.04
- ✓ Greenhouse gas reduction, 0.86

- ✓ Pollution reduction and cleanup, 0.80
- ✓ Recycling and waste reduction, 1.19
- ✓ Agricultural and natural resources conservation, 0.97
- ✓ Education, compliance, public awareness, and training, 1.38

Of the seven BLS green industry categories, Renewable Energy is strongest in the Capital Region, with employment at a level 1.7 times that of the nation as a whole. Employment in Education, Compliance, Public Awareness, and Training also well exceeds national levels, and Recycling and Waste Reduction employment is higher in the Capital Region than in the nation overall. Energy Efficiency and Agricultural and Natural Resource Conservation are on par with national levels. Greenhouse Gas Reduction and Pollution Reduction and Cleanup are relatively weak in the Capital Region compared to a national standard.





Figure 5.3 Combined Housing and Transportation Costs

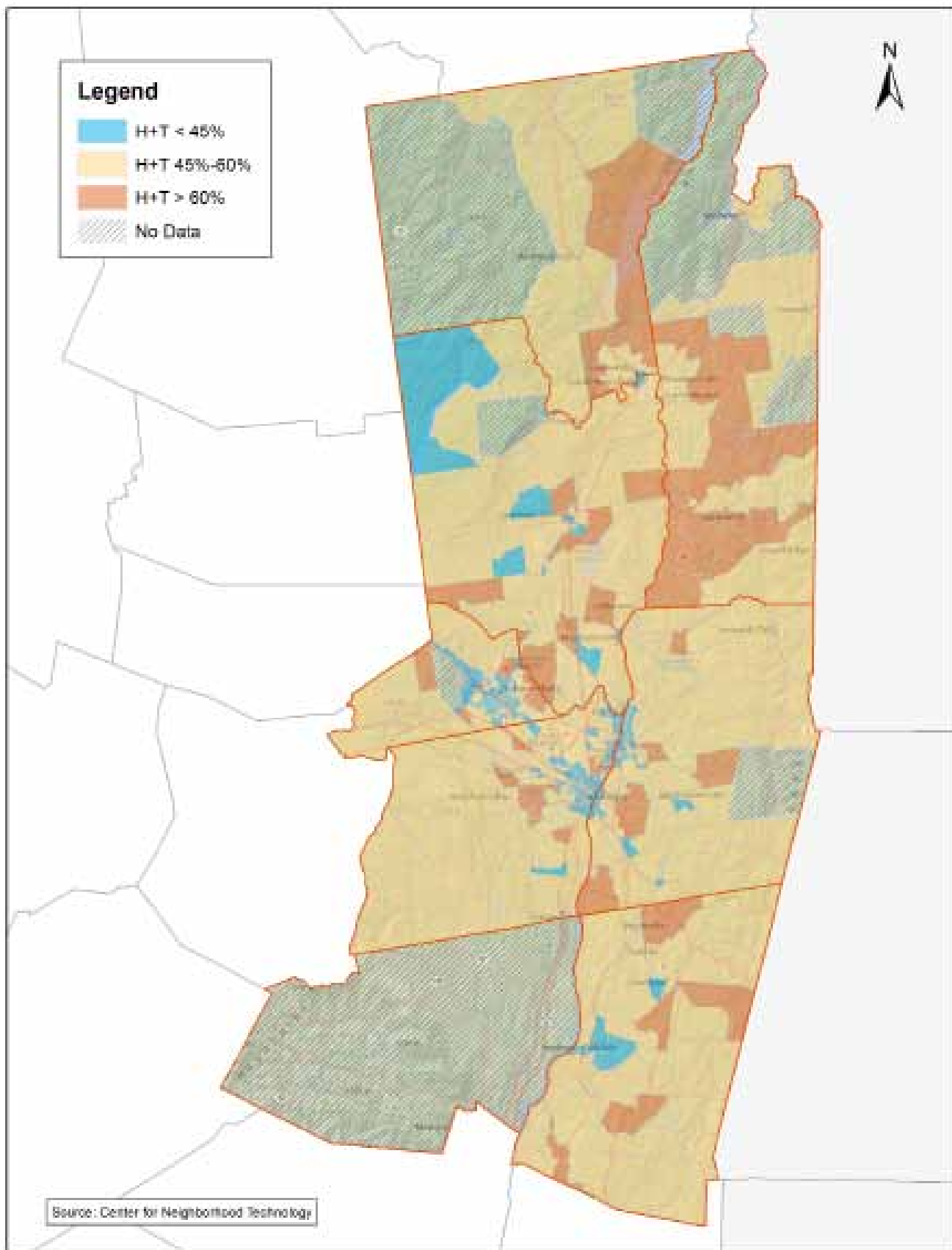


Table 5.4 Housing and Transportation Index by County

| Geography | Percentage of Households with H&T > 45% of Median Household Income |
|--------------------|--|
| Albany County | 54.5% |
| Columbia County | 83.5% |
| Greene County | Not Available |
| Rensselaer County | 63.7% |
| Saratoga County | 83.5% |
| Schenectady County | 53.5% |
| Warren County | 98.1% |
| Washington County | 100% |
| Capital Region | 66.5% |



Housing and Transportation (H&T) Index

Housing and transportation represent the two largest expenses for most households. The benchmark for combined housing and transportation (H & T) affordability stands at 45% of median household income. Combined H&T expenses of more than 45% are considered higher than what is affordable for most households (CNT, 2012).

Figure 5.3 shows, at the Census block group level, the combined costs of H&T as a percentage of area median income throughout the Capital Region. Most block groups (62%) in the Capital Region have housing and transportation costs greater than median area income. Affordable (H&T less than 45%) block groups in the region are concentrated in the urban areas

Best Practices

“Buy Local” Marketing - The most successful “buy local” campaigns promote awareness of the importance of supporting local businesses, and also help to market locally owned and operated establishments. Innovative practices include the publication of independent business directories and the creation of regional currencies accepted by locally owned businesses.

of Albany, Schenectady, and Saratoga, this is likely because residents in these areas live closer to workplaces and other amenities, which reduces their transportation costs.

Table 5.4 provides the percentage of households by county with combined H&T expenses greater than 45% of median household income.

Goals

The Economic Development Technical Committee developed the goals outlined in Table 5.5. Much of the Technical Committee’s work focused on improving the micro-economic environment of the Capital Region, meaning that economic development is focused at the local scale. This is in contrast to many economic development programs and policies that focus on attracting the large scale businesses and companies, which, while employing many, often requires significant public incentives along with major investment in new infrastructure to compete against other parts of the state or country.

Significant discussion revolved around helping the small business community by assisting with financial literacy, improving access to low cost financing and venture capital along with a variety of approaches to provide support for equitable economic growth and





Table 5.5 Economic Development Goals

Goals

Economic development should focus on the Capital Region’s 52 cities and villages—through such strategies as transit-oriented, mixed-use development and land recycling—to increase community revitalization, reduce poverty, improve the efficiency of public works investments, and safeguard our rural and agricultural resources.

Expand economic opportunities to support a socially and economically diverse population by focusing on small business growth, neighborhood revitalization, expanding our agricultural economy and reducing urban and rural poverty.

Align state, regional and local policies and funding to remove barriers to collaboration and shared services, increase the opportunities to leverage funding, and improve accountability and effectiveness of all levels of government.

Grow the Capital Region’s agricultural economy by assisting local farms and complementary businesses in promoting their products at the local, state and national level and by expanding and strengthening the agricultural infrastructure. The importance of agriculture and its positive social, environmental and economic benefits must be highlighted and celebrated as part of the Capital Region’s heritage, community, environment and business climate.

Capitalize on knowledge and innovation offered by the Capital Region’s 16 universities and the technology offered by the private sector to advance our green economy to the forefront nationally by becoming more energy efficient, increasing production and use of renewable energy sources, creating green buildings, increasing recycling, creating Complete Streets, and reducing greenhouse gas emissions.

development. This effort would link to an integrated regional “buy local campaign” that promotes our agricultural economy, while focusing investment in our villages and cities.

Regional Initiatives

A number of the economic development initiatives were developed to help the Capital Region achieve the identified goals outlined in Table 5.5. To prioritize the initiatives the Committee evaluated each for their overall

benefit to the Capital Region, their cost, and their feasibility. The initiatives were ranked by the public and the Technical Committee, followed by a final ranking by the Executive Committee. The top three initiatives are discussed below. Preliminary scoring and the prioritization process and results can be found in Appendix 2 and 3, respectively.

The first regional initiative will leverage the multiple programs throughout the Capital Region to streamline resources for small businesses.

The second initiative focuses on encouraging investment in the Capital Region’s cities and villages by fostering additional land banks to get undeveloped and vacant properties and buildings back on the tax roll. The third priority initiative focuses on fostering our burgeoning green economy by developing an integrated, regional approach for green jobs training.

The Technical Committee believes the priority initiatives will help address the Capital Region’s disparity issues and poverty levels by supporting inner city small businesses, especially among low income and minority business owners. Further enhancing our green jobs training program, creates “blue collar” job opportunities for everything from the building trades to agriculture and administrative work.

Strengthen Regional Small Business Support Programs. The Technical Committee believes that assistance for the Capital Region’s small businesses should be an important priority, and the REDC’s Strategic Plan also expresses strong support for small businesses. To that end, this initiative proposes to develop a comprehensive plan to review small business support programs to help improve efficiency, share resources and reduce redundancies throughout the multiple programs. Micro-enterprise assistance, business financing, and training programs are offered throughout the Capital Region by multiple counties and chambers of



commerce. The Center for Economic Growth and the NYS Small Business Development Center also offer multiple programs to support small business. The Regional Small Business Support Program should:

- ✓ Include an incubator program designed to assist inner city, low income and minority populations access low cost financing and venture capital for start-up and emerging businesses.
- ✓ Expand support for start-up and locally-owned small businesses, micro enterprises, worker-owned and social enterprises.
- ✓ Provide regional access to high quality training and technical support, including financial literacy.
- ✓ Access to small business incubators and related support.
- ✓ Provide access to affordable capital.
- ✓ Identify advocacy liaisons to reduce barriers and navigate permitting, licensing, certification processes.
- ✓ Support buy local campaigns that support locally-owned businesses and facilitate local re-circulation of capital.
- ✓ Identify and nurture small businesses and small business clusters that can generate significant economic activity.

Support Expansion of Regional Land Banks by existing and new mechanisms. Promote the development of multiple land banks to allow quick and efficient acquisition and disposition of brownfield, vacant, abandoned and tax delinquent properties. In 2011, Empire State Development was granted the authority to approve ten land bank programs in New York State. Five land banks were approved in Round 1 of the

program, including the City of Schenectady/ Schenectady County/City of Amsterdam in the Capital Region. As additional jurisdictions in the Capital Region look to begin land banks, or the establishment of a regional land bank is explored, Empire State Development should be considered a primary resource for expertise and future approval authority.

Expand green jobs training.

Expanding green jobs training was also identified in the REDC Strategic Plan. By

Best Practices

Land bank programs allow municipal or regional agencies to acquire vacant, abandoned, and tax delinquent properties. These properties are rehabilitated or redeveloped, and then sold to members of community as improved real estate. The City of Schenectady, Schenectady County, and the City of Amsterdam were awarded funding in Round 1 of the New York State Land Bank Program to institute a land bank.





leveraging NYSERDA funding for energy efficiency and renewable energy training in coordination with experienced local training providers including, but not limited to, BOCES and the Capital Region's community colleges (e.g., solar installer training, building operations and maintenance, green building principles, etc.), these training programs can further supported through the coordination of hands-on and experiential learning opportunities supported under the REDC Strategic Plan.

The REDC's Strategic Plan identifies specific measures that can be taken to improve and expand green jobs training in the Capital Region. These include creating the Clean Technologies and Sustainable Industries Early College High School, which would offer specialized education and training to prepare students for careers and higher education in green industries. Industry involvement in this (or a similar) program will provide hands-on training while establishing a talent pipeline that benefits the Capital Region's companies.

The REDC recommends that the region should “develop mechanisms to achieve alignment in how all sectors (school districts, colleges and universities, technical and vocational training institutions, job placement services, business enterprises) network with each other to understand and respond to current and emerging needs, and to develop a comprehensive plan to prepare, attract and retain the 21st Century talent pipeline.” Regional internship programs (potentially supported by a Chamber of Commerce) provide an effective way to match interested students with compatible local industries, leading to the improved retention of skilled employees in the Capital Region.



Implementation

Identifying these priority initiatives in many ways is the easiest part of the planning process. Implementation of the priority initiatives identified in the Sustainability Plan can be far more difficult. The barriers to implementing these initiatives either in the past or moving forward are many.

Lack of funding and resources, poor communication between supporters, conflicting priorities at the municipal level, absence of a strong proponent or implementer, lack of grassroots support, poor or non-existent inter-municipal cooperation and inter-municipal competition have and will continue to be a barrier to implementation if not addressed.

Therefore, to overcome these barriers an implementation strategy which outlines the resources, costs and timeline associated with achieving the priority initiatives and overcoming these barriers is provided in Table 5.6.

Sustainability Indicators

Sustainability indicators and targets have been established to allow the Capital Region to track its progress with each Focus Area. For Economic Development, five indicators have been established:

- Annual Regional Energy Consumption Per Capita
- Annual Waste Disposal Per Capita
- Annual Agriculture – Farm Production (Dollars)
- Per Capita Land Consumption
- Housing + Transportation Index
- Annual Median Household Income;
Families Below the Poverty Line & Population Below the Poverty Line

Refer to Section 13 for specific information about the sustainability targets and indicators.



Table 5.6 Economic Development Implementation Strategy

| Initiative | Regional Priority | Implementer | Partners | Preliminary Cost* | Greenhouse Gas Reduction Potential** | Potential Funding Sources | Timeline |
|---|-------------------|---|--|-------------------|--------------------------------------|--|-------------------|
| Strengthen regional small business support programs to improve efficiency, effectively share resources, and reduce regional redundancies. | 1 | Capital Region Economic Development Council | <ul style="list-style-type: none"> - Center for Economic Growth - Empire State Development - County IDA's - Chamber of Commerce - Economic Development Corporation - Community Loan Fund of the Capital Region - National Grid | \$\$ | Low | <ul style="list-style-type: none"> - NYS Consolidated Funding Application - Chambers of Commerce - County IDA - Empire State Development | Midterm (1-5 yrs) |
| Support expansion of land banking through existing and new mechanisms. | 2 | County-Municipal Partnerships | <ul style="list-style-type: none"> - Empire State Development - Local Governments - County IDA's - National Grid - NYS Build Now | \$\$\$ | Medium | <ul style="list-style-type: none"> - Empire State Development/New York - State Land Bank Program - NYS Consolidated Funding Application | Midterm (1-5 yrs) |
| Expand support of green jobs training programs to include green infrastructure design and maintenance. | 3 | Capital Region Economic Development Council | <ul style="list-style-type: none"> - Adirondack Community College - Schenectady Community College - Hudson Valley Community College - Columbia Green Community College - Capital District BOCES - Northeast Parent & Child Society - Trade Unions | \$\$ | Medium | <ul style="list-style-type: none"> - NYSERDA - Community Colleges - NYS Consolidated Funding Application | Midterm (1-5 yrs) |

*Overall Cost: \$<\$100,000; \$\$-100,000 to \$500,000; \$\$\$> \$500,000.

**Greenhouse Gas Reduction Potential: High - Strategy will result in a direct, quantifiable reduction in GHG emissions; Medium - Some GHG emissions reduction may occur but it cannot be quantified; Low - GHG reduction is very indirect, unlikely to occur, or unknown

In addition to the implementation strategy listed above, it is recognized that these initiatives will require action by local government. The governance overview in Table 5.7 provides guidance to jurisdictions on specific actions they can take to implement the Sustainability Plan's various initiatives. It also evaluates each initiative against all others in the plan to identify where there are alignments or hindrances to implementation.

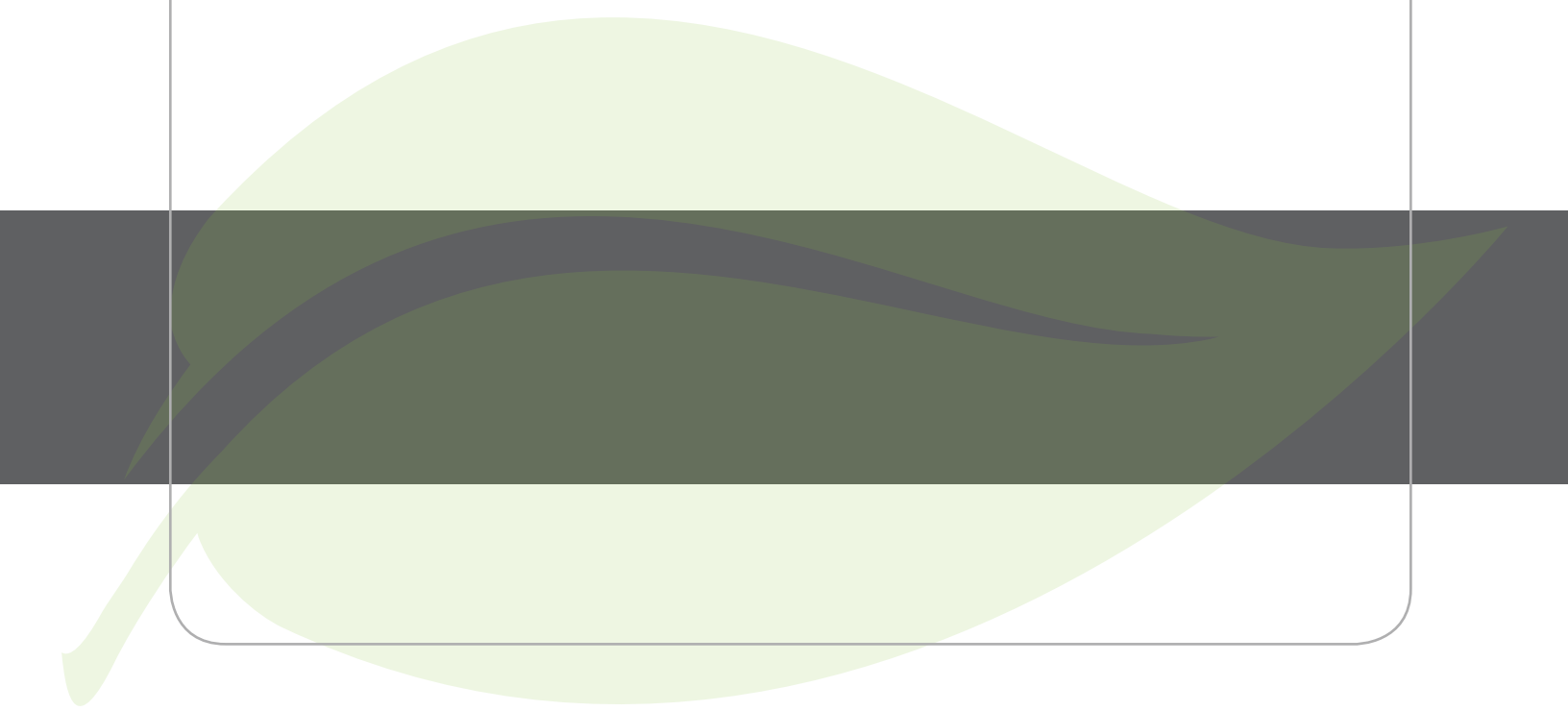


Table 5.7 Economic Development Governance Recommendations

| Name of Initiative | Process to Implement (update zoning ordinance, adopt a policy or plan, resolution to approve funding, etc.) | Related Policies – positive linkages and alignments | Related Policies – barriers and cross-purposes | Local Government Level of Implementation |
|---|---|---|---|---|
| Strengthen regional small business support programs to improve efficiency, effectively share resources, and reduce regional redundancies. | Develop Regional Strategic Plan. | - Existing small business support programs throughout the Capital Region. | Requires intermunicipal and interagency cooperation. | Require involvement from all state municipal and county agencies supporting small businesses. |
| Support expansion of land banking through existing and new mechanisms. | Must be approved through NYS Land Banks Program Administered by Empire State Development. | <ul style="list-style-type: none"> - Within Economic Development, land acquisition through land banks could complement the model zoning code, particularly where the code addresses redevelopment. - Potential to link land bank activity to Climate Adaptation to conduct Local Vulnerability Assessments and Adaptation Planning. | Requires inter-municipal, interagency cooperation. In general, land acquisition-related initiatives and code changes should be coordinated so they are working toward common outcomes and not attempting to duplicate efforts (e.g., targeting land acquisition where zoning keeps land in desired uses). | Should be implemented at the regional level. |
| Expand support of green jobs training programs to include green infrastructure design and maintenance. | Coordination and planning among green jobs training programs. | <ul style="list-style-type: none"> - NYSERDA's Green Job Training Program - Capital District BOCES - Community Colleges | Requires intermunicipal and interagency cooperation. | Limited since local government does not conduct green job training. |



Section 6.0
Energy







SECTION 6.0: **Energy**

The responsible use of our energy resources to meet the needs of the present without compromising the ability of future generations to meet their needs is an essential component of the Sustainability Plan.

Energy production and consumption are the Capital Region's largest source of greenhouse gas emissions. However, Capital Region residents, business, and government leaders possess the will and innovation to live more efficiently and shift to cleaner technologies, both as an environmental objective and also as a way to reduce energy costs and spur economic development. Technologies that promote sustainable energy systems include renewable energy sources such as hydroelectricity, solar energy, wind energy, geothermal energy, and also technologies designed to improve energy efficiency. The Capital Region's energy needs can be satisfied through both conserving energy and incorporating more renewable energy systems onto the grid.

The preferred path for the Capital Region will be to develop a local energy future that focuses on reduced demand through conservation and efficiency while increasing the supply of clean energy. This Sustainability Plan focuses on initiatives that the Capital Region can implement to promote energy efficiency and conservation, increase the development of renewable resources, support the development of innovative green practices, and increase public awareness of the Capital Region's energy resources.

Best Practices

Tax Breaks for Energy Efficiency– Montgomery County, Maryland offers property tax credits up to \$250 for the installation of eligible energy-conservation devices.



Regional Baseline

In order to identify and prioritize areas for improvement in the energy sector, it was necessary to assess the current energy profile of the Capital Region, including generation and consumption, and the resulting greenhouse gas emissions of the Capital Region. The Energy Technical Committee referenced various publicly available data sources as part of this process. This included data from the following:

- ✓ U.S. Energy Information Administration (EIA), State Energy Data System
- ✓ U.S. Census Bureau (Census), State & County Population Estimates
- ✓ New York State Climate Action Plan Interim Report (2011)
- ✓ New York State Energy Plan (2009)
- ✓ New York State Department of Taxation and Finance, Office of Real Property Tax Services
- ✓ New York State Regional Greenhouse Gas Emissions Summary
- ✓ Climate Smart Communities Regional Greenhouse Gas Inventory (Draft)

Energy consumption from the following sectors was evaluated:

- ✓ Residential
- ✓ Commercial
- ✓ Industrial
- ✓ Transportation

Energy Usage

Energy usage data for New York State and the Capital Region was provided by EIA and the Regional Greenhouse Gas Inventory, respectively. Usage is summarized in Million British Thermal Units (MMBtu) in Figure 6.1 and Table 6.1. The totals highlighted in Table 6.1 are estimates based on 2008 EIA data for New York and are prorated based on 2011 population for the Capital Region. It was also assumed that the Capital Region has similar energy consumption by sector as the State of New York as a whole.

The commercial sector consumes more energy than other sectors, but the residential and transportation sectors are a very close second and third, respectively.

Energy use per capita is provided in Table 6.2. (eia Beta 2010). The Capital Region is slightly above the statewide average but significantly below US average. For comparison, New York State's energy use per capita is the second lowest of all states in the nation. The Capital Region is slightly above the New York State average

Greenhouse Gas Emissions

Greenhouse gas emissions from energy, both stationary and mobile sources, represent 88 percent of all emissions for the Capital Region. Per capita greenhouse gas (GHG) emissions are provided in Table 6.3.

The energy sector emissions sources include energy consumption for the stationary environment in the residential, commercial, and industrial sectors regardless of where the energy was generated, as well as emissions from energy generated within the Capital Region. The stationary energy portion represents approximately half of all regional emissions.

Of that, as indicated in Table 6.4, residential energy consumption is the largest source of GHG emissions. Within the residential and commercial sectors, emissions from consumption of natural gas were the largest portion, followed closely by emissions from electricity consumption. Also included in Table 6.4 is the summary of transportation emissions due to fuel use in on-road, off-road, rail, and marine vehicles.

While transportation emissions are reported as a separate sector in the Regional Greenhouse Gas Inventory, transportation represents a mobile source of emissions from energy use, and is thus provided here for reference. Transportation emissions represent 36% of the Capital Region's total emissions. A detailed breakdown of energy emissions and consumption, by sector and fuel source, can be found in Appendix 8—the Tier





Figure 6.1 Capital Region Energy Consumption Percentages by Sector

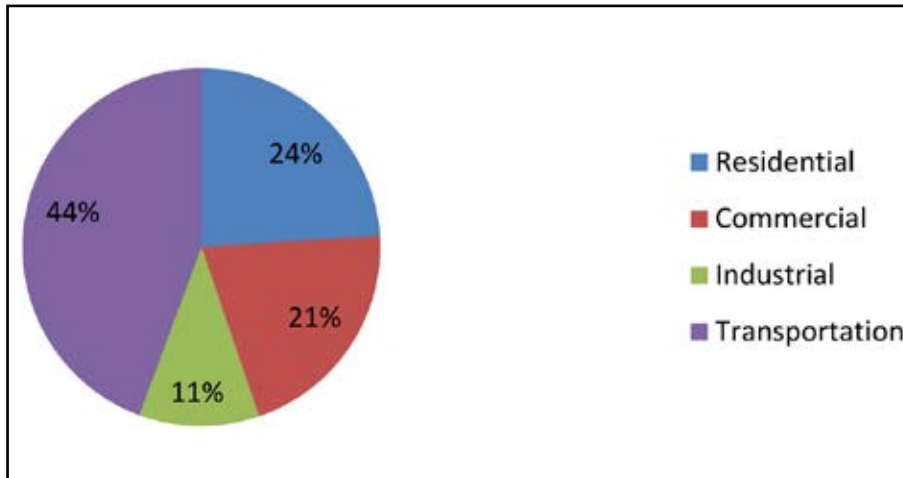


Table 6.1 Capital Region Energy Usage by Sector

| Sector | New York Total (MMBtu) | Capital Region Total (MMBtu) |
|----------------|------------------------|------------------------------|
| Residential | 1,165,877,544 | 56,203,144 |
| Commercial | 1,274,997,238 | 48,591,773 |
| Industrial | 434,151,103 | 25,464,195 |
| Transportation | 1,113,122,682 | 103,913,669 |
| Total | 3,988,144,670 | 234,172,780 |

Table 6.2 Capital Region Energy Use per Capita

| County Name | Energy Use per Capita (MMBtu/person) |
|----------------------|--------------------------------------|
| Capital Region | 216.9 |
| New York (2010) | 192.2 |
| United States (2010) | 315.9 |

Table 6.3 Average per Capita Greenhouse Gas Emissions

| Region | Metric tons CO ₂ e per capita |
|---------------------------|--|
| US Average | 19.0 |
| New York State (with NYC) | 9.8 |
| New York City | 5.9 |
| NYS (no NYC) | 12.7 |
| Capital Region | 16.3 |

Source: US Energy Information Agency and PlaNYC



II Regional Greenhouse Gas Inventory.

Generation

Regional 2011 electricity generation by source was obtained via a review of the New York Independent Service Operators 2012 Gold Book report and is presented in Table 6.5 for each county.

Renewable Energy

Technologies such as solar photovoltaic (PV), solar thermal hot water, wind energy, and geothermal heating and cooling can be sustainable alternatives to fossil fuels. Renewable energy contributes to the public benefit by enhancing the reliability of the grid, increasing in-state electricity generation, increasing the diversity of the Capital Region's energy resources, keeping local dollars within the state, and making the electric supply market more competitive by promoting consumer choice. Solar PV technology makes use of the abundant energy from the sun, and its use has little impact on our environment.

Best Practices

Green Leases– Green leases (also known as aligned leases, high performance leases, or energy efficient leases) align the financial and energy incentives of building owners and tenants so they can work together to save money, conserve resources, and ensure the efficient operation of buildings.

SmartGrid Demonstration Project– A utility provider in Ohio replaced traditional electric meters with new, digital Smart Meters in 2010. This upgrade of about 110,000 traditional residential and business electric meters in northeast central Ohio is the first step of the gridSMART project.

Solar PV can be used in a wide range of products, from small consumer items to large commercial solar electric systems. Solar PV is the most prominent (non-hydro) renewable technology based on in-region

Table 6.4 Capital Region Energy Sector GHG Emissions by Source and County, 2010 (Metric Tons CO₂e)

| | Region | Albany | Columbia | Greene | Rensselaer | Saratoga | Schenectady | Warren | Washington |
|--------------------------------|------------|-----------|----------|-----------|------------|-----------|-------------|-----------|------------|
| Residential Energy Consumption | 3,015,446 | 882,719 | 181,437 | 140,327 | 438,817 | 646,897 | 453,778 | 152,773 | 118,698 |
| Commercial Energy Consumption | 2,902,316 | 1,338,288 | 108,159 | 96,635 | 295,356 | 479,506 | 359,341 | 75,117 | 149,914 |
| Industrial Energy Consumption | 1,788,853 | 779,985 | 34,599 | 170,045 | 50,078 | 252,497 | 165,519 | 282,584 | 53,546 |
| Energy Generation/ Supply | 1,348,995 | 586,188 | 15,124 | 327,265 | 129,048 | 157,056 | 99,350 | 33,404 | 17,093 |
| Transportation | 6,288,768 | 1,874,252 | 396,517 | 402,927 | 780,688 | 1,439,606 | 575,254 | 504,771 | 314,754 |
| Total: | 15,344,378 | 5,461,432 | 735,836 | 1,137,199 | 1,693,987 | 2,975,562 | 1,653,242 | 1,048,649 | 654,005 |

Table 6.5 Regional Electric Generation by Type and County (2011 Gigawatt Hours)

| | Albany | Columbia | Greene | Rensselaer | Saratoga | Schenectady | Warren | Washington |
|-------------|--------|----------|--------|------------|----------|-------------|--------|------------|
| Hydro | 312 | 2 | 0 | 104 | 1,442 | 0 | 250 | 342 |
| Fossil Fuel | 6,243 | 0 | 7,254 | 3,932 | 900 | 0 | 0 | 1 |
| Nuclear | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Fuel | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |

Source: www.albany2030.org





generation capacity. Table 6.7 summarizes the installed Solar PV Capacity by County.

Goals

As the Capital Region’s population grows, energy usage will be affected by increases in housing, commercial floor space, transportation, and the production of goods and delivery of services. These changes will affect not only the level of energy use but also the mix of fuels consumed.

Changes in the structure of the economy and in the efficiency of the equipment used throughout the economy will also have an impact on energy use per capita. Efficiency gains in household appliances, construction, and vehicles are expected to have a direct, downward impact on energy

use per capita. Efficiency gains in the electric power sector, are also anticipated, as older, inefficient coal and other fossil fuel based electricity generating plants are retired.

In addition, the renewable share of total energy generation is expected to increase as technology advances, and as the availability of tax credits for renewable electricity generation offsets installation costs. A number of the region’s local governments have taken steps to reduce their contribution to climate change. For example, the City of Albany has developed a Comprehensive Plan, Albany 2030, which is a master guidance document outlining a framework for future community efforts, sustainability initiatives, investments, policy decisions and management within the City. Albany 2030 is a “to do” list that will be used to leverage positive and effective improvements, while complementing current and ongoing City initiatives and (re)development.



As shown in Figure 6.2, 109 local governments have also joined New York’s Climate Smart Communities (CSC) program, a state-local partnership dedicated to reducing greenhouse gas emissions, saving taxpayer dollars and advancing community goals for health and safety, economic vitality, energy independence and quality of life. Additionally, the Capital Region is part of a CSC pilot program providing direct technical assistance

Table 6.6 Upstate NY Electric Grid Generation Mix by Type (2009)

| Resource Type | Percent of Generation Mix |
|---------------|---------------------------|
| Coal | 14.49% |
| Oil | 0.90% |
| Natural Gas | 18.93% |
| Nuclear | 30.59% |
| Hydro | 30.79% |
| Biomass | 1.60% |
| Solar | 0.00% |
| Wind | 2.35% |
| Geothermal | 0.00% |
| Other Fossil | 0.35% |

Source: USEPA Emissions and Generation Resource Integrated Database (eGrid)

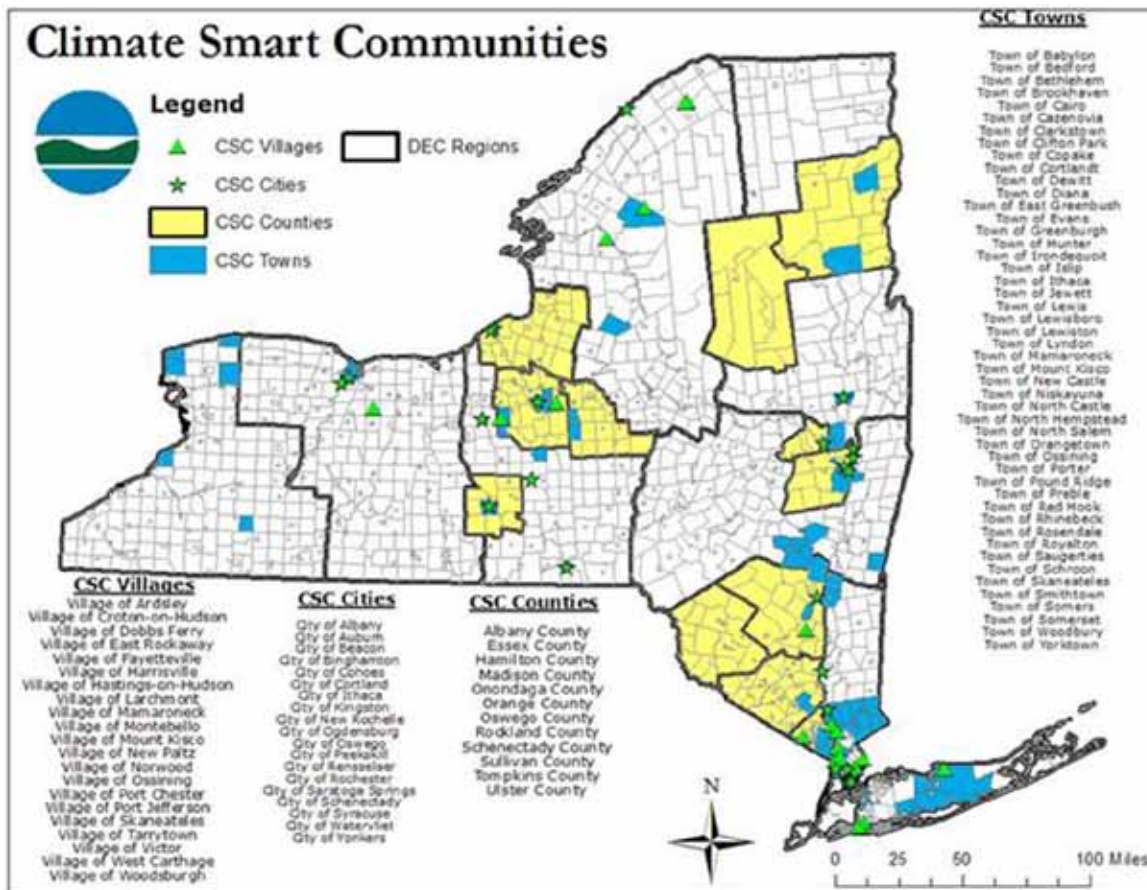
Table 6.7 Installed Solar PV Capacity by County

| | Albany | Columbia | Greene | Rensselaer | Saratoga | Schenectady | Warren | Washington |
|----------------------------------|--------|----------|--------|------------|----------|-------------|--------|------------|
| Installed Solar PV Capacity (kW) | 3736 | 2500 | 607 | 2854 | 3412 | 2604 | 676 | 592 |

Source: Installed Solar PV Capacity provided by NYSERDA PowerClerk. Current as of 10/25/2012. <http://nyserda.powerclerkreports.com>



Figure 6.2 Climate Smart Communities



to the 16 communities in the Capital Region who have adopted the pledge. Any town, city, village or county can join Climate Smart Communities, without cost, by adopting the CSC Pledge and informing NYSDEC that their community has adopted the pledge. Benefits include access to information, technical assistance and funding.

In 2009, New York State set a goal to reduce GHG emissions from all sources within the state by 2050. In support of that objective, the Energy Technical Committee set a target to reduce baseline energy consumption from 1990 levels 10% by 2020. To achieve this objective, the Energy Technical Committee suggested the goals outlined in Table 6.8.

NYSERDA and the utilities in the region, including National Grid, NYSEG, Central Hudson, and Green Island Power Authority, each have various energy efficiency incentive programs already in place to support the Capital Region's goals. These incentives come in the form of rate discounts, capital project funding assistance, and

The Capital District Clean Communities Coalition (CDCC) is part of the US Department of Energy's Clean Cities Program and is managed by the Capital District Transportation Committee staff. The CDCC serves Albany, Rensselaer, Saratoga, Schenectady, Fulton, Montgomery, Schoharie, Otsego, Greene, Columbia, Warren and Washington Counties. The CDCC provides substantial opportunities for the expansion of the alternative fuel marketplace, particularly with the large state vehicle fleet that operates in the area. Stakeholders in CDCC recognize the need to provide greater fuel choices in the Capital District and to reduce its dependence on imported oil. Many stakeholders have received grants through the Clean Cities program to help in the cost of converting vehicles, purchasing new alternative fuel vehicles or vehicle technologies, or installing alternative fueling infrastructure. The CDCC can be a partner in moving the Capital District towards energy independence.





Table 6.8 Energy Goals

| Goals |
|---|
| Improve efficiency of buildings and operations in the residential, commercial, industrial, municipal and institutional sectors. |
| Increase public awareness and understanding of energy efficiency, conservation, and renewable sources. |
| Improve the Capital Region's Energy Security and Resiliency. |
| Support economic development of the Capital Region through sustainable energy initiatives. |
| Increase the percentage of the Capital Region's energy that comes from renewable sources. |
| Reduce energy consumption and intensity throughout the region as part of a larger GHG reduction plan. |

energy audits, and are an important part of any planned energy efficiency project.

Regional Initiatives

The Energy Technical Committee identified a number of initiatives that could help the region achieve the six goals outlined in Table 6.8. The details of initiatives were evaluated for their overall benefits to the region, costs, and feasibility. The initiatives were ranked by the public and the Technical Committee followed by a final ranking by the Executive Committee. The top three priority initiatives are described below. Preliminary scoring and the prioritization process and results of all initiatives considered can be found in Appendix 2 and 3, respectively.

Establish Energy Efficiency and Renewable Energy Financing Districts (or PACE program).

The most common challenge for residential and commercial property owners in upgrading their home or building to be more energy-efficient is the upfront cost of the upgrades. While efficiency upgrades are typically viewed

as a worthy investment with a real payback, environmental benefits, and improved building performance, the reality is that many property owners, particularly residential and small business owners, do not have the upfront capital to make the investment.

Energy efficiency and renewable energy financing districts, more commonly known as Property Assessed Clean Energy or PACE programs, allow property owners to borrow money to pay for energy improvements. The municipality will provide financing for the project, typically by selling bonds secured solely by payments made from participating property owners.

The amount borrowed is often repaid via a special assessment on the property over a period of up to 20 years. These programs can be established for the commercial or residential sectors, or both. Such a program could supplement the efficiency programs currently offered through NYSEERDA or local utilities to create more significant improvements in efficiency across two of the largest energy consuming sectors, the

Long Island Green Homes, a program of the Town of Babylon, NY is a residential retrofit financing program in which the Town pays a contractor directly for the home energy improvements and the owner pays the Town back through a monthly payment that would be covered by their energy savings. Residents pay a 3% interest rate and if the homeowner moves, payments are passed on to the next owner. The Town implemented this program by defining energy waste as a form of waste and therefore provided a "benefit assessment" wherein the Town pays for energy improvements through its solid waste fund because the improvements serve as a public benefit. More information is available at <http://ligreenhomes.com/>.



Emissions Reduction Potential from PACE:

If a residential PACE program were implemented in half of the region and realized just a two percent uptake among homeowners, it would have the potential to reduce regional GHG emissions by approximately 9,000 Metric Tons of Carbon Dioxide Equivalent (MTCDE), a potential that would be greater if implemented broadly and with high levels of participation.

Emissions Reduction Potential from Local Energy-Efficient Building Code:

A Climate Policy Initiative report estimates that the impact of energy efficient building codes is a 1.8% reduction in GHG emissions from the residential building sector. Applying this rate to both the residential and commercial sector, if energy efficient building codes were implemented across the region, the potential reduction would be 106,520 MTCDE.

commercial and residential built environment. New York State has passed PACE, enabling legislation, but the funding to support it can only come from federal dollars under current law.

Given that DOE's Energy Efficiency and Conservation Block Grant program has effectively come to an end, alternate federal sources would need to be identified or other public/private funding mechanisms would need to be considered, if available. Also, it is important to note that residential PACE programs have been halted due to federal litigation regarding the priority of the lien on the mortgage.

Most communities that are implementing PACE programs at this point are focused solely on the commercial sector. Alternative solutions for funding such programs have also been implemented, such as in Babylon, New York. The Energy Technical Committee recommends this program be implemented at the county level or by a group of municipalities in order to pool resources and reduce overhead costs.

Establish a revolving energy efficiency improvement fund for local businesses.

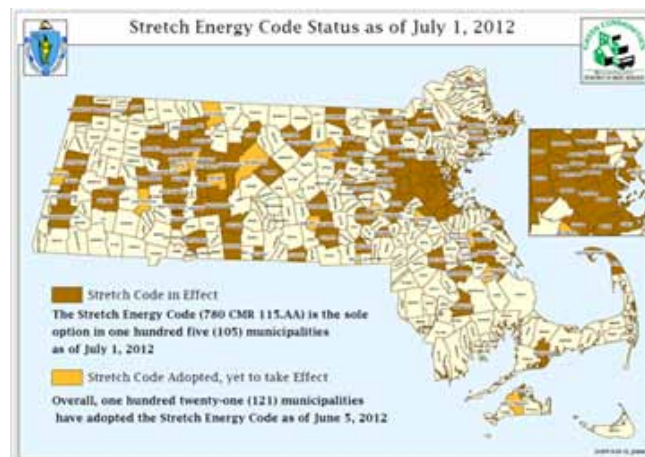
The purpose of a revolving energy fund is to provide small businesses with low-interest loans to cover the initial costs of energy efficiency and

renewable energy projects for their buildings and operations.

While NYSERDA's Green Jobs/Green New York Program provides low interest financing for business and non-profits to pay for their energy efficiency upgrades, the intent of this initiative is to supplement that program. The initiative will provide financing to non-qualifying businesses and/or costs (e.g., capital cost in excess of funding limits, engineering, etc.).

With this initiative, loans are provided at a low interest rate and are repaid by the business owner with savings achieved from the energy efficiency projects. The loan could be for total or partial project costs and typically the fund would set a limit on the loan amount available. The repayment plus the interest costs collected keep the fund replenished so that loans can continue to be offered in the future.

Figure 6.3 Stretch Energy Code Status





Revolving energy funds are a popular mechanism for financing energy improvements because after the initial capital is invested, the fund is self-sustaining. Central New York Regional Planning and Development Board (CNYRPDB) established an Energy Efficiency Revolving Loan Fund to support energy efficiency improvements as well as economic development goals within the region. CNYRPDB's fund could serve as a model for the Capital Region if implemented at the regional scale.

Adopt a local energy-efficient building code.

Currently, new construction in New York State operates under the Energy Conservation Construction Code of New York State -2010 (ECCCNYS). Local governments can adopt their own energy conservation requirements, as long as they are no less restrictive than the current ECCCNYS. Local additions or changes to the code could include stricter energy efficiency requirements and/or green building standards.

A stricter energy code results in better performing buildings, lower energy costs, and higher property values. It also creates job training and job creation opportunities for home energy raters, high efficiency equipment suppliers and installers, and other related professionals.

The Energy Technical Committee recommends developing a stricter, standard energy efficient building code that could be adopted at the local level. This has been a successful model for implementation in Massachusetts, as shown in Figure 6.3, where local governments adopted a "Stretch Energy Code" as part of the requirements for becoming a Green Community. The Stretch Energy Code specifically lays out requirements to improve on the current state energy code by at least 20%. Collaboration and education among local governments, building inspectors, home builder associations, and developers will be an essential component of implementing this initiative.

The local energy-efficient building code should be developed in context with state level initiatives to move toward higher-performance codes, such as Energy Star, Home Energy Rating System (HERS) and the International Green Construction Code (IgCC). Furthermore, the state building code will be adopting more stringent energy efficient standards in July 2013, for commercial buildings, followed by residential buildings in May 2014. With these initiatives establishing the new standard for energy efficiency, the local energy efficient building code for the Capital Region will provide another level of energy efficiency.

Implementation

Identifying these priority initiatives in many ways is the easiest part of the planning process. Implementation of the priority initiatives identified in the Sustainability Plan can be far more difficult, because the barriers to implementing these initiatives either in the past or moving forward are many.

Lack of funding and resources, conflicting priorities at the municipal level, absence of a strong proponent or implementer, lack of grassroots support, poor or non-existent inter-municipal cooperation and lack of municipal expertise in energy planning and procurement have and will continue to be a barrier to implementation if not addressed.

To that end, an implementation strategy which outlines the resources, costs and timeline associated with achieving the priority initiatives and overcoming these barriers is provided in Table 6.9.



Table 6.9 Energy Implementation Strategy

| Initiative | Regional Priority | Implementer | Partners | Preliminary Cost | Greenhouse Gas Reduction Potential** | Potential Funding Sources | Timeline |
|---|-------------------|--|---|------------------|--------------------------------------|---|----------------------|
| Establish Energy Efficiency and Renewable Energy Financing Districts (or PACE program) | 1 | County level or multiple municipalities/ counties | - Municipalities–town, village, and county - NYSERDA and/or NYSDEC - 3rd Party Financing Entity - NYS Homes and Community Renewal - Local Housing Authorities | \$ | Medium | - NY Environmental Protection Fund - Local Solid Waste Funds - USDOE - NYSERDA | Mid-Term (1-5 years) |
| Establish a revolving energy efficiency improvement fund for local businesses to supplement NYSERDA's Green Jobs/Green New York Program | 2 | - Capital District Regional Planning Commission (CDRPC) - Community Loan Fund of the Capital District, or non-profit partnership between financial entity and municipality(ies) | - CDRPC - Municipalities - Banks - Chambers of Commerce - Center for Economic Growth - Community Loan Fund | \$\$ | Low | - Community Loan Fund - Empire State Development - NYSERDA - Local Governments | Short Term (<1 year) |
| Adopt a local energy-efficient building code that would exceed the NYS Energy Construction Code to improve the efficiency of buildings in all sectors | 3 | Local government (whichever level enforces building code) | - NYS Builders Association - Local developers - Building Performance Contractors Association | \$ | Medium | Municipal budget to cover administrative costs of code revisions, education, and implementation | Mid-Term (1-5 years) |

*Overall Cost: \$ - < \$100,000, \$\$ - \$100,000 to \$500,000, \$\$\$ - > \$500,000

**Greenhouse Gas Reduction Potential: High – Strategy will result in a direct, quantifiable reduction in GHG emissions; Medium – Some GHG emissions reduction may occur but it cannot be quantified; Low – GHG reduction is very indirect, unlikely to occur, or unknown

In addition to the implementation strategy listed above, it is recognized that these initiatives will require action by local government. The governance overview in Table 6.10 provides guidance to jurisdictions on specific actions they can take to implement the Sustainability Plan's various initiatives. It also evaluates each initiative against all others in the plan to identify where there are alignments or hindrances to implementation.

Sustainability Indicators

Sustainability indicators and targets have been established to allow the Region to track its progress with each Focus Area. For Energy, two indicators have been established:

- Annual Regional Energy Consumption Per Capita
- Greenhouse Gas emissions per capita

Refer to Section 13 for specific information about the sustainability targets and indicators.





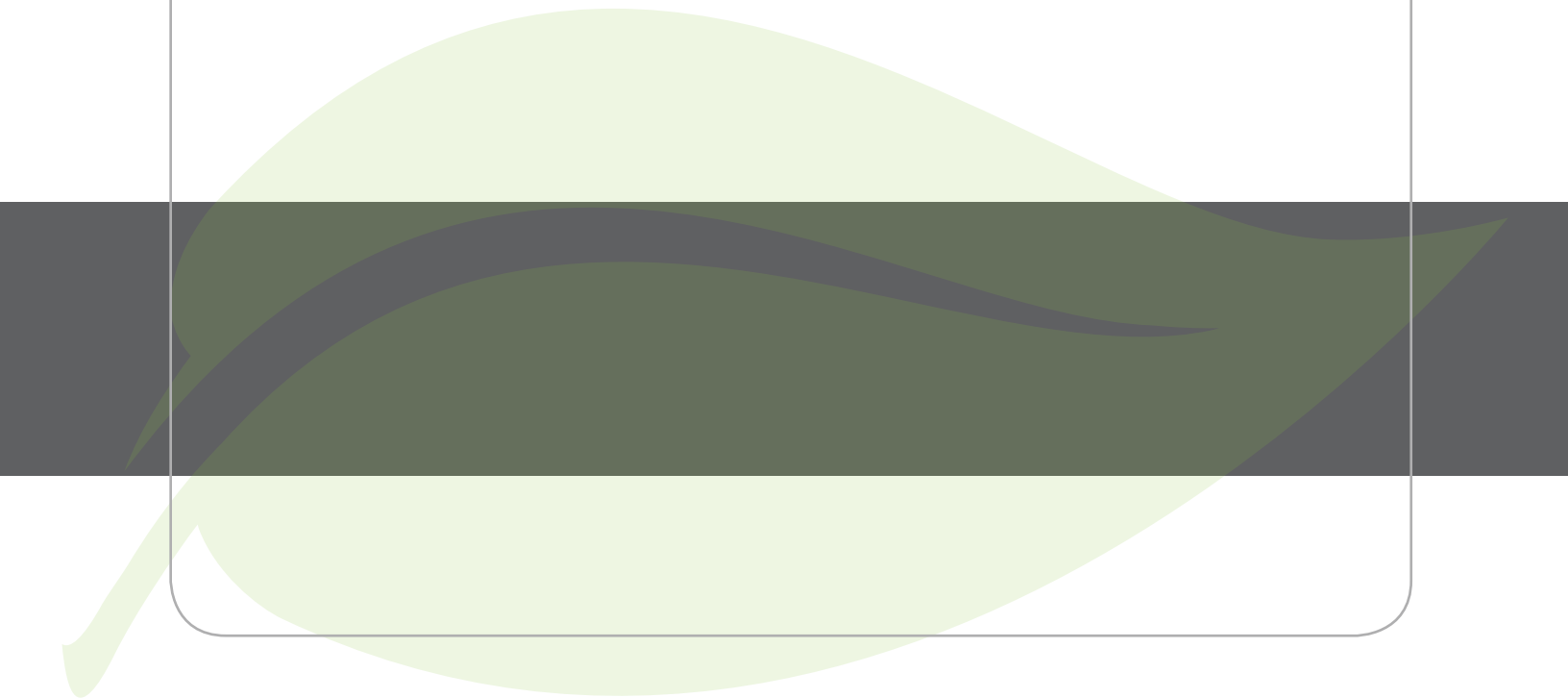
Table 6.10 Energy Governance Recommendations

| Name of Initiative | Process to Implement (update zoning ordinance, adopt a policy or plan, resolution to approve funding, etc.) | Related Policies – positive linkages and alignments | Related Policies – barriers and cross-purposes | Local Government Level of Implementation |
|--|---|--|---|---|
| Establish Energy Efficiency and Renewable Energy Financing Districts (or PACE program). | Establish financing district at the local government level. | <ul style="list-style-type: none"> - Within the Energy focus area, generally complementary with efforts to promote energy efficiency and conservation. - Could help support other initiatives focused on economic development such as Economic Development - Create Green Alliance Between Government and Business. Can also help support energy efficient housing options for Land Use- Promote Sustainable and Affordable Housing. | <ul style="list-style-type: none"> - May need to distinguish appropriate use of this financing vs. revolving loan fund. PACE has also faced legal issues. - Public education on incentives & programs. | Implementation at the local level, linked to collection of property taxes. |
| Establish a revolving energy efficiency improvement fund for local businesses to supplement NYSERDA's Green Jobs/Green New York Program. | Establish revolving loan fund at county or regional level. | <ul style="list-style-type: none"> Energy <ul style="list-style-type: none"> -Establish Energy Efficiency and Renewable Energy Financing Districts. Solid Waste <ul style="list-style-type: none"> -Site and Develop Anaerobic Digestion Facilities. | <ul style="list-style-type: none"> - Outreach to regional businesses - Funding support | Implementation at the regional level; also potential local implementation at the larger city or county level. |
| Adopt a local energy-efficient building code that would exceed the NYS Energy Construction Code to improve the efficiency of buildings in all sectors. | Update building codes at municipal level. | <ul style="list-style-type: none"> - Within the Energy Focus Area, this initiative should be coordinated with Energy Efficiency and Renewable Energy, Financing Districts and encouraging district energy systems, all of which can also be addressed in code. Land Use and Livable Communities <ul style="list-style-type: none"> -Modify local codes and land use regulations. | <ul style="list-style-type: none"> - Some jurisdictions have encountered challenges integrating energy efficiency and historic preservation objectives in Land Use- Develop and Implement Sustainability Guidelines for Historic Buildings and Districts. - Potential for opposition by some regional businesses, property owners, and contractors. | Driven by state code requirements but implementation by all jurisdictions at the local level for any comparable or above-standard code development; may in some cases be at county level where building code is enforced. |



Section 7.0

Food Systems





CDGD Mumford Street Community Garden,
Schenectady, NY



SECTION 7.0: **Food Systems**

A food system encompasses the chain of activities that connect all aspects of the food life cycle from the farms that produce our food, the farmers who work to produce it, and the people who consume it

In 2010, the Academy of Nutrition and Dietetics (formerly American Dietetic Association), American Nurses Association, American Planning Association, and American Public Health Association initiated a collaborative process to develop a set of shared principles to support sustainable food systems that promote health – the current and future health of individuals, communities, and the natural environment (APA, 2012).

The focus of this chapter of the Sustainability Plan is to create and sustain a regional food system for the 21st Century – one that supports local farmers and creates economic development opportunities for both new and experienced farmers. In order to accomplish this, the initiatives in this chapter focus on protecting farmland to support local food production as well as investing in the creation of additional processing and distribution facilities to sustain the Capital Region's food production competitiveness. In addition, this chapter also recommends projects and programs that enhance access to healthy food for all the Capital Region's citizens by expanding community gardens, providing fresh produce at local neighborhood stores, and distributing donated food to those with an immediate need.

Best Practices

Farmfinder Website -
New England Farmland
Finder website at
newenglandfarmlandfinder.org
helps farmers and landowners
find each other. It contains
information and resource links
to inform and support farm
seekers and landowners. The site
was launched by a collaboration
of New England organizations
focusing on farmland access
issues. The new service
complements local and statewide
efforts to match new farmers
with available land.



Best Practices

Urban Agriculture – City of Portland, OR allows agriculture that “includes activities that raise, produce or keep plants or animals” under its agriculture use category. Feedlots, food processing, livestock auctions, and retail plant nurseries are mentioned under different use categories. This agriculture use category is permitted by right in all industrial districts and low-density residential districts, and conditional in medium density districts and some retail commercial districts.

In Madison, Wisconsin the zoning ordinance allows the “keeping of up to four (4) chickens on a [residential] lot” provided the owner obtains a license (\$10.00/ year) and follows the enclosure and setback rules stipulated in the ordinance.

Regional Baseline

The Capital Region’s agricultural sector is strong and diverse, including businesses that provide goods and services to farmers, such as feed and fertilizer; farms that produce a variety of crops, dairy, livestock and other farm products; food processors; and trucking companies involved in processing, distributing, and marketing food and food products.

Small Farms within the Capital Region

Within the Capital Region, there are many small-scale farming operations with farmers producing to provide secondary income or farming for lifestyle reasons. Over half of the farms in the Capital District have sales of less than \$10,000 annually (USDA, 2007).

The Capital Region’s agricultural economy supports approximately 3,300 businesses that generate over \$9.9 billion in revenue (CREDC, 2011).

According to the Capital Region Economic Development Council, in 2011 there were 34,400 employees working in the agricultural sector, with the average business generating \$3.5 million in sales and employing 11 individuals (CREDC, 2011). In addition to farming, the agricultural sector includes businesses that process, transport, warehouse, distribute, and harvest agricultural products. The farms in the Capital Region support numerous ancillary businesses such as feed and fertilizer suppliers, equipment sales and repairs, fuel, and veterinary services (NY Data Book, 2008). According to the 2011 Capital Region Economic Development Council Strategic Plan, the agricultural industry has provided “a solid platform for economic growth and job creation over the last five years, posting a 20 percent growth in firm numbers and nearly one percent growth in employment base over a period when the balance of the economy contracted (CREDC, 2011).”

New York State is recognized as a national leader in agricultural productivity. Within the Capital Region, farmers sold \$19 million worth of fruit, tree nuts and berries in 2007 (USDA, 2007). The Capital Region is also a top producer of animals, animal products, and animal feed. For example, Washington County has the third-highest farm acreage for corn for animal feed (silage) in New York State and Columbia County is first in the State in the sale of sheep, goats, and their products (OSC, 2010). Other crops and hay make up five percent of the total crop production market value of the entire Capital Region, and is particularly dominant in Saratoga County where hay and other grass silage products are worth approximately \$4 million (USDA, 2007). Milk and other dairy products sold in the Capital Region brought in \$173 million to the region in 2007 (Ranking, 2007).





Farmers Markets can provide access to fresh, healthy produce to areas that are typically underserved by full service grocery stores. A satellite farmers market, based on the successful Schenectady Greenmarket, is being located within a Schenectady “food desert” in the Bellevue neighborhood. Funding for the satellite market is from a \$7,000 grant through the New York State’s Fresh Connect Program.

Within the Capital Region, Washington, Columbia, Saratoga and Rensselaer Counties all have significant dairy production.

While the Capital Region’s agricultural economy continues to be strong, farmland in the region is vulnerable to sprawl-type development. An analysis of farmland and development patterns by the Columbia Land Conservancy in Columbia County found that the amount of land in agricultural use was declining. In fact, the entire Capital Region had a net loss of about 45,000 acres of farmland and 16 farms in the five year period between 2002 and 2007, the year of the last USDA survey.

One of the primary tools that New York State uses for farmland protection is its Agricultural Districts Program, which promotes the continued use of farmland for agricultural production through a number of farmer benefits. The program’s benefits include preferential real property tax treatment (agricultural assessment and special benefit

assessment), protections against overly restrictive local laws, government funded acquisition or construction projects, and assistance with private nuisance suits involving agricultural practices (NYS Department of Agriculture and Markets, 2012).

“The agricultural industry has provided a solid platform for economic growth and job creation over the last five years posting a 20 percent growth in firm numbers and nearly one percent growth in employment base over a period when the balance of the economy contracted.”

Figure 7.1 shows the Capital Region’s current designated agricultural districts (except Warren County – spatial data was not available). More than one-fifth of the Capital Region’s lands are designated as agricultural districts, with about 18 percent in active farming, including Warren County (CREDC, 2011). However, not all farmers in the Capital Region may be aware of the benefits offered by enrolling in the agricultural district program, making outreach and support for this program a priority to continue to protect the Capital Region’s agricultural lands (Town of Charlton, 2010).

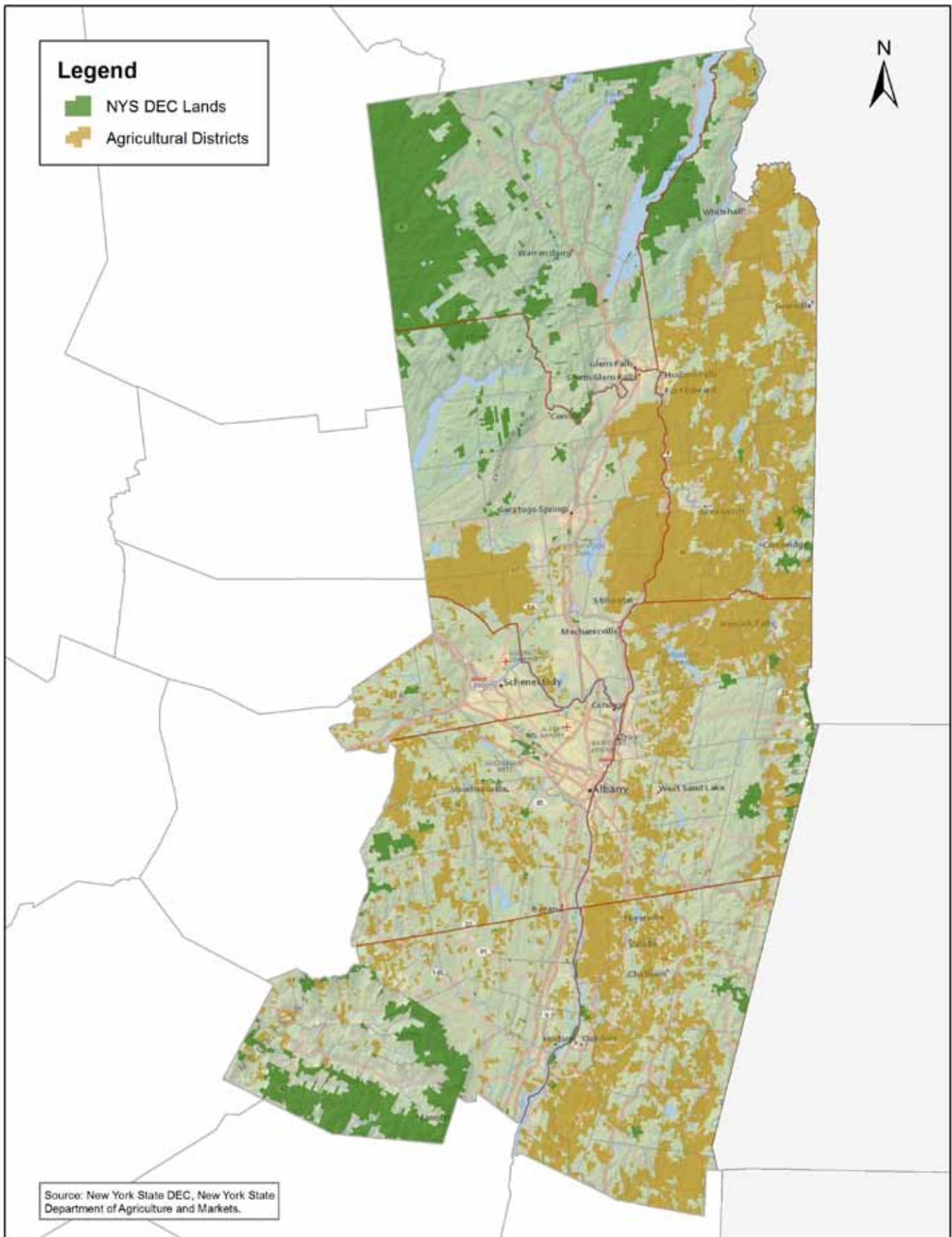
Food Processing and Distribution

While the preservation of existing farms and the creation of new farms are important to sustaining viable farmland, there are two other important components of sustainable food systems—processing and distribution. Of the 340 meat, poultry, and egg processing facilities in New York State regulated by the USDA’s Food Safety and Inspection Service (FSIS), approximately 23 are in the Capital Region in Albany, Columbia, Rensselaer, Saratoga and Schenectady Counties (FSIS, 2012).

The current locations of all food processing and distribution facilities were not available for the entire Capital Region. However, a review of the literature indicates there is a need for



Figure 7.1 Agricultural Districts and NYS Department of Environmental Conservation Land within the Capital Region





additional processing operations (washing, grading, freezing and packing fruit and vegetables, slaughter and mills) and wholesale distribution serving local farm products (Williams and Zimmerman, 2010). In addition, the USDA and New York State inspection and certification processes can be somewhat of a barrier for individual farmers to surpass due to the complexity and requirements that can vary by size, scale, and type of processing facility.

The Capital Region Economic Development Council Strategic Plan encourages the creation of “an urban kitchen incubator in one or more of the Capital Region cities to encourage food entrepreneurs who need access to a licensed commercial kitchen and want to work with locally produced ingredients in their start-up food retailing or catering businesses” (CREDC, 2011). Providing adequate processing and distribution facilities, located more strategically throughout the Capital Region, can improve profit margins for farmers helping to keep the Capital Region competitive within the larger agricultural economy and remove the barrier for new farmers to process and distribute their products.

Consumption

Another important element of a food system is consumption. Within the Capital Region, there is great demand for regional agricultural products, as seen in the increasing number of farmers markets and community supported agriculture (CSA) programs throughout the Capital Region. Today, there are 52 farmers markets throughout the Capital Region, with at least two occurring in each county (see Table 7.1).

Despite a strong agricultural presence, many Capital Region residents do not have adequate access to affordable, healthy food. Food deserts are defined as low-income census tracts where a substantial number or share of residents has low access to a supermarket or large grocery store.

Low-access to a healthy food retail outlet is defined as households that are more than one mile from a supermarket or large grocery store in urban areas and as more than 10 miles from a supermarket or large grocery store in rural areas (USDA ERS, 2012).

According to the USDA, ten census tracts in Albany County, nine census tracts in Schenectady County, and two census tracts in Columbia County are classified as food deserts (USDA ERS, 2012). Figure 7.2 provides a map of food deserts in Albany and Schenectady Counties. More than 40,000 people in Albany County, almost 20,000 people in Schenectady County, and 7,500 people in Columbia County live in food deserts.

The existence of food deserts has also been linked to public health concerns, including increased obesity rates (Whitacre et al., 2009) (Ploeg et al., 2009) (Mari Gallagher, 2007). As shown in Figure 7.3, adult obesity rates in the Capital Region are nearing 30 percent in five counties, and the low-income preschool obesity rate in four counties is over 15 percent (see Figure 7.1). The Capital Region’s adult obesity rate of 27.2 percent is above New York State’s average of 23.9 percent (CDC, 2012). The obesity rates are also above the

*In support of regional collaboration on agriculture, the American Farmland Trust recently sponsored a conference in November 2012 in Saratoga Springs called **Harvesting Opportunities in New York: Growing Local Food Economies and Protecting Farmland**, to inspire and educate New Yorkers to support agriculture, strengthen local farm and food economies, and protect farmland. Farmers, public officials, land trusts, local food and public health leaders, and concerned citizens were all invited to attend.*



Table 7.1 Number of Farmers Markets in the Capital Region

| County | Farmers Markets | Farmers Markets Participating in WIC/FMNP | Number of Year Round Farmers Markets |
|-------------|-----------------|---|--------------------------------------|
| Albany | 15 | 15 | 1 |
| Columbia | 7 | 5 | 1 |
| Greene | 2 | 2 | 0 |
| Rensselaer | 5 | 3 | 1 |
| Saratoga | 8 | 8 | 3 |
| Schenectady | 9 | 4 | 1 |
| Warren | 4 | 4 | 1 |
| Washington | 7 | 7 | 0 |
| Total | 52 | 48 | 8 |

Source: NYS Department of Agriculture and Markets: <http://www.agriculture.ny.gov/>

Notes: WIC is a federally-funded health and nutrition program for women, infants, and children.

FMNP is the Senior Farmers Market Nutrition Program awards grants to States to provide low-income seniors with coupons that can be exchanged for eligible foods (fruits, vegetables, honey, and fresh-cut herbs) at farmers' markets, roadside stands, and community supported agriculture programs.

Healthy People 2010 targets established by the Center for Disease Control (CDC), which establishes adult obesity targets of no more than 10 percent and childhood obesity targets of no more than 5 percent (CDC, 2011). Increasing access to grocery stores with fresh produce can be an effective tool in reducing obesity rates in the Capital Region.

The Capital Region had a net loss of about 45,000 acres of farmland and 16 farms just in the five year period between of 2002 and 2007.

Greenhouse Gas Emissions

Sectors of the Regional Greenhouse Gas Inventory that are relevant to the Food Systems focus area of this Plan include agriculture, waste, transportation, and energy (see Appendix 8 for details). In other words, food systems are connected to all of the major sources of greenhouse gas (GHG) emissions

within the Capital Region. While the direct contribution of food systems within each of these sectors cannot be quantified, GHG emissions are generated from commercial buildings that process and distribute food, from fuels burned in the transport of fuels across the Capital Region, from the decomposition of food waste in landfills, and from agriculture processes in the growing of food.

Therefore, while no direct reduction potential could be measured for any one initiative identified for Food Systems in the Sustainability Plan, the potential contribution to emissions reduction from strategies such as locally sourcing foods, making food processing facilities more efficient, increasing composting options and other methods of handling food waste, and improving agriculture practices, can all have a significant impact in reducing a portion of the Capital Region's 17.5 million metric tons of CO₂ emissions.



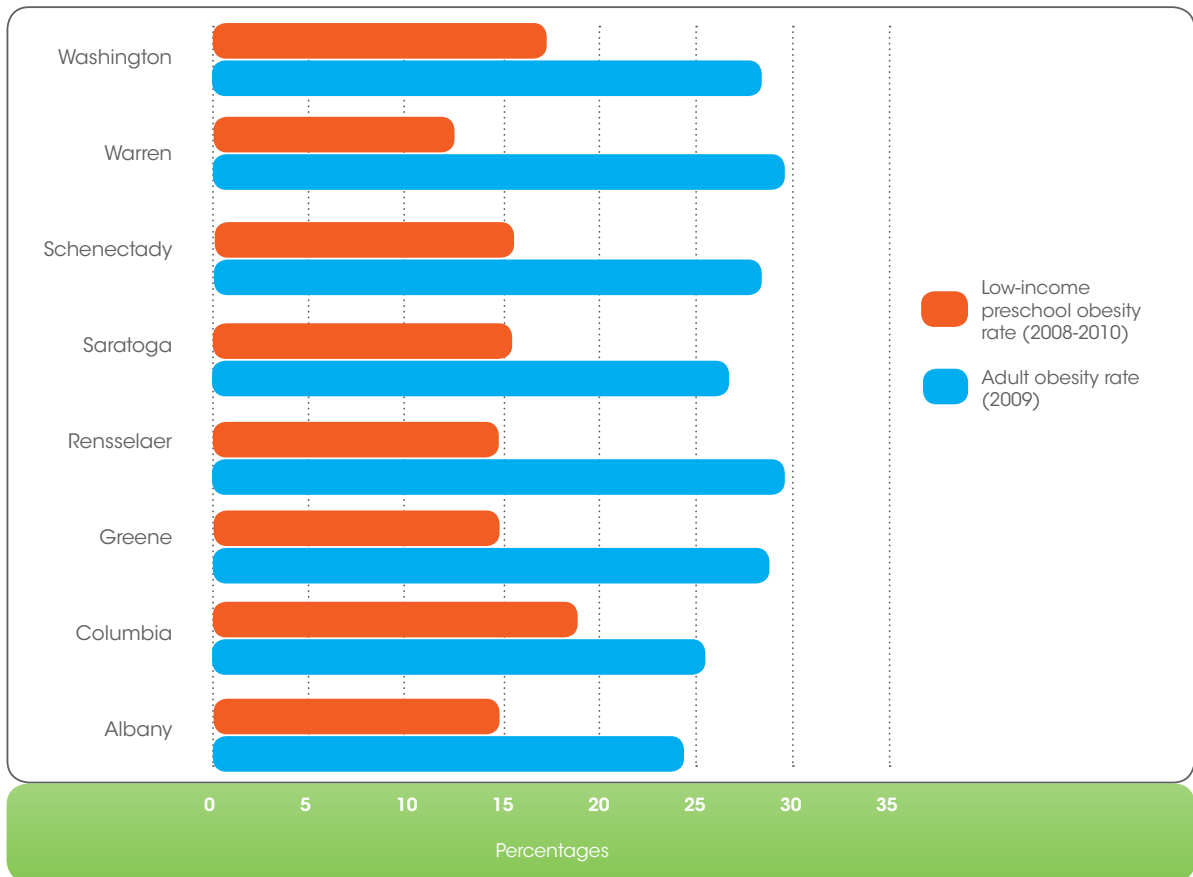


Figure 7.2 Food Deserts within the Capital Region



Source: U.S. Department of Agriculture. Food Desert Location Documentation. Accessed June 2012. <http://www.ers.usda.gov/data/fooddesert/documentation.html>

Figure 7.3. Adult and Low-Income Preschool Obesity Rates



One of the primary tools that New York State uses for farmland protection is its Agricultural Districts Program, which promotes the continued use of farmland for agricultural production through a number of farmer benefits.

Current Initiatives

Despite some of its challenges, the Capital Region is addressing many issues associated with food systems such as establishing local policies, preserving farmland, and increasing access to local and healthy food for all residents in the Capital Region. Assistance and support is available at many levels in the Capital Region:

- ✓ Local governments develop and implement Agricultural and Farmland Protection Plans, and adopt Right to Farm Laws;
- ✓ The Soil and Water Conservation Districts and USDA Farm Service Agency and Natural Resource Conservation Service assist farmers with land conservation and farm management programs; and
- ✓ Non-profit organizations have been actively preserving farmland in the region, including the American Farmland Trust (www.farmland.org), Agriculture Stewardship Association (www.agstewardship.org), Scenic Hudson (www.scenichudson.org), Open Space Institute (www.osiny.org), Rensselaer Land Trust (www.renstrust.org), and the Columbia

The Regional Food Bank of Northeastern New York collects large food donations from the food industry and distributes it to charitable agencies serving hungry and disadvantaged people in northeastern New York, which includes the Capital Region. In 2011 alone, the Regional Food Bank distributed 10.8 million pounds of food to agencies in the Capital Region.

Land Conservancy (clctrust.org) . The Cornell Cooperative Extension has offices throughout the Capital Region that support local farm businesses by offering technical service, workshops, tours, newsletters and one-on-one consultation.

Also active in the Capital Region's urban centers, the Capital District Community Gardens (CDCG) (www.cdgc.org) is a nationally recognized non-profit organization that fosters self-sufficiency through gardening, improves access to fresh fruits and vegetables in underserved areas, and revitalizes urban neighborhoods by turning vacant lots into productive neighborhood garden spaces. In addition to many other food based initiatives (see sidebar), CDCG operates 48 community gardens in communities in Albany, Rensselaer, Saratoga, and Schenectady Counties.

Goals

Based on the issues identified in the baseline assessment and discussions with the Food Systems Technical Committee, eight overarching goals were identified for food systems. The Technical Committee identified goals for four categories: 1) Production; 2) Processing; 3) Distribution; and 4) Consumption. Food waste, which is an important component of food systems, is addressed in the Solid Waste chapter of this Plan. Three goals under Production address preservation and enhancement of agricultural land to support the economy and protection of the rural lifestyle desired by many Capital Region residents. The Processing and Distribution categories include three goals that emphasize the creation of processing facilities and increasing access for farmers to regional distribution networks like grocery stores and farmers markets. The final two goals, in the Consumption category, are to promote the consumption of local food and increased access by all sectors of the population. Table 7.2 lists the goals and related initiatives for Food Systems.





The Capital District Community Gardens runs the following programs:

The successful Veggie Mobile produce market makes regular stops in urban neighborhoods with limited access to food and distributes affordable, fresh produce.

The Healthy Convenience Store Initiative program supports inner-city convenience stores to provide affordable produce in the urban neighborhoods of Albany, Schenectady and Troy. The program is supported with a grant from the Albany County Health Department.

The Produce Project involves Troy High School students in operating an organic, year-round urban farm business in Troy. By selling their crops to local restaurants and at farmers markets, students learn entrepreneurial skills while earning money that will help sustain the Produce Project.

Within the Squash Hunger program, fruit and vegetable donations are brought to shelters, pantries, and soup kitchens by volunteers.

Regional Initiatives

The Food Systems Technical Committee identified a number of initiatives that could help the Capital Region achieve the goals outlined in Table 7.2. The details of the initiatives were discussed by the Technical Committee and were evaluated for their overall benefit to the Capital Region, their cost and feasibility. The initiatives were ranked by the public and the Technical Committee, followed by a final review and ranking by the Executive Committee. The top three priority initiatives are described below. Preliminary scoring and prioritization process of all the initiatives considered can be found in Appendix 2 and 3, respectively.

The first initiative, to create a food hub for regional food processing, storage, and distribution, is focused on providing a centralized facility to store, process, and disseminate agricultural products. This initiative will help support the many small farms in the Capital Region by assisting with the dissemination of their products to the broader region.

The second initiative recommends creating a coalition of food and agricultural stakeholders working together to address regional agricultural issues. Ideally, this initiative will help create a regional entity engaged and focused on protecting agricultural land in the Capital Region.

The third initiative would increase local food transactions between residents, regional food stores, and farmers, increasing the market for local food. The food systems initiatives are listed below in the order that they were ranked by the Food Systems Technical Committee.

Create a food hub for regional food processing, storage, and distribution. A food hub is a facility that centralizes the business management structure to facilitate the aggregation, storage, processing, distribution, and/or marketing of locally

Table 7.2 Food System Goals

Goals

- Prioritize the protection of agricultural land
- Increase the volume of local food production commensurate to existing and future demand.
- Maximize the utilization of land appropriate for agriculture and encourage production using sustainable and best management practices.
- Enhance the capacity and number of processing facilities for meat, produce, and other local agricultural products.
- Increase distribution of locally produced foods to institutions and food stores, including large chain grocery stores and corner stores.
- Create a variety of warehousing and storage options to accommodate seasonal food options and adverse weather conditions.
- Augment access to fresh produce for residents across the capital region from urban neighborhoods to rural settings.
- Educate consumers and food buyers about the benefits of eating healthy, preparing, and purchasing local foods.



and regionally produced food products. A food hub may provide the core services of a packing house, and/or aggregate and distribute farm-packed cases. This initiative would be to either create a new food hub or augment the capacity and infrastructure at the current farmers market and food hub in Menands, NY.

The first step in implementing this initiative would be to define the ‘food shed.’ It will be important to understand the geographic boundaries of the area that the food hub will need to serve to identify the stakeholders and understand capacity needs for the hub. In order to assess the viability and need for a food hub or multiple food hubs, the implementer, in this case the Capital District Community Gardens and yet to be established Regional Food and Agricultural Coalition, should undertake a gap analysis to review needs and feasibility, including infrastructure, location, connection to transportation networks, investment needs, and funding sources.

Re-establish a Regional Food and Agricultural Coalition for the Capital Region. This initiative envisions an organized coalition of stakeholders that would meet regularly to identify needs, gaps, and advocate for and promote the Capital Region’s agricultural sector. This includes investigating local, regional and state food policies; protecting agricultural land; addressing hunger abatement and food justice; creating a more efficient processing and food distribution network; and

enhancing access to healthy locally produced food. The Regional Food and Agricultural Coalition would initiate collaboration efforts with agriculture, higher education, technology, transportation and economic development organizations and institutions to promote the Capital Region agricultural products. One of its first orders of business would be to evaluate the feasibility of a food hub or hubs in the Capital Region. The Capital Region Economic Development Council Strategic Plan also charges a Farm and Food Coalition to work with local business schools about next generation concepts to enhance the competitiveness of the local agribusiness.

Establish an initiative to create/increase “local food” transactions, especially between large grocery stores and farms. This initiative would encourage the Capital Region’s grocery stores, restaurants, residents, and institutions to purchase local food from the

Best Practices

Farm to Hospital Program - The University of Virginia Health System serves 45,000 meals per week. In order to obtain the needed volume of produce to serve this number of meals, items must be ordered from a number of farms. To address the issue of procurement and delivery, the hospital works with the Local Food Hub (LFH), a fast-expanding aggregator of produce from 70 farms within 100 miles, which has passed along \$750,000 of local produce to its customers. Also, the Local Food Hub operates farm-stands in the hospital cafeterias, a health-promoting service to hospital staff, patients and visitors.

The Food Systems Technical Committee identified the creation of additional medium to small-sized processing facilities as one of the top priorities for the region. Committee members agreed there is a need for more processing facilities at all levels of food production, in particular brewing, meat, and specialty food processing facilities. Potential funding for food processing businesses could be found through the USDA - Rural Economic Development Funds; SARE - Sustainable Agriculture; State Agriculture and Markets development program; County IDAs; and partnerships with local universities and business schools. One idea that could help meet this demand would be to use school and university kitchens which are typically not used during summer months for small-scale processing operations when agricultural production in the region is at its peak.





Why are regional food hubs important? According to the USDA, “many farmers and ranchers—especially smaller operations—are challenged by the lack of distribution and processing infrastructure of appropriate scale that would give them wider access to retail, institutional, and commercial foodservice markets, where demand for local and regional foods continues to rise. Food hubs offer a combination of production, distribution, and marketing services that allows them to gain entry into new and additional markets that would be difficult or impossible to access on their own.” (USDA, Regional Food Hub Resource Guide, 2012)

region’s farmers. This will require overcoming significant hurdles because larger businesses are accustomed to buying from the larger suppliers. Part of this initiative may include a branding campaign that restaurants, grocery stores, and retailers could use to market locally grown foods to consumers. This initiative may require additional study to identify the current hurdles for the Capital Region’s grocery stores in working with local farms and how they may be overcome. A good model for a regional initiative that creates and increases “local food” transactions can be found in Western Massachusetts under Community Involved in Sustaining Agriculture (CISA). This program involves residents, restaurants, grocery stores, and retailers in supporting local agriculture and has seen rapid growth and participation over the past several years:

- ✓ Community membership in CISA grew by 188 households, an increase of 42% from 2009
- ✓ In 2010, the number of farms, restaurants, retailers and related food businesses participating in CISA’s be a Local Hero, Buy Locally Grown® program increased by 10% to over 300 (CISA, 2010)

Many non-profit organizations have been actively preserving farmland in the region, including the American Farmland Trust, Agriculture Stewardship Association, Scenic Hudson, Open Space Institute, Rensselaer Land Trust, and the Columbia Land Conservancy.

Implementation

Identifying these priority initiatives in many ways is the easiest part of the planning process. Implementation can be far more difficult because the barriers to implementing these initiatives either in the past or moving forward are many.

Lack of funding and resources, poor communication between supporters, conflicting priorities at the municipal level, absence of a strong proponent or implementer, lack of grassroots support, and an under developed network of producers and distributors have and will continue to be a barrier to implementation if not addressed.

To that end, an implementation strategy which outlines the resources, costs and timeline associated with achieving the priority initiatives and overcoming these barriers is provided in Table 7.3.

Sustainability Indicators

Sustainability indicators and targets have been established to allow the Region to track its progress with each Focus Area. For Food Systems, one indicator has been established:

- Annual Agriculture – Farm Production (Dollars)

Refer to Section 13 for specific information about the sustainability indicators and targets.



Table 7.3 Food Systems Implementation Strategy

| Initiative | Regional Priority | Implementer | Partners | Preliminary Costs | Greenhouse Gas Reduction Potential ** | Potential Funding Sources | Timeline |
|--|-------------------|---|--|-------------------|---------------------------------------|---|----------------------------------|
| Create a food hub for regional food processing, storage, and distribution of locally produced food products. | 1 | Capital District Community Gardens and Regional Food and Agricultural Coalition | <ul style="list-style-type: none"> - Capital District Cooperative, Inc. - Capital District Community Gardens - USDA - Distributors - Food Service Corps - Institutions/Hospitals - Skidmore College - SUNY Albany - Cornell Cooperative Extension - Farmers - Farm Bureaus - Economic Development stakeholders - County IDAs | \$\$\$ | Medium | <ul style="list-style-type: none"> - USDA–Rural Economic Development Funds - SARE–Sustainable Agriculture - State Agriculture and Markets development program - County IDAs | Long Term (greater than 5 years) |
| Re-establish a regional food and agricultural coalition for the Capital Region to identify needs, gaps, and advocate for the agricultural sector. | 2 | Capital District Community Gardens | <ul style="list-style-type: none"> - Local governments or elected officials - Emergency Food provider; USDA - Statewide food policy council - Farm Bureaus - American Farmland Trust - Northeast Organic Farming Association - Cornell Cooperative Extension (Farm and Nutrition) - Local food and public health leaders - Urban representatives (such as the Affordable Housing Partnership) - Skidmore College and other higher education institutions | \$ | Low | <ul style="list-style-type: none"> - USDA Value Added Producer Grants - USDA Community Facilities Grants - USDA Community Food Projects Grants - Competitive Grant Program (CFP) | Short Term (<1 year) |
| Establish an initiative to create/increase “local food” transactions, to encourage the Capital Region’s grocery stores, restaurants, residents, and institutions to purchase local food from the Capital Region’s farms. | 3 | Capital Region Economic Development Council | <ul style="list-style-type: none"> - Grocery store chain owners and managers - Farmers - Farm Bureaus - Cornell Cooperative Extension - Regional Food and Agricultural Coalition - Restaurant owners - Local government officials and planning staff | \$\$ | Medium | <ul style="list-style-type: none"> - USDA Farm to School grant program - USDA Food and Nutrition Service Program - Discretionary Grants - USDA’s Rural Development Business Opportunity Grant | Mid-Term (1 - 5 years) |

*Overall Cost: \$ - < \$100,000, \$\$ - \$100,000 to \$500,000, \$\$\$ - > \$500,000

**Greenhouse Gas Reduction Potential: High – Strategy will result in a direct, quantifiable reduction in GHG emissions; Medium – Some GHG emissions reduction may occur but it cannot be quantified; Low – GHG reduction is very indirect, unlikely to occur, or unknown





In addition to the implementation strategy listed above, it is recognized that these initiatives will require action by local governments. The governance overview in Table 7.4 provides guidance to jurisdictions on specific actions they can take to implement the Sustainability Plan's various initiatives. It also evaluates each initiative against all others in the plan to identify where there are alignments or hindrances to implementation.

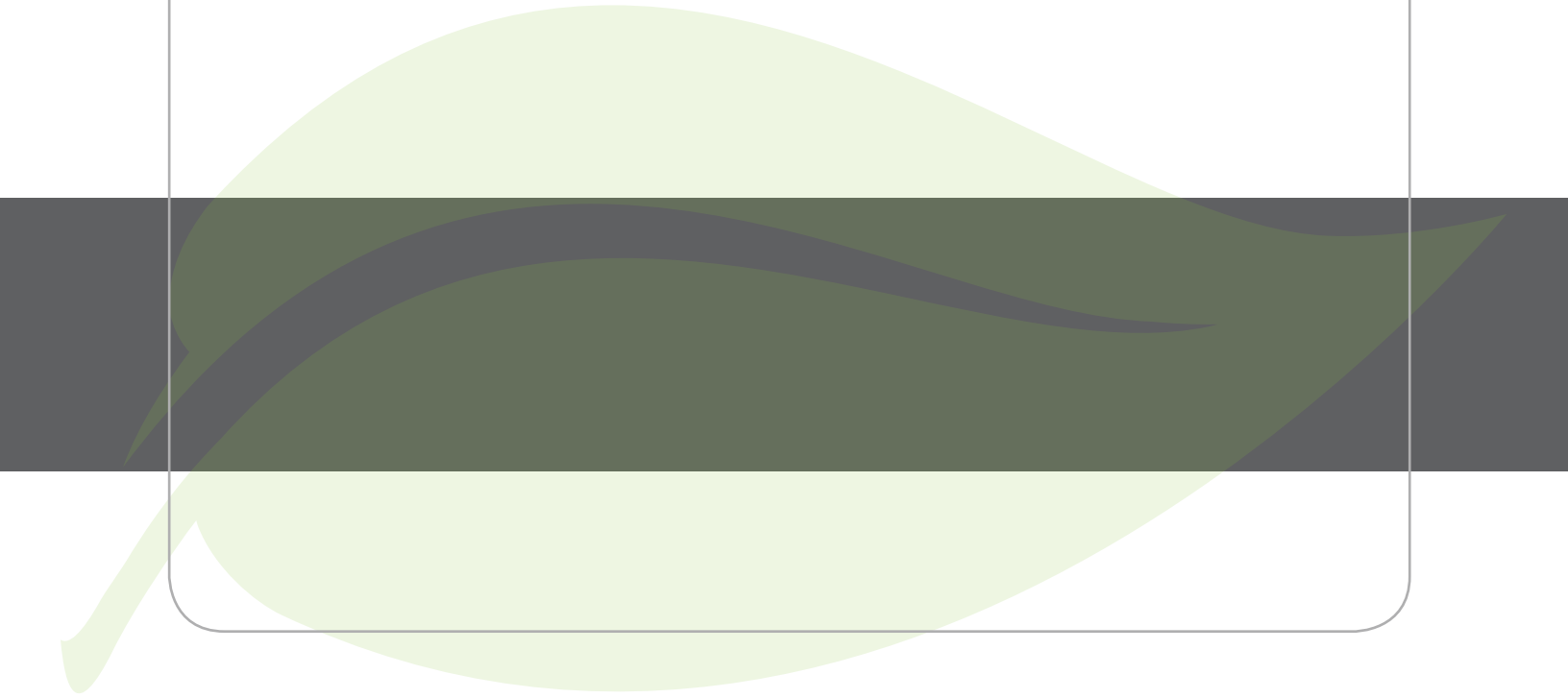
Table 7.4 Food Systems Governance Recommendations

| Name of Initiative | Process to Implement (update zoning ordinance, adopt a policy or plan, resolution to approve funding, etc.) | Related Policies – positive link-ages and alignments | Related Policies – barriers and cross-purposes | Local Government Level of Implementation |
|--|--|--|--|--|
| Create a food hub for regional food processing, storage, and distribution of locally produced food products. | <ul style="list-style-type: none"> - Establish Physical Home and Infrastructure for Food Hub. - Zoning and building code updates - Transportation infrastructure improvements | <ul style="list-style-type: none"> - The various initiatives in the Energy Focus Area that incentivize energy conservation and renewables could help support the viability of a hub. | <ul style="list-style-type: none"> - Lack of regional organization with sufficient resources to coordinate will be a barrier. | Establish at the regional level. |
| Re-establish a regional food and agricultural coalition for the Capital Region to identify needs, gaps, and advocate for the agricultural sector. | <ul style="list-style-type: none"> - Establish Coalition with appointed members from local governments in the region. | <ul style="list-style-type: none"> - The Coalition could assist with implementation of the Food Hub and creation of processing facilities. - They could also serve as a resource for local governments creating farmland protection plans. | <ul style="list-style-type: none"> - Lack of sponsor to develop grassroots movement to establish coalition will be a barrier. | Establish at the regional level. |
| Establish an initiative to create/increase "local food" transactions, to encourage the Capital Region's grocery stores, restaurants, residents, and institutions to purchase local food from the Capital Region's farms. | <ul style="list-style-type: none"> - NA – no Governance structure | | <ul style="list-style-type: none"> - Lack of regional organization with sufficient resources to coordinate will be a barrier. | |



Section 8.0

Land Use and Livable Communities







SECTION 8.0: **Land Use and Livable Communities**

*L*ivability is based on several key principles including: providing transportation choices; promoting equitable, affordable housing; enhancing economic competitiveness; supporting existing communities; coordinating policies and leveraging investments; and valuing communities and neighborhoods (PSC, 2012).

Land use policies have a direct relationship to each of these principles, making it an essential component to creating and supporting livable communities.

The focus of this chapter is to create a Capital Region composed of livable communities. In order to accomplish this, the initiatives in this chapter focus on land use solutions that protect and enhance the Capital Region's natural and cultural resources, encourage investment and redevelopment that create connected and walkable communities, and promote diverse, affordable and energy efficient housing.

Regional Baseline

A baseline assessment was performed to identify existing land use and livable community conditions in the Capital Region, and to identify needs and opportunities for sustainable land use planning. Data was obtained from a variety of resources including U.S. Census, National Land Cover Dataset, NOAA's Coastal Change Analysis Program (C-CAP) as well as several regional planning studies. Baseline data includes land use, population growth, aging population, poverty and housing.



Land Cover and Development Overview

The eight-county Capital Region covers an area of approximately 5,340 square miles. Sixty percent of the land cover in the Capital Region is forested, according to C-CAP data (see Figure 8.1). Agriculture and woody wetlands are two other dominant land covers in the Capital Region. NYSDEC alone manages approximately 286,700 acres of land in the Capital Region, not including other local and private conservation lands.

Developed land (C-CAP, 2006) accounts for just over five percent of the land in the Capital Region. According to C-CAP, approximately 3.3 square miles of land in the Capital Region was developed between 1996 and 2006. The amount of developed land counted here however, has been underestimated since this data is based strictly on satellite imagery (which is captured in 30 meter by 30 meter pixels) and therefore often fails to document small scale/low density development. As shown in Figure 8.2, most of the land developed in the Capital Region during this period, was for developed open space (which could include residential parcels with large amounts of open

Table 8.1 Housing Affordability Index

| Area | 1990 | 2000 | 2006* |
|--------------------|------|------|-------|
| Capital Region | 3.1 | 2.4 | 3.3 |
| Albany County | 3.3 | 2.6 | 3.5 |
| Columbia County | 3.5 | 2.7 | NA |
| Greene County | 3.3 | 2.5 | NA |
| Rensselaer County | 2.9 | 2.3 | 2.8 |
| Saratoga County | 2.9 | 2.3 | 3.5 |
| Schenectady County | 3.0 | 2.2 | 2.8 |
| Warren County | 3.0 | 2.4 | 3.4 |
| Washington County | 2.4 | 2.1 | NA |

*Data for Albany, Rensselaer, Saratoga, Schenectady and Warren Counties only in 2006.

**Affordability Index (Median Value of Owner Occupied Units/ Median Household Income).

Source: New York State Division of Housing and Community Renewal, 2008

C-CAP uses multiple dates of remotely sensed imagery to produce nationally standardized land cover and land change information for the coastal regions of the U.S. This analysis includes all of the Capital Region. While efforts have been made to ensure that data are accurate and reliable within the limits of current technology, C-CAP data sets are not jurisdictional or intended for use in litigation. These data are intended for use in identifying regional landscape patterns and major functional habitats. C-CAP is a national and regional data set that should be used only as a screening tool for very local or site-specific management decisions. Small features and changes should be verified with a higher resolution data source.

Community Planning and Conservation in Clifton Park, NY

Through a tool called Transfer of Development Rights (TDR), the Town of Clifton Park in Saratoga County, NY is managing land development to protect commercially viable agricultural land and preserve natural resources.

TDRs send or transfer some or all development rights from one property to another. The “receiving” properties are allowed to develop more intensively than would normally be permitted by the area’s zoning. TDR “sending” areas seek to preserve important community land resources (e.g. agriculturally productive soils, groundwater recharge areas, wildlife habitats, etc.).

Flexibility in the TDR program allows transfer of development rights from one political jurisdiction to another.

The TDR program, as stipulated in Chapter 40 of the NYS Laws of 1989, is a voluntary, flexible program, that provides a low cost mechanism to conserve important lands.:

Clifton Park’s TDR Program:

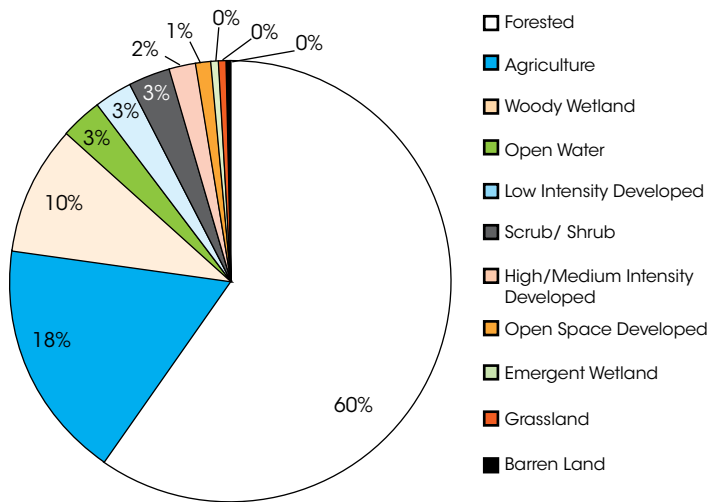
- 1) Protects lands in the sensitive western portion of Town (sending properties), and
- 2) Allows bonus density incentives for developments in other locations in the Town (receiving properties).

<http://saratogaplan.org/documents/PDR-TDR-FS.pdf>





Figure 8.1 Land Use in the Capital Region (2006)



Best Practices

Density Incentives - Arlington County, VA created a green building density bonus program that allows builders to request a larger building than is normally allowed by County Code if the project gains official LEED certification at any of the four levels. The amount of the bonus depends on the award level of the project.

space and developed recreational uses such as golf courses) and low density residential uses. This may be indicative of an increase in sprawl.

Land Use

Since land use regulations in New York State are primarily controlled at the municipal level, individual communities have the ability to adopt zoning, subdivision regulations and, environmental regulations, often guided by a comprehensive planning process that sets priorities for land use. In the case of the Capital Region, some communities have extensive planning processes and regulations, while others have limited regulations or resources, including a lack of zoning regulations.

Population Growth

The increase in development in the Capital Region is accompanied by an overall increase in population. According to the U.S. Census, the Capital Region's population grew by almost five percent between 2000 and 2010. This is the second highest growth rate in New York State's ten regions according to A New Vision for the Capital Region's Economy (Regional Economic Development Council, 2011). As shown in Figure 8.3, all counties within the Capital Region experienced growth over this time span. Saratoga County, in particular, had the highest growth in the entire state (9.5 percent). This growth is a dramatic change from the previous ten-year period. Between 1990 and 2000, the Capital Region grew by just over two percent overall. Some counties in the Capital Region (Rensselaer and

Figure 8.2 Development in the Capital Region

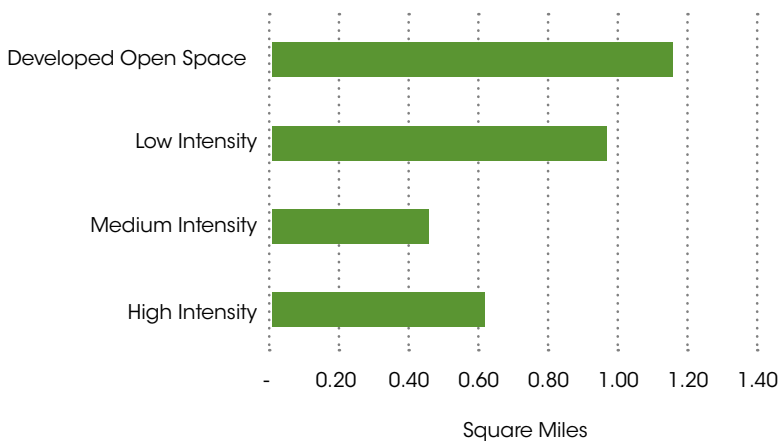
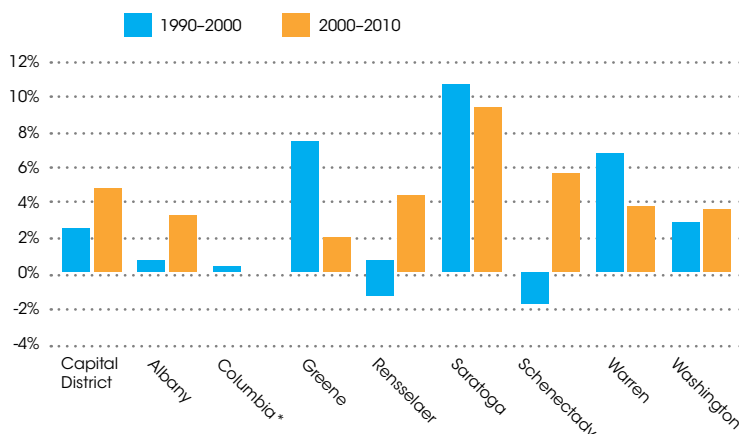


Figure 8.3 Population Change in the Capital Region 1990-2000 compared to 2000-2010



*Columbia County experienced no change in population between 2000-2010





Chatham, NY

Schenectady) even experienced a decline in population during that time period.

Aging Population

The population in the Capital Region is also aging. Between 2000 and 2010, the average median age for the Capital Region increased by three years (from 38.2 to 41.2). The number of people over the age of 85 also increased in the last decade by 20 percent (PAD, 2012). Saratoga County has had a particularly large increase of this over age 85 demographic (53 percent).

The aging population in the Capital Region is of particular concern with regard to land use and housing. As the population increases, the demand for elderly housing will increase. Denser, mixed-use, and walkable communities are generally more senior-friendly than

low-density, car-dependent developments. The ability to access basic services (grocery stores, pharmacies, etc.) without having to drive is an important community asset for seniors. Also, it is important to ensure that senior-friendly communities are accessible for all income levels. Many seniors are on fixed incomes and have limited ability to relocate; therefore, their needs must be addressed in their existing communities.

Housing

The homeownership rate in the Capital Region is above the US average (65.1 percent) in all counties except for Albany County. It is also above the New York State average (55.2 percent) in every county; however, this average is skewed by the low homeownership rate in New York City.

Table 8.2 Housing and Economic Development Organizations Within The Capital Region

| | |
|--|---|
| Center for Economic Growth (CEG) | http://www.ceg.org/ |
| Capital District Homeownership Collaborative | http://www.ahphome.org/collaborative.htm |
| CARES, Inc – CARES Housing Program | http://caresny.org/cares-housing-program.cfm |
| Capital District Regional Planning Commission (CDRPC) | http://www.cdrpc.org/ |
| Community Loan Fund of the Capital Region | http://www.mycommunityloanfund.org |
| Various neighborhood and rural preservation companies including housing authorities and providers, community development block grants (CDBGs) and other housing service providers. | |





The median household income throughout the Capital Region is similar to both the U.S. (\$51,914) and New York State (\$55,603) averages. All counties except for Saratoga fall just below the New York State average, while Greene, Warren and Washington also fall below the U.S. average.

The median value of owner-occupied units has increased in all counties between 1990 and 2010. The values are still well below the New York State average of \$303,900. In 2010, the median value of owner-occupied units surpassed the U.S. average of \$188,400 in all eight counties. Housing value relates to affordability and is dependent on income levels. The housing affordability index (the higher the number, the less affordable housing is), as displayed in Table 8.1, shows that, overall, housing affordability has declined in the Capital Region between 1990 and 2006.

Housing Assets and Needs

Information gathered from housing studies conducted for the Capital Region and from the Land Use and Livable Communities Technical Committee were used to assess the housing-related assets and needs within the Capital Region (NYSHCR, 2010). Assets in the Capital Region include a stable workforce supported by the public sector and a growing high tech sector; a range of housing and economic development agencies and organizations; and a mix of rural and small urban areas with access to open space. Table 8.2 provides a list of several housing and economic development organizations operating within the Capital Region to assess and meet the housing needs in the region's communities.

A variety of housing needs exist within the Capital Region. According to the 2011 NYSHCR Catalogue of Need, two primary housing needs identified in the Capital Region include: increasing the amount of quality affordable housing, particularly for extremely low-income residents (households earning 30 percent or below the area median

Best Practices

Sustainable/Green Building Standards – The Town of Greenburgh, NY Town Code requires every applicant who files an application for site plan review for construction to make a good faith effort to achieve LEED certification by providing a completed LEED checklist.

income [AMI]) and those impacted by the second home market; and addressing the vacant and blighted properties throughout the Capital Region's cities and rural areas.

A specific need for smaller rental housing (8-12 units) in rural communities for families and seniors was identified by the Land Use and Livable Communities Technical Committee. Also, many very low income residents are being priced out of the rental market and/or living in substandard housing. More affordable homeownership opportunities are needed to match the economic realities of residents throughout the Capital Region. It was also noted by the Committee that funding for repairs and accessibility upgrades of senior occupied homes is needed to enable seniors and the elderly to age in place. Additionally, it was expressed that special needs, supportive services, and affordable housing should be spread throughout the Capital Region, and not concentrated in just a few locations.

Greenhouse Gas Emissions

Land use plays a significant role in many activities that are sources of greenhouse gas emissions. Specifically, land use policies will impact how much land is conserved, land that may serve as point of carbon sequestration. These policies also impact the movement of goods and people throughout the Capital Region and thus the emissions from the transportation sector. Finally, land use policies shape building development, particularly building density and proximity to services. Because land use



Table 8.3 GHG Emissions, Capital Region, 2010 (Metric Tons CO₂e)

| | Region | Albany | Columbia | Greene | Rensselaer | Saratoga | Schenectady | Warren | Washington |
|---------------------------------|-----------|-----------|----------|---------|------------|-----------|-------------|---------|------------|
| Residential Energy Consumption* | 3,015,446 | 882,719 | 181,437 | 140,327 | 438,817 | 646,897 | 453,778 | 152,773 | 118,698 |
| On-road** | 5,526,882 | 1,650,002 | 342,133 | 349,166 | 691,191 | 1,302,373 | 506,514 | 420,380 | 265,123 |

Sources:

* 2010 Capital Region Tier 2 Regional Greenhouse Gas Inventory

** Calculated using Vehicle Miles Traveled (VMTs). See Table 9.1.

policies impact a variety of areas that are sources of emissions, it is difficult to directly quantify the impact of specific initiatives on emissions. However, the goals outlined in this chapter will have an impact on reducing emissions specifically in residential energy consumption and in on-road transportation. The emissions of GHGs by county from the residential and on-road transportation sector are highlighted in Table 8.3.

Goals

Based on the issues identified in the baseline assessment and in discussions with the Land Use and Livable Communities Technical Committee, three overarching goals were identified for this chapter of the Plan. These goals relate to the use of land, both in rural urban and suburban environments, and the human factors that make a place livable and sustainable.

Ten specific initiatives were identified to achieve these goals. Each initiative directly supports at least one goal. However, some initiatives may also contribute to supporting other goals as well. Table 8.4 lists each land use and livable communities initiative by the goal it primarily supports.

Regional Initiatives

The Land Use and Livable Communities Technical Committee identified a number of initiatives that could help the Capital Region

Table 8.4 Land Use and Livable Communities Goals

| Goals |
|--|
| Preserve, protect and enhance the Capital Region's natural and cultural resources, sensitive ecosystems and agricultural lands, and effectively provide and manage accessible public space to increase recreational and civic opportunities for all. |
| Encourage investment and redevelopment in existing cities, town centers, villages and hamlets, and encourage compact, connected, walkable communities wherever major development occurs in the Capital Region. |
| Promote diverse, energy efficient and healthy housing options for all residents of the Capital Region. |

achieve the goals outlined in Table 8.4. The details of the initiatives were discussed by the Technical Committee and were evaluated for their overall benefit to the Capital Region, their cost and feasibility. The initiatives were ranked by the public and the Technical Committee, followed by a final review and ranking by the Executive Committee. The top three priority initiatives are described below. Preliminary scoring and prioritization process of all the initiatives considered can be found in Appendix 2 and 3, respectively.

Modify local codes and regulations to allow for sustainable, compact development.

One of the major drivers of new development, beyond market forces, is what is permitted in any given community as per existing codes and comprehensive planning documents. Through this initiative, opportunities for updates to local comprehensive plans, zoning and/or





design guidelines would be investigated to determine ability to accommodate form-based codes, provisions for walkable village centers, green infrastructure, green buildings, and other sustainable strategies.

Communities are realizing that sprawling growth has an effect on municipal services and can have a negative effect on open space and traffic. By changing the direction of growth by encouraging more density and walkable environments, the community can form the foundation for growing and changing in a way that can conserve land and other natural resources and reduce the use of personal vehicles. To make these changes requires technical expertise and extensive staff time, which can be a deterrent.

Repair and Modernize Existing Infrastructure.

The infrastructure in the Capital Region is increasingly taxed due to the overall age of it and the additional burden of a growing population. The NYS Environmental Facilities Corporation estimates regional water and sewer improvements alone to cost approximately \$2.5 billion. Overall upgrades are needed for water, sewer, sidewalks, parks, telecommunication, utilities and transportation in existing population centers. Ideally, these upgrades will also promote complete street and green infrastructure concepts. Cities and town centers are important cultural, civic and economic centers. Ensuring they have the proper infrastructure to maintain such vital functions is critical to any region.

In urban areas, pocket parks within a 1/4 mile of residential areas could provide open spaces with the added functions of civic space and green infrastructure areas. Having a compelling downtown or village/town center will also make these areas a more attractive place to live and play, not just to work or shop.

Develop a Regional Greenway Connectivity Plan. The Capital Region has various trails and greenways including state, county and town/city parks, privately held conservation lands,

Best Practices

Development Approval Incentives—Sarasota County, FL approved a Green Development Initiative that provides fast-track permitting for residential and commercial green developments. Incentives apply to projects pursuing LEED.



and multi-use paths. There are numerous plans in place to conserve additional lands and increase trail networks, however there is limited funding to execute these plans. A Regional Greenway Connectivity Plan would help bring these plans together to create a well-connected network of green spaces and trails throughout the eight-county Capital Region. Funding of this Plan, as well as the expansion and completion of the existing trail network and planned trails in various communities would help the Capital Region create a robust greenway system that ties together natural resources, recreation and cultural elements.

Implementation

Identifying these priority initiatives in many ways is the easiest part of the planning process.



Implementation of the priority initiatives identified in the plan can be far more difficult. There are many barriers that must be overcome to successfully implement the initiatives.

Lack of funding and resources, poor communication between supporters, competition between municipalities for limited funds, challenges associated with prioritizing multiple needs, conflicting priorities at the municipal level, absence of a strong proponent or implementer, lack of grassroots support, and lack of innovative local examples have and will continue to be a barrier to implementation if not addressed.

To that end, an implementation strategy which outlines the resources, costs and timeline associated with achieving the priority initiatives and overcoming these barriers is provided in Table 8.5.

Sustainability Indicators

Sustainability indicators and targets have been established to allow the Capital Region to track its progress with each Focus Area. For Land Use and Livable Communities the following indicators have been established:

- Annual Regional Energy Consumption Per Capita
- Annual Agriculture – Farm Production (Dollars)
- Per Capita Land Consumption

Refer to Section 13 for specific information about the sustainability indicators and targets.



Table 8.5 Land Use and Livable Communities Implementation Strategy

| Initiative | Regional Priority | Implementer | Partners | Preliminary Cost | Greenhouse Gas Reduction Potential** | Potential Funding Sources | Timeline |
|---|-------------------|---|---|------------------|--------------------------------------|--|---|
| Modify local codes and regulations to encourage form based codes, provisions for walkable communities, green infrastructure, green buildings, and other sustainable strategies. | 1 | Municipalities | <ul style="list-style-type: none"> - MPOs and Regional planning agencies (CDTC,A/GFTC, CDRPC) - County Planning departments, - Department of Health - Community gardens and citizen groups - Could involve multiple communities working together - Developers and large property owners | \$ | Medium | <ul style="list-style-type: none"> - NYSDOS/EPF - CDTC's Linkage program (requires 25% local match) - Parks & Trails NY - Greenway Grants (Hudson Valley Greenway) | Mid-Term (1 - 5 years) assuming all planning has been done and codes are ready to implement |
| Repair and modernize existing infrastructure including water, sewer, parks, transportation, and telecommunications in existing population centers. | 2 | Local governments Regional coalitions Sewer districts | <ul style="list-style-type: none"> - Local governments - Public authorities - Regional coalitions - Sewer districts - Water districts - Private developers | \$\$\$ | Low | <ul style="list-style-type: none"> - NYSEFC - Clean water/drinking revolving loan fund - NYSDOT | Mid-Term (1 - 5 years) or Long-Term (>5 years), depending on scope |
| Develop a regional greenway connectivity plan to bring together existing trail and greenway plans and support their completion. | 3 | Local/County government, Coalition | <ul style="list-style-type: none"> - MPOs - NYSDOT - NY Parks & Trails - Local advocacy groups | \$\$\$ | Low | <ul style="list-style-type: none"> - Existing state conservation funding | Mid-Term (1 - 5 years) |

*Overall Cost: \$ - < \$100,000, \$\$ - \$100,000 to \$500,000, \$\$\$ - > \$500,000

**Greenhouse Gas Reduction Potential: High – Strategy will result in a direct, quantifiable reduction in GHG emissions; Medium – Some GHG emissions reduction may occur but it cannot be quantified; Low – GHG reduction is very indirect, unlikely to occur, or unknown

In addition to the implementation strategy listed above, it is recognized that these initiatives will require action by local government. The governance overview in Table 8.6 provides guidance to jurisdictions on specific actions they can take to implement the Sustainability Plan's various initiatives. It also evaluates each initiative against all others in the plan to identify where there are alignments or hindrances to implementation.



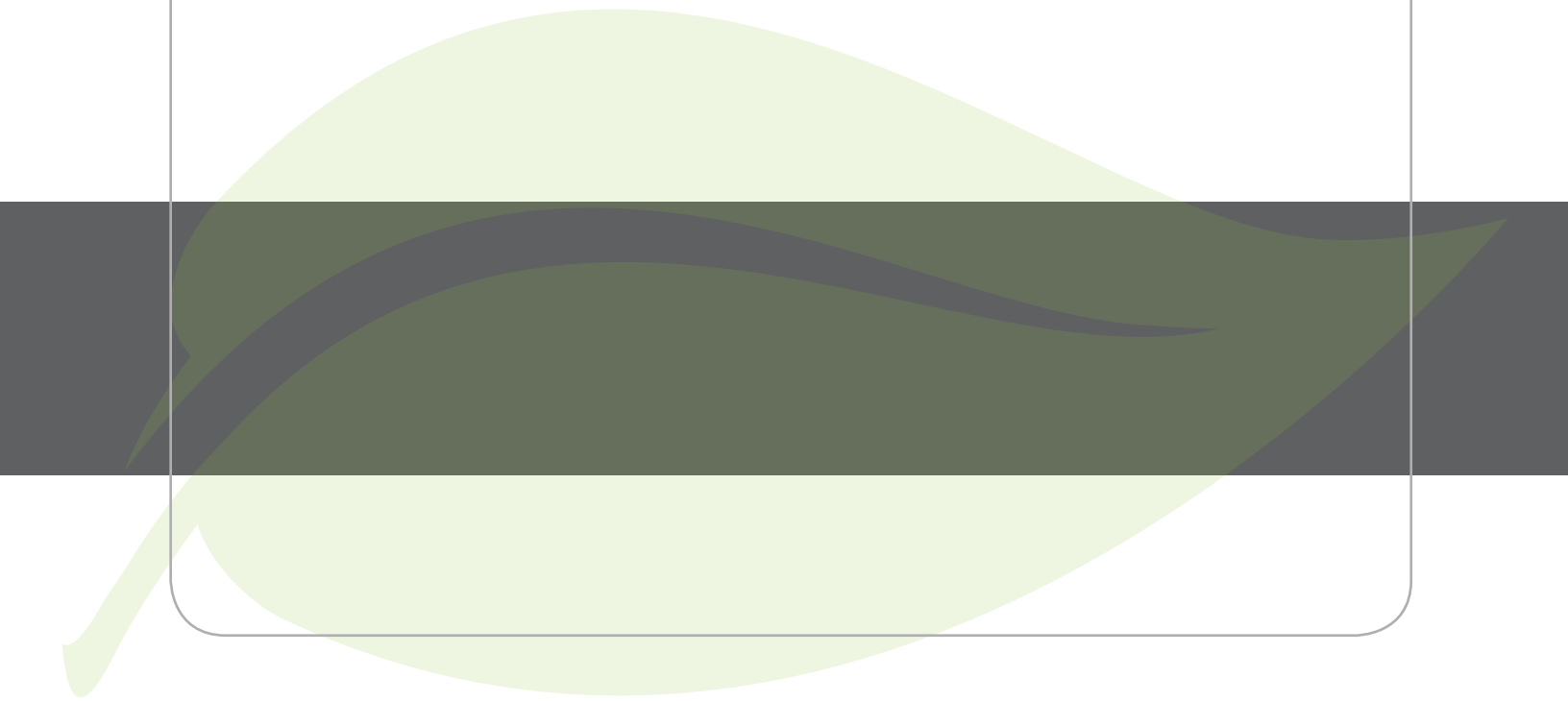
Table 8.6 Land Use and Livable Communities Governance Recommendations

| Name of Initiative | Process to Implement (update zoning ordinance, adopt a policy or plan, resolution to approve funding, etc.) | Related Policies – positive linkages and alignments | Related Policies – barriers and cross-purposes | Local Government Level of Implementation |
|--|--|---|--|--|
| <p>Modify local codes and regulations to encourage form based codes, provisions for walkable communities, green infrastructure, green buildings, and other sustainable strategies.</p> | <p>Update and Zoning Codes Revise and Adopt Comprehensive Plans. Coordinate with the Regional Planning Commission.</p> | <p>- Coordinate efforts with the multiple code- related initiatives in the Plan including: - Climate Adaptation - Promote Green Infrastructure - Energy - Adopt a local energy efficient building code</p> | <p>There is the potential to work at cross-purposes if code revision efforts are not coordinated. For example, Adaptation—Promote Green Infrastructure and Adaptation—Enforce and Enhance Floodplain Ordinances.</p> | <p>Implementation by all jurisdictions at the local level.</p> |
| <p>Repair and modernize existing infrastructure including water, sewer, parks, transportation, and telecommunications in existing population centers.</p> | <p>Revise and Adopt Capital Improvement Plans.</p> | <p>- Strong linkage with Adaptation. - Promote Green Infrastructure. - Infrastructure investments should be informed by Adaptation. - Conduct Local Vulnerability Assessments and Adaptation Planning. - Infrastructure issues should also be addressed in Economic Development. - Establish Model Green Code for Adoption by Communities as well as Transportation. - Develop and Expand Electric Vehicle/Alternative Fuel Infrastructure and Transportation. - Optimize Transportation Systems through Alternative Street Design. - Water and sewer-related infrastructure investments should be coordinated with all of the water-related initiatives.</p> | <p>Insufficient funding will make implementation difficult.</p> | <p>Implementation by all jurisdictions at the local level with cooperation from RPC and other regional entities.</p> |
| <p>Develop a regional greenway connectivity plan to bring together existing trail and greenway plans and support their completion.</p> | <p>Develop and Adopt Regional Plan.</p> | <p>- Leverage synergies with: - Climate Adaptation - Promote Green Infrastructure - Conduct Vulnerability Assessments and Climate Adaptation Planning. -Transportation - Implement a bicycle and pedestrian infrastructure improvement program. -Water - Watershed Assessment for Stormwater Management.</p> | <p>Potential to be at cross purposes with: -Transportation - Implement a bicycle and pedestrian infrastructure improvement program. -Water - Watershed Assessment for Stormwater Management.</p> | <p>Establish at the regional level. Projects implemented locally.</p> |



Section 9.0

Solid Waste



HISTORIC ALBANY FDN. EST. 1974





SECTION 9.0: **Solid Waste**

Solid waste is broadly defined as materials that have been used for their intended purpose and no longer have value to the owner. Sustainability in solid waste creates systems to reduce waste, recover resources and energy, and minimize waste disposal.

There are many components of solid waste. Municipal solid waste (MSW) consists of everyday items used in our homes, schools and workplaces, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, and batteries. Solid waste also includes construction and demolition (C&D) debris, sludges from water and wastewater treatment facilities, and non-hazardous industrial wastes resulting from manufacturing and industrial processes. There are formal definitions of solid waste which are included in both federal and state laws and regulations. In some cases, these definitions include hazardous materials. For purposes of this Sustainability Plan, however, the focus is on the management of non-hazardous solid waste.

Since 1988, New York State has had an established policy with a preferential waste management hierarchy of reduction, reuse, recycling, and energy recovery, with landfill disposal as the method of last resort. Much progress has been made since that time in advancing these preferred waste management methods as well as making landfill disposal more protective of the environment. Yet, 20 years after these policies were established, an estimated 56 percent of the solid waste generated in the state is still delivered to landfills, and only 36 percent is recycled (NYSDEC, 2010).

The Sierra Processing Facility in the City of Albany opened in 2010 to process single stream recyclables, which is a mixture of recyclable paper, glass, metal, and plastic containers collected together. Single stream facilities allow the recycler to only use a single container for material collection, which is more efficient and convenient for the recycler.



Table 9.1 Local Solid Waste Planning Units

| Planning Unit | Geography Served |
|--|---|
| Capital Region Solid Waste Management Partnership | Parts of Albany and Rensselaer Counties |
| Town of Colonie | Parts of Albany County |
| Columbia County | All of Columbia County |
| Eastern Rensselaer County Solid Waste Management Authority (ERCSWMA) | Parts of Rensselaer County |
| Greene County | All of Greene County |
| Saratoga County | All of Saratoga County |
| Schenectady County | All of Schenectady County |
| Warren / Washington Counties | All of Warren and Washington Counties |

In 2010, the New York State Department of Environmental Conservation (NYSDEC) established a new state-wide solid waste management plan with a new approach, as follows:

“...a shift from focusing on ‘end-of-the-pipe’ waste management techniques to looking ‘upstream’ and more comprehensively at how materials that would otherwise become waste can be more sustainably managed through the state’s economy. This shift is central to the state’s ability to adapt to an age of growing pressure to reduce demand for energy, reduce dependence on disposal, minimize emission of greenhouse gases and create green jobs.” (NYSDEC, 2010)

Following NYSDEC’s lead on this new materials management approach, the Sustainability Plan focuses on finding ways to more effectively manage our materials to reduce waste, recover resources and energy, and minimize disposal.

Regional Baseline

Existing programs, facilities and infrastructure for solid waste and material management in the Capital Region are a mixture of both publicly-owned and privately-owned. Most waste reduction and recycling programs in the Capital Region are implemented by local or county governments. Alternatively, programs

Best Practices

Product Stewardship - Also known as extended producer responsibility (EPR), product stewardship calls on manufacturers, retailers, users and disposers to share responsibility for reducing environmental impacts from products. The NYS Electronic Equipment Recycling and Reuse Act requires manufacturers to provide free and convenient recycling of electronic waste to most consumers in the state.

are put into practice by Local Solid Waste Management Planning Units, which have been formed to develop and execute Local Solid Waste Management Plans (LSWMP) pursuant to the Solid Waste Management Act of 1988. A listing of the Planning Units in the Capital Region is presented in Table 9.1.

There are three materials recovery facilities (Sierra Processing, Resource Recovery Systems, and Cascades Recovery), all privately owned and operated, located throughout the Capital Region. Typically, these facilities process and upgrade one or more types of mixed recyclable materials (e.g. mixed paper, bottles, cans, and plastic containers) for sale to intermediate markets or to final users of the recycled materials, such as paper mills. In addition to these facilities, there are a number of recyclable handling facilities which primarily function as transfer stations to move recyclable materials to these facilities or facilities outside the Capital Region.

There are also eleven construction and demolition (C&D) processing facilities, all privately-owned and operated, located in the Capital Region. These C&D processing facilities are regulated by NYSDEC and typically remove reusable building or construction materials from the waste stream and process the material





Table 9.2 Recycling and Composting Facilities in the Capital Region

| Facility Name | Facility Type | Location | City | County | State |
|--|---------------------------------|-------------------------------|------------------|-------------|-------|
| Albany Compost Facility | Yard Waste Composting | One Connors Blvd | Albany | Albany | NY |
| Cascades Recovery - MRF | Recyclables | 71 Fuller Road | Colonie | Albany | NY |
| Bethlehem Compost Facility | Handling & Recovery | 1244 Feura Bush Road | Selkirk | Albany | NY |
| Sierra Processing - MRF | Yard Waste Composting | 865 S Pearl St | Albany | Albany | NY |
| Bonded Concrete Company | Recyclables Handling & Recovery | Route 155 and Grenada Terrace | Watervliet | Albany | NY |
| King Road Materials | C&D Processing | 145 Cordell Rd | Colonie | Albany | NY |
| Callanan Watervliet Asphalt | C&D Processing | 100 Crabapple Lane | Watervliet | Albany | NY |
| WM Biers, Inc./BBC Aggregate Recycling | C&D Processing | 100 Port Road | Port of Albany | Albany | NY |
| Copake Valley farms | C&D Processing | 13 Lackawana Road | Copake | Columbia | NY |
| Seward Valley Farms | C&D Processing | 502 Union Street | Hudson | Columbia | NY |
| Resource Recovery Systems - MRF | C&D Processing | 37 Salerno Drive | Ghent | Columbia | NY |
| County Waste Transfer Corp | Recyclables Handling & Recovery | 799 Burden Ave | Troy | Rensselaer | NY |
| County Waste & Recycling Service | Recyclables Handling & Recovery | 1927 Route 9 | Halfmoon | Saratoga | NY |
| Hiram Hollow Transfer Station | Recyclables Handling & Recovery | 100 Washburn Road | Gansevoort | Saratoga | NY |
| Magnum Environmental | C&D Processing | 74 Hudson River Road | Waterford | Saratoga | NY |
| Salvage and Demolition | C&D Processing | 69 Button Road | Halfmoon | Saratoga | NY |
| Mead Enterprises | C&D Processing | 603 Main Street | Corinth | Saratoga | NY |
| Petruzzo Wood Processing Facility | C&D Processing | 24 Hetcheltown Road | Clifton Park | Saratoga | NY |
| Clifton Park Compost | Yard Waste Composting | 300 Anthony St | Saratoga Springs | Saratoga | NY |
| Saratoga Springs Compost | Yard Waste Composting | Vinewood Ave | Schenectady | Schenectady | NY |
| Schenectady County Composting | Food and Yard Waste Composting | 2754 Aqueduct Road | Schenectady | Schenectady | NY |
| Schenectady WWTP | Biosolids Digestion | 544 Burdeck St. | Rotterdam | Schenectady | NY |
| Rotterdam Compost facility | Yard Waste Composting | 34 Padanarum Road | Schenectady | Schenectady | NY |
| Jackson Demolition Service | C&D Processing | 5983 Route 9 | Rotterdam | Schenectady | NY |
| W.M. Larned and Sons | C&D Processing | 1342 Bay Road | Bolton Landing | Warren | NY |
| Aqua Terra Systems | C&D Processing | Route 22 | Chestertown | Warren | NY |
| Peckham Materials Corp | C&D Processing | 212 Miller Road | Lake George | Warren | NY |
| French Mt | C&D Processing | 12 Wing Street | Hebron | Washington | NY |
| Byrd Construction Corp. | C&D Processing | 17 Cortland Street | Argyle | Washington | NY |
| Central Timber | C&D Processing | 517 Route 49 | Fort Edward | Washington | NY |



Table 9.2 Recycling and Composting Facilities in the Capital Region (continued from previous page)

| Facility Name | Facility Type | Location | City | County | State |
|---|---------------------------------|--------------------|--------------|------------|-------|
| Fort Edward Materials Recycling Facility (Waste Mgmt) | Recyclables Handling & Recovery | 12 Wing Street | Fort Edward | Washington | NY |
| Washington County WWTP | Biosolids Composting | 17 Cortland Street | Fort Edward | Washington | NY |
| CTI Agricycle | Food and Yard Waste Composting | | Cambridge | Washington | NY |
| Jameson Demo & Salvage | C&D Processing | 517 Route 49 | Greenwich | Washington | NY |
| Pallets Inc | C&D Processing | 99 1/2 East Street | Fort Edward | Washington | NY |
| Peckham Materials Corp | C&D Processing | 438 Vaughn Road | Hudson Falls | Washington | NY |

into usable components or products (NYSDEC, 2012). Eighteen scrap metal recycling facilities were also identified in the Capital Region, most of which are not regulated by NYSDEC. While these facilities do not provide data to NYSDEC on the quantities of material they recover, they represent an important part of the material management infrastructure that exists in the Capital Region. For example, it was recently mentioned at a CDTC (Capital District Transportation Committee) Policy Board meeting that the largest export from the Port of Albany this year was scrap metal.

There are nine composting facilities operating in the Capital Region that have solid waste facility permits from NYSDEC. These include two biosolids (sewage sludge) composting operations, however compost operations at the Schenectady Waste Water Treatment Plant (WWTP) have recently been replaced by anaerobic digestion. There are also five yard

waste composting facilities, and two facilities (CTI Agricycle in Washington County and the Schenectady County Composting Facility) which are permitted to accept both food and yard waste. Certain very small composting facilities are exempt from NYSDEC permitting requirements if they accept less than 3,000 cubic yards per year of animal manure/bedding or yard waste, alone or in combination. Other small composting facilities do not need permits, but must register with NYSDEC, if they accept more than 3,000, but less than 10,000 cubic yards of yard waste, or more than 1,000 cubic yards of source separated organic waste.

Major recycling and composting facilities in the Capital Region are summarized in Table 9.2, and are shown in Figure 9.1.

While biosolids from the City of Schenectady and Washington County WWTPs are composted or anaerobically digested, most of the remaining biosolids generated by the WWTPs in the Capital Region are managed by incineration or are disposed at a landfill. The Albany County Sewer District operates two large wastewater treatment plants. The North Plant is located in Menands and is designed to treat an average flow of 35 million gallons a day (MGD). The South Plant is located in the Port of Albany, and is permitted for 29 MGD. Biosolids from each of these facilities are managed by sludge thickening, followed by dewatering with a filter press and combustion in a multiple hearth incinerator.

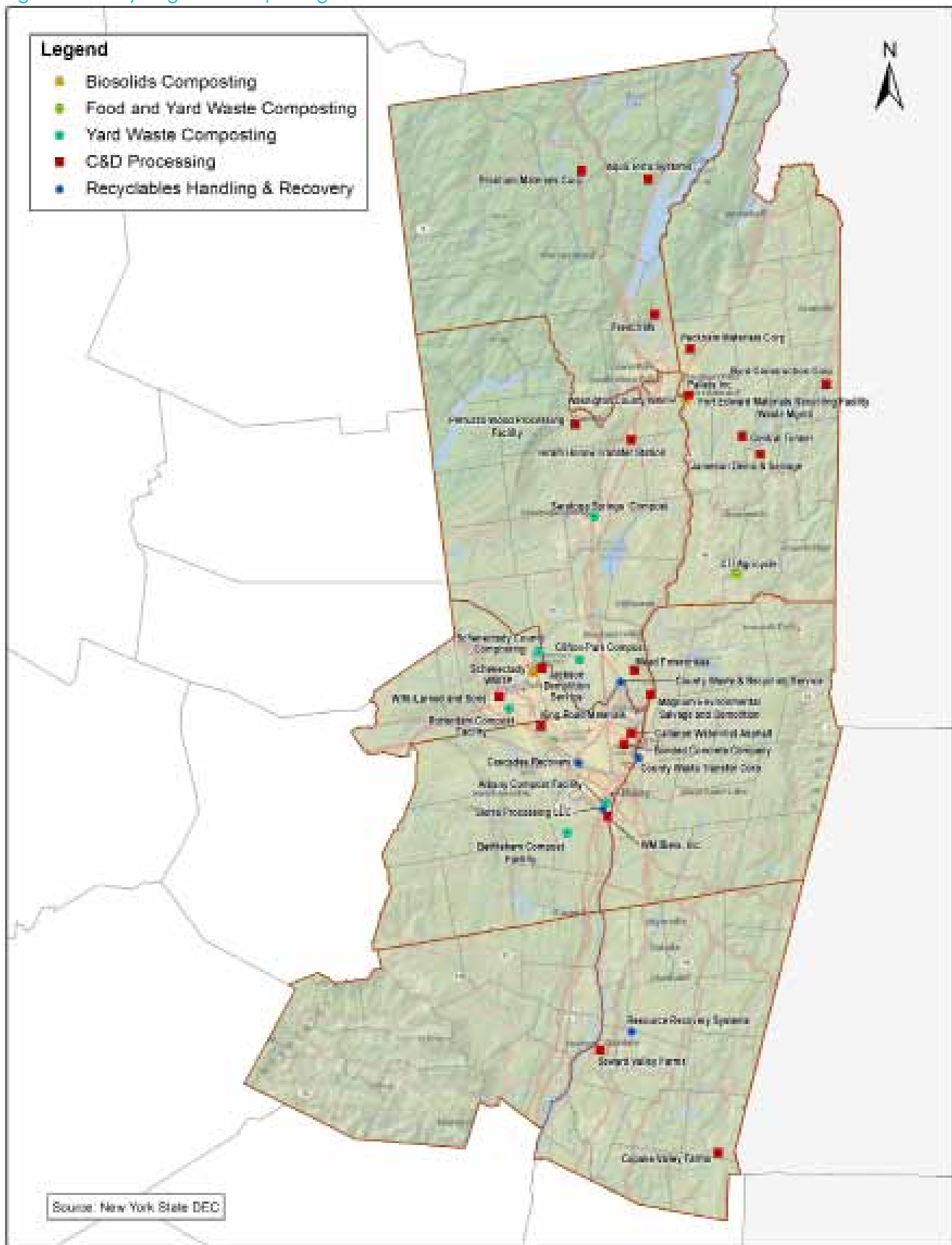
Best Practices

Resource Recovery Park - The City of Lee, MO has developed a Resource Recovery Park which provides for the co-location of reuse, recycling, compost processing, manufacturing, and retail businesses in a central facility. The facility allows waste haulers, businesses and residents to bring all their wastes and recoverable materials to a single place.





Figure 9.1 Recycling and Composting Facilities





**Compost Truck
Resource Center, Chicago**

The incinerator at the North Plant is being upgraded to recover waste heat for electricity generation and is being funded with \$7.9 million in grants from the state and federal governments. It was expected to be completed in 2012. The project will have a long term environmental benefit by reducing GHG emissions and will provide significant economic benefit to the member communities through millions of dollars of energy cost savings (Albany County Sewer District, 2011).

Much of the solid waste collected in the Capital Region is delivered to transfer stations, with most of the larger transfer stations operated by private companies. At these transfer stations, waste is unloaded from collection vehicles and then reloaded into larger vehicles for shipment to a landfill or waste-to-energy (WTE) facility. There are many smaller transfer stations located throughout the Capital Region. These are often owned by

The Radix Ecological Sustainability Center in Albany has established a Community Compost Initiative. A weekly compost pick-up service brings City food scraps to the Sustainability Center, places them in wire bins, and layers them with wood chips and leaves. After several months, a nutrient dense soil is created which is used for the Center's food growing demonstrations.

The City of Schenectady's Water Pollution Control Plant has developed a \$7 million project that includes a combined heat and power (CHP) system producing biogas and an internal combustion engine to create electricity. The plant will generate an estimated 1,800 megawatt-hours of electricity per year from biogas—enough to power more than 275 private homes for a year. This will offset the energy costs of the plant and, combined with other improvements, save an estimated \$300,000 in energy costs each year. The system uses anaerobic digestion to produce the biogas methane. The methane is purified and combusted to generate electricity. NYSERDA provided a \$1 million award to the project. The finished product can be used for compost (NYSERDA, 2012).

municipalities or counties, and many accept both solid waste and recyclable materials from residents as well as waste haulers.

There is one WTE facility in the Capital Region located in Hudson Falls. This facility is privately owned and operated, and was originally developed under a long-term service agreement with Warren and Washington Counties. Some solid waste from the Capital Region is also delivered to other WTE facilities located outside of the Capital Region.

Disposal capacity for MSW and other non-hazardous solid wastes are provided at regional landfills owned by the City of Albany and the Town of Colonie, as well as at several privately-operated landfills located outside of the Capital Region. The City of Albany Landfill has capacity only through approximately 2020. While the Colonie Landfill, which is now privately-operated, has capacity to operate at least until 2025, and may have options for expansion which will provide additional future capacity. Saratoga County developed a landfill site in the Town of Northumberland, but that landfill has never operated. In October 2012,





The Albany County Sewer District (ACSD) and the City of Watervliet partnered with Spectrum Bioenergy on a materials recovery program, which included sludge cake and food waste. The NYSERDA funded pilot project involves the anaerobic digestion of ½ tons per day (TPD) of various mixes of organic materials including sludge cake, food waste provided. Materials were supplied by the ACSD, Price Chopper, Bimbo Bakeries, Baker Commodities, and the City’s Residential Organic Waste collection program. Spectrum is conducting a follow-up financial feasibility study. This economic feasibility study will assume a 75 TPD anaerobic digestion facility, with feedstock consisting of 40 TPD of sludge cake from ACSD and 35 TPD of organic waste from other commercial sources in the Capital Region and is expected to be completed in 2013.

Table 9.3 Major Transfer Stations and Disposal Facilities in the Capital Region

| Facility Name | Location | City | State | County |
|--|------------------------------|--------------|-------|-------------|
| Albany Rapp Road Landfill | 525 Rapp Road | Albany | NY | Albany |
| Colonie Landfill | 1319 New Loudon Road | Cohoes | NY | Albany |
| Bethlehem Transfer Station | 136 Rupert Road | Selkirk | NY | Albany |
| BFI Runway Avenue Waste Transfer Station | Runway Ave. | Latham | NY | Albany |
| Waste Management New York Transfer Station | 21 Gansevoort Street | Albany | NY | Albany |
| Murphy Rubbish Transfer Station | 119 Wade Road | Latham | NY | Albany |
| Waste Management POA Transfer Station | 100 Boat Street | Albany | NY | Albany |
| Carmen Barbato, Inc. Transfer Station | 2778 State Route 23 | Hillsdale | NY | Columbia |
| Covanta B-3 / EcoWaste Transfer Station | 25 Flints Crossing Road | Canaan | NY | Columbia |
| Greenport Transfer Station | 51 Newman Road | Hudson | NY | Columbia |
| Coxsackie Transfer Station | Plank Rd. | Coxsackie | NY | Greene |
| Windham Transfer Station | Mitchell Hollow Rd. (Rte 21) | Windham | NY | Greene |
| Hunter Transfer Station | Hylan Rd. | Hunter | NY | Greene |
| Catskill Transfer Station | State Route 385 | Catskill | NY | Greene |
| Poestenkill Transfer Station | Route 66 and 351 | Averill Park | NY | Rensselaer |
| County Waste - Troy Transfer Station | 799 Burden Avenue | Troy | NY | Rensselaer |
| Hiram Hollow Transfer Station | 100 Washburn Rd. | Gansevoort | NY | Saratoga |
| County Waste and Recycling Service, Inc. | 1927 Route 9 | Clifton Park | NY | Saratoga |
| Schenectady Transfer Station | Weaver Street | Schenectady | NY | Schenectady |
| Fort Ann Transfer Station | Route 149 | Fort Ann | NY | Washington |
| Wheelabrator Hudson Falls Res. Rec. Facility WTE | 61 River Street | Hudson Falls | NY | Washington |





the County received proposals to consider the opening of that site under private operations, and a decision on that matter is pending.

There are also six non-hazardous industrial waste landfills in the Capital Region designed and operated to accept the specific waste streams generated by their respective facilities. Several small C&D Landfills and Land Clearing Debris Landfills are active in the region. Major transfer stations and disposal facilities in the Capital Region are summarized in Table 9.3 and their locations are shown in Figure 9.2.

Greenhouse Gas Emissions

Greenhouse gas emissions from the waste sector in the Capital Region included emissions from landfills as well as from MSW incineration. The Regional Greenhouse Gas Inventory, found in Appendix 8 also included wastewater process emissions in this sector. However, those are reported in

the Water chapter. GHG emissions from the waste sector totaled 228,849 metric tons CO₂e in 2010, as indicated in Table 9.4. Greenhouse gas emissions from solid waste disposal represent only 1.6 percent of total GHG emission in the Capital Region. This is slightly less than the 1.8 percent of total statewide emissions of GHG that NYSERDA attributed to landfills in its November 2010 “Climate Action Plan Interim Report”. While this may seem like a small fraction of GHG, these numbers do not include emissions that are embedded in the products that are discarded into the waste stream and that can be reduced if these discarded materials are recycled.

Goals

In an effort to move the Capital Region toward more sustainable systems, the Solid Waste Technical Committee identified three primary goals (Table 9.5).

Table 9.4 GHG Emissions from Waste, Capital Region, 2010 (Metric Tons CO₂e)

| | Regional Total | Albany | Columbia | Greene | Rensselaer | Saratoga | Schenectady | Warren | Washington |
|------------------------|----------------|--------|----------|--------|------------|----------|-------------|--------|------------|
| Solid Waste Management | 228,849 | 65,900 | 13,224 | 10,316 | 33,494 | 55,761 | 32,428 | 11,306 | 6,421 |
| Landfill Gas | 183,703 | 60,836 | 13,224 | 10,316 | 33,303 | 32,778 | 32,428 | 426 | 392 |
| MSW incineration | 45,146 | 5,064 | - | - | 190 | 22,983 | - | 10,880 | 6,029 |

Table 9.5 Solid Waste Goals

Goals

Develop new systems to recycle and/or recover energy from food waste and other organic materials in the existing solid waste stream.

Improve existing reduction and recycling programs by more effectively diverting designated recyclables, by increasing the number of materials that are currently designated for recycling, and by increasing public awareness of the value of waste reduction and recycling.

Develop material management strategies, on both the regional and local level, that encourage local manufacturing that utilizes regionally recycled materials and that encourages and incentivizes municipalities, businesses, institutions and local non-profits to buy local products, including recycled products.

While parts of the Capital Region are among the leaders in statewide recycling achievement, significant quantities of organic materials, including food waste, continue to be disposed of as part of the MSW stream. Diversion of these organic materials represents one of the best opportunities to increase the amount of material recovered for recycling through composting, or the amount of energy recovered, through anaerobic digestion. Existing capacity is lacking and new systems, both large and small, are needed to take advantage of this opportunity.



Best Practices

Volume Based User Fees – The Oneida Herkimer Solid Waste Management Authority has an established Variable fee (Volume based) residential waste collection programs, also referred to as Pay as You Throw (PAYT). The program results in business and residents reducing their waste and increase recycling in an effort to save money.

Waste reduction and recycling programs in the Capital Region are well developed, but they could be more successful if more residents, businesses and institutions fully participated. Better public outreach, with more effective enforcement when necessary, will maximize participation and recovery. Designation of additional materials for mandatory recycling will also result in reductions in the amount of waste destined for disposal facilities.

Moving from waste management to materials management will result in a more sustainable region, as our formerly discarded waste becomes the raw materials for local manufacturing and agriculture operations. For example, the product of organic waste composting can be an asset to both agriculture and community gardens and the old growth lumber removed from deconstructed buildings can be a feedstock for a local furniture maker. To do this successfully, we need to better incentivize participants on both ends of these transactions.

Regional Initiatives

The Solid Waste Technical Committee identified a number of initiatives that could help the Capital Region achieve the goals outlined in Table 9.4. The details of the initiatives were discussed by the Technical Committee and were evaluated for their overall benefit to the Capital Region, their

cost and feasibility. The initiatives were ranked by the public and the Technical Committee, followed by a final review and ranking by the Executive Committee.

The top three initiatives are discussed below. The first initiative, to improve and increase composting options, is focused on providing additional regional capacity to reduce the amount of organic waste that is destined for disposal. The second initiative focuses on creating incentives for increased reduction and recycling of C&D debris by leveraging policy initiatives to promote the development of new facilities. The third initiative will also result in the reduction of organic waste materials destined for disposal, but will also recover energy for beneficial use. A strategy for implementation of these initiatives is included in Table 9.6.

The three solid waste initiatives are described below in the order in which they were ranked by the Solid Waste Technical Committee.

Improve and increase composting options.

This initiative envisions a variety of measures including promotion of backyard composting; developing community scale composting facilities; expanding existing leaf and yard waste compost sites to accept additional organic materials, like food waste, and; implementing programs for curbside collection of food waste from residential and commercial sources for composting and anaerobic digestion. Development of new capacity to compost source separated organic waste has been constrained by economic barriers, such as the availability of inexpensive landfill disposal options. While state agency policies prefer composting to landfill disposal, these policies alone may not provide adequate incentive to develop the new capacity.

This initiative could be led by municipalities or local solid waste planning units with institutions, non-profits, and private companies as potential partners. Facility





Compost Bins - New York Botanical Gardens



development may be eligible for funding through Municipal Waste Reduction and Recycling Grants (MWRR) from NYSDEC. Revenue to cover operating expenses can be derived from public works or solid waste program budgets, supplemented revenue from user fees and material sales revenue.

Adopt C&D waste reduction and recycling policies. Under this initiative, municipalities would enact and implement local laws requiring that applications for building construction, demolition and renovation submit plans for the reduction and recycling of C&D debris. There are no major barriers to the implementation of this regional initiative, and some communities in the Capital Region (like the City of Albany) have already enacted such local laws and policies. More widespread adoption of this policy initiative will then spur the creation of additional C&D recycling capacity by private developers. Private facility development may be eligible for funding from Empire State Development's Environmental Investment Program.

Enforcement of local laws and ordinances will incur expenses that will need to be funded at the local level, and may be eligible for partial reimbursement through MWRR Grants.

Site and develop anaerobic digestion facilities in the Capital Region.

This initiative will support the development of anaerobic digestion (AD) facilities that can accept food waste and other biosolids to generate energy. This can include AD facilities at WWTP for biosolids, Co-digestion of WWTP biosolid with other organics, or AD facilities for other mixed organic waste streams. The development of AD facilities has been constrained by economic barriers, such as the availability of inexpensive landfill disposal options. This initiative could be led by municipalities or local government entities with private facility developers and operators as potential partners. Facility development may be eligible for funding from NYSERDA and U.S. Department of Energy. Revenue to cover operating expenses is typically derived from user fees and



revenue derived from the sale of energy. However, developing a revenue stream from the sale of energy will be difficult. Potential options for using the biogas from the AD facilities to generate electricity include producing electricity and heat via a Combined-Heat Power (CHP) cogeneration facility, selling the biogas through a dedicated private fuel pipeline to a nearby user, or cleaning-up the biogas to utility-grade quality and selling it into the utility natural gas pipeline. All of these approaches have complex legal, design and construction issues that will need to be overcome to develop the biogas into a source of revenue.

Implementation

Identifying these priority initiatives in many ways is the easiest part of the planning process. Implementation of the priority initiatives identified in the plan can be far more difficult. The barriers to implementing these initiatives either in the past or moving forward are many.

Lack of funding and resources, conflicting priorities at the municipal level, absence of a strong proponent or implementer, market challenges and competition, and legal and regulatory issues have and will continue to be a barrier to implementation if not addressed.

To that end, an implementation strategy which outlines the resources, costs and timeline associated with achieving the priority initiatives and overcoming these barriers is provided in Table 10.5.

Table 9.6, presents implementation strategies for the three prioritized solid waste regional strategies. The strategy includes an outline of the resources, costs and timeline associated with achieving these initiatives.

Sustainability Indicators

Sustainability indicators and targets have been established to allow the Capital Region to track its progress with each Focus Area. For Solid Waste, one indicator has been established:

- Annual Waste Disposal Per Capita Annual

Refer to Section 13 for specific information about the sustainability indicators and targets.





Table 9.6 Solid Waste Implementation Strategy

| Initiative | Regional Priority | Implementer | Partners | Preliminary Cost | Greenhouse Gas Reduction Potential** | Potential Funding Sources | Timeline |
|---|-------------------|---|---|------------------|--------------------------------------|--|-------------------------|
| Improve and increase composting options through a combination of backyard composting, community scale composting, and the expansion of leaf and yard waste composting facilities. | 1 | Municipalities or Local Solid Waste Planning Units. | Institutions, Non-profits, and Private companies. | \$\$ | High | - Municipal Waste Reduction & Recycling Grants from the NYSDEC - User fees | Mid-Term (1 to 5 years) |
| Adopt C&D waste reduction and recycling policies at the local level. | 2 | Municipalities | Private developers and facility operators to develop additional C&D recycling facilities as needed. | \$ | Medium | - Empire State Development's Environmental Investment Program - MWRR Grants from the NYSDEC | Mid-Term (1 to 5 years) |
| Site and develop anaerobic digestion facilities that can accept food waste and other biosolids to generate energy. | 3 | Municipalities or other Local Government Entities. | Private facility owners or operators. | \$\$\$ | High | - NYSERDA grant - USDOE - User fees - Energy revenue | Mid-Term (1 to 5 years) |

*Overall Cost: <\$100,000, \$\$-\$100,000 to \$500,000, \$\$\$->\$500,000.

**Greenhouse Gas Reduction Potential: High – Strategy will result in a direct, quantifiable reduction in GHG emissions; Medium – Some GHG emissions reduction may occur but it cannot be quantified; Low – GHG reduction is very indirect, unlikely to occur, or unknown

In addition to the implementation strategy listed above, it is recognized that these initiatives will require action by local government. The governance overview in Table 9.7 provides guidance to jurisdictions on specific actions they can take to implement the Sustainability Plan's various initiatives. It also evaluates each initiative against all others in the plan to identify where there are alignments or hindrances to implementation.



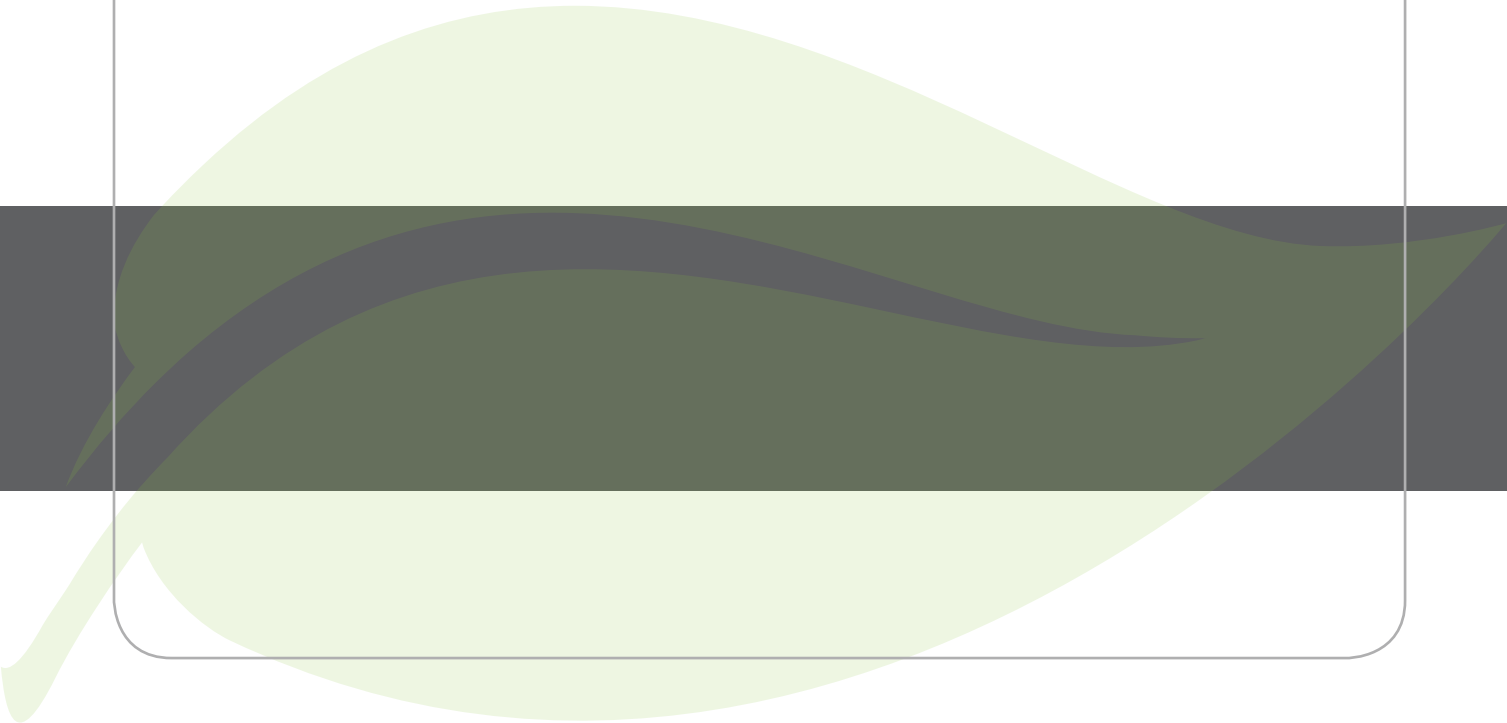
Table 9.7 Solid Waste Governance Recommendations

| Initiative | Process to Implement (update zoning ordinance, adopt a policy or plan, resolution to approve funding, etc.) | Related Policies – positive linkages and alignments | Related Policies – barriers and cross-purposes | Local Government Level of Implementation |
|--|--|---|--|---|
| <p>Improve and increase composting options through a combination of backyard composting, community scale composting, and the expansion of leaf and yard waste composting facilities.</p> | <ul style="list-style-type: none"> - Expand Program and Collection. - Develop Complementary Education program. - Site Facilities. - Promote small scale and backyard composting, where feasible. | <ul style="list-style-type: none"> - This initiative complements Waste Site and Develop Anaerobic Digestion Facilities. It may also be possible to support Food Systems and the Regional agriculture sector with a potential use for agricultural waste. - It may also be possible to leverage Implementation. - Create Green Alliance Between Government and Business and Food Systems. - Create a Regional Food Hub to link to potential compost processors or end users. | <p>Lack of available funding has limited the development of composting options.</p> | <p>Local jurisdictions in partnership with private facility owners and operators.</p> |
| <p>Adopt C&D waste reduction and recycling policies at the local level.</p> | <ul style="list-style-type: none"> - Adopt Policies. | <ul style="list-style-type: none"> - Efforts could be linked with the updates of building and zoning codes identified in: <ul style="list-style-type: none"> - Energy <ul style="list-style-type: none"> - Adopt a Local Energy Efficient Building Code. - Land Use and Livable Communities <ul style="list-style-type: none"> - Modify Local Codes and Land Use Regulations. | <p>Increased construction costs as a result of C&D recycling has limited wide spread adoption of these ordinances.</p> | <p>Implementation by all jurisdictions at the local level.</p> |
| <p>Site and develop anaerobic digestion facilities that can accept food waste and other biosolids to generate energy.</p> | <ul style="list-style-type: none"> - Establish Siting Criteria. - Adopt Supportive Zoning. - Market and Attract Third-Party Developers. | <ul style="list-style-type: none"> - Development of anaerobic digestion facilities could be linked with: <ul style="list-style-type: none"> - Energy <ul style="list-style-type: none"> - Establish energy efficiency and renewable energy districts. | <ul style="list-style-type: none"> - Zoning code-related initiatives such as: <ul style="list-style-type: none"> - Land Use <ul style="list-style-type: none"> - Modify Local Codes and Land Use and Livable Communities Regulations should allow for the siting of such facilities. - Potential perceived land use conflicts. - Lack of available funding has limited the development of these facilities to date. | <p>Local jurisdictions in partnership with private facility owners and operators.</p> |



Section 10.0

Transportation





Coxsackie, NY



SECTION 10.0: **Transportation**

The ability to get from one place to the next is an essential component of sustainability, but the degree to which we achieve sustainability is directly impacted by the transportation choices we make on a daily basis.

Modes of transportation heavily influence GHG emission rates, making sustainable transportation a crucial element of any sustainable system. The vehicle miles traveled (VMT) by cars and other motor vehicles generate significant GHGs and must be offset by the provision of sustainable transportation choices for individuals' daily needs. Those choices must include the opportunity to choose walking, bicycling, transit, and fuel efficient vehicles. A multi-modal transportation system results in fewer auto trips, less demand for sprawling land development, and thus lower VMT, leading to a healthier and more sustainable community environment.

Within the Capital Region, there are many active trails, bicycle plans, and transit operators. The City of Albany has produced its own sustainability plan, and other communities are planning bikeways, trails, and considering transit needs. Regional planning and transportation agencies such as CDTC, A/GFTC (Adirondack/Glens Falls Transportation Council), and CDRPC are focused on sustainable transportation investments and planning for future development by linking transportation and land use.

This chapter provides an overview of the transportation network and ongoing projects within the Capital Region. Transportation sustainability goals, developed through a public process, are presented along with associated strategies and initiatives to implement those

Best Practices

Alternative Fuels - Several cities including Boulder, CO, Keene, NH, and Medford, MA have upgraded city fleets to B20 biodiesel fuel. B20 produces 20 percent fewer GHG than regular diesel, and can generally be used in unmodified engines



goals. These strategies, were evaluated based on criteria discussed below, and will create a more sustainable transportation system in the Capital Region, where walking, biking, transit and fuel efficiencies are promoted.

Regional Baseline

Extensive planning for all modes of transportation (walking, biking, riding transit, driving, and freight and goods movement) currently exists within the Capital Region. This planning (as well as operation and implementation) is completed by many municipal, county, regional, and state agencies and organizations. In line with the federal government requirement that every metropolitan area with a population of over 50,000 have a designated Metropolitan Planning Organization (MPO) to qualify for any federal transportation funding, the two Capital Region MPOs, CDTC and A/GFTC (which cover 6 of the 8 counties in this region) have assembled multi-modal regional short and long range plans.

The goals and initiatives of these plans, as well as those from regional transit agencies, New York State Department of Transportation (NYSDOT), and others, provide the baseline from which this sustainability plan is developed. This baseline assessment provides a

brief overview of the extensive programs, plans, and existing transportation facilities within the Capital Region. The other two counties in the Capital Region, Greene and Columbia, are not part of an MPO. Other reports and projects from these counties were reviewed to ensure their full inclusion in this baseline assessment.

Roadways

According to NYSDOT's 2010 Mileage Report for New York State, there are currently about 12,600 centerline miles of roadways in the Capital Region, which is 11 percent of all centerline miles in New York State. Of this mileage, 8,266 miles are local roads, 2,256 miles are county roads, 1,886 miles are state roads, and 150 miles are other roads (which includes non-DOT parkways, Reservation roads, Federal agency roads, institutional roads and toll roads, such as the NYS Thruway). Figure 10.1 illustrates major roadways of the Capital Region roadway network.

VMT is a key indicator and performance measure of sustainable transportation systems and GHG emissions. VMT for each county is shown in Table 10.1. In total, there are 12.5 million VMT per year, or 11,593 miles per person. This per capita number is nearly double the New York State VMT per capita, and about one-third higher than the U.S. average. It should be noted that the New York State per capita VMT is skewed by the high transit ridership of New York City. Likewise, measuring VMT at the county level alone omits important information about the relationship between development patterns and VMT. Congestion on Capital Region roadways, however, is not reported to be a key transportation problem.

The Capital District Regional Bike-Hike Map (CDTC 2006) provides perhaps the most comprehensive look at the non-motorized network, however only a portion of the Capital Region is covered in this plan.



Coxsackie, NY



Table 10.1 VMT for the Capital Region

| Counties | Annual VMT | 2010 Population | VMT per Capita |
|----------------------|-----------------------|-----------------|----------------|
| Albany | 3,823,439,548 | 3304,204 | 12,569 |
| Rensselaer | 1,573,280,999 | 159,429 | 9,868 |
| Saratoga | 2,968,604,573 | 219,607 | 13,518 |
| Schenectady | 1,166,027,160 | 154,727 | 7,536 |
| Columbia | 759,137,123 | 63,096 | 12,031 |
| Greene | 762,114,755 | 49,221 | 15,484 |
| Warren | 886,640,874 | 65,707 | 13,494 |
| Washington | 571,652,844 | 63,216 | 9,043 |
| Capital Region Total | 12,510,897,877 | 1,079,207 | 11,593 |
| New York State | 135,250,000,000 | 19,378,104 | 6,980 |
| United States | 2,966,506,000,000 | 308,745,538 | 9,608 |

Notes:

- VMT estimates for Albany, Rensselaer, Saratoga and Schenectady are for the year 2010 and are based on the CDTC STEP Model.
- VMT estimates for Columbia, Greene, Warren and Washington Counties are for the year 2009 and are based on the Highway Performance Monitoring System.
- New York State 2010 VMT obtained from NYSDOT - https://www.dot.ny.gov/divisions/policy-and-strategy/darb/dai-unit/ttss/repository/vmt_0.pdf
- US 2010 VMT obtained from FHWA - <http://www.fhwa.dot.gov/policyinformation/statistics/2010/vm202.cfm>

New York State Complete Streets Law (S.5411A/A.8366)

Requires State and local transportation projects undertaken by the State or receiving federal or state funding to consider the convenient access and mobility on the road network by all users of all ages. Design features may include sidewalks, bicycle lanes, crosswalks, pedestrian control signalization, bus pull outs, raised crosswalks, and traffic calming measures.

The City of Saratoga Springs adopted a complete streets policy using inter-agency cooperation and with the assistance of a group of advocates and stakeholders (Shared Access Saratoga). The policy designated the appointment of an advisory board and the creation of a project checklist to evaluate the integration of complete streets principles in public and private projects within the City.

Transit

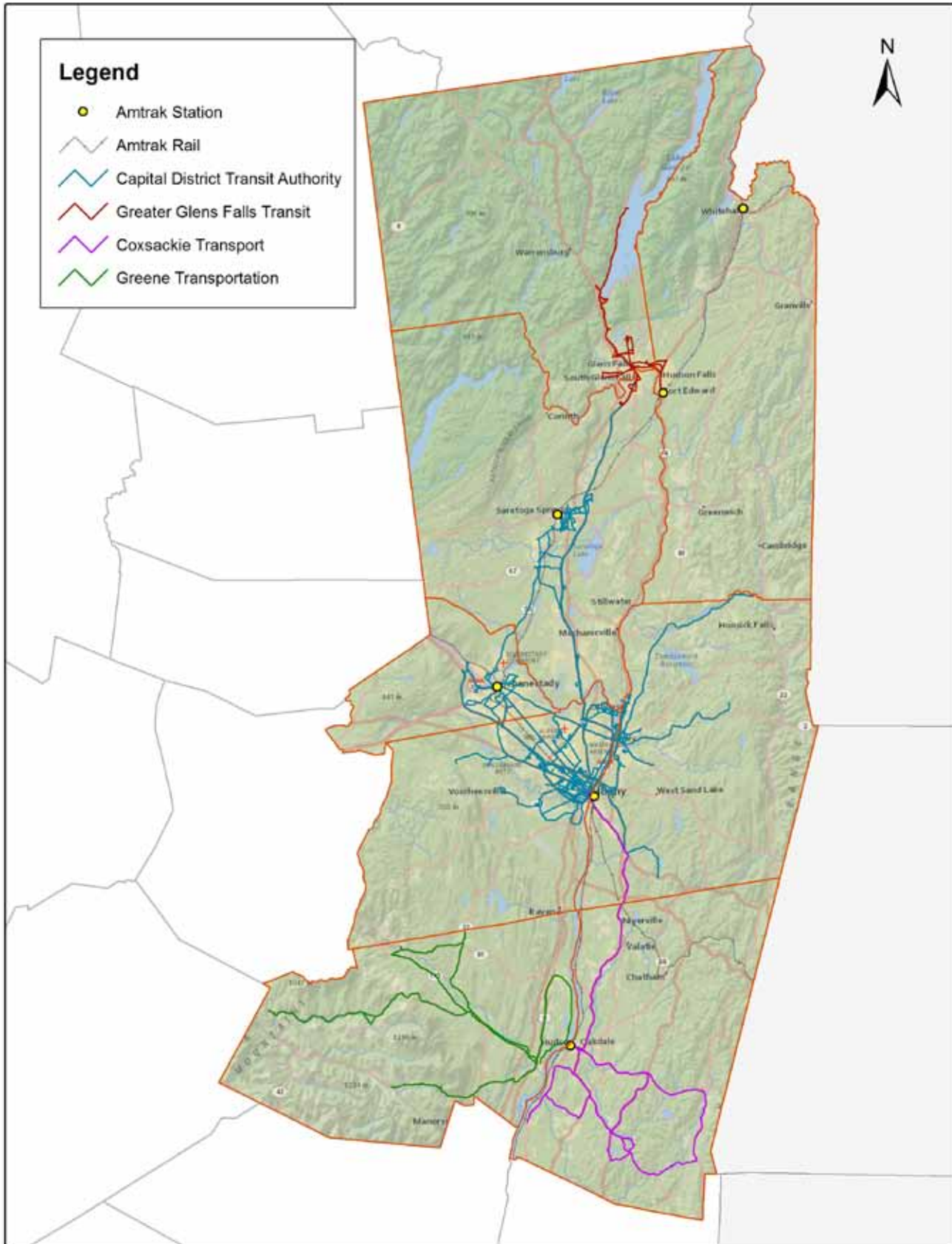
Transit services within the Capital Region are operated by several different transit providers and agencies. Figure 10.2 illustrates the fixed routes of each of these primary transit operators. Capital District Transit Authority (CDTA) is the largest provider, operating surface transit for Albany, Rensselaer, Saratoga, and Schenectady Counties. Service is provided on nearly 60 local and express routes and paratransit shuttles. According to CDTA’s Annual Report 2011-2012, total annual ridership in the fiscal year was 14,910,000 rides with over 62,000 bicycles carried on buses during the year. CDTA has 29 park and ride lots throughout its service area, with 1,655 parking spaces for transit and rideshare use.

Greater Glens Falls Transit (GGFT) provides fixed route bus, paratransit and seasonal trolley





Figure 10.2 Capital Region Transit and Passenger Rail Network



services to Washington and Warren Counties, and extending into northern Saratoga County to the Town of Moreau and Village of South Glens Falls. In 2011, total ridership was about 341,000 riders (Post Star, 15 Feb. 2012) and all GGFT buses include bicycle racks.

Other transit services in the Capital Region include the following:

- ✓ Coxsackie Transport provides bus and shuttle service within Columbia County, and between Hudson and Albany.
- ✓ Greene County provides bus service to and from Catskill, NY and surrounding areas, but is limited to peak commuter directions and periods only.
- ✓ Private coach services are also provided by Adirondack Trailways, Yankee Trails, and Brown Coach.

CDTA's first BusPlus bus rapid transit (BRT) route, along Route 5, has successfully increased ridership and reduced travel time along the system's busiest route. BusPlus BRT's efficiency is largely due to limited-stop service and signal prioritization. As shown in Figure 10.3, BusPlus is operated with new hybrid buses which include bicycle racks. Bicycle parking is also provided at most BRT stations. CDTA is planning additional future BRT routes to serve the Capital District.

Figure 10.3 CDTA's Busplus North Manning Station (photo courtesy of CDTA)



“CDTC Linkage Program is one of the most significant cooperative regional efforts in the nation to reflect, in practice, what representatives of the region’s counties, cities, towns and villages as well as state and local transportation providers have adopted as policy. In recognition of this regional achievement, the Linkage Program received a 2010 National Planning Excellence Award from the Federal Highway Administration, the Federal Transit Administration and the American Planning Association. As of March 2012, CDTC has funded a total of 73 collaborative, jointly-funded studies over the past eleven years. Study sponsors have included 40 separate urban, suburban and rural municipalities and counties as well as not-for-profits and other public entities. Roughly \$4.7 million in federal, state and local funds have been committed to the Linkage Program since its inception in 2000.”

Amtrak also provides rail service in the Capital Region at six stations: Hudson, Albany-Rensselaer, Schenectady, Saratoga Springs, Fort Edward-Glens Falls, and Whitehall. Albany-Rensselaer is the ninth busiest Amtrak Station in the nation (55,000 passengers in 2010). Currently, \$35.4 million is being sought by the Governor for construction of capacity



Clifton Park Bike Path





improvements at Albany-Rensselaer Station, including a new fourth track. The Saratoga Springs station serves over 29,000 passengers per year, primarily traveling to and from New York City. Finally, environmental impact studies are currently underway for the Empire Corridor, a potential high-speed rail service that would travel 463 miles from NYC through Albany/Schenectady to Niagara Falls.

Land Use: Transportation Relationship

National research has shown 4,000 persons per square mile is the minimum density needed for a community or region to support public transportation with adequate ridership (NCHRP, 2011). This relationship between transit service and population centers is important when it comes to developing a sustainable transportation system. Figure 10.4 (see next page) illustrates the existing transit service in relationship to population density. The map shows that most population centers are being served, with a few exceptions. Important to note, however, is that just serving a population center is not the entire story—to increase ridership and capture more potential transit demand, transit

services must connect customers with the destinations to which they want to travel. As illustrated in Figure 10.5, almost 80 percent of Capital Region residents commuted to work by driving alone – with only 2.7 percent of Capital Region residents using public transportation. Comparing those currently using public transportation to the actual number of people living within access of transit, as shown in Table 10.2 indicates that 63 percent, or almost 685,000 of Capital Region residents, live within ½ mile of bus services (not including paratransit or on-demand services). They could potentially use a bus rather than a personal vehicle. Of these 685,000 people, 555,000 are within the CDTA bus service area.

However, although this indicates potential ridership, a key issue is not that there is

According to CDTA's Annual Report 2011-2012, total annual ridership in the fiscal year was 14,910,000 rides with over 62,000 bicycles carried on buses during the year. CDTA has 29 park and ride lots throughout its service area, with 1,655 parking spaces allowing riders to access the bus services.

Figure 10.4 Mode of Commuting to Work

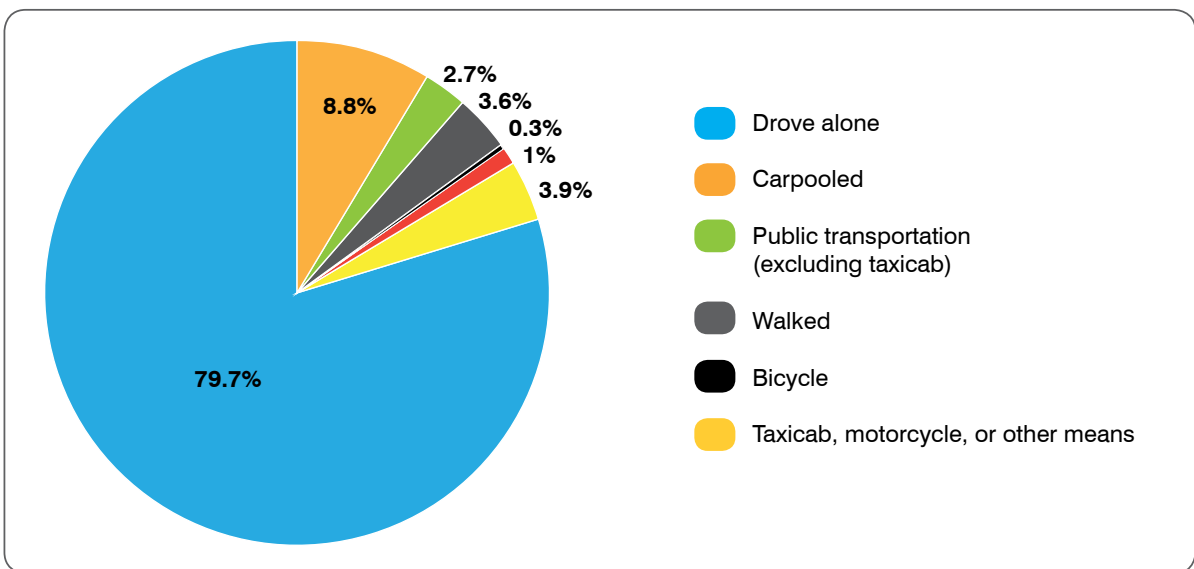
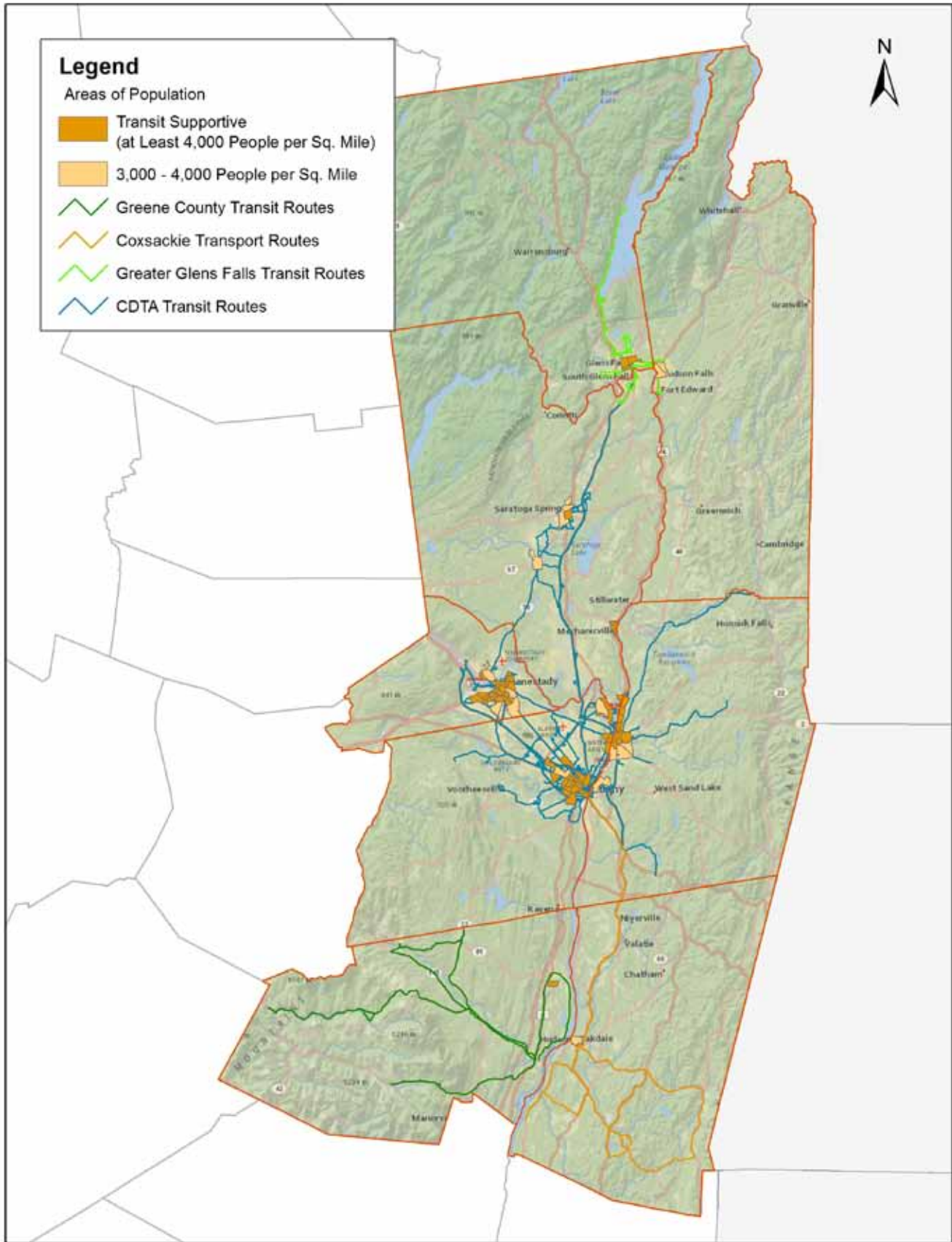


Figure 10.5 Transit and Population Density





no access to transit, but rather the transit service provided does not meet the needs of those living nearby. This may be because of inconvenient schedules or routes or the cost- and time effectiveness of taking transit vs. driving. In addition, the walk or bicycle trip to the transit stop may not be considered safe or comfortable by potential transit riders; improving walk and bike access to transit stops has the potential to increase ridership. Another measure of potential dependency on public transportation is whether or not a household has access to a car. Lack of access is typically understood to be an indicator of the need for public transportation. Figure 10.6 illustrates the percent of households in each county that report having access to a vehicle. Within the Capital Region, Saratoga County has the highest car access rate at about 95 percent. Albany County has the lowest rate, at about 87 percent, and Rensselaer and Schenectady Counties have the next lowest rates. These three counties (plus Saratoga County), make up the CDTA service area which, as shown above, also

Best Practices

Regional Bicycle and Pedestrian Plan— In CA, the Sacramento Area Council of Governments (SACOG) developed a regional bicycle, pedestrian and trails master plan that incorporates all local and county plans to foster inter-jurisdictional bicycle and pedestrian connections, fill gaps in existing and planned interregional bicycle or pedestrian networks, and provide non-motorized access across barriers.

To increase ridership and capture core potential transit demand, transit services must connect customers with the destinations to which they want to travel.

Table 10.2 Population Within ½ Mile of Transit

| Coverage Area | Total Population | Population in walking distance to transit * | Percent of Population in walking distance to transit |
|---|------------------|---|--|
| Warren & Washington Counties | 128,923 | 50,989 | 40% |
| Albany, Rensselaer, Saratoga and Schenectady Counties | 837,967 | 554,712 | 66% |
| Columbia County | 63,096 | 50,615 | 80% ** |
| Greene County | 49,221 | 28,303 | 58% |
| Total | 1,079,207 | 684,619 | 63% |

* Walking distance is defined as ½-mile from a bus stop, however, these numbers are based on census block groups. Even if a block groups is only partially within ½-mile, the population of the entire block group is entirely included. This may overstate population within a ½-mile of transit.

Routes in Greene and Columbia Counties do not have bus stops and buses are flagged down by riders at any point on the route. As a result, all population within ½-mile of the route (not just bus stops) is included.

** Not all Columbia County routes operate every day of the week, so this percent includes all people that are within a ½-mile from any route regardless of when it operates.



has the greatest number of persons living within walking distance of transit service. Combined, these two measures show that transit investment particularly in Albany, Rensselaer and Schenectady counties could serve additional households that have no other means of transportation. Although these figures indicate a broad potential for transit riders, a barrier to encouraging public transportation within the Capital Region is a general lack of roadway congestion. Congestion was rarely raised as a public concern. In addition, free and widely available parking does not discourage driving. To encourage additional transit ridership, system expansions and improvements of the transit experience would likely be required as well as increases in parking pricing.

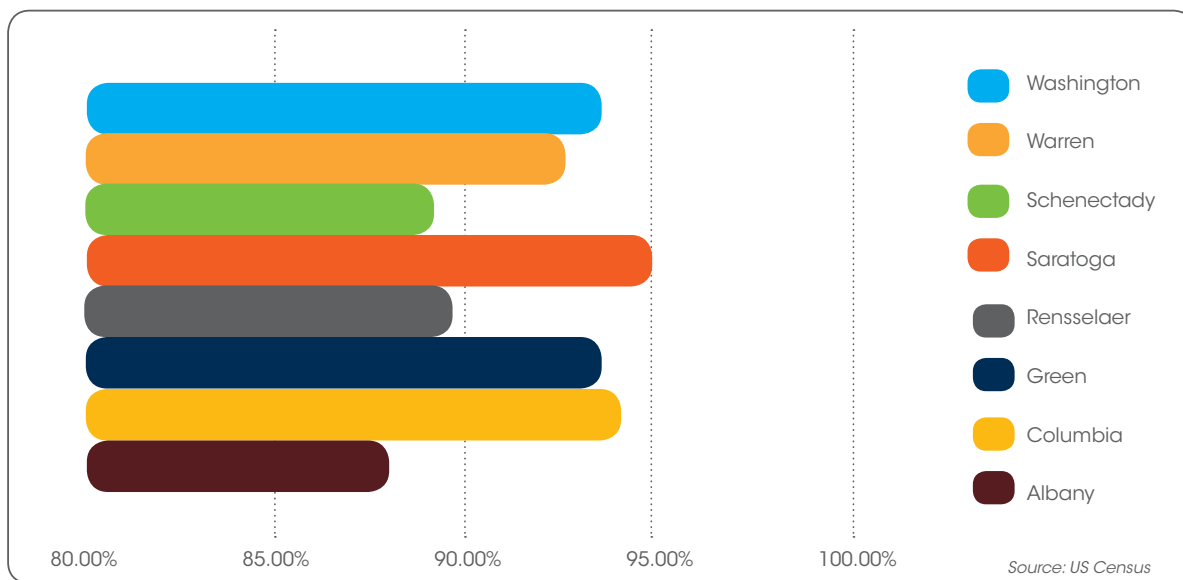
Pedestrians, Bicycles and Trails

Although there is no centralized source of data for bicycle, pedestrian and trail planning, accommodations for non-motorized transportation and recreation is occurring in many jurisdictions and agencies at a robust level throughout the region. The Capital District Regional Bike-Hike Map (CDTC, 2006) provides a comprehensive look at the non-motorized network. However, only a

portion of the Capital Region is covered in this plan. Currently available bicycle, pedestrian and trail maps, programs and plans in the Capital Region include:

- ✓ NYSDOT Designated Bicycle Routes (State Bicycle Routes 5 and 9)
- ✓ Warren County Bicycle Plan
- ✓ Mohawk-Hudson Bike-Hike Trail Map Update
- ✓ City of Albany Bike Master Plan
- ✓ Tech Valley Trails: Greenways Concept Plan for Capital Region
- ✓ Capital District Regional Bike-Hike Map
- ✓ A/GFTC Bicycle & Pedestrian Plan and Regional Bicycle Map
- ✓ Mohawk-Hudson Bike-Hike Trail Economic Study
- ✓ Rensselaer County trail plan
- ✓ City of Schenectady Bicycle Plan
- ✓ NYS OPR has a data set of trails throughout the state
- ✓ NYSDOT database of abandoned rail corridors, and canal corridors
- ✓ CDTA and GGFT have bicycle racks on buses, and bicycle racks are found at many CDTA BusPlus stations.
- ✓ Parks & Trails New York online Trail Finder

Figure 10.6 Households with Vehicle Availability





Coxsackie, NY

- Capital Coexist campaign (launched in 2010) to provide safety and awareness to bicyclists and motorists.

- Safe Routes to School Program (first round awarded funding to six schools in NYSDOT Region 1)

Vehicular Programs

Both CDTC and A/GFTC host a web-based ridematching site, with linked databases of potential riders. A/GFTC's site is called iPoolNorth, and CDTC's is called iPool2.

The City of Albany has undertaken a feasibility study to examine ways it and other cities can support and promote the use of electric vehicles (EV) through their Electric Vehicle Infrastructure Feasibility Study. This study aims to identify what actions must be taken to make a city "EV Ready" as well as including both policy and charging station location recommendations, information on EV use and demand, existing charging infrastructure, best practices on becoming an EV Ready city, and a checklist for EV readiness that can be used by other municipalities in their efforts to support EVs.

Airports

Albany International Airport (ALB) is the primary provider of commercial air transportation to the Albany area. There are 25 non-stop destinations served from ALB with 90 daily departures. ALB recently completed a new 230,000 square foot terminal, garage, air traffic control tower, and cargo facility, and recently embarked on a \$232 million capital plan to improve safety and passenger needs. The airport has surface transit connections including local via CDTA and long distance via Adirondack Trails.

In addition to ALB, there are four general aviation airports in the region: Columbia

at <http://www.ptny.org/trailfinder/>.

It includes information on greenways, rail trails, canal trails, bikeways, and riverwalks state wide.

- ✓ Altamont Pedestrian and Bicycle Master Plan

A significant number of additional activities and studies are ongoing, including, but not limited to:

- ✓ A/GFTC is just finished revising and updating its bicycle & pedestrian map, which is now available to the public.
- ✓ A/GFTC's Make the Connection Program is a regional set-aside of construction funds to be used solely for bicycle and pedestrian improvements. CDTC has a similar program called the Spot Improvement Program. Both programs seek to help plug gaps in the bicycle or pedestrian network.
- ✓ City of Albany is undertaking a study to implement a bikeshare program.
- ✓ CDTC's New Visions 2035 Plan includes several initiatives, including:
 - Bicycle-Pedestrian Priority Map
 - regional network of over 450 miles and 109 route segments to be made bicycle and pedestrian friendly as a regional system of continuous usable facilities.



County, Saratoga County, Schenectady County and Floyd Bennett Memorial Airport (Warren County).

Goods Movement

Goods movement in the Capital Region is provided by roadway, rail, port and air operations, with access to the interstate highway system and the, Class-I freight railroad system, NY State Barge Canal system. The Capital Region is a key link in the larger upstate region, and efforts must be made to support the sustainable aspects of the goods movement, while still respecting and supporting walkable and livable neighborhoods. Important facts about the freight transportation system today include:

- ✓ The Port of Albany is located on CSX's Northeast Corridor, with rail access to Lake Ontario /Erie Canal, New York/New Jersey, and Boston. The rail provides a connection to Montreal via Canadian Pacific Rail.
- ✓ Selkirk Rail Yard, 8 miles south of Albany, is a CSX major classification yard for the Northeast. It provides a gateway to points east of the Hudson River including New York City, and typically handles 8,000 rail cars per day.
- ✓ The Port of Albany is located on the Hudson River, 124 miles north of New York City. In 2008, a record setting year, they imported 227,299 tons and exported 362,050 tons. Recent improvements have allowed the port to increase capacity and become a distribution point for intermodal containers from Pennsylvania, New York and New Jersey.
- ✓ In 2010, Albany International Airport ranked 97th in total cargo based upon statistics compiled by Airports Council International-North America. They have a full-service air cargo terminal serving FedEx, UPS and Mobile Air.

The Town of Bethlehem implemented a bicycle route plan in 10 months for minimal costs. Residents and officials of the Town together developed a list of potential bicycle route projects. As part of the Town's Energy Management and GHG Inventory Development project, qualitative analysis of each potential bicycle project was completed, followed by a quantitative evaluation of implementation costs for each type of improvement. The two scores were added for a final ranking and then a GPS locus map of a proposed "pilot project" for an on-road bike route was created. During a single-day field review the location of signs and sharrows were marked with a GPS coordinate hand held receiver. The Town DPW bought and installed the signs and purchased a sharrow template (\$275) and painted the markings. Total time from beginning to end took just 10 months, including waiting through the winter for installation. The bicycle route opened in May 2012.

Greenhouse Gas Emissions

The transportation sector is responsible for 36 percent of GHG emissions in the Capital Region. That makes it the second largest contributor of emissions (after non-mobile energy consumption and generation), according to the 2010 Regional Greenhouse Gas Inventory, which can be found in Appendix 8. Within this sector, as indicated in Table 10.3, on-road transportation is the largest portion of emissions. Because VMT data is the foundation for calculating on-road transportation emissions, the emissions data follows a similar trend to the VMT data provided in Table 10.1. Other sources of emissions within the region include those associated with fuel used in off-road vehicles and equipment, as well as in the operation of trains and marine vessels.





Table 10.3 GHG Emissions from Transportation, Capital Region, 2010 (Metric Tons CO₂e)

| | Regional Total | Albany | Columbia | Greene | Rensselaer | Saratoga | Schenectady | Warren | Washington |
|-----------------|----------------|-----------|----------|---------|------------|-----------|-------------|---------|------------|
| On-road | 5,526,882 | 1,650,002 | 342,133 | 349,166 | 691,191 | 1,302,373 | 506,514 | 420,380 | 265,123 |
| Rail | 115,385 | 28,430 | 8,310 | 8,197 | 24,952 | 13,339 | 23,088 | 355 | 8,714 |
| Marine | 120,321 | 67,375 | 6,020 | 4,881 | 5,106 | 11,060 | 1,200 | 21,135 | 3,544 |
| Off-road Mobile | 526,180 | 128,445 | 40,054 | 40,682 | 59,439 | 112,834 | 44,451 | 62,901 | 37,373 |

Table 10.4 Transportation Goals and Initiatives

Goals

Provide viable options as alternatives to personal vehicles and single occupancy vehicle commuting.

Create walkable and bikeable communities interconnected by regional transit and trail networks.

Encourage the use of alternative fuels and transportation technologies.

Encourage expanded use of efficient and sustainable freight movement, respecting quality of life of communities.

Goals

The Transportation Technical Committee identified the goals and supporting initiatives shown in Table 10.4. Important in the goal development was to maintain consistency with existing long range plans, including among others, the A/GFTC Long Range Transportation Plan for 2030, CTDC's New Visions 2035 Plan Update, and the City of Albany 2030 Comprehensive Plan. This list is not at all comprehensive, but these plans are specifically mentioned because they articulate similar goals for multi-modal transportation, transit-supportive land use, and the efficient movement and fueling of vehicles and freight.

Regional Initiatives

The Transportation Technical Committee identified a number of initiatives that could

help the Capital Region achieve the goals outlined in Table 10.4. The details of the initiatives were discussed by the Technical Committee and were evaluated for their overall benefit to the Capital Region, their cost and feasibility. The initiatives were ranked by the public and the Technical Committee, followed by a final review and ranking by the Executive Committee. The top three priority initiatives are described below. Preliminary scoring and prioritization process of all the initiatives considered can be found in Appendix 2 and 3, respectively.

Implement a bicycle and pedestrian infrastructure improvement program.

Improve regional non-motorized connectivity by closing the gaps between individual trails, sidewalks or bicycle facilities within the existing network, as well as by creating new facilities. A number of key locations for trails are identified, planned and ready for design approval. This initiative would also provide for expanding bicycle and pedestrian networks both through "spot" improvements and implementing bicycle and pedestrian plans within communities. Such projects should include a focus on improving transit access for pedestrians and bicycles, linking subdivisions to each other and to nearby commercial uses, and/or creating complete streets. Municipalities would partner with non-profits, community organizations and developers to implement this initiative. This initiative is intended for high value, short term implementation projects that can link existing facilities thus encouraging more use of bicycle, pedestrian



and transit facilities. Valuable components can be implemented in the short term.

Improve transit service through technology improvements: This initiative focuses specifically on improvements to transit services throughout the Capital Region, with a focus on bus transit. This initiative looks to implement transit technology improvements such as transit signal priority, signal optimization, off-board fare collection, smartcard fare media, automatic vehicle location (AVL)/“NextBus” tracking systems to improve travel time, reliability, and overall user experience and to increase ridership. Additional bus rapid transit routes in the CDTA network can benefit from this initiative, as well as providing opportunities for other regional transit systems to implement technology improvements. Some routes are ready to be implemented based on funding availability.

Optimize transportation system through alternative street design and advanced signal technology: The focus of this initiative is on the complete transportation system, including walking, biking, driving and transit. The intention is to use this initiative to create a balanced system between all of these modes through a variety of physical and technological improvements that will improve travel flow, reduce travel times and make communities more attractive for walking, biking, and transit. Improvements could include connecting the street grid, roundabouts, signal optimization, signal coordination, complete streets design, access management, and energy efficient technology such as LED lighting. The redesign of infrastructure is emphasized and although some projects would be longer term, such as street reconstructions, there are valuable short term projects, such as street restriping to incorporate all modes, which could be implemented quickly and cost effectively. The remaining initiatives are listed below:

- ✓ Establish car sharing programs throughout the Capital Region.

- ✓ Convert municipal fleets and transit vehicles to electric or other alternative fuels.
- ✓ Create an interconnected regional transit system.
- ✓ Develop and expand electric vehicle and alternative fuel infrastructure.
- ✓ Improve freight facility operations, infrastructure, and highway connections.
- ✓ Incentivize use of clean and fuel-efficient truck and freight technology.

Implementation

Identifying these priority initiatives in many ways is the easiest part of the planning process. Implementation of the priority initiatives identified in the plan can be far more difficult because there are several barriers.

Lack of funding and resources, conflicting priorities at the municipal level, absence of a strong proponent or implementer, poor or non-existent inter-municipal cooperation, lack of overall public and private support and a corresponding lack of local and regional examples have and will continue to be a barrier to implementation if not addressed.

To that end, an implementation strategy which outlines the resources, costs and timeline associated with achieving the priority initiatives and overcoming these barriers is





Glens Falls Feeder Canal Heritage Trail



Schenectady Segment of Mohawk Trail



GHG Reduction Potential from Bicycle and Pedestrian Infrastructure Improvements:

Bicycle and pedestrian infrastructure improvements can reduce VMT by 1-2%. Assuming a 1.5% VMT reduction, the Capital Region could see a reduction of GHG emissions from on-road transportation of 82,743 MTCDE (Metric Tons of Carbon Dioxide Equivalent).

GHG Reduction Potential from Signal Optimization:

According to the Center for Clean Air Policy, as a rule of thumb, GHG emissions are reduced by two percent from improved traffic signalization. A 2% reduction in transportation emissions across the region would result in a reduction of 110,324 MTCDE.

Best Practices

Car sharing/Fleet Management - In their Sustainability Management Plan, the City of Asheville, NC identified ways to reduce the government's fuel consumption by supplementing the municipal vehicle fleet with a city-wide Zipcar membership (or Fastfleet by Zipcar program). Also, a survey of employees determined that most staff could complete their city duties on a Segway. Police responded that they could do their duties on bicycle. The plan recommended that the City establish a formal percent reduction goal to measure implementation success.

Sustainability Indicators

Sustainability indicators and targets have been established to allow the Capital Region to track its progress with each Focus Area. For Transportation, four indicators have been established:

- Housing + Transportation Index
- Percent of Passengers Traveling by Mode
- Annual Vehicle Miles Traveled (VMT) Per Capita
- Greenhouse Gas emissions per capita

Refer to Section 13 for specific information about the sustainability indicators and targets.





Table 10.5 Transportation Implementation Strategy

| Initiative | Regional Priority | Implementer | Partners | Preliminary Costs | Greenhouse Gas Reduction Potential** | Potential Funding Sources | Timeline |
|---|-------------------|--|---|-------------------|--------------------------------------|--|----------------------|
| Implement a bicycle and pedestrian infrastructure improvement program to create new connections and eliminate gaps between existing trails, sidewalks, and bicycle facilities. | 1 | <ul style="list-style-type: none"> - Municipalities (especially across municipal boundaries) - Counties - State agencies, and other agencies such as CDTC, A/GFTC and CDTA. | <ul style="list-style-type: none"> - Community groups - Businesses Developers, etc. | \$\$ | Medium | <p>- There are many programs, however they are very competitive and constrained. Also, successful projects typically use a combination of funding sources and rely heavily on the community for support and work to get projects creatively implemented. Some potential sources may include:</p> <ul style="list-style-type: none"> - Private foundation support and NGO's - CMAQ, if available - Recreation trails programs - Environmental protection fund - MAP21 - Community Development Block Grants - Greenway grants; etc. | Mid-Term (1-5 years) |
| Improve transit service through technology improvements to include items such as signal priority, signal optimization, off board fare collection, vehicle tracking systems, and smart card fare media. | 2 | <ul style="list-style-type: none"> - Transit Agencies throughout the region. | <ul style="list-style-type: none"> - Municipalities - NYSDOT | \$\$\$ | Medium | Traditional federal funding sources are a potential source. These are, however, constrained and have not been available for this type of initiative, to date. | Mid-Term (1-5 years) |
| Optimize transportation system through alternative street design and advanced signal technology to improve travel flow, reduce travel times, and make communities more attractive for walking, biking, and transit. | 3 | <ul style="list-style-type: none"> - Municipalities, DOT, transit agencies, counties. | <ul style="list-style-type: none"> - Development community - Community organizations - Non-profits | \$\$ | High | Municipal budgets, federal and state options (though extremely constrained), developers. | Mid-Term (1-5 years) |

*Overall Cost: \$ - < \$100,000, \$\$ - \$100,000 to \$500,000, \$\$\$ - > \$500,000

**Greenhouse Gas Reduction Potential: High – Strategy will result in a direct, quantifiable reduction in GHG emissions; Medium – Some GHG emissions reduction may occur but it cannot be quantified; Low – GHG reduction is very indirect, unlikely to occur, or unknown



In addition to the implementation strategy listed above, it is recognized that these initiatives will require action by local government. The governance overview in Table 10.6 provides guidance to jurisdictions on specific actions they can take to implement the Sustainability Plan’s various initiatives. It also evaluates each initiative against all others in the plan to identify where there are alignments or hindrances to implementation.

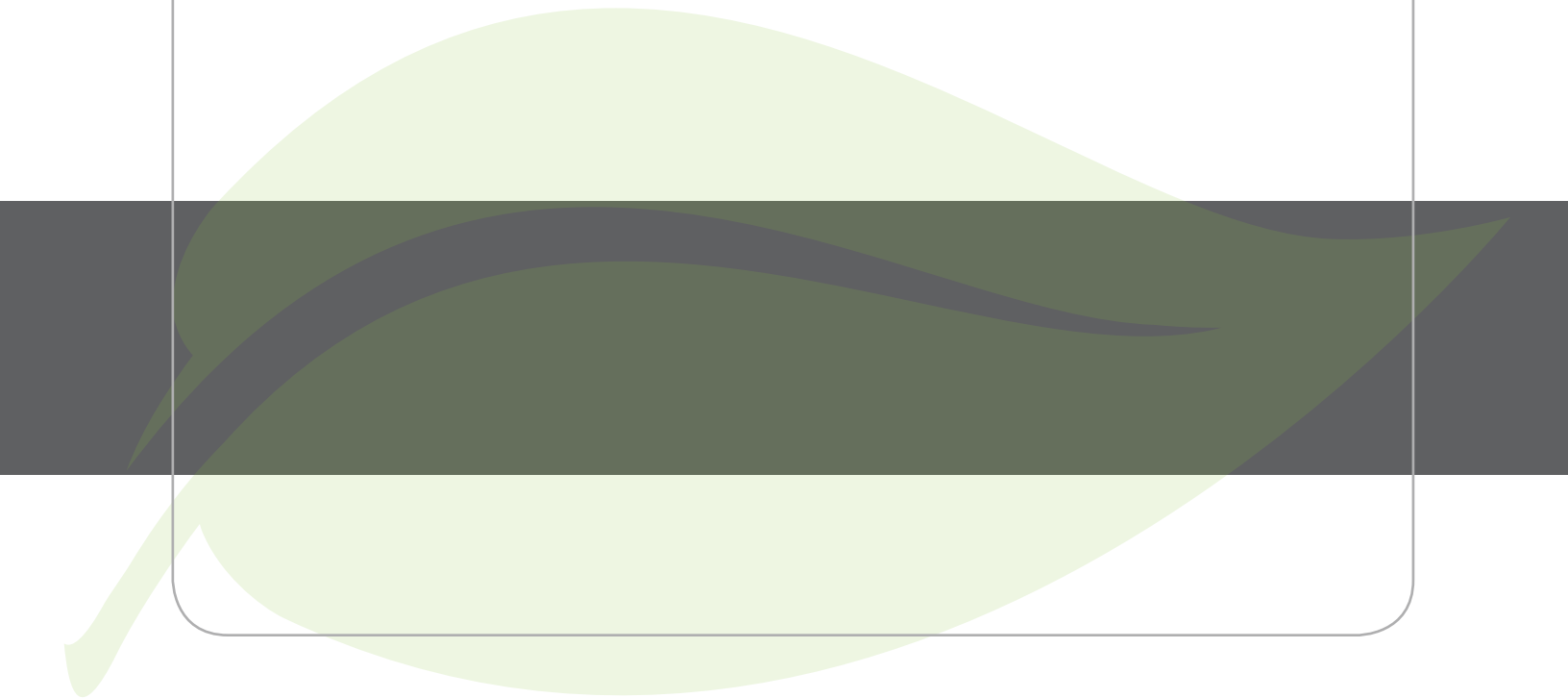
Table 10.6 Transportation Governance Recommendations

| Initiative | Process to Implement (update zoning ordinance, adopt a policy or plan, resolution to approve funding, etc.) | Related Policies – positive linkages and alignments | Related Policies – barriers and cross-purposes | Local Government Level of Implementation |
|---|--|---|--|---|
| Implement a bicycle and pedestrian infrastructure improvement program to create new connections and eliminate gaps between existing trails, sidewalks, and bicycle facilities. | <ul style="list-style-type: none"> - Revise and adopt transportation plans to reflect planned infrastructure improvements. - Revise and adopt supportive zoning. | <p>Possible linkages with:</p> <ul style="list-style-type: none"> - Land Use and Livable Communities - Modify local codes and land use regulations. - Develop a regional greenway connectivity plan. | Lack of funding has prevented the development of the bicycle and pedestrian infrastructure to date. | |
| Improve transit service through technology improvements to include items such as signal priority, signal optimization, off board fare collection, vehicle tracking systems, and smart card fare media. | <ul style="list-style-type: none"> - Revise and Adopt Transportation Plans. | Improved transit service can support economic development efforts and strengthen the Capital Region’s urban centers. | Lack of funding has limited transit system improvements to date. | Incorporate transit goals into local planning efforts. |
| Optimize transportation system through alternative street design and advanced signal technology to improve travel flow, reduce travel times, and make communities more attractive for walking, biking, and transit. | <ul style="list-style-type: none"> - Revise and Adopt Transportation Plans. - Revise and Adopt Supportive Zoning. - Coordinate with Transit Agencies and Companies. | Street improvements and advanced signal technology should generally be complementary with economic development efforts. | <p>Code updates should allow for such transportation technologies and improvements:</p> <ul style="list-style-type: none"> - Land Use and Livable Communities - Modify local codes and land use regulations to allow for sustainable, compact development. | All Local jurisdictions including local municipalities, counties, DOT’s and transit agencies. |



Section 11.0

Water





Village of Lake George, West Brook Stormwater Improvement Project



SECTION 11.0: **Water**

Water is essential to life and is therefore an essential consideration for each focus area included in the Sustainability Plan. We need water to drink and support our daily activities. We need water to grow and prepare our food. We desire water for recreation of all kinds. Water is part of cultural and religious practices and is integral to our public spaces. With such a heavy dependency on water, we must protect this resource from overuse and degradation.

The Capital Region and much of the Northeast have an ample supply of water. This is not true for every corner of the region, but, in general, the populated areas have access to good supplies that are not likely to be diminished significantly by climate change. Central to this supply are the Hudson and Mohawk Rivers and some of the large aquifers that are associated with these rivers.

How we treat our water resources affects the quality of the water that we use. We must, therefore, also focus on our wastewater treatment systems and the runoff we generate from our built environment to ensure proper treatment and control the erosive and sometimes destructive forces of storm events, amplified by impervious area and deforestation.

Regional Baseline

Water Supply

A simple comparison of average daily water use, projected daily water demand and the list of the approved capacities of NYSDEC permitted facilities indicates that the permitted water supply far

Best Practices

Water Harvesting Program—The State of California has instituted a water harvesting program for commercial projects. All commercial projects must be designed to capture and retain 50% of its water demand based on the water demands of the designed landscape.



exceeds water demand in the Capital Region both now and for the foreseeable future.

In 2010, the population of the Capital Region was 1,051,233 (CDRPC, 2012) (Cornell, 2012). Based on data provided by NYSDEC (Appendix 20), there are 80 permitted facilities serving approximately 885,000 people within the Capital Region. It is assumed the remaining 166,000+/- people generally rely on private well water for potable water. Additionally, the existing permitted facilities also serve a minimum of 454,545 square feet of non-residential uses (industrial, commercial, and other).

A few current best practices to reduce water use include:

- ✓ *Use water recycling systems for decorative fountains, ponds, lakes and pools.*
- ✓ *Reduce outside irrigation by 50% and complete between 7:00pm and 9:00am.*
- ✓ *Program the use of low flow showerheads and toilets.*
- ✓ *Install timers and sensors on automated sprinkler systems.*
- ✓ *Install water efficient landscaping.*

Residential and industrial growth projections for the years 2020 and 2030 were used to calculate future water demand at 100 gallons

Table 11.1 Residential Water Use Projections
(in millions of gallons)

| County | 2020 per day | 2020 per year | 2030 per day | 2030 per year |
|-------------|--------------|---------------|--------------|---------------|
| Albany | 29.0571 | 10,605.8415 | 29.4798 | 10,760.1270 |
| Columbia | 6.0777 | 2,218.3605 | 5.6460 | 2,060.7900 |
| Greene | 4.9572 | 1,809.3780 | 4.9192 | 1,795.5080 |
| Rensselaer | 15.8579 | 5,788.1335 | 15.9895 | 5,836.1675 |
| Saratoga | 23.3633 | 8,527.6045 | 24.6647 | 9,002.6155 |
| Schenectady | 14.8694 | 5,427.3310 | 14.8751 | 5,429.4115 |
| Warren | 6.6189 | 2,415.8985 | 6.5391 | 2,386.7715 |
| Washington | 6.3148 | 2,304.9020 | 6.1459 | 2,243.2535 |
| | 107.1163 | 39,097.4495 | 108.2593 | 39,514.6445 |

Table 11.2 Industrial Water Use Projections
(in millions of gallons)

| County* | 2020 per day | 2020 per year | 2030 per day | 2030 per year |
|-------------|--------------|---------------|--------------|---------------|
| Albany | 5.1596 | 1,883.2540 | 5.2834 | 1,928.4410 |
| Columbia | | | | |
| Greene | | | | |
| Rensselaer | 1.14872 | 419.2828 | 1.18078 | 430.9847 |
| Saratoga | 1.81988 | 664.2562 | 1.9470 | 710.6550 |
| Schenectady | 1.40886 | 514.2339 | 1.42468 | 520.0082 |
| Warren | | | | |
| Washington | | | | |
| | 9.53706 | 3,481.02690 | 9.83586 | 3,590.0889 |

* Existing industrial and projected square footage available for Saratoga, Schenectady, Albany, and Rensselaer Counties.





per day (gpd) per person for residential users and 20 gpd per square foot for industrial users. As shown in Table 11.1, in 2020, residential water use is projected to grow to 107.1 million gallons per day (mgd) and to over 39,097 million gallons per year (mgy). In 2030, residential water use increases to 108.3 mgd and 39,514 mgy. Table 11.2 shows the anticipated growth in industrial water use in four Capital Region counties. In 2020, industrial water use is projected to grow to 9.5 mgd and 3,481 mgy. In 2030, industrial water use increases to 9.8 mgd and 3,590 mgy.

When residential and industrial water uses are combined for the year 2030, water demand is estimated to grow to an average of 118.09 mgd. This compares to an existing capacity of NYSDEC permitted facilities of 254.57 mgd, indicating there is adequate water supply available. However, this data does not take into account several variables. Projections for industrial water use were not readily available for Columbia, Greene, Warren and Washington Counties. In addition, there are users that do not rely on permitted facilities for their water supply. This accounted for approximately 16.61 mgd or 13.8% of all water use in 2010.

The topic of water supply and availability, however, is far more complicated than simple straight line projections. The location of permitted facilities as they relate to population density, land use intensity, water demand intensity, the type and size of water supply (groundwater, surface water reservoir, and river) all play critical roles in the availability of potable water to a specific user or location. Also key to water supply is the availability and condition of permitted water facility infrastructure and distribution systems as well as the quantity and quality of groundwater for users relying on private wells.

The Water Supply Resources map (Figure 11.1) provides generalized information and the location of groundwater resources throughout the Capital Region. The EPA-designated

Schenectady-Niskayuna Sole Source Aquifer is subject to land use regulations to ensure water quality of the aquifer.

The quality and quantity of the water supply is affected by surrounding land use patterns, sewage overflows, loss of natural buffers and wetlands, increased water temperatures, low stream flows, and non-point pollution, including urban and agricultural runoff.

Wastewater Treatment

Properly designed and maintained wastewater treatment facilities, whether municipal facilities or individual septic systems, are critical to protecting the water quality of streams, rivers, lakes and groundwater and ensuring adequate supplies of water for drinking, recreation and wildlife.

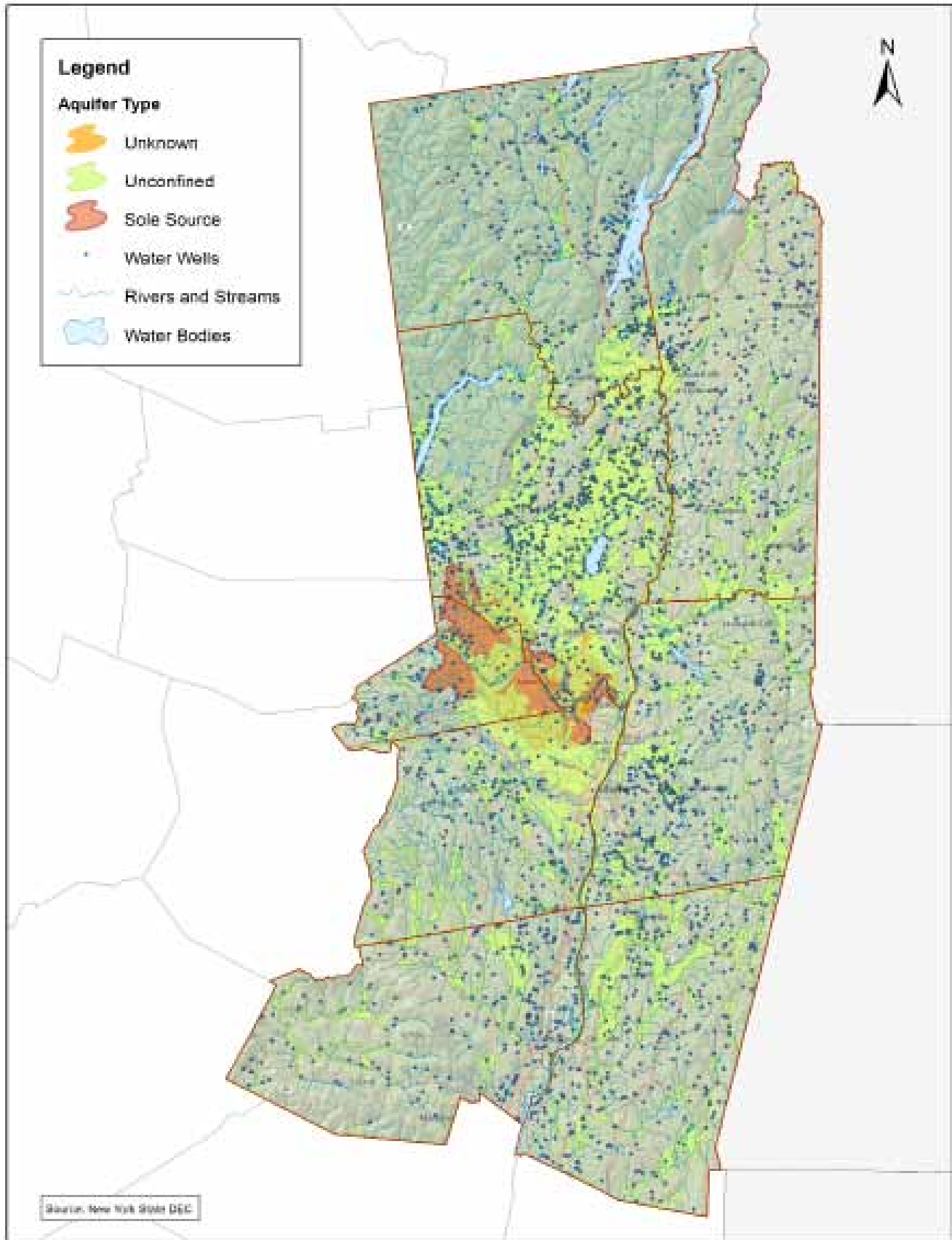
In the Capital Region, there are numerous facilities including wastewater treatment plants and other facilities (municipal, state or commercial) that hold State Pollutant Discharge Elimination System (SPDES) permits to discharge into waterways. These are identified on the Wastewater Treatment Plants and Discharges map shown in Figure 11.2. The quality of this discharge is critical to maintaining the quality and health of receiving water bodies. This, along with the effectiveness of individual septic systems, may have a major impact on both surface and groundwater quality.

Wastewater treatment concerns vary within the Capital Region due to the dynamic development patterns and the combination of older and new development. Within many of the older cities, a major issue is

Green infrastructure is being used in some locations in New York to treat Combined Sewer Overflow (CSO) discharges. One facility in Syracuse will evaluate the effectiveness of three types of treatment wetlands.



Figure 11.1 Water Supply Resources





combined sewers and the potential for overflows during certain storm events. In more rural areas, concerns may be focused on runoff from agricultural operations, improperly operating individual septic systems, or single point pollution from an industrial or commercial facility.

The Hudson and Mohawk Rivers are the major watersheds in the Capital Region, with the Hudson River watershed comprising the majority of the land area. The river essentially bisects the counties flowing north to south. The protection of the rivers and their tributaries is critical to water quality. The Hudson River and its tributaries are already affected by combined sewer overflows (CSO) and sanitary sewer overflows (SSO). CSO's occur during periods of heavy precipitation when a combined stormwater/ sewer system cannot handle all of the additional runoff and discharges untreated sewage into the receiving waterbody. An SSO is designed to discharge sewage prior to reaching the treatment facility during wet weather conditions or emergencies.

The Environmental Features map (Figure 11.3) provides an overview of the important water related resources including reservoirs, NYSDEC wetlands, rivers and streams as well as coastal habitats and New York State agricultural districts that can be impacted by water quality issues related to wastewater discharges.

Stormwater Management

Effective stormwater management is necessary to reduce the impacts of erosion and flooding and is also important in improving the Capital Region's water quality. Stormwater management can be accomplished through a combination of natural systems, green systems and gray systems, designed to control and treat runoff.

The Developed Land and Watershed map (Figure 11.4), delineates land cover with the red areas indicating more densely

Asset management plans take a comprehensive look at water, sewer, and stormwater systems to address all aspects of system function to reduce losses and conserve resources (water and energy).

Best Practices

Green Roofs– A green roof is a roof that is partially or completely covered with vegetation and soil, or a growing medium, planted over a waterproofing membrane. Green roofs are used for stormwater management and energy savings, as well as for aesthetic benefits. Green roofs absorb stormwater and release it back into the atmosphere through evaporation and plant transpiration, while reducing urban temperatures by limiting the amount of heat retaining structures. The vegetation on these roofs also absorb a great deal of the pollutants in the water before it is released into the atmosphere.

developed areas. Traditionally, more developed land areas include a higher percentage of impervious area and as a result generally rely on gray infrastructure facilities. These are the traditional storm sewers and detention basins. Suburban areas have relied on detention ponds for years to control peak runoff from development. State standards for stormwater management for new construction have evolved over time to address stormwater quality in addition to quantity. Stormwater management systems now include treatment wetlands, vegetated swales (bioswales), and other small, strategically placed treatment wetlands often called rain



Figure 11.2 Water Treatment Plants & Discharges

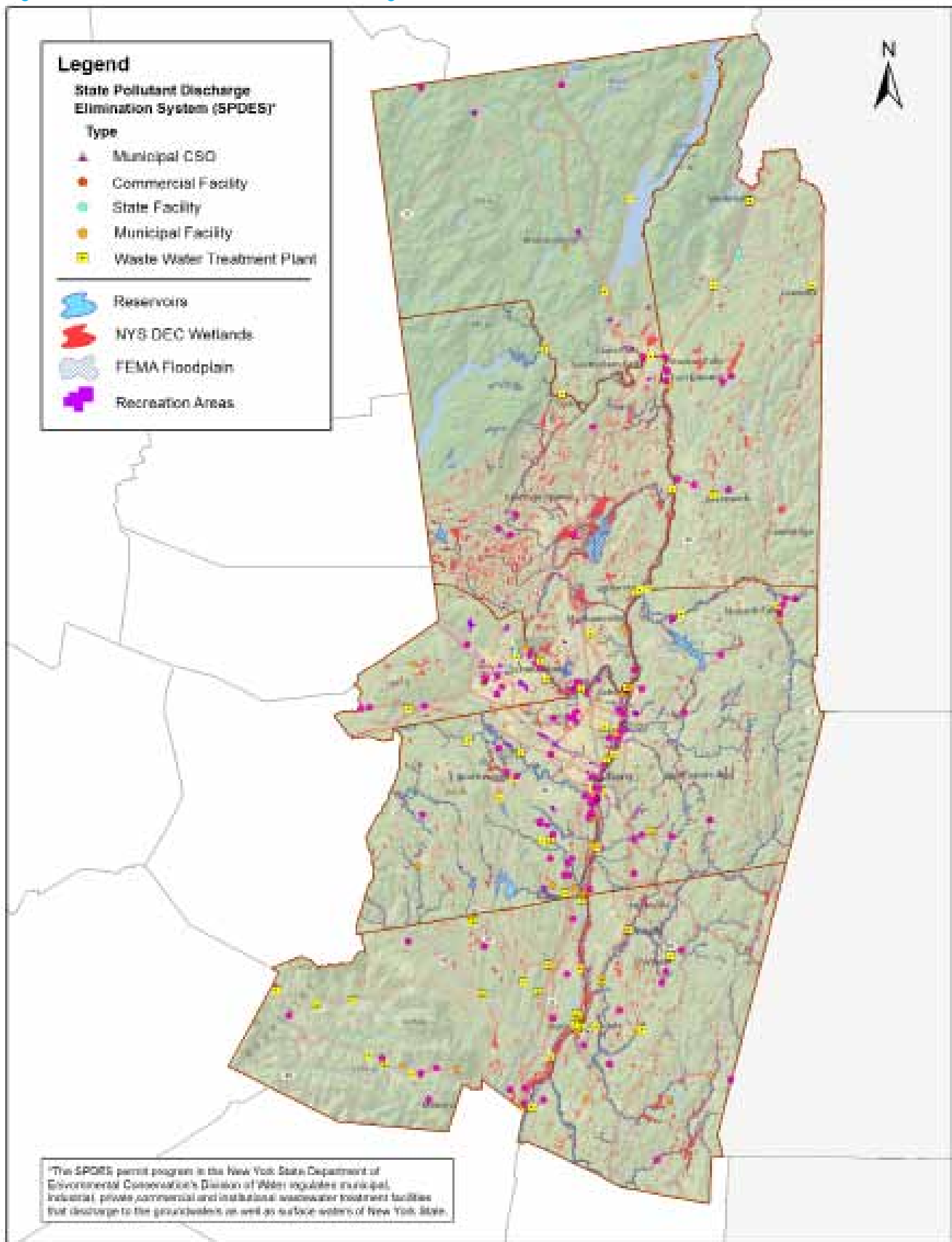




Figure 11.3 Environmental Features

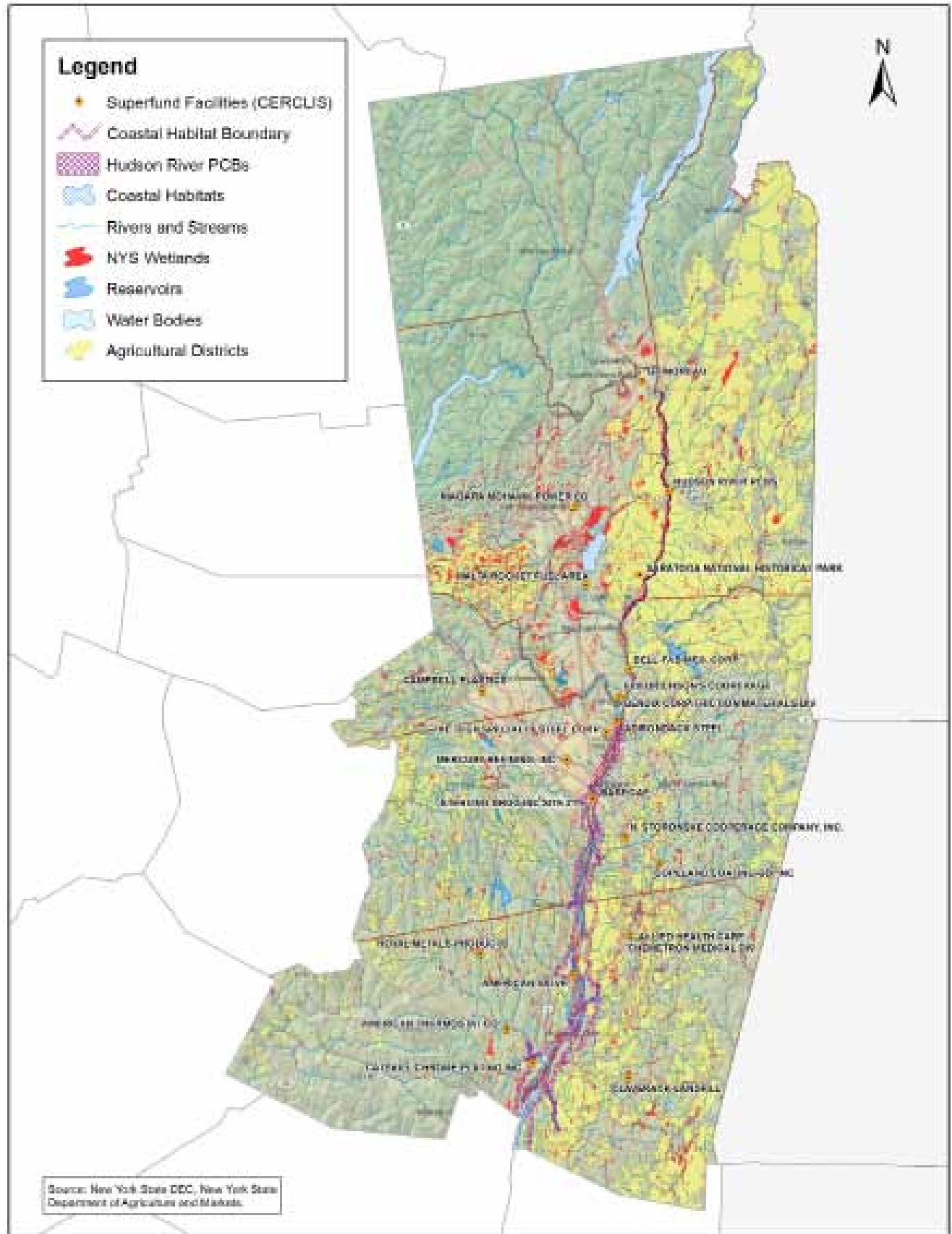
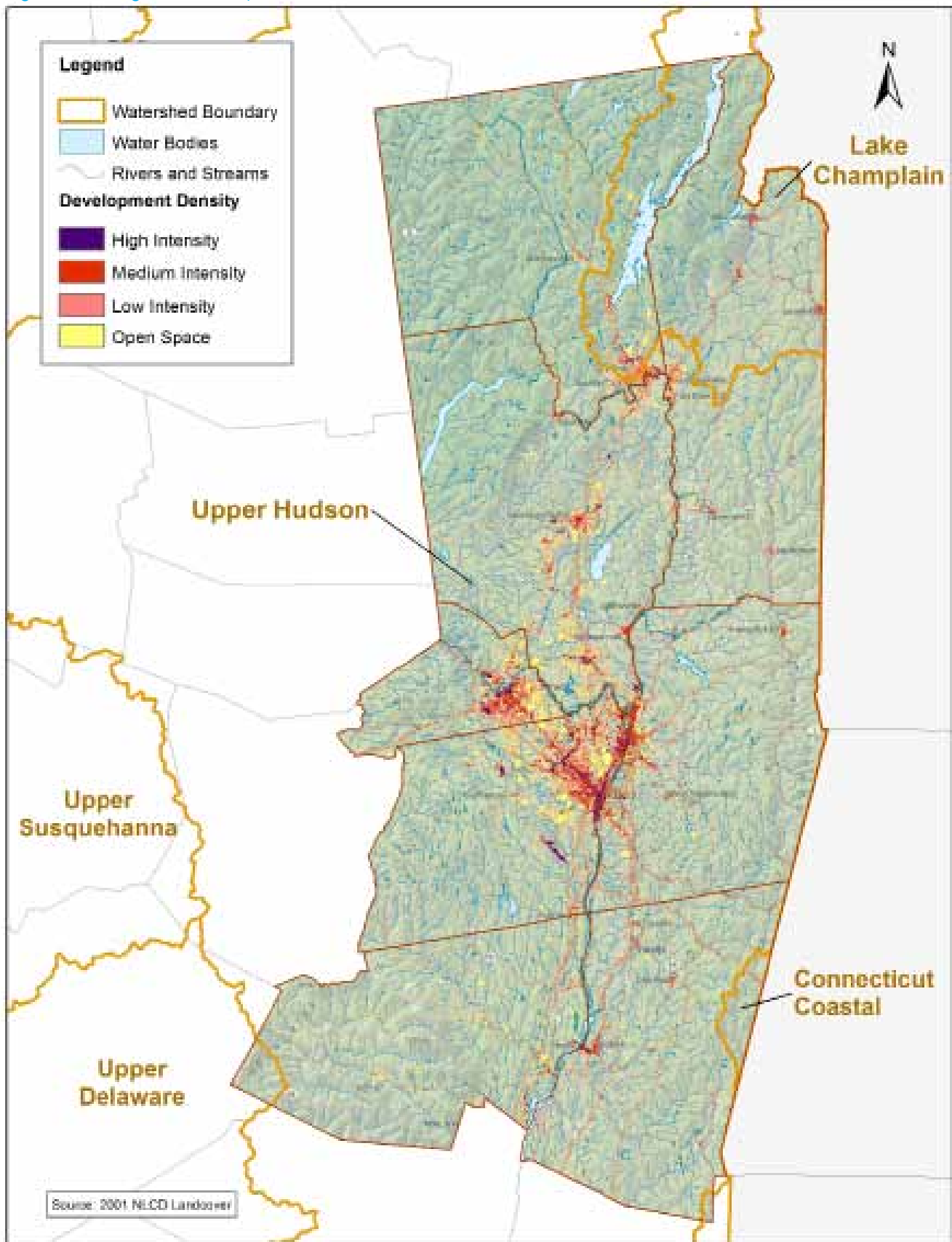


Figure 11.4 Regional Developed Land and Watersheds





gardens. These types of treatment systems are referred to as green infrastructure since they combine natural functions in a constructed feature such as a basin or swale. The Save the Rain Program in Onondaga County provides excellent guidance for the use of green infrastructure as a stormwater management strategy. Completed projects have ranged from large scale (construction of a 60,000 square foot green roof on the Onondaga County Convention Center) to neighborhood level projects (tree plantings at a local community center) (Onondaga County, 2012).

Natural systems provide stormwater management functions with little or no manipulation and can be the most effective and least expensive stormwater management feature to operate. However, to be used as a planning tool for stormwater management, more information is required at a watershed level to identify appropriate areas for land conservation. There has been limited study to date for this purpose in the Capital Region.

Greenhouse Gas Emissions

The relevant greenhouse gas emissions for the water focus area, as shown in Table 11.3, include emissions from both the energy sector and from the waste sector, specifically emissions from wastewater treatment. Emissions from wastewater treatment in the region include process emissions from both septic systems and wastewater treatments plants. The total regional emissions from wastewater treatment in 2010 was 107,943 metric tons CO₂e.

The initiatives identified for this focus area, specifically those that will improve wastewater treatment processes and efficiencies will have an impact on the emissions from this sector, though it is worth noting that this particular emissions source represents less than one percent of total regional emissions. However, improvements in water, wastewater, and stormwater practices in the region, particularly efficiency improvements in the pumping, distribution, and treatment of water, as well as in overall water consumption, could have a significant impact on emissions related to energy consumption in the residential, commercial, and industrial sectors. More details on emissions from energy sources can be found in the Energy chapter.

Goals

The Water Technical Committee identified three primary goals and eight initiatives as part of this Sustainability Plan. The availability and quality of our water resources should be protected, maintained, and improved by addressing the critical goals described in Table 11.4 (see next page).

Regional Initiatives

The Water Technical Committee identified a number of initiatives that could help the region achieve the goals outlined in Table 11.4. The details of the initiatives were discussed by the Technical Committee and were evaluated for their overall benefit to the Capital Region, their cost and feasibility. The initiatives were ranked by the public and the Technical Committee, followed by a final review and ranking by the Executive Committee. The

Table 11.3 GHG Emissions from Wastewater Treatment, Capital Region, 2010 (Metric Tons CO₂e)

| Wastewater Treatment | Regional Total | Albany | Columbia | Greene | Rensselaer | Saratoga | Schenectady | Warren | Washington |
|----------------------------------|----------------|--------|----------|--------|------------|----------|-------------|--------|------------|
| Central WWTPs and Septic Systems | 107,943 | 29,554 | 6,130 | 4,782 | 15,489 | 21,335 | 15,032 | 7,174 | 8,447 |



Table 11.4 Water Goals

| Goals |
|--|
| Maintain and improve the availability and reliability of the potable water supply and reduce water consumption to ensure adequate supply for all users. |
| Minimize the use of gray infrastructure by maximizing use of both natural systems and when necessary the construction of green infrastructure. Ensure that all downstream areas are appropriately protected from the impacts of stormwater runoff. |
| Protect water quality of streams, rivers, lakes, reservoirs, and groundwater to ensure adequate supplies of water for drinking, recreation and wildlife. Reduce energy consumption and maintenance costs associated with sewer systems. |
| Maintain and improve water quality and quantity for recreation and habitat. |

Watershed assessment studies will provide better information on the existing conditions of our surface waters and help to provide effective solutions for stormwater management.

Some local examples of Stormwater Management Best Practices include:

- ✓ *Doane Stuart School, Rensselaer - Green Roof*
- ✓ *Municipal rain gardens – Bethlehem, Cohoes, Colonie, Guilderland*
- ✓ *Columbia County SECD office - rain gardens and porous pavement*
- ✓ *Lake George Village-installation of grass pavers and porous asphalt*

top three priority initiatives are described below. Preliminary scoring and prioritization process of all the initiatives considered can be found in Appendix 2 and 3, respectively.

Create Asset Management Plans for Water and Sewer Systems. An effective means of assessing and managing water loss, infiltration and inflow, combined sewer overflows, service areas, and energy consumption in a municipal water or sewer system is to conduct an Asset Management Plan that will address all aspects of the system. This initiative will begin with an inventory and assessment of the existing system for a given area or municipality. An energy audit should also be included, focusing on the major components of the system. The next stage of this initiative will involve the creation of a capital improvement plan. This will take into consideration both the extent and location of future growth and is therefore tied to community land use planning. Conceptual plans will be developed and preliminary cost estimates provided along with an implementation schedule. An education campaign will accompany the implementation strategy to aid in the process of leveraging funding.

Asset management plans are occasionally prepared for portions of water and sewer systems but are seldom comprehensive in scope, due largely to the cost. This was consistently the top initiative throughout the voting process and clearly an important and missing sustainability component that could have significant implications for conserving water resources, decreasing energy use, and improving water quality.

Create a Small Grant Program for Innovative Water Quality Projects. The intent of this program is to allow the general public to propose innovative projects to improve water quality. The projects would be funded by grant programs administered by Water Quality Coordinating Committees, Soil and Water Conservation Districts or MS4 Consortiums.

This initiative ranked high because it allowed for the development and implementation of small projects that communities or organizations could undertake that could have a significant beneficial impact on water quality. It could include funding for research and pilot studies. Opportunities





for these types of projects are normally limited to educational institutions. This program would make funding available to a broader array of groups and individuals, potentially covering all areas of the region.

Conduct a Watershed Assessment for Stormwater Management. A Watershed Assessment for Stormwater Management will inventory and assess the existing drainage network and stormwater systems, both natural and built. The initial step in the process is to identify problem areas within the watershed that should be targeted for improvements followed by the identification of specific projects or mitigation measures selected through an alternatives analysis of various gray infrastructure, green infrastructure, and natural resources options. The predictive model would be a useful tool to assist in the selection process. The last component of this initiative is the opportunity to provide technical assistance to support commercial and residential development.

The need for watershed planning has been recognized for many years but undertaking studies at this scale can be very expensive. More importantly, most watersheds cross political boundaries that create problems in implementing land use recommendations and creating regional systems with shared costs. Key to the success of this initiative will be the development of public consensus on the need for and benefits of the recommendations.

Implementation

Identifying these priority initiatives in many ways is the easiest part of the planning process. Implementation of the priority initiatives identified in the plan can be far more difficult.

Lack of funding and resources, conflicting priorities at the municipal level, absence of a strong proponent or implementer, and poor or non-existent inter-municipal cooperation have and will continue to be a barrier to implementation if not addressed.

Best Practices

Whole Farm Planning– Whole Farm Planning is a holistic approach to farm management used to identify and prioritize environmental issues on a farm without compromising the farm business. Potential risks to the water supply are identified and addressed through careful structural planning to reduce or avoid the transport of agricultural runoff into farm streams and into water supply reservoirs or rivers. By successfully integrating traditional and innovative farm management approaches into a flexible and wide-ranging strategy, this program is unique in its ability to prevent agricultural pollution while also protecting the economic viability of farming.

Riparian Buffers– A riparian, or forested, buffer is an area along a shoreline, wetland, or stream where development is restricted or prohibited. The primary function of aquatic buffers is to physically protect and separate a stream, lake, or wetland from future disturbance or encroachment. If properly designed, a buffer can provide stormwater management and can act as a right-of-way during floods, sustaining the integrity of stream ecosystems and habitats.



Colonie Public Operations Center





West Brook Stormwater Improvement Project. Village of Lake George

To that end, an implementation strategy which outlines the resources, costs and timeline associated with achieving the priority initiatives and overcoming these barriers is provided in Table 11.5.

Sustainability Indicators

Sustainability indicators and targets have been established to allow the Capital Region to track its progress with each Focus Area. For Water, three indicators have been established:

- Annual Regional Energy Consumption Per Capita
- Annual Waste Disposal Per Capita
- Total Annual Water Permit Notice of Violations (Number)

Refer to Section 13 for specific information about the sustainability indicators and targets.



Table 11.5 Water Implementation Strategy

| Initiative | Regional Priority | Implementer | Partners | Preliminary Cost | Greenhouse Gas Reduction Potential** | Potential Funding Sources | Timeline |
|---|-------------------|--|---|------------------|--------------------------------------|---|--|
| Complete asset management plan for water & sewer systems include inventory and assessment, capital improvement plans, and educational plans. | 1 | Owner or operator of water or sewer system. | <ul style="list-style-type: none"> - State Health Dept. - County Health Dept. - Professional Organizations - Watershed coalitions - Combine Sewer Overflow (CSO) interests - NYSDOS | \$\$ | Medium | <ul style="list-style-type: none"> - State Revolving Fund (limited) - EPA - NYSDEC | Mid-Term (1-5 years) |
| Develop small grant program for innovative water quality projects that can be implemented at the local level. | 2 | Water quality committees or soil & water conservation districts. | <ul style="list-style-type: none"> - NYSEFC - NYSDEC - NYSDOS - Regional planning commission - Water and sewer districts - Darrin Freshwater Institute | \$ | Low | limited | Short Term (<1 year) |
| Watershed assessments for stormwater management that includes inventory and assessment of existing drainage systems and identifies measures to mitigate water quality issues. | 3 | Counties, coalitions, colleges and universities. | <ul style="list-style-type: none"> - Stormwater coalitions - Soil and water conservation districts | \$\$ | Low | <ul style="list-style-type: none"> - EPA - NYSDEC - FEMA - NYSDOS - Canal Corp | Medium-Long term, depends on size of watershed |

*Overall Cost: \$ - < \$100,000, \$\$ - \$100,000 to \$500,000, \$\$\$ - > \$500,000

**Greenhouse Gas Reduction Potential: High – Strategy will result in a direct, quantifiable reduction in GHG emissions; Medium – Some GHG emissions reduction may occur but it cannot be quantified; Low – GHG reduction is very indirect, unlikely to occur, or unknown

In addition to the implementation strategy listed above, it is recognized that these initiatives will require action by local government. The governance overview in Table 11.6 provides guidance to jurisdictions on specific actions they can take to implement the Sustainability Plan’s various initiatives. It also evaluates each initiative against all others in the plan to identify where there are alignments or hindrances to implementation.



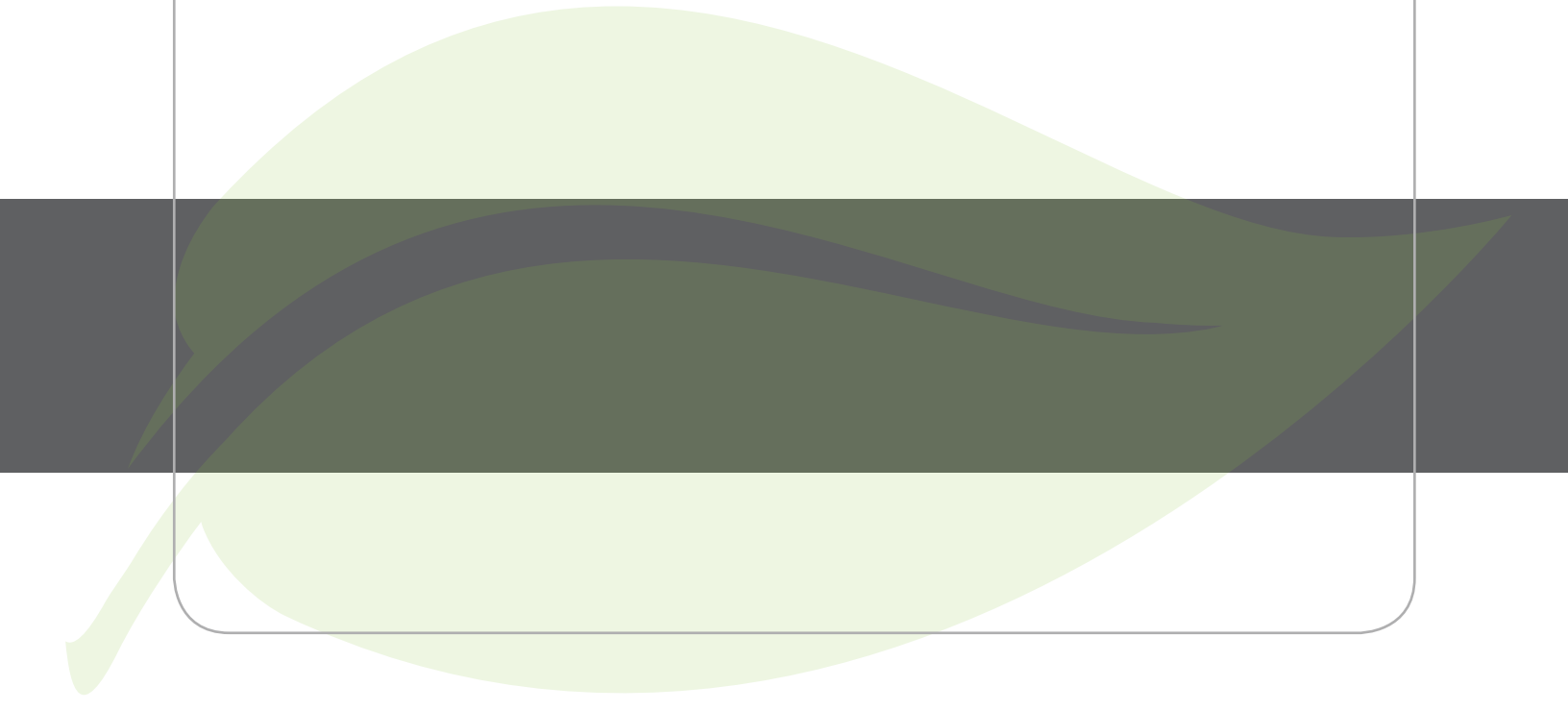
Table 11.6 Water Governance Recommendations

| Name of Initiative | Process to Implement (update zoning ordinance, adopt a policy or plan, resolution to approve funding, etc.) | Related Policies – positive linkages and alignments | Related Policies – barriers and cross-purposes | Local Government Level of Implementation |
|---|---|--|--|---|
| Complete asset management plan for water & sewer systems include inventory and assessment, capital improvement plans, and educational plans. | <ul style="list-style-type: none"> - Complete system assessment. - Develop and adopt capital improvement plans. - Develop education program. | Asset plans should be informed by Adaptation <ul style="list-style-type: none"> - Conduct Local Vulnerability Assessments and Adaptation Planning to prepare for a changing climate’s impacts on infrastructure. | Lack of funding has prevented asset management plans being prepared. | Local jurisdictions with municipal water systems and Regional Shared Service entities. |
| Develop small grant program for innovative water quality projects that can be implemented at the local level. | <ul style="list-style-type: none"> - Establish program by resolution and fund program. | Any comprehensive effort to identify potential water quality projects or areas for improvement could be coordinated with this effort. This may include: <ul style="list-style-type: none"> - Water <ul style="list-style-type: none"> - Conduct a Watershed Assessment Study for Stormwater Management, or any mapping that is completed. - Climate Adaptation <ul style="list-style-type: none"> - Conduct Local Vulnerability Assessments and Adaptation Planning. | Lack of a sponsor and funding has prevented this initiative from being undertaken to date. | Establish at the county or regional level. |
| Watershed assessments for stormwater management that includes inventory and assessment of existing drainage systems and identifies measures to mitigate water quality issues. | <ul style="list-style-type: none"> - Assess problem areas and identify projects. | Watershed assessments and vulnerability analysis under Climate Adaptation could be coordinated. Identified problem areas can also be used as “prototype” projects to inform code updates in the Climate Adaptation, and Land Use and Livable Communities addressing stormwater management. | Lack of funding has limited the preparation of watershed assessments. | Assessment and project identification at hydrologic unit level; project implementation at local jurisdiction level. |



Section 12.0

Plan Implementation





E1. Considerations
E1. Partnership
E1. Considerations
E1. Partnership



Man in light blue shirt pointing at the map.

Man in a patterned shirt and glasses, partially visible on the left side of the frame.

Woman in a grey blazer and glasses, sitting at the table and looking at a laptop.

Woman in a white sweater, sitting at the table and looking towards the man pointing at the map.

Woman in a tan jacket, sitting at the table and looking at a document.

SECTION 12.0: **Plan Implementation**

The success of the Cleaner Greener Communities Capital Region Sustainability Plan process is dependent on implementation of the focus area identified initiatives. Additionally, three specific initiatives were identified to support the overall implementation of the entire Sustainability Plan:

- ✓ Identify a Regional Sustainability Coordinator;
- ✓ Create a Regional Green Alliance; and
- ✓ Develop a Regional Sustainability Website Portal.

These initiatives will have region-wide impact since they establish advocacy and coordination of sustainability efforts across focus areas, provide tools and resources for educating and building capacity, and track the Capital Region's progress in meeting its sustainability goals. The Center for Economic Growth, with support from the Consortium, has been identified as a potential prime implementer of these overarching strategies.

As with all of the initiatives in this Sustainability Plan, an implementation strategy was created to identify the responsible parties, potential partners, costs, funding sources, and a timeline for completion. The implementation strategy illustrates the potential barriers that must be overcome for successful implementation. Table 12.1 presents the implementation strategies for the overarching regional sustainability initiatives. Table 12.2 provides the overarching regional sustainability initiatives governance recommendations.

The overarching initiatives will need a strong partnership among the many organizations and communities in the Capital Region involved with promoting sustainability. Moreover, since financial support is critical, a grant application should be submitted in the first round of the Cleaner Greener Communities Program implementation funding available in 2013.

To ensure implementation of the Sustainability Plan, it is highly recommended that the Capital Region's counties and municipalities adopt a simple resolution indicating their support for the Plan and intent to incorporate it into their planning and government operations



Regional Sustainability Coordinator

The region must identify and empower a long-term advocate to ensure continued progress on implementing the Sustainability Plan. The Regional Sustainability Coordinator will be responsible for the timely implementation of the priority initiatives throughout the region and developing support, education, and communication around the identified sustainability goals. The Coordinator will work closely with the Regional Green Alliance and assist with the development and maintenance of the Regional Sustainability Website Portal.

The position will serve as a point of contact for local governments, businesses,

A great model for the Regional Sustainability Website is used by the Regional Planning agency based in Victoria British, Columbia:

Regional Sustainability Monitoring

regional and state agencies, institutions, foundational donors and other stakeholders to assist with achieving the Capital Region's sustainability goals. The Coordinator will also assist with ongoing collection and dissemination of baseline information, best practices and tracking sustainability indicators and targets. It is recommended that the Climate Smart Communities Regional Coordinator be leveraged and potentially further resourced to support this function.

Table 12.1 Overarching Regional Sustainability Initiatives Implementation Strategy

| Initiative | Implementer | Partners | Preliminary Cost | Potential Greenhouse Gas Reduction | Potential Funding Sources* ** | Timeline |
|--|----------------------------|--|------------------|------------------------------------|---------------------------------|--------------------------|
| Establish Regional Sustainability Coordinator to support Plan implementation. | Center for Economic Growth | - Local Governments - State Agencies Regional - Green Alliance | \$ | Low | Phase 2 Cleaner Greener Program | Short (less than 1 year) |
| Establish regional green alliance to promote the Sustainability Plan throughout the Capital Region. | Center for Economic Growth | - Local Governments - Community Loan Fund - Capital District Regional Planning Commission; - Lake George-Lake Champlain Regional Planning Board; - Capital District Economic Development Council; - Capital District Transportation Committee | \$ | Low | Phase 2 Cleaner Greener Program | Short (less than 1 year) |
| Develop regional sustainability website to provide centralized information about sustainability in the Capital Region. | Center for Economic Growth | - Local Governments - Regional and State Agencies | \$ | Low | Phase 2 Cleaner Greener Program | Short (less than 1 year) |

*Overall Cost: \$ - < \$100,000, \$\$ - \$100,000 to \$500,000, \$\$\$ - > \$500,000

**Greenhouse Gas Reduction Potential: High – Strategy will result in a direct, quantifiable reduction in GHG emissions; Medium – Some GHG emissions reduction may occur but it cannot be quantified; Low – GHG reduction is very indirect, unlikely to occur, or unknown

*** Note: Phase 2, Cleaner Greener Program will not start until sometime in 2013 and it is uncertain yet what types of projects will be eligible



Regional Green Alliance

A diverse, multi-stakeholder Regional Green Alliance is needed to implement the initiatives in the Sustainability Plan and promote sustainability throughout the region. At a minimum, the Green Alliance should include representatives from government, business, regional agencies, non-profit organizations, academic institutions, and agriculture. The Green Alliance would work closely with the Sustainability Coordinator and the Capital Region Economic Development Council to implement the initiatives in the Sustainability Plan, including identifying opportunities to fund and support those initiatives. It is recommended that the existing Executive Committee be considered as a foundation for establishing the Regional Green Alliance.

the Plan: <http://sustainablecapitalRegion.org/>. Upon completion of the Plan, the website could be re-designed to track the progress of implementation. The website could be organized by focus area to communicate the sustainability targets, report the implementation status of each initiative, and demonstrate progress towards goals through updated metrics on each sustainability indicator. The website could also include specific opportunities for regional stakeholders to participate in implementing the initiatives in the Plan. Examples include: sample templates of innovative zoning ordinances or replicable projects that can be implemented throughout the region.

Regional Sustainability Website Portal

A website was created for the Capital Region Sustainability Plan to engage regional stakeholders and track the progress of creating

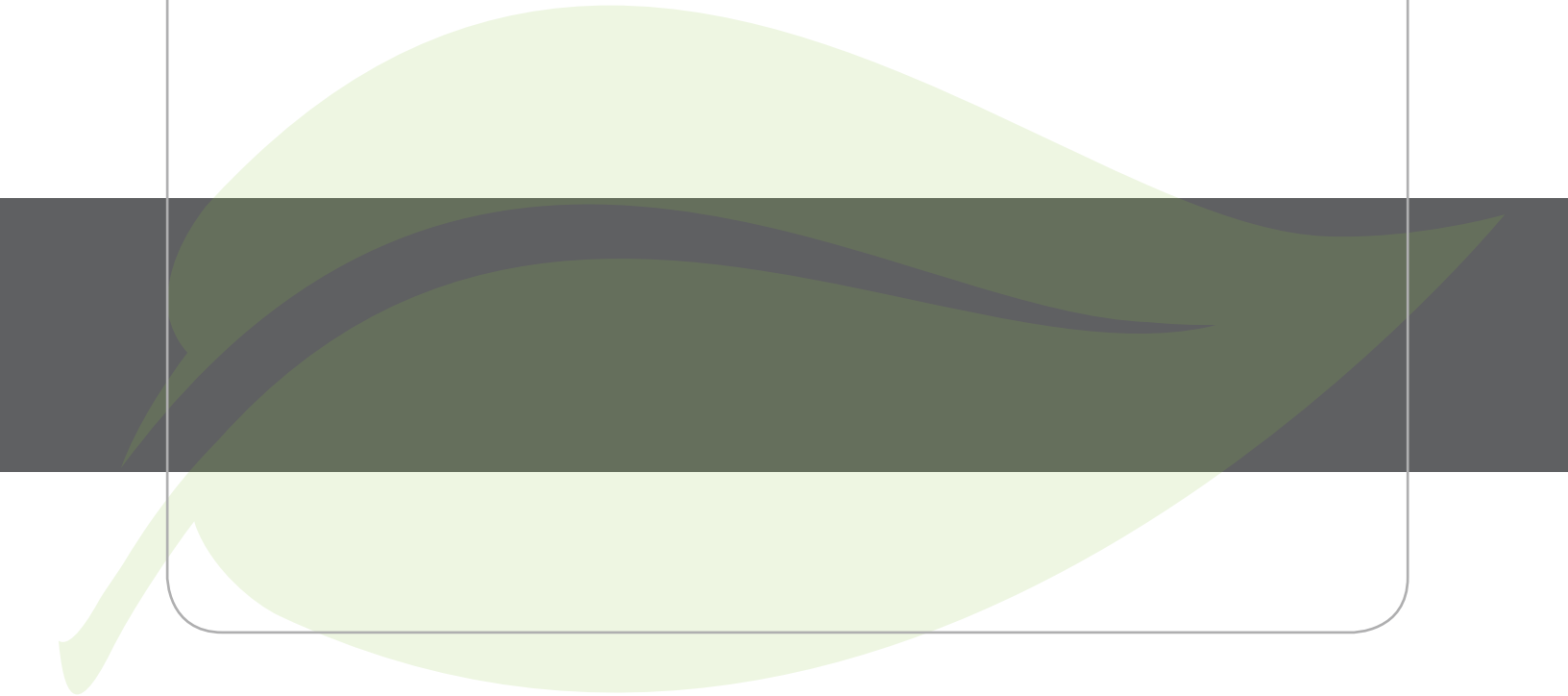
Table 12.2 Overarching Regional Sustainability Initiatives Governance Recommendations

| Initiative | Process to Implement (update zoning ordinance, adopt a policy or plan, resolution to approve funding, etc.) | Related Policies—positive linkages and alignments | Related Policies—barriers and cross-purposes | Local Government Level of Implementation |
|--|---|---|--|--|
| Establish Regional Sustainability Coordinator to support Plan implementation. | n/a | <ul style="list-style-type: none"> - Coordinate with Climate Smart Communities - Regional Coordinator Program | | |
| Establish regional green alliance to promote the Sustainability Plan throughout the Capital Region. | Municipal resolution required to participate in the Alliance | <ul style="list-style-type: none"> - Coordinate with Capital District Regional Economic Development Council | None Indicated | Establish at the Regional Level |
| Develop regional sustainability website to provide centralized information about sustainability in the Capital Region. | n/a | | | |



Section 13.0

Regional Indicators & Targets







SECTION 13.0: **Regional Sustainability Indicators and Targets**

Sustainability indicators allow the Capital Region to track progress towards achieving goals. The targets are the desired state for each indicator from the baseline.

Sustainability targets are specific and measurable and represent milestones on the Capital Region's path towards achieving its sustainability goals. If possible, sustainability indicators should be tracked on an annual basis.

Effective sustainability indicators:

- ✓ Are **relevant** to the Capital Region's specific priorities and focus areas such that they are tracking meaningful outcomes that resonate with communities, residents and decision makers;
- ✓ Are **clear and concise** in the sense that they do not rely on overly complex definitions or calculations that are difficult for stakeholders and decision makers to understand;
- ✓ Are **well grounded** and **defensible**;
- ✓ Have a **long-range view**, rather than rack disconnected short-term outcomes;
- ✓ Are based on **reliable data** so that they can be consistently and accurately tracked over time; or, if data do not currently exist, a system to reliably collect data can be established;
- ✓ **Cover multiple community priorities**- including economic, social, and environmental;



- ✓ Are **practical** and achievable, but challenging; and,
- ✓ Have a **specific** timeline.

Methodology

Initial guidance on developing sustainability indicators for the Capital Region was provided by NYSERDA. NYSERDA's guidance focused on balancing consistency across regions with the need to customize based on unique regional features. Specifically, NYSERDA required each of the Sustainability Plan's focus areas include at least one common indicator (common to all regions in the state preparing sustainability plans) from NYSERDA's Common Indicators Document (Appendix 4) and that the five required indicators be included (two for land use, two for transportation, and one for energy).

Furthermore, the initial list of indicators was also informed by:

The Capital Region Economic Development Council Strategic Plan, with a particular focus on Goals, Strategies, and Expected Outcomes from the Strategic Plan that align with the topics of the Sustainability Plan;

The STAR Community Rating System proposed performance measures by topic area, which were used as a general best practice benchmark for sustainability indicator topic areas and approaches;

The consultant team's technical knowledge of sustainability indicators from other sustainability planning efforts nationally.

Initially, over 30 potential indicators were identified. These potential indicators were shared with and vetted by each of the eight Technical Committees. Technical Committee members were asked to comment on a number of key questions regarding the potential indicators including: feasibility

of obtaining data, relevance to focus area goals, and whether or not certain indicators were able to track progress at a systems level or across multiple focus areas, as opposed to only at a specific goal level.

As a result of Technical Committee input, potential indicators were sorted into "Priority 1" and "Priority 2" indicators to provide the Capital Region guidance on which indicators might be most effective, given resource limitations. Criteria used to identify Priority 1 indicators include:

- ✓ **Relevance to multiple goals within one or more focus areas**
- ✓ **Availability of data**
- ✓ **NYSERDA required Common Indicator**

A total of 12 indicators were identified as potential Priority 1 indicators. Based on planning team review, trends in sustainability targets across the nation and the current state of the indicator in the Capital Region, targets for most of the Priority 1 Indicators were then established and are outlined in Table 13.1.





Table 13.1 Priority 1 Indicators

| Proposed Indicator | Common NYSERDA Indicator/ Required Indicator? | Related Focus Areas | Data Sources | Current Baseline | Plan Target | Basis for Target |
|---|---|--|---|---|--|---|
| Annual Regional Energy Consumption Per Capita (Million British Thermal Units (MMBtu)) | Common and Required Indicator | Energy (P), Climate Adaptation, Waste, Water, Land Use, Economic Development and GHG Reduction | - Capital Region Tier II Greenhouse Gas Inventory. - CGC Albany Regional Energy and 2000-2009 Population Estimates. | 225 MMBtu/Capita | Reduce per capita energy consumption 20% by 2020 | Consistent with targets established by leaders in sustainability, including New York City; Department of Energy Better Buildings Program |
| Annual Waste Disposal Per Capita | Common Indicator | Waste (P), Economic Development and GHG Reduction | - NYSDEC: www.dec.ny.gov ; - U.S. Census Bureau Figures for Normalizing Per Capita | Total Waste (includes MSW, C&D, NHIW and biosolids): 1.22 tons/capita/year Municipal Solid Waste: 0.72 tons/capita/year. | Reduce per capita disposal of MSW to 0.11 tons/capita/ per year by 2030. | Consistent with NYSDEC's Beyond Waste Plan (2010) |
| Annual Agriculture – Farm Production (Dollars) | Common Indicator | Food Systems (P), Climate Adaptation, Economic Development and Land Use | - U.S Department of Agriculture Statistics Division, Annual Bulletin on Food Production by County: www.nass.usda.gov | \$31.6 million (data not available for Warren County) | Increase by 30% by 2025 | Capital Region agricultural industry experienced 20% growth from 2005-2010. Source: CR Economic Development Council. Based on goals and initiatives identified this target seemed achievable |
| Land Use Patterns, Annual Per Capita Land Consumption (Acres) | Common and Required Indicator | Land Use (P), Climate Adaptation, Water Economic Development, Food Systems and GHG Reduction | - Multi-Resolution Land Characteristics Consortium National Land Cover Database. Total amount of land that is developed divided by total regional population. http://www.mrlc.gov/ | 0.000276 square miles/capita | Reduce by 5% by 2030 | Consistent with plans from throughout the US Maryland Land Consumption Texas Land Consumption Kings County Land Consumption |
| Total Annual Water Permit Notice of Violations (Number) | Common | Water (P) and Climate Adaptation | NYSDEC Permit Violation Data | Approximately 593 violations/yr. over past 5 years. | 40% reduction by 2020; 0 permit violations by 2030 | Consistent with the goals established by the regional stormwater coalition |
| Housing + Transportation Index | Common and Required Indicator | Economic Development (P), Land Use and Transportation | - Center for Neighborhood Technology: H+T Affordability Index - (http://htaindex.cnt.org/) | Current baseline: Household H & T > 45%: 225,033 (66.5%) | Reduce percent of households with H & T >45% 10% by 2030 | Based on the estimated impact of current and proposed initiatives in the region related to increasing urban center density, mixed use developments, and commercial incentives to operate in urban centers |
| Percent of Passengers Traveling by Mode | Common and Required Indicator | Transportation (P) and GHG Reduction | - American Community Survey (Number of employees in the region employed full or part time and number of employees commuting by carpool, transit, walking, and biking). www.census.gov/acs/www | Single Occupancy Vehicle (SOV): 79.7% Carpooled: 8.8% Public Trans. 2.7% Walked: 3.6% Bike: 0.3% Other: 1.0% Work at Home: 3.9% | Reduce SOV miles 25% by 2030 | SOV mode share in Eastern US cities range from 28.7% in NYC to 36% in Philadelphia and 45% in Boston |
| Annual Vehicle Miles Traveled (VMT) Per Capita | Common and Required Indicator | Transportation (P) and GHG Reduction | Summary of VMT by County in the Eight County Capital Region. | 11,593 miles/capita | Reduce VMT per capita 20% by 2030 | Consistent with other plans from throughout the US |
| Annual Median House-hold (MHH) Income, Families Below the Poverty Line, Population Below the Poverty Line | Common Indicator | Economic Development (P), Energy, Waste and | 2010 United States Census - 2006-2010 American Community Survey, 5-Year Estimates; New York State Department of Labor. | MHH: \$55,683 Families below poverty level: 43,749 (6.71%); Population below poverty level: 114,141 (10.62%) | Increase MHH 3% above rate of inflation by 2020; Reduce total population and number of families below the poverty line 50% by 2020 | Consistent with Campaign to Reduce Poverty in America: US Catholic Charities |
| Economic Value of Property Vulnerable to Flooding | Common and Required Indicator | Climate Adaptation | Village, Town and City Assessors | \$10.8 Billion (does not include Schenectady, Washington, Warren, and Greene Counties; digital floodplain data not available) | Maintain current level through 2030 | Preliminary estimate |
| Number of Climate Smart Communities within Region. | Common and Required Indicator | Governance (P), Climate Adaptation | Climate Smart Communities Program | 16 | Increase by 25% annually | Based on level of engagement throughout the planning process by local governments |
| Greenhouse Gas emissions per capita (metric tons of CO2 equivalent per person) | Common and Required Indicator | Energy, Transportation | Tier II Inventory; US Census | 16.3 MTCDE (Metric Tons of Carbon Dioxide Equivalent) per capita | 12 MTCDE per capita by 2020 | Based on current New York State per capita GHG emissions (excluding New York City) |

1. Required – required by NYSERDA. Common – suggested by NYSERDA. New – region-specific indicators developed during the planning process
2. (P) – Primary Focus Area the indicator supports





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Glossary

Anerobic Digestion

The process in which volatile organic materials are broken down in the absence of oxygen. This biological process produces a gas, sometimes called biogas, principally composed of methane and carbon dioxide. Waste treatment in this fashion uses the same process which naturally occurs in decomposing organic mud at the bottom of marshes or in landfills.

Aquifer

A body of saturated rock through which water can easily move. Aquifers must be both permeable and porous and include such rock types as sandstone, conglomerate, fractured limestone and unconsolidated sand and gravel. Fractured volcanic rocks such as columnar basalts also make good aquifers.

Biosolid

Solid organic matter recovered from a sewage treatment process and used especially as fertilizer.

Brownfield

Land previously used for industrial purposes or some commercial uses. The land may be contaminated by low concentrations of hazardous waste or pollution, and has the potential to be reused once it is cleaned up.

Combined Sewer Overflow(CSO)

Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. Most of the time, combined sewer systems transport all of their wastewater to a sewage treatment plant, where it is treated and then discharged to a water body. During periods of heavy rainfall or snowmelt, however, the

wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant and overflow and discharge excess wastewater directly to nearby streams, rivers, or other water bodies. These overflows, called combined sewer overflows (CSOs), contain not only stormwater but also untreated human and industrial waste, toxic materials, and debris.

Complete Streets

Living streets as implemented in North America, which are designed and operated to enable safe, attractive, and comfortable access and travel for all users, including pedestrians, bicyclists, motorists, transit and school bus riders, delivery and service personnel, freight haulers and emergency responders of all ages and abilities.

Compost

A mixture of various decaying organic substances, such as dead leaves or manure, used for fertilizing soil.

Compressed Natural Gas (CNG)

A fossil fuel substitute for gasoline (petrol), Diesel fuel, or propane. Although its combustion does produce greenhouse gases, it is a more environmentally clean alternative and it is much safer than other fuels in the event of a spill (natural gas is lighter than air, and disperses quickly when released). CNG may also be mixed with biogas, produced from landfills or wastewater, which doesn't increase the concentration of carbon in the atmosphere. CNG is made by compressing natural gas, which is mainly composed of methane, to less than 1% of the volume it occupies at standard atmospheric pressure.

Estuary

A body of water formed where freshwater from rivers and streams flows into the ocean, mixing with the seawater.

Floodplain Ordinance

A plan including corrective and preventative measures for reducing flood damage. An ordinance is generally designed to meet National Flood Insurance Program (NFIP) standards for floodplain development, and includes maps with base flood elevations and other flood data, permits required, confirmation that new development does not cause increased flooding elsewhere and standards to control protection of new buildings from the base flooding.

Food Desert

Low-income census tracts where a substantial number of residents has low access to a supermarket or large grocery store. Low-access to a healthy food retail outlet is defined as households that are more than 1 mile from a supermarket or large grocery store in urban areas and as more than 10 miles from a supermarket or large grocery store in rural areas.

Food Hub

A centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.

Food System

The whole array of activities, ranging from input distribution through on-farm production to marketing and processing, involved in producing and distributing food to both urban and rural consumers.



Fossil Fuel

Buried combustible geologic deposits of organic materials, formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils by exposure to heat and pressure in the earth's crust over hundreds of millions of years. The burning of fossil fuels by humans is the largest source of anthropogenic emissions of carbon dioxide, which is one of the greenhouse gases that contributes to global warming.

Geothermal Energy (Geothermal heating and cooling)

Thermal energy generated and stored in the Earth. Geothermal heating and cooling systems use the relatively constant temperature of the earth to heat and cool buildings using 40% to 70% less energy than conventional systems. Electricity is used to move heat from the earth into buildings, allowing much higher efficiencies.

Gleaning

The act of collecting leftover crops from farmers' fields after they have been commercially harvested or on fields where it is not economically profitable to harvest.

Greenhouse Gas

Greenhouse Gas absorbs and emits radiation within the thermal infrared range. The primary greenhouse gases in the Earth's atmosphere are water vapour, carbon dioxide, methane, nitrous oxide, and ozone. Greenhouse gases greatly affect the temperature of the Earth; without them, Earth's surface would average about 33°C (59°F) colder than the present average of

14 °C (57 °F). However, the burning of fossil fuels has contributed to the increase in carbon dioxide in the atmosphere and comes from combustion of carbon based fuels, principally wood, coal, oil, and natural gas.

Green Jobs

Jobs in businesses that produce goods and services that benefit the environment or conserve natural resources.

Greenway System

Greenways are defined as corridors of land and/or water that connect and protect the natural, cultural, and recreational resources that define communities, linking these features within the surrounding landscape. Greenways systems help to create sustainable landscapes by connecting ecological and community processes, and prevents fragmentation by development.

Grey Infrastructure

Conventional piped drainage and water treatment systems (i.e. pipes, tanks, conventional treatment systems including energy-intensive water treatment systems and processes such as membranes and reverse osmosis).

Heat Island

An area, such as a city or industrial site, having consistently higher temperatures than surrounding areas because of a greater retention of heat, as by buildings, concrete, and asphalt.

Hydroelectricity

The production of electrical power through the use of the gravitational force of falling or flowing water; the most widely used form of renewable energy.

Livability

The subset of sustainability impacts

that directly affect people in a community. Livability is based on several key principles including: providing transportation choices; promoting equitable, affordable housing; enhancing economic competitiveness; supporting existing communities; coordinating policies and leveraging investments; and valuing communities and neighborhoods.

Mitigation

The effort to reduce loss of life and property by lessening the impact of disasters. Generally involves existing historic or natural resource such as a stream, wetland, endangered species, archeological site or historic structure.

Organic Materials

Matter that has come from a once-living organism; is capable of decay, or the product of decay; or is composed of organic compounds.

Photovoltaic Technology

A method of generating electrical power by converting solar radiation into direct current electricity using semiconductors (solar panels) that exhibit the photovoltaic effect.

Potable Water (drinking water)

Water safe enough to be consumed by humans or used with low risk of immediate or long term harm.

Power Purchase Agreement

A legal contract between an electricity generator (provider) and a power purchaser (buyer, typically a utility or large power buyer/trader). Commercial PPAs have evolved as a variant enabling businesses, schools, and



governments to purchase electricity directly from the generator rather than from the utility, facilitating the financing of distributed generation assets such as photovoltaic, microturbines, reciprocating engines, and fuel cells.

Renewable Energy

Energy that comes from natural resources such as sunlight, wind, rain, tides, waves and geothermal heat. These energy sources are “renewable” because they are naturally replenished at a constant rate.

Sanitary Sewer Overflow (SSO)

Unintentional discharges of raw sewage from municipal sanitary sewers caused by blockages, line breaks, sewer defects that allow storm water and groundwater to overload the system, lapses in sewer system operation and maintenance, power failures, inadequate sewer design and vandalism. The untreated sewage from these overflows can contaminate water, causing serious water quality problems.

Sole Source Aquifer

An aquifer that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas may have no alternative drinking water source(s) that could physically, legally and economically supply all those who depend on the aquifer for drinking water.

Solid Waste

Any discarded (abandoned or considered waste-like) materials. Solid wastes can be solid, liquid, semi-solid or containerized gaseous material.

Sustainability

Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, to fulfill the social, economic and other requirements of present and future generations. Sustainability is important to ensure that we have and will continue to have, the water, materials, and resources to protect human health and our environment.

Tidal Power

A renewable energy source that converts the energy of tides into electricity. Tidal power is a form of hydropower where energy of the water gets extracted from the Earth’s oceanic tides.

Urban Sprawl

The unplanned, uncontrolled spreading of urban development into areas adjoining the edge of a city.

Vegetated Swale (bioswale)

A broad, shallow channel with a dense stand of vegetation covering the side slopes and bottom. Swales can be natural or manmade, and are designed to trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of storm water runoff.

Wastewater Treatment

Chemical, biological, and mechanical procedures applied to contaminated water to remove, reduce, or neutralize contaminants.

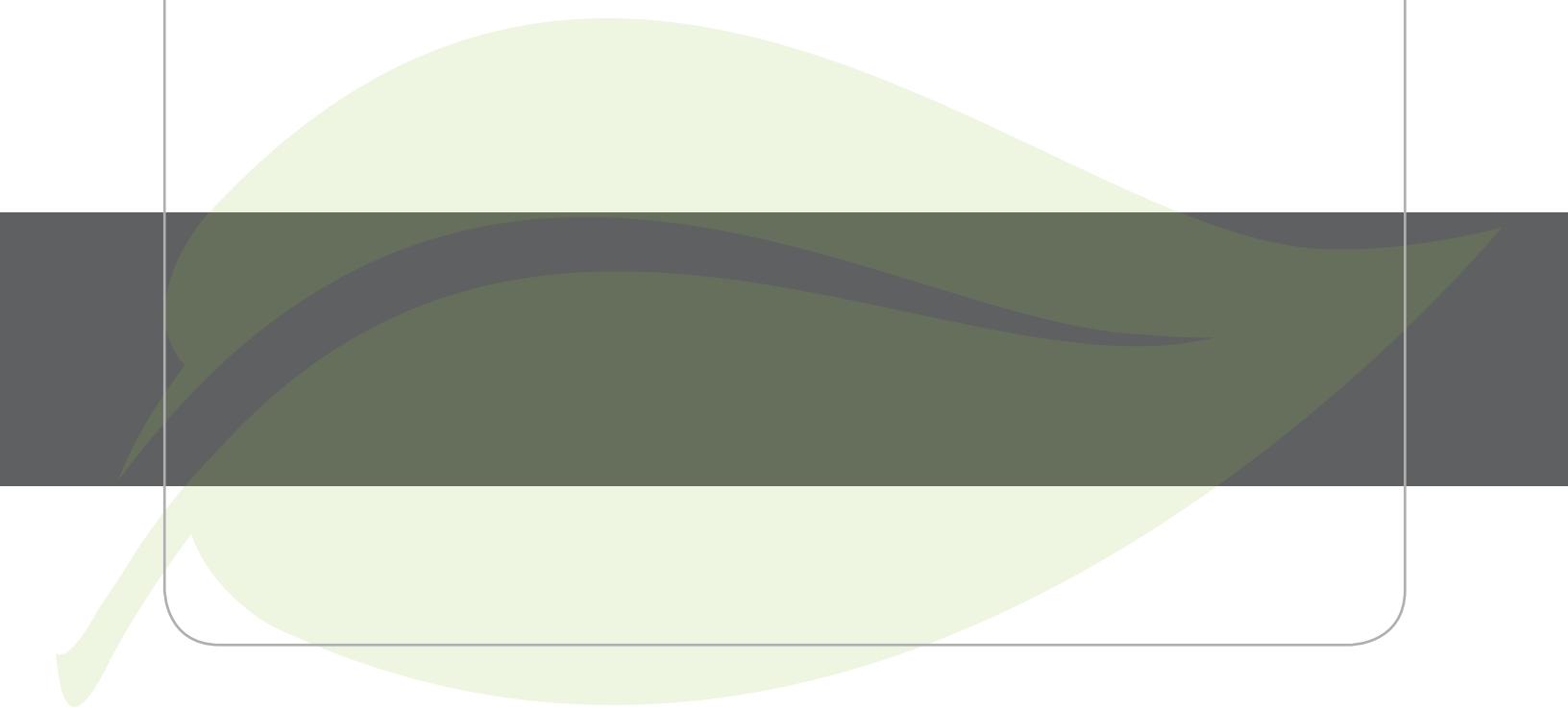
Zoning Code

Zoning is the process of planning for land use by a locality to allocate certain kinds of structures in certain areas. Zoning codes include restrictions in different zoning areas, such as

height of buildings, use of green space, density (number of structures in a certain area), use of lots, and types of businesses. Types of zoning include open space, residential, retail, commercial, agricultural, and industrial.



NYSDERDA Disclaimer



NYSERDA Disclaimer

FOR GENERAL REPORT:

This report was prepared by a consortium of Capital Region municipalities led by the City of Albany and their planning team in the course of performing work contracted for and sponsored by the New York State Energy Research and Development Authority. The opinions and analyses expressed in this report do not necessarily reflect those of NYSERDA or the State of New York.

FOR APPENDIX:

Projects included in the appendices or within the content of this report are meant to provide examples of potential ways to address the strategies identified in the report and were submitted to the planning consortiums as part of the public outreach efforts by the consortium. These projects are in no way prioritized or guaranteed to receive funding through Phase II Implementation Funding of the Cleaner, Greener Communities Program. Projects not listed in the appendices section or content of the plan will have equal opportunity to submit an application for funding through Phase II. Regardless of being listed in the plan, a Consolidated Funding Application must be submitted in order to be considered for funding in Phase II. All projects must address the qualifications and eligibility requirements as listed in the Cleaner, Greener Communities Phase II solicitation notice.

