APPENDIX D

City of Albany, NY

Climate Action Plan

Current Climate Science Summary

Climate change is one of the biggest social, environmental, and economic challenges facing our society. In Albany, a warmer overall climate can result in many adverse impacts, such as more intense and frequent storms, sea level rise along the tidal Hudson River, and an increase in high heat days and heat waves.[1] Climate change is expected to cause an increase in precipitation during the winter months, with more precipitation falling in heavy downpours rather than light rain.[2] Tropical Storm Irene, which hit the region in September 2011, demonstrated that intense storms can have tremendous impact on Albany economically and socially. In addition to property damage and disruption to businesses, Albany County experienced its first human case of West Nile Virus, which the County Public Health Commissioner attributed to the ideal conditions for mosquito breeding grounds created by Irene.[3]

Figure 1. The Greenhouse Gas Effect

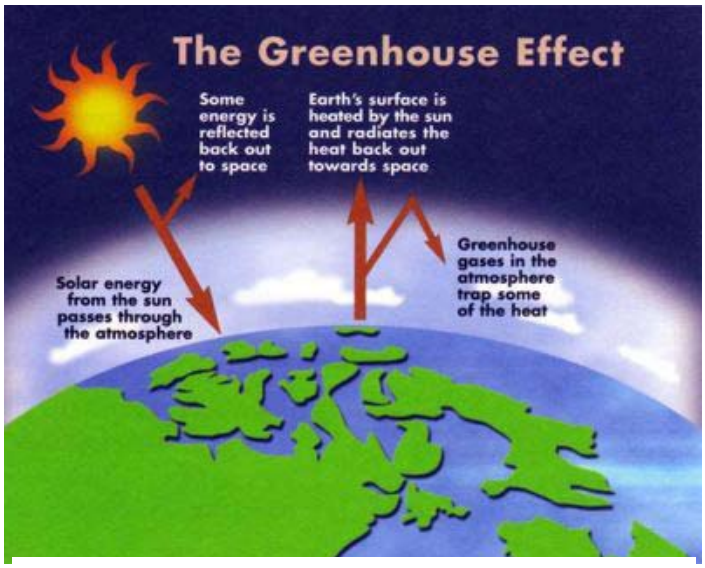

Image Credit: http://effectsglobalwarming.org/wp-content/uploads/2011/04/A-New-Explanation-of-Global-

Since the industrial revolution, humans have been altering the earth's climate by releasing large quantities of carbon dioxide and other heat trapping gases, known as greenhouse gases, into the atmosphere.[4] As shown in Figure 1, the earth's atmosphere naturally contains greenhouse gases, which trap heat from the sun and creates a climate that is warm enough to support life. However, as the concentration of greenhouse gases in the atmosphere increase, too much heat becomes trapped, which changes the climate in ways that are largely detrimental to society.

New York State has recognized the threat of a changing climate, and is already taking action to reduce the State's greenhouse gas emissions and to prepare for unavoidable climate impacts. Through Executive Order 24, New York established a statewide goal of reducing greenhouse gas emissions by 80 percent below 1990 levels 2050, the amount of reduction that scientists agree must occur globally to avoid potentially catastrophic impacts from climate change.[5] The State has also created a Climate Action Plan to help meet this goal and prepare for the impacts of climate. By addressing the issue of climate, Albany is not only helping New York reach its greenhouse gas emissions reduction target, but is also taking steps to increase the City's social, economic, and environmental resiliency.

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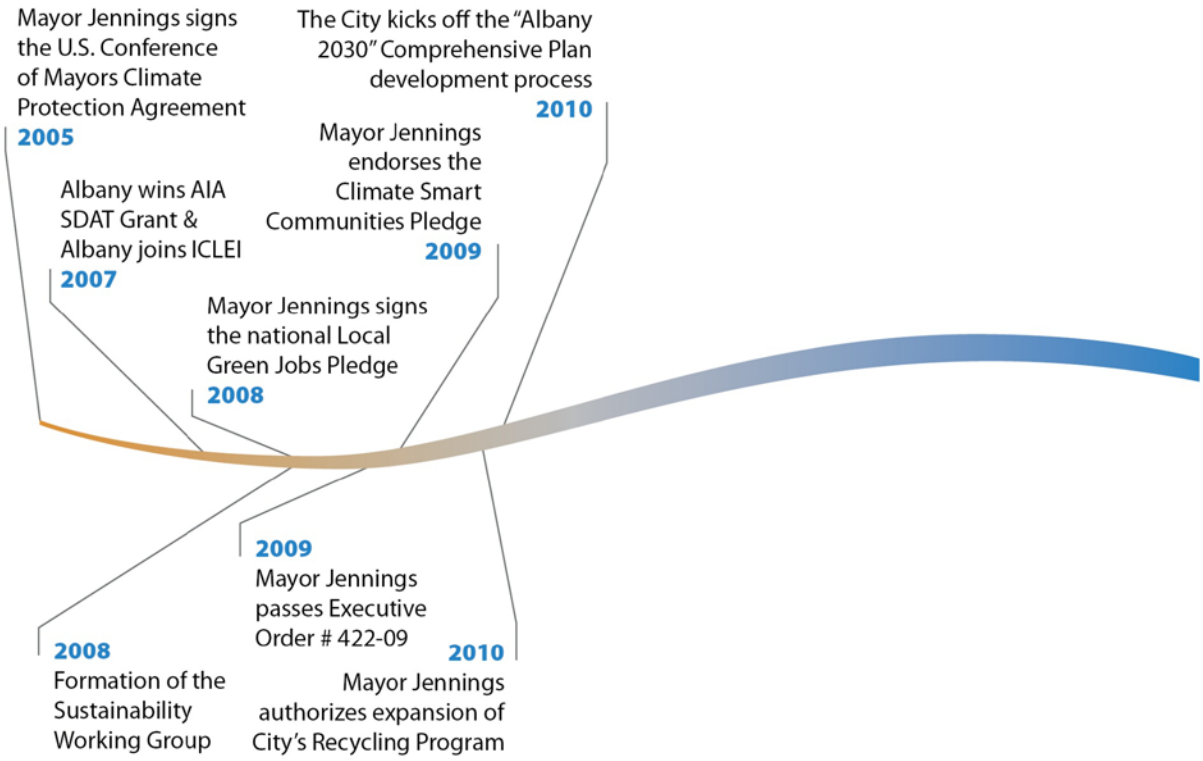
[1] Responding to Climate Change in New York State, Synthesis Report, NYSERDA ClimAID Team. 2010.
[2] Responding to Climate Change in New York State, Synthesis Report, NYSERDA ClimAID Team. 2010.
[3] Albany County Department of Public Health News Release, September 2011 http://www.albanycounty.com/departments/health/news.asp?id=3109
[4] EPA, Climate Change – Science, http://www.epa.gov/climatechange/science/recentcc.html
[5] New York State Climate Change Action Plan, Interim Report November 9, 2010 http://www.nyclimatechange.us/InterimReport.cfm

Overview of Climate Action in Albany

The City of Albany has been taking action to address greenhouse gas emissions since 2005 when Mayor Jennings joined a group of mayors from around the country in signing on to the Mayors' Climate Protection Agreement. Since then more than 1,000 mayors have signed on, committing to reduce the greenhouse gas (GHG) emissions in their communities by 7% below 1990 levels by 2012. Since then, as outlined in the timeline below, the City has steadily been moving forward on its efforts to reduce GHG emissions and become a more sustainable community. With the creation of the Mayor's Office of Energy & Sustainability, the City is now better positioned to expedite the implementation of activities to reduce energy use and costs for both the government and the community at large. Since the creation of the Office, the City has completed a comprehensive GHG emissions inventory, installed more than 100 Big Belly solar trash compactors and recycling bins around the City, developed a municipal energy conservation policy, and is working to become an electric vehicle ready community.



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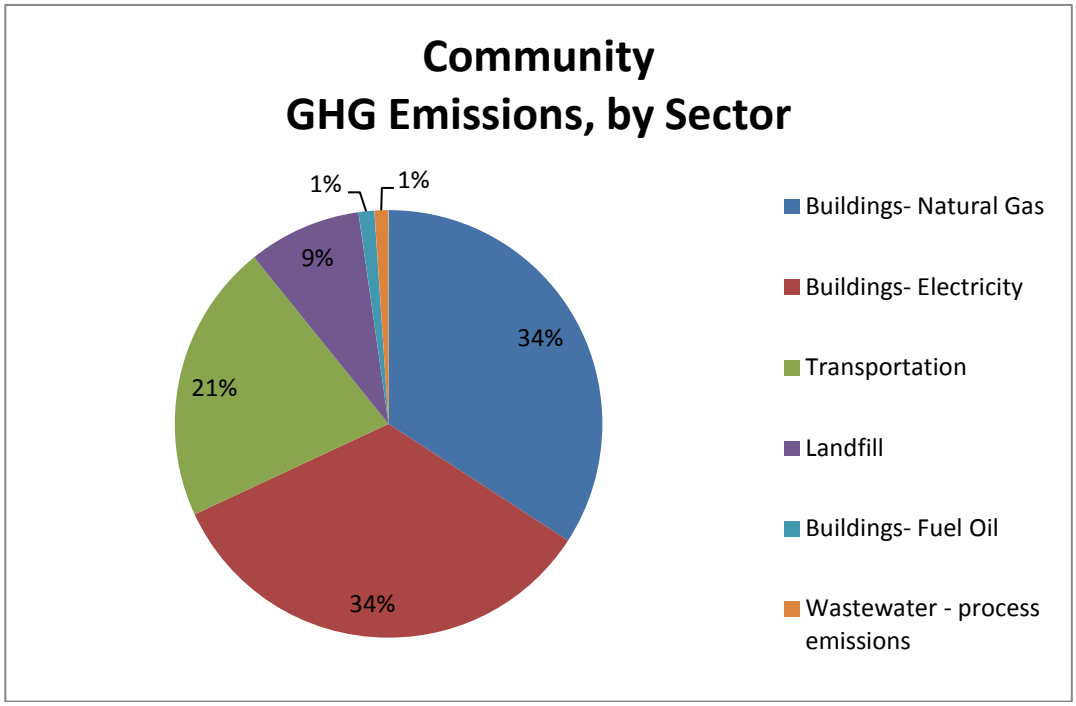
Greenhouse Gas Emissions Inventory Overview

In 2010, the City of Albany completed its first comprehensive assessment of greenhouse gas (GHG) emissions from both government operations and community wide. The GHG inventory analyzes the various sources of GHG emissions from the community, including energy used in buildings and transportation; methane emissions from the solid waste landfill; and emissions from wastewater processes. The details of the community inventory are presented below in various tables and pie charts.

Sectors	Total GHG Emissions (Metric Tons CO_2e)
Buildings- Natural Gas	445,963
Buildings- Electricity	441,764
Transportation*	276,097
Landfill*	111,514
Buildings- Fuel Oil	15,550
Wastewater - process emissions*	13,797
TOTAL	**1,304,685**

*Emissions from the Transportation, Landfill, and Wastewater sectors were calculated utilizing a Scope 1 methodology, which incorporates all emissions generated within the boundaries of the City, regardless of who is responsible for them and excludes emissions from sources outside the City's boundaries even if the City is responsible for them.



City of Albany Greenhouse Gas Emissions Forecast for 2030

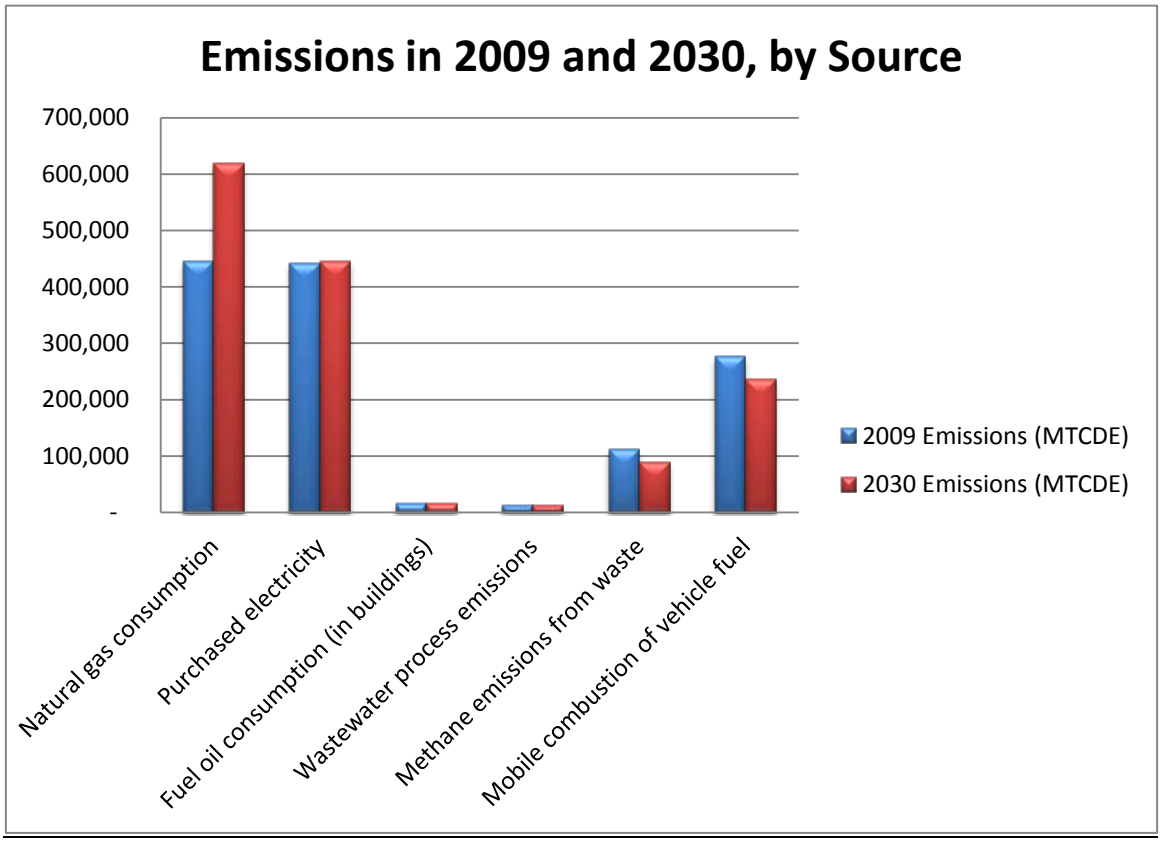
As the City works to complete its Albany 2030 Comprehensive Plan, it is helpful to forecast the City's future GHG emissions for 2030 as well. Using the 2009 emissions as a benchmark for future emissions, this forecast was developed to provide an estimate of GHG emissions given a Business As Usual (BAU) scenario for the year 2030.

The sources of GHG emissions included in this forecast are:

- Consumption of natural gas
- Consumption of fuel oil (used in buildings)
- Electricity purchased from the grid
- Combustion of vehicle fuel
- Methane from decomposition of waste in the landfill
- Process and fugitive emissions from wastewater treatment

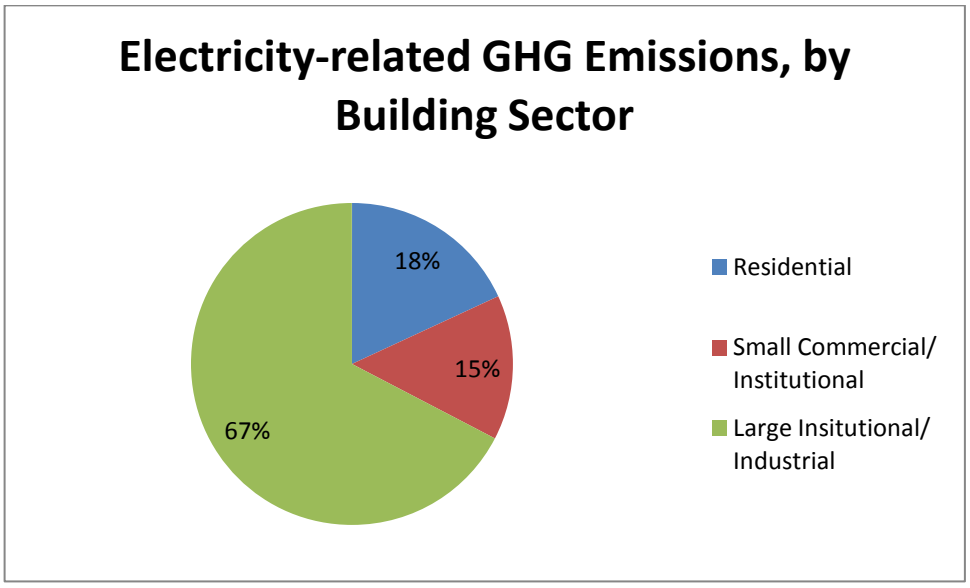
The result when totaling emissions from all sectors is an overall 9% increase in emissions for 2030 under a BAU scenario. The BAU scenario assumes that there will not be significant policy, programmatic, or technical changes in any of these sectors that would impact consumption of energy, volume of wastewater treated, or vehicle use, other than standard population growth, anticipated changes in vehicle fuel efficiency, and the regional energy profile. The only exception to this is that this scenario has incorporated the City's goal of a 65% waste diversion rate, which would reduce the overall amount of waste that ends up in the Rapp Road Landfill. The following table and chart shows the detailed results.

City of Albany 2030 Emissions Forecast			
Sector	**Source**	**CY 2009 CO2e (metric tons)**	**Projected CO2e (metric tons) for 2030**
Buildings and Facilities			
	Natural gas consumption	445,963	619,889
	Fuel oil consumption	15,550	15,550
Wastewater			
	Process and fugitive emissions	13,797	13,812
Transportation			
	Mobile combustion of fuel	276,097	237,443
Landfill			
	Methane emissions from waste decomposition	111,514	89,211
Buildings and Facilities			
	Purchased electricity	441,764	446,182
TOTAL		**1,304,685**	**1,422,087**


Emissions in 2009 and 2030, by Source
700,000
600,000
500,000
400,000
300,000
200,000
100,000
-
Natural gas consumption
Purchased electricity
Fuel oil consumption (in buildings)
Wastewater process emissions
Methane emissions from waste
Mobile combustion of vehicle fuel
2009 Emissions (MTCDE)
2030 Emissions (MTCDE)

Buildings

Electricity, natural gas, and fuel oil consumption in buildings was responsible for 903,226 metric tons of CO_2e in 2009. The dominance of the buildings sector (69%) in the community inventory reflects the fact that Albany possesses a large number of state government buildings, hospitals, universities, and other institutions that emit large quantities of greenhouse gas emissions. Based on data provided by National Grid, 67% of building electricity demand is consumed by the city's largest institutions and industries, while 18% is attributed to city residences. The results highlight the importance of addressing community energy efficiency and renewable energy opportunities in Albany's upcoming sustainability plan. The City will need to work in collaboration with institutional and commercial partners to design, resource, and implement sustainability programs to address energy needs.



Mitigation

Strategy	Action
1) Create a baseline inventory of greenhouse gas (GHG) emissions that identifies all sources of energy and GHG emissions from government operations and the community as a whole. Use the inventory as a benchmark to track progress towards GHG reduction goals.	
2) Incentivize energy-efficiency and renewable energy technologies in construction and rehabilitation projects.	a. Require all new housing built or rehabilitated with public-private funding be LEED Certified or meet some other minimal level of energy-efficiency.
	b. Create tax-rebates or incentives to encourage residents to replace older, inefficient appliances (e.g., refrigerators, toilets, heaters) with new Energy-Star appliances.

	c. Update building codes to reflect the latest in energy-efficient building code standards for new and rehabilitated housing , including cool roofs. (e.g., International Green Construction Code).
	d. Partner with local utilities (e.g., National Grid) or non-profits to offer low-cost energy audits and services (e.g., weatherization) to Albany residents.
	e. Develop municipal renewable energy pilots to showcase and educate the public and development community about the feasibility and benefit of renewable energy.
	f. Develop lighting standards that promotes energy-efficiency, reduces light pollution, while providing adequate lighting for safety.
3) Reduce energy consumption in municipal operations.	a. Implement the Green Fleet Program, which aims to replace 10% of the City's gasoline or diesel vehicles with alternative fueled / hybrid vehicles by 2030.
	b. Develop a Municipal Facility Energy-Efficiency Plan that includes energy audits and a multi-year phasing and funding plan to retrofit municipal buildings with green building practices, such as energy efficient lighting, Energy Star appliances, green roofs, recycled materials, and renewable energy sources.
	c. Incorporate green building practices in all new construction and renovation projects for municipal buildings.
	d. Explore all options for renewable energy systems at City of Albany properties and facilities and implement demonstration projects.
	e. Develop and implement a Green IT program.
4) Develop an education program to communicate the City's energy and sustainability goals and accomplishments to residents, businesses, and institutions.	a. Establish a community liaison committee within the Office of Energy and Sustainability comprised of neighborhood leaders, business leaders, and institutional leaders to communicate the City's energy and sustainability goals and objectives.

Adaptation

Strategy	Action
1) Increase resilience of housing stock to impacts of climate change	a. Work with utilities and communications service providers to develop a long-term plan to address the projected climate change impacts on the existing communications infrastructure.
	b. Investigate the potential benefits of forming mutual insurance pools to spread the risk of climate change.
2) Promote the use of historic tax credits and state and federal green building incentives to encourage rehabilitation and reuse of historic buildings	a. Develop a vulnerability assessment to identify areas most prone to the impacts of climate change.

Transportation

Transportation is the second largest GHG sector in Albany accounting for 21% of the total community inventory. The Transportation sector generated 276,097 metric tons of CO2e from 621,062,681 vehicle miles traveled. This includes emissions from gasoline and diesel of all private, commercial, and public on-road cars, vans, buses, trucks, and heavy-duty vehicles. Vehicle miles traveled were only calculated for trips within the City of Albany. The inventory does not account for emissions from vehicles commuting into the city from neighboring municipalities. The large impact of transportation indicates that there is plenty of opportunity for the City to reduce its emissions through planning for and around public transit and alternative modes of transportation.

Mitigation

Strategy	Action
1) Integrate planning for transportation and land use by coordinating transportation planning decisions, policies and strategies to be supportive of the land use vision.	a. Review all new development from a transportation perspective to ensure adequate roadway facilities, and to advance the implementation of facilities for pedestrians, cyclists, transit and other alternatives to the automobile.
	b. Use zoning to promote mixed use and transit-oriented development around transit hubs and along transit corridors, such as neighborhood commercial centers, the downtown, and along bus rapid transit (BRT) corridors.
	c. Promote patterns of land uses, such as clustered development and mixed-use zoning that encourage maximum potential for pedestrian and bicycling mobility throughout the city and reduce automobile usage.
	d. Develop a Complete Streets program including design standards, land use plans, and zoning regulations that provide the highest level of integration between pedestrians, cyclists and transit riders as appropriate based on the surrounding land use and street types. Adopt Complete Streets legislation that would address the retrofit of existing and design of new and reconstructed roadways.
	e. Incorporate new transportation modes into redesigned streets, such as electric cars, mopeds and other types of personal mobility devices.
	f. Implement “green streets” as part of a Complete Streets program, including porous pavement treatments, street trees, rain gardens, bioswales, and other such techniques. This can be incorporated into a Green Infrastructure plan for the city.
	g. Consider climate vulnerabilities when installing new or rehabilitating existing transportation infrastructure.
2) Maintain and improve the existing sidewalk network to increase safety and provide connections between residences, schools, transit, activity centers, work, and public facilities for persons of all ages and abilities.	a. Develop a pedestrian plan for the City of Albany, including a citywide sidewalk inventory, implementation plan, and design standards as part of the Complete Streets program.
	b. Implement a Safe Routes to School program, which enables community leaders, schools and parents to improve safety and encourage more children to safely walk and bicycle to school. See www.saferoutesinfo.org for more information.

	c. Improve street crossings to meet the safety standards of the Manual on Uniform Traffic Control Devices (MUTCD), local and state regulations, and the American with Disabilities Act. Standards would include elements such as crosswalks, lighting, median refuges, corner sidewalk widening, ramps, signs, signals and landscaping. Give priority to intersections near schools, senior housing, community and senior centers, parks and transit stations and stops.
3) Promote and implement the Bicycle Master Plan.	a. Work cooperatively with the CDTC, New York State Department of Transportation (NYSDOT), Capital District Transportation Authority (CDTA), and neighboring communities to coordinate development and implementation of the bikeway network.
4) Connect to regional trails.	a. Improve key connection points from the bicycle and pedestrian network to greenways including connections to the waterfront, to the Mohawk Hudson trail, the Patroon Creek Multi-use trail, and replacement of the Livingston Avenue Bridge.
5) Employ transportation demand management techniques to improve transit choices, including the use of incentives	a. Create Transit Oriented Development (TOD) overlay districts along existing and proposed transit corridors (such as BRT routes) to encourage mixed use development with higher densities, reduced parking, and walkable streets. Work with neighborhood associations to determine the appropriate density levels and mix of uses as well as appropriate locations for TOD.
	b. Work with CDTA and CDTC to promote and advertise the use of transit, including new routes, financial incentives, and the use of alternates to auto commuting through park-and-rides and BRT services.
	c. Evaluate, as part of the citywide parking strategy, incentivizing transit use through changes to parking fees that would encourage a shift from driving to riding transit.
	d. Promote CDTC's iPool2 carpooling system, to promote ridesharing and explore the feasibility and/or development of transportation management associations with large employers or groups of employers, perhaps through a Business Improvement District or other existing or proposed entity.
	e. Create incentives to single-occupancy vehicle commuting.
	f. Implement a car-sharing program within the City of Albany to reduce the fleet of vehicles required for City employees.
	g. Work with CDTA to promote the Transportation Demand Management website under development with completion expected in Fall 2011.
	h. Free or discounted parking for occasional use for people carpooling, vanpooling or taking transit to work.
6) Increase transit connectivity between and among City neighborhoods, employment centers, educational facilities, health facilities, and recreation facilities.	a. Work cooperatively with the CDTA in their effort to restructure transit routes in Albany.
	b. Improve the access to and attractiveness of bus transit facilities, including sidewalks, shelters, signage, etc.
	c. Ensure all transit facilities and bus equipment are fully accessible to persons with disabilities or special needs and ensure the adequacy

	of demand responsive systems for those unable to use regular public transportation.
7) Explore transit expansion options.	a. Support the operation of the Route 5 BusPlus, the CDTA's first BRT route, which will provide service between Albany and Schenectady along Central Avenue. Significant improvement and investment in this corridor is programmed, including new vehicles, stations, park and ride lots, transit signal priority, and potentially off-board fare collection (CDTC TIP).
	b. Encourage the development of additional BusPlus routes throughout the City and to regional destinations, including along Western Avenue, as well as connecting the Albany, Schenectady, and Troy city centers.
	c. Support the development and implementation of the federally-designated high speed rail Empire Corridor, extending from New York City to Albany to Buffalo, with a priority on the New York City to Albany route.
	d. Investigate potential opportunities for light rail connections to growing suburbs, city centers and regional activity centers. Explore funding sources and feasibility.
	e. Determine the feasibility of reestablishing streetcar lines along highly-traveled city routes.
8) Promote efficient, hybrid, or alternative-fueled vehicles.	a. Promote the use of alternative vehicles, where appropriate, in transportation plans, including facilities for plug-in electric vehicles on streets and in parking facilities.
	b. Encourage alternative vehicle use through programs such as priority parking and use of high-occupancy vehicle lanes.
	c. Incorporate alternative-fueled vehicles into the city fleet.
9) Connect land use patterns and the transportation network to maximize transportation efficiency and reduce automobile dependency.	a. Prioritize land use investments (i.e., vacant and abandoned properties acquisition and redevelopment) along transit corridors.
10) Create multi-modal design guidelines. Use urban design standards and guidelines as a way to support alternative modes of transportation (pedestrian, bicycle and transit).	a. Allow for mixed-use, compact development to minimize distances and accommodate walking, biking, and transit connections between neighborhoods, jobs, school, and commercial activity.
	b. Require build-to lines, which are flexible based on scalable indicators such as building height, right-of-way and sidewalk width, along transit corridors, downtown, in neighborhood commercial areas, the waterfront, and other areas as appropriate to enhance the pedestrian experience.
	c. Require parking to be located behind or to the side of buildings where feasible to enhance the pedestrian experience. Where it is not feasible to locate parking behind buildings, require decorative screening.
	d. Require alternative transportation amenities and parking (e.g. bike racks, bike lockers, bus shelters, crosswalks) for projects that meet designated thresholds.
11) Improve road infrastructure and reduce congestion.	a. Investigate the benefit of utilizing heat resistant construction materials for pavement in preparation for climate change.

12) Improve public access to waterways.	a. Develop and improve existing pedestrian and bicycle connections to the Corning Preserve and the Mohawk-Hudson Bike Trail from Downtown and adjacent neighborhoods (e.g., Broadway, Colonie Street). Ensure that Albany's waterfront is linked to the future convention center site.

Adaptation

Strategy	Action
1) Modernize the port to accommodate increased demand and increase resilience regarding future climate change impacts.	a. Support the implementation of the recommendations of Port Master Plan, including the potential increase in open storage space for project cargo, steel or other cargo. Alternatives for creating this space would include the current Cargill Salt leasehold and/or site 11 if the ethanol lease does not eventuate, or the current Hudson River Recycling (HRR) site.
	c. Preserve industrial waterfront uses in the vicinity of the port to allow for future expansion if necessary.
	d. Support implementation of programmed CDTC TIP elements including security improvements, operational improvements and maintenance dredging, freight wharf and dock repairs, and the bio fuels transfer facility.
	d. Encourage the use of heat resistant construction materials for pavement and rail tracks in preparation for climate change.
2) Improve connections between neighborhoods and recreation facilities. Provide parks, public spaces, recreation and community centers within walking distance of each neighborhood.	a. Use service areas for existing parks, public spaces, recreation and community centers (i.e., ½ mile walking distance) and prioritize neighborhoods in need of facilities based on mapping.
	b. Partner with public and private schools to share resources and increase or allow community access to school playfields and recreational facilities where appropriate.
	c. Develop partnerships with private and non-profit organizations to fund recreational facilities.

Solid Waste

Methane emissions from the Rapp Rd landfill account for 111,514 metric tons, or 9% of the total community GHG baseline inventory for 2009. Because Rapp Rd is the only landfill inside the city boundary, and because it is owned by the City, the emission number reported here is the same as reported and discussed in the City's local government operations inventory. Emissions are associated with waste collected and processed by the City from all over the Capital District. In future inventory years, as a policy tool, the City will also attempt to extract and report emissions from municipal solid waste generated only by Albany City residents. This will enable the City to better track the impact of waste reduction measures.

Mitigation

Strategy	Action
1) Maintain and expand waste reduction, reuse and recycling efforts, as set forth in the SWMP Modification.	a. Appoint a Planning Unit Recycling Coordinator (PURC) as an area-wide resource to promote waste reduction and recycling, monitor compliance with municipal recycling ordinances, provide assistance in applying for available grant funding, and compile annual information about recycling program achievement in each municipality.
	b. Continue to conduct commercial waste inspections to determine presence of excess recyclables.
	c. Work with the Cornell Cooperative Extension or the city's Department of General Services to provide a discount to residents to purchase composters. In exchange, the residents would need to attend a class on recycling and composting to reduce household waste disposal.
	d. Enhance backyard composting, organic waste recycling and yard waste management throughout the Planning Unit.
2) Explore alternatives for solid waste reduction and disposal.	a. Create incentives for reducing solid waste disposal. As recommended in the SWMP, explore the effectiveness and feasibility of pay-as-you-throw programs, or volume-based disposal charges to create financial incentives for waste reduction and recycling.
	b. Develop a building and construction material reuse and recycling program. Currently, the Town of New Scotland is the only community in the Planning Unit to provide for recycling of construction debris.
	d. Adopt policies to reduce office waste in municipal offices (e.g., double sided printing, electronic filing).
	e. Expand alternatives which recover energy from waste, such as the current methane power generation at the Rapp Road Landfill.
	f. Increase the percentage of demolition material diversion required as part of demolition permit approval and develop a compliance tracking system. Develop a pilot building deconstruction or green demolition program. [Best practice: http://www.buffaloreuse.org/GreenDemolition]
	g. Implement single-stream recycling for residents.

Water/Wastewater

In 2009, 1,034 million gallons of wastewater from Albany was treated in an aerobic digester process at the Albany County Sewer District. Although aerobic, the treatment process produces some residual CH4 (methane) and N2O (nitrous oxide) emissions (21 times and 310 times the global warming potential of CO2 respectively). The process CO2e emissions from wastewater treatment are 13,797 metric tons. Electricity consumption by the wastewater treatment facility is accounted for in the buildings portion of the community inventory.

Although wastewater process emissions are small, this is still an important area to mitigate. The City and its residents pay by volume of wastewater treated, much of which is stormwater sent via combined storm and

sewer system. Working to reduce outflow through the climate adaptation component of the City's sustainability plan will not only reduce emissions, but will also save money and reduce pollution to the Hudson River.

Albany's water system is gravity fed so there are no direct emissions associated with moving water through the system.

Water

Mitigation

Strategy	Action
1) Encourage water conservation	a. Set city-wide department targets for reducing water use in public facilities and buildings. (Note: to be updated based on Climate Action Plan recommendations for targets)
	b. Develop standards for new construction and rehabilitation projects to require the use of high-efficiency toilets and low-flow fixtures.
	c. Investigate the feasibility of utilizing the City's gravity fed water and sewer system for renewable energy generation.
	d. Develop a citywide comprehensive drought management plan, including the monitoring of water supply storage levels.
	e. Partner with public schools, universities, other institutions, and businesses to reduce water use through conservation measures (e.g., reducing the need for landscape watering through native landscaping or rain gardens, replacing older toilets and bathroom fixtures to improve efficiency).
	f. Develop a marketing campaign and/or incentives to encourage residents to reduce water consumption, install high-efficiency fixtures and appliances, and shift high water use activities (e.g., washing clothes, dishwashing) to non-peak hours.

Wastewater

Mitigation

Strategy	Action
1) Encourage water conservation.	a. Work with the Albany Sewer District and Albany Water Board to explore the potential for a Reclaimed Water Program. Reclaimed water is wastewater that is treated and distributed for non-potable use (safe for anything but drinking water). This water is often available at a significantly lower rate than potable water.
	b. Revise building codes to allow the use of greywater recycling systems (i.e., untreated household wastewater from showers, bathroom sinks, washing machines) for irrigation and other non-potable uses.

Water/Wastewater

Adaptation

Strategy	Action
1) Create a green infrastructure system as an alternative to "grey" (engineered) infrastructure in order to better absorb stormwater runoff and filter pollutants.	a. Develop a green infrastructure plan that sets targets for reductions in impervious surfaces and stormwater sewer inputs. As part of the plan, establish a "toolbox" of green infrastructures techniques (green streets, permeable pavers, green roofs, bioswales, riparian buffers, tree plantings, etc.) that can be implemented to achieve targets, and other techniques identified in the New York State Stormwater Management Design Manual.
	b. Develop stormwater management demonstration projects (e.g., "green streets" with new street trees, tree trenches, permeable pavers, and modified stormwater inlets) in target locations such as parking lots, residential streets, and parks and measure performance in absorbing runoff.
	c. Pilot a "green neighborhood" through the development of a comprehensive green infrastructure system as part of new and redevelopment activities.
2) Incorporate green infrastructure strategies in the Long Term Control Plan to mitigate the water quality impacts of combined sewer overflows (CSO's).	a. Implement New York State Best Management Practices (BMPs) for combined sanitary and storm sewers. Include BMPs that reduce stormwater runoff, restore wetlands, improve riparian corridors, and reduce costs associated with CSO solutions.
	b. Implement phased strategies to reduce stormwater runoff and ultimately eliminate CSOs, comply with New York State water quality standards, and Clean Water Act requirements. Potential strategies include new street trees, underground cisterns, green roofs, and rainwater capture.
3) Reduce impermeable surfaces through land development regulations.	a. Allow for impermeable pavements to be used in low-volume traffic areas, such as driveways, parking lots, and alleys.
	b. Establish impervious coverage (buildings and pavement) limits for large scale developments and in areas located in proximity to natural features such as waterways, floodplain, habitat preserves, and steep slopes.
	c. Where appropriate, allow reduced road widths and reduced and alternative parking strategies, such as shared parking, off-site parking, and allow on-street parking to count toward parking space requirements.
	d. Explore the potential for a fee structure for stormwater management that determines fees by calculating the amount of impervious cover on a given property, providing a financial incentive to develop or retrofit properties with green infrastructure practices that reduce impervious cover.
4) Control sources of negative environmental impact (e.g., construction runoff, illicit discharges, nonpoint source pollutants, etc.).	a. Strengthen development standards to minimize site disturbance during construction near sensitive environmental areas such as waterways, steep slopes, and natural habitat. In general, Albany's waterways are located in highly developed areas where urban runoff from construction, past and current industrial activities, residential and commercial development, and golf courses are a concern.

	b. Partner with parks and recreation providers (e.g., Albany Department of Recreation, golf courses, universities, and public schools) to reduce use of potentially harmful chemical fertilizers near waterways and reduce stormwater runoff into waterways.
5) Use zoning and environmental review as a tool to protect river and stream corridors.	a. Enforce the Stormwater Management and Erosion Control section of the Albany code (§133-100) which requires a stormwater pollution plan (including means of controlling erosion from construction) for all activities subject to subdivision and/or site plan review.
	b. Require native vegetation to be planted in landscape buffers and setbacks from river and stream corridors.
	c. Continue to use the site plan review process to review proposed developments for any potential impacts on river and stream corridors.

Economy

The City of Albany's economic system needs to provide a wide range of jobs capitalizing on the diverse skills offer today while, at the same time, ensuring that the workforce and meet the needs of employers tomorrow. A vital economy engages individuals, businesses and organizations in working independently and together across the public, private and not-for-profit sectors and across regional interests to create a prosperous sustainable city.

Mitigation

Strategy	Action
1) Coordinate the city's economy development and energy / sustainability efforts to promote and incentivize "green" jobs.	a. Create pilot programs and job training materials to enhance the workforce's access to "green-centric" skills development.
	b. Examine City procurement practices to identify opportunities to include green criteria in selection guidelines.
	c. Streamline permitting and other regulatory procedures and provide incentives for buildings incorporating green improvements into their construction or renovation plans.
	d. Create an awards program to honor businesses that employ environmentally sensitive or green building practices.
	e. Identify funding mechanisms to establish a revolving loan fund for municipal and private energy related improvements
	f. Create a "green corps" to provide green job training to students and low-income residents. [Best Practice – Green Corps Chicago]

Adaptation

Strategy	Action
1) Target regional growth industries by leveraging area intellectual capital.	
2) Foster Coalitions and community-initiated economic development partnerships and initiatives that improve neighborhood livability and reinforce the goals set forth in the ReCapitalize Albany, neighborhood plans, and the Albany 2030 Comprehensive Plan.	
3) Improve connections between the downtown and the Hudson River waterfront and provide waterfront amenities.	a. Update the Local Waterfront Redevelopment Program (LWRP) to address access to the waterfront from downtown and adjacent neighborhoods
	b. Plan for the potential impacts of climate change, including the rise of the Hudson River, particularly during extreme storm events.
	c. Assess and target industries vulnerable to climate change, as well as those that will benefit, and develop policies to support economic adaptation and growth.

Social

A socially sustainable Albany supports more equitable distribution of resources, supports diversity within the community, meets the basic needs of residents, and invests in social and human capital, thereby sustaining the quality of life and community livability for all residents into the future.

Mitigation

Strategy	Action
1) Encourage and support a "sustainability curriculum" in primary and secondary schools to educate students about issues associated with civic responsibility, urban planning, and sustainability and climate change.	a. Develop a green technology park focusing on renewable energy production and innovative solid waste management technologies.

Adaptation

Strategy	Action
1) Enhance resiliency against natural events linked to climate change and that threaten the well being of the community.	a. Complete and implement the Albany Climate Adaptation Plan to anticipate ways the city will need to adjust its resource management, infrastructure, and land use planning incrementally to address both current climate variability and future climate change.
	b. Develop a citywide emergency response plan to anticipate and quickly respond to weather and other emergency events.
	c. Partner with the New York State Office of Emergency Management (OEM) to increase coordination between the City of Albany Police and Fire and Emergency Services Departments and the

	state and region.
	d. Identify populations most vulnerable to a changing climate and increase resilience in those populations.
	e. Assess emergency response plans in anticipation of climate change impacts and develop a city wide natural disaster response plan to anticipate and quickly respond to weather and other emergency events.
	f. Establish cooling centers in response to rising temperatures and more frequent and intense heat waves.
2) Create and maintain open lines of communication and cooperation between and among institutions.	a. Develop a regional government coordination group that includes representatives of the City of Albany, nearby municipalities, county, and state government to discuss regional trends, economic development, and other issues.
	b. Strengthen communication between institutions and City government and seek ways to collaborate on strategies (e.g., Brownfield redevelopment, preventative health measures, access to healthy foods, college/public school mentoring, etc.).
	c. Increase coordination and partnerships between universities and the City of Albany to support the City's sustainability and revitalization strategies (e.g., planning and technology departments of local universities and city departments).
3) Improve, develop and maintain communications infrastructure.	a. Partner with the New York State Office of Technology, communications service providers, the school district, and major institutions to expand wireless internet service for commercial, institutional and residential use throughout Albany and the Capital Region.

Natural Habitats

Albany's natural habitat support native or indigenous species of animals, plants or other type or organisms. The Albany Pine Bush Preserve, Corning Preserve and Tivoli Preserve are examples of natural habitat areas within City's boundaries. The City of Albany will work to protect, enhance, restore and expand the City's natural habitat areas.

Adaptation

Strategy	Action
1) Implement the Albany Pine Bush Preserve Management Plan.	a. Provide numerous mechanisms for information exchange, particularly between the Commission, the general public, area school districts, local governments, local fire districts, and adjacent private landowners.
	b. Continue encouraging public actions that benefit Preserve protection and management.

	c. Continue partnering with the APB Commission and the towns of Guilderland and Colonie to advance appropriate public use of, and access to, the Preserve and support for the Preserve's goals.
	d. Continue to explore the feasibility of linking the Albany Pine Bush Preserve with other formal paths and trails within the regional context through partnerships and/or access agreements with municipalities, institutions, and private businesses adjacent to the Preserve in areas where public access is desirable, but not currently available.
	e. Support the recommendations for areas designated for full protection, partial protection, and open space. Work with the APB Commission, county and towns to review development proposals for property within these areas to ensure that development will not have a direct adverse impact on the Albany Pine Bush Preserve.
2) Limit encroachment into habitat areas through land use controls.	a. Continue to use the LC Land Conservation Zoning District to designate nature preserves, parks and recreation areas, and wildlife sanctuaries.
	b. Revise the City's Site Plan review standards to require a landscape buffer and building setback for properties adjacent to properties in the LC Land Conservation District.
	c. Include clear guidelines for applicants and the Planning Board to protect natural habitats.
3) Restore and maintain high quality natural habitats.	a. Partner with non-profit environmental groups such as the Friends of the Pine Bush to encourage participation in ecological management and restoration activities (e.g., removal of invasive species, clean-up days, replanting native species, steep slope stabilization).
	b. Continue to work with preservation/neighborhood groups such as Inner City Outings and the Arbor Hill Environmental Justice Corporation to clean up and revitalize the Tivoli Preserve.
	c. Plan for the potential impacts of climate change on the City's natural habitat areas, including an increase in invasive species and a potential shift in biotic communities. *(Note: will include update with the next phase of the Climate Action Mitigation Plan*).
	d. Investigate the potential of utilizing wetlands mitigation and violation banking as a mechanism to fund waterfront and estuary projects.
4) Use the Pine Bush Discovery Center and the W. Haywood Burns Environmental Education Center as resources for promoting habitat protection.	a. Continue to promote and expand the use of educational programming and special events (e.g., land preservation fundraising events, educational events) at the LEED-Gold Certified Pine Bush Discovery Center. Educational events can raise awareness of the sustainable building techniques used in the design of the building itself and the benefits and opportunities for increased habitat protection. In addition, consider renting out the facility for special events in an effort to increase fundraising for habitat protection.

	b. Develop a master plan for the Tivoli Preserve for its long-term use as an outdoor environmental preserve classroom and green job training center, as recommended in the Albany NY SDAT Report. Include a strategy for ongoing maintenance that involves residents, schools, and nearby institutions to ultimately reverse the problems the Tivoli Preserve has faced over the years and integrate it into the larger Patroon Greenway and Regional Open Space Plan.
	c. Participate in marketing efforts (e.g., promotion on the City's website, social media sites) to raise awareness of the City's nature preserves and volunteer opportunities at Albany's nature preserves.

Food and Health

For the City of Albany to achieve its goals of sustainability it must promote and support local food production as an economic development tool but as an opportunity to bring healthy and fresh foods into underserved areas of the City.

Adaption

Strategy	Action
1) Support local food production as a means of economic development and local food security.	a. Promote and incentivize community gardens, rooftop gardens, farmers markets, and urban farms. Increase access to local farmers markets and increase participation by farmers through a year-round marketing campaign.
	b. Develop a partnership between farmers markets and institutions (e.g., Albany School District, hospitals, and universities) where institutions agree to purchase local products to support regional agriculture.
	c. Revise zoning to permit agricultural uses and markets in commercial or industrial zoning district, with appropriate performance standards to minimize any potential negative impacts.
	d. Develop an Urban Agricultural Plan to support efforts to grow and consume more fresh, sustainably produced, and locally grown foods within the city, increasing community health, economic diversity, and local food security.
	e. Develop an urban farm demonstration project.
	f. Work with Normanskill Farm to develop demonstration projects for gardening and composting.
2) Increase access to healthy food options for all neighborhoods.	a. Encourage local restaurants and stores to carry and use locally-sourced fresh produce, dairy and meat
	b. Improve transit access to grocery stores and farmers markets.

Land Use

Community sustainability requires a transition from poorly-managed sprawl to land use planning practices that create and maintain efficient infrastructure, ensure close-knit neighborhoods and sense of community, and preserve natural systems. The City of Albany's goal is to promote the development of balanced future land use patter than supports safe, livable neighborhoods and a vibrant urban center.

Adaptation

Strategy	Action
1) Develop a Future Land Use Framework Map to guide land use decisions.	a. Update the City's existing land use data for use in Comprehensive Plan implementation. The City's GIS parcel layer has incomplete land use data for some parcels. The data should be updated to provide the most accurate and current depiction of existing land use.
	b. Revise the zoning ordinance and map to be consistent with the future land use framework map and related strategies and actions. This may include creation of new zoning or overlay districts, elimination of existing zoning districts that are obsolete or ineffective, and rezoning of areas of the City to existing or new districts.
	c. Establish criteria to guide land use decision-making (e.g., fiscal costs/benefits and impacts on the tax base; coordination with transportation investments; provision of needed neighborhood services, etc.)
	d. Future land use map should take into account changing land patterns due to climate change (i.e. updated FEMA maps, waterfront areas, areas prone to flooding, etc.)
	e. Assess areas vulnerable to climate change and incentivize development away from floodplains and other vulnerable areas.
2) Connect land use patterns and the transportation network to maximize transportation efficiency and reduce automobile dependency	a. Investigate best practices and the potential benefits of forming mutual insurance pools to spread the risk of climate change.
	b. Use zoning to promote mixed use development in neighborhood commercial centers, the downtown, and along transit corridors.
	c. Prioritize land use investments (i.e., vacant and abandoned properties acquisition and redevelopment) along transit corridors.

Urban Forest

The urban forest plays an important role in the City of Albany it filters the air, water and sunlight as well as provides shelter to animals. The Urban forest moderates local climate change, slows wind and stormwater, provides shading to home and businesses that helps conserve energy. It is important for the future of the City of Albany that the Urban Forest be maintained and protected.

Adaptation

Strategy	Action
1) Develop an urban forestry program to increase and maintain the health of Albany's tree canopy.	a. Measure the existing tree canopy, quantify its current CO2 sink capacity as a means of climate change mitigation, and set a canopy coverage goal for the next ten years.
	b. Update Urban Forest Management Plan to include best practices for increasing and maintaining the City's urban tree canopy, including replacing aging and diseased trees, and planting species resistant to pests and disease, and are low-pollen producers. Consider i-Tree or other tools to build capacity for urban forest assessment and management.

	c. Set targets for planting trees in parks, along streets, and in sensitive environmental areas (e.g., riparian corridors and areas with steep slopes) based on the existing inventory.
	d. Partner with community garden groups and others interested in neighborhood greening to increase participation in Albany's Street Tree Planting Program.
	e. Develop a tree maintenance program that utilizes volunteer services in partnership with universities, Capital District Community Gardens (CDCG), and/or other neighborhood groups. The program could be modeled after Ithaca's volunteer Citizen Pruner program, which provides free training to volunteers in exchange for a commitment to assist the City Forester with maintaining trees and other special projects throughout the City.
	f. Disseminate information on the benefits of the urban forest and best practices for planting and maintenance. For example, shading from trees reduces the urban heat island impact, cooling demands, and heat related illnesses.
	g. Identify neighborhoods vulnerable to heat-related impacts of climate change and assess existing and needed street tree coverage.
2) Use zoning and environmental review as a tool to protect the urban forest.	a. Adopt a tree preservation/landscape ordinance that limits disturbance to existing trees and vegetation, requires replacement of trees above a specified size that are removed (e.g., equal caliper inch replacement), and includes provisions requiring native trees and plants be retained in sensitive environmental areas (e.g., floodplains, steep slopes).
	b. Adopt landscape standards requiring new trees and landscape materials as part of the site plan review process.

Glossary of Terms

Alternative Fueled Vehicle: A vehicle that operates on a non-traditional fuel, including natural gas, electricity, propane, biofuels, compressed air, or hybrid power systems.

Bus Rapid Transit (BRT): A bus line that offers quicker and more efficient service along a line, typically through reduced stops and timed traffic lights. CDTA's 905 line is the only line currently in operation in the Capital District.

CDTA: Capital District Transportation Authority, operator of Albany's bus system.

CDTC: Capital District Transportation Committee, the regional Metropolitan Planning Organization (MPO).

Climate Change: A change in regional weather patterns as a result of a fluctuating greenhouse effect or other factors.

Combined Sewer Overflows (CSOs): Many older cities, including Albany, do not have separate sewer and storm water systems. During rain storms the stormwater enters the sewer system, and if heavy enough can force the City's wastewater plants to discharge excess sewage into the Hudson River.

Complete Streets: Streets that are designed to be used by all modes of traffic equally, including vehicles, bicycles, and pedestrians.

Greenhouse Gas (GHG): Atmospheric gases that absorb or re-radiate solar radiation. In excess they have been shown to increase the temperature of the planet. GHGs include carbon dioxide (CO_2), methane (CH_4), and water vapor (H_2O).

Greenhouse Gas Inventory: A comprehensive overview of the GHG emissions by a municipality, population, or organization.

Greywater: Wastewater that is reused for irrigation and other uses. Greywater typically originates from laundry, bathing, and dishwashing and does not use water that has come into contact with human waste (blackwater).

LEED Certification: Leadership in Energy and Environmental Design. A building can receive certification by the U.S. Green Building Council (USGBC) if it is constructed or rehabilitated and meets the USGBC's standards for sustainable design and construction techniques.

Single Stream Recycling: A method of collecting recycling where all recyclables are collected in one container, eliminating the need to separate each type at the source. Separation is done later at a dedicated facility.