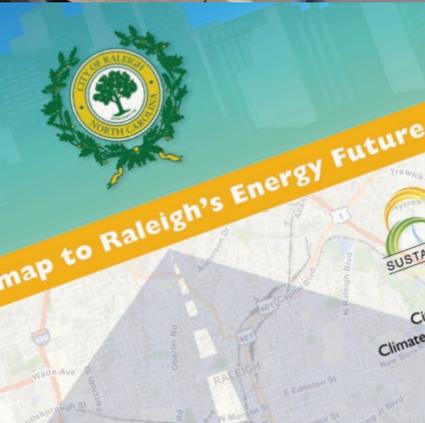




LED lighting; LINE, Raleigh's free bus service around town on hybrid electric buses; Daily Solar Trash Compactor at the corner of Salisbury and Lenoir streets, which holds four times as much trash as regular containers and is powered by solar energy; Electric vehicle charging stations at 614 S. Salisbury Street, powered by two solar panels providing 2.88 kilowatts of electricity; Progress Energy Center for the Performing Arts at 2 E. South Street, a Depression-era building that has been redesigned with LED lighting, occupancy sensor lights and low-flow plumbing, and uses "green" cleaning supplies; Shaw University at 118 E. South Street, founded in 1865 and the first historically black college of the south; Marriott Hotel at 500 Fayetteville Street, an LEED-certified sustainable con-



# CITY OF RALEIGH SUSTAINABILITY REPORT 2013

## ACCORDING TO THE CITY COUNCIL'S MISSION STATEMENT ADOPTED IN JUNE 2008, "WE ARE A 21ST CENTURY CITY OF INNOVATION FOCUSING ON ENVIRONMENTAL, CULTURAL AND ECONOMIC SUSTAINABILITY." THIS LONG-TERM VISION CONTINUALLY FRAMES GOALS AND POLICY DECISIONS.

**AS A 21ST CENTURY CITY OF INNOVATION, RALEIGH IS CONCERNED WITH THE STANDARD OF LIVING FOR ALL CITIZENS.** Raleigh's recognized leadership is evident at the national level, and its efforts are reflected in the numerous awards and accolades it receives on America's *Best Cities* lists.

### **Nation's Most Sustainable Midsize Community**

The U.S. Chamber of Commerce lauded Raleigh with its 2011 Siemens Sustainable Community Award for "a range of factors including its commitment to developing a 'green economy.'" Specifically cited was the City of Raleigh's workforce development program to retrain workers with the skills necessary for employment in the green economy, and its leadership to accommodate electric vehicles.

Raleigh's internal focus on sustainability, resiliency and innovation is evident throughout each of the City's departments. Through many varied projects and initiatives, staff is committed to test new

technologies, evaluate policies and implement practices that save taxpayer dollars and reduce greenhouse gas emissions and energy consumption while establishing Raleigh as a national leader. Specific initiatives are outlined on pages 6-7. A \$3.82 million Energy Efficiency and Conservation Block Grant, from the U.S. Department of Energy as part of the American Recovery and Reinvestment Act, funded the Office of Sustainability's startup efforts and many of its initial programs.

Numerous external partners extend the City's sustainability efforts into the private sector and other public agencies. This comprehensive approach creates a positive synergy and provides opportunities to move the entire community forward in ways that would not otherwise exist.



To view sustainability "on the street," residents and visitors are encouraged to take the approximately 2-mile self-guided walking tour of Downtown Raleigh at <http://g.co/maps/v6rtv>.



Raleigh City Council, starting top left: Thomas Crowder, Bonner Gaylord, John Odom, Randall Stagner, Mary Ann Baldwin, Russ Stephenson, Mayor Nancy McFarlane and Eugene Weeks.

*America's Best City: Businessweek.com*

*#1 Best Places for Business and Careers: Forbes*

*#1 Healthiest Cities for Women: Women's Health*

*#2 Best Cities for Young Professionals: Forbes*

*#3 Best Cities for Raising a Family: 24/7Wall St.*

*Hottest Spot for Tech Jobs in the U.S.: DICE.com*

**T**HE CITY OF RALEIGH'S NATIONAL REPUTATION as a "sustainability hub of innovation" — embracing public-private partnerships and leveraging collaboration — reaps significant increased business investment, job growth and entrepreneurship in the growing green and creative economies.

**EXAMINING TOTAL COST OF OWNERSHIP INVESTS DOLLARS WISELY**

Extracting the best value from long-term public investments requires big-picture thinking. Better capital investments may cost more initially, but evaluating their return over a longer horizon provides opportunities to save taxpayer dollars and reduce wasted resources.

**SMALL BUSINESS IS BIG ECONOMIC FOCUS**

Small businesses play a vital role in the growth and development of Raleigh's economy, and the community continues to be a hot spot for small business innovation and development. The City's Economic Development Department partners closely with other Raleigh business-focused organizations to promote opportunities, connections and resources.

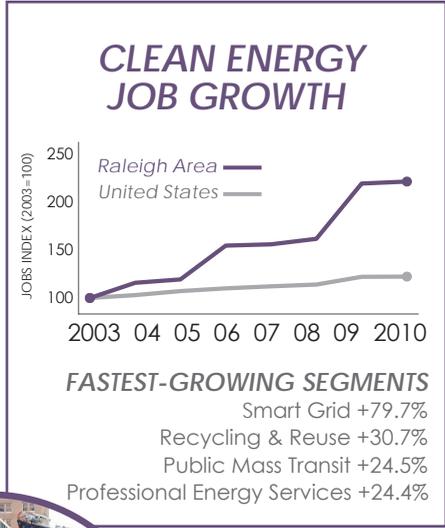
**INDIVIDUALIZING COST BENEFITS OF SUSTAINABILITY**

Through its leadership and willingness to explore technologies, the City of Raleigh helps quantify financial impacts of green decisions. Whether it's the energy savings return on simple weatherization techniques or the potential for reducing hard-earned money spent at the gas pump through the purchase of a plug-in electric vehicle, Raleigh helps individuals understand just how sustainability makes sense.

**EQUAL BUSINESS OPPORTUNITIES ARE A PRIORITY**

The City of Raleigh provides small disadvantaged minority and women-owned businesses equal opportunities to participate in all aspects of the City's contracting and procurement process. The goal is to award 15% to this group, with a sub-goal of 8% to minorities and 7% to women, for each project in construction contracts over \$100,000 and in general purchases.

*During fiscal year 2011-12, 48% of City of Raleigh purchase orders were fulfilled within Wake County, and 30% from within Raleigh.*



**CLEAN ENERGY JOBS POWER LOCAL ENTREPRENEURIALISM**

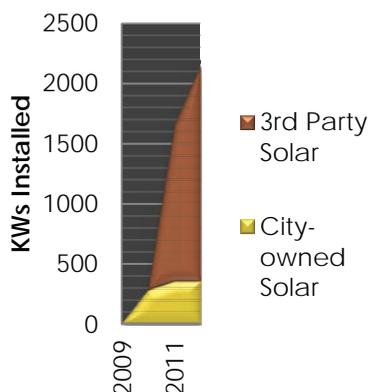
According to the North Carolina Sustainable Energy Association, 228 firms with activities in the solar energy sector account for approximately 1,900 full-time equivalent positions, or 13% of North Carolina's estimated 14,800 clean energy industry jobs.

These jobs are distributed throughout the solar energy supply chain with the majority of the jobs (~48%) in the installation, design, and developer field. The greater Wake County region boasts the most clean energy firm offices of any county in North Carolina at nearly 400 reported clean energy establishments.

One phenomenal success story comes from an individual who attended Raleigh's Green Building Training solar photovoltaic class. Building on the knowledge and relationships established in class, Capstone Civil Group employed more than 300 workers in the field for a year installing six utility-scale solar photovoltaic projects in North Carolina that will send power directly to the local utility provider. With more than 10 additional contracts in place for 2013, the firm plans to more than double its in-the-field workforce.

brockings.edu/metro/clean\_economy.aspx

### CITY OF RALEIGH SOLAR PV INSTALLATIONS



#### RALEIGH CONVENTION CENTER SOLAR ARRAY DISPLAYS ADVANTAGE

The LEED® Silver certified Raleigh Convention Center's 500kW rooftop solar array is the second-largest convention center solar array in the nation and the City's largest urban solar energy system. Covering approximately 60 percent of the roof, the 2,080 panels are expected to produce 750,000 kWh of electricity each year, roughly equivalent to the annual energy use of 70 homes in North Carolina.

This production reduces CO2 emissions by about 500 tons annually, the equivalent to eliminating CO2 emissions from about 100 passenger vehicles.

FLS Energy and PowerWorks Electric financed, engineered, built, own and operate the solar system. Progress Energy buys electricity generated by the array and uses it to serve its customers. FLS Energy is leasing the Convention Center rooftop space from the City for \$3,000 annually to operate the solar array, and the City will have an opportunity to purchase the array at the end of the lease agreement.



**T**HROUGH PROMOTION OF EMERGING TECHNOLOGIES, the City's renewable energy initiatives create job opportunities and cultivate local businesses and entrepreneurs, adding to Raleigh's energy security while saving the City money. This innovative synergy provides a resilient path to move the entire community forward.

#### PUBLIC-PRIVATE PARTNERSHIPS PAVE THE WAY

A combination of federal and state policy priorities, combined with the private sector's access to equity and ability to utilize available tax credits, created the perfect opportunity for Raleigh to advance its efforts with renewable energy at no cost to taxpayers. Working closely with Progress Energy, the City relies on private sector expertise to plan, design and install projects such as the 1.3MW ground-mounted solar photovoltaic Neuse River Solar Farm and the 500kW Raleigh Convention Center rooftop solar array.

#### RALEIGH'S RESILIENT ENERGY FUTURE

Raleigh's resilient future requires rethinking its reliance on existing power sources and distribution systems. The need for greater flexibility and better integration of renewable resources in the power grid is apparent. By participating in Rocky Mountain Institute's eLab research and pilot project, Raleigh is helping accelerate electrical innovation at the distribution edge. Investing in geothermal heating and cooling systems, solar thermal technology and recovering methane for profit expands the City's energy portfolio while providing a model for others.

#### EXPLORING AN ENERGY FARM

The City is exploring the feasibility of multi-purposing the Wrenn Road and Neuse River Wastewater Treatment Plant acreages, and the closed Wilders Grove landfill, into functional energy farms. Through its numerous partnerships, City leaders are taking a closer look at producing energy through small wind, biomass and harnessing effluent discharge while proceeding with biofuel crops and large-scale solar photovoltaic installations.

#### SMALL HYDRO POWERS TALK ABOUT FALLS LAKE POTENTIAL

City leaders are also evaluating the feasibility for small hydropower generation through Falls Lake water releases, potentially based on an outlet tower turbine concept as constructed at Jordan Lake.

*A diversified clean energy economy is vital to Raleigh's future.*

**T**HE CITY ENCOURAGES SUSTAINABLE INFRASTRUCTURE, including electric vehicle charging stations, affordable transit, bicycle lanes and greenway trails. Multi-modal transportation improves air quality; alternative fuel vehicles and innovative products encourage a cleaner and healthier environment for Raleigh residents and workers.

**CITY PROVIDES TRANSPORTATION LEADERSHIP**

Complete streets and universal access, coupled with advances in technology such as LED streetlights and bus-tracking apps, improve transportation choices. Raleigh strongly supports regional transportation initiatives, and prioritizes growth and investments based on strategic transit corridors. The free R-Line bus expands Downtown Raleigh access, and coordination of Capital Area Transit and Triangle Transit schedules enhances service. The City is also exploring electric buses, and the cutting-edge technology of Evatran — plugless, hands-free wireless charging infrastructure for electric vehicles.

**BICYCLE AND PEDESTRIAN PLANNING ON THE FAST TRACK**

From 2009 to 2012, Raleigh’s four miles of bike lanes grew to more than 22 miles; federal grant funds will increase the total by 40-50 miles. Expanding the award-winning greenway system, adding 70 bike racks downtown, and outreach helped the City earn bronze status as a Bike-Friendly City. Raleigh was chosen to host the inaugural North Carolina Bicycle Summit as recognition for its commitment to cycling. Raleigh’s new Pedestrian Plan identifies missing infrastructure and includes techniques and programs to encourage walkability. With public approval of the 2011 Transportation Bond, the City made an \$11-million commitment to adding sidewalks and repairing pedestrian infrastructure.

**FLEET OPTIMIZATION REVS SAVINGS**

Measures to optimize the City’s fleet operations include vehicle right-sizing; remote operations centers strategically positioned and stocked with alternative fuels; fuel consumption (rather than dollars) budget; pilots to test technologies such as propane fueling and anti-idling batteries; and an electronic motor pool to share vehicles.

*Sustainable transportation treats cars, bicycles, pedestrians and transit equally; providing easy mobility choices and alternatives improves public health and the environment.*

**FLEET VEHICLE ALTERNATIVE FUELS**

**26%**

of City fleet vehicles use alternative fuels as of 7/1/2012



**ELECTRIC VEHICLE INFRASTRUCTURE & OUTREACH SPARKS A NEW ERA**

Recognized as a global leader in the 2012 EV Casebook: A Look at the Global EV Movement by Center for Climate & Energy Solutions (C2ES), the City removed barriers to plug-in electric vehicle (PEV) adoption by addressing building codes, electrical codes and ordinances related to uniform standards, signage, parking and fees for charging. The City also streamlined permitting and inspections for resident EV supply equipment installation as part of Rocky Mountain Institute’s Project Get Ready.

Raleigh’s leadership role extends to the statewide PEV adoption taskforce, a collaborative working group examining barriers to PEV adoption and proposing solutions throughout North Carolina.

According to the Environment North Carolina report, **Charging Forward: The Emergence of Electric Vehicles and Their Role in Reducing Oil Consumption**, 11,810 North Carolina drivers could purchase their first plug-in vehicle by 2015. These vehicles could reduce the state’s greenhouse gas emissions by a minimum of 10,726 metric tons annually while reducing oil dependence in North Carolina by 2,770,278 gallons each year.

## NUMEROUS CITY INITIATIVES SUPPORT THE THREE SPHERES OF SUSTAINABILITY: **ECONOMIC STRENGTH, ENVIRONMENTAL STEWARDSHIP AND SOCIAL EQUITY**. THIS LIST PROFILES SOME OF THESE WIDE-RANGING EFFORTS.

### CITY OF RALEIGH INITIATIVE DESCRIPTION

|  |  |
|--|--|
| <b>Affordable Housing</b>                | Partnerships with different developers positively impact neighborhoods and provide affordable housing; programs emphasize neighborhood revitalization to encourage stability and preservation of existing housing stock.   |
| <b>Bicycle Program</b>                   | 40-50 miles of bike lanes/sharrows by 2014; award-winning greenway system; Bronze status as Bike-Friendly City.  |
| <b>Big Belly Solar Trash Compactors</b>  | Smart wireless system notifies staff when public trash and recycling stations are full, saving time and resources.   |
| <b>Biofuels</b>                          | Biofuels power City fleet vehicles; Public Utilities grows and processes its own sunflower and canola crops as feedstock for this process.   |
| <b>Communications Outreach</b>           | Information flows in and out from residents and the City through See Click Fix, GovDelivery enews, Twitter, informative videos and Citizens Advisory Councils.   |
| <b>Digital Connections</b>               | Raleigh Connected Internet access, YouRConnected wireless downtown, Digital Connectors community service, Open Raleigh data and ideas, and Geographic Information Services all promote equity in the digital realm.  |
| <b>Downtown Sustainability Tour</b>      | Sustainability up close and personal via a 2-mile self-guided walking tour in Downtown Raleigh.  |
| <b>eLab</b>                              | Participation in Rocky Mountain Institute's state-of-the-art forum for collaborative innovation, accelerating the transformation of the U.S. electricity system to a more efficient, renewable, and affordable future.   |
| <b>Energy Assurance Plan</b>             | The Energy Assurance plan is both a reflective and proactive approach to improve the City's disaster readiness. This all-hazards plan helps mitigate damaging effects of all types of energy-related disasters by establishing expectations and interdependencies during energy emergencies, as well as identifying areas for improvement. |
| <b>Energy Efficiency</b>                 | Saving taxpayer dollars by prioritizing improvement projects, exploring new technologies and encouraging sustainable user behavior.  |
| <b>Environmental Advisory Board</b>      | Recognition of environmental best practices through the Environmental Awards Program, celebrating leadership and the public's commitment to responsible environmentalism.  |
| <b>EV Charging Stations</b>              | Raleigh's leadership in the plug-in electric vehicle industry includes installing 29 grant-funded, City-owned electric vehicle charging stations (pedestal, wall-mount, on-street, and parking decks).   |
| <b>Fleet Vehicle Transformation Plan</b> | Comprehensive efforts to reduce fossil fuel usage and GHGs through vehicle right-sizing, alternative fuels and fueling stations, motor pool, anti-idling batteries, fuel consumption budgets rather than cost, driver education, remote operations centers, and increased technology use (i.e. teleconferencing and telecommuting).        |
| <b>Geothermal</b>                        | Installations at the Transit Operations Facility and Solid Waste Services Center; City is monitoring not only energy efficiency performance but impacts on well fields.  |
| <b>Green Building Training Program</b>   | Internationally recognized program trained 460+ private sector workers in the new "green" economy, providing opportunities while moving Raleigh's institutions and industries forward.   |
| <b>Green Infrastructure</b>              | The City encourages collecting/reusing stormwater onsite through best management practices such as bioretention cells, swales and cisterns.  |
| <b>Green IT</b>                          | Electronic data interface allows Facilities Management to process more than 760 monthly energy account payments electronically, providing quality data for consumption tracking. Server consolidation and multi-function printer program increases energy efficiency.  |
| <b>Green Restaurant Program</b>          | Outreach to Raleigh-area restaurants encourages sustainable behavior and identifies barriers to adoption of sustainable practices; online links to NC 10% campaign promote local foods.  |
| <b>Green/Vegetative Roofs</b>            | Ongoing analysis to determine best practices; plant species selection and irrigation critical to success; deeper intensive installations better for hot summers.   |
| <b>Greenhouse Gas Inventories</b>        | As a foundation for a coordinated action plan to reduce emissions and energy consumption from municipal operations, the City's GHG inventory will save taxpayer dollars and improve air quality. In 2012, the City of Raleigh developed a baseline GHG emissions inventory for community-wide activities.                                  |
| <b>Home Repair Programs</b>              | Low-income homeowner financial assistance is available for needs such as leaking roofs; faulty plumbing, electrical or heating systems; broken windows; flooring; and lead paint removal.  |
| <b>JouleBug</b>                          | Mobile gaming app modeling sustainable behavior; Sustainable Raleigh badge.  |
| <b>Land Stewardship</b>                  | Protection of high quality natural resources within the park system is an important goal in the City's 2030 Comprehensive Plan; detailed natural resources inventory and mapping of rare plants and natural communities on park and greenway sites guide management recommendations.   |
| <b>LED City</b>                          | In 2006 Raleigh agreed to become the world's first LED City, piloting emerging light-emitting diode lighting technology in real-world projects.  |

|   |   |
|---|---|
| <b>LEED Silver Municipal Standard</b>     | Council mandated new municipal construction over 10,000 square feet must meet LEED Silver standards. (2) LEED Platinum buildings: Transit Operations Facility and Wilders Grove Solid Waste Services Center. (9) LEED Silver buildings, including Raleigh Convention Center.                    |
| <b>Methane Recovery</b>                   | Since 1989, the Wilders Grove landfill has been collecting landfill gas for use in energy recovery and flaring systems; it now receives an average of \$8000 monthly for recovered methane.   |
| <b>NC PEV Taskforce</b>                   | Leadership role in statewide taskforce preparing for increased adoption of plug-in electric vehicles.   |
| <b>NeighborWoods</b>                      | Residents receive free trees in exchange for planting and caring for these street trees, with more than 10,000 donated and planted in residential neighborhoods since 2003.   |
| <b>Pedestrian Program</b>                 | The Comprehensive Pedestrian Plan's measurable goals and detailed strategies will improve pedestrian mobility and safety throughout the city.   |
| <b>Periscope</b>                          | Dashboard acts as a powerful 'front end' for existing building automation systems, compiling data for a big-picture overview.   |
| <b>Project Get Ready</b>                  | Raleigh, Indianapolis and Portland were chosen by Rocky Mountain Institute to coordinate efforts to overcome perceived barriers related to technology, consumer demand, infrastructure and incentives for plug-in electric vehicles.  |
| <b>Rainwater Harvesting</b>               | Nine fire stations installed cisterns to capture roof rainwater runoff, storing it for later use in training exercises and to wash equipment.   |
| <b>Remote Operations Centers</b>          | Remote operations centers, stocked with alternative fuels, are strategically positioned to minimize fuel use.   |
| <b>Residential Recycling</b>              | Raleigh's goal is to make it easy for residents to recycle as many materials as possible, leading the way through larger single-stream carts, and curbside electronics and yard waste pickups. Recycling adds revenue to the City budget through recovered materials and avoided landfill fees. |
| <b>Reuse Water</b>                        | Two separate City distribution systems (Raleigh and Zebulon) provide reuse water for irrigation, cooling towers, industrial processes, concrete production and toilet flushing.   |
| <b>R-Line</b>                             | Downtown Raleigh's FREE circulator bus service features hybrid electric buses running every 10-15 minutes with real-time projections through the web and smartphone apps.   |
| <b>Roadmap to Raleigh's Energy Future</b> | Framework and implementation strategies to reduce the City's dependence on fossil fuels.  |
| <b>SDMWOB</b>                             | Small Disadvantaged Minority and Women Owned Business office provides resources for equal business opportunities.   |
| <b>Small Hydropower</b>                   | Currently evaluating potential for generation through Falls Lake releases.  |
| <b>SmartGrid</b>                          | Potential to shed power loads from smart buildings during peak demand.  |
| <b>Solar EV Charging Station</b>          | Research partnership with Progress Energy and Advanced Energy harnesses the sun's power to charge plug-in electric vehicles, 616 South Salisbury Street.  |
| <b>Solar Photovoltaic</b>                 | Broad-based efforts to integrate solar photovoltaic energy installations into City facilities, and third-party partnerships on large-scale farms.   |
| <b>Solar Thermal</b>                      | Solar thermal water heating systems supplement natural gas units at some of the City's fire stations and at the Raleigh Municipal Building, decreasing utility costs.   |
| <b>Strategic Transportation Planning</b>  | Strong emphasis on multi-modal opportunities drives investments and planning efforts.   |
| <b>Stream Monitoring Programs</b>         | Volunteers monitor selected streams for water quality parameters and perform surveys for larval insects; Adopt-a-Stream groups clean up debris at least once a year and watch for illicit discharges.   |
| <b>Streetscape Program</b>                | Prioritizing infrastructure renovations through the lens of the pedestrian program and to enhance economic development opportunities.   |
| <b>Sustainability Revolving Fund</b>      | Internal City projects vie for funding, typically using dollars to pay for features that may have larger up-front costs but provide significant long-term savings.  |
| <b>Sustainability Seminar Series</b>      | City employees learn about personal and professional sustainability issues during these monthly seminar events.   |
| <b>Sustainable Greenhouse</b>             | Technology (water reclamation, building automation, polycarbonate skin, evaporative cooling) "greened" the Marsh Creek greenhouse facility.   |
| <b>Sustainable Home Raleigh</b>           | Staff presents low-cost, easy-to-use techniques Raleigh residents can implement immediately to save energy and increase sustainability.   |
| <b>Sustainable Planning</b>               | Initiatives such as the 2030 Comprehensive Plan, Unified Development Ordinance, Greenprint, Bicycle Plan, Pedestrian Program and numerous other planning efforts emphasize quality of life, economic opportunities, and environmental stewardship.  |
| <b>Sustainable Procurement Policy</b>     | The City recognizes the products and services it buys have inherent social, human health, environmental and economic impacts, and procurement decisions embody the City's commitment to sustainability whenever possible.   |
| <b>Sustainable Raleigh Map</b>            | Sustainable features (i.e. LEED buildings, EV charging stations, solar installations, rainwater harvesting) are highlighted on this GIS map of Wake County.   |
| <b>Total Cost of Ownership</b>            | Long-term views replace short-term cost-only decisions, saving taxpayer dollars and reducing wasted resources.  |
| <b>Traffic Management</b>                 | Synchronized stop lights reduce GHG emissions and save fuel.  |
| <b>Union Station</b>                      | The City and NCDOT are proposing to construct a new passenger train station in Downtown Raleigh at 510 West Martin Street, replacing the existing Amtrak Station on Cabarrus Street.  |
| <b>Upper Neuse Clean Water Initiative</b> | Comprehensive conservation plan to identify and rank land most critical for water supply protection in the Upper Neuse River Basin.   |
| <b>Waste Services Route Optimization</b>  | Routesmart software optimizes the most efficient waste and recycling routes and re-entry points.  |
| <b>Water Efficiency</b>                   | Several programs help educate customers about the most water-efficient technologies (including the toilet rebate program) and the City's mandatory conservation measures.   |
| <b>Water Resources Education</b>          | Staff presents water-wise educational programs to children and adults.  |
| <b>Yard Waste Recycling Center</b>        | Yard waste debris is recycled into wood chips, mulch and compost, available for purchase.   |

## ENERGY EFFICIENCY INVESTMENT: LEED PLATINUM TRANSIT OPERATIONS FACILITY



CENTS PER SQUARE FOOT,  
NEW FACILITY'S PROJECTED ENERGY  
COSTS 2/3 LESS THAN OLD FACILITY  
DUE TO 150 GEOTHERMAL WELLS,  
RADIANT FLOOR HEAT &  
OTHER MEASURES

### ROADMAP TO RALEIGH'S ENERGY FUTURE

The *Roadmap to Raleigh's Energy Future* framework and implementation strategies come at a critical time as the City seeks to reduce dependence on fossil fuels while lowering emissions of local pollutants and greenhouse gases.

This challenge offers tremendous opportunities to rethink energy usage, protecting environmental and human health while expanding the local economy through energy efficiency and innovation. The emergence of the smart grid, distributed energy, demand response and other technologies will only hasten the need for collaboration and education across the entire organization.

Energy costs have steadily increased over time; aggregated energy is now the City of Raleigh's second-largest operating expense, second only to personnel-related expenses. Long-term savings in operating and capital budgets will be realized for taxpayers after thorough total cost of ownership and business case evaluations.

This ground-breaking collaborative initiative is the beginning of transformative change for the City of Raleigh's operations.



## R ALEIGH'S NUMEROUS ENVIRONMENTAL INITIATIVES AND TECHNOLOGIES

promote energy efficiency and conservation within City operations. The commitment to conserve energy, embraced by all departments, reduces greenhouse gas emissions and equates to real dollar savings for citizens.

### INTELLIGENT BUILDINGS CREATE SMART SAVINGS

Energy efficiency is the City's mantra, guiding decisions small and large. Automated building monitoring systems are an important tool, with more than 60 "smart" buildings online now and plans to increase up to 90 in the next four years. Automation drives peak efficiency for systems and staff, and Periscope software aggregates historical and comparative trendlines for the big-picture overview. One ultimate goal is to tie smart buildings into the smart grid, using algorithms to shed imperceptible power loads over the entire network during peak use times — shaving costs without impacting comfort or productivity.

### LEDs LIGHT THE PATH TO EFFICIENCY

A public/private partnership with LED innovator Cree, Inc. helped the City of Raleigh earn the title of *First LED City in the World* through the early adoption of state-of-the-art solid state light fixtures using a new energy-efficient lighting technology: light-emitting diodes (LEDs). More than 75 separate LED projects (some powered by the sun) now illuminate building interiors, parking garages and lots, City Plaza downtown, the Cree Shimmer Wall on the west façade of the Raleigh Convention Center, traffic lights, and streetlights in five neighborhoods and parts of downtown. These not only save energy, but provide significant savings in maintenance costs and shine a brighter, whiter light without "spilling" over into unwanted areas. The City realizes more than \$260,000 savings in annual operating expenses due to this technology, with potential savings in the millions of dollars as additional streetlights are converted. The City is also taking a statewide leadership role in examining streetlight efficiency and ownership structure as part of a greater energy policy discussion.

*The Periscope dashboard provides a powerful "front end" for existing building automation systems, accelerating our goals for improved energy efficiency throughout the City.*

**A SAFE, EFFICIENT AND EFFECTIVE waste collection and disposal system protects the natural environment while supporting Raleigh's vision to create a sustainable future for generations to come. Dedication to quality service and willingness to embrace new technologies build customer and community partnerships.**

**STRATEGIC PLAN HIGHLIGHTS SUSTAINABILITY**

The City's five-year strategic plan sustainability goals for solid waste include increasing efficiency through technology, and expanding recycling and yard waste tonnage. Routesmart, the City's database planning tool, considers terrain, equipment, and number of stops to plot the most efficient routes and re-entry points. This technology saves fuel, equipment costs, and staff time. Trucks powered by biodiesel lower toxic emissions and particulates.

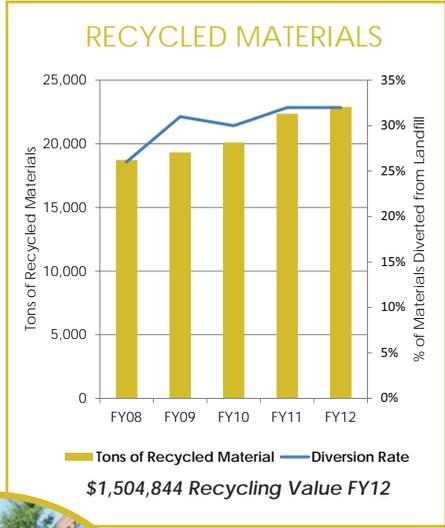
**RECYCLING TURNS TRASH INTO CASH**

Continuing to grow the City's progressive single-stream recycling program takes commitment and a passion for public education. Already considered a leader, the City aggressively pursues grant funding to expand its reach. Significant milestones include establishing a "swap shop;" adding public recycling to parks, community centers, and downtown; offering curbside electronics pickup; and exchanging residential bins for 95-gallon roll carts. Newer recyclable materials, such as spiral paper cans, are added frequently for customer convenience. This also increases revenue from recycling and avoided landfill fees at \$63 per ton recycled, a total value of \$1,504,844 for fiscal year 2012.

**COMPOST PROGRAM CREATES BLACK GOLD**

Turning curbside yard waste into nutrient-rich, desirable compost keeps organic materials out of the landfill and provides a valuable product residents can purchase at a discount to enhance lawns and gardens.

*Collaborative state legislative efforts to redefine the National Pollutant Discharge Elimination System permitting process for a yard waste composting facility will save the City of Raleigh \$10 million annually.*



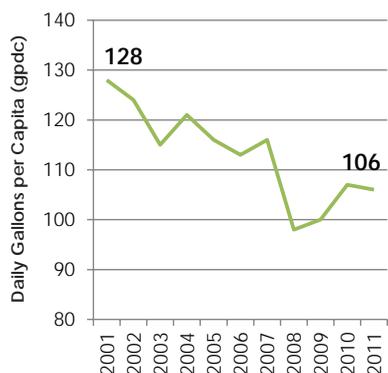
**BIG BELLY SOLAR TRASH COMPACTORS ELIMINATE WASTE IN COLLECTIONS**

The City of Raleigh's Big Belly Solar waste and recycling collection system pilot project, part of the Clean is Green Raleigh campaign, includes nearly 50 dual stations installed throughout the city.

Installing this Made in the USA technology will save taxpayers' money, encourage sidewalk recycling and keep streets cleaner. Funded by a federal Energy Efficiency & Conservation Block Grant, these smart, high-tech solar-powered trash stations reduce overflows and decrease the number of collection trips by 80 percent, saving fuel use and carbon emissions by the same amount while also reducing both staff time for pickups and the wear and tear on streets.

The compacting feature removes the air volume of wasted space, and the Collection Logistics Efficiency and Notification (CLEAN) system emails Solid Waste Services staff when the station needs to be emptied, eliminating unnecessary trips. This provides an estimated \$38,000 annual savings in vehicle, labor and maintenance costs for the first 20 stations installed.

**RALEIGH WATER CONSUMPTION  
DAILY GALLONS PER CAPITA**



**SUSTAINABLE GREENHOUSE  
GROWS SAVINGS**

The City used grant funds to upfit its new Marsh Creek Greenhouse with several sustainable practices and technologies; building this efficient greenhouse structure decreased resources needed to provide a desirable growing environment.

**Water Reclamation** – Two large cisterns collect 4,800 gallons of rainwater, stored to water plants.

**Automation and Controls** – An advanced computer system fully automates shade systems, heating, cooling and irrigation. The shade system will automatically open and close depending on the temperatures to help reduce energy costs and provide the opportunity to grow year round.

**Polycarbonate Skin** – Polycarbonate double layer skin provides 50% better insulation than glass panels, reducing heating and cooling costs and use of fossil fuel.

**Evaporative Cooling** – A system installed along the west side of the greenhouse uses cooling pads moistened by recirculated water. Exhaust fans on the east then efficiently pull the cool air through the greenhouse.



**L**AND, WATER AND AIR make life possible. Issues such as clean air and climate change, water quality and quantity, land conservation and habitat protection all influence urban sustainability. Raleigh’s leadership can simultaneously improve the long-term health of local residents and regional ecological systems.

**PLANNING VISION MODELS A GREEN CITY**

Greenprint Raleigh’s guiding vision and principles promote environmental sustainability and stewardship; through enhanced policy framework and land management practices, the City protects sensitive lands while preserving water, air and land resources. The Unified Development Ordinance addresses contemporary development and zoning practices while acknowledging market trends, incorporating best practices and focusing on contextual issues throughout the city.

**WATER EFFICIENCY IS KEY**

City programs educate customers about the most water-efficient technologies, including the toilet rebate program, and help them understand the City’s mandatory conservation measures, providing resources and tools.

**GREEN INFRASTRUCTURE IMPROVES WATER QUALITY**

Projects to improve surface water quality in Raleigh’s streams include stream restoration and enhancement; constructing wetlands and rain gardens; and installing cisterns, green roofs, or other retrofits to reduce stormwater pollution.

**UPPER NEUSE CLEAN WATER INITIATIVE PROTECTS WATER SUPPLY**

The Upper Neuse Clean Water Initiative, a comprehensive conservation plan, identifies and ranks land most critical for water supply protection in the Upper Neuse River Basin. The City provides marginal financial assistance as needed to complement other funding sources for priority purchases.

**URBAN FORESTRY PRIORITIZES HEALTH AND ENVIRONMENT**

A Tree City USA for 24 years, the City’s skilled arborists ensure Raleigh remains the City of Oaks by managing existing trees and planting the next generation. The urban forest increases property values, improves air and water quality, reduces heating and cooling costs and increases public health and wellness.

*One acre of forest absorbs six tons of CO2 and emits four tons of oxygen annually, enough to meet the needs of 18 people.*

**E** DUCATION, OUTREACH AND RESOURCE SHARING create opportunities to foster partnerships, provide training and engage the community. Recognition of outstanding projects and individuals reinforces sustainable values and showcases exemplary behavior, providing a replicable roadmap for future development.

**SUSTAINABLE HOME RALEIGH PROVIDES GUIDANCE**

The Office of Sustainability's residential educational program, *Sustainable Home Raleigh*, provides personal training and guidance on numerous sustainability issues, including energy efficiency, landscaping, water use and recycling. It's symbolic of the City's tireless efforts to build a foundation in sustainable thought and behaviors while encouraging public participation and two-way communication.

**COMPREHENSIVE CLASSES EXPAND HORIZONS**

Raleigh Parks and Recreation offers endless opportunities to learn something new, refine skills, or just meet new friends. Programs are offered for children as young as 6 months old and extend through senior adults.

**ENVIRONMENTAL AWARDS PROGRAM CELEBRATES EXCELLENCE**

The City's annual Environmental Awards program, administered by the Environmental Advisory Board, recognizes quantifiable results positively affecting the environment. The 60+ public and private sector projects, individuals and organizations recognized over the years celebrate leadership and the best in Raleigh's commitment to responsible environmentalism.

**JOULEBUG APP SHOWCASES LOCAL TALENT**

JouleBug, a smartphone app making it simple and fun to be more sustainable, includes a *Sustainable Raleigh* badge. Developed by a Raleigh-based gaming firm, this partnership is a direct result of the City's national leadership in sustainable practices. JouleBug showcases the City's commitment to developing local entrepreneurs.

**SEMINAR SERIES PROFILES SUSTAINABILITY ISSUES**

City of Raleigh employees bring their lunch while learning in-depth about varied sustainability issues — such as green burials, fracking, smart grid, eco-driving, energy efficiency and green cleaning — in this monthly seminar series.

*A well-trained “green workforce” will continue to make us a leader and our community a great place to live and work.*

**MEDIA COVERAGE**

CITY OF RALEIGH  
SUSTAINABILITY INITIATIVES

18 INITIATIVES  
56 MEDIA SOURCES  
81 TOTAL STORIES

PRINT, ONLINE & BROADCAST  
COVERAGE IN LOCAL, NATIONAL  
AND INTERNATIONAL MEDIA  
JAN-OCT 2012



**GREEN BUILDING TRAINING PROGRAM EMPOWERS LOCAL ENTREPRENEURS & INDIVIDUALS**

*Sustainable Raleigh's Green Building Training Program empowered small businesses and individuals with the knowledge and skills to market themselves in the growing green economy.*

*Wholly grant-funded, this internationally recognized award-winning program ensured Raleigh a skilled workforce trained in cutting-edge technologies, ensuring the city's built environment is more environmentally friendly and energy efficient. More than 460 people, at no cost to them, attended courses such as Solar Photovoltaic, Solar Thermal, Building Performance Institute Building Analyst/HERS, Energy Star 3.0, LEED®, Green Real Estate, Green Plumbing, Green Cleaning, and Sustainable Landscaping.*

*Partner organizations Wake Technical Community College and North Carolina State University continue to offer green building training opportunities, and the City's internal training program based on these courses continues to provide no-cost, cutting-edge knowledge for employees.*

# SUSTAINABILITY IS A COMMITMENT TO PEOPLE, THE PLANET, AND OUR COLLECTIVE PROSPERITY. ITS PRINCIPLES MOVE THE CITY FORWARD AND ENSURE OUR FUTURE IS BRIGHT.

THE OFFICE OF SUSTAINABILITY IS CHARGED WITH THE RESPONSIBILITY to create an organizational environment where each and every City departmental operation, investment and initiative incorporates the City's commitment to building a *Sustainable 21st Century City of Innovation*.

The focus over the last four years has been to identify, test, evaluate and implement innovative technologies, policies, programs, strategies, partnerships and financing approaches using pilot and demonstration projects and grants to improve the City's internal operations. With this greater understanding of best practices, we are charting a course for ensuring our City's future resilience. Raleigh is now recognized as a national municipal leader, and this annual report highlights some of these achievements and efforts.

Tangible evidence of the value of these investments is apparent in sustainability-related conference bookings at the internationally recognized LEED Silver Raleigh Convention Center. The direct economic impact of these 12,024 hotel room nights (primarily in 2011 and 2012) is worth nearly \$8 million, and is just a beginning indication of the facility's positive economic potential.

It is now time to take these "lessons learned" out to the larger community, including Raleigh's residents, businesses and institutions in our journey. As we move forward, we'll continue to focus on state-of-the-art technologies, financial stewardship, community enhancement and economic strength as the guiding principles of this program.

Next steps include increasing our community involvement, creating a "green" economic development strategy, and implementing the *Roadmap to Raleigh's Energy Future*.



Prepared by City of Raleigh Office of Sustainability  
November 2012 • 100% recycled  
222 West Hargett Street #302, Raleigh, NC 27601  
[www.RaleighNC.gov/SustainableRaleigh](http://www.RaleighNC.gov/SustainableRaleigh)



Printing funded by U.S. Department of Energy  
Energy Efficiency and Conservation Block Grant,  
part of the American Recovery & Reinvestment Act.

