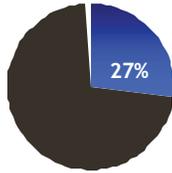


## Better Buildings Goals, Actions & Recommendations



Quantifiable measures could achieve 27% of 2030 reduction goal (equal to 289,861 mtCO<sub>2</sub>e). See page 21 for details.

### ACTIONS

1. Require new City-owned buildings and renovations to non-historic existing City-owned buildings to be sustainable.
  - A. Set specific performance targets for site selection, water conservation, energy and atmosphere, materials and resources, indoor environmental quality, and operations and maintenance.
  - B. Meet the energy reduction targets of Architecture 2030.
2. Historic buildings are inherently sustainable. Require modifications to historic City-owned buildings to follow current best practices with regard to integrating historic preservation with modern sustainable practices.
3. Encourage private sector to adopt voluntary sustainable building practices.
4. Encourage disclosure of utility data and building performance.
  - A. Disclose utility data for each City building annually, with comparisons to the previous year and to regional or national benchmarks.
  - B. Encourage sellers of private property to provide utility data for the previous twelve months.
5. Develop a weatherization program.
6. Help increase financing options.
7. Focus on public outreach.
  - A. Develop an aggressive, comprehensive, and multi-faceted communications and public education campaign.
  - B. Implement the campaign in collaboration with local partners, developing Sustainable Design Workshops and Green Building Seminars.

### **B1. REQUIRE NEW CITY-OWNED BUILDINGS AND RENOVATIONS TO NON-HISTORIC EXISTING CITY-OWNED BUILDINGS TO BE SUSTAINABLE**

**Summary of Specific Issues:** On April 22, 2008, Mayor Riley signed into law Resolution 2008-05 supporting a variety of sustainability policies. These included the requirement that all new construction and major renovation of City-owned buildings achieve LEED certification beginning in 2009. By expanding this requirement to include

all non-historic City buildings, and by requiring additional third party certifications, this system can be used to greater effect.

**Recommendation/Strategy/Action Plan:**

**A. Expanded Standards:** The City should expand Resolution 2008-05 so that all new City buildings and renovations to non-historic existing City buildings are required to meet a new standard for sustainable building, to be called the “Charleston Sustainable Building Standard.” To minimize administrative effort and expense, the City should not attempt to create and audit a new standard. Instead, the City should use existing third-party certifications such as LEED, Green Globes, EarthCraft, or other suitable standards for all non-historic building construction, operations, and maintenance.

**B. The 2030 Challenge:** The City should develop the Charleston Sustainable Building Standards so that it can meet “The 2030 Challenge,” issued by an independent nonprofit group called Architecture 2030. Architecture 2030 has asked the global architecture and building community to adopt the following targets:

- All new buildings, developments and major renovations shall be designed to meet a fossil fuel, greenhouse gas, energy consumption performance standard of 50% of the regional (or national) average for that building type.
- An equal amount of existing building area, at a minimum, shall be renovated annually to meet a fossil fuel, greenhouse gas, energy consumption performance standard of 50% of the regional (or country) average for that building type.
- The fossil fuel reduction standard for all new buildings shall be increased to: 60% in 2010, 70% in 2015, 80% in 2020, 90% in 2025. Carbon-neutral in 2030 (using no fossil-fuel, greenhouse-gas-emitting energy to operate).
- The 2030 challenge targets may be accomplished by implementing innovative sustainable design strategies, generating on-site renewable power and/or purchasing renewable energy and/or certified renewable energy credits (20% maximum).<sup>1</sup>

Inspired by the 2030 Challenge, and based on the currently existing LEED standard for New Construction, we recommend as an example that the following be adopted as the Charleston Sustainable Building Standard:

- LEED Gold certification.
- Earn 50% of the available points under the Sustainable Sites credit, including mandatory achievement of both stormwater quality and quantity control points. The Sustainability Director shall have discretion to relax this requirement where the project is developed in an existing dense urban area using high-density urban design criteria established by the City and building footprint occupies 80% of the total property acreage.
- Earn a minimum of 3 out of the 5 available points under the Water Efficiency Credits, including mandatory achievement of the 30% Water Use Reduction point.
- Earn the minimum number of Optimize Energy Performance points under the

# Recommendations

Energy and Atmosphere Credit Category necessary to meet the 2030 Challenge target energy use reductions and fossil fuel use reductions.

- Earn an additional 3 points under the Energy and Atmosphere Credit Category, including mandatory achievement of the Measurement & Verification point.
- Earn 50% of the available points under the Materials and Resources Credit Category, including mandatory achievement of the 50% Diversion of Construction Waste from Disposal, 10% Recycled Content and 10% Regional Materials points.
- Earn 50% of the available points under the Indoor Environmental Quality Credit Category, including mandatory achievement of Construction IAQ Management Plan (During Construction and Before Occupancy) points and Low Emitting Materials points for adhesives, sealants, paints, coatings and carpets.
- Earn a minimum of 2 points under the Innovation and Design Credit Category.
- Noting the many sustainable and life safety benefits of automatic fire protection systems, require that all City owned new buildings and major renovations (commercial and residential) include them as part of their design and construction.
- Provide Owner's operations manual for City record. (Eighty-five percent of the cost of owning a building occurs after the building is constructed or renovated. Having a complete record

of each building's as-built drawings, operations and maintenance, and care instructions for all equipment, materials, and assemblies can help the City optimize energy efficiency. Maintaining these records permanently, in an electronic format, would benefit the City and any future owners, as well as city planners, building officials, and emergency responders.)

Similar criteria should be established for each LEED rating system and other comparable rating systems being considered or applied.

## **Implementation Responsibilities/Assignments**

The City Sustainability Director, in conjunction with the Capitol Projects Division Sustainability Project Manager, will develop, update, and maintain the Charleston Sustainable Building Standard, including the establishment of minimum target performance goals under the sustainable sites, development density, public transportation, water efficiency, energy and atmosphere, materials and resources, renewable power, indoor environmental quality, operations, maintenance and procurement categories of those standards. The Charleston Green Committee can assist. All City departments responsible for initiating, developing, permitting, approving and managing existing buildings, new construction and major renovation projects shall meet the Charleston Sustainable Building Standard. Recognizing that the building performance rating systems proposed above can help achieve many recommendations proposed by other subcommittees, the Sustainability Director will coordinate and track these

complementary effects when evaluating and reporting on the status and success of this entire plan.

**Cost to Implement/Net Savings from Implementation:** Initial costs to the City should be minimal, including only City staff time. Later costs will depend on the specifics of each project.

**Additional Benefits:** Reduced environmental impact in construction, operation and maintenance of buildings; better indoor air quality; reduced construction waste; higher water efficiency; better use of new and existing materials and resources; economic stability through increased jobs in design, construction, manufacturing, demolition, recycling, waste management and renewable energy industries.

**Timeline for Implementation:** The Sustainability Director should begin developing and implementing the Charleston Sustainable Building Standard upon adoption of this recommendation by the City Council.

**References:** City of Charleston 2002 CO2e inventory.

## **B2. HISTORIC BUILDINGS ARE INHERENTLY SUSTAINABLE. REQUIRE MODIFICATIONS TO HISTORIC CITY-OWNED BUILDINGS TO FOLLOW CURRENT BEST PRACTICES WITH REGARD TO INTEGRATING HISTORIC PRESERVATION WITH MODERN SUSTAINABLE PRACTICES.**

**Summary of Specific Issues:** Founded in 1670 and home to well over 3,000 historic structures, Charleston is one of the oldest and

best preserved and sustained cities in the country. The community's long-standing practice of historic preservation—not only of individual buildings, but including entire neighborhoods--has made it a national leader in preservation practices. The beauty, quality and character of the existing historic fabric has enabled the city to become one of the most desirable places to live and visit in the world.

Historic structures are inherently sustainable; it has often been said that “the greenest building is the one that is already built.” What this refers to is the concept of embodied energy - that is, the total energy used in the building's lifecycle. The preservation of historic buildings (or any existing buildings) recognizes the value of the existing embodied energy and the resources that have already been expended versus the new consumption of energy and resources, and the waste generated, required to construct an entirely new structure.

In addition, because most were built prior to the advent of mechanical systems, many historic structures are excellent examples of sustainable design. They employ passive design features that reduce energy use, promote operator adaptability to changing environmental conditions, and employ quality materials that are provide long life cycles.

For these reasons, the continued protection and preservation of Charleston's historic structures is a high priority. Fortunately, historic buildings can be both preserved and made more environmentally responsible and energy efficient.

**Recommendation/Strategy/Action Plan:** The Charleston Sustainable Building Standard discussed in Recommendations B1 and B3 will not be appropriate for many of Charleston's historic structures. For historic

# Recommendations

structures, the City should adopt a “preservation first” approach. At the same time, the City should develop guidelines that suggest how to integrate modern sustainable design and construction practices into the preservation, restoration, and adaptation of historic buildings. The City should commit to following these guidelines, while for other property owners they will be voluntary.

The Historic Structures Subcommittee of the Charleston Green Committee has developed specific guidance on this subject. This information may be found in the appendix.

#### **Implementation Responsibilities/**

**Assignments:** Developing sustainability guidelines for historic structures should be a collaborative effort among:

- The City Department of Planning, Preservation and Sustainability;
- Preservation Society of Charleston;
- Historic Charleston Foundation;
- The National Trust for Historic Preservation;
- Charleston Heritage Foundation; and
- Any other local groups with essential expertise on this subject.

The Charleston Green Committee can assist as well. For City-owned properties and facilities, responsibility for following the guidelines will lie with City departments responsible for initiating, developing, permitting, approving and managing existing buildings, new construction and major renovation. For privately owned properties and facilities, please see Recommendation B3.

#### **Cost to Implement/Net Savings from**

**Implementation:** Initial costs to the City should be minimal, including only City staff time. Later costs will depend on the specifics of each project.

**Additional Benefits:** Reduced environmental impact in construction, operation and maintenance of buildings; better indoor air quality; reduced construction waste; higher water efficiency; better use of new and existing materials and resources; economic stability through increased jobs in design, construction, manufacturing, demolition, recycling, waste management and renewable energy industries.

**Timeline for Implementation:** The Sustainability Director should begin developing and implementing the guidelines upon adoption of this recommendation by the City Council.

**References:** 113 Calhoun St. Center for Sustainable Living

## **B3. ENCOURAGE PRIVATE SECTOR TO ADOPT VOLUNTARY SUSTAINABLE BUILDING PRACTICES**

**Summary of Specific Issues:** Through Recommendations B1 and B2, the City will take a leadership role in sustainable design and construction. However, approximately 95% of all buildings in Charleston are privately owned. Therefore, the City must encourage owners of private buildings to participate as well. Nationwide, cities are offering such incentives as expedited permit review; density and other bonuses; financial incentives including tax credits and permit fee reductions; and technical and marketing assistance.

#### **Recommendation/Strategy/Action**

**Plan:** The City should develop

incentives to encourage private developers and owners to build, renovate, operate and maintain to the Charleston Sustainable Building Standard (or, for historic structures, the guidelines described in Recommendation B2). Applicants for these incentives will be required to submit evidence of application for, or receipt of, the independent, third-party certifications that underlie the Charleston Sustainable Building Standard.

Developers will need to apply for these incentives prior to applying for the underlying third-party certification, during the design phase. Some incentives, then, may be awarded by the City conditional upon receipt of the underlying certification.

Owners that satisfy the Charleston Sustainable Building Standard should receive the following incentives:

- **Recognition:** Owners should receive an emblem which may be affixed to the exterior of the building and will be displayed on the City’s Sustainability webpage in a list of recognized buildings, ideally with a link to the building’s sales listings. Such recognition will not only assist consumers of commercial or residential real estate by providing a unified list of buildings that have satisfied stringent requirements, but will provide a unique marketing opportunity for the owner. The application shall simply be submission of proof that the building has achieved third party certification in accordance with the recommendations set forth in items B1 and/or B2.
- **Waivers:** The City should offer waivers of general density, minimum square footage, and parking requirements for such buildings. Such waivers will increase the profitability of such projects, while satisfying other City goals such as increased infill development, reduced traffic, and increased reliance on public transportation.
- **Fast Track Review:** Developers of buildings seeking to satisfy the Charleston Sustainable Building Standard should have special access to a designated City liaison to respond to questions and streamline the City regulatory process. Details can be worked out by the Sustainability Director and City staff.
- **Public Transit Bonus:** Occupants of recognized private buildings should receive discounted or free passes for public transportation for 3 years. Such passes will have a minimal cost to the City, but will be a significant marketing advantage to developers. Also, the City should partner with CARTA to encourage “transit-oriented development” by coordinating this incentive with recommendations of the Communities and Transportation sections of this plan. Note that this incentive will help developers meet public transportation access requirements of many of the underlying third party certifications. Encouraging occupants of the recognized buildings to use public transportation will also minimize the effect of increased density and reduced parking.

**Estimated Greenhouse Gas Reductions to be Achieved - In Metric Tons/Year:** Will vary according to certification levels and other prerequisites required by the City.

**Implementation Responsibilities/Assignments:** The Green Committee will work with the City and the Sustainability Director to develop and implement incentives for private parties and ways to advertise them on the City’s Sustainability webpage.

# Recommendations

**Cost to Implement/Net Savings from Implementation:** The costs to the City should be minimal, as follows: City staff time to develop and advertise incentives program; discounted public transit passes; and plaques for sustainable buildings.

**Additional Benefits:** Benefits for individual buildings include better indoor air quality; better return on investment; reduced operating costs; increased building value and occupancy rate; and increased rent ratios. Benefits for the City include reduced environmental impact in construction, operation and maintenance of buildings; reduced construction waste; higher water efficiency; better use of new and existing materials and resources; economic stability through increased jobs in design, construction, manufacturing, demolition, recycling, waste management and renewable energy industries; decreased traffic through improved location and use of public transit; and enhanced marketing of Charleston buildings.

**Timeline for Implementation**  
The Sustainability Director should commence to develop and implement the Charleston Sustainable Building Standard and system of incentives upon adoption of this recommendation by the City Council.

## **B4. ENCOURAGE DISCLOSURE OF UTILITY DATA AND BUILDING PERFORMANCE**

**Summary of Specific Issues:** Electricity and natural gas produce most of the carbon dioxide emissions for a building. To reduce these emissions, building owners need to use less electricity and natural gas. It is also important to conserve water. Disclosing utility data

allows citizens, building users, and potential buyers to see and compare energy usage, which increases consumer demand for higher performance buildings. This will encourage property owners to improve efficiency and operate buildings conscientiously.

### **Recommendation/Strategy/Action Plan:**

- A. City Disclosure:** The City should commit to annual disclosure of utility data for all its properties. This information should be compared to the previous year's usage and regional or national databases of buildings with comparable use and occupancy. The format of the report should include the building's square footage, number of stories, use or occupancy (commercial, residential, mixed use, assembly, storage, etc.), number of occupants, total energy use by utility type (electricity, natural gas, water, and sewer, in the same units used by the utility company), energy use per square foot, total cost by utility type, and percent increase or decrease from the previous year.
- B. Disclosure by Sellers:** The City should encourage all sellers of residential and commercial property to provide potential buyers with utility bills or reports for electricity, natural gas, water, and sewer. Seller should disclose this information for at least the previous twelve months before a sales contract becomes binding.

**Implementation Responsibilities/Assignments:** For City-owned buildings, the Sustainability Director shall develop or purchase an online database for

collecting and reporting this data. For privately-owned buildings, it will be the responsibility of the owner to disclose this information. Also, the Sustainability Director should work with state officials to investigate disclosure of utility data by sellers of real property. If this is impossible, the Director will explore other options such as cooperative efforts with sales agents or public education.

**Cost to Implement/Net Savings from Implementation:** There will be minimal cost to the City. Building improvements inspired by it will be up to the owner and funded by the owner.

**Additional Benefits:** Reduces energy use; reduces demand requirements for local power companies; and helps create market forces that encourage sustainable building construction, renovation, operation, and maintenance.

**Timeline for Implementation:** The program should begin for City buildings upon adoption of this recommendation by the City Council. The Sustainability Director should also immediately begin investigating implementation of the private portion, which may take one or two years to implement.

**References:** This recommendation complements Recommendation B3.

## **B5. DEVELOP A WEATHERIZATION PROGRAM**

**Summary of Specific Issues:** More home and business owners would weatherize their buildings if it were easier to calculate the cost savings, access capital, and get the work done. Some qualify for federally-funded weatherization programs, but most do not.

**Recommendation/Strategy/Action Plan:** The City should develop a Home/Business Weatherization Program for those who do not

qualify for federal programs, identifying appropriate lenders, financing options, and service providers. Successful models of these programs exist in many cities, including Milwaukee, Wisconsin and Babylon, New York. Approached as a four-phase program, Phase 1 addresses the fundamentals, such as sealing air leaks, replacing high-energy lighting, and wrapping or upgrading the water heater. Phases 2 to 4 address system upgrades in appliances, HVAC, and windows, doors, and anything else necessary to weatherize the building envelope. Phase 1 of this strategy can be modeled on a similar federal initiative currently in development. Funding can be provided through partnerships with local lenders willing to offer low-cost loans. (See also Recommendation E-2E.)

**Implementation Responsibilities/Assignments:** Once the recommendation is adopted by City Council, it will be the responsibility of the Sustainability Director to develop and implement the program. Heirs' property circumstances require a partnership with the Center for Heirs' Property Preservation and similar organizations to overcome the hurdle of unclear title.

**Energy and Gas Saved**  
Phase 1 saves approximately 10% on energy costs, up to Phase 4 that saves approximately 50%.

**Cost to Implement/Net Savings from Implementation:** The cost to weatherize a building will vary depending on the age, condition and number of weatherization-related energy-conservation measures undertaken by the building owner. The City Staff and/or an energy alliance would work with the owner to help evaluate and analyze energy conservation measures and recommend those that have the potential to provide enough savings over time to offset the monthly cost of installing and

maintaining the energy-conservation measure throughout its expected useful life. These costs are borne by the property owner, with access to financing options from conventional lenders and/or an energy efficiency revolving fund. The City of Charleston or an energy-efficiency partnership would bear the cost of staff time.

**Timeline for Implementation:** Phase 1 should begin within first year of the Sustainability Director's tenure. Phases 2 to 4, including development of funding partnerships to provide larger loans, should be developed and implemented sequentially beginning in the second year of the Director's tenure.

## **B6. HELP INCREASE FINANCING OPTIONS**

**Summary of Specific Issues:** Due to current economic difficulties and a lack of familiarity among lenders with sustainable building, there are very limited financing options for these projects. There are even fewer options that appropriately value the improvements included in these projects. The City could be uniquely influential in helping to increase financing options for sustainable building projects.

**Recommendation/Strategy/Action Plan:** The Sustainability Director and the Green Committee should work with lenders, investors, and state and federal agencies to increase and publicize financing and funding opportunities for sustainable building projects. Successful models of this program exist elsewhere, including New York City, Kansas City, Cambridge, Massachusetts, and Austin, Texas.

**Implementation Responsibilities/Assignments:** The Sustainability Director

and the Green Committee should contact local lenders to explore available financing options. Available options could be publicized on the City's Sustainability webpage. The Sustainability Director should also explore and coordinate financing and funding options available at the state and federal levels.

**Cost to Implement/Net Savings from Implementation:** Beyond staff time, there should be no additional cost for this program.

**Additional Benefits:** In addition to the environmental benefits, helping local builders, developers, and owners find financing will have positive economic benefits for Charleston.

**Timeline for Implementation:** Noting the great increase in federal funds available for efficiency projects, the Sustainability Director should begin the process immediately upon adoption of this recommendation by the City Council. The goal should be to have a framework and initial database of available funding organizations and resources published within 6 months of adoption of this plan.

## **B7. FOCUS ON PUBLIC OUTREACH**

**Summary of Specific Issues:** The success of this plan depends on whether a critical mass of City staff and Charleston residents understand and implement its recommendations. It is in everyone's best interest to increase our collective understanding of climate protection, sustainable living practices, and what each person can do to make a difference.

**Recommendation/Strategy/Action Plan:** The Sustainability Director and the Green Committee should develop and implement a professional public relations campaign and a community-wide public education initiative concerning climate protection, sustainability, energy efficiency, and renewable energy. This initiative should include the following:

**A. Communications Plan:** Develop a comprehensive, multi-faceted communications and public engagement plan. This plan should target business, faith communities, schools, and the general public.

**B. Public Relations Campaign:** Undertake an aggressive public relations and community education campaign in partnership with Chamber of Commerce, the Home Builders Association, the Charleston Green Builders Council, the Charleston AIA, historic preservation leaders, other trade and professional associations, foundations, non-profits, neighborhood organizations, home owners associations, and others that support sustainable building practices.

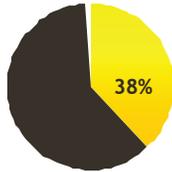
- **Design Workshops:** As part of this campaign, develop Sustainable Design Workshops that provide information for both professionals and home owners preparing to build, buy, or remodel a home with the intention of improving energy and water efficiency.
- **Green Building Seminar:** In addition, develop a monthly, lunch-time Green Building Seminar Series open to all building design and construction professionals and City personnel. Learning Unit and Continuing Education credits should be available for American Institute of Architects (AIA) and licensed professional engineers.

**Implementation Responsibilities/**

**Assignments:** The Sustainability Coordinator and the Green Committee should partner with local school districts, institutions of higher education and other local, regional and national organizations listed above to develop curricula for comprehensive lifelong learning opportunities in climate protection and sustainable living practices for all sectors of the local population.

**Timeline for Implementation:** The first phase of education will begin with the adoption of the plan and its publication for use by City staff and the public at large. Ongoing development of programs and curricula will be continuous from that date forward.

## Cleaner Energy Goals, Actions & Recommendations



Quantifiable measures could achieve 38% of 2030 reduction goal (equal to 427,175 mtCO<sub>2</sub>e). See page 21 for details.

### ACTIONS

1. Establish an “Efficiency-First” principle.
2. Use energy efficiently.
  - A. Increase the conservation of electricity,
  - B. Develop energy-efficient procurement standards for the City.
  - C. Continue to use energy service companies.
  - D. Create a Charleston Climate Partnership with major energy consumers.
  - E. Establish an alternative financing program to facilitate energy efficiency.
  - F. Study the implementation of a four-day workweek.
3. Generate and support renewable energy.
  - A. Set a goal for renewable energy.
  - B. Help develop large-scale sources of renewable energy.
  - C. Encourage on-site generation of renewable energy on City and private property.
4. Transmit and deliver electricity

efficiently.

5. Encourage the public to participate.

### E1. ESTABLISH AN “EFFICIENCY-FIRST” PRINCIPLE

Summary of Specific Issues: Population growth and new technologies have increased energy demands, and consequently greenhouse gas emissions. Energy efficiency is the most cost effective, cleanest, and quickest way to reduce energy consumption and decrease greenhouse gas emissions.

Recommendation/Strategy/Action Plan: The City should establish an “Efficiency First” principle to guide all of its energy-use decisions. This principle should influence energy contracts (Recommendation E-2A) and purchases of equipment and supplies (Recommendation E-2B).

The Efficiency First principle should guide decisions about buildings and land use. (See Buildings Section and Recommendation B1.) The success of an “Efficiency First” principle depends on City employees’ general understanding of the costs and benefits of selecting energy-efficient items.

Estimated Greenhouse Gas Reductions to be Achieved - In Metric Tons/Year: Probably substantial.

Implementation Responsibilities/Assignments: The Sustainability Director should create a program to educate City employees about the “Efficiency First” principle.

**Cost to Implement/Net Savings from Implementation:** Probably quite small.

**Additional Benefits:** Cost savings and leading by example.

**Timeline for Implementation:** Immediate.

**References:** Programs instituted in both Los Angeles and Kansas City.

## E2. USE ENERGY EFFICIENTLY

### E-2A: Increase the conservation of electricity.

**Summary of Specific Issues:** In other cities, “demand-side management” (DSM) programs have reduced the growth in the demand for electrical power. There are two types of DSM programs:

- Energy conservation programs that reduce total quantity of electricity used (measured in kilowatt-hours).
- Demand response programs that reduce peak demand for electricity (measured in kilowatts).

Since these conservation programs reduce electrical usage, utility companies can forgo the construction of expensive new generating facilities. With reduced usage, peak electrical demands are lessened and the strains on the existing power infrastructure are diminished, minimizing the probability of future power outages. Also, utility companies providing consumers with low-cost, real-time energy usage monitoring devices will help households with the means to make wise energy conservation choices. Finally, a community’s energy needs are met with less electricity, reducing greenhouse gas emissions. DSM programs, then, can make the delivery of electricity more reliable, less expensive, and less polluting.

### Recommendation/Strategy/Action Plan:

- **SCE&G:** Since the City of Charleston does not operate a municipal utility, it must rely on SCE&G to meet its electricity needs. The City should therefore encourage SCE&G to employ robust DSM programs. Charleston should also review its contracts with SCE&G to insure that DSM programs and other energy conservation measures are encouraged. Further, the City should work with the state Public Service Commission to require that all of the state’s utilities have DSM practices and other conservation measures to increase efficiency and reduce greenhouse gases.
- **INTERNAL PROGRAM:** Internally, the City should use energy management systems in its buildings to monitor energy uses at the department level. City departments should design and implement energy conservation and demand response programs. In the process, the City should take advantage of any additional opportunities for efficiency, including but not limited to:
  - Installing thermostats with timer-activated set points that control air conditioning/space heating to provide higher or lower temperatures for nights and holidays; and
  - Switching to work-space lighting and reduced room lighting with timer-actuated room lighting to turn off lights after working hours (subject to safety regulations for passageways and stairwells.)

### Implementation Responsibilities/Assignments:

The Sustainability Director should oversee energy use. The Mayor’s office should work with SCE&G to help design its DSM programs. The City should participate in South Carolina Public Service Commission dockets as necessary to promote its interests in DSM and conservation.

# Recommendations

**Cost to Implement/Net Savings from Implementation:** Primarily staff time.

**Additional Benefits:** Cost savings and community leadership.

**Timeline for Implementation:** Review of the contract and DSM program development with SCE&G should start immediately.

## **E-2B: Develop energy-efficient procurement standards for the City.**

**Summary of Specific Issues:** Purchasing decisions affect the amount of energy used. Purchasing rules that promote the use of environmentally preferable products and consider life-cycle costs are an effective means of saving money and energy.

**Recommendation/Strategy/Action Plan:** A green life-cycle purchasing policy should be established for all City departments. In purchasing decisions, departments should be directed to consider life-cycle costs; energy consumption to make, ship, operate, and decommission the product; waste generation; recycled material content; and longevity of items purchased. (See also Recommendation W-1E.)

**Implementation Responsibilities/Assignments:** The Sustainability Director should review and suggest modifications to the City's existing procurement policy. Department heads and purchasing officers are tasked with overseeing implementation of the policy.

**Cost to Implement/Net Savings from Implementation:** Staff time for both the Sustainability Director and City purchasing officers.

**Additional Benefits:** This policy will reinforce Charleston's commitment to energy conservation and environmental

stewardship. The City will provide leadership and inspiration for regional municipalities and local businesses.

**Timeline for Implementation:** Immediate because of low initial cost.

## **E-2C: Continue to use energy service companies.**

**Summary of Specific Issues:** Energy service companies, often called ESCOs, provide comprehensive energy solutions that save money and energy. Additionally, these companies provide a means to finance the up-front costs of energy purchases. For instance, the City of Charleston has a successful relationship with Johnson Controls, ESCO, that currently allows it to save more than a half-million dollars per year on energy costs.

**Recommendation/Strategy/Action Plan:** Charleston should maintain and expand its present relationship with energy service companies.

**Estimated Greenhouse Gas Reductions to be Achieved - In Metric Tons/Year:** See Johnson Controls Reports.

**Implementation Responsibilities/Assignments:** Sustainability Director should be involved in overseeing the Johnson Controls contract and performance.

**Cost to Implement/Net Savings from Implementation:** See Johnson Controls Reports.

**Timeline for Implementation:** Continuation of current practices.

## **E-2D: Create a Charleston Climate Partnership with major energy consumers.**

**Summary of Specific Issues:** The City of

Charleston's plans to reduce greenhouse gases can only be realized with the cooperation of the City's major energy consumers.

**Recommendation/Strategy/Action Plan:**

Create a Charleston Climate Partnership that challenges large energy users and near-by communities to work together to reduce energy consumption. Develop major business and residential outreach campaigns supporting the adoption of best practices related to energy conservation and the purchase of renewable energy.

**Implementation Responsibilities/Assignments:**

The Sustainability Director and the Charleston Chamber of Commerce should work together to develop the Charleston Climate Partnership.

**Cost to Implement/Net Savings from**

**Implementation:** Little cost to the City beyond staff time.

**Additional Benefits:** Sharing of information about energy conservation and renewable energy, and the City assuming a leadership role in working with other communities and business leaders.

**Timeline for Implementation:** Immediate as there are no initial costs involved.

**References:** New York City

**E-2E: Establish an alternative financing program to facilitate energy efficiency.**

**Summary of Specific Issues:** Charleston's aging building stock offers immense opportunities for energy efficiency in commercial, industrial, municipal, and residential sectors. Often it is lack of knowledge, financing opportunities, and skilled labor that prevent residents, business owners, and government entities from taking advantage of potential energy reductions and cost savings.

**Recommendation/Strategy/Action Plan:** The

City is already working with a consultant and various local partners to create a self-sustaining entity that will offer comprehensive services to support energy efficiency improvements in residential, commercial, industrial, and government facilities. Services will include energy audits, tailored retrofit programs, financing options, and skilled labor. The City should continue to play a leading role in this effort through and beyond the program's projected launch date in 2010. (See also Recommendation B5.)

**Implementation Responsibilities/Assignments:**

The Sustainability Director should coordinate this effort for the City.

**Cost to Implement/Net Savings from**

**Implementation:** Proportional to program and services provided. Estimates have made up to \$500,000.

**Additional Benefits:** Local job creation, revenue generation, improved health and quality of life, and demonstration of leadership by the City for the State of South Carolina.

**Timeline for Implementation:** The program could be operational by spring 2010. It should provide services to 1,000 housing units, small businesses, or other institutions by 2011; and provide services to all housing units, small businesses and institutions requesting help by 2015.

**References:** Many cities have established similar programs, including the Cambridge Energy Alliance in Massachusetts and programs in Milwaukee, Wisconsin; Charlottesville, Virginia; Portland, Oregon; Babylon, New York; and New York City.

**E-2F: Study the implementation of a four-day workweek.**

**Summary of Specific Issues:** Electricity used in buildings operated by the City of Charleston accounts for 63% of City government's carbon

footprint. Several cities and businesses have instituted a four-day workweek to save energy and reduce operating costs. A four-day workweek can reduce automobile travel, as well as reduce electricity use in City buildings, and can therefore reduce carbon dioxide emissions.

**Recommendation/Strategy/Action Plan:**

The City of Charleston should study the possibility of a four-day workweek with departments and the community.

**Estimated Greenhouse Gas Reductions to be Achieved - In Metric Tons/Year:**

There will be a small decrease in electricity demand because the reduced work week will be partly compensated for by extending working hours on the remaining four days. We estimate at most a 15% reduction in energy use for City departments. The major energy saving and greenhouse gas reduction will accrue from a 20% reduction in commuting mileage.

**Implementation Responsibilities/**

**Assignments:** The Sustainability Director working together with City department heads should study possible implementation of the four-day workweek.

**Additional Benefits:** Improvement in worker morale, increased work productivity, improved employee retention, reduced employee absenteeism, reduced highway usage.

**Timeline for Implementation:**

Implementation will be complex because services to the public may be affected. We recommend initiation of a study during the next 5 years.

**References:** The state of Utah.

[http://www.heraldextra.com/news/local/article\\_e5e96c0c-7ee6-5787-b46f-c8ac9990c440.html](http://www.heraldextra.com/news/local/article_e5e96c0c-7ee6-5787-b46f-c8ac9990c440.html)  
<http://www.usatoday.com/news/>

[nation/2008-06-30-four-day\\_N.htm](http://www.theoil drum.com/node/2996)  
<http://www.theoil drum.com/node/2996>

College of Charleston MES Green Committee (Case Studies Fall 2008); Recommendations to the Charleston Green Committee for a Sustainable Charleston, SC.

## E3. GENERATE AND SUPPORT RENEWABLE ENERGY

### E-3A: Set a goal for renewable energy.

**Summary of Specific Issues:** To meet long-term goals for reducing greenhouse gas emissions, the city needs to access low-cost, reliable, renewable energy. Our goal is to have 15% of Charleston's energy needs met by new renewable energy sources, developed after passage of this plan, by 2020 and 30% by 2030.

This is a modest goal. Thirty-three states have set renewable energy goals. Ten percent is the lowest goal set by any state, and states that chose that goal plan to reach it no later than 2015. More ambitious states include California, which will require its utilities to generate 20% of their power from renewables by 2010, and 33% by 2020.

Los Angeles is scheduled to reach 20% renewable energy by 2010, and 40% by 2020. Ahead of Los Angeles, interestingly, is Grand Rapids, Michigan, which met its goal of 20% in 2008. By 2020, Grand Rapids plans to rely 100% on renewable energy.

**Recommendation/Strategy/Action Plan:**

The City should develop a strategy that will result in at least 15% of its electrical energy needs being met from renewable energy sources by 2020. The City should also pursue opportunities to procure, support, or generate renewable energy.

**Estimated Greenhouse Gas Reductions to be Achieved - In Metric Tons/Year:** If the goal of 15% is met by 2020, there would be a reduction of approximately 40,500 tons CO<sub>2</sub>/yr.

**Implementation Responsibilities/Assignments:**

- The Sustainability Director should identify possible renewable energy sources to replace fossil fuels. The Sustainability Director will collaborate with utilities and pursue other funding sources.
- City lawyers should review the SCE&G contract to determine the feasibility of producing renewable energy or procuring renewable energy from SCE&G and/or other providers.
- The Sustainability Director should review opportunities to purchase renewable energy (e.g. green tags) from green power purchase programs (e.g. Palmetto Clean Energy) or other sources.
- The City with SCE&G, South Carolina Public Service Commission, and the South Carolina General Assembly should explore the possibilities of setting reasonable statewide standards for renewable energy generation.

**Additional Benefits:** Embracing renewable energy could foster economic development around sustainability and renewable energy.

**Timeline for Implementation:** Implementation can begin immediately.

**E-3B: Help develop large-scale sources of renewable energy.**

**Summary of Specific Issues:** Development of local, large-scale facilities that generate renewable energy is an important step toward fulfilling long-term goals for reducing carbon dioxide emissions. The wind energy potential

offshore near Charleston is sufficient to meet much of the City's electricity demand. Off-shore wind farms are successful in Europe and plans are underway for major installations in the Northeastern US.

There is also the potential for Charleston to attract a national/ international offshore wind manufacture and distribution hub. The city already meets important infrastructure requirements, such as port facilities and steel manufacturing facilities.

In addition, tidal and wave energy, as well as large-scale solar farms, may be potential energy resources for the Charleston area.

**Recommendation/Strategy/Action Plan:** The City should support and/or undertake feasibility studies of potential renewable energy sources, including wind, solar, tidal, and wave energy. The City should then develop a strategy for supporting appropriate renewable energy projects.

**Estimated Greenhouse Gas Reductions to be Achieved - In Metric Tons/Year:** European experience indicates a large possible displacement of fossil fuels.

**Implementation Responsibilities/Assignments:**

Because of the long-term nature of this recommendation, the Sustainability Director and the Charleston Green Committee should take on this responsibility with the possible support of the City Business Innovation Director.

**Cost to Implement/Net Savings from Implementation:** Cost will be mainly Sustainability Director's time.

**Additional Benefits:** Embracing renewable energy could foster significant economic development.

**Timeline for Implementation:** Next 5 years.

# Recommendations

**References:** MES (College of Charleston) case studies report on Off-shore winds.

## **E-3C(i): Encourage on-site generation of renewable energy (City property).**

**Summary of Specific Issues:** To make dramatic reductions in power use and associated climate impacts, it may be necessary to change the City's policy for acquiring power for its own facilities.

**Recommendation/Strategy/Action Plan:** A City-financed study should address the technical and legal feasibility of on-site renewable energy facilities for City buildings, as well as off-grid retrofits for specific building functions such as solar lighting, space heating, and hot water heating. A further target is conversion from air-source heat pumps to ground- or water-sourced systems, which operate more efficiently.

**Estimated Greenhouse Gas Reductions to be Achieved - In Metric Tons/Year:** None until the study's recommendations are implemented.

**Implementation Responsibilities/Assignments:** The Sustainability Director should manage the survey of City-owned facilities.

**Cost to Implement/Net Savings from Implementation:** The cost of this feasibility study would be modest, whether undertaken by a consultant or City employees. Much of the information needed is readily available.

**Additional Benefits:** Public education regarding viability of alternative energy technology.

**Timeline for Implementation:** This is an important "first step" and should be

implemented immediately because of its low cost. An RFP could be developed within 60 days, a study could be completed in 6 months, and implementation could take place over two to five years depending on study results and budget constraints.

**References:** Kansas City

## **E-3C(ii): Encourage on-site generation of renewable energy (private property).**

**Summary of Specific Issues:** The actions of private property owners have a large impact on energy use. Photovoltaic solar power generation for home or commercial consumption or grid feed-in, solar space heating, and solar hot water heating can substantially reduce greenhouse gas emissions.

**Recommendation/Strategy/Action Plan:** City staff should:

- Examine city ordinances and work with SCE&G to reduce obstacles to, and create incentives for, the installation of energy-generating devices on private property (e.g. net metering, interconnection standards);
- Work with Charleston County Housing Authority and the Department of Housing and Community Development to apply for renewable energy grants for low-cost public housing;
- Investigate financing mechanisms that allow homeowners to amortize the upfront costs of renewable energy generation by utilizing the municipal bond market (e.g. a renewable energy finance district);
- Provide via the City website timely information about state and federal

incentives for solar and other renewable energy installations.

**Implementation Responsibilities/Assignments:** Sustainability Director working together with the Housing Authority and City Department of Housing and Community Development.

**Cost to Implement/Net Savings from Implementation:** Minimal cost for City staff time.

**Additional Benefits:** Public education regarding viability of alternative energy technology.

**Timeline for Implementation:** Can begin immediately.

**References:** Kansas City

## E4. TRANSMIT AND DELIVER ELECTRICITY EFFICIENTLY

**Summary of Specific Issues:** A “Smart Grid” uses available technologies to make the nation’s electrical grid work more efficiently and increase reliability. Increased efficiency of energy delivery reduces consumer’s electrical bills and decreases greenhouse gas emissions associated with energy generation. Household energy monitoring devices linked to a smart grid will help household to make better energy usage decisions, because the consumer can postpone energy-intensive activities until off-peak hours when energy costs less. The “Smart Grid” technology is fully compatible with on-site renewable energy generation. A Smart Grid is used with DSM (Recommendation E-2A) to reduce energy consumption and save money in many cities, including Miami, Florida and Austin, Texas.

**Recommendation/Strategy/Action Plan:** The City should work with SCE&G to bring Smart Grid technology to Charleston. The City can encourage SCE&G to follow the lead of Duke Energy, which is trying to bring Smart Grid

technology to all its customers. The City should ask the South Carolina Public Service Commission to help introduce Smart Grid technology to South Carolina.

**Implementation Responsibilities/Assignments:** The Sustainability Director and Charleston business leaders should work with the state and SCE&G to bring Smart Grid technology to Charleston.

**Cost to Implement/Net Savings from Implementation:** Costs would accrue mainly to SCE&G, but are offset by a reduction of the number of standby generation facilities that will be needed.

**Additional Benefits:** A Smart Grid will encourage the use of on-site renewable energy devices; encourage conservation; and enhance Charleston’s “green” reputation.

## E5. ENCOURAGE THE PUBLIC TO PARTICIPATE

**Summary of Specific Issues:** Ultimately, the effectiveness of an energy-efficiency campaign depends on how many individuals and businesses participate. It is therefore essential to include an education and public relations campaign that can address a broad range of stakeholders.

**Recommendation/Strategy/Action Plan:** The City should build or enhance partnerships with a range of interested parties, including utilities, local and regional government entities, and nonprofit groups to establish and implement an education and training program on energy and the environment.

**Implementation Responsibilities/Assignments:** The Sustainability Director should manage this process and work with the Charleston Chamber of Commerce, the County School Board, local colleges, and neighborhood committees, among others.

# Recommendations

**Cost to Implement/Net Savings from Implementation:** The only cost to the City would be the Sustainability Director's time and the preparation of public relations materials.

**Additional Benefits:** Enhanced City leadership.

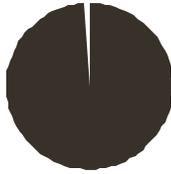
**Timeline for Implementation:** Planning of the program could begin immediately.

**References:** Educational activities are common to all City energy and greenhouse gas reduction plans examined by the Energy Subcommittee.



# Recommendations

## Sustainable Communities Goals, Actions & Recommendations



Given the interrelated nature of the Sustainable Communities recommendations, several overlapping quantifiable measures could be attributed to this chapter. See page 21 for measurable effects of related strategies.

### ACTIONS

#### 1. Plan future growth to use land efficiently and reduce vehicle emissions.

- A. Encourage compact, complete and mixed use communities.
- B. Encourage infill development and the retrofit of suburban areas.
- C. Encourage sustainable “Traditional Neighborhood Design.”
- D. Encourage affordable housing.
- E. Encourage local, sustainable food production.
- F. Coordinate infrastructure decisions with other government entities to support sustainable development by way of the actions listed previously (C-1A through C-1E).

#### 2. Plan where growth occurs, then plan transportation accordingly.

- A. Plan sustainable neighborhoods, then plan transportation to support them, rather than allowing poorly-planned roads to create sprawl.

- B. Create a regional public transit plan and a citywide “multimodal” transportation plan, then encourage “transit-oriented development.”

#### 3. Encourage sustainable engineering standards.

- A. Revise engineering standards to minimize water pollution, reflect “nature as infrastructure” principles, and use less energy.
- B. Reduce the “urban heat island effect.”
- C. Develop sustainable parking strategies.
- D. Remove roadblocks to sustainable development.

#### 4. Create a sea level rise adaptation plan.

#### 5. Create public education programs.

### C1. PLAN FUTURE GROWTH TO USE LAND EFFICIENTLY AND REDUCE VEHICLE EMISSIONS

#### C-1A: Encourage compact, complete and mixed use communities.

Automobile use is a major contributor to greenhouse gas emissions. Yet sprawl development separates our homes from workplaces, schools, and shopping, forcing us into our cars. At the same time, sprawl isolates people, promotes sedentary behavior, erodes a sense of community, and turns unique local landscapes into “Anywhere, U.S.A.”

Fortunately, there is no need to remain prisoners of sprawl. Development is based on local planning codes, along with public investment and market forces. We can change planning codes and direct public investment to create more diverse choices for city residents. We can also offer incentives for developers to create communities that integrate work, school, play, and home life. Added benefits include protection for clean water, agricultural land, and native habitat throughout the region.

### Specific Recommendations

- **Context-Sensitive Planning:** The City should adopt a settlement code that encourages compact, complete and mixed use communities in urban, sub-urban and rural contexts. This code would reflect the special qualities of each area of the city (i.e. Peninsula, West Ashley, James Island, Johns Island, Daniel Island and Cainhoy). Currently, one type of planning tool for this purpose is “transect-based.”<sup>1</sup> Transect-based planning divides a metropolitan area into precise zones, ranging from the urban core to natural areas. Design standards vary logically according to the zone. In the future, other, better models may be developed. At that time, the City can consider these alternatives. (See Glossary for more on “context-sensitive” and “transect-based” planning.)
- **Sustainable Development Standards:** Settlement codes should promote complete, compact, and sustainable neighborhoods and communities, drawing from such models as the historic districts on the Charleston peninsula, as well as from such publications as the City of Charleston’s 2008 Preservation Plan, SmartCode, LEED-ND, Canons of Sustainable Architecture & Urbanism, and the Awahnee Principles. These standards should yield a range of densities, including establishing minimum densities where appropriate; provide a variety of housing opportunities/choices (including workforce housing); use “form-based codes” that encourage mixed uses; facilitate community-scaled civic and institutional uses (i.e. neighborhood schools); create connected, multi-modal street networks; provide appropriate recreational and open space; and protect significant natural areas; including native habitat and wildlife corridors throughout the city. (See Glossary for more on “form-based codes.”)
- **Incentives:** Incentives should be offered to developers willing to build complete, compact, and sustainable communities. These could include waived impact fees, streamlined permitting, and, if possible, assistance in obtaining public financing. Also, impact fees should be based on actual impact. (See Glossary for more on “impact fees.”)
- **Urban Growth Boundary:** Context-sensitive (urban to rural transect) planning is mapped from city centers and gathering places outward to an Urban Growth Boundary (UGB), beyond which development codes reflect the increasing rural nature of the area. As part of the next comprehensive plan update, the City should review its UGB for consistency and completeness. Particularly in Berkeley County, the City should map important natural and agricultural resources and evaluate growth projections, then determine how much new land is needed to accommodate future development. Throughout the city, a high priority should be given to directing new development toward infill and retrofitting suburban areas. In future

# Recommendations

plan updates, the entire UGB should be reevaluated using the process described above. (See Glossary for more on “Urban Growth Boundary.”)

- **Thoroughfare Standards:** Consistent with context-sensitive settlement codes, the City should adopt different street design standards for different communities. Current standards tend to mandate wider streets, and are the same whether the street is in historic downtown Charleston or suburban West Ashley. Instead, the new standards should encourage walking, biking, and neighborhood activity. Future investment in maintenance and waste collection vehicles should be consistent with the new thoroughfare standards.
- **Community Planning and Outreach:** Context-sensitive settlement codes should be created with significant community involvement so that communities have the opportunity to become comfortable and familiar with the principles of sustainable design. Focusing on one community at a time, as department budgets permit, planning staff should conduct “charrettes,” or detailed design workshops, in West Ashley, James Island, Cainhoy, the Peninsula, etc. After each charrette, planning staff should recommend changes to the comprehensive plan. These recommendations would be referred to the Planning Commission and City Council for approval and addition to the area plan. (See Glossary for more on “charrettes.”)
- **Planned Unit Developments:** As the City moves toward context-sensitive settlement codes, it should require that all Planned Unit Developments (PUDs) be designed to be context sensitive. Also, PUD standards should be revised to

include sustainable development requirements. Once new codes are adopted, PUD’s would no longer be needed and should be eliminated to avoid confusion and inconsistent requirements. (See Glossary for more on “Planned Unit Development.”)

## C-1B: Encourage infill development and the retrofit of suburban areas.

The Charleston *Post & Courier* recently reported that approximately 135,000 homes were planned for the Charleston metropolitan area. Of these homes, 114,000, or about 85%, will be built beyond I-526, creating more sprawl and increasing auto emissions.

Sustainable cities are built on an entirely different model. Growth is directed toward underutilized “infill” sites closer to the urban core. In these areas, existing buildings can often be adapted, and natural landscapes protected or restored. Infill development reduces auto emissions, provides easy commutes, creates vibrant neighborhoods, and also saves taxpayers significant infrastructure costs.

Sustainable cities also “retrofit” their suburbs, making these areas less auto-dependent and more appealing to homeowners. At the simplest level, a suburban retrofit can involve inserting mixed-use residential pockets and town centers - some with significant public amenities - among existing office parks, malls, and subdivisions.

The most sustainable suburban retrofits emphasize the creation of “transit-worthy” communities. Such communities are dense enough to support public transit (at least 4 - 15 dwelling units per acre depending on the type of transit), and can conveniently be

linked with one another for that purpose. (See Glossary for more on “transit-worthy” communities.”)

Such projects not only reduce auto emissions by making alternative transportation feasible and strengthening street networks. They also mitigate traffic congestion, meet affordable housing needs, and create vibrant communities that provide residents with services and activities closer to home.

## Specific Recommendations

- **Inventory:** The City should conduct a “room-to-grow” inventory of the City, i.e. an analysis of underutilized or poorly designed properties, to determine how much growth can be accommodated. Areas surrounding current and future public transit stops should receive especially careful attention.
- **New Infill Standards:** The City should modify its comprehensive plan and zoning codes to encourage infill development, permitting mixed uses and traditional neighborhood design in these areas.
- **New Suburban Retrofit Standards:** The City should modify its comprehensive plan and zoning codes to encourage the retrofit of suburban areas, permitting mixed uses and traditional neighborhood design in these areas. Specifically, the City should adopt a Century V Comprehensive Plan Amendment dealing with suburban retrofits and simultaneously adopt codes and regulations that encourage the use of sustainable design standards such as LEED-ND. Suburban retrofits should include a strengthened street network.
- **Incentives:** The City should provide incentives for infill development and suburban retrofits, possibly including waived impact fees, streamlined permitting, and/or assistance in obtaining public financing. The City is encouraged to establish a Redevelopment Authority to evaluate financial incentives such as Tax Increment Financing (TIF), Municipal Improvement Districts (MID), property tax abatement, impact fee abatement, public-private partnership, affordable housing funds, Local Development Corporation (LDC) funding, transportation funding for transit housing, and other funding sources relevant to infill development and suburban retrofitting. The Redevelopment Authority or the City could also take the lead in coordinating with financial institutions, including local community banks, likely to respond positively to redevelopment projects, in addition to educating these institutions about successful ventures elsewhere in order to increase their comfort level and the likelihood of successful investment.

### **C-1C: Encourage Sustainable “Traditional Neighborhood Design.”**

“Traditional Neighborhood Design,” or TND, refers to neighborhoods that look and function like traditional towns, with minor updates to meet modern standards. TND is sustainable because it is walkable, contains mixed uses, reduces auto-dependency, provides jobs in neighborhoods, and preserves quality open space. TND makes it easy to walk or bike to essential services, and provides neighborhood amenities that encourage people to play and socialize near their homes. These include everything from street furniture under shade trees to urban

# Recommendations

squares and village greens appropriate for festivals and community events. Also, TND developments provide density that is sufficient to support public transit (i.e. 4 - 15 dwelling units per acre depending on the type of transit). The primary obstacle in building a TND development is outmoded zoning codes that actually outlaw traditional neighborhood features and separate residential from commercial uses.

## Specific Recommendations

- **Design Standards:** Zoning codes should be amended to permit traditional neighborhood features that support biking, walking, and neighborhood gatherings. These could include, for example, mixed uses, nearby parks and civic buildings, reduced lane widths, reduced right-of-way (ROW) widths, bundling of ROW utilities, smaller lots, and even smaller homes. Such flexibility not only allows developers to create bicycle- and pedestrian-friendly neighborhoods; it also frees more land for public green space.
- **Retail and Services:** Zoning codes should also be amended to ensure that neighborhood retail and essential services can be included in plans for all new development and redevelopment, including infill, suburban retrofit, and “greenfield” development that converts rural land to urban uses. Concepts such as the five-minute walk, the pedestrian shed, and mixed use centers should be included in this planning. Further, planning should go beyond small corner stores to include convenience stores (10,000-30,000 sq. ft.) and typical neighborhood centers (60,000-80,000 sq. ft.) (See Glossary for more on “pedestrian shed.”)
- **Research & Collaboration:** To the

extent that City budgets permit, the process of amending zoning codes to permit TND development should include retail expertise and examination of successful case studies, including financing scenarios and public-private partnerships. It should also include, to the extent possible, coordination with financial institutions and the Local Development Corporation (LDC), which could potentially help developers access Community Development Block Grants.

- **Priority Investment Act:** In its efforts to promote TND, the City should evaluate the S.C. Priority Investment Act, signed into law in 2007 to amend the Local Government Comprehensive Planning Enabling Act of 1994. This law allows local governments to identify “priority investment zones” in which they can eliminate nonessential regulations and use market-based incentives to encourage TND. Incentives may include, but are not limited to, density bonuses, streamlined permitting, design flexibility, reduced or waived fees, and relaxed zoning regulations such as lot area requirements or setbacks. Note: local governments must incorporate this law into their existing comprehensive plans during their next five-year review or update, which for Charleston occurs in 2009-10.

### **C-1D: Encourage affordable and workforce housing.**

The recommendations listed previously (C-1A through C-1C) - which encourage compact development, infill development, suburban retrofits, and Traditional Neighborhood Design - can all help increase the City’s supply of affordable housing. Additional measures should also be taken to promote affordable and workforce housing because it is vitally important that people

of all income levels have easy access to employment.

- **Affordable Housing Recommendations:** A representative of the City’s Sustainability Division should be included on the City’s Affordable Housing Task Force to insure that affordable housing is as sustainable as other forms of housing. Also, affordable housing should be indistinguishable from, and as marketable as, other forms of housing. Further, the City should consider seeking state and federal funds, including transportation funds, to support affordable housing projects based on a mixed-use development model. The City should also explore the feasibility of offering financial incentives to potential residents.
- **New Standards:** The City should set minimum thresholds for achieving diversity of housing types in new neighborhoods, i.e. minimum densities and/or allowances for accessory units. At the same time, the City should move forward in permitting accessory units throughout the city.

### C-1E: Encourage local, sustainable food production.

On average, food is trucked approximately 1,500 miles before appearing on an American dinner table, adding to the vehicle emissions that spur climate change. Also, most food production in the US releases additional greenhouse gases and has other significant negative effects on the environment.

By contrast, sustainable cities in Europe and elsewhere offer residents larger quantities of fresh, local food, much of it produced with negligible environmental impact. In the US, hundreds of new developments feature organic farms and “edible

landscaping” as the primary amenity. These developments, including the posh Serenbe near Atlanta, are just one aspect of a broader movement called “agricultural urbanism,” which promotes the integration of sustainable food production into urban settings. (See Glossary for more on “agricultural urbanism.”)

### Specific Recommendations

- **Protect Agricultural Land:** The City should protect remaining agricultural areas within its borders and advocate protection beyond the Urban Growth Boundary from suburban sprawl. Incentives should be among the tools used to protect this land.
- **Allow Food Production:** Coordinating with Berkeley, Dorchester, and Charleston counties and organizations promoting local food production, the City should map urban, suburban, and rural areas, permitting local food production at all scales wherever possible, including apiaries. Throughout the City the presumption should be in favor of permitting food production. Food distribution should also be permitted at appropriate locations, potentially including roadside stands and drop-off points for community supported agriculture in residential neighborhoods.
- **Support Gardens/Markets:** The City should support creation of food-based gardens at schools, on rooftops, and in parks and abandoned lots where feasible. Also, the City should support creation of additional farmers markets where appropriate.
- **Encourage Sustainable Production:** The City should consider offering incentives for landowners willing to

# Recommendations

farm in a way that does not threaten human health, clean water and biodiversity, or exacerbate climate change.

## **C-1F: Coordinate infrastructure decisions with other government entities to support sustainable development by way of the actions listed previously, C-1A through C-1E.**

The SC Priority Investment Act is a 2007 amendment to the Local Government Comprehensive Planning Enabling Act of 1994 which requires a basic level of coordination among local governments, school districts, utilities, etc. as they plan roads, schools, sewer lines, and other public infrastructure. Public infrastructure is often poorly planned and can encourage unnecessary sprawl development in rural areas if not properly coordinated. The motto “plan where you grow, and grow where you planned,” should be cooperatively applied by local government.

Note: local governments must incorporate this law into their existing comprehensive plans during their next five-year review or update, which for Charleston occurs in 2009-10.

### Specific Recommendations

- The City should fulfill the requirements of the Priority Investment Act during the Comprehensive Plan Update in 2009.
- The City should be a leader and advocate of regional planning and intergovernmental/interagency coordination. Concerning public infrastructure planning and spending, the City should consider requiring current analysis of impacts, costs, and

benefits of all proposed public infrastructure projects that are not adjacent to existing thoroughfares and/or human settlement of a certain density. The City should use that data to construct an impact fee scale based on *actual* impact. If legally permissible, the City could use these collected impact fees to establish a revolving fund to assist with City expenses related to infill projects and suburban retrofits.

## **C2. PLAN WHERE GROWTH OCCURS, THEN PLAN TRANSPORTATION ACCORDINGLY.**

### **C-2A: Plan sustainable neighborhoods, then plan transportation to support them, rather than allowing poorly-planned roads to create sprawl.**

Often, decisions to build roads are made in isolation from decisions about community development. The result has been broad highways - which in turn spawn commercial strips, attract sprawling residential development, displace working farms, and destroy both native habitat and a local “sense of place.”

By contrast, sustainable cities seek first to create vibrant, active neighborhoods, then link them using a “connected” transportation network. Where roads are not well connected, larger streets and freeways promote auto-only travel and traffic congestion. They also increase vehicle miles traveled and consequently increase auto emissions.

By contrast, a connected street network offers travelers multiple options. This improves traffic flow, shortens trip lengths,

and minimizes auto emissions. The result is a sustainable urban fabric, in which residents can fulfill many daily needs closer to home; can often choose to walk, bicycle, or use public transit; and can travel shorter distances when they do use autos.

## Specific Recommendations

- **Communities First:** The City should plan vibrant, active, context-sensitive neighborhoods, then link them by planning a connected transportation infrastructure.
- **Fifty-Year Vision:** The City, along with the Berkeley-Charleston-Dorchester Council of Governments (BCD-COG), should plan for a 50-year vision of such linked neighborhoods.
- **Revise for Consistency:** The City should revise zoning, land development, building codes, and engineering standards to ensure adherence to the principle of communities first, transportation second.

### **C-2B: Create a regional public transit plan and a citywide “multimodal” transportation plan, then encourage “transit-oriented development.”**

Charleston is well designed for public transit and has critical components available, such as existing rail lines and appropriate densities. Though the City cannot create a regional public transit plan alone, it can provide the leadership essential to a cooperative, intergovernmental effort. The City can also ensure that this plan is based on the principle of communities first, transportation second.

Once a public transit plan is in place, future

development should be organized around future transit lines and hubs. Development in these areas should integrate rather than separate jobs and housing, and establish appropriate densities supportive of transit-oriented development.

Further, critical to transit-oriented development is the opportunity for residents to walk, cycle, etc. to public transit stops. Therefore a citywide “multimodal” transportation plan should facilitate a safe, efficient coexistence among those who choose to walk, cycle, and use scooters or roller blades, as well as those who use autos and public transit. (See Glossary for more on “multimodal” planning and “transit-oriented development.”)

## Specific Recommendations

- **Regional Plan:** The City should request that the Berkeley-Charleston-Dorchester Council of Governments (BCD-COG) develop a regional public transit plan with all local counties and municipalities, based on the principle of communities first, transportation second.
- **Sub-Area Plans:** Next, sub-area plans for future public transit stops should be developed through a series of local workshops aimed at educating the public, soliciting opinions and support, and identifying potential solutions.
- **Zoning Revision:** The zoning code near future public transit stops should be amended to reflect standards for minimum densities, parking structures, park and ride features, and mixed uses needed for transit-oriented development. New rules should delineate requirements related to the “pedestrian shed” and “transit shed,” so that residents will live close enough

# Recommendations

to services and transportation that they can choose not to use automobiles. (See Glossary for more on “pedestrian shed” and “transit shed.”)

- **Multi-Modal Plan:** The City should develop a citywide multimodal transportation plan, complete with capital improvement recommendations and funding strategies. Collaboration with Charleston County, BCDCOG, and CHATS is essential. In order to focus on this priority, the City should revise the Comprehensive Plan to do away with mutually exclusive traffic study requirements.

## C3. ENCOURAGE SUSTAINABLE ENGINEERING STANDARDS

**C-3A: Revise engineering standards to minimize water pollution, reflect “nature as infrastructure” principles, and use less energy.**

There are many ways the City’s engineering standards can be revised to enhance sustainability. Perhaps the most important revisions are needed to protect our diminishing wetlands and water quality. While the State has jurisdiction over filling wetlands, the City can still do a great deal to protect wetlands and other water resources by how it chooses to manage its stormwater runoff.

In populated areas, stormwater runoff contains oil, gasoline, fertilizers, herbicides, and other chemicals that are toxic to aquatic life. Conventional stormwater management systems allow this runoff to spill off pavement and manicured lawns into stormwater drains, then directly into surrounding bodies of water. In addition, frequent flooding results when conventional stormwater systems fail to

drain water as efficiently as natural drainage systems.

Alternatively, stormwater systems based on the principle of “nature as infrastructure” capture and filter polluted runoff by mimicking natural drainage systems. These systems also reduce stress on stormwater drains, minimizing flooding. Further, the best “nature as infrastructure” designs can significantly reduce engineering and construction costs. They are also compact and attractive, potentially increasing property values. (See chapter introduction for more on “nature as infrastructure.”)

## Specific Recommendations

- **Higher Standards for Stormwater:** The City should require the use of stormwater systems based on “nature as infrastructure” principles. Techniques include pervious pavements, bioswales and rain gardens, and the combined use of trees and structural soils. The best of these natural stormwater management techniques have been compiled into the “light imprint” standards.<sup>2</sup> Light imprint standards are designed to be used with context-sensitive planning, and specify which techniques are most appropriate in which parts of the city. The City’s Storm Water Management Plan and Drainage Manual should be brought into alignment with Light Imprint standards, and the City should expeditiously approve and adopt them. (See Glossary for more on “Light Imprint.”)
- **Higher Standards for Buffers:** The City should establish higher standards for protection of water resources, including fresh and saltwater wetlands, going beyond the minimal protection provided by state and federal laws. New standards should include wider natural

buffers, with specific requirements for supplemental plantings, native vegetation, and buffer preservation. Further, the City should devise and fund a monitoring and enforcement plan, including meaningful fines.

- **Stormwater Fees:** The City should develop a tiered schedule for stormwater fees for all development, commercial and residential, existing and proposed. These fees should be based on actual impact.
- **City Properties:** New construction on City properties should use exemplary sustainable design for paved areas, landscaping, buffers, and pervious surfaces wherever possible.
- **Shoreline Enhancement:** The City should create a “Living Shorelines” enhancement program that promotes the use of natural structures instead of conventional engineering to protect and restore damaged shorelines. Programs should encourage planting oyster beds, reducing wake-zones, planting vegetative buffers, etc. This should be undertaken in collaboration with the state’s Office of Ocean and Coastal Resource Management (OCRM) and other local governments. (See Glossary for more on “Living Shorelines.”)
- **Wetlands/Water Quality Expertise:** The City should have an ecologist on staff with expertise in natural resource protection, with particular expertise in stormwater management, soils, topography, water quality, and wetlands and critical area protection (including delineation, buffering, habitat protection, and federal, state, and local policies governing these areas.) Further, the City should establish an advisory committee to review standards and enforcement mechanisms and

provide supplementary expertise on wetlands and water quality.

- **Essential Data:** City planners have access to a wealth of Geographic Information Systems (“GIS”) data on natural resources, water resources, and drainage information in and around City boundaries. The City’s GIS inventory should be updated with the most current information available from USGS, SCDNR, NOAA, and Coast Guard professional land surveys, plats, site plans, etc. GIS information should include wetlands data, existing topography, critical line data, receiving water bodies, existing outfalls, existing drainage systems, etc. Information should be integrated on a regional basis.
- **Collaboration:** The City should continue to collaborate with other local governments on watershed management and public education.
- **Additional Standards:** The City should also revise other engineering standards based on national LEED standards - for example, the use of reclaimed materials to increase pavement strength. Further, the City should adopt the 2030 targets for public lighting, reducing energy use and minimizing light pollution by requiring light-emitting diodes, down-lighting, and pathway lighting. Finally, the City should consider eliminating all but the most essential lighting (joining the Dark Skies Initiative), as well as increasing enforcement to address noise pollution.

### C-3B: Reduce the “urban heat island effect.”

The “urban heat island effect” occurs when metropolitan areas are warmer than the surrounding countryside. Cities become

# Recommendations

heat islands because of increased pavement, reduced vegetation, buildings that absorb heat and block wind, and “waste heat” from automobiles, air conditioning, and industry.

The Charleston peninsula is often 3-6 degrees warmer than surrounding areas on a summer day, with a much higher differential at night. Warmer urban temperatures increase air conditioning costs, as well as peak energy demand and greenhouse gas emissions. They also diminish quality of life for city residents; facilitate the formation of ozone and other air pollutants; and stress vegetation and aquatic ecosystems.

One of the most effective ways to reduce the urban heat island effect is to plant shade trees. Another is to create “green roofs” -- that is, soil installed on the top of buildings and planted with a variety of vegetation. Both strategies have important additional benefits. Trees reduce stormwater runoff by intercepting and diminishing the impact of rainfall and by making the soil more porous. This causes the water to drain into the soil or onto paved surfaces at a much slower rate, decreasing the possibility of overwhelming stormwater systems or other drainage patterns. As a result, groundwater is recharged, flooding is reduced, and pollutants are filtered naturally rather than poured directly into creeks and rivers. Both trees and green roofs capture carbon dioxide (a potent greenhouse gas); provide wildlife habitat; and create a more beautiful and more peaceful urban atmosphere. Other strategies to reduce heat include the use of light-colored, reflective roofing and pavements.

## Specific Recommendations

- **Multigenerational Tree Canopy:** The

Plan should promote a diversity of long-lived tree species chosen for their environmental benefits, including heat reduction, carbon sequestration, and runoff retention. (See Glossary for more on “Multigenerational Tree Canopy.”)

- ◇ **Master Plan and Coverage Goal:** The City should develop an Urban Forestry Master Plan, beginning with an Urban Forest Effects Model of the City’s existing urban forest. Further, the Master Plan should set a citywide tree canopy coverage goal to meet or exceed 40%, with specific goals set for different areas and for new and existing development.
- ◇ **Public Land:** The City should invest in a multigenerational tree canopy on public land. This requires not only protecting the existing canopy of mature trees, but also planting on a regular schedule to replace these trees. It is important to select a diversity of tree species, focusing on native species and those that conserve water. Further, the City should give as high a priority to urban planting as it does to planting in suburban and rural areas.
- ◇ **Private Land:** Through its land development standards and through the use of incentives, the City should promote the planting of shade trees and the use of native vegetation and natural backyard buffers on private land. Further, existing shade trees on private land should be replaced if removal is necessary.
- ◇ **Stewardship Fee:** The City should advocate a state-level fee for the purchase and planting of new

trees by local governments.

- **Cool Roofs & Pavements:** For new construction on City property, the City should set a high standard by using green roofs and rooftop gardens, as well as light-colored, reflective roofing and pavements. Again, plant species should be diverse, with a focus on native species and those that conserve water. On privately-owned property, the City should use incentives to promote the use of these heat-reduction strategies.

### C-3C: Develop sustainable parking strategies.

Large parking lots encourage the exclusive use of single-occupancy automobiles, and also contribute to the heat island effect. By developing new parking strategies, the City can support public transit, bicycling, walking, etc.; minimize environmental impacts; and maximize efficiency.

#### Specific Recommendations

- **Diverse Strategies:** The City should implement a variety of parking strategies. These should include shared parking, which allows multiple users to share a single space on a predetermined schedule; and “park once” districts, which allow motorists to park in a central location then access multiple stores and services on foot. Also, the City should consider reduced parking requirements. Further, the City should explore “shared vehicle systems,” now popular in many urban areas, which provide easy access to vehicles from a shared fleet for short periods of time. Shared vehicle systems allow families to reduce their need for multiple cars and reduce the pressure to maximize parking capacity. (See Glossary for

more on shared parking, “park once districts,” and “shared vehicle systems.”)

- **Visitor and College Parking:** The City should investigate parking management strategies that relate to out-of-town visitors, as well as college campuses. In both cases the goal should be to discourage the use of single-occupancy vehicles and encourage the use of bicycling, walking, and public transit.
- **Multiple Levels:** The City should discourage the creation of single-level parking lots and instead encourage multi-level parking structures with green roofs and sustainable stormwater systems.
- **City Parking:** All City public parking lots and garages should use exemplary sustainable design, including pervious surfaces, native landscaping, tree canopies, and sustainable stormwater systems.

### C-3D: Remove roadblocks to sustainable development.

Application of many of the sustainable development principles discussed in this plan currently requires variances, rezoning, or an extensive review as part of a Planned Unit Development process - or they are prohibited altogether. Once City codes are amended to permit and promote sustainable development, these barriers and delays should be eliminated.

In the meantime, the City should identify and eliminate any barriers to sustainable design and construction in the development review process. The City should offer incentives to developers of sustainable communities. Sustainable development projects should be encouraged and

# Recommendations

systematically facilitated through practices such as waived impact fees, streamlined permitting, and assistance in obtaining public financing.

## Specific Recommendations

- **Training/Liaison:** The City should invest in training on sustainable design and construction for staff members who review development plans. During a transitional period, the City should establish a special liaison to help guide sustainable development projects through the review process. An objective third-party standard should be used to determine which developers the liaison can assist - for example, LEED-ND.
- **Regional Coordination:** The liaison and other relevant staff should also be trained to help developers of sustainable communities coordinate intergovernmental and interagency review (involving, for example, counties or state agencies).
- **Process Improvement:** The City should investigate development review processes used in cities friendly to sustainable design and construction, and revise its own process to facilitate sustainable projects.
- **Incentives:** The City should waive impact fees, assist with public financing, and guarantee expedited permitting for those developers whose practices meet a certain objective, third-party standard - for example, LEED-ND. Impact fees should be based on actual impact, rewarding developers of infill communities and requiring higher fees for developments far from the urban core.

## C4. CREATE A SEA LEVEL RISE ADAPTATION PLAN.

Sea level is conservatively projected to rise at least one foot over the next century. While many nations and communities are taking steps to reduce greenhouse gases, there is already a buildup in the atmosphere, and Charleston will experience some effects of climate change for years to come. Thus, it is essential that the city plan to adapt to projected impacts.

## Specific Recommendations

### C-4A: Establish a commission to create the plan.

The City should empanel a “Blue Ribbon” commission, representing local stakeholder groups. The commission should be established as soon as possible, and should be charged with developing this plan within one year.

- **Impacts:** The plan should identify potential short-term, mid-term, and long-term impacts of climate change scenarios likely to affect the City. Issues to be addressed include accelerated sea level rise; increased flooding; intensification of tropical storms; drought; saltwater intrusion into coastal rivers and aquifers; increases in pollen and mold spores; increases in heat-related illness; increases in ground-level ozone; impacts on the insurance and tourism industries; loss of homes and communities; displacement of residents; wildlife and fishing impacts; and insect vectors.
- **Options:** The plan should identify policy options for addressing the impacts of climate change on residents (particularly temperature-sensitive

populations); vital infrastructure and public facilities; economic systems; energy systems; transportation systems; communications systems; natural systems (including farmland, forests, and wetlands); and all other areas of concern throughout the city.

- **Process:** The commission should: (1) review available reports and state and national adaptation plans; (2) create an inventory of adaptation policy options, relying on examples from flood-prone communities like New Orleans and Holland; (3) analyze the cost-effectiveness of these options, as well as the potential risks and costs associated with inaction; (4) prioritize selected policy options based on the certainty and severity of adverse impacts to citizens, ecosystems, and local economies; (5) include suggested policies to be used in considering major capital investments; (6) include a plan and suggested sources of funding for developing accurate assessments of sea level rise; (7) include a plan and suggested sources of funding for public education and outreach; (8) provide specific goals, as well as a time line, for recommended actions; and (9) call for periodic update of the plan (at least every five to ten years.)

#### **C-4B: Involve all affected agencies and sectors.**

The commission should involve and coordinate with all appropriate federal, state, and local agencies (e.g. NOAA, DHEC), organizations (e.g., Save The Lowcountry Coalition), and institutions (e.g., universities) to ensure that all potential impacts and solutions are identified. Further, the plan should complement and be coordinated with related efforts, including:

- **Emergency Response:** State and local emergency management response plans address short-term responses to natural disasters, including violent storms.
- **CECAC:** The Governor’s Climate, Energy, and Commerce Advisory Committee (CECAC) developed a state Climate Action Plan which specifically addresses adaptation.
- **OCRM:** The Office of Ocean and Coastal Resource Management (OCRM), a division of the state Department of Health and Environmental Control (DHEC), has formed a Shoreline Change Advisory Committee. The Committee’s charge is to identify research needs and policy options to address storms, coastal erosion, and sea level rise.

#### **C-4C: The plan should be implemented with reasonable speed.**

Public education and outreach efforts about the need for adaptation should begin immediately. “Low-hanging fruit” opportunities should be addressed as rapidly as possible, and proactive adaptation initiatives should begin within the next two to three years.

### **C5. CREATE PUBLIC EDUCATION PROGRAMS**

The City has access to a wide range of resources related to public education, both within its various departments and among the public agencies and non-profit groups whose missions include educating Charleston residents about sustainable community planning and development. In educating the public about the Climate Change and Sustainability Plan, opportunities for collaboration abound.



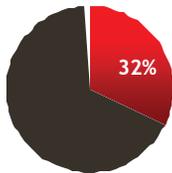
# Recommendations

## Specific Recommendations

- **City Departments:** Both internally and with the public, City departments should continue to build awareness about the benefits of sustainable development models, including compact communities, urban infill, and suburban revitalization.
- **Collaboration:** City departments should collaborate with public agencies and non-profit groups to accomplish this goal, thereby making the most of limited resources.



## Improved Transportation Goals, Actions & Recommendations



Quantifiable measures could achieve 32% of 2030 reduction goal (equal to 355,517 mtCO<sub>2</sub>e). See page 21 for details.

### ACTIONS

#### 1. Reduce dependence on single-occupancy vehicles.

- A. Keep “vehicle miles traveled” within the City at the 2010 level.
- B. Move the City towards a fully multi-modal transportation system.
- C. Adopt and implement a Complete Streets Ordinance.
- D. Support employer-based programs that encourage alternative transportation.
- E. Encourage vehicle-free tourism.

#### 2. Increase convenient, reliable public transportation.

- A. Support collaborative programs that encourage the use of public transit.
- B. Show visible support for public transit through the location of city events and public service facilities.

#### 3. Expand bicycle and pedestrian options.

- A. Adopt and implement a city bicycle and pedestrian plan.
- B. Restripe corridors for bicycle use.
- C. Acquire “Bicycle-Friendly Community” status.
- D. Provide incentives for City

employees to commute or conduct business using bicycles.

#### 4. Increase fuel efficiency and use of biofuels.

- A. Set high standards for the purchase, use, and maintenance of City vehicles.
- B. Support reduction of emissions from freight-related diesel trucks, trains, and ships.
- C. Support strict enforcement of speed limits.
- D. Study the benefits of providing free or preferred parking for high-efficiency vehicles on City and County lots and decks.
- E. Improve vehicle flow by using transportation system management.
- F. Support anti-idling programs and technologies.
- G. Research a property tax assessment on vehicles that is based on emissions rather than value.
- H. Support purchase, use, and appropriate maintenance of high-efficiency vehicles for the CARTA fleet.

#### 5. Improve air quality

- A. Reduce emissions from small-motor equipment.
- B. Raise public awareness of the need to reduce air pollution outdoor burning and emissions from inefficient, outdoor wood-burning stoves. Educate the public on the existing laws and available cleaner-burning technologies and materials.

### T1. REDUCE DEPENDENCE ON SINGLE OCCUPANCY VEHICLES

**T-1A: Keep “vehicle miles traveled” within the City at the**

## 2010 level.

**Summary of specific issues:** Vehicles occupied by one person (“single-occupancy vehicles” or SOVs) generate much greater greenhouse gas emissions per passenger-mile than carpools or public transit. SOVs also increase traffic congestion, which itself increases emissions due to traffic idling.

In order to reduce dependence on SOVs, the City’s primary goal should be to stabilize, or eventually reduce, the total annual “vehicle miles traveled” (VMT) within the City. This would provide the largest possible reduction in greenhouse gases by the largest group of people.

**Strategy/Action Plan:** City staff should establish a method for quantifying VMTs within City limits, one that can be documented and monitored annually. The inventory should be GIS-based and cover all streets maintained by the City. Ideally, traffic counts for these streets will be regularly updated so that changes can be monitored. In addition, reducing VMT should become a cornerstone of future comprehensive land use and transportation planning goals for the City. (See Recommendation C1.)

**Implementation responsibilities/ assignments:** The departments of Planning, Preservation, and Sustainability, Economic Innovation, and Traffic and Transportation should be responsible for creating this inventory, combining GIS skills with the skills needed to measure traffic counts.

**Regional partners for funding and implementation:** To minimize cost, assistance should be sought from regional partners. Many data may already be collected and on a collection schedule. Potential partners include: the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG);

South Carolina Department of Transportation (SCDOT); and Charleston County RoadWise Program.

**Benefits anticipated, aside from greenhouse gas reductions:** Improved air quality and improved public health, both from cleaner air and more walking, cycling, etc. Also, a reduction in VMT means less traffic congestion, enhancing quality of life.

**Timeline for implementation:** The initial inventory of City streets and traffic counts can begin immediately, in 2009. GIS based street data and a robust traffic count database are readily available and free of charge. By setting the goal of sustaining VMTs for the year 2010, it is intended that the database be complete and ready for annual updates beginning in 2010.

## T-1B: Move the city toward a fully multi-modal transportation system.

**Summary of specific issues:** The City should continue to identify, enact, and enforce policies that support multi-modal transportation of people and goods. This will require significant changes in policies governing community development and redevelopment. Communities should be located and designed to support all transportation modes, including public transit, bicycling, and walking. (See Recommendation C1.)

**Strategy/Action Plan:** The City should enact a citywide multi-modal transportation plan as part of the City Comprehensive Plan. The plan will identify transportation solutions to support land use decisions on a corridor level, preserving system connectivity and thoroughfares. The following should be considered:

- Multiple modes of transportation
- Corridors with significant congestion
- Regional connectivity

# Recommendations

- Network connectivity
- Identification of transit nodes, and encouragement of “transit-oriented” development

Further, the City should include policies that will reduce dependence on SOVs, such as:

- Partnering in Travel Demand Management Programs that sponsor, coordinate, and encourage carpools, vanpools, and group-based transportation,
- Creating a permitting system that offers incentives for developments that support alternatives to SOVs,
- Participating in regional transit planning initiatives (bus and rail planning activities).

Because transit service is both costly and regional in nature, the City should strengthen and create necessary partnerships, continuing to play a significant role in regional transit planning through BCDCOG. This planning should include bus, rapid bus, commuter rail, light rail, and/or any other modes deemed reasonable.

**Implementation responsibilities/ assignments:** Most of the responsibility for implementation lies with the Department of Planning, Preservation, and Sustainability in coordination with the Department of Traffic and Transportation and regional partners.

**Regional partners for funding and implementation:** Many agencies, including Charleston County, the SCDOT, and BCDCOG, are involved in transportation planning. Specifically, BCDCOG has initiated a travel demand management program, making that agency an ideal partner for introducing such programs to businesses within the City of Charleston. Also, the City will eventually share experience and successes with neighboring communities.

**Benefits anticipated, aside from greenhouse gas reductions:** Health benefits from cleaner air and additional physical activity, as well as an increased sense of community as services and activities become more localized and “community based.”

**Timeline for implementation:** The City’s update of its comprehensive plan in 2009 affords a good opportunity to plan for a multi-modal transportation system. Implementation and enforcement will be gradual over the plan years.

## **T-1C: Adopt and implement a Complete Streets Ordinance.**

**Summary of specific issues:** The City should adopt and implement a citywide Complete Streets ordinance. This ensures that all plans for street construction and reconstruction consider the needs of pedestrians of all ages and abilities, bicyclists, transit users, transit vehicles, and other non-automobile users.<sup>1</sup>

**Strategy/Action Plan:** The policy should be reviewed by City planning staff, Traffic and Transportation staff, and regional stakeholders including Charleston County and the SCDOT before adoption and implementation by the City. Further, the City should encourage regional stakeholders to incorporate Complete Streets into regional plans.

**Implementation responsibilities/ assignments:** City staff should establish a liaison to work with regional stakeholders.

**Regional partners for funding and implementation:** Many regional partners are needed for funding as well as implementation. An initial list includes:

- BCDCOG - The regional Metropolitan Planning Organization has included

Complete Streets in the regional long range transportation plan, and has a Complete Streets budget to assist in funding eligible projects in the region.

- SCDOT - The state conducts restriping studies for municipalities within the traffic engineering division of the SCDOT. These studies are done at the request of policy makers on the municipal level.
- Charleston County RoadWise - The Charleston County Sales Tax program.

**Benefits anticipated, aside from greenhouse gas reductions:** Complete streets increases air quality, physical activity, and overall health; better serves the transportation needs of the elderly, handicapped, and children; reduces traffic congestion; reduces the cost of maintaining roads due to less use by heavy vehicles; and requires no additional funds for planning and engineering evaluation, since existing transportation funds can be used.

**Timeline for implementation:** City liaison with regional partners should establish initial meetings as soon as possible. Implementation will be visible to the public as soon as road improvements are complete.

On-going implementation will require vigilance on the part of the City's liaison with regional stakeholders, as transportation projects are constantly in progress. Through the County RoadWise program, the Charleston Area Transportation Study (CHATS) long range transportation plan, and County resurfacing projects, there are many projects where this policy can be implemented.

### **T-1D: Support employer-based programs that encourage alternative transportation.**

**Summary of specific issues:** The City

should offer incentives to employees who use public transit and other SOV alternatives. The City should also support other employers willing to do the same.

**Strategy/Action Plan:** The City should first implement some or all of the following policies, then offer reduced taxes to other employers willing to do the same:

- Provide CARTA passes for employees at discounted rates
- Provide preferred or free parking for carpoolers/vanpoolers
- Offer bonuses to employees who use alternatives to SOVs
- Guarantee a ride home in case of emergency
- Eliminate free employee parking

Further, the City should educate employers about federal pre-tax benefits associated with transit use, and support mortgage rate incentives for homes purchased near public transit through permitting and public education.

**Implementation responsibilities/ assignments:** The City's Sustainability Director should work with other City staff and employer contacts in the region to implement this plan.

**Regional partners for funding and implementation:** State of South Carolina, SC DOT, CARTA, Tri-County Link, BCDCOG, Charleston Metropolitan Chamber of Commerce.

**Cost to implement/net savings from implementation:** Reduced City tax revenues and, potentially, reduced state fuel tax revenues if gasoline purchases decline. However, reduced use of SOVs reduces roadway maintenance costs. Further, increased SOV use could cause Charleston to exceed federal air quality standards, which would put federal transportation funding at

# Recommendations

risk.

**Benefits anticipated, aside from greenhouse gas reductions:** Reduced traffic congestion; increased quality of life; and stronger community relationships as more residents commute together. Also, the region may experience an economic multiplier effect as gasoline savings shift toward purchases that provide higher profits for local residents.

**Timeline for implementation:** A community-wide template for implementation can be made available to all regional employers. Later, the success of City-based initiatives can spread to other municipalities in the region.

## **Recommendation T-1E: Encourage vehicle-free tourism.**

**Summary of specific issues:** Since tourism is a central to Charleston's economy, the City should address the transportation demand created by visitors who use their own vehicles to enjoy the City's attractions. The City should create a plan to limit vehicle use by visitors.

**Strategy/Action Plan:** Strategies could include enhanced public transit, restriction of vehicle travel on certain streets, increased availability of bike rentals, expansion of green taxis and pedi-cabs, and affordable city-perimeter parking with frequent shuttle service. Also, the City should aggressively market these alternatives to visitors.

**Implementation responsibilities/ assignments:** Implementation should be coordinated by the City's Sustainability Director, in partnership with the CVB and the Hotel/Motel Association, who can help with the marketing campaign. Materials can

be distributed to hotel/motel concierges and on travel websites.

**Regional partners for funding and implementation:** BCDCOG's regional travel demand management program, SCDOT, the Governor's Council on Tourism and Travel, CARTA, Charleston Metro Chamber of Commerce, Tri-County Link. Also North Charleston Convention Center, Tanger Factory Outlets, Kiawah Island Resort, Wild Dunes Resort and Conference Center, and Charleston Visitors Bureau.

**Cost to implement/net savings from implementation:** The cost of marketing can be spread across stakeholders, including the tourist attractions themselves, the hotel/motel industry, and others in the tourism community.

**Benefits anticipated, aside from greenhouse gas reductions:** Charleston has many strengths: historic setting, access to the waterfront, excellent dining, and her beauty as a walking city. Reducing vehicles on our congested streets would make the city even more walkable than it already is. Marketing the City as a "Green" destination should be pursued as part of a cost-benefit analysis of this program. Consistent with bicycle, pedestrian, running, and other specialty tourism marketing campaigns, "eco-friendly" tourism has emerged as a strong selling point for environmentally-conscious travelers looking to reduce their carbon footprint.

**Timeline for implementation:** Implementation can reasonably be expected by summer 2010.

## **T2. INCREASE CONVENIENT, RELIABLE PUBLIC TRANSPORTATION**

## **T-2A: Support collaborative programs that encourage the use of public transit.**

**Summary of specific issues:** The City should strengthen already strong partnerships with CARTA and Tri-County Link, working together to encourage the use of public transit.

**Strategy/Action Plan:** Strategies should include the following:

- **Require CARTA bus stops and sheds within new developments and redevelopments along current and proposed CARTA routes:** Staff should create an inventory of current CARTA stops, distance between stops and frequency of bus lines to overlay with new/redeveloped residential neighborhoods. Determination of route adjustments and additions should be based on an equidistant measurement between bus stops. The inventory should be GIS-based and should cover all streets presently serviced by CARTA. Provision of “park and ride” lots may be a viable alternative should neither CARTA nor Tri-County Link provide service in close proximity to these development projects.
  - **Establish public and private partnerships to increase transit ridership:** CARTA and Tri-County Link already have ridership programs involving large regional employers such as MUSC and College of Charleston. Employers of all sizes should also be asked to participate. The Sustainability Director should designate a liaison to help CARTA market this program to Charleston business owners.
  - **Make public transport more visible and inviting, including additional lighting**
- to enhance safety:** Relatively few people use public transit in Charleston, perhaps because the system has a poor public image - particularly bus service. Many bus stops have no seating, substandard seating, lack rain cover, lack litter control and/or have poor landscaping. Modest investment in waiting area upgrades will put a professional “face” on Charleston’s primary public transit system. While the provision of these facilities is the responsibility of CARTA, the City of Charleston should help improve transit service in the City. The City should create a plan to improve the stops, including solar-powered lighting, benches, rain covers, and trash and recycling receptacles. The City should consider an “adopt-a-stop” program for volunteers, similar to Adopt-a-Highway programs. The City may also wish to consider special “transit teams”, made up of police, trash removal and Parks and Recreation staff to monitor waiting areas on a scheduled basis.
- **Support the creation of bilingual CARTA route programs over the next 15 years:** All CARTA information should be available in both English and Spanish. This should include CARTA’s website, route maps, on-board signage, and bus stop signage, and should also include bilingual drivers and help-line associates. Further, the Charleston Visitors Bureau may identify other languages of significance for this program, depending on what percent of visitors speak foreign languages.

**Implementation responsibilities/ assignments:** The Sustainability Director should create an action plan to implement these recommendations, including identification and pursuit of funding sources. In most cases, identifying a City liaison to regional transit agencies will

# Recommendations

suffice, but higher-level City involvement may be necessary to ensure that the City effectively influences regional transit planning efforts.

**Regional partners for funding and implementation:** See above.

**Benefits anticipated, aside from greenhouse gas reductions:** Improved air quality; improved public health from walking to public transit stops; reduced traffic congestion; and a stronger sense of community from sharing transportation, and improved quality of life.

**Timeline for implementation:** This action can begin upon approval from City Council.

## **Recommendation T-2B: Show visible support for public transit through the location of city events and public service facilities.**

**Summary of specific issues:** The City should locate meetings, events, and public service facilities where people can easily access them using public transit. Public service facilities include, for example, hospitals, libraries, post offices, homeless shelters, and community centers,

**Strategy/Action Plan:** Strategies include the following:

- **Continue to advertise CARTA routes for City meetings and events:** Establish a City policy stating that meeting and event sites should be within a five minute walk of CARTA or Tri-County Link route stops. Also, the City Office of Public Information should continue to include public transit information in advertisements for all public events.

- **As public service facilities are planned, relocated, or scheduled for retrofit, proximity to public transit should be a priority as decisions are made about location.**

**Implementation responsibilities/ assignments:** The Sustainability Director should create an action plan to implement these recommendations.

**Regional partners for funding and implementation:** CARTA and Tri-County Link should both be included in efforts to provide public transit to public services facilities.

**Benefits anticipated, aside from greenhouse gas reductions:** Equal access to city functions and facilities for those who do not use an SOV is a significant public benefit.

**Timeline for implementation:** These recommendations can be implemented immediately at no additional cost to current operations.

## **T3. EXPAND BICYCLE AND PEDESTRIAN OPTIONS**

### **Recommendation T-3A: Adopt and implement a City bicycle and pedestrian plan.**

**Summary of specific issues:** Bicycle and pedestrian mobility are key elements of a sustainable transportation network. Bicycle and pedestrian travel already account for more than 6% of all trips to work in the City of Charleston.<sup>2</sup> Many areas of the City, such as the downtown area, provide safe travel for cyclists and pedestrians. However, many suburban areas have inadequate facilities.

**Strategy/Action Plan:** The City should

develop a plan to promote bicycle and pedestrian transportation and recreation throughout the City and beyond. The plan, which should be developed with community involvement and input from appropriate local and state agencies, should specify how to develop convenient access and ensure safety within an integrated, connected network of streets, trails and other transit corridors. Further, the plan should complement the Charleston Area Transportation Study (CHATS) long range plan and the BCDCOG Regional Transportation Plan. City Council should adopt this plan, including specific, actionable items.

A key element of this plan should be a funding and implementation strategy. Funding for construction and maintenance of new transportation facilities is one of the biggest challenges municipalities face. Our goal is to have a dedicated account funded annually through City revenue for bicycle- and pedestrian-related improvements, with reasonable limitations placed on eligible users and the amount and types of expenditures. Ideally, the fund would support multiple smaller projects rather than partially funding just a few larger projects.

**Implementation responsibilities/ assignments:** Development of the plan is the responsibility of the City's Planning, Preservation & Sustainability (PPS) Department. Implementation should involve all departments on some level but especially the following departments: Traffic and Transportation, Parks Department, Public Service Department and Recreation Department.

One of the main goals of the plan will be to integrate the process of planning for bicycles and pedestrians into every planning decision or project construction. The plan should also be integrated into the City's

overall comprehensive plan with an emphasis on the strong connection between land use and transportation. The Mayor and City Council will be involved in adopting the plan and approving policies and funding.

**Regional partners for funding and implementation:** The City should work closely with SCDOT, Charleston County and CHATS to ensure that projects are appropriately funded and major projects are included in their respective plans.

**Cost to implement/net savings from implementation:** The costs of a comprehensive bicycle and pedestrian plan include both the up-front costs of developing the plan and the costs of implementation over time. The plan may cost between \$50,000 and \$100,000 while recommendations such as zoning or City code changes cost virtually nothing. The highest costs should be those associated with facility improvements such as path construction or bike lane striping. If combined with road improvements or new construction, these elements should become a modest component of those projects.

Much of the savings associated with implementing a bicycle and pedestrian plan will occur much later when congestion and road wear are reduced by increased walking and bicycling. Also, road construction costs may decrease as a result of building pedestrian-scale streets with less width and less associated drainage infrastructure.

**Benefits anticipated, aside from greenhouse gas reductions:** Increased air quality, better public health through increased physical activity, reduced traffic congestion, enhanced recreational opportunities, better quality of life.

**Timeline for implementation:** Funding for a bicycle and pedestrian plan may be included in the budgeting process for the fiscal year following adoption of this recommendation.

# Recommendations

The development of the plan may then take 6 months and adoption may occur soon thereafter. By the end of 2010, a local plan should be adopted and implementation underway.

## **T-3B: Restripe corridors for bicycle use.**

**Summary of specific issues:** Once outside the Charleston peninsula, most streets connecting neighborhoods are multi-lane, high-speed corridors that provide no accommodations for bicycling. The City has the option of restriping certain roads to create on-street bicycle lanes. Hundreds of cities in the U.S. have used this strategy to create a network of safe, convenient bicycle routes. SCDOT, the Charleston Area Transportation Study (CHATS) Committee, and Charleston County all employ a process for road resurfacing that could easily include such restriping for a minimal increase in costs. Restriping may also include “sharrows,” or shared lane markings, which reinforce correct bicycle direction and indicate exactly where bicycles should travel inside a lane.

**Strategy/Action Plan:** The City should first study its roads to determine those appropriate for restriping. This may be done by either staff or a consultant. To streamline costs and provide consistency, the study may also be done as part of an overall City Bicycle/Pedestrian Plan. The City should then prioritize projects and obtain funding through federal enhancement grant funding, State C-funds (transportation-related funds distributed at the county level), City revenue, or other private or public grant sources.

**Implementation responsibilities/ assignments:** The City may initiate a partnership with Charleston County or CHATS because the most likely roads for restriping are major corridors that impact

multiple jurisdictions. The Traffic and Transportation Department, Public Service Department (Engineering Division and Streets & Sidewalks Division) and the Planning Division should be involved. It may be helpful to designate a staff member as a liaison to SCDOT and Charleston County resurfacing programs. The City may also need to apply for funding.

### **Regional partners for funding and implementation:**

- CHATS Committee - this regional transportation planning entity prioritizes projects that receive federal funding. It also distributes federal enhancement grant funding and a regional ‘Complete Streets’ fund.
- Charleston County - the County maintains a county-wide road resurfacing schedule through in which all jurisdictions participate. The City should work closely with the County to ensure that restriping happens when a road is resurfaced. The County also may approve funding for some projects from the ½ cent transportation sales tax.

SCDOT - The State maintains most of the major corridors in Charleston and must approve all restriping plans. In cities around the state, the SCDOT has conducted traffic engineering and design needed to restripe highways.

**Cost to implement/net savings from implementation:** In the overall cost of road construction or road resurfacing, striping is negligible. It is an option to request that SCDOT do the necessary engineering in-house at little to no cost to the City. The per-mile cost estimates widely reported range between \$5,000 and \$14,000 including engineering, labor, paint, signage and signals.

**Benefits anticipated, aside from**

**greenhouse gas reductions:** Increased air quality, better public health through increased physical activity, reduced traffic congestion, enhanced recreational opportunities, better quality of life.

**Timeline for implementation:** The recommendation for a restriping plan may be implemented concurrently with other efforts to increase bicycling by creating a comprehensive network. The City is working on an action plan to become a Bicycle Friendly Community and restriping for bike lanes is one of the many items to be implemented. The City may be able to identify some funding and formalize a process for working with the partnering agencies immediately, resulting in a coordinated schedule with Charleston County for resurfacing within the City.

### **T-3C: Acquire “Bicycle Friendly Community” status.**

**Summary of specific issues:** A Bicycle Friendly Community, as defined by the League of American Bicyclists, is one where cycling is prevalent and supported by the community. Charleston can achieve this designation by meeting certain criteria - for example, a network of bicycle facilities and a certain level of educational and promotional programs. Charleston already has the climate, terrain and physical attractions to provide a great cycling environment and has been gradually improving its bicycle accessibility. Efforts are underway to achieve this prestigious designation.

**Strategy/Action Plan:** The first thing a Bicycle Friendly Community (BFC) needs is an action plan. A BFC task force has been formed by the Mayor to formulate an action plan. This plan includes:

- Adopting a target
- Creating a network of bicycle routes, paths and lanes throughout the entire

community

- Establishing information programs to promote cycling and its benefits
- Encouraging employees to commute or conduct work using a bicycle
- Ensuring plans, policies and codes meet the needs and goals of creating a bicycle friendly community
- Educating bicycle users on the rules of the road and safe interaction with other vehicles and pedestrians
- Enforcing traffic laws to increase safety for all users of the roads
- Promoting intermodal travel by allowing bikes on buses or trains and establishing bike parking at transit stops
- Ensuring City staff have the training available to implement bicycle plans/ projects

Once a plan is underway, the task force should complete the application process to the League of American Bicyclists.

**Implementation responsibilities/ assignments:** Achieving BFC status will be a community-wide effort led by City elected officials and staff. The newly formed BFC task force includes stakeholders from various areas of the City, bicycle-related organizations, and all relevant City departments. The task force is responsible for creating a BFC action plan and submitting an application. Five task force sub-groups are responsible for completing section of application related to Engineering, Encouragement, Education, Enforcement and Evaluation.

**Regional partners for funding and implementation:** Many of the educational and promotional programs can be accomplished on a regional basis through BCDCOG, while infrastructure improvements rely heavily on projects approved through the SCDOT, CHATS or Charleston County programs.

**Cost to implement/net savings from**

# Recommendations

**implementation:** Costs associated with policy and zoning codes will be minimal. Community stakeholders will get involved in educational and promotional programs for very little cost. Costs also include those related to bicycle facilities, which will be incurred on a project by project basis. Cost savings include reduced costs for auto infrastructure; for example, fewer parking facilities or replacing some city motor vehicles with bicycles. Financial benefits include more tourism dollars, increased property values and increased bicycle sales.

**Benefits anticipated, aside from greenhouse gas reductions:** Stronger marketing for tourism, increased air quality, better public health through increased physical activity, reduced traffic noise and congestion, enhanced recreational opportunities, better quality of life.

**Timeline for implementation:** This recommendation is already underway with a goal of receiving “bronze level” designation in the next 18 months. After Charleston receives the BFC designation, the City should continue to implement and evaluate our goals. The process will move from focused efforts to sustained processes through community groups and City departmental planning and decision-making.

## **T-3D: Provide incentives for City employees to commute or conduct business using bicycles.**

**Summary of specific issues:** Bicycles provide efficient, cost-effective transportation. The City should provide incentives for employees to commute or conduct business via bicycle.

**Strategy/Action Plan:** The City already gives employees subsidized CARTA bus passes. This program could expand to include a similar benefit for bicycle

commuters. Business employee bicycle subsidies of up to \$20 per month are tax exempt.<sup>3</sup>

Another way to promote bicycle commuting is to provide shower or changing facilities. City staff can work to identify potential locations in City offices or recreation buildings, or contract with off-site health clubs for showers and locker rooms.

The City may also provide bicycles as an option for some work-related vehicle trips. Incentives may be needed to encourage the purchase and use of bicycles by appropriate Departments. Note: when police recover bicycles and their owners cannot be found, the City now makes them available for conducting City business.

**Implementation responsibilities/ assignments:** The purchase of City bicycles should be the responsibility of individual departments. The City’s Department of Human Resources and Organizational Development can implement the bicycle subsidy. The City’s Property Manager should be instrumental in identifying shower/locker facility locations.

**Regional partners for funding and implementation:** Partners may include community groups that sponsor programs or provide grants for purchasing bicycles or maintenance equipment. CARTA could be involved with an effort to combine transit passes with a bicycle subsidy, since most CARTA buses have bike racks for longer-distance commuters.

**Cost to implement/net savings from implementation:** Costs include purchase and maintenance of bicycles and facility upgrades for showers. Potential cost reductions include City-subsidized employee parking, motor vehicle purchase and maintenance, and costs associated with employee health as employees become

more active.

**Benefits anticipated, aside from greenhouse gas reductions:** The City could inspire other employers/employees to increase the use of bicycles, reducing traffic congestion and noise pollution.

**Timeline for implementation:** Incentive and employee benefit programs may be studied within the next 8 months and policies in place within the next 12 months.

## T4. INCREASE FUEL EFFICIENCY AND USE OF BIOFUELS

### T-4A: Set high standards for the purchase, use, and maintenance of City vehicles.

**Summary of specific issues:** Despite price fluctuations up to \$4 per gallon in August 2008, and despite alternatives entering the marketplace, the United States still relies on petroleum for 97% of the fuel for cars, buses, trucks, trains, planes, and ships.<sup>4</sup> At the very least, the City's own fleet should be moving toward greater fuel efficiency and the use of cleaner fuels.

**Strategy/Action Plan:** Short-term action items should include the following:

- Quantify fuel economy for different classes of City vehicles, which could include passenger, light-truck, truck, bus, and off-road.
- Implement DHEC anti-idling education for City staff and partner organizations.
- Consider the total lifecycle costs, including maintenance, insurance, and resale value, of hybrid, plug-in hybrid, battery electric, and biofuel vehicles.
- Analyze cost/benefit for "plug-in" facilities at City garages.

- Consider delaying procurement when a cost-effective, more fuel-efficient vehicle will be available within two years.
- Add fuel inefficiency as a priority consideration when retiring fleet vehicles.
- Where funding and return-on-investment permits, retrofit City vehicles and equipment with alternative fuels or emissions filters.
- Encourage the use of bicycles, mopeds, motorcycles, and electric vehicles where appropriate.
- Meet the LEED standard for City garages by implementing one of the following LEED options:
  - ◇ Provide low-emitting and fuel-efficient vehicles for 3% of Full-Time Equivalent (FTE) occupants and provide preferred parking for these vehicles.
  - ◇ Provide preferred parking for low-emitting and fuel-efficient vehicles for 5% of the total vehicle parking capacity of the site.
  - ◇ Install alternative-fuel refueling stations for 3% of the parking capacity of the site (liquid or gaseous fueling facilities must be separately ventilated or located outdoors.)

Low-emitting and fuel-efficient vehicles are defined as vehicles that are either classified as Zero Emission Vehicles (ZEV) by the California Air Resources Board or have achieved a minimum green score of 40 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide.

Long-term action items are as follows:

# Recommendations

- After a majority of short-term action items have been implemented, set a fuel reduction goal (a certain percent over a certain amount of time) for the City.
- Engage the City's electric utility provider and encourage grid improvements and other infrastructure improvements needed to reap the benefits of plug-in vehicles.
- Coordinate with City Fleet Management to develop a schedule for vehicle retirement and a strategy for funding this process.

**Implementation responsibilities/ assignments:** Most of the action items listed above should be carried out by City Fleet Management, Planning, Preservation and Economic Innovation, and Traffic and Transportation.

**Regional partners for funding and implementation:** State and regional partners include:

- BCDCOG
- SCDOT
- South Carolina Department of Health and Environmental Control (SCDHEC)

**Benefits anticipated, aside from greenhouse gas reductions:** Improved air quality, reduced dependence on foreign oil, and an injection of capital into local economies.

**Timeline for implementation:** The initial inventory of vehicle fuel efficiency along with implementation of short-term action items can begin immediately, in 2009, and be measured annually thereafter. Long-term action items can be implemented as technology, funding, and best practices permit.

## T-4B: Support reduction of

## emissions from freight-related trucks, trains, and ships.

**Summary of Specific Issues:** The Charleston area is home to a thriving ocean port, as well as local industry. Transportation of freight generates significant truck, train, and ship traffic. The City should support significant reductions in emissions from this traffic.

**Recommendation/Strategy/Action Plan:** While most vehicle use and maintenance is outside the City jurisdiction, the City should identify opportunities to influence key decisions. The following strategies should be included:

- Decrease congestion of freight corridors to improve freight travel times;
- Move freight more fuel efficiently, or using cleaner fuels; and
- Reduce unnecessary idling by ships, trains and trucks;

**Implementation Responsibilities/ Assignments:** The City's Sustainability Director should identify opportunities for City involvement in this issue.

**Regional Partners in Implementation:** The City should form partnerships with the following to have a constant presence on technical working groups, steering committees, and other groups with policy making and implementation:

- South Carolina State Ports Authority
- BCDCOG (Neck Area Transportation Master Plan, CHATS Long Range Transportation Plan)
- SCDOT (Corridor Planning)
- SC Trucking Association
- DHEC (Air Quality initiatives)

**Cost to Implement/Net Savings from Implementation:** The cost to implement may be limited to the time spent working as meeting participants.

#### **T-4C: Support strict enforcement of speed limits.**

**Summary of specific issues:** According to the federal EPA, speeding, rapid acceleration, and rapid braking can lower gas mileage by 33% at highway speeds. Simply observing the speed limit can result in up to a 23% increase in fuel economy.<sup>5</sup> For these reasons, CECAC recommended stricter speed enforcement, targeting vehicles traveling 5 mph or more over the speed limit on highways with speed limits of 55 mph or more. This will reduce emissions through improved fuel efficiency in both light- and heavy-duty vehicles.

**Strategy/Action Plan:** The City should participate in any statewide public information campaigns that support this CECAC recommendation.

**Implementation responsibilities/ assignments:** Sustainability staff should keep abreast of state plans for a public information campaign. The Sustainability Director should coordinate staff from the office of Planning, Preservation and Economic Innovation, the department of Traffic and Transportation and the Public Information Office.

**Regional partners for funding and implementation:** Partners may include SCDOT and BCDCOG.

**Benefits anticipated, aside from greenhouse gas reductions:** Improved fuel economy and increased safety.

**Timeline for implementation:** Staff from the Sustainability Division can immediately begin to monitor the status of CECAC policy recommendation TLU-8. The City's actual participation will depend on the timeline of a statewide program.

#### **T-4D: Study the benefits of providing free or preferred parking for high efficiency vehicles on City and County lots and decks.**

**Summary of specific issues:** Hybrid and alternative-fuel autos, which reduce greenhouse gases and other emissions, are gaining traction in the marketplace. Cities across the nation are helping to promote this trend by providing free or preferred parking to these vehicles. Such programs help offset increased costs to consumers purchasing such vehicles; promote awareness about hybrid and biofuel technology; and offer an incentive to prospective buyers of hybrid, biofuel, and other high-fuel efficiency autos.

**Strategy/Action Plan:** The City should explore ways to help promote purchase of high-efficiency vehicles, including the provision of free or preferred parking on lots or decks owned by the City and County. The City should evaluate what aspects of these programs are appropriate for Charleston and recommend any innovations appropriate for Charleston.

**Implementation responsibilities/ assignments:** The Sustainability Director should coordinate with Traffic and Transportation staff to conduct the study and, if advisable, create an implementation plan.

**Regional partners for funding and implementation:** Charleston County may have useful information to contribute, and coordination with the County will be essential if implementation includes County-owned facilities.

**Benefits anticipated, aside from greenhouse gas reductions:** Increased air quality and enhanced public health.

# Recommendations

**Timeline for implementation:** The initial study can begin immediately, followed by an implementation plan and implementation.

## **T-4E: Improve vehicle flow by using transportation system management.**

**Summary of specific issues:** The efficient flow of traffic through the City of Charleston is vital in increasing fuel efficiency and reducing emissions. The idling of cars on congested roadways results in the unnecessary release of tons of hydrocarbons, nitrous oxide, and carbon monoxide.

**Strategy/Action Plan:** The City of Charleston completed a traffic signal sequencing plan in 2008 which reduced travel times on 15 of Charleston's major travel routes during peak commuting hours by approximately 9%. This reduction should prevent consumption of more than 240,000 gallons of gasoline annually, as well as emission of associated greenhouse gases. To maintain the effectiveness of traffic signal coordination, sequencing and retiming should be reevaluated every 5-10 years.

Vehicle flow could be improved further by using high occupancy vehicle (HOV) lanes; roundabouts instead of stop signs and traffic signals; and variable message signs to direct traffic around congestion. Another strategy would be to encourage local businesses and agencies to adopt alternate working hours. (Note: improved public transit is ultimately the most effective way to reduce traffic and harmful emissions.)

**Implementation responsibilities/ assignments:** Most primary commuter routes are under state jurisdiction. Therefore, it will be necessary for SCDOT to fund and

implement HOV lanes, intersection redesigns, and variable message signs. SCDOT will also need to grant permission for these modifications. Also, funding to reevaluate traffic signal sequencing is the responsibility of SCDOT. The City should do what it can to encourage and assist.

**Regional partners for funding and implementation:** In addition to SCDOT, such changes can be incorporated into BCDCOG's long range transportation plan, thereby qualifying to receive BCDCOG funds.

**Benefits anticipated, aside from greenhouse gas reductions:** Increased fuel efficiency; increased air quality; small changes in commute time with significant aggregate effect.

**Timeline for implementation:** HOV lanes and intersection redesigns can be costly, and will probably be considered primarily when highways are being widened or otherwise improved. On the other hand, identification of locations which would benefit from variable message signs could begin immediately. Obtaining agreement and funding from SCDOT for such signs will likely require persistent and frequent communication. Retiming and optimal sequencing of traffic signals was completed in 2008, and should be reevaluated between 2013 and 2018.

## **T-4F: Support anti-idling programs and technologies.**

**Summary of specific issues:** Extended idling can be a significant contributor to air pollution. Near a school, idling vehicles can have an even stronger negative impact because of the proximity to children and pedestrians. School children engage in a high level of outdoor activity (athletics, bands, etc.) which makes them particularly vulnerable to pollution.

**Strategy/Action Plan:** Reduce idling near all city schools by using DHEC's existing B2, Breathe Better education program. Educational programs can be conducted within schools, and appropriate signage added to other problem areas such as loading zones and bus stops. The City should enforce its existing idling ordinance.

**Implementation responsibilities/ assignments:** Partnering with the City Information Office, the Traffic and Transportation Department, and the police force, the Sustainability Director should identify opportunities for anti-idling policies and education.

**Regional partners for funding and implementation:** Primarily DHEC.

**Cost to implement/net savings from implementation:** This program can cost the City next to nothing. DHEC manages state-funded education and compliance programs.

**Benefits anticipated, aside from greenhouse gas reductions:** Improved air quality and enhanced public health. Cleaner air near schools will benefit children, teachers, and staff.

**Timeline for implementation:** Partnerships with DHEC and other agencies can be established in 2009. Development of additional programs and educational outreach will be on-going.

### **T-4G: Research a property tax assessment on vehicles that is based on emissions rather than value.**

**Summary of specific issues:** Vehicles emitting more carbon dioxide have a greater impact on the air that citizens breathe. Communities that are in non-

attainment of federal air quality standards will be required to initiate programs that reduce emissions from vehicles. The Charleston metropolitan area is very close to this non-attainment level. Research should be conducted of the rationale and the feasibility of the state of South Carolina taxing a vehicle based on its emissions. The tax could be based on the miles-per-gallon ranking for each type of vehicle. If implemented, this strategy could be phased in over time with advance notice to allow more efficient vehicles to be on the market and to allow more informed purchasing of vehicles. This will help promote the popularity of high-efficiency vehicles, thereby lowering greenhouse gas emissions.

**Strategy/Action Plan:** State legislation would be required to enable such a tax. Once this legislation is in place, the City can work with the County to develop the tax. Coordination and public support should be maintained throughout the process, and should continue after implementation in case any changes need to be made.

**Implementation responsibilities/ assignments:** The Sustainability Director should spearhead this effort.

**Regional partners for funding and implementation:** Charleston County and the General Assembly, as well as civic organizations and non-profits.

**Benefits anticipated, aside from greenhouse gas reductions:** Increased air quality; enhanced public health; increased energy independence; increased community resilience to fluctuations in the price of oil.

**Timeline for implementation:** Initial research and outreach can begin immediately, engaging County and local community to obtain necessary support. Before the beginning of the next legislative session, General Assembly members should

# Recommendations

be engaged as well.

## **T-4H: Support purchase, use, and appropriate maintenance of high-efficiency vehicles for the CARTA fleet.**

**Summary of specific issues:** Buses present many fuel efficiency and emission challenges. Solutions enter the market with every new bus design. However, as buses last ten to twenty years, the most immediate improvements would result from retrofits to the existing fleet.

**Strategy/Action Plan:** City staff should appoint a liaison to help CARTA and Tri-County Link pursue federal and state grant opportunities. Tasks should include the following:

- Regularly research advances in the technology of alternative fuels, such as biodiesel, compressed natural gas, propane injection, etc.
- Regularly research advances in the technology of pollution control devices such as diesel filtration, oxidation converters, etc.
- Regularly compare the lifecycle costs and benefits of retrofitting buses in the existing fleet.

**Implementation responsibilities/ assignments:** The Sustainability Director or City Fleet Management should designate an appropriate liaison.

**Regional partners for funding and implementation:** CARTA, Tri-County Link, and BCDCOG, which facilitates of federal funding for local transit providers.

**Benefits anticipated, aside from greenhouse gas reductions:** Improved air quality, reduced dependence on foreign oil, and an injection of capital into local economies.

**Timeline for implementation:** The partnership and grant assistance should begin immediately.

## **T5. IMPROVE AIR QUALITY**

### **T-5A: Reduce emissions from small-motor equipment.**

**Summary of specific issues:** Small gasoline-powered motors account for a disproportionate amount of air pollution compared with other petroleum-fueled motors. Reductions in pollution from lawn equipment should not only improve overall air quality, but should also improve air quality in localized residential areas.

**Strategy/Action Plan:** The City should continue working with DHEC and other local governments and private entities to promote voluntary lawnmower exchange programs. This recommendation overlaps with the recommended procurement program, supporting the purchase and use of lower emissions equipment by the City of Charleston.

**Implementation responsibilities/ assignments:** The City of Charleston should participate through the Sustainability Office in the Lowcountry Lawnmower Exchange programs.

**Regional partners for funding and implementation:** DHEC, Sustainability Office, Charleston County Recycling.

**Cost to implement/net savings from implementation:** Lawnmower exchange programs can occur with little or no monetary support from the City.

**Benefits anticipated, aside from greenhouse gas reductions:** Noise pollution

will be reduced by the increased use of the quieter, electric mowers.

**Timeline for implementation:** The first lawnmower exchange program took place in March 2009.

**T-5B: Raise public awareness of the need to reduce air pollution outdoor burning and emissions from inefficient, outdoor wood-burning stoves. Educate the public on the existing laws and available cleaner-burning technologies and materials.**

**Summary of specific issues:** Existing state and local laws already limit outdoor burning. Pollution from burning yard debris burning and from wood stoves degrades air quality in residential areas and can lead to respiratory problems for sensitive people, such as those with asthma.

**Strategy/Action Plan:** Burning yard debris is prohibited, but enforcement needs to be improved. Also, outreach campaigns could spread the word about the adverse affects of open burning, alternative methods for disposing yard debris, and the benefits of using clean-burning wood stoves. Effective forms of outreach include press releases and direct contact with neighborhood associations.

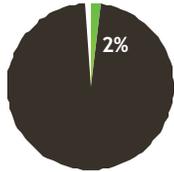
**Implementation responsibilities/ assignments:** City staff, including the Fire Department.

**Regional partners for funding and implementation:** DHEC could assist by participating in neighborhood association meetings or contributing air quality data.  
**Benefits anticipated, aside from greenhouse gas reductions:** Improved air

quality, especially in localized areas, and improved fire safety.

**Timeline for implementation:** Programs can be identified by summer 2010, and initiated by the end of 2010.

## Zero Waste Goals, Actions & Recommendations



Quantifiable measures related to W.1 could achieve 2% of 2030 reduction goal (equal to 22,860 mtCO<sub>2</sub>e). See page 21 for details.

### ACTIONS

1. **Commit to Zero Waste**
  - A. Pass a Zero Waste resolution.
  - B. Encourage inter-jurisdictional cooperation.
  - C. Implement per-unit system for waste collection and disposal fees.
  - D. Improve bulky trash collection.
  - E. Require the City to purchase environmentally preferable products when price and quality are comparable.
  - F. Improve data collection on solid waste, recycling, and composting.
2. **Expand Recycling and Composting**
  - A. Facilitate composting and mulching of all organic waste.
    - i. Residential and commercial
    - ii. City-owned facilities
  - B. Improve recycling of hazardous and electronic waste.
  - C. Increase recycling of construction waste.
    - i. Created by private projects
    - ii. Created by City projects
  - D. Redesign residential recycling program for ergonomics and increased recycling.
  - E. Encourage the County to add cardboard and all plastics #1 through #7 to residential recycling.
  - F. Require residential recycling.
  - G. Require commercial recycling, and make it easy and beneficial for

- business owners.
- H. Provide a recycling bin next to each public trash bin
- I. Require recycling at local events.

### 3. Explore Energy Recovery Technologies

- A. Create energy from residual solid waste, using the landfill as a last resort.

### 4. Encourage the Public to Support These Efforts

- A. Create a Zero Waste education plan.
- B. Educate builders about construction debris.
- C. Create and advertise a guide to help businesses reduce waste.

## W1. COMMIT TO ZERO WASTE

### W-1A: Pass a Zero Waste Resolution

**Summary of Issue(s) and Benefits:** Zero Waste is a philosophy and a design principle for the 21st century. By taking a “whole system” approach to the vast flow of resources and waste, Zero Waste maximizes recycling, minimizes waste, reduces consumption, and ensures that products are made to be nontoxic, durable, repairable, reusable, recyclable, or compostable.

Charleston County currently sends 90% of its waste to landfills: a “diversion rate” of only 10%. Various states and municipalities report diversion rates of 50%, 60%, and even 70%, while businesses nationwide, including Hewlett-Packard, report diversion rates of 90% or more.

#### **Recommendation/Strategy/Action Plan:**

With support from the Charleston Green Committee, the City should pass a Zero Waste Resolution that sets a goal to reduce the volume and weight of the City’s waste to zero or near zero by using the following actions:

- Revise local ordinances to support zero waste;
- Hold industry liable for creating less

toxic and more efficient products. This is called Extended Producer Responsibility (EPR). Work through the Conference of Mayors, Chamber of Commerce, State and Federal Government agencies and private industries;

- Use the City’s buying power to support EPP principles (See Recommendation W-1E);
- Work with the County and surrounding municipalities to build and continuously improve processing and recovery systems that will move us toward Zero Waste (See Recommendation W-1B);
- Require waste to be separated at the source into three streams: compostables, recyclables and residuals (See Recommendations W-2A through W-2I);
- Compost and mulch organic waste to avoid potent methane emissions (See Recommendation W-2A);
- Improve solid waste and recycling data collection (See Recommendation W-1F);
- Educate citizens so that Zero Waste becomes part of our culture. (See Recommendation W-3A)

#### Implementation Responsibilities/Assignments

- The Sustainability Director should identify which local ordinances should be changed to support zero waste;
- The Public Services Department should conduct a waste composition study;
- City to provide incentives to businesses that support EPR;
- City should Invest in recovery infrastructure, not landfills
  - ◊ No more tax funds for landfills or incinerators
  - ◊ Use tax funds to build “Resource Recovery Parks”
  - ◊ Example CHARM Boulder, Colorado;
- Maximize Employment Opportunities -- Sorting and processing recyclables alone sustains ten times more jobs than landfilling or incineration.<sup>1</sup>

#### Timeline for Implementation/Performance Goals

- 2010 or before City Council to Pass a Zero Waste Resolution
- Implement all other Waste Subcommittee recommendations as soon as possible
- 2010 Work with County to pass ordinance to ban certain items from the landfill

- 2010 Pass ordinance to prohibit sale of unnecessarily toxic or polluting products ex. plastic bags (San Francisco, etc)
- 2010 and beyond work with County to educate citizens
- 2010 Work with Chamber of Commerce to educate commercial sector and manufacturers

#### References (standards, other cities etc.):

Eco Cycle: <http://www.ecocycle.org/zero/index.cfm>

Cool 2012 Campaign: <http://www.cool2012.com/>

Stop Trashing the Climate Report: <http://www.stoptrashingtheclimate.org/>

Grass Roots Recycling Network: <http://www.grrn.org/zerowaste/index.html>

Reaching for Zero: A Citizens Plan for Zero Waste in New York City:

<http://www.consumersunion.org/other/zero-waste/overview.html>

Zero Waste California: <http://www.zerowaste.ca.gov/>

Gary Liss and Associates, Zero Waste: <http://www.garyliss.com/id18.html>

These cities have achieved approximately 50% diversion: Seattle; San Jose; Twin Cities, MN; and smaller cities like Poway in northern San Diego County and Tacoma Park, MD.

- The State of New Jersey has reported a 56% statewide diversion rate and the Australian Capital Territory of Canberra has adopted a Zero Waste goal by 2010.
- Halifax, Nova Scotia has adopted a resource management strategy to achieve Zero Waste.
- 97% diversion - Mad River Brewing in Northern California
- 95% diversion - Zanker Construction & Demolition Landfill in San Jose, CA
- 97% diversion - Hewlett-Packard in Roseville, CA
- 95% recycling rates at office buildings in the EPA Green Buildings program
- 80-90% diversion rates at many businesses with some progressive businesses now adopting Factor 10 goals to achieve a ten-fold increase in efficiency

**W-1B: Encourage inter-jurisdictional cooperation.**

# Recommendations

## **Summary of Issue(s) and Benefits:**

Responsibility for solid waste in Charleston County is shared among the County, the municipalities, and various private businesses. Waste hauling is provided by municipalities and private entities. Disposal is provided by the County and private entities. Recycling services are provided by the County and by private business.

## **Recommendation/Strategy/Action Plan:**

Given this complex web, the City of Charleston must work with Charleston County, other municipalities, and private businesses to create and maintain a solid waste system that places the highest value on waste reduction, recycling, and composting.

## **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

To be calculated using EPA's Waste Reduction Model (WARM).<sup>2</sup>

## **Implementation Responsibilities/**

**Assignments:** Inter-jurisdictional coordination is already well underway as the City of Charleston is represented on the Charleston County Green Ribbon Committee and Charleston County is represented on the City of Charleston's Green Committee. The City Green Committee and City staff are responsible for finalizing the City Green Plan, which will need to be revised once the County writes its own Green Plan. Cooperation on solid waste issues among City and County elected officials and staff should increase.

## **W-1C: Implement per-unit system for waste collection and disposal fees.**

**Summary of Issue(s) and Benefits:** Across the nation, more than 7,000 cities and towns are using Unit-Based Pricing (UBP) to save tax dollars and generate revenue. Under our current system, residents pay flat fees to the City and the County regardless of how much waste they generate. These flat fees obscure the actual cost of waste disposal, and require customers who create little waste to subsidize customers who

generate large volumes. The fee structure should be changed to provide a strong incentive to recycle and compost more and discard less.

## **Recommendation/Strategy/Action Plan:**

The City should collaborate with the County to plan and implement a UBP system. Several approaches can be taken. The simplest would be to have the County charge the City for all actual waste disposal costs. The city would in turn develop a rate structure based on the size of trash container provided and frequency of collection. Extensive outreach will need to be developed for residential customers to familiarize them with the new system.

## **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

To be calculated using EPA's Waste Reduction Model (WARM).<sup>3</sup> Performance measures, to be quantified by City and County staff, should include the percent reduction in garbage disposed at energy recovery facilities and landfills, and the financial savings for residents.

## **Implementation Responsibilities/**

**Assignments:** A UBP system will require both inter-jurisdictional coordination with Charleston County and guidance from an expert in solid waste management. Both the City and the County already have access to such expertise.

## **Cost to Implement/Net Savings from Implementation:**

Costs may include additional consulting fees. Net savings will likely be substantial based on the experience of other municipalities. Dover, New Hampshire, for example, saves \$322,000 annually while reaching a recycling rate of 50%.<sup>4</sup>

## **References (standards, other cities etc.):**

EPA Waste Conservation Tools Website with Unit Based Pricing standards and communities <http://www.epa.gov/epawaste/conserve/tools/payt/index.htm>

## **W-1D: Improve bulky trash**

## collection.

**Summary of Issue(s) and Benefits:** The City currently provides weekly collection of loose trash, using a claw truck to grab items ranging from old sofas to bagged household garbage. Yard waste is supposed to be separated, but often is not. In addition to routinely sending yard waste to the landfill, this service also discourages residents from repairing or donating reusable items. Further, it will undercut attempts to implement Unit-Based Pricing for roll-cart collection.

**Recommendation/Strategy/Action Plan:** The City should analyze the following options and implement the best choices:

- Reduce the frequency of this service to no more than once a month;
- Replace the service with a special call-in service;
- Implement unit based pricing for this service.

At the same time, the service should be restricted to bulky items too large to fit into roll carts. It should clearly prohibit yard waste, electronic waste, and bags of household garbage. It should insure recycling of “white goods,” i.e. large appliances. Further, where yard waste and bulky trash collection coincide on the same day, residents should be required to keep piles sufficiently separated to avoid cross-contamination. The City should separately look to implement a GPS-based tracking system to increase collection efficiency. As bulky trash service is improved in these ways, outreach materials will be needed for residents.

### **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

Percent reduction in bulky waste requiring curbside pickup.

### **Implementation Responsibilities/Assignments:**

The City’s Public Services Department should coordinate with the County to ensure proper disposal of bulky trash, consistent with recommendations on Unit-Based Pricing (W-1C) and composting (W-2I).

**Cost to Implement/Net Savings from Implementation:** Cost savings from elimination of service could be rebated to residential

customers.

## **W-1E: Require the City to purchase environmentally preferable products when price and quality are comparable.**

**Summary of Issue(s) and Benefits:** Currently, City departments independently purchase supplies and services pursuant to policies set forth by the City’s procurement office. Whether to purchase environmentally preferable products is left to the discretion of multiple City employees.

Many municipalities, states, and the federal government have committed to EPP. Such programs restrict purchasing to products that are nontoxic, durable, repairable, reusable, recyclable and or compostable where price and quality are comparable.

Factors that can be considered in making purchasing decisions include raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, and disposal of the product. Benefits of EPP programs include potential cost savings; reduction of waste sent to landfills and incinerators; reduced pollution; conservation of natural resources; and support of locally produced goods and services.

### **Recommendation/Strategy/Action Plan:**

- Establish an EPP Policy;
- Develop EPP goals and track EPP purchases;
- Purchase only EPP products where quality and price are equal to or better than non-EPP products;
- Develop standards - for example, minimum quantity of recycled content - using guidelines set forth by the EPA, other governments, and non-profit organizations, such as Green Seal;
- Create a cross-functional team (including City staff from key purchasing areas, a procurement representative, a local sustainability expert, and the Sustainability Director) that will conduct research, target product categories and attributes, and develop an implementation plan;
- Develop a charter for the team and timelines for the project;

# Recommendations

- Evaluate other jurisdictions' programs and get feedback on successes and challenges;
- Obtain department feedback on what is currently purchased and what could be purchased through an EPP program;
- Train City employees.

## **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

Performance measures could include the dollar value of EPP purchases. In the long run, the City might develop measures to determine how much money is being saved and/or make annual comparisons of materials costs, energy costs, water consumption, insurance costs, recycling rates, and chemical consumption, to the extent that these quantities can be determined.

## **Implementation Responsibilities/**

**Assignments:** The Sustainability Director will facilitate meetings with the cross-functional team and City departments and divisions. The team will make its recommendations to the Mayor's Office and City's Department Heads. Once the policy is approved, the Sustainability Director will coordinate implementation of the program with assistance from the cross-functional team. City departments will then be required to set internal goals and track EPP purchases.

## **References (standards, other cities etc.):**

In addition to the federal government, the states of North Carolina, Indiana, Minnesota, Oregon, and California, have adopted EPP policies. Local governments with such policies include:

- ◇ Austin, Texas
  - ◇ Boulder, Colorado
  - ◇ Phoenix, Arizona
  - ◇ King County, Washington
  - ◇ Portland, Oregon
  - ◇ Seattle, Washington
  - ◇ San Jose, California
- The federal EPA EPP Program helps federal agencies comply with green purchasing requirements, using the federal government's enormous buying power to stimulate market demand for

green products and services. <http://www.epa.gov/opptintr/epp/>

- Green Seal is an independent, nonprofit organization dedicated to safeguarding the environment by promoting the manufacturing, purchasing, and use of environmentally responsible products and services. [http://www.greenseal.org/resources/reports/CGR\\_officesupplies.pdf](http://www.greenseal.org/resources/reports/CGR_officesupplies.pdf)
- A model EPP policy is available from Alameda County, California: [http://www.ecocycle.org/tools/atwork/documents/sample\\_epp.pdf](http://www.ecocycle.org/tools/atwork/documents/sample_epp.pdf)

## **W-1F: Improve data collection on waste, recycling, and composting.**

**Summary of Issue(s) and Benefits:** In order to improve Charleston's waste management system in the most cost-effective way, we need data, including the current amounts of solid waste, yard waste, construction and demolition (C&D) waste, and recyclables produced within City limits.

## **Recommendation/Strategy/Action Plan:**

The City should gather key waste management data, including but not limited to the following: amount of trash collected in tons and volume, amount of garbage collected in tons and volume, amount of yard waste collected in tons and volume, amount of C&D waste disposed of in a landfill versus recycling, amount of trash going to landfill versus incinerator, amount of garbage going to landfill, amount of white goods (i.e. large appliances) recycled in tons and volume, amount of yard waste being composted vs. landfilled, amount of recycling from all city facilities including commingled plastic, glass, aluminum and steel cans, paper, cardboard, scrap metal, phone books, books, magazines, newspaper, rechargeable batteries, fluorescent tubes, mercury, pallets, oil, oil filters, tires, and antifreeze.

The EPA and DHEC currently use Re-Trac data management system to keep track of the amounts of materials recycled,

composted and deposited at a landfill. The City should implement either Re-Trac or a compatible system.

#### **Implementation Responsibilities/Assignments**

- The Public Services and Sanitation departments should measure all aspects, including but not limited to all aspects noted above, of their solid waste programs.
- The County should be asked to report on a monthly basis to the City on the amount of solid waste and recycling collected within City limits.
- Private haulers should be asked to report on a monthly basis to the City on the amount of trash, garbage, yard waste, C&D waste, and recyclables collected within City limits.
- Reporting should be tied to the Business License for the private haulers.
- Annual reports should be made to DHEC, Charleston County, the Municipal Association, the City's Director of Process and Service Improvement, and the Sustainability Director.
- All data should be peer-reviewed for accuracy.

#### **Cost to Implement/Net Savings from Implementation:**

The City will need to set up a database system using existing computer resources, or they will need to purchase a system. The City will also need to retrain staff to track data.

#### **Timeline for Implementation/Performance Goals:**

Begin immediately, because it allows measurement of the success of other recommendations.

#### **References**

See SC DHEC Office of Solid Waste Reduction and Recycling

## **W2. EXPAND RECYCLING AND COMPOSTING**

### **W-2A: Facilitate composting and mulching of all organic waste.**

**Summary of Issue(s) and Benefits:** Organic waste, including food scraps and yard clippings, accounts for 40% of the waste produced by

individuals.<sup>5</sup> Burying this organic waste produces prodigious amounts of the greenhouse gas methane, which is 72 times more potent than carbon dioxide over a 20-year period. Incinerating organic waste releases large quantities of carbon dioxide. Charleston County has buried or incinerated much of its organic waste in the past, but the County is now in the process of changing these policies.

In San Francisco, residents and businesses send 400 tons of organic waste each day, including food scraps, yard clippings, and soiled paper, to a facility where it is composted.<sup>6</sup> This is a brand new program, quickly expanding. Other local governments in North Carolina, Minnesota, Michigan, Colorado, California, and Washington State are now collecting food scraps as well as yard waste for composting.<sup>7</sup>

Compost, when used in organic farms and gardens, actually captures carbon dioxide the way a forest would, slowing climate change.<sup>8</sup> Also, compost is a marketable product.<sup>9</sup> So is mulch, which is easily created using a chipper. Charleston residents and businesses have been paying significant fees to landfill or incinerate organic waste. The City then spends \$15,000 per year for mulch, and an undetermined amount for compost, for parks and public landscaping.

**Recommendation/Strategy/Action Plan:** The City should:

- **Research Composting:** Research development of an organic waste composting and mulching program for City operations, including any laws or regulations that may present challenges. Include a waste audit to determine how much organic waste is buried or incinerated each year. Include a plan for using compost and mulch in City operations and marketing or donating the rest to local residents and businesses. Assess the interest in developing a countywide approach. Research markets for yard debris that may not be easily mulched or composted (e.g., palm fronds).
- **Facilitate Composting:** Depending on the results of this research, facilitate organic waste composting by:

# Recommendations

- ◇ Developing a pilot curbside organic waste collection program;
  - ◇ Identifying drop sites for organic waste;
  - ◇ Assisting and encouraging groups and individuals interested in developing a composting co-op;
  - ◇ Identifying locations at City parks where it would be practical to compost on-site;
  - ◇ Encouraging the use of biodegradable and compostable packaging and garbage bags; and
  - ◇ Encouraging, through education and possible subsidies, the use of backyard composting vessels, which could capture up to 25% of the municipal solid waste stream.
- **Create Partnerships:** Foster a dialogue between local agriculture and landscaping enterprises, City and County waste handlers, and restaurants and other copious producers of organic waste to explore the creation of an organics market. Restaurants in Chicago and elsewhere are forming just such compost co-ops.
  - **Use Compost:** Require the use of finished compost as an alternative to petrochemical fertilizers in city activities such as City parks, facilities and public rights-of-way.
  - **Mitigate greenhouse gases:** Mitigate methane from existing sources where organics have already been buried by flaring or using it for an energy source.

## Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics

- Percent reduction of compostable waste diverted from landfill/incineration, and resulting reduction in greenhouse gas emissions (need baseline).
- Number of people receiving composting guidance.
- Amount of compost sold or used by the City, and resulting greenhouse gas sequestration.<sup>10</sup>
- Reduction in use of petroleum-based fertilizers (need baseline).

- Amount of money saved by businesses involved in cooperative composting, or receiving free or reduced-rate compost from the City.

## References (standards, other cities etc.)

Dominic, Ernest, Favoino, and Hogg. The Potential Role of Compost in Reducing Greenhouse Gases. 2008. Waste Management & Research, Vol. 26, No. 1, 61-69  
Kashmanian, Richard. Markets for Compost. EPA. 1993.

In encouraging biodegradable plastics, governments such as Malta have used a carrot-and-stick approach, increasing taxes on eco-unfriendly plastics, while keeping biodegradable products tax exempt. Other cities, like Chicago, have introduced legislation to encourage “buyers co-ops” to reduce the price of such plastics. San Francisco is one of the leading city for plastic waste reduction and biodegradable plastic use.

## W-2B: Improve recycling of hazardous and electronic waste.

A loophole in the current law allows households to mix hazardous waste with regular trash. Hazardous household waste includes, for example, bleach, batteries, pool chemicals, insecticides, paints and construction chemicals, and items containing mercury such as thermometers. Toxins associated with these items are dangerous and have both human health and environmental implications.

Electronic Waste (E-waste), including cell phones, computers, televisions, and DVD players, is one of the fastest rising waste streams in the nation. At the same time, E-waste is one of the largest sources of heavy metals and organic pollutants in the waste stream. Further, many electronics contain valuable recyclable materials including gold, silver, aluminum, and plastics. Nationwide, over 100 million pounds of materials are recovered from electronics each year. Here in South Carolina, we generated an estimated 56,025 tons of E-waste in 2005, but only 728 tons were

recycled.<sup>11</sup>

Currently, residents can properly dispose of hazardous and E-wastes only by driving to the Bees Ferry Landfill or the Charleston County Recycling Center on Romney Street. Multiplying these locations would help reduce the amount of hazardous waste being disposed of improperly.

**Recommendation/Strategy/Action Plan:** Work with the County, DHEC, and private entrepreneurs to establish more drop-off sites and provide public education about hazardous and E-wastes.

**Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:** Monitor the amount and types of hazardous and E-wastes properly disposed of as reported by Charleston County. Count the number of new waste sites approved annually.

**Cost to Implement/Net Savings from Implementation:** As a cooperative effort, the cost will be spread among stakeholders including Charleston County, the City of Charleston, businesses and residents.

**References (standards, other cities etc.):**

Charleston County Solid Waste and Recycling Department  
DHEC Bureau of Land and Waste Management  
EPA eCycling Website: <http://www.epa.gov/epawaste/conservematerials/ecycling/index.htm>  
EPA Universal Waste Website <http://www.epa.gov/epawaste/hazard/wastetypes/universal/index.htm>

**W-2C(i): Increase recycling of construction waste (created by private projects ).**

**Summary of Issue(s) and Benefits:** In South Carolina, the amount of construction and demolition (C&D) debris has risen consistently. According to the state Department of Health and Environmental Control (DHEC), 1.1 million tons of this waste in 1999 increased to 3.6 million tons in 2007. At the same time, C&D debris went from being 13% of the state's solid waste stream to 21%.

Here in Charleston County, more than 45% of the waste taken to the Bees Ferry Landfill in 2006 was C&D waste. By 2007, the total C&D waste taken to Bees Ferry was 189,000 tons - almost 10% of the state C&D total. In 2008, Bees Ferry stopped accepting this waste from private haulers to prolong the life of its C&D "cells."

Better management of C&D waste would reduce environmental impact and greenhouse gas emissions associated with putting this debris into landfills. The good news is that 80% of a home builder's waste is recyclable. Unfortunately, of the 3.6 million tons of C&D debris generated statewide in 2007, only one-third was recycled or salvaged. The rest went to landfills or incinerators.

**Recommendation/Strategy/Action Plan:** The City should significantly reduce the amount of C&D debris taken to the landfill from private commercial and residential projects by increasing recycling, reuse and/or salvage. Materials diverted should include all masonry, aggregate, untreated lumber, metals, cardboard, glass, and other reusable building materials. The City should build a strong C&D waste diversion program by first incentivizing proper waste management planning and compliance with a minimum diversion rate established by the City; in time, requiring use of a materials recovery and recycling plan and achievement of a minimum waste diversion rate established through City mandate. Specific strategies are as follows:

- **Use Incentives:** The City should develop an incentive scheme encouraging builders to achieve a minimum diversion rate, preferably through the use of a comprehensive materials recovery and recycling plan prepared by the builder. The general contractor could show compliance by submitting receipts showing waste tonnage and destination. The City should employ phased implementation first incentivizing and then requiring proper planning and waste diversion to allow time for outreach, builder education, and development of markets for recycled/reused materials. Initially, the City should reward the achievement of a minimum diversion rate established by the City and

# Recommendations

the use of a materials recovery and recycling plan. Possible incentives include reduced impact fees.

- **Require Planning:** First through incentive and then by mandate, require all builders seeking a City permit for a C&D project to have a comprehensive materials recovery and recycling plan showing the ability to achieve the minimum diversion rate established by the City. The waste management plan should include specific methods for refuse recycling, salvage, reuse, or reclamation and on-site source separation. The City should develop guidelines for materials recovery and recycling plans and minimum diversion rates, which should depend on the project size and whether the project is residential or commercial.

#### **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

- Number and percent of developers/ construction firms awarded the incentive and projects which achieve minimum diversion rate.
- Amount of C&D debris that has been diverted from the landfill. A baseline value is needed. Then measurements can determine change over time.

**Cost to Implement/Net Savings from Implementation:** Initially, builders (and their clients) will bear increased cost of on-site waste separation and non-landfill disposal as the construction salvage and recyclables market develops the capacity/ scale to provide the services required at costs comparable to conventional comingled C&D debris dumpster service.

**Timeline for Implementation/Performance Goals:** Create program by 2011; incentivize the use of a comprehensive materials recovery and recycling plan with a 50% diversion by 2012; and require a plan and a 75% diversion by 2017.

#### **References (standards, other cities etc.):**

Standards: LEED, ECH, NAHB  
MUSC guidelines: <http://academicdepartments.musc.edu/vpfa/>

[eandf/sustainability/c\\_d](http://eandf/sustainability/c_d)

Other cities: Austin, TX

## **W-2C(ii): Increase recycling of construction waste (created by City projects)**

**Summary of Issue(s) and Benefits:** In April 2008, the City passed a resolution to ensure that all City construction projects meet LEED basic certification level standards whose planning began in 2009. Construction waste management is an aspect of LEED certification. By following this recommendation, the City will be in a position to help the County achieve its recent mandate to increase recycling and waste diversion rates to 40%.

#### **Recommendation/Strategy/Action Plan:**

The City should commit to:

- Significantly reduce the amount of landfilled C&D debris generated by City construction projects;
- Develop guidelines for, and establish the use of, a comprehensive site waste management plan for each project. The plans should detail methods of recycling, reuse, salvage and separation on-site;
- Commit to achieve a minimum diversion rate through steps to recycle, salvage and/or reuse, at a minimum, all masonry, aggregate, untreated lumber, metals, cardboard, glass and other reusable building materials from all City-owned C&D sites;
- Commit to a diversion rate of 50% per project by 2012 and 75% by 2017, in order to achieve basic LEED certification standards for Materials and Resources credits 2.1 and 2.2 respectively;
- Establish specific, predetermined disposal sites to facilitate the recycling or salvage of C&D materials. Also, establish disposal protocols and identify appropriate receptacles;
- Develop outreach to inform City staff and contractors of new procedures.

**Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

- Amount and percent of C&D debris diverted from landfills (need to establish a baseline figure before the program begins). From this figure it is possible to calculate a reduction in greenhouse gases.
- Number of projects that achieve waste diversion rates. (success rate)

#### **Cost to Implement/Net Savings from Implementation**

- Short term: possible increased cost to City and/or contractor of on-site separation and hauling, may be offset by decreased disposal fees at landfill.
- Long term benefits will accrue due to rising cost of landfill tipping fees and development of markets for recycled/reused materials.

#### **References (standards, other cities etc.):**

Standards: LEED-NC, LEED-ND  
 MUSC guidelines [http://academicdepartments.musc.edu/vpfa/eandf/sustainability/c\\_d](http://academicdepartments.musc.edu/vpfa/eandf/sustainability/c_d)  
 Other cities: Austin

### **W-2D: Redesign residential recycling program for ergonomics and increased recycling.**

**Summary of Issue(s) and Benefits:** The County currently provides biweekly recycling collection to residential customers using small 20-gallon bins. By contrast, the City provides weekly garbage collection using 96 gallon roll carts. Residents, therefore, have 10 gallons of recycling capacity for every 96 gallons of trash capacity: a ratio of about 1 to 10. Recycling bins can quickly fill up before the next collection, making it harder for residents to recycle.

Also, full recycling bins can be very heavy. Because they lack wheels and require bending and lifting, they can be a challenge even for healthy adults to handle safely.

**Recommendation/Strategy/Action Plan:** The Public Services department should coordinate with the County to replace all recycling bins with larger roll carts, or offer the option of larger roll carts to interested customers, as part of replacement plan to modernize collection equipment vehicles over time. If recycling roll

carts are optional, outreach materials will be needed to inform residents. Over time as recycling increases and garbage collection decreases, Public Services can coordinate with the County to adjust the frequency of both garbage and recycling collection. Implementation of this recommendation should be consistent with implementation of Unit-Based Pricing. (See Recommendation W-1C.)

#### **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

- Number of residents using a roll cart versus bin versus nothing.
- Percent increase in recycled materials from residences (need baseline data).
- Percent decrease of recyclable waste in trash containers (need baseline data).
- Number of requests for roll carts if optional.

**Cost to Implement/Net Savings from Implementation:** The primary cost are new roll carts and a different type of collection vehicle.

### **W-2E: Encourage the County to add cardboard and all plastics #1 through #7 to residential recycling.**

**Summary of Issue(s) and Benefits:** More than one-quarter of South Carolina's municipal solid waste is cardboard. Yet cardboard, which is accepted at the County's recycling center, is not included in the residential curbside collection service, due to limitations of current recycling truck fleet to hold large sheets of cardboard.

The County does accept plastics #1 and #2 bottles, jugs and jars for recycling, but it does not accept other plastic #1 and 2 containers or any plastics #3 through #7. Some markets exist for this material.

**Recommendation/Strategy/Action Plan:** The Public Service department should encourage the County to add cardboard to their curbside collection, perhaps by using a compactor truck, typical of garbage collection, to pickup and haul cardboard for recycling. The department should also encourage the County to begin recycling all plastic types #1 through #7, accepting them as part of curbside collection. The City should

# Recommendations

assist the County by researching costs and market values and developing a full proposal, then assist with outreach to residents.

## **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

- Amount of new material collected.
- Decrease in tonnage of trash collected from City residences (need baseline).
- Decrease in waste sent to the landfill (need baseline.)

## **References (standards, other cities etc.):**

SC Recycling Market Development Advisory Council <http://www.scommerce.com/resources/conferencesevents/recyclingmarketdevelopmentadvisorycouncil.aspx>

## **W-2F: Require residential recycling.**

**Summary of Issue(s) and Benefits:** The South Carolina Solid Waste Policy and Management Act of 1991, set a 35% recycling goal for the State of South Carolina by 1995. Charleston County currently only recycles 10% of its solid waste, far below the stated goal for the State.

Kessler Consulting, solid waste consultant for the County, has estimated that residential recycling in Charleston County could more than double. Local households currently recycle only 22,000 tons per year, whereas we could be recycling 45,000.

Recycling has numerous benefits, beyond what most people are aware of:

- Recycling reduces the pollution, environmental damage, and greenhouse gas emissions caused by the extraction, transport, and processing of virgin materials;
- Recycling saves energy. Producing an aluminum can from recycled metal uses 95% less energy. Producing products from recycled steel uses 60% less energy, recycled glass 40% less energy, and recycled plastics 70% less energy;<sup>12</sup>
- Recycling avoids costs associated with

incineration and landfilling ;

- Recycling stimulates development of “green” technologies and products.

## **Recommendation/Strategy/Action Plan:**

The City should pass an ordinance that:

- Requires residential recycling consistent with the County’s collection capacity;
- Ban disposal of paper, aluminum and tin cans, plastic bottles #1 & #2, cardboard, and glass jars in curbside trash collection bins and carts; and
- Institute policies necessary to enforce this requirement.

Further, the City should provide information to residents about proper curb-side recycling, including an outline of materials collected, acceptable condition of materials, and separation guidelines.

## **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

- Need baseline data on the amount of material recycled and annual percent increase of household recyclables collected;
- Need number of households in compliance.

## **Implementation Responsibilities/Assignments:**

- The Public Services Department should arrange with the County to coordinate weekly residential recycling and trash collection so that collection can fall on the same day in as many areas of the City as possible. Public Services and the County should coordinate initial education for residents.
- City should determine unacceptable amount of recyclables in trash (e.g. more than 1-2 items), at which point Solid Waste and/or Environmental Services will be notified and the resident issued a first-time warning then a non-compliance fee.

## **References (standards, other cities etc.):**

State of South Carolina  
[http://www.scstatehouse.gov/ sess109\\_1991-1992/bills/388.htm](http://www.scstatehouse.gov/ sess109_1991-1992/bills/388.htm)

State of Virginia  
<http://www.deq.state.va.us/recycle/mandatory.html>

Cambridge, Mass: <http://www.cambridgema.gov/TheWorks/departments/recycle/ordinance.html#>  
In March 1991, Cambridge City Council passed the Mandatory Recycling Ordinance, which requires each owner or occupant of all residential and commercial buildings to implement recycling programs. The Ordinance set a goal of recycling 15% of our refuse within two years after the start of the curbside program and 25% after five years.

Cheltenham Township, PA: <http://www.cheltenhamtownship.org/publicworks/recycreg.htm#Mandatory%20Recycling%20Guidelines>.

San Diego County: <http://www.borderwastewise.org/databank/mandat.htm>

Seattle: [http://www.seattle.gov/util/Services/Recycling/Recycle\\_at\\_Your\\_House/index.asp](http://www.seattle.gov/util/Services/Recycling/Recycle_at_Your_House/index.asp)

San Francisco: [http://www.sfenvironment.org/our\\_programs/interests.html?ssi=3&ti=6&ii=236#what\\_the\\_ordinance\\_does](http://www.sfenvironment.org/our_programs/interests.html?ssi=3&ti=6&ii=236#what_the_ordinance_does)

Westford, Ma: <http://www.westfordrecycles.org/index.htm>

## W-2G: Require commercial recycling, and make it easy and beneficial for business owners.

**Summary of Issue(s) and Benefits:** Currently, businesses and other commercial waste generators have three voluntary options for recycling. If they are on a County recycling collection route, they can use the same small 20-gallon bins offered to residents, if they are on King Street or Market Street they can call Fisher Recycling for cardboard, oyster shells, cooking oil and wine cork collection, or they can pay a fee for private recycling collection. These limited options create obstacles to broad participation in commercial recycling.

City staff has proposed a pilot recycling collection project for downtown merchants that would be bundled with existing solid waste collection service. Based on the success of the pilot, the City would consider expansion beyond

the downtown business district. For the service to be economically efficient, broad participation will be necessary.

**Recommendation/Strategy/Action Plan:** Based on the City's experience with the pilot program, the Public Service Department should write an ordinance requiring mandatory commercial recycling in all service zones as the service becomes available. Recycling service should be convenient; it should include all recyclables consistent with the County collection service including cardboard and it should be available in a cost-neutral or beneficial format to all business and commercial waste generators. The City should consider contracting for service with the County or private haulers.

Enforcement should be handled as with residential customers. Waste haulers will periodically report on cardboard put out for trash collection. Solid Waste and/or Environmental Services will issue notices and assess appropriate fees for non-compliance.

Further, the City should study the suggestion that a waste reduction and recycling plan be included with business license applications and renewals, and should provide information about proper recycling practices. (See Recommendation W-3C.)

### Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:

- Amount of material collected (need baseline).
- Decrease in waste tonnage collected from City businesses (need baseline).
- Number of businesses in compliance.

## W-2H: Provide a recycling bin next to each public trash bin.

**Summary of Issue(s) and Benefits:** There are currently limited recycling bins for public use on City streets and in City facilities, including garages and parks. As with event recycling, recycling in public areas is a high profile, low-cost service demonstrating the City's commitment to zero waste.

**Recommendation/Strategy/Action Plan:** All public area waste stations throughout the City

# Recommendations

should include both waste and recycling receptacles. The Parks and Public Service departments should coordinate and standardize their activities, including:

- Selecting recycling bins based on function and aesthetics;
- Obtaining BAR/Design Review Committee approval as needed;
- Developing a collection plan;
- Placing the bins;
- Exploring a public/private partnership where businesses purchase bins for streets and the City services the bins;
- Educating citizens using various media;
- Surveying use of the bins annually to determine the need to move them or add more.

#### **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics**

- Number of recycling receptacles placed.
- Amount of recycled material collected from public receptacles.
- Percent reduction in City public area waste sent to landfill and incinerator (need baseline).
- Cross-contamination rate (recyclables mixed with trash).

**Cost to Implement/Net Savings from Implementation:** Cost of bins and labor.

**References (standards, other cities etc.):**  
City of San Jose, [www.sjrecycles.org](http://www.sjrecycles.org)  
Cambridge, MA [www.cambridgema.gov](http://www.cambridgema.gov)

#### **W-2I: Require recycling at local events.**

##### **Summary of Issue(s) and Benefits:**

Charleston is a popular destination where events take place year round. From small functions like weddings to large gatherings like the Cooper River Bridge Run, events generate waste and often contribute to problems with litter and air and water pollution. No official sustainability guidelines currently exist for events, and few local vendors and event organizers use sustainable practices.

**Recommendation/Strategy/Action Plan:**

The City should include a sustainability component in its process for permitting events, including recycling and on-site separation measures. Permanent recycling receptacles should be provided at all City event locations. Additional temporary recycling receptacles should be available, just as additional trash receptacles are available. Recyclables collected would, of course, be consistent with Charleston County Recycling collection .

The City should create a sustainable event rating system whereby events will be rated by waste haulers based on the amount of material properly separated and other key criteria. Preference in scheduling for future events should be given to events with high ratings for waste reduction.

The City Special Events Committee can create an on-line guide to the new procedures based on models from other municipalities and organizations. It may be helpful to get input from a focus group of regular event applicants as the guide is being written. A simple printed sheet or card can alert events applicants to changed procedures and direct them to the website for details.

The Special Events Committee should remain available to answer questions; update the guide and permit applications; approve permitting requests; track event waste and recycling volume; and monitor compliance with permit requirements.

The City should coordinate with the Chamber of Commerce Sustainable Business Awards to develop an award for the “greenest” event related to recycling and waste diversion. Finally, the City should attempt to develop a reputation as a sustainable event center for the southeast based on objective, quantifiable accomplishments over the next few years.

#### **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:**

- Establish baseline data using the number of individuals who participate in events, and the number of events that transpire annually. Compare this with

data from other event-active municipalities regarding CO2 generation.

- Compare county waste data from weeks with very large events to weeks with no large events (need baseline data).

**Cost to Implement/Net Savings from Implementation:** These changes will cost the City staff time, and there will be an initial cost to event organizers while they learn the new rules.

**Timeline for Implementation/Performance Goals:** This is such an important and visible statement that the work should be undertaken as soon as possible, in late 2009 and early 2010.

**References (standards, other cities etc.):**  
[www.portlandonline.com](http://www.portlandonline.com)  
Sustainable Event and Sport Toolkit (online)  
[www.recyclingadvocates.org](http://www.recyclingadvocates.org)  
New York City Marathon

### W3. EXPLORE ENERGY RECOVERY TECHNOLOGIES

#### W- 3A: Create energy from residual solid waste, using the landfill as a last resort.

**Summary of Issue(s) and Benefits:** Waste reduction efforts such as unit based pricing, environmentally preferable purchasing, composting, and recycling should reduce our waste stream by 40% or better. It will take some time for these waste reduction efforts to take effect. While we are working to reduce our waste stream as close to zero as possible, the residual solid waste could be converted to an energy source. The city should work with the County to research energy recovery technologies.

Landfilling solid waste should be the last resort. If solid waste must be landfilled, the landfill should meet or exceed all EPA and state regulations. Landfill gas contains dioxin, carbon dioxide, mercury, and hundreds of other contaminants.<sup>13</sup>

**Recommendation/Strategy/Action Plan:** Create energy from our residual solid waste. All such energy recovery technologies should meet

or exceed EPA and state air quality standards and should recycle materials such as metal and glass not converted to energy. Energy recovery technologies should not undercut the economics or take the place of source reduction, composting, and recycling. Energy created should be used locally if possible.

**Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics:** To be calculated using EPA's Waste Reduction Model (WARM).<sup>14</sup> Performance measures, to be quantified by City staff, should include the percent reduction in garbage disposed at energy recovery facilities and landfills, and the financial savings for residents.

**Timeline for Implementation/Performance Goals:** The County is currently working on its future solid waste plans. The City should continue to work with the County through avenues such as the Green Ribbon Committee.

### W4. ENCOURAGE THE PUBLIC TO SUPPORT THESE EFFORTS

#### W-4A: Create a Zero Waste Education Plan

**Summary of Issue(s) and Benefits:** As explained in Recommendation W-1A, Zero Waste maximizes recycling, minimizes waste, reduces consumption and ensures that products are made to be non-toxic, durable, repairable, reusable, recyclable or compostable.

Charleston County currently has a limited amount of permitted landfill space. Also, waste improperly disposed in the landfill, or incinerated, unnecessarily increases our exposure to toxins and increases greenhouse gas emissions. Recently, a consultant for the County estimated that the county's current recycling rate, 10%, could increase to 40%. To allow this to occur, what is needed is a cultural shift toward reducing waste.

**Recommendation/Strategy/Action Plan:** The City Public Services Department should do the following, perhaps in collaboration with Charleston County Solid Waste Division:

# Recommendations

- Provide every customer with easy access to Zero Waste information, guidelines and resources, using a variety of formats and outreach methods;
- Update City and County websites with a focus on being user-friendly to all customers.
- Partner with other government departments that communicate monthly with customers (i.e. info printed on monthly utility bills.)
- Collaborate with existing community, government, and business recycling initiatives (i.e. businesses where batteries or oil are recycled.)
- Partner with businesses that already reach our customers. For example realtors, home delivery advertising companies such as VAL-PAK, businesses that send welcome info to new residences, telephone directories, and more.
- Post information on appropriate public information boards (i.e. library bulletin board).
- Conduct community outreach events regularly to support the Zero Waste program.
- Use Charleston's 101 Neighborhood Associations to communicate with and raise awareness among residents.
- Explore potential for labeling roll carts used for residential trash collection to notify residents of what should not be thrown in the trash.

#### **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics**

- Collaborate with the County to track solid waste and recycling data.
- Use citizen survey to track/monitor Zero Waste awareness and participation.

#### **Timeline for Implementation/Performance Goals**

- 2010 or before City Council to Pass a Zero Waste Resolution.
- Implement all other Waste Subcommittee recommendations as soon as possible.
- 2010 and beyond work with County to educate citizens.
- 2010 and beyond work with Chamber of

Commerce to educate commercial sector and manufacturers.

#### **W-4B: Educate builders about construction debris.**

**Summary of Issue(s) and Benefits:** As private builders are encouraged/ incentivized and City contractors are required to increase diversion rates for construction and demolition (C&D) debris, industry professionals will need to be educated about how to achieve these benchmarks. Looking forward to that time, the Charleston Green Committee supported the development of a C&D Waste Diversion Guide (on-line searchable database for the state and printed brochure for the tri-county area.)<sup>15</sup>

#### **Recommendation/Strategy/Action Plan:**

The City should:

- Advertise this guide on the City website and with appropriate businesses and nonprofits.
- Distribute the guide with all City issued construction and demolition permits.
- Assign a dedicated Public Services Department staff member to maintain and update the guide.

#### **Estimated Green House Gas Reduction Achieved and Other Performance Measures/Metrics**

Number of website hits

Number of brochures printed/requested

#### **Timeline for Implementation/Performance Goals:**

Ongoing updates and development of guide.

#### **References (standards, other cities etc.)**

DHEC Solid Waste and Recycling  
Boulder, CO

#### **W-4C: Create and advertise a guide to help businesses reduce waste.**

**Summary of Issue(s) and Benefits:** In 2008, commercial solid waste constituted an estimated 13% (4,721 tons) of the solid waste collected in the City. By minimizing

waste and increasing recycling, businesses can offset the cost of waste disposal. Also, recycling is increasingly becoming the signature of a “green” business.

**Recommendation/Strategy/Action Plan:** The Department of Public Services should create a guide to help businesses minimize waste and maximize recycling. The guide should include information on incentives like the Chamber of Commerce Sustainability Awards. Public Services and other departments should advertise the guide on the City website, make hard copies available, and use PSA’s, the telephone book, the water bill, etc. Also, approval or renewal of business licenses should be linked to the creation of a waste recycling plan.

**Estimated Greenhouse Gas Reduction Achieved and Other Performance Measures/Metrics:**

- Volume of materials/tonnage recycled by City businesses (need baseline).
- Percent of businesses implementing recycling (need baseline).
- Number of web hits and hard copies requested.

**Timeline for Implementation/Performance**

**Goals:** Create the guide with the launch of the downtown commercial recycling pilot program.

**References (standards, other cities etc.)**

Carolina Waste  
DHEC  
Charleston County